



Design Cultures in Conflict:

An Analysis of User Experience Design Standards in Social Media Smartphone Apps

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TABLE OF CONTENTS

Abstract.....	9
Acknowledgements	10
Declaration of Originality	11
Introduction.....	12
What is User Experience Design?	12
Motivation	14
Primary Questions/Aims	16
Methodological Approach	17
Content Analysis	17
Related Work.....	19
Genre in Social Media Traditions.....	23
Social Media App Sub-Genres: Text-Driven and Image-Based	27
Other Related Work.....	29
Research Contribution	31
Chapter Summaries	32
Part One: Framework & Context	38
Chapter 1 - UXD History & Framework.....	39
1.1 Usability and Human Factors & Ergonomics.....	41

1.1.1 From Human Error to Design Error	42
1.1.2 Timeless Principles of Perception	43
1.1.3 Early Recognition	44
1.2 Usability and Human Computer Interaction.....	46
1.2.1 The 70s: A Community is Born.....	46
1.3 The Development of HCD Approaches	49
1.3.1 The 80s & 90s: Design Principles	49
1.3.2 The 90s: Process and Usability Methods.....	54
1.3.3 The 90s: Interaction Design & Cooper.....	57
1.4 Usability & UXD.....	59
1.4.1 Reconciling Traditional Usability with UX.....	59
1.4.2 UXD in Context.....	62

Chapter 2 - Theoretical Framework: Cultural Media Studies ..66

2.1 Power Structures & Hegemony	67
2.1.1 Ideology	68
2.1.2 Capitalist: Exploitation, Force, and Coercion	69
2.1.3 Gramsci's Cultural Hegemony	70
2.1.4 Common Sense	72
2.1.5 Ideological Contestation	74
2.2 Media Forces of Change.....	76
2.2.1 Medium Theory & Technological Determinism	77

2.2.2 Medium as a Hybrid	79
2.2.3 Remediation and Convergence	80
2.2.4 Comparing Mediums	84
2.2.5 Dominant Design: The Development of Standards	86
2.2.6 Immediacy	90
2.2.7 Hypermediacy	92
2.2.8 Hypermediacy in Action	93
Chapter 3 - Historical Analysis.....	96
3.1 Typewriters	97
3.1.1 Initial Conceptions of Writing Machines	98
3.1.2 Evolution from “W”	100
3.1.3 Bar-Strikes: Lack of Visibility & Feedback	104
3.1.4 In Plain Sight	107
3.2 GUI & Interaction Design	110
3.2.1 Early HCI, GUI, & Indirect Control	111
3.2.2 A Familiar System	116
3.2.3 Same Mouse Different Considerations	119
3.3 Early Touchscreens & Direct Control	122
3.3.1 The Final Component	122
3.3.2 Other Touchscreen Technologies	125
3.3.3 The Birth of Multi-touch	128

3.3.4 The First iPhone: A Continued Convergence.....	131
Part Two: Methodology & Case Studies	135
Chapter 4 - Methodology	136
4.1 The Corpus	137
4.1.1 The Platform & Hardware	137
4.1.2 Corpus Eligibility & Selection	138
4.1.3 Data Collection	140
4.2 Affordance, Genre & ‘Move’ Framework.....	144
4.2.1 Related Work.....	146
4.3 User-Interface Standards Analysis	149
4.3.1 Aspects of User Experience Design	149
4.3.2 ‘Move’ Scheme Formation.....	151
4.3.3 Chi-square Analysis & Overall Results.....	157
4.3.4 Limitations.....	159
Chapter 5 - Entertainment through Frames of Inconsistency .	162
Part 1.....	165
5.1 User Freedom & Consistency.....	165
5.2 Aspect Ratios 2016: An Overview	167
5.3 A Tradition of User Freedom and Facebook.....	172
5.3.1 The Visibility Mechanics of Mobile Social Media	174

5.3.2 Multiple Images, Thumbnails, and Layers	177
Part 2	185
5.4 Horizontal Rectangles & Consistency	185
5.4.1 Early Historical Inconsistencies	186
5.4.2 YouTube & Vimeo: Remediation of TV & Film	187
5.4.3 Consistency at the Cost of ‘Boxing’	189
5.4.4 Recreating Experiences: Influence and Familiarity.....	193
5.4.5 Convergence within a Vertical Space.....	199
Part 3	209
5.5 Squares & Consistency	209
5.5.1 A Shared History: Square & Vertical Rectangles	210
5.5.2 Instagram Design: From Novelty to Norm.....	212
5.5.3 Interaction Design Analysis: From 2:3 to 9:16	217
5.5.4 Negotiating between Space and Presentation.....	222
5.6 Vertical Rectangles & Consistency	225
5.6.1 Vertical Video: Snapchat, Flipagram, and Musical.ly.....	227
5.6.2 Interaction Design: Snapchat.....	229
5.6.3 Interaction Design: Flipagram & Musical.ly	230
5.7 Conclusion	233
Chapter 6 - The Intersection of Primary Navigation Designs ..	236
6.1 Identifying Navigational Elements	237

6.2 Familiar OS Navigation Elements & Bars	246
6.3 YouTube & Users	251
6.3.1 Diverse Users.....	254
6.3.2 Different Experience Levels & Interactions.....	257
6.3.3 Tab Bar Visibility and Control	262
Part Three: Conclusion & Recommendations	267
Chapter 7 - Conclusion.....	268
7.1 Culturally Contingent UXD.....	268
7.2 Future Recommendations	272
7.2.1 Practical Recommendations for Designers.....	274
References.....	277
Appendix A:.....	302
Data Overview & Chi Square Results	302
Information	302
Navigation	306
Engagement	309
Entertainment	313
Personalisation	316
Appendix B:.....	319
Detailed Data & Examples	319

Information	319
Navigation	331
Engagement	341
Entertainment	358
Personalisation	365

Abstract

This thesis explores the User Experience Design (UXD) standards of social media apps through a cultural and media studies lens. UXD is a philosophy that guides how products are designed. Its most defining aspect is that designs are informed by knowledge about users. Research on UXD is generally focused on presenting practical considerations for designers and tends to lack historical and cultural accounts of the UXD practices and standards implemented within the app industry. To address this gap, this research project drew on a comprehensive historical snapshot of 60 social media apps available in 2016 divided equally into text-driven and image-based subgenres and stratified the apps' design features using a move-scheme analysis. The findings of this analysis were then used for app case studies grounded in a framework of UXD principles and explored through theories such as hegemony, remediation, and dominant design. This thesis demonstrates that the designs of social media apps are culturally contingent and shaped beyond the mere application of technical know-how through historical and cultural perspectives. The cultural contingency of design is highlighted through the many examples of conflicting app design standards in relation to media formats and navigation. These case studies demonstrate the complexity and challenge of designing for different users and meeting the UXD philosophy of putting the user first.

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Declaration of Originality

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

I give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

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Sami Dannaoui, June 2021

Introduction

This doctoral research is interdisciplinary in nature. It explores the design practices that were prominent at a time when the User Experience Design (UXD) philosophy and technologies were undergoing significant change. Counter to technological determinist approaches, this dissertation views this change through a socio-technical lens. This lens illuminates the reality of UXD practices and standards as being contingent upon cultural influences that often result in contesting practices. The dissertation explores these dynamics in relation to smartphone social media apps that existed in the 2016 market, a period when mobile social media communication was becoming more image focused.

What is User Experience Design?

The concept of ‘experience’ has been the subject of debate across different traditions and disciplines throughout the ages (Jay, 2005). Marc Hassenzahl (2010), a UX professor and scholar, defined an experience as “an episode, a chunk of time that one went through—with sights and sounds, feelings and thoughts, motives and actions; they are closely knitted together, stored in memory, labeled, relived and communicated to others” (p. 8). According to Hassenzahl the addition of the term ‘user’ to ‘experience’ emphasises a focus on interactive products (p. 8). In fact, the term ‘user experience’ grew out of the field of human-computer interaction.

Cognitive scientist Don Norman coined the term ‘user experience’ (UX) in 1993, during his time working at the computer company Apple. With his intervention,

the term ‘user experience’ moved from being merely an informal phrase to being formally included within a job title (Nielsen Norman Group, n.d.-c). At Apple, Norman served as Vice President of the Advanced Technology Group in the 1990s (Merholz, 2007; Norman et al., 1995) and led a group called the User Experience Architect’s Office (Norman, 2013, p. xiv).

Attempts at defining UX began as early as 1996 (Alben, 1996) and despite popular attempts to provide an all-encompassing definition (Hassenzahl & Tractinsky, 2006, p. 95), there appears to be no universal consensus regarding the definition of UX in the literature (Law et al., 2008). However, writers consistently describe three dimensions of UX: “user, product and interaction” (Hellweger & Wang, 2015, p. 1).

Don Norman refers to UX as encompassing “all aspects of the end-user's interaction with the company, its services, and its products” (Norman & Nielsen, n.d., Summary section). In an interview, Norman elaborates by adding that this “[includes] industrial design, graphics, the interface, the physical interaction and the manual” (Merholz, 2007, para. 2). Indeed the design of all these elements together bears an influence on the user’s overall experience. However even at an individual level, “every product that is used by someone creates a user experience: books, ketchup bottles, reclining armchairs, cardigan sweaters” (Garrett, 2010, p. 6), and even smartphone apps. Product designers generally strive to evoke a positive experience in users through good product design.

There have been several design philosophies developed that can support achieving a UX design (Saffer, 2009, p. 33). Human-Centred Design (HCD) for instance contributes to a UXD philosophy by focusing primarily on users (Norman, 2013, p. 8). The HCD philosophy has been widely cited by designers and scholars who

have brought forth their own HCD approaches and design principles, as explored in Chapter 1. The HCD approach used to assess the UX design (UXD) of app interfaces is similar to the heuristic evaluation method introduced by Nielsen (1993, p. 223) in that design principles are being applied to examine designs. More importantly, the design principles ground the research in a UXD framework to bring an understanding of the condition of UXD in social media apps.

Some of the HCD approaches (discussed later) have become an industry standard used by big corporations such as Facebook, Google, Microsoft, and Apple. The methods empower designers to design products with positive user experiences. For example, Apple's first smartphone product, the iPhone, was introduced in 2007 and astonished market competitors and customers with its overall design and features. The renowned iPhone became an exemplar of the UXD philosophy. Further, the introduction of the iPhone also marked the beginning of smartphone proliferation.

Motivation

In the years leading to 2007, developments had already begun to usher in a time where the ability to share images online was as conveniently accessible as that of sharing text. For instance, at the turn of the 21st century commercial mobile phones began to be equipped with in-built cameras for capturing images (CNN, 1999), the infrastructure for Multimedia Messaging Services (MMS) was being put in place for multimedia communication via a cellular network (Open Mobile Alliance, 2002), and trials on 3G network services had already begun for establishing faster internet speeds (CNN, 2001).

The diffusion of smartphones into the market after 2007 helped consolidate this change, especially since software applications (apps) offered more ways of sharing images.

Apps were popularised through the launch of distribution channels, such as Apple's App Store that was launched in 2008 and welcomed third party app distribution (Apple, 2008c). These distribution channels were the backbone through which third party developer apps increasingly diffused world-wide. Social media apps are among the most popular apps in distribution stores (Warren, 2015), and access to rapid image-sharing presented designers of social media apps and apps in general with an opportunity to create concepts with new innovative design features and more image-based app experiences. In fact, the popularity of social media apps highlighted two social media traditions that are expanded on later in this introduction: in one tradition, there are image-based apps, such as Instagram, which emphasise images over text, while the other tradition comprises text-driven apps, such as Twitter, which emphasise text over images.

The popularity of such apps is supported by several important factors including their interface and UX designs which shape the user's impression of the platform or service. Their designs are therefore of utter importance to app stakeholders. Since distribution stores such as App Store and Google Play opened up their doors to third party apps, app designers and developers have been continuously applying new innovative features and UX design practices, including guidelines, to their apps for competitive edge. Meanwhile app regulators and distributors have been establishing their own UX design guidelines and standards (Android, n.d.; Apple, n.d.-f; Microsoft, n.d.) that instruct designers *how* to best design for their platforms.

In fact, literature on UXD is also generally focused on *how* designers can achieve a high quality user experience. Scholars of UXD frequently present different approaches including tools and methods that can be used practically within industry to achieve hands-on results, such as the work of some notable scholars (Nielsen, 1993; Norman, 2013; Shneiderman et al., 2018). Some of these approaches are documented in chapter 1. However, the UXD literature lacks historical and cultural accounts of the UX designs and practices implemented within the app industry. Therefore, this dissertation provides an informed understanding of UXD by surveying the UXD standards of social media apps and viewing them through a lens of culture, history, and historical development.

Primary Questions/Aims

Based on this background, this dissertation aims to address the below primary research question (**PRQ**).

- **PRQ:** How have the interface and user experience designs of social media apps transformed as society moved towards more frequent image-based communication? In order to address the primary research question, the below 2 research questions (**RQs**) are presented:
 - **RQ 1:** How can the development of social media app interfaces and UX designs be understood culturally and historically?
 - **RQ 2:** What are the differences between the interfaces of text-driven and image-based social media apps?

The answers derived from the **PRQ** form the basis for answering the third research question:

- **RQ 3:** What implications does this research have for the future of the user experience design practice?

Methodological Approach

A content analysis method was chosen as the most suitable approach for the observation of social media interfaces and their design standards. To explain the benefits of content analysis, this section starts by introducing the overall methodological approach of content analysis and then showing related work that has used a similar method, before moving to a discussion of the specific approach used in this thesis. This approach involves genre analysis as a way to understand text-driven and image-based social media platforms as subgenres within a genre system. The distinction between these two subgenres is important because it reveals the intended primary nature of the apps amidst other salient features. It provides a lens for distinguishing between the two subgenres at a time when society was moving towards more frequent image-sharing communication. Finally, other related work is presented that reaffirms why other methods are much less suitable than content analysis.

Content Analysis

The beginnings of content analysis date back as early as the 1600s where texts were analysed in a systematic way. However, the English phrase “content analysis” did not

appear until the 1940s, and the idea has since developed and spread at an astounding rate (Krippendorff, 2013, pp. 10, 23). Krippendorff defines the term as “a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use” (p. 24). Not limited to just written texts, his definition also includes “art, images, maps, sounds, signs, symbols, and even numerical records...” (p. 25). Ary et al. (2018) similarly refer to content analysis but with a different focus, defining it as “a research method applied to written or visual materials to analyze characteristics of the material” (p. 14). This includes documentations such as pages on the web, social network sites, or Twitter feeds. Utilising a content analysis for the characterisation of both text and visual aspects is necessary for analysing a smartphone user interface (UI) because it requires a methodological system that can handle multimodal information. Further, using a content analysis method means that data can be collected not only with regards to the ‘what’ (i.e. design-features) but also the ‘how’, meaning the interaction itself (Hassenzahl, 2010, pp. 43-45; n.d.). Researchers can use a content analysis method to hold a large amount of qualitative data and present it quantitatively, which allows for a significant amount of design information to be gathered from app interfaces. In this thesis, this is achieved by applying the ‘move’ method introduced by Swales (1990, p. 141; 2011, pp. 1, 82) detailed in the methodology chapter.

A content analysis via observation lays the foundation for all the questions of this study to be answered. In order to address **RQ1** about understanding the development of social media app interfaces—their design features and UX designs through a cultural/historical lens, a content analysis of their design standards was necessary. While this study is primarily a qualitative study, it was important to base

findings on an initial collection of data driven by a content analysis method. A content analysis method was used to first answer **RQ2** about revealing the differences between text-driven and image-based app interfaces. Design features from 30 apps from each category were observed and stratified based on the UXD aspects they best exemplified, drawing from a model of information, navigation, engagement, entertainment, and personalisation (Cheung, 2016, p. 334). The differences are made apparent through a chi-square (χ^2) test to the collected data that reveals the significance of the differences statistically. The results from **RQ2** provide the data for answering the other sub questions including **RQ3** about the implications of the research.

Related Work

The content analysis method has been used successfully by other researchers for the observation of design features. Researchers have applied similar observational methods to the ones used in this study and have categorised design features under a set of design-related categories. In this section I review a selection of the most relevant studies that address relatively similar questions. I present these studies thematically and in the following order under apps, web blogs, homepages, and websites.

The analysis of social network messaging apps via observations can be seen in a study by Youn et al. (2017) that explores the design elements of layout and function of five apps using a case analysis model. The study compared the UI design of the apps and revealed that there were only few disparities between them. Although the case study was insightful, the sample size and collected data were relatively limited in comparison to my study which goes much deeper. In education, Crescenzi-Lanna and Grané-Oró

(2016) looked at the quality of the interaction design of educational apps for children on a mobile device. Structured observations were registered in a content analysis that was conducted on the design features of 100 apps, revealing low quality design in such apps.

A greater number of studies of the design features of digital media have been done on older web-related media. For example, the consideration of design features within computer-mediated communication is central to a study on blogs by Herring et al. (2004), *Bridging the Gap: A Genre Analysis of Weblogs*. They compared claims made about web blogs against their own observations of the features of 203 blogs. A results subsection labelled "Structural Characteristics" (p. 7) presented some of the collected data which are most relevant to my study, such as: providing a search functionality, allowing comments, and other information. In another early study by Scheidt and Wright (2004), weblog design elements were looked at from a visual point of view. Some of the accounted design features included custom colours, fonts, images, graphical dividers, and text effects. The scholars used techniques from both a classical content analysis and computer-mediated discourse analysis. One finding suggested that weblogs dominated in visual alterations that were simple, which may be related to the difficulty that comes with coding more drastic alterations that require further programming or HTML skills. In terms of how social networks of blogs relate to each other, Ali and Lee (2010) used content analysis to compare groups of four networks of blogs based on five categories including the author's profile, blog profile, information design, navigation design and visual design. The study revealed that design elements of blogs within the same networks share similar design preferences. Similar to my study, a chi square test was used to derive further insight in terms of levels of significance.

In addition to weblogs, the design features of homepages were also an area of interest for scholars. For example, S. L. Jones and Thorpe (2014) compared the website homepages of 313 academic libraries, specifically of medium sized institutions, based on a coding scheme consisting of the following aspects: design & navigation, content, search, and multimedia & social media. This revealed the commonalities in the design practice of these pages. Similarly, Thorpe and Lukes (2015) compared the homepages of 430 public libraries in Indiana based on 129 design elements derived from the coding scheme of the previous study. A study by S. L. Jones (2015) focused on the homepage design practices utilised by Fortune 500 websites. A content analysis was employed and all 500 websites were analysed for design elements from categories such as navigation, visual design, and multimedia. A more recent study by McConnaughy and Wilson (2018) evaluated the design features and content of homepages in 135 academic health sciences libraries. A compilation of 18 questions formed the basis for the homepage checklist which enabled the identification of common themes.

Scholars have also been interested in websites more generally. Web observation studies have been conducted on retail and other types of websites. Haynes and Taylor (2006) conducted a comprehensive content analysis of the design elements in 285 retail websites. Ranawaka (2008) compared the UI design of websites from three groups of banking sector organisations in Sri Lanka. A list of 10 factors, such as the use of aesthetics and allowing personalisation, were used to survey the presence of the design elements within each website. This revealed the groups which utilised the most and least design elements, and the elements that were most and least used. Further, Hashim et al. (2010) compared the top 100 online clothing websites with the aim of inspecting dynamic design elements with a focus on the aesthetics of interaction. A

checklist of these elements made the basis for a survey of the websites via observations. The study revealed that dynamic design elements exist, however, only in a small number of the websites.

Scholars have also investigated the web design elements used by different cultures through web observations and a chi squared probability test. A study by Hsieh et al. (2013) compared government websites from Taiwan and Australia. Focus groups were used to identify 5 categories of interface design which included visual representation, navigation, links, layout, and multimedia. The design characteristics from the categories were made into a questionnaire. Observations of the interfaces accounted for the presence of these characteristics. A chi square probability test was applied and showed that web design features or preferences do significantly vary amongst cultures. Similarly in a later study, V. Wang et al. (2015) compared the design features of 320 corporate websites from US and Chinese small and medium size enterprises. Through the use of a content analysis and a chi squared probability test, the results revealed a significant difference between the two, which the authors said may be due to not only different cultural orientations but also marketing practices.

Much like the studies presented in this section, the study I present compares the design features of text-driven and image-based apps across five design aspects presented by Cheung (2016, p. 334) that are expounded upon in the methodology chapter. Further, the distinction between text-driven and image-based apps is important especially at a time when image-sharing and mobile-communication had been rapidly increasing in society through social media.

Genre in Social Media Traditions

To determine whether there are differences in the UXD standards between social media apps which are based on sharing images, and those which are more driven by textual communication, this study compares two subgenres of social media apps: those which are *image-based* and those which are *text-driven*. The distinction between these apps was drawn through the following categories:

- Text-driven: Apps which allowed user-generated content to only include text, without an attached image or media file such as photos or videos.
- Image-based: Apps which required user-generated content to include at least one image or media file (photo or video) published, regardless of whether text was also attached.

Within these categories, the text-driven subgenre included apps such as Facebook, LinkedIn, and Twitter, and the image-based subgenre included apps such as YouTube, Instagram, and Snapchat. For example, in 2016 users on YouTube could only post text as a caption on a video, in contrast to Twitter, where users could make posts that only included text. While Twitter and other text-driven apps usually support user-generated posts that include images and video files, these kinds of posts are optional. Text-driven apps are distinct from image-based apps in supporting text-only posts. This section identifies the social media genre used for this study and in the next section shows that the social media subgenres are part of two historical traditions present in the early 21st century.

The study follows a point of view brought forth by Yates and Orlikowski (1992) that the characterization of genres in a meaningful way can include the use of recurrent

electronic communication. Genres are often defined by scholars of rhetoric theories as “typified rhetorical actions based in recurrent situations” (Miller, 1984, p. 159).

Professor of Linguistics, John Swales (1990) states that a genre consists of “a class of communicative events, the members of which share some set of communicative purposes” (p. 58). He regards a communicative purpose as a “privileged criterion and one that operates to keep the scope of a genre... narrowly focused on comparable rhetorical action” (p. 58). Similarly, Bazerman (1988) states that a genre is:

[a] social construct that regularizes communication, interactions, and relations.

Thus the formal features that are shared by the corpus of texts in a genre and by which we usually recognize a text’s inclusion in a genre are the linguistic/symbolic solution to a problem in social interaction (p. 62).

Based on these definitions, a genre is represented and recognisable via texts whose meanings are linguistic or symbolic. In the context of this study, this means that users can recognise different online social media platforms as belonging to different genres, and designers are presented with recognisable design choices which are dictated by different social media genres. Indeed, social media platforms can be understood as falling under different genre categories.

According to Bhatia (2014) genres are by their nature adaptable and “identifiable at various levels of generalization” (p. 65). He presents different levels of genres. A ‘super genre’ is general and encompasses a multitude of more specific genres or ‘genre colonies’, meaning a “grouping of closely related genres” (p. 66). In this study I consider the social media genre as belonging to a web-based communication super genre. In fact, among social media scholars there is some consensus that social media

are generally understood to mean web-based services that empower people to interact with one another (Treem et al., 2016). Indeed, Bhatia (2014) states that “to a large extent [genre colonies] share their individual communicative purposes, although most of them will be different in a number of other respects, such as their... contexts of use... audience constraints and so on” (p. 66). This is reflected in the literature where scholars’ definitions of social media differ in emphasis and with regards to the kind of social interactions that social media provide (Fuchs, 2021, p. 28). However, this is the space under which genre colonies can be conceptualised. These genre colonies have the broad communicative purpose of allowing the exchange of user communication and media through online services.

The definition of the social media genre used in this thesis fits under the broader definition brought forth by Kaplan and Haenlein (2010) who define social media as “a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content” (p. 61). Kaplan and Haenlein present six categories that fit under their definition, one of which ‘social networking sites’ reflects the definition of the social media sites/apps genre used in this thesis. According to Kaplan and Haenlein:

Social networking sites are applications that enable users to connect by creating personal information profiles, inviting friends and colleagues to have access to those profiles, and sending e-mails and instant messages between each other. These personal profiles can include any type of information, including photos, video, audio files, and blogs (Kaplan & Haenlein, 2010, p. 63).

This definition is suitable for the purposes of this thesis, though it is not necessary for such platforms to be equipped for sending emails. However, a defining feature that does need to be added to that definition is the ‘feed’, a constant stream of user-generated content or interactive media information relayed within lists (Cooper et al., 2014, p. 577; Facebook, n.d.-a). This genre of sites/apps is distinct from other social media genres such as chat messengers and website blogs that too are encompassed by a macro level ‘super genre’. However, according to Bhatia (2014) genres can also include “sub-genres” (p. 66). The social media site/app genre I refer to can be assumed to include text-driven and image-based subgenres that share similar communicative purposes.

In fact, according to Swales (1990) the communicative purposes of a genre need to be recognisable by “expert members of the parent discourse community” (p. 58) and that discourse communities possess “common goals” (p. 26). In this study the community is made up of designers or developers of iPhone apps who are qualified in the design of such apps and who have a common goal of improving the UX of social media apps. However, a communicative purpose is not the only criterion for inclusion in a genre, Swales (1990) mentions similarities in “structure, style, content and intended audience” (p. 58).

Further, Swales (1990) states that “genres are communicative vehicles for the achievement of goals” (p. 46). In the context of this study, the social media app genre can be viewed as a communicative vehicle between app users and designers whose efforts contribute to the formation of a genre. Social media apps are put forward by designers, but users are the ones that decide whether or not the app of a genre, including its UXD and features, is favourable or not. User feedback is communicated and

accessible to the app design community members and used to improve the app that is recognised as being part of a genre or subgenre.

Social Media App Sub-Genres: Text-Driven and Image-Based

In the 2000s, many social media sites were launched that introduced new ways to share media including apps such as Twitter, Flickr, Facebook, Vimeo, and YouTube (Ortner et al., 2018, p. 377). However, these sites differed in the kind of media they prioritised for user generated content. For example, Twitter only allowed text posts, Flickr was focused on photos, and Vimeo and YouTube were focused on video content. Although video content was the primary media for YouTube, the site allowed for text content to be added to a video post as a description. However, text was not YouTube's primary type of media content as it was for Twitter. This thesis argues that the differences in primary types of user-generated media created two primary sub-genres of social media apps: apps which are text-driven, and apps which are image-based, (including video sharing apps). The two subgenres are distinguishable by some features and functions, which can be seen in social media applications from the early 2000s such as Twitter, Facebook and YouTube that pre-date smartphone applications. As these web-based platforms were remediated into smartphone apps, and other mobile-native social media platforms such as Instagram and Snapchat were launched, the distinction between image-based and text-driven apps may seem less apparent, but has nevertheless persisted.

After the App Store opened up in 2008 (Apple, 2008c) and smartphones were increasing in popularity, social media sites such as Twitter and YouTube expanded their

reach by introducing their own apps. However, the term app had begun taking on a different meaning. Morris and Elkins (2015) “define app as a moment in the history of the software commodity when the form, distribution model and economics behind software production have shifted to encourage a proliferation of mundane software and an intensified integration of software into everyday routines” (p. 70). Indeed, by 2013 smartphones were continuing to be taken up by consumers, while sales for personal computers (PCs) were on the decline. In fact, the first quarter of 2013 showed that sales of PCs decreased 14 per cent dropping to 76.3 million units shipped worldwide (Moses, 2013) and to 60.6 million units in the first quarter of 2016 (IDC, 2016). Smartphones on the other hand, with their inbuilt cameras, had been increasing in numbers and empowering rapid image sharing through social media apps that were ranking among the highest apps in the market, most notably YouTube and Facebook (Bell, 2016; Warren, 2015). In fact, over many years Facebook’s monthly active users had been constantly increasing (Statista, 2017). In June 2016, they reported 1.57 billion monthly active users and an average of 1.03 billion daily active users, all to which were accessed via mobile alone (Facebook, 2016). Indeed, social media apps that had originally existed as desktop websites were reaping the benefits of mobile.

However, such apps were also joined in the market by apps designed mainly for smartphones that did not necessarily have a desktop presence and they too became of the most successful apps in the market in the 2010s. They include apps such as Periscope, Instagram, and Snapchat (Warren, 2015) with the latter two undergoing consecutive yearly success (Bell, 2016). These apps capitalised on the inbuilt camera feature and in a similar way to how some desktop social media sites prioritised images, so did they. For example, Instagram prioritised images but also allowed for a text

description to be added, much like YouTube. In fact, Instagram's image-based design was a contributor to its success. Instagram posted in June 2016 that its number of daily users exceeded 300 million and the total number of monthly active users exceeded 500 million (Instagram, 2016a), a significant increase from 400 million in September 2015 (Instagram, 2015a). Further, 95 million plus photos and videos were being shared in its community daily (Instagram, 2016b). The popularity of image-sharing and the abilities brought forth by the smartphone meant that designers of even older platforms were moving their platforms towards more image-sharing, such as Twitter and Facebook. However, the two traditions have remained distinguishable in the 2016 context.

Other Related Work

Scholars investigating interface design-features relating to text and images have generally used different methods that incorporate users as participants such as (Aula et al., 2010; Gatsou et al., 2011; González et al., 2015; Park & Sundar, 2015). This contrasts with the content analysis method used in this thesis to observe the design features of text-driven and image-based apps.

For example, Gatsou et al. (2011) conducted a study aimed at uncovering the differences between the text and visual metaphors of a design feature, presented as a main menu button. Participants of different age groups were given a navigational task on a tablet in order to interact with the buttons. Results revealed a preference among young users for visual metaphors, and text for older participants. While the method used was able to address these scholars' questions, a content analysis comparing the different main menu buttons of market apps used by different age groups would not be suitable

for answering the authors' user-dependant question. Further, while the method used by these scholars enabled their study to bring insight to the design practice with regards to text and visual metaphors, it did not however, paint a picture of an existing market design practice specifically, as my study aims to achieve.

Involving users is clearly suitable for studies where evaluating effectiveness and performance are directly involved. In fact, I argue that the content analysis approach is the most suitable method for surveying design practices. It contrasts with other methods that involve input directly from the user including surveys, focus groups, or in-depth interviews. For example, González et al. (2015) compared searches for both text and visual information of newspaper websites. The employed method was usability testing and involved 47 participants. Participants were tasked to conduct separate searches for both text and visual information on one of two websites. Afterwards they were asked questions in order to gather qualitative information about the user experience.

The results showed that the difficulty of searching for visuals can lead to a lower perception of usability. While user perceptions are important, the answers given by users about their perceptions may differ. However, the use of a content analysis method via observations requires no user involvement and is able to be based strictly on the merit of the unchanged content presented. In fact, Krippendorff refers to content analysis as "an unobtrusive technique" (Krippendorff, 2013, p. 45). Further in support, the principle known as the uncertainty principle of Heisenberg brings forth concerns regarding the observation of participants (Vogt & Johnson, 2011, p. 164). It informs us that "acts of measurement interfere with the phenomena being assessed and create contaminated observations; the deeper the observer probes, the greater the severity of the contamination" (Krippendorff, 2013, p. 45).

The use of a content analysis method is most suitable for surveying the design features/standards of social media apps and revealing the differences between text-driven and image-based interfaces. In addition, it sets up the foundation for answering the other research questions with regards to understanding the development of social media app interfaces and the research implications.

Research Contribution

This research provides several contributions to the academic literature surrounding the development of UXD and social media apps. Apart from contributing through cultural and historical perspectives, much of the existing research conducted on social media platforms tends to mainly target single brands with a bias towards Facebook (Rains & Brunner, 2015; Stoycheff et al., 2017). This research project, however, serves as the most comprehensive account of social media apps design-features for the period of 2016 accomplished via a content analysis across five design aspects that can influence the user experience as posited by Cheung (2016, p. 334). I used the five design aspects for the development of five ‘move’ schemes, using the ‘move’ method introduced by Swales (1990, p. 141; 2011, pp. 1, 82). While other research has proposed ‘move’ schemes for content analysis, no research has proposed such schemes for the analysis of smartphone app interfaces. Finally, the combined use of quantitative, qualitative, and probability methods to analyse a large set of interfaces represents a significant contribution to the study of digital media.

Chapter Summaries

This thesis is divided into three parts. The first part is comprised of Chapters 1-3 and is focused primarily on the theoretical framework and overall context of UXD in digital media. In Chapter 1, I look closely at how a UXD philosophy can be achieved through Human Centred Design (HCD). The chapter introduces some of the key scholars and their HCD principles/approaches that have influenced the UXD practice. This is presented through a brief historical overview of some of the disciplines that existed prior to the use of the term UXD, but, have become associated with the UXD practice. These disciplines can be grouped under traditional usability and include Human Factors or Ergonomics, Human-Computer Interaction (HCI), Usability Engineering, and Interaction Design (IxD). The sections of this chapter provide an understanding of traditional usability, however, the last section reconciles this understanding with a newer conception of UXD, and finally introduces the UXD framework used in this thesis.

This chapter also shows that research on UXD is generally focused on presenting practical considerations for designers and tends to lack historical and cultural accounts of the UX designs and practices implemented within the app industry. In fact, design is culturally contingent and often results in conflicting design standards being put forward by different companies or groups. Therefore, the next chapter introduces a culturally-related theoretical lens through which this research can be interpreted.

In Chapter 2 the development of this theoretical lens begins with Antonio Gramsci's theory of hegemony that deals with relations between culture and power, because power structures play a role in the development of media through economic and

social forces. The chapter presents key elements from the theory such as ideological contestation, leadership via the consent of the led, and the notion of ‘common sense’. It also reflects upon the earlier work of Marx, presenting notions such as ideology and the commodity-form. I draw relations between the comparatively small yet important role of app design standards and the grander scheme of hegemony. The chapter then moves to explain the forces that underlie continuous media change that are important to understanding the development of UX designs, drawing on theories of mediamorphosis, remediation, convergence, and dominant design. The theory of remediation allows the comparison of different media across time and provides an understanding as to how media refashion each other through the notions of immediacy and hypermediacy. Dominant design allows the recognition of familiar standards and analysis of the development of UX designs within the features of a single medium.

To demonstrate the value of this theoretical framework, and of conducting a cultural/historical UX design analysis, Chapter 3 demonstrates how this framework can be used to understand the historical development of products, highlighting the cultural contingency and temporality of design. This is done by tracing a history of the development of the UXD standards of technological inventions that have shaped the way new digital media are used today, including typewriters, input devices, personal computers, and smartphones. The historical development of typewriters in the 19th and 20th century shows how different inventors approached typewriter design and how the dominant design—that includes the QWERTY layout provided a better UXD through speed and principles of visibility and feedback. The layout of the typewriter formed the basis for future computer keyboards.

The historical analysis of Chapter 3 is important, because it makes it possible to trace the development of design principles that continue to be influential in the interfaces of mobile phones and social media apps. For example, as human-computer communication moved towards graphics, interface designers realised the importance of UXD principles—such as familiarity and recognition, that were used in the design of the graphical user-interface (GUI) of early commercial computers and set the standard for future designs. The development of computer input devices in the second half of the 20th century shows how the mouse was favoured for desktop personal computers over others, and that different devices with similar objectives provide different UX designs, emphasising a divergence in hardware. As this chapter demonstrates, developments in touchscreens occurred in parallel, and despite the variety of technological inventions, PCAP touchscreens later became the dominant design used in iPhones that shaped user's expectations of touchscreen UXD and functionality.

Taken together, the three chapters of Part 1 provide a theoretically and historically grounded basis for the qualitative analysis of social media apps in Part 2 of the thesis. The second part of the thesis comprises Chapters 4-6. Chapter 4 is a discussion and justification of the methods used for data collection, while Chapter 5 and Chapter 6 are detailed case studies that analyse examples from the dataset based on the framework established in Part 1.

Chapter 4, the methodology chapter, details the process I undertook to comprehensively explore the design features/standards of social media apps in 2016, and address **RQ2** about what the differences are between text-driven and image-based social media app interfaces. The chapter first details the process I used to collect app data sets for the two subgenres (text-driven and image-based), each consisting of 30

apps, based on some requirements and a list of eligibility criteria. The following section expands on the concept of the ‘move’ method introduced by Swales (1990, p. 141; 2011, pp. 1, 82) that can be used to analyse the contents of the social media apps. The metaphorical notions of ‘move’ and ‘step’, or simply ‘categories’ and ‘subcategories’, function to operationalise units of text towards the formation of ‘move’ schemes that are used to survey the design features/standards across apps. Further, the section presents other studies where this method was used to achieve similar results.

The chapter then details the comprehensive exploration of the design features/standards of the app sample and the production of five ‘move’ schemes based on five design aspects that can influence the user experience as posited by Cheung (2016, p. 334). It also highlights some research limitations and presents recommendations for future researchers. The ‘move’ scheme results revealed the differences between the two app data sets and subgenres, which were then enhanced by applying a chi-square (χ^2) test to the collected data thereby revealing the significance of the differences statistically. The overall results of the study revealed that the design features were largely common among the two subgenres. However, they also uncovered that many significant differences exist. The following chapters analyse selections of this data through the theoretical frameworks I chose that add to UXD some perspectives of culture, history, and historical development. Through these lenses, I demonstrate that the UX designs of social media apps are culturally contingent and shaped beyond the mere application of technical know-how.

The first case study, Chapter 5, explores the image presentation of social media apps through the opposing UXD strategies of ‘consistency’ and ‘user freedom’, focusing on apps that provide various, horizontal, square, and vertical formats, with a

section dedicated to each within this chapter. It shows the many conflicting standards and the challenges that designers faced when designing for the smartphone medium. The chapter takes into account factors such as the historical and cultural significance of the used dimensions via remediation, iPhone screen space which is valuable, limited and varying, and the use of immediacy as a UXD advantage. It demonstrates how even something as seemingly as simple as an aspect ratio has historical and cultural dimensions which can affect how an interface's UX design can support different types of behaviour.

In the second case study, Chapter 6, I explore the intersectionality of conflicting design standards used for primary navigation as they appear in the designs of apps, focusing on YouTube and the parent iOS platform. Social media platform owners care to cater to a more diverse user range by presenting consistent and familiar designs. However, users are presented with conflicting design standards that gets in the way of achieving this UXD ideal and may negatively impact the experience of users who have already been accustomed to a certain navigational standard.

While many iOS apps have capitalised on historically established dominant design standards such as those encouraged by Apple's iOS design guidelines, the design of others such as YouTube disregards those standards and aligns with a counter-practice championed by competitors, Google and Windows. YouTube designers capitalise on historical conventions while optimising for a consistent design for app users, and provide a flexible navigation system. In doing so, they are catering to a diverse user range that includes users of different experience levels, as shown in this case study.

Part 3 of the thesis is dedicated to the conclusion chapter. It presents future recommendations for researchers and also practical recommendations for designs. However, crucially, it emphasises the cultural contingency of design and what this means for the UXD practice.

Part One: Framework & Context

Chapter 1 - UXD History & Framework

Although the term ‘UX’ started to become popular in the 1990s, the practice of UX design (UXD) can be traced farther back historically in a number of capacities, under different names and disciplines such as human factors and human-computer interaction (HCI). In fact, UXD encompasses a significant share of many other design-related disciplines as seen in Figure 1.1.

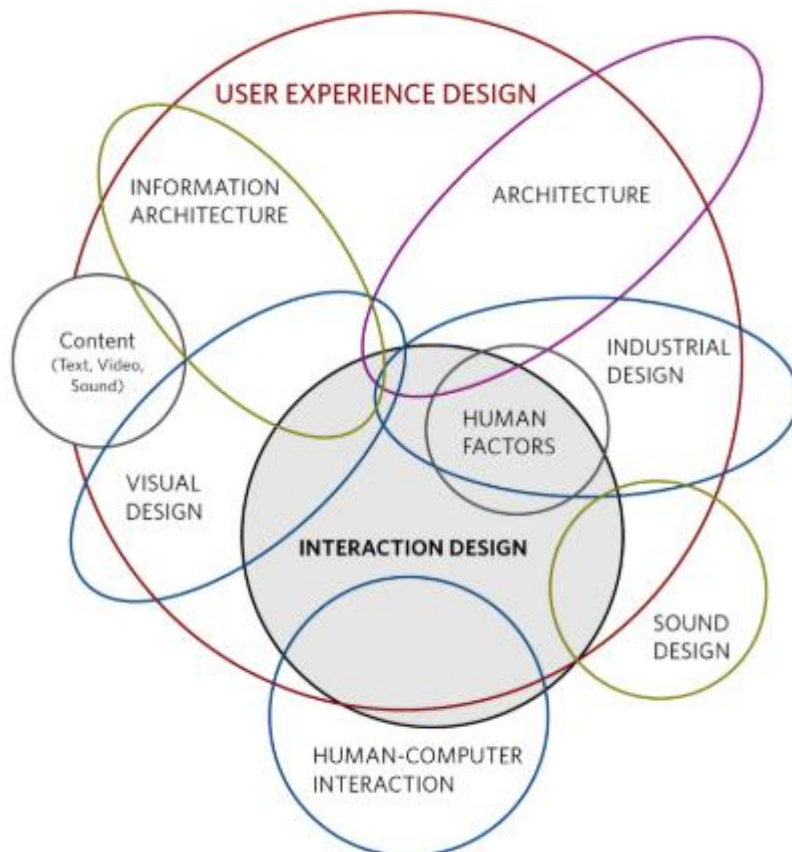


Figure 1.1: This illustration shows an attempt at portraying the relationship between the different design-related fields and the degrees to which they overlap (Saffer, 2009, p. 21).

One concept that overlaps with UXD practices has been known traditionally as usability, which is an important aspect within earlier fields beginning informally in the early 1900s with Human Factors and formally later within other disciplines such as HCI. Today, UXD is understood to encompass the traditional conception of usability. Indeed, usability is an important part of UX but not the whole UX. This is reflected in Norman's broad definition of UX as encompassing "all aspects of the end-user's interaction with the company, its services, and its products" (Norman & Nielsen, n.d., Summary section). It is worth clarifying that the term 'UX' in the design industry usually refers to the profession (Sharp et al., 2019, p. 9). However, to avoid confusion, the terminologies used in this thesis reflect the actual meanings of the words, so UX is used for the experience of users and UXD refers to the design practice/profession.

The name of the field begs the question: how does one go about designing a user experience? A user experience is a subjective matter, and it is generally understood that it is not possible to design a user experience, rather one can "only design *for* a user experience" (Sharp et al., 2019, p. 13), although some may disagree (Hassenzahl, 2018, p. 26). There are several design philosophies developed that can arguably be used to support achieving a high quality user experience (Saffer, 2009, p. 33). User-Centred Design (UCD), for example, has much in common with UXD due to its focus on the user. UCD or Human-Centred Design (HCD), used interchangeably from now on, is defined by Norman (2013) as "an approach that puts human needs, capabilities, and behavior first, then designs to accommodate those needs, capabilities, and ways of behaving" (p. 8).

Many scholars have brought forth HCD approaches and design principles, as shown throughout this chapter. These approaches are shown through a brief roughly-

chronological historical overview of some of the disciplines associated with traditional usability and the development of the HCD philosophy. This chapter is divided into four sections. The first section focuses mainly on the first half of the 20th century leading into the 1950s. It shows the beginnings of the disciplines of human factors and ergonomics, demonstrates the importance of applying HCD principles to designs, and the early usefulness of HCD experts.

The second section focuses on the beginning of the HCI discipline in the 1970s and 1980s, and the early multidisciplinary community that it attracted which recognised the need for systems with HCD approaches. Several UXD pioneers came out of that community. The third section presents the contributions of some of the relevant and key UXD scholars that in the 1980s and 1990s introduced design principles/approaches that have influenced the UXD practice and discipline of interaction design (IxD). While the previous sections provide an understanding of traditional usability, the final section shows how the notion of UX challenged the understandings of scholars in relation to traditional usability, and introduces the UXD framework used in this thesis.

1.1 Usability and Human Factors & Ergonomics

The terms ‘human factors’ and ‘ergonomics’ are strongly related to each other. Today, the International Ergonomics Association (n.d.) defines them both as a scientific discipline and also “the profession that applies theory, principles, data, and methods to design in order to optimize human well-being and overall system performance” (para. 1). However, prior to World War II, applying such HCD knowledge to design was not formally recognised. This section shows the early lack of understanding of designers

with regards to HCD, the role that psychological principles can play in improving designs, and the increasing early recognition of the need for research and experts/psychologists with such human-centred understandings of design.

1.1.1 From Human Error to Design Error

In the beginning of the 20th century, prior to the existence of human factors experts, there was emerging concern by psychologists regarding the efficacy of aviators in operating aircraft due to human limitations. The focus at the time was on the capabilities of people, therefore when recruiting individuals for flight training, the assessment provided by typical psychologists and physicians regarding the best candidates for the job was important (Stuster, 2006, p. 5). However, as World War 2 unfolded psychologists started to realise the effects of cockpit design on pilot performance and errors.

In the 1940s experiments relating to equipment design in aviation were already on their way in England (Bartlett, 1943; Craik, 1940). According to Roscoe (1997), perhaps the first time anyone set about to solve a design problem in an airplane using a psychological principle was during World War 2 as had occurred with US Psychologist and Air Force Lieutenant Alphonse Chapanis. At that time the words ‘pilot error’ were a common reoccurrence in aviation-related reports, however what Chapanis found seemed to suggest that errors were also design related (p. 2).

Pilots and co-pilots of several aircrafts had been accidentally retracting inwards the wheels of the aircrafts after landing, as opposed to pulling-in the flaps. Therefore in 1943 Chapanis was assigned the task of investigating these errors. Although Chapanis was distant from any equipment design research, he instantly realised that the controls

for the wheels and flaps were confusing not only because they were virtually identical, but also because they lay beside one another. Conversely, the psychologist noticed that corresponding controls were not close to each other and required differing methods for operation, thereby adding to the potential confusion experienced by pilots and co-pilot when attempting to retract the aircraft flaps. Chapanis realised that a re-coding of these qualities to a coherent state was necessary if the usability of cockpit controls was to be improved, and applied a quick fix which solved the problem. A miniature rubber-tire symbolising the aircraft wheel was attached to the wheel control, and similarly the flap control was associated with a wedge shape. After the war, these assistive control shapes became internationally standardised (Roscoe, 1997, pp. 2, 3). Lt. Chapanis's psychological diagnosis of the cockpit design issues are grounded in psychological principles, likely some of which have their roots in a field of study called Gestalt psychology that began in the early 1900s.

1.1.2 Timeless Principles of Perception

Gestalt psychology is a branch of psychology that deals with understanding how humans perceive visual forms (J. Johnson, 2014, pp. 13-27). Three of Gestalt psychology's most prominent exponents, Wertheimer (1923/2013), Koffka (1935/2013), and Kohler (1947), have supported the idea that visual forms are perceived by humans "as organized, structured *wholes*" (Levitin, 2002, p. 146). There are several laws of perceptual organization within Gestalt psychology, such as the laws of similarity and proximity. In fact the principles of perception have been adopted and used commonly today by graphic design practitioners, and are applicable and important within the practice of UXD (IDF, n.d.-a) and UCD (Lowdermilk, 2013, p. 63). The law

of similarity states that similar parts (including colours, forms, and sounds) are perceived to be of the same group. Similarly, the law of proximity states that parts that are closest in distance are grouped together (Koffka, 1935/2013, pp. 164, 165; Wertheimer, 1923/2013, pp. 74, 75). Both of these psychological principles are reflected in Chapanis's 1943 diagnosis of the cockpit design issues where corresponding controls were not in close proximity to one another and did not have similar methods of operation. However, in the 1940s, researchers were beginning to pay more attention to designs that were human-centred.

1.1.3 Early Recognition

After the war, in 1947, a document titled *Psychological Research on Equipment Design* in the field of 'human engineering' was produced in part by the psychology staff members at Chapanis' air force base in the U.S. (Fitts, 1947, p. III). It was the first major work published on human engineering with a perspective of design and human factors, the latter being a term not yet formalised at the time. The document was based on several years of work, including wartime, a time when equipment design via human factors considerations was a skill 'human engineers' were simply not trained in formally. However, the field was still being consolidated in the 1940s and 1950s, and the value of human factors experts too was becoming more and more recognised (Roscoe, 1997, pp. 3-5). In those early days, Bell Labs was one of the first in the commercial sphere to recognise the importance of hiring a psychologist for design. It started in 1945 by hiring John E. Karlin to design telephone communication systems, and grew shortly after to include an entire department (Hanson, 1983, p. 1573).

Meanwhile, across the Atlantic a group of scientists in the U.K. had also been dealing with human-related problems and in 1950 they established the Ergonomics Research Society, known today simply as Ergonomic Society (Edwards, 1988, pp. 4-5). Similarly in the U.S, the Human Factors Society of America was established in 1957, and is known today as the Human Factors and Ergonomics Society (Vu & Proctor, 2011, p. 6). In that same year Don Norman, a young student at the time, received his undergraduate degree in Electrical Engineering (Norman, 2018). The emergence of more research laboratories in the 1940s and 1950s, including ones in academia produced engineering psychologists (Roscoe, 1997, pp. 3-5). As a field of study, ‘engineering psychology’ was concerned with the performance of humans during systems operation, and links closely to ‘human factors’ and ‘ergonomics’ (Stuster, 2006, p. 5) in that they all apply behavioural science to designs that are aimed at humans (Hanson, 1983, p. 1572). However, the latter two fields have nuanced differences.

For instance, today ergonomics tend to focus on an environment’s physical elements such as a workstations or control panels, while human factors is concerned with work-systems more broadly (Chartered Institute of Ergonomics & Human Factors, n.d.). Regardless, what unites the terms today also united them in the past, which is “knowledge of human abilities and limitations to design systems... for safe, efficient, and comfortable human use” (Computer Ergonomics for Elementary School, n.d., para. 1). In fact this human-centred element of interactive interfaces makes it “hard to draw the line between traditional human factors and what we might call ‘user experience’” (Nielsen, 2017), meaning UXD. However, the UXD practice and HCD approach are not

only reflected within these domains but also within the discipline of human-computer interaction, focusing on computer products.

1.2 Usability and Human Computer Interaction

As the name implies, human-computer interaction (HCI) encompasses people's interactions with computer systems (A. J. Dix & Shabir, 2011, p. 42). It can be traced back to the 1960s, as found in the early work of both Ivan Sutherland (1964) on the Graphical User Interface (GUI) and Douglas Engelbart (1988, p. 194) on the computer mouse, discussed in more detail in Chapter 3. However, as a formal discipline, HCI emerged in the 1980s and has its roots in the 1970s. This section introduces the early HCI community that recognised the importance of usability and HCD, and from which UXD pioneers emerged. Further, it shows the early interdisciplinary nature of that community, which reflects onto the HCI (and UXD) practice.

1.2.1 The 70s: A Community is Born

The Association for Computing Machinery (ACM) played an important role in the birth of HCI. ACM was established in the U.S. in 1947 and is today a leading science and education society for Information Technology (IT). However, in the 1970s and 1980s, it provided a platform for the HCI discipline to grow through one of its international Chapters and Special Interest Groups (SIGs) (ACM, n.d.-b). Namely, the SIG group focusing exclusively on HCI (ACM, n.d.-a) named SIGCHI in 1982, the last three letters CHI stand for Computer-Human Interaction (SIGCHI, n.d.). The work of this

community and its scholars contributed to the formation of the discipline of HCI and the profession of UXD (Shneiderman, 2019).

In its early years SIGCHI existed under a different name, SIGSOC, which stood for Social and Behavioral Computing (SIGCHI, n.d.) and was formed in 1969 (Borman, 1996, p. 5). Later in the 1970s, personal computers were introduced by computer companies at un conventionally affordable prices, which contributed to their wide-spread proliferation. Computer purchases were now made not only by programmers as had been common, but also by non-technical users from various industries (Preece et al., 1994, p. 5). This influx of computer systems meant that the usability of computers was becoming more important and emphasised than ever before (Bennett, 1979). Indeed the usability of computer products eventually became acknowledged as a key concept in HCI (Preece et al., 1994, p. 14), just as it is an essential aspect of UXD today.

However, during the 1970s human interaction with computer systems was also increasingly becoming a concern for people. Alan Cooper, an influential figure in the UXD community today, for example, has discussed how his focus as a programmer was reformed in the 1970s after his experiences made him realise that software programs needed to be built from the perspective of its users, as opposed to the software product (Computer History Museum, 2017, 3:12:00 – 3:14:00).

Indeed, a strong interest emerged from within the computing profession with regards to ‘people-oriented’ systems that “reflected the needs and behavioural characteristics of the user population” (Borman, 1996, p. 4). This is evident by a 1978 SIGSOC conference panel discussion titled *People-Oriented Computer Systems: When, and How?* (Dunn et al., 1978). In fact a statement by Borman (1978) presented in the

newsletter 'SIGSOC Bulletin' accurately portrayed the thoughts of many people of that time:

In every journal, in every discussion these days, we hear that systems aren't being used as the designers envisioned; [it is] time to emphasize research directed towards the users. The days of computer-oriented people are passing; the new era must lead towards people-oriented computers. (p. 9).

This statement also echoes the thoughts that had been sparked decades earlier within the human factors domain where there was a shift towards focusing on understanding people or users in order to inform design decisions. In other words, applying a HCD approach to computer systems, though the terms UCD and HCD were not formally used at the time. In fact, early HCI work was brought about in light of the need for HCD, and was interdisciplinary in nature.

The early landmark studies that came out of the 1970s were inspired by a combination of both psychology and software (Shneiderman, 1980; Weinberg, 1971). In fact, by the late 1970s a partnership between disciplines had already formed in the HCI community, where SIGSOC members in 1978 included people from both the social sciences and the computer and information science disciplines (Borman, 1996, p. 4). Among the early members that contributed to SIGCHI's eventual success were Don Norman of a psychology background and Ben Shneiderman of a computer science background (p. 5).

Today, Shneiderman's academic background in computer science and his contributions to the field of HCI and UXD elevate him alongside other pioneers of the fields (Shneiderman, 2019, pp. 174, 175). In fact, Shneiderman's (1980) book *Software*

Psychology focused on the application of psychology to computer science and is representative of some of the early roots of the HCI discipline. Some of the HCD approaches of Shneiderman and other UXD pioneers are expanded on in the next section.

1.3 The Development of HCD Approaches

The 1980s laid the foundation for the field of UXD. It marked the beginnings of the development of the GUI as part of personal computers, which would eventually become an area of focus for UX designers. Perhaps not coincidentally, it also marked the beginning of the development of design approaches and principles, leading into the 1990s, by notable academic scholars and practitioners of what would eventually be termed UXD, including Don Norman, Jakob Nielsen, Ben Shneiderman, and Bruce Tognazzini. Many of the approaches they proposed, although developed from different backgrounds, have become standard industry practice and taught in academia. This section presents the contributions of relevant UXD scholars in the field with regards to design principles, the development process, usability methods, and the disciplines of usability engineering and interaction design.

1.3.1 The 80s & 90s: Design Principles

Don Norman became one of the most prominent pioneers of UXD, beginning with the development of his own HCD approach and principles, a design journey that began in the 1980s (Shneiderman, 2019, pp. 154, 155). However, Norman began developing parts

of his approach much before the 1980s. After attained qualifications in electrical engineering and psychology Norman published his first book (Norman, 1969) in a series of other publications that made him a scholar of cognitive science in his own right. For example, Norman's work on memory, learning, and information processing in the 1960s and 1970s led to his 1982 book *Learning and Memory* (Norman, 1982).

Norman also worked on a developing his notion of cognitive engineering in the early 1980s that focused on “provid[ing] designers with the tools [including design principles] required to make their products more sensitive and responsive to the needs of the users” (Norman, 1983a; 1983b, p. 257). Norman's UCD approach was expanded in his chapter *Cognitive Engineering* in the 1986 co-authored book *User-Centered System Design: New Perspectives on Human-Computer Interaction* (Norman & Draper, 1986). The term UCD was not widely used at the time but spread further after the release of this publication in 1986.

Norman amalgamated his work on UCD in his seminal 1988 book *The Psychology of Everyday Things* (Norman, 1988) and articulated the concepts and models of his approach. They included the notion of conceptual models, affordances, visibility, mapping, feedback and others (pp. 8-28). Norman's book built towards the summation of seven principles that can facilitate good usability (pp. 188-201) and suggested that a design should communicate to the user knowledge regarding appropriate actions, and the system's current state (p. 188). In fact Norman's books catalogue examples of the interfaces of products with designs that fail to indicate clearly the clues required for appropriate system operation. Additionally, unlike some other scholars Norman's concepts were not put forward as tools to enhance the usability of computer systems only but as tools to improve the usability of 'everyday things'. In

other words, improving the usability of products generally such as doors, kitchen appliances, and automobiles (Norman, 1992).

For marketing reasons, Norman's 1988 book was renamed to *The Design of Everyday Things* starting with its 1990 reprint, emphasis on the word *Design* (Norman, 1990, p. vii). Decades later and the book is still recognised as a "usability classic" (Krug, 2014, p. 37) and the concepts and principles derived from it had become practiced industry wide. In fact the latest edition of Norman's (2013) book has no changes to the concepts originally presented (p. xiii) and Norman asserts that "the principles of human psychology [have been and] will remain the same" (p. xiv), in contrast with technology which tends change more rapidly over time. However, despite his work being grounded in cognitive psychology, Norman argues that an understanding of both psychology and technology are essential for good design to be achieved (p. 8).

While Norman specialised in the area of cognitive psychology, Shneiderman's technological background in computer science enabled him to produce his second book *Designing the User Interface: Strategies for Effective Human-Computer Interaction* in 1987 (Shneiderman, 1987). In his book, Shneiderman proposed *The Eight Golden Rules of Interface Design*. The eight design principles were a concise amount of generally applicable principles in comparison to some scholars around that period that had accumulated over 160 principles (Brown, 1988; Marshall et al., 1987; Mayhew, 1992), and even close to a 1000 principles over many years (S. L. Smith & Mosier, 1986). Shneiderman's golden list today includes principles for providing consistency, usability for all users, giving users feedback, preventing errors, maintaining user control and others (Shneiderman et al., 2018, pp. 95-97). Shneiderman's golden rules maintain a renowned status in industry and academia and have been continuously refined based on

decades of experience (Shneiderman et al., 2018, p. 95; Wong, 2020). In fact the origins of such principles can be sourced from both practical experience and psychological theory (Preece et al., 1994, p. 492), the latter corresponding more closely to the work of Norman.

By the early 1990s, the HCI discipline had grown to include several disciplines aside from computer science and psychology, such as sociology, anthropology, and industrial design (Preece et al., 1994, p. 38). In fact the growth of the field warranted an expansion of HCI's definition (Hewett et al., 1992, p. 5). Around that time, some scholars such as Jakob Nielsen built on the work conducted in the 1980s (Shneiderman, n.d.). Nielsen, with his HCI background, later became recognised as an important contributor to the profession of UXD and is renowned for his expertise in usability (Nielsen Norman Group, n.d.-b). Nielsen's early work as a teacher (Nielsen & Molich, 1989) motivated the co-development of nine design guidelines (Molich & Nielsen, 1990), termed 'heuristics' for their broad application before being refined and presented as ten heuristics years later (Nielsen, 1993, 1994b). These ten principles became widely available online (Nielsen, 1994a) and highly regarded within industry. Nielsen assembled his years' worth of work in his highly cited 1993 book *Usability Engineering* (Nielsen, 1993), named after the discipline in which Nielsen had become as a leader. In his book Nielsen improved on the earlier work of Shackel (1991, p. 22) by including usability within a hierarchal model of product acceptability (Kurosu, 2015, p. 228; Nielsen, 1993, p. 25).

In the same year, 1993, the term UX was coined by Norman (Nielsen Norman Group, n.d.-c). The term was not widely used in 1993, however Nielsen's book on usability aimed to provide designers with the tools that would result in a positive user

experience. Nielsen emphasised five traditionally recognised attributes of usability including learnability, efficiency, memorability, error-free use, and satisfaction (Nielsen, 1993, p. 26). This seems to have influenced the definition of usability that was standardised in 1998 by the International Organization for Standardization (ISO) under ISO Standard 9241-11. It included the use of the term ‘satisfaction’ alongside the other two key concepts of effectiveness and efficiency (ISO, 1998). The presence of these core aspects of its definition have been maintained in the latest standard (ISO, 2018).

One year before the term UX was coined, Bruce Tognazzini released his first book *Tog on Interface*. In it Tognazzini provided design principles and shared his professional experiences including his work at Apple that started when he was hired as the 66th employee in 1978, the same year that he developed the original Apple Human Interface Guidelines (Tognazzini, 1992). In addition, in 1998 Jakob Nielsen and Don Norman teamed up to cofound the UX research and consulting firm Nielsen Norman Group, with Bruce Tognazzini later becoming a principal alongside them (Nielsen Norman Group, n.d.-a).

Although all these scholars have presented their own design principles, Jeff Johnson, a HCI pioneer with a background in psychology (Shneiderman, 2019, p. 114), has argued that many design principles presented by some scholars are very similar due to them being grounded in human psychology, and differing only based on terminology, emphasis, and context to which they were written (J. Johnson, 2014, p. xv). By contrast, Shneiderman (n.d.) argues that the diversity in design rules presented by scholars such as Nielsen and Johnson only “enriches the discussion” (para. 1). However, as discussed in the case studies in Part Two of this thesis, while there is overlap between some of

these principles, they are not always congruent, and UX designers may face dilemmas when established UXD principles pull designs in contrasting directions.

The HCD approaches presented thus far are based on design principles. However, design principles and other kinds of HCD approaches are incorporated by designers within a product development/design process.

1.3.2 The 90s: Process and Usability Methods

Although the development of products or software is usually done through a process, historically, different approaches have been used. The process applied traditionally in the software engineering practice was known in the 1990s as the ‘waterfall’ approach (Nielsen, 1993, p. 94). It was modelled decades prior as sequential waterfall-like or linear developmental stages that included: requirements, analysis, design, coding, testing, and operations (Royce, 1970). Although each stage proceeded logically after the other in a linear fashion, such models were opposed in favour of more iterative and user-centred ones (Gould & Lewis, 1985). The ‘waterfall’ model continued to be criticised for leaving product or interface testing and evaluation till too late in the development process (Nielsen, 1993, p. 94; Preece et al., 1994, p. 47). As a response to ‘waterfall’, the ‘agile’ approach was formed (Cooper et al., 2014, p. 158). It was a iterative process for software development that was more favoured by some (Larman, 2004, pp. 27, 28) and was being consolidated as an alternative approach in the 1990s. However, ‘agile’ methodologies were focused explicitly on the *customer* but not on the *end-user*, unlike other mixed agile approaches that would later emerge such as Lean UX (Gothelf & Seiden, 2013).

By the mid-1990s however, HCD was already being conceptualised as an “iterative process” (Karat, 1996, p. 20) and efforts had been made towards a unified view. This is captured by Karat (1997) who stated “I suggest we consider UCD an adequate label under which to continue to gather our knowledge of how to develop usable systems. It captures a commitment the usability community supports—that you must involve users in system design—while leaving fairly open how this is accomplished” (Karat, 1997, p. 38). In 1999 the idea of an *iterative* HCD and development *process* was still being championed (Norman, 1999, pp. 216, 217) and became recognised formally in ISO Standard 13407:1999 (ISO, 1999). Despite variations between scholars, today the HCD process is understood to include four iterative activities including observation, ideation, prototyping, and testing (Norman, 2013, p. 222). Different approaches and methods are used throughout the design process.

During the 1980s and 1990s, scholars endeavoured to develop usability methods that they carried out through the discipline of usability engineering, as catalogued in some works (Nielsen, 1993; Whiteside et al., 1988). The focus of usability engineering was on “provid[ing] structured methods for achieving usability in user interface design during product development” (Mayhew, 1999, p. 2). Some approaches and methods used within different stages of the development processes form part of a designer’s HCD toolbox.

One approach to being user-centred was involving users in the design process as seen in Participatory Design (Schuler & Namioka, 1993), and informing design decisions by collecting data about users as they work in their work environment as seen in Contextual Design (Holtzblatt & Beyer, 1997). Some of the tools and methods

developed for usability-evaluation included scenarios such as Scenario-Based Design (Carroll, 2000) and prototyping such as Paper Prototypes (C. Snyder, 2003, pp. 13, 14). Nielsen (1992) advocated for the explicit use of prototypes as tools for early iterative usability evaluation, as opposed to the use of dull and abstract texts (p. 18).

Approaches used to evaluate interfaces included usability-testing and inspection methods. ‘Thinking-aloud’ was one usability-testing method (Lewis, 1982) that became well-known. The method allowed a test subject to express her thoughts out loud as she interacted with an interface. The inspection methods approach differed from usability-testing in that it didn’t require test subjects but rather relied on practitioners’ inspection, such as ‘cognitive walkthroughs’ as presented in SIGCHI conferences (Lewis et al., 1990; Wharton et al., 1992). In fact, Nielsen proposed his own (Nielsen, 1993, p. 223) distinct usability inspection method based on his 10 design heuristics or principles. The heuristics became a part of Nielsen’s ‘heuristic evaluation’, a method that entailed the use of his design principles as a means to inspect the design of interfaces (Nielsen & Molich, 1990). The approach used in this thesis to assess the UX designs of app interfaces is similar to that of Nielsen’s inspection method in that design principles are being applied to existing designs. The approaches and methods proposed by scholars involved improving the design and usability of products, and ultimately a person’s product experience. This is similarly the case in the interaction design (IxD) discipline that started after HCI.

1.3.3 The 90s: Interaction Design & Cooper

The term ‘interaction design’ was originally coined by industrial designers Bill Moggridge and Bill Verplank in the mid-1980s (Moggridge, 2007, p. 14), but the wide recognition of interaction design (IXD) as a formal discipline only began over a decade later (Cooper et al., 2014, p. xxi). Today, IXD shares a significant portion of the UXD profession as highlighted in Figure 1.1. In addition, IXD overlaps with HCI and differs only in scope (Sharp et al., 2019, p. 10).

Interaction design has been defined as “the practice of designing interactive digital products, environments, systems, and services... focus[ing] on... the design of behavior” (Cooper et al., 2014, p. xix). The discipline uses theories, methods, and tools borrowed from other fields such as those mentioned earlier, as seen in the work of scholars such as Norman, Nielsen, and others. In addition, for the practice of UXD and the field of IXD,(Sharp et al., 2019, p. 9), the work of software inventor and programmer Alan Cooper was very influential.

Cooper’s HCD approach was backed by many years of experience. Among Cooper’s most notable early work was the development of a visual programming UI named Ruby. It improved the development experience by allowing developers to quickly program applications with graphical interfaces. Ruby was purchased in 1988 by Microsoft co-founder Bill Gates, and was incorporated into what became known as Visual BASIC, earning Cooper recognition as ‘Father of Visual BASIC’ (Hsu, 2017). Cooper’s contribution to Visual BASIC played an important role in the success of Microsoft Windows to which he received the Windows Pioneer Award in 1994

(Cooper, 2004), two years before co-founding “the first interaction design consulting firm” (Cooper et al., 2014, p. v).

In fact, Cooper’s experiences in the software and consulting industry led to the development of tools and techniques for the improvement of software designs (Cooper, n.d.). The methods were distinct from usability engineering approaches and other important work of that time (Spool et al., 1999). Since then, some of Cooper’s methods and tools have become an IxD and UXD industry standard (Hsu, 2017).

Cooper presented his ideas under Goal-Directed Design (GDD), a HCD approach and process, documented in his two seminal books published in the 1990s (Cooper, 1995, 1999). In his 1999 book, Cooper presented his novel and now commonly practiced concept of ‘personas’. Personas are research-based and designer-constructed archetypes of users that are incorporated in the design process (Cooper et al., 2014, p. 26), alongside other methods such as scenarios and prototypes.

Cooper’s GDD approach is distinct by its unwavering focus on the user’s goals, and by bridging the gap between research and design (Cooper et al., 2014, p. 21). Cooper’s goal approach is distinguishable from other HCD approaches when viewed through Hassenzahl’s three levels of UXD that include the ‘why’, ‘what’, and ‘how’ (Hassenzahl, 2010, pp. 43-45; n.d.). For instance, while Norman’s (1988) approach focuses on ‘how’ a product works (Hassenzahl, n.d.), Cooper’s upper-lens attempts to address the ‘why’, meaning the end goals and expectations of the users (Cooper et al., 2014, pp. 14, 15).

In the mid to late 1990s other HCD approaches were presented by UXD practitioners and researchers. While some were centring the role of usability in

providing exceptional experiences such as Krug's book *Don't Make Me Think* (Krug, 2000), others had already begun conceptualising the meaning of UX beyond mere usability and its relation to effective interaction design (Alben, 1996), as shown in the next section.

1.4 Usability & UXD

By the 2000s, HCD approaches of designing *for* a user experience had been consolidating as one of its key components, usability. However, although there was agreement among scholars that usability did not simply equate to the whole UX and that UX was rather complex, there was still no universal consensus regarding the definition of UX in the literature (Law et al., 2008). This section begins by showing how the notion of UX challenged the understandings of scholars in relation of traditional usability by showing the different scholarly research perspectives. It then presents the understanding of UXD used in this thesis.

1.4.1 Reconciling Traditional Usability with UX

Some scholars related the notion of UX to the understanding of traditional usability as presented in ISO Standard 9241-11 of 1998 (ISO, 1998). This resulted in three perspectives: UX encompasses usability, UX complements usability, and UX is just one of the parts that constitute usability (Følstad & Rolfsen, 2006, pp. 10,11). In the latter perspective UX may be thought of as an extension to the notion of satisfaction (p. 11) as seen in the early work of Nielsen (1993, p. 26) and ISO Standard 9241-11 (ISO, 1998) where satisfaction was one of other essential elements within traditional usability.

However, the first perspective, that UX encompasses usability has been advocated by some pioneers (Norman & Nielsen, n.d.) and became the popular view within the UXD industry and academia today (IDF, n.d.-b). This view can be seen through the work of UXD practitioner Jesse James Garrett (2002). Garrett introduced an influential HCD approach that focused on deconstructing the ‘elements of user experience’ in a practical manner into layers. Some layers included usability-related aspects such as interaction design, information architecture, and navigation design (pp. 28-30).

The second and final perspective holds that UX complements or adds to traditional usability. This perspective was summed up into three general areas of focus by Hassenzahl and Tractinsky (2006) in one of the most highly cited papers in the UX field. The areas include experiential, affective, and non-task related aspects. The ‘experiential’ focus area holds that an experience has a set beginning and end, and is constituted by several elements “such as the product and internal states of the user (e.g. mood, expectations, active goals)” (Hassenzahl & Tractinsky, 2006, p. 94). Indeed, a focus on the user’s internal states can be seen as adding to the conception of traditional usability.

In fact, Hassenzahl and Tractinsky (2006) point out that the notion of UX has challenged the assumption within traditional HCI (i.e. usability) that holds that the lack of problems is equivalent to high quality. They argued that instead of simply preventing problems of usability, the notion of UX would shift the focus towards generating quality experiences, in their own words it’s “designing for pleasure rather than for absence of pain” (p. 95). In fact this is echoed in the thoughts and work of many scholars in the late

1990s leading into the 2000s that explored aspects of UXD beyond mere traditional usability, as shown more clearly in the other two focus areas of the last perspective.

Apart from focusing on the ‘experiential’ aspect, scholars also focused on ‘non-task related’ aspects and highlighted the importance of notions such as beauty and aesthetics as seen in one controversially titled article *What is Beautiful is Usable* (Tractinsky et al., 2000), and others works (Hassenzahl, 2004; Lavie & Tractinsky, 2004). Norman (2002) elaborated on these ideas, auguring that products that are pleasant and attractive work better, and that “[j]ust as negative affect can make some simple tasks difficult, positive affect can make some difficult tasks easier” (p. 40).

In the third aspect ‘affect and emotion’, scholars focused on yielding positive emotions like “joy, fun and pride” (Hassenzahl & Tractinsky, 2006, p. 93), and the role of affect in relation to product use both as a consequence of its use (Desmet & Hekkert, 2002; Hassenzahl, 2003; Kim & Moon, 1998) and as an antecedent (Norman, 2004a, pp. 65-69; Singh & Dalal, 1999). This focus on positivity was also being reflected in a trend in psychology called ‘positive psychology’ advocated by Csikszentmihalyi and Seligman (2000) and supported by others (C. R. Snyder & Lopez, 2001).

In the early 2000s a parallel trend of looking beyond mere usability was also occurring under the banner of ‘funology’, a notion SIGCHI conference researchers developed that involved the “study of pleasure” (Grudin, 2012, p. L). In fact, Blythe and Monk (2018) points out that psychologists prior to that period were not concerned with the notions of fun or enjoyment (p. 4), with the notable exception of the concept of ‘flow’ as presented by Csikszentmihalyi (1975) to describe an experience of intense absorption in an activity. In 2003 an argument for the inclusion of ‘enjoyment’ as part of traditional usability approaches was presented in the book *Funology: From Usability*

to *User Enjoyment* (Blythe et al., 2003, p. xvi) through the compiled work of some scholars. In fact a quote later by Norman (2004b), usability pioneer, captures the thoughts of the era: “It is not enough that we build products that function, that are understandable and usable, we also need to build products that bring joy and excitement, pleasure and fun, and, yes, beauty to people’s lives” (Norman, 2004b, p. 312).

1.4.2 UXD in Context

The macro UXD understanding used in this thesis follows the first perspective, that UX encompasses usability. This section contextualises the UXD understanding through the work of Norman (2004a) who co-developed three levels of emotion and cognition (Ortony et al., 2004). The levels provide a framework for UXD that goes beyond his earlier work that had focused strongly on usability.

Norman (2004a) expanded upon the three levels of design in his seminal book *Emotional Design*. The three levels included, *visceral* design that is concerned with “appearances, touch, and feel” (p. 37) including beauty (Norman, 2004b, p. 314), *behavioural* design concerned with the ‘pleasure and effectiveness’ derived from use, and *reflective* design concerned with “the rationalization and intellectualization of a product” (Norman, 2004a, p. 5). Although these three levels are very distinct from each other, they are interwoven and inherently included within any design (p. 6).

The focus in this thesis is primarily on the behavioural aspect of UXD. The behavioural level of design corresponds closely to usability— understanding how to operate a product with ease. However, the behavioural level is also about the experience

of using a product that includes not only usability but also two other aspects, a product's design-features, and the performance of operating these features (p. 37). In other words, the 'what' (i.e. design-features) and the 'how', meaning the interaction itself (Hassenzahl, 2010, pp. 43-45; n.d.). Although some scholars have presented conceptions of UXD outside the traditional usability paradigm, the 'behavioural level' or traditional usability are still pillars that support enjoyment through an interface.

In fact, the previous section showed that notions such as joy and pleasure, tend to be used by some scholars to describe user states beyond the experiences of mere usability. However, there are different ways through which these states can be conceptualised in relation to UXD. For example, Nielsen (2003) states that a user interface is enjoyable when it runs smoothly and “[does] things the way you want” (p. 103). Similarly, Norman (2004a) states that negative emotion in product use stems from confusion or frustration, “[b]ut if the product does what is needed, if it is fun to use and easy to satisfy goals with it, then the result is warm, positive affect” (p. 37). Nielsen asserts that the added:

[U]ser experience dimensions, while important, still depend on a solid usability foundation. You can design an attractive product that is consistent with your moral values, but sales of that attractive product may suffer if it is hard to learn, not very efficient, and error prone (Nielsen, 2009, pp. 3, 4).

As mentioned, the approach taken to assess the UX designs of app interfaces is similar to the heuristic evaluation method introduced by Nielsen (1993, p. 223) in that design principles are being applied to inspect designs. However, the app designs that are being assessed in this study are not prototypes but products existing in the market that

have already undergone an iterative design process. More importantly, in the case of this research, the design principles also ground the research and analysis chapters in a UXD framework to bring an understanding of the condition of UXD in social media interfaces. An important overarching UXD principle that is woven into the framework of this thesis is the principle of familiarity, the idea of creating a “[m]atch between system and real world” (Nielsen, 1994b, p. 153). In other words, presenting users with familiar designs. The principle of familiarity ties in with the concept of ‘mental models’ introduced by Norman (2013), defined as people’s conceptions of how a product works (p. 26). ‘Mental models’ are based on a user’s present and past experiences, including interactions with products (p. 26). Therefore, designers should base their designs on standards that are familiar to users. It is important that designers present users with a ‘conceptual model’, meaning an “explanation... of how something works” (p. 25), through the product design that is familiar and also consistent across different platforms.

To conclude, this chapter has given an overview of the development of UXD practice and related disciplines through a historical perspective. More importantly, it has demonstrated the importance of applying HCD principles to designs through the example of Lt. Chapanis and the use of Gestalt principles, and introduced the HCD principles/approaches of UXD pioneers before highlighting the facet of UXD which this research focuses on.

In addition, this chapter has shown that much research on UXD has been generally focused on presenting practical considerations for designers (Nielsen, 1993; Norman, 2013; Shneiderman et al., 2018). In fact, research on UXD tends to lack historical and cultural accounts of the UX designs and practices implemented within the app industry. Therefore, the next chapter introduces a cultural and media theoretical lens

through which this research can be interpreted to show that design is culturally contingent and shaped beyond the mere application of technical know-how.

Chapter 2 - Theoretical Framework:

Cultural Media Studies

The theoretical frameworks introduced in this chapter add perspectives based on cultures, economics, and historical developments to the study of UXD design standards. The chapter shows the cultural contingencies and complexities of design that have arisen and the introduction of various concepts that help explain the dynamic and ever-changing environment through which digital media products are developed. In fact, literature shows that cultural contingency of design often results in conflicting design standards being put forward by different groups or companies in the name of good design while also benefiting their own interests. This adds to the complexity of the UXD practice and planning that goes into designing consistent and familiar designs.

In order to work toward a greater understanding of design practices, and the hierarchical systems of corporate ownership that may impact on these practices, the first section of this chapter focuses primarily on Antonio Gramsci's theory of hegemony that deals with relations between culture and power (Gramsci, 1971). From this, I explore the links between the comparatively small yet important role of app design standards and the grander scheme of hegemony and 'common sense'. Moving on from the wide theoretical lens of the first section, in the second section I move more specifically into the field of media studies, focusing primarily on the theories of remediation brought forth by Bolter & Grusin (2000) and Henry Jenkin's work on convergence. I also draw

on other Media Studies concepts including immediacy and hypermediacy that explain the forces that underlie media change and that are important for understanding the development of UXD and how it impacts on the development of consumer technologies. Finally, these theories all lead to an investigation of dominant design and standardisation processes that are critical to this thesis and a broader understanding of app development.

2.1 Power Structures & Hegemony

The contribution of Antonio Gramsci's theory of hegemony to Marxist thought in the 20th century is held in high regard. Gramsci held the position of General Secretary of the Italian Communist Party up until his long imprisonment by the Fascist State, starting in 1926. Gramsci's theory was written in prison before his death in 1937 and was later uncovered and pieced together. Despite the theory itself not being presented in a cohesive manner through the prison notes, hegemony was still the theme which unified Gramsci's ideas (Bates, 1975, p. 351).

Bates (1975) defines the theory of hegemony as one that sees "political leadership based on the consent of the led, a consent which is secured by the diffusion and popularization of the world view of the ruling class" (p. 352). The element of consent is a defining characteristic within Gramsci's theory, as shown later in this chapter alongside Gramsci's important framing of the notions of ideology and common sense. Marx's concept of ideology called attention to the materialist and economically driven nature of the capitalist society, a similar ideology that critics claim is used by multinational technology corporations that produce electronic devices and their software

designs for mass consumption. Gramsci's work on hegemony and common sense links directly to the present-day commodification of electronic devices, their software designs, and our usage.

2.1.1 Ideology

In *The German Ideology*, Marx & Engels (1970) state that "[t]he ideas of the ruling class are in every epoch the ruling ideas" (p. 64). Gramsci (1971) acknowledged and attributed this observation to Marx, similarly stating that establishing a ruling class or state "is equivalent to the creation of a *Weltanschauung*" (p. 381) or world-view. However, as noted by Bates (1975), for Gramsci this realisation was "much more suggestive" (p. 351) than it was for Marx. In fact, Marx's writings show his understanding that the ruling ideas are an outcome of economic theory, elaborating that the ruling class controls the production of a society's ideas *because* they have control over the material means of production such as machines and factories. Consequently, for Marx, the ruling class's ideas become the "ideal expression of the dominant material relationships" (Marx & Engels, 1970, p. 64) that are absorbed by the subordinate classes, which in return enable the dominance of the ruling class. In this way, the ruling class "rule also as thinkers, as producers of ideas, and regulate the production and distribution of the ideas of their age" (p. 64). Based on this linear relationship, the ruling class can be seen as playing a crucial role in shaping the designs and distributions of commodified products.

Marx and Engels (1970) posit that such ideas are not used by the ruling class only for their own interests, but are also represented as "the common interest of all the

members of society... expressed in ideal form... the form of universality, ... the only rational, universally valid ones” (pp. 65, 66). These ideas allow the ruling class to not only dominate and control the subordinate class but also take advantage of them through the capitalist framework that the ruling class has constructed.

2.1.2 Capitalist: Exploitation, Force, and Coercion

Drawing from Marx, Stoddart (2007) states that, “it is through the dominant ideologies of capitalism that the working classes take for granted their exploitation within economic structures of inequality” (p. 197). One way this is done is through what Marx (1976) calls commodity “fetishism” (p. 165), built upon the distinction between use-value and exchange-value. To explain, while a wooden house gives timber a use-value, the exchange-value of a wooden house is the social labour required to build it specifically for a capitalist economy. ‘Commodity fetishism’ refers to the manner in which products created through people’s labour are disconnected from that process and placed with an exchange-value in a capitalist economy (Stoddart, 2007, p. 196).

The transactions between capitalists and workers, Marx (1976) argues, are “veiled by the commodity-form of the product and the money-form of the commodity” (p. 713). Stoddart (2007) points out that Marx’s writing suggests that these two ideological ‘forms’ serve the ruling class’s dominance over the working class who hand over this power through their “willing participation” (p. 197). However, workers are not only participating but also forced into participation. Marx (1976) posits that the worker is under compulsion economically, thus is coerced to sell his own labour. The worker requires this transaction continuously as he lacks the necessary means of survival. The

capitalist on the other hand, by whom the means of production are owned, is economically capable and indifferent (pp. 47, 48). Marx recognises that the capitalist pays the worker money for the commodity's value, however, insists that the wages or "money is merely the transmuted form of the product of his labour" (p. 712). Based on this understanding, workers involved in the production of electronic devices and their designs do so while also being subject to similar inequalities while forcefully participating in maintaining the capitalist ideology and securing their own domination by the capitalist class. In Marx's perspective, the working class are exploited by the ruling class who maintain their power *because* they have the means of material production. It is perhaps important to return here to Gramsci's work to help create the foundation for a broader argument on the construction of hegemony and how it might relate to the 21st century and the availability of smartphone apps.

2.1.3 Gramsci's Cultural Hegemony

The main contribution of Gramsci's theory of hegemony is that it attempts to "address the relation between culture and power under capitalism" (Lears, 1985, p. 568). Bates (1975) points out that necessary changes were applied by Gramsci to Marx's superstructure in an effort to achieve his own conception, leading to the reconstruction of the superstructure into two levels consisting of civil and political society, where:

[p]olitical society... is composed of those public institutions—the government, courts, police, and army—which exercise 'direct dominion.' It is synonymous with the 'state.' (p. 353).

On the other hand, Gramsci saw civil society as “composed of all those ‘private organisms’—schools, churches, clubs, journals, and parties—which contribute in molecular fashion to the formation of social and political consciousness” (p. 353).

While Bates (1975) acknowledges that power is secured by the ruling class (p. 352), Strinati (2004) offers a nuanced definition that implies that the ruling class are primary in their status as rulers, but do not dominate exclusively, rather they form a part of dominant groups (p. 153). In fact, while Marx focused on socioeconomic classes, Gramsci’s notion deviates by encouraging analysis of the formation of social groups across a wider range of categories. This includes social formations of “ownership and nonownership and that are bound by religious or other ideological ties as well as those of economic interest” (Lears, 1985, p. 571). This means that in Gramsci’s conception it is not necessarily the ruling ‘class’ that plays an important role in shaping product designs, but ruling ‘groups’. Barker (2012) explains how Gramsci’s notion of ideology plays a role here, stating that:

Within Gramscian analysis, ideology is understood in terms of ideas, meanings and [*also*] practices which, while they purport to be universal truths, are maps of meaning that sustain powerful social groups (p. 67).

We could think of this, for example, through the scenario of an Apple designer/employee or third-party app developer who engages routinely in the development of electronic devices and digital products, which supports the capitalist ideologies of Apple and its group affiliates and maintains their power. In fact, in the Gramscian understanding, the designers are not forced, rather they consent to being dominated by doing their daily work-related activities.

As mentioned, consent is a defining characteristic within Gramsci's theory. Strinati (2004) also states that dominance is achieved by securing the consent of subordinate groups (p. 153), adding that this is also how dominance is maintained. However, how does a dominant group gain the consent of people? One approach for securing and maintaining the consent of people is through negotiation. Cormack (1993) states that dominant groups seek to maintain their possession of power by providing the subordinate groups with reasons to gain their support and consent; to this effect they act upon incorporating the aims of some of the subordinates (p. 12). Therefore, for corporations like Apple, providing high levels of usability and affectively positive user experiences is therefore part of the process for securing consent. As noted by Stoddart (2007), since hegemonic power is "often-implicit" (p. 203), the role that social media app UX designs play in securing the consent from users is often viewed uncritically, due to a notion that Gramsci calls 'common sense'.

2.1.4 Common Sense

Gramsci's notion of common sense is described by Fulton (1987) as "*a sense in common, common consciousness or commonality of experience*, one which is shared by persons having a similar relationship to nature and other persons" (p. 203). Although Fulton's definition is still in accordance with Gramsci's usage, Gramsci goes further by challenging people's understandings of what constitutes a common sense belief.

Gramsci (1971) draws a distinction between that which is 'felt' or in other words what he refers to as 'common sense', and what is 'known' or the result of "intellectual order" (pp. 325, 326).

Crucially, Gramsci (1971) differentiates the meanings of ‘good sense’ and ‘common sense’. He states that ‘good sense’ is “practical [and] empirical” (p. 323), but ‘common sense’ is “[b]roadly... the incoherent set of generally held assumptions and beliefs common to any given society” (p. 323). These assumptions and beliefs are grasped “spontaneous[ly]” (p. 198) in an “uncritical and largely unconscious way” (p. 322) and are “formed through everyday experience” (p. 199). Stoddart (2007) points out that subordinate classes consent to be ruled by capitalists through usual everyday ‘common sense’ activities related to family, worship, school, and work (p. 203). To borrow an earlier example, an Apple designer/employee or third-party app developer engages routinely in the development of electronic devices and software because it is the ‘common sense’ thing to do, thereby consenting to be dominated by dominant groups such as Apple and group affiliates.

The ‘common sense’ notion may be understood as a tool used by a dominant group to maintain their power and therefore continue to employ an unconscious design community that furthers and promotes design ideologies— including philosophy, standards, and practices, in order to meet their capitalist interests. The ideologies of a dominant group influence the design of the product and the philosophy that underlies their functionality. In the case of Apple and many other technologies firms, the framework of UXD has become one of the core philosophies that guides the design of their products and software. To view this through a Marxist/Gramscian lens, capitalist corporations present product designs based on a UXD philosophy as a way of maintaining their cultural and market dominance, while their dominance in turn serves to make the designs inspired by these philosophies seem ‘common and natural’. Although most designers are striving to create designs that will legitimately appeal to

users, ultimately any successful designs serve to enrich the capitalists, and to enhance their cultural dominance. Despite the fact that the designers are separated from the product of their work through commodity fetishism, ‘common sense’ makes striving within this system seem natural, even desirable. In addition to these complexities, dominant ideologies (and, as shown later in this chapter, dominant designs) change over time.

The temporal nature of such processes is reiterated according to Gramsci (1971) since ‘common sense’ is “the traditional popular conception of the world” (pp. 198, 199), and is not fixed in time, but rather subject to the fashion of the time. Gramsci states that “[c]ommon sense is not a single unique conception, identical in time and space. It is the “folklore” of philosophy, and, like folklore, it takes countless different forms” (p. 419). Further, ‘common sense’ does not exist without opposition (p. 419), but rather is shaped by it.

2.1.5 Ideological Contestation

Earlier I introduced Gramsci’s notion of historical blocs that constitute the formation of social groups. Gramsci (1971) states that “preserving the ideological unity of the entire social bloc” (p. 328) is problematic, but this unity is important to “secure the consent of the governed” (Stoddart, 2007, p. 201). Regardless, based on Gramsci’s writing Stoddart states that “there is never a unified, totalizing system of ideological domination” (p. 201) and a state of tension exists between hegemony and its ideological opposition, and through it both are shaped. Stoddart claims that hegemonic power is a continuously remade outcome of social action, but adds that contestation occurs

between dominant and subordinate groups resulting in hegemonic networks (p. 201). For Cormack (1993) the dynamics between these social groups “suggest that the cultural products aimed at a mass audience... will in some way reflect this continual struggle” (p. 12). He provides the example of Hollywood films suggesting that a deeper look beyond the apparent ideological signs of their content may reveal “evidence of conflicting interests, contradictory discourses and unresolved struggles” (p. 12). Similarly, in the case of commodified electronic devices and digital products, hegemonic networks of different companies or group affiliates support different and conflicting UXD standards/approaches that benefit their own interests.

To conclude, products are shaped by the dominant ideology of a time and its contending oppositions. These product designs are brought into being under a capitalist ideology that promotes commodity fetishism through structures of inequality that benefit capitalist groups and maintain their power. Further, ‘common sense’ is used as a tool to secure the consent of designers to participate in furthering the capitalist agenda through the design of the ‘commodity-form’ of the product, including the support of certain practices and standards.

The UXD philosophy has arguably become a dominant design philosophy for the production of electronic devices and software products, as exemplified through Apple’s innovative iPhone design and the growing body of UXD literature in the 20th century, as shown in the previous chapter. UXD is often used as a force for good that improves the experiences of users. However, for dominant capitalist groups, the UXD philosophy embedded within products forms part of a smartphone or app’s marketing lure that supports the economic interests of those capitalist groups whose design philosophy it is. Therefore, although providing users with easy-to-use experiences

through great designs is effective, the designs are proprietary software owned by rival companies such as Apple and Google that use them in order to convince people to buy into their systems and consent to the domination of their design standards.

2.2 Media Forces of Change

While the work of Marx and Gramsci may be far removed from an investigation of Smartphone apps, they provide an entry point for a greater understanding of how monopoly cultures have formed in today's neo-capitalist societies. Increasingly, new media is part of these structures, and U.S. journalist and graphic designer Roger Fidler, a new media pioneer for his work into tablet-style newspapers, states the only certainties of scholars with regards to society and their communication systems is that they will often change unpredictably and that:

Some of the changes that will occur in the next century will undoubtedly conflict with present-day social values and standards. Popular forms of communication media may be called by different names, and they may be used in different ways. But however society and media may change, we can be reasonably assured that they will continue to embody and build upon the experiences of the past, as they always have. By letting history be our guide, we will see that the forces shaping our future are essentially the same forces that have shaped our past (Fidler, 1997, p. 7).

Fidler's statement captures the theme of this chapter which builds on the previous section by showing that UXD can be shaped by hegemonic forces of

ownership and control beyond mere technical know-how. Drawing on theories of remediation, convergence, and dominant design, this chapter seeks to explain the forces that underlie media change and are important for understanding the development of UXD. This chapter also explains how these theories can build an understanding of media design practices as both technological and cultural.

2.2.1 Medium Theory & Technological Determinism

Prior to the internet, the study interest for many media scholars was the production and reception of media content, with the technologies or the *how* of mediation often neglected (Braman, 2004, p. 123). However, some scholars did explore communication technologies from a historical and cultural perspective. Professor of Communication, Joshua Meyrowitz (1994) refers to the body of literature that focuses on the potential influences of technology as *medium* theory, in distinction to their content or *media* theory (p. 50). Early work by Lewis Mumford (1934) showed an original perspective, suggesting that the dominant medium of a civilisation determines how that civilisation is shaped. This deterministic view was expanded on by Harold A. Innis (1951) when considering the “significance of communication to the rise and decline of cultural traits” (p. 33) within civilisations. Innis reasoned that there are two primary characteristics of a communication medium, time (e.g. medium durability) and space (e.g. medium lightness). He suggested that a civilisation is characterised by the media that they effectively use and their bias towards either of these characteristics (p. 33). Innis’s work inspired his student Marshall McLuhan who later became a prominent media theorist, widely known for his phrase “the medium is the message” (McLuhan, 1964, p. 7; 1967).

McLuhan emphasised that the medium through which content is delivered shapes a society more than the communicated content itself (McLuhan, 1967, p. 8), defining a medium as “any extension of ourselves” (McLuhan, 1964, p. 8), for example, “the wheel is an extension of the foot... the book is an extension of the eye... electric circuitry, an extension of the central nervous system” (McLuhan, 1967, pp. 31-40).

McLuhan’s broad conception of a medium is also layered, as he considered that “the ‘content’ of any medium is always another medium” (McLuhan, 1964, p. 8), arguing that as speech is the content of writing, “the written word is the content of print, and print is the content of the telegraph” (p. 8). Further, McLuhan explains that “the ‘message’ of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs” (p. 8) He provides an example stating that:

The railway did not introduce movement or transportation or wheel or road into human society, but it accelerated and enlarged the scale of previous human functions, creating totally new kinds of cities and new kinds of work and leisure (p. 8).

McLuhan’s work inspired a community of scholars (e.g. E. L. Eisenstein, 1979; Meyrowitz, 1986; Ong, 1982; Postman, 1985), and although his theories pre-date the Internet they were foundational for other scholarly work published at the turn of the 21st century such as the theory of remediation by Bolter and Grusin (2000). However, the deterministic message behind the core arguments of McLuhan, Innis, Mumford and other scholars about the role of a medium or technology in society has been deemed by other scholars to be somewhat reductive (Bolter & Grusin, 2000, pp. 75, 76; Braman,

2004, p. 139; R. Williams, 1975). Instead, scholars have taken an alternative or more balanced approach towards technology's role as an agent of change in societal affairs.

2.2.2 Medium as a Hybrid

An example of this more balanced approach comes from Bolter and Grusin (2000), who regard new media technologies as “agents in our culture... [that] emerge from within cultural contexts” (p. 19). They attempt to counter the technological determinism by refusing to “insist on any aspect as cause or effect (p. 78) and “treat[ing] social forces and technical forms as two aspects of the same phenomenon: [exploring] digital technologies themselves as hybrids of technical, material, social, and economic facets” (p. 77). Bolter and Grusin define a medium as “that which remediates” (p. 65), meaning “that which appropriates the techniques, forms, and social significance of other media and attempts to rival or refashion them in the name of the real” (p. 65). This conception not only explains the criterion of a medium that is both technical and social but also explains the function of ‘remediation’ which is expanded on in the following sections.

Similarly, Historian Lisa Gitelman (2006) defines media as twofold. On the one hand, a medium is a technology that allows communication, on the other it is a set of social and cultural practices or “associated protocols” (p. 7) that have developed around a technology. Gitelman elaborates stating that:

Protocols express a huge variety of social, economic, and material relationships. So telephony includes the salutation “Hello?” (for English speakers, at least), the monthly billing cycle, and the wires and cables that materially connect our phones. E-mail includes all of the elaborately layered technical protocols and

interconnected service providers that constitute the Internet, but it also includes both the QWERTY keyboards on which e-mail gets “typed” and the shared sense people have of what the e-mail genre is. (pp. 7, 8)

More importantly however, these protocols include standards that have either been mandated by standardisation bodies, formed through de facto norms, or “get effectively imposed, by corporate giants like Microsoft, because of the market share they enjoy” (Gitelman, 2006, p. 8). In fact, these are the same monopolising ‘giants’ that in Gramsci’s conception form dominant and subordinate social groups and ‘effectively impose’ the UX designs that benefit their own interests through ‘common sense’ and commodity fetishism.

Gitelman (2006) acknowledges that some protocols surface differently from others and that digital genres and computer keyboards for instance have come about through the interactions of different media. However, Gitelman adds that “protocols are far from static... norms and standards can and do change, because they are expressive of changeable social, economic, and material relationships” (p. 8). These are complex forces that change media standards, so it is useful to understand the concepts that explain how these are enacted.

2.2.3 Remediation and Convergence

One way of conceiving the ongoing process of transformation occurring to all communication media comes from Roger Fidler’s concept of *Mediamorphosis* from his book of the same name (1997). According to Fidler, the morphing of media is “usually brought about by the complex interplay of perceived needs, competitive and political

pressures, and social and technological innovations” (p. 23). ‘Mediamorphosis’ is an umbrella term for the ideas that underlie the technological evolution of communication media. An essential principle in Fidler’s work is an understanding that “new media do not arise spontaneously and independently—they emerge gradually from the metamorphosis of old media. And that when newer forms of communication media emerge, the older forms usually do not die—they continue to evolve and adapt” (p. 23). For example, as television grew in its popularity and diffusion, it took over a mass audience, but threatened the existence of radio. However, radio did not die, it was still able to find its own success via niche audiences despite its decline as a medium of a mass audience.

Henry Jenkins, a scholar of media and popular culture, provides a somewhat different perspective that separates media from delivery technologies. Jenkins (2006) states that:

history teaches us that old media never die... [w]hat dies are simply the tools we use to access media content... [d]elivery technologies become obsolete and get replaced; media, on the other hand, evolve. Recorded sound is the medium. CDs, MP3 files, and 8-track cassettes are delivery technologies” (p. 13).

Another phenomenon that underlies change is ‘convergence’, which Jenkins describes broadly as “the flow of content across multiple media platforms” (p. 2). In his 2006 book, *Convergence Culture*, Jenkins lists the different facets of the complex notion of convergence that continuously play out in society, including the convergence of technology, industry, and media (p. 16). Technological convergence refers to the process by which the functions of distinct devices are merged into single devices. In

fact, Jenkins argues against a misconception of technological convergence that he calls the Black Box Fallacy that says that eventually all media will be processed through a single device in the living room, or a mobile device. Instead Jenkins supports the notion that while content converges, hardware diverges and that this links to hardware devices being designed depending on the users' context/location (pp. 14-15). Further, a single black box is not possible, Jenkins argues, because "convergence refers to a process, not an end point" (p. 16). In fact, the continuity of convergence applies to all its facets.

As noted, Jenkins (2006) argues against the understanding that convergence is primarily a technological process (p. 3). Jenkins builds on this idea by saying that "[m]edia convergence... alters the relationship between existing technologies, industries, markets, genres, and audiences" (p. 15), and can be driven by temporal factors such as commodity fetishism. Industry convergence, for instance, refers to the "the cooperation between multiple media industries" (p. 2) and the way in which media conglomerates with varying kinds of media are formed through the merger of different companies seeking synergy. As an example, he points to Warner Bros, a large multinational company that "produces film, television, popular music, computer games, Web sites, toys, amusement park rides, books, newspapers, magazines, and comics" (p. 16). In fact, through this variety, convergence affects change in both media production and consumption.

With regards to media consumption, Jenkins (2006) provides an example of media convergence stating that "[a] teenager doing homework may juggle four or five windows, scan the Web, listen to and download MP3 files, chat with friends, word-process a paper, and respond to e-mail, shifting rapidly among tasks" (p. 16). Indeed, under continuous convergence different media systems coexist (p. 282). The continuous

change and emergence of new media gives the impression that new media are always at the brink of becoming obsolete and that consumers need to update their media to remain relevant. However as new media scholar Chun (2016) argues, new media matter the most when their use becomes habitual and they have lost their initial lustre.

Although remediation and convergence are separate concepts, Bolter and Grusin (2000) state that these concepts can be seen as different labels for essentially the same phenomenon (p. 224), however, remediation differs by focusing on the repurposing of media. As mentioned, remediation refers to “that which appropriates the techniques, forms, and social significance of other media and attempts to rival or refashion them in the name of the real” (p. 65). For example, photography was once regarded as “more immediate [or ‘real’] than painting, film than photography, television than film, and now virtual reality fulfills the promise of immediacy and supposedly ends the progression” (p. 60).

Bolter and Grusin (2000) acknowledge that convergence is not unidirectional and that as different technologies and commodity-forms arrive, “they remediate each other in various ways and in various ratios to produce different devices and practices” (p. 225). Similarly, Fidler (1997) highlights how media coexist and also coevolve, stating that “[a]s each new form emerges and develops, it influences, over time and to varying degrees, the development of every other existing form” (p. 29). In simpler terms, for Bolter and Grusin (2000) “remediation is mutual” (p. 224), just as old media influence newer ones, so do the new influence the old (p. 55). For example, the Internet refashions television and vice versa.

Bolter and Grusin's remediation approach does not insist on any linear history, rather a historical "genealogy of affiliations" (Bolter & Grusin, 2000, p. 55). They acknowledge their appropriation of renowned historian and philosopher Michel Foucault's notion of genealogy within their framework, relaying it as it had been originally stated, "an examination of descent..." (Foucault, 1977, p. 146). Their genealogical examinations are categorised into three parts, remediation and its two associated logics of representation: Immediacy and Hypermediacy (discussed later in this chapter). With this approach in mind, the theory of remediation provides a theoretical framework that enables the analysis of the social media app interfaces while drawing from a historical perspective of resonance. The historical analysis in this thesis therefore provides insights with regards to the 2016 context and the design standards and features of social media apps.

2.2.4 Comparing Mediums

The idea of understanding a media form by comparing it to other forms is alluded to in McLuhan's early writing (1964). In fact Meyrowitz (1994) states that:

Medium theory [inspired by McLuhan] focuses on the particular characteristics of each individual medium or of each particular type of media. Broadly speaking, medium theorists ask: What are the relatively fixed features of each means of communicating and how do these features make the medium physically, psychologically, and socially different from other media and from face-to-face interaction? (p. 50).

Similarly, Fidler (1997) highlights the importance of accounting for “the similarities and relationships that exist among past, present, and emerging forms” (p. 23) of communication media due to their existence as part of an interdependent system. Further, Bolter & Grusin (2000) assert that “[a] medium in our culture can never operate in isolation...[and] today... we cannot even recognize the representational power of a medium except with reference to other media” (p. 65).

However, media such as smartphones consist of both physical and software forms. N. Katherine Hayles (2004) argues in her article *Print Is Flat, Code Is Deep* the importance of her notion of a ‘media-specific’ analysis that recognises text (or content) as being embodied elements within a material form and that understanding the material form is important for understanding the content. Hayles states that:

In emphasizing materiality, I do not mean to imply that all aspects of a medium’s apparatus will be equally important. Rather, materiality should be understood as existing in complex dynamic interplay with content, coming into focus or fading into the background, depending on what performances the work enacts (p. 71).

Such dynamics are taken into account when comparing the different commodity-forms of media, including competing smartphone operating systems and software, in this thesis. With this in mind, while Bolter and Grusin’s framework makes this cross-medium comparison possible, in the software world, the design features of apps of the same smartphone medium can vary significantly in their similarities and differences. In this sense, Bolter and Grusin’s framework is relevant because it includes a category of refashioning that happens specifically within a single medium, “refashioning one's

predecessors” (Bolter & Grusin, 2000, p. 49). They state that this refashioning “is a special case of remediation, and it proceeds from the same ambiguous motives of homage and rivalry” (p. 49). They provide the example of when a painting is represented within another painting, or when a newer film borrows from an older one. However, as mentioned, the software world can be more complex because a new software product can borrow a set of design features that are recognisable from an earlier software product. This enables the comparative analysis of different media, and software of the same medium.

2.2.5 Dominant Design: The Development of Standards

The idea of having a set of recognisable design features ties in with the concept of ‘dominant design’ that can also be used to compare design features from the same medium. The concept was introduced by James M. Utterback (1994) in his book *Mastering the Dynamics of Innovation*. Although I borrow the concept from business-related disciplines, it is nonetheless relevant in this thesis. It focuses on how a dominant design is formed through a gradual process leading to the amalgamation of different design features into a particular product (p. 24). The product becomes recognisable through those features and characterised by them.

In addition, much like the concepts of mediamorphosis, convergence, and remediation, the concept of a dominant design too explains the phenomenon that underlies change within media but from the perspective of the market. Therefore, a comparison of different app products and their features can be understood in light of a

dominant design formation process that is partly shaped by market forces, including customer choices and the economic interests of capitalist groups.

The dominant design concept was based on earlier work by Utterback & Abernathy (1975), later clarified by Utterback (1994) when he explained that “[t]he dominant design usually takes the form of a new product (or set of features) synthesised from individual technological innovations introduced independently in prior product variants” (p. 24). Suárez & Utterback (1995) state that these product variants are “either custom designed or designed for a particular and demanding market niche” (p. 418). However, the defining factor of a dominant design as stated by Utterback (1994) is that it is “the one that wins the allegiance of the marketplace, [and] that competitors and innovators must adhere to if they hope to command significant market following” (p. 24), hence the promotion of commodity fetishism through the creation of brand alliances amongst consumers.

Several historical examples of a dominant design are provided by Utterback (1994), one of which is the Underwood Model 5 typewriter that incorporated several market-proven design features, discussed further in the historical analysis chapter. He points out that an indication of its dominance was its market success followed by product imitations by major rivals from the industry (p. 24). This links to the notion of refashioning or borrowing from one’s predecessors motivated by rivalry as presented by Bolter and Grusin (2000, pp. 49, 65) earlier. Further, the dominant design process implies that a standard is being made.

According to Hemenway (1975) a standard is defined as “that which is accepted for current use through authority, custom or general consent” (as cited in Suárez &

Utterback, 1995, p.417). Suárez & Utterback (1995) argue that when the term standard is defined in such a broad sense then the two notions of a dominant design and a standard pull further together. With this perspective, “a dominant design becomes the industry standard” (p. 417), and according to Gitelman (2006), includes “associated protocols” (p. 7) that have developed around a technology. These ‘protocols’ include standards that have been either mandated by officials, formed through de facto norms, or imposed by large corporations (p. 8). Based on this broad understanding of media and standards, a dominant design can be understood as a temporal form of media, within a process of change.

Further, a dominant design standard can be recognised without the need to delve deep into the intricacies of the market, by acknowledging a product design as a standard. For example, Utterback (1994) states, regarding the dominant design of the Underwood Model 5 typewriter, that it extended for decades and defined people’s perception and expectation of a typewriter’s appearance and functionality (p. 25). However, Suárez & Utterback (1995) present a somewhat different way of looking at standards. They state that “for complex assembled products with many parts, [a dominant design] embodies a collection of related standards” (p. 417). This understanding brings the notion of standards closer to the individual features of a dominant design, or in the case of apps, a collection of related design patterns or features that form the interface when assembled together.

The notion of a dominant design can also be tied into our understandings of UXD. A dominant design as a standard is closely related to familiarity, an important UXD principle mentioned in Chapter 1. Their link is that a dominant design standard is often a familiar standard. In fact, Fidler (1997) argues the importance of using familiar

designs in support of early product adoption by users (pp. 14-18). Importantly however, the notion of remediation by Bolter & Grusin (2000) opens up a channel to view familiar designs across different media, across time. In addition, their notions of immediacy and hypermediacy, discussed in the next section, can show how the design of a medium has been made familiar through a sense of immediacy, closely related to the temporal notions found in commodity fetishism.

However, familiarity is not the only way in which the concept of dominant design overlaps with UXD. Utterback (1994) argues that “[a] dominant design drastically reduces the number of performance requirements to be met by a product by making many of those requirements *implicit* in the design itself” (p. 25). Utterback (1994) provides examples of these ‘requirements’, for instance, the presence of windscreen wipers is expected within cars, similarly, both uppercase and lowercase function of typewriters are expected features (p. 25). However, he highlights that in actuality these product features were originally advertised as being advantageous over earlier products that lacked these features, but have become part of the dominant design (p. 26). This implies that UXD plays a role in shaping a dominant design through the choices of consumers between products in the market based on their UX designs and features. Utterback (1994) states that now, “these features are implicit in designs that the market expects and that all producers find themselves compelled to emulate... [t]hey are subsumed within the popularly accepted design” (p. 26). In this thesis, the concept of dominant design is used to look at the development of design features and UX designs as part of a potentially emerging dominant design standard.

Utterback (1994) does offer a caveat, however, when he emphasises that a dominant design is not custom-made for certain groups, but rather it “embodies the

requirements of many classes of users” (p. 25) and is a “satisficer [sic] of many... instead of an optimizer for a few” (p. 25). In terms of recognising a dominant design, he states his conviction that this can only be done through “retrospect” (p. 49), we cannot necessarily predict what will become a dominant design, therefore we need to be able to draw from the theory of remediation and its double logic discussed next.

2.2.6 Immediacy

According to Bolter and Grusin (2000) remediation operates under two logics or styles of representation, termed ‘immediacy’ and ‘hypermediacy’ (p. 21). While they use these notions in both an epistemological and psychological sense (pp. 70, 71), this thesis uses the psychological side as it is more focused on the user and relevant to the practicalities of UXD. Psychologically, immediacy is linked to both commodity fetishism and ‘common sense’, as it is characterised by the user’s feeling that the medium is no longer there and that the objects of presentation (or contents) are forefront instead, which establishes the user’s feeling that their experience is authentic (pp. 70, 24), despite being mediated by many layers of technology that have been created through capitalist value systems. Bolter and Grusin (2000) state that there are various types of immediacy and insist that in all their forms they share a commonality which “is the belief in some necessary contact point between the medium and what it represents” (p. 30). They provide examples of the concept through various mediums and posit that producers of older media drew their media closer to immediacy “through the interplay of the aesthetic value of transparency” (p. 24). For example, during painting they used linear perspective to depict the geometry of reality and erasure to remove traces of

brushstrokes. Producers also used the technique of automaticity that is ascribed to reflected images seen through photography, film, and television, which made linear perspective automatic (p. 25).

Some television programs are another example of immediacy where viewers are shown live footage, such as “what it is like to accompany a police officer on a dangerous raid” (Bolter & Grusin, 2000, p. 5). Similarly, webcams allow computer users to perceive images of and from various locations (p. 5), such as a bedroom or an outdoor scene of nature. In fact, a sense of immediacy is often integral in the ‘common sense’ that is mediated through the commodity fetishism of digital technologies. In the context of the GUI of personal computers, Bolter and Grusin argue that immediacy is clearly desired, stating that:

The desktop metaphor, which has replaced the wholly textual command-line interface, is supposed to assimilate the computer to the physical desktop and to the materials (file folders, sheets of paper, inbox, trash basket, etc.) familiar to office workers. The mouse and the pen-based interface allow the user the immediacy of touching, dragging, and manipulating visually attractive ideograms. Immediacy is supposed to make this computer interface ‘natural’ rather than arbitrary (p. 23).

However, the digital space is full of diverse media forms, such as websites that contain text, images, and videos, and all these forms presented together create a hypermediated state (Bolter & Grusin, 2000, p. 6). Regardless, immediacy can also be achieved in such conditions.

2.2.7 Hypermediacy

While immediacy can be achieved through erasure and automaticity, Bolter and Grusin (2000) state that hypermediacy operates by a different logic that “acknowledges multiple acts of representation and makes them visible” (pp. 33, 34). For instance, hypermediacy as seen in PCs not only contain various media such as text, photos, and videos, but also content-adaptive windows which are scalable and through which media is held (p. 33). All of these elements compete for attention (p. 32). In the context of social media, Grusin (2009) notes that the YouTube platform’s hypermediacy is evident via its “multiple networks of... users, bloggers, news media, social networkers and so forth” (p. 61). Furthermore, Bolter and Grusin (2000) argue that hypermediacy presents a visual space that is heterogeneous, while immediacy leans towards a unified space (p. 34). Regardless, they acknowledge that immediacy and hypermediacy are “mutually dependent” (p. 6).

For Bolter and Grusin (2000), the defining factor of hypermediacy is that it does not try and deny the presence of the medium, rather, psychologically, it is the experience obtained “in and of the presence of media [and] the insistence that the experience of the medium is itself an experience of the real” (p. 71). They state that the viewer or user’s experience is what defines the real, describing it as “that which would evoke an immediate (and therefore authentic) emotional response” (p. 53). In fact, even hypermediated works are attempts by designers to achieve a kind of immediacy. For instance:

The CNN site is hypermediated—arranging text, graphics, and video in multiple panes and windows and joining them with numerous hyperlinks; yet the web site

borrow its sense of immediacy from the televised CNN newscasts. At the same time televised newscasts are coming to resemble web pages in their hypermediacy (p. 9).

Bolter and Grusin (2000) state that the CNN site's editors and designers clearly desire to not only embody television but also to surpass it (p. 9). Indeed, as mentioned, remediation is also the process of refashioning media "in the name of the real" (p. 65). Bolter and Grusin state that digital media borrow from each other in an attempt to appropriate the immediacy achieved by other digital and analogue media (p. 9). Grusin (2009), for instance, argued that the social media platform YouTube was indeed a medium due to its remediation of television and that YouTube "sets out to remediate TV not merely as a neutral intermediary but as an active mediator" (p. 61). Indeed, immediacy can be achieved in different ways, within individual photographs and within a hypermediated environment. However, a hypermediated environment is distinct in its interaction style and relates more to the interaction design of software interfaces.

2.2.8 Hypermediacy in Action

The visual style of hypermediacy is described by William J. Mitchell (1994) as one that "privileges fragmentation, indeterminacy, and heterogeneity and that emphasizes process or performance rather than the finished art object" (p. 8), a definition that is deemed fitting by Bolter and Grusin (2000, p. 31). The process or performance relates to the user's interaction with a digital multimedia interface. Bolter and Grusin (2000) point out that the character of hypermediacy in the PC context assures that there is constant interaction as the user "oscillates between manipulating the windows and

examining their contents” (p. 33). In other words, between immediacy and hypermediacy, the latter constantly keeps the user aware of the interface and its design elements. In this sense, a designer or programmer of a hypermediated interface not only “strives to make the viewer acknowledge the medium as a medium [but also] to delight in that acknowledgment” (pp. 41, 42).

Bolter and Grusin (2000) note that this awareness is maintained by recognising the multiplication of areas and media, and “repeatedly redefining the visual and conceptual relationships among mediated spaces” (p. 42). For example, the role of replacement and its ability to change the visual area on the screen, where a newly launched page can grab the user’s attention via “erasure (interpenetration), tiling (juxtaposition), or overlapping (multiplication) of the previous page” (p. 44). Within a computer’s screen (and increasingly, smartphones), replacement interactions include the expansion of a menu such as drop-down, clicking on icons, and moving through areas via scrolling. Bolter and Grusin assert however, that “replacement is at its most radical when the new space is of a different medium” (p. 44), such as the appearance of a graphical image after the user clicks on a textual hyperlink. Although Bolter and Grusin (2000) discuss replacement within the context of desktop PCs, hypermediacy within smartphone apps follow more tactile design interactions, such as swiping and tapping through links and pages. In fact, a good UXD supports achieving a delightful experience or performance of the interface and its design features.

Conclusion

The theoretical framework presented in this chapter recognises that power structures play a role in the development of media. While the broader theories of ideology and hegemony were initially conceived in light of state and political control, they nevertheless help us to understand the social and economic forces at play in the world of corporate technologies. The theory of remediation allows media to be viewed from a historical perspective with an understanding that media are diversifying and changing as part of a continuous process of mediamorphosis and convergence. In addition, the remediation framework allows the comparison of different media across time and provides an understanding as to how media refashion each other through the notions of immediacy and hypermediacy. Furthermore, the concept of dominant design can be employed to recognise familiar standards, allowing the exploration and comparison of the development of UX designs within the features of a single medium.

Finally, this thesis uses the understanding that media are both technological and cultural practices to focus on the UXD practices of social media apps. To demonstrate the value of conducting a cultural/historical UX design analysis, the next chapter demonstrates how these theories can apply to the historical development of UXD in relation to the design cultures and conflicts that have shaped digital media today.

Chapter 3 - Historical Analysis

This chapter uses the framework established in the previous two chapters to trace a history of technological inventions that have shaped the way social media apps on smartphones are used today. It shows how principles that are now understood as part of UXD philosophies were central to the transformation that occurred to the design of these communication media. Furthermore, it demonstrates that the development of different technologies and media traditions have contributed to the convergence of these technologies into smartphone social media apps through a process of mediamorphosis and hegemonic pursuits that led to the creation of a ‘common sense’ understanding about design features. The chapter demonstrates the value of doing a cultural/historical UXD analysis.

The first section focuses on the development of typewriters in the 19th and 20th century and the different approaches used by designers. It shows how the dominant design used UXD principles of visibility and feedback and set the foundations for future typewriters and keyboards. The second section explores the development of the personal computer (PC), its input devices, and GUI in the latter half of the 20th century, which set the standard for future designs and the methodological expectations of the development of a computer interface through HCD. Further, it shows how the UXD principles of ‘direct control’ and ‘indirect control’ can be used to understand why the mouse was chosen as the favoured input device for the desktop computers, over other devices. These principles are further explored in the third section, which focuses on early

developments in touchscreen technologies and gestural practices that have influenced the user experiences of smartphone users today. Further, it ends with a cross-medium (input device) analysis that is built throughout the chapter, and concludes by showing how some of the technologies and traditions explored in this chapter have been built upon as they converged within the first iPhone. Therefore, this chapter allows us to understand the myriad technical, cultural and historical developments that underlie the user experiences of the app interfaces that are analysed in the second part of the thesis.

3.1 Typewriters

These technical, cultural, and historical developments in fact stretch back hundreds of years. For example, while the conception of a typewriter and the features that constitute its design may be defined in the minds of its 20th and 21st century users, the typewriter has gone through many developments to reach the standard that it has become known by, as this section shows. Further, the section explores some of these developments in light of the role of UXD. It focuses on the desire for speed, and UXD developments in terms of the principles of visibility and feedback. Further, it shows how some of the designs that reflected these principles made it as part of the emerging dominant design standard, as similarly argued by some scholars from varying fields who brought their own disciplinary perspectives (Adler, 1973; Norman, 2013; Richards, 1964; Utterback, 1994). The section focuses predominantly on the inventions of the 19th century, though the earliest mention of a typewriter began much earlier.

3.1.1 Initial Conceptions of Writing Machines

The first knowledge available of a writing-machine was found in a text from 1714. The significant text was written by her Majesty Anne the Queen of Great Britain, in which she awarded Henry Mill his patent, *Machine for Transcribing Letters*. The text read:

...by his great study, paines, and expence lately invented and bought to perfection an artificial machine or method for the impressing or transcribing of letters, singly or progressively, one after the other, as in writing, whereby all writings whatsoever may be engrossed in paper or parchment so neat and exact as not to be distinguished from print... (Woodcroft, 1862, p. 49).

The Queen's text first describes what strongly resembles the inputting of letters one after the other in a typewriter-like fashion. However, her writing continues to describe the designer's intention for the machine's output to be not only identical to that of print but better by lasting longer (Woodcroft, 1862, p. 49). The exact details of the engineer's invention are unknown and there is no evidence to confirm whether his machine was created or merely patented. In any case, the typewriter became an object of deep interest and development for numerous inventors from the United States and other regions in the 19th century (Richards, 1964, p. 17).

In the 19th century, William Austin Burt invented the first American typewriter (Bliven, 1954, p. 25). He was a very busy man which fuelled his intention to build a machine that was going to reduce his load of paper work and save him time (p. 29). Burt's 'Typographer' invention was patented in July 1829 (Burt, 1829) and is regarded as the first practical machine (Richards, 1964, p. 18). However, its shape as revealed by

the patent resembled that of a rectangular box with four legs as a table for support (Burt, 1829). Indeed it was very different from the modern day conception of a typewriter.

Burt's machine was heavy and predominantly made from wood. Moreover, it used a mechanism where types were fixed onto a curved frame section that was movable so that the user could pivot the types over to the printing area by hand. Then using a lever, the user would apply pressure downwards on the desired type, leaving an impression (Bliven, 1954, p. 30).

As a user that was experienced in its operation, Burt was satisfied with its output but saw that its speed was as an apparent issue, in his subjective estimation it was "slightly slower than writing with the pen" (Bliven, 1954, p. 30). Indeed, the typewriter remedies the function of the pen, and designers have strived to build typewriters that could outmatch the speed of pen-writing. In fact, speed was one among several important UXD features in typewriters that was a concern for inventors.

Another notable American typewriter invention was patented in 1843. Charles Thurber claimed that his machine was an enhancement in printing-machines (Thurber, 1843), however, much like Burt's machine, Thurber's was slow to use. Despite the latter being able to produce "good work" (Richards, 1964, p. 19), they were both far removed from the 19th century conception of a typewriter.

Thurber's invention used a horizontal flat platen to back a paper (Thurber, 1843, pp. 1, 5), but he later replaced this with a horizontal cylindrical platen that later became part of the dominant design. Other added features formed the basis for what is today recognised as a carriage system, such as a paper feed method, and revolving and lateral motion of the platen. Although the platen needed to be moved manually in the new

model, letter-spacing occurred automatically, and a special key was dedicated to spaces between words (Adler, 1973, p. 79). These features are prototypes of the features that would be found in later typewriter models developed by capitalist/commercial groups for mass consumption.

3.1.2 Evolution from “W”

Christopher Latham Sholes is known for the great contribution that he brought to the development of the typewriter. He and his other partners with vested interests helped push the typewriter invention to the commercial stage. Some regarded Burt’s invention in 1829 as the first practical machine, however, Sholes brought forth a machine that was both practical and commercial (Bliven, 1954, p. 42).

The repetition of the letter W, as in WWW for example, is not uncommon to users of mobile devices today, but, when Christopher Sholes first typed the letter W, that was the only letter capable of being typed using his primitive invention. After verifying that his invention worked, another was developed with the full alphabet, but it was limited to upper-case letters (Bliven, 1954, pp. 44, 45). In October the 11th 1867, Christopher Latham Sholes, Carlos Glidden, and Samuel W. Soule filed for a patent for their work on a on a ‘type-writer’ as referred to in their patent text (Sholes et al., 1868). The machine was heralded as superior, simple, and fitting for everyday means of communication and comparable to that of writing with a pen (p. 4). Astonishingly however, the machine’s keys layout somewhat resembled that of a traditional piano (Adler, 1973, p. 142) and so did its mechanical inner workings. In Sholes’ mechanical design, bars with different type on their bottom end (type-bar) would propel through

their radius going upwards from their downward position, striking and leaving an impression on a paper (Bliven, 1954, p. 44; Sholes et al., 1868, p. 1). In fact, the mechanism design that was thought of by Sholes was an early development of the great mechanisms to come, discussed later.

The machine was the team's first working model, and although it was still slower than writing with a pen (Adler, 1973, p. 42), it was still relatively fast (Richards, 1964, p. 23). Sholes' then developed the working machine into 50 different experimental models and his new partner Densmore organised for rigorous testing (Bliven, 1954, p. 49). Densmore and a newer partner Yost managed to seal a deal with E. Remington & Sons, which granted the facilitation and production of a 1000 machines, shipped in 1874 (Adler, 1973, pp. 172, 173, 148) to further their economic interests under commodity fetishism.

The machine became known as the Sholes and Glidden Typewriter (Bliven, 1954, p. 55). Prior to production however, Remington designers were able to easily resolve many of the design problems in the delivered typewriter (p. 56). Regardless, the work of Sholes and others defined much of the main commodity-form of the Sholes and Glidden Typewriter and subsequent machines which backed the interests and ideologies of hegemonic groups. The typewriter had four rows of keys with each row elevated after the other. It included type that were arranged in a manner that later became accepted and adopted universally (Bliven, 1954, p. 55) even till today, referred to as the QWERTY keyboard layout.

Although there has been conflicting understandings as to how the QWERTY layout came to be arranged (Wershler-Henry, 2007, p. 153), scholars seem to agree that

change of the keys arrangement was motivated by the collision of the keys' type-bars when users of even moderate speeds typed (p. 156). As a solution Sholes and Densmore came up with the idea of distancing the keys that occurred most frequently together on separate sides of the typewriter keyboard (Richards, 1964, p. 24). In fact, Norman (2013) argues that in contrast with other proposed layouts, the separation of the frequently used pairs of QWERTY keys to be used by hands on each side of the layout was a "great advantage" (p. 278). Indeed, different keyboard layouts have been introduced by contenders in the 20th century, none of which dominated over the QWERTY layout that by then had been in use for a long time (Richards, 1964, p. 24).

Other features of the Sholes and Glidden Typewriter also became part of the 20th century conception of the typewriter, such as a long bar introduced in front of the keys used for creating space between typed words (Richards, 1964, p. 27). In addition, the overall rectangular shape of the QWERTY layout keys (Norman, 2013, p. 275), which are unlike earlier designs and some designs introduced even into the 1900s (Richards, 1964, pp. 4-10). However, eventually commercial typewriter companies all followed the Sholes and Glidden Typewriter configuration "at the public's insistence" (Bliven, 1954, p. 55). This design configuration included the use of type-bars, rows forming a rectangular shape, and the key layout developed by Sholes and others (p. 55). Another element used in Sholes' design, seen in the 1871 patent, was the cylindrical horizontal platen (Sholes, 1871) which was originally found in the work of Thurber (Adler, 1973, p. 79) mentioned earlier, and that also later became a standard within typewriters. In Gramscian terms, the public consents to the domination of these designs, from whom the capitalist companies benefit and are able to maintain their hegemony. As the design features of typewriters became standardised, the process described by Fidler (1997) as

mediamorphosis works to transform the way that the public thinks about writing. This process is still occurring and can be seen especially in text-driven apps that continue to use the keyboard and some of the design features established during the time when the dominant design of typewriters was emerging.

One example of this is the persistence of a 'shift key' in mobile device keyboards, when the Sholes and Glidden Typewriter and the Remington Typewriter No. 1 introduced later in 1876 only allowed upper-case letters (Richards, 1964, p. 27). However, the Remington Typewriter No. 2 introduced in 1878 introduced the ability for users to type in upper-case and lower-case through a 'shift' key, which allowed for the direct transitioning between the two modes whilst using the same alphabetic keys (Richards, 1964, p. 27). Though having changeable keyboard sets is the accepted standard even today, in the late 1800s this was not the only standard. Yost introduced Remington's first competitor in 1881, the Caligraph typewriter, that was improved into the Caligraph No. 2 and included a double keyboard where both upper-case and lower-case keys were presented together (p. 177). The design of the fixed set of keys conflicted with that of Remington as users were presented with more keys, and the machine sold for decades (p. 177), establishing competing 'common sense' design standards in the minds of users, rather than a singular, expected user experience for users of 19th century typewriters. This reflects the continual struggle between hegemonic networks.

With regards to speed, the Sholes and Glidden Typewriter was almost as fast as writing with a pen, but only for some people (Adler, 1973, p. 150). In fact, the Remington No. 2 was faster than the previous Remington models, and after its introduction, competing machines such as the Caligraph were achieving similarly fast

speeds. In comparison to a pen, a writing race using the Remington No. 2 vs an acclaimed professional longhand writer revealed that the Remington produced 99 words per minute vs 65 words by the writer (Adler, 1973, p. 42). However Remington and companies with similar machines were soon rivals in machine speed (pp. 42, 43) and other UXD features. Although typewriter designers of the time would have not used the words ‘user experience’ to describe the feeling of operating these devices, through the lens of UXD principles we can understand the developments retrospectively as creating a more efficient UXD and pleasant UX, which in turn helped typing to become an increasingly dominant form of communication throughout the 19th and 20th centuries.

3.1.3 Bar-Strikes: Lack of Visibility & Feedback

The keyboard was only one design feature of typewriters which can be understood in terms of its user experience. Another important UXD factor in the development of the typewriter was the visibility of the output and feedback that it provided its users.

Norman (1988) argues that visibility and feedback are two important UXD principles for interface design. He emphasises that relevant parts of an interface need to be made visible, and that feedback entails “giv[ing] each action an immediate and obvious effect” (Norman, 1988, p. 99). The visibility of the output and user-feedback varied in different typewriter models due to their inner workings. In fact, these differences gave different typewriters advantages over others.

One example of this is what has been classified by Richards (1964) as a type-bar mechanism (p. 10). Although Richards uses the term type-bar to group many similar mechanisms, I have used the term bar-strike and introduced other terms to the

subcategories of this mechanism in order to achieve a clearer understanding of the role of UXD, especially in regards to the visibility of type and feedback to users.

The development of the bar-strike mechanism for typewriters didn't appear until the late 1800s, as seen earlier with Sholes' typewriter. After a key is pressed, a bar holding type would pivot and strike a paper, thereby leaving an impression. In the bar-strike design, the paper is always backed by a horizontal cylindrical platen. Designers brought forth different approaches to the bar-strike design of different machines, especially in relation to the location from which the platen was struck. One design strikes the platen upwards and others strike downwards from the front, back, or even side (Richards, 1964, pp. 10-16).

The first bar-strike design I have termed bottom-strike. It worked by pivoting upwards and striking the platen from the bottom which did nothing in enabling the user to directly see the text as they typed. This is the case for the very first bar-strike typewriter models used in the Sholes and Glidden, Remington No. 1 & 2, and even the Caligraph models mentioned (Richards, 1964, pp. 10, 11). The lack of visibility of the type imprint hampered the UXD of the machines that used this mechanism because it meant that the user would not be able to verify the results of their actions through direct feedback from the machine without the manual intervention of lifting the platen (p. 10).

The second bar-strike design, termed top-strike, is shown in a patent received by Charles Spiro (Spiro, 1889). Spiro's Bar-Lock No.7 machine was designed to strike the top section of its platen (Richards, 1964, p. 12). However, the design placed the downwards-pivoting bars between the user and the platen, meaning that all the erect bars for all the characters hid the user's typed characters from direct vision and that the

user facing the machine would need to move up in order to see the typed text (Richards, 1964, p. 11). Indeed, while this may be a better UX than having no visibility at all, the solution did not go far enough.

Another design mechanism of this downwards pivoting of the bar-strike is the one striking from the location behind the platen. In this design, between the user and the strike-bar mechanism was the platen. This was good because the bar-strike was no longer in the way of the user's vision. However, although this design allowed the user to be able to see the text after striking, the visibility only extended to new text. Old text was moved out of sight due to the typewriter's mechanical design which didn't allow the paper to move upwards. This was similarly the case for machines which struck from the side (Richards, 1964, p. 12), such as Williams' mechanism presented in the early to mid-1890s (p. 13) that worked in a grasshopper-like fashion as revealed by his patent (J. N. Williams, 1890). However, the disappearing text of these machines left the user at the mercy of his memory to recall precisely what he had written previously.

The design mechanisms presented so far lacked in visibility and feedback. Indeed it was typing speed and being faster than a pen that had been an important aspect in the development of typewriters so far and an important marketing feature for Remington. Interestingly however, although typing speed was important, little interest was shown by Remington with regards to visibility and feedback of typed text, which were two factors that could influence the speed at which a writing task was achieved as a whole, as opposed to a focus on typing alone. The irony is that while the focus was on being faster than a pen, text that has been written with a pen is always visible and in plain sight to the writer.

3.1.4 In Plain Sight

Two refined mechanisms were used in common typewriters beginning at the turn of the century and leading well into the 1900s (Richards, 1964, pp. 13-16). Unlike the previously discussed designs which struck the top or bottom, the first of the new designs hit the horizontal platen in between its top and middle front section referred to as a “semi-front-strike” (p. 13), herein named the top-mid-strike. This new design meant that the user would be able to see the text in an acceptable location as they typed (Richards, 1964, p. 13) without needing to move upwards every single time. However, the second refined design termed “front-strike” (Richards, 1964, p. 15) hit the platen at its middle, more centred on the horizontal platen for the eye, herein named the mid-strike. This design allowed the user to see the typed characters fully (p. 15) and with immediate feedback as to what was being typed. In addition, unlike other designs, it allowed users to see the previously typed line (Bliven, 1954, p. 86).

A pioneering typewriter and mid-strike design can be accredited to Franz X. Wagner (Adler, 1973, p. 176). Wagner and his brother incorporated a mid-strike design into their own typewriter which was later sold to John T. Underwood. The production of the Underwood No. 1, as it was named, began in 1895 (Bliven, 1954, p. 88). The Underwood business took off quickly and experienced continued growth over several years (Bliven, 1954, p. 88). In fact, in retrospect, the Underwood No. 1 was the prototype of what became the 20th century typewriter design conception (Adler, 1973, p. 33).

Other than providing full vision and having features similar to those mentioned in the Remington typewriters (Wagner & Wagner, 1899), the Underwood No. 1 had a

shift key accessible from two sides for convenience, and a tabulator (tab) key that designers incorporated originally as an essential part of the machine (Richards, 1964, pp. 35, 36). Despite its popularity, it was the subsequent Underwood No. 5 that was the most popular (Bliven, 1954, p. 88). In fact, Utterback (1994) argues that the Underwood No. 5 was the most important refinement of the Underwood model, stating that it:

“had the look and feel of the modern manual typewriter that anyone today who has ever used such a device (a vanishing breed) would quickly recognize and feel comfortable with; it had visible type, a light touch, a tab function, quiet operation, and a design that made corrections easy” (p. 10).

Further, Utterback (1994) argues that the Underwood No. 5 was followed by product imitations by rivals such as Remington and the Smith Brothers company (p. 11) from hegemonic networks. However, unlike Remington the Smith brothers were strong believers in text visibility as an advantage. In 1903 the brothers pulled out of an agreement with Remington who were reinforcing a ‘common sense’ design standard that was counter to having a more visible UXD. The Smith brothers then brought forward their own mid-strike machines with visible type and wanted everyone to know about them to the effect that they featured their machine’s strengths on billboards across their property showing written slogans such as ‘Writing in Sight Is in Line with Progress’ (Bliven, 1954, p. 88).

As shown earlier, the Remington typewriters formed a lot of the modern conceptions of a typewriter. However, Remington typewriters were not the leaders in terms of text visibility which placed them at a disadvantage. Carelessly, Remington maintained their bottom-strike design, but eventually lost the battle against competitors

of visible type (Adler, 1973, p. 33), mainly Underwood. In fact, the first of the Remington series to show visible text using a mid-strike mechanism was in 1907 with the Remington No. 10 (Richards, 1964, pp. 16, 38). Remington's delay towards change and propagation of machines that showed less visible text highlights the cultural contingency of design. While Remington and Underwood would not have understood visibility as a principle of UXD as conceived by Norman (1988), this example nevertheless demonstrates that improvements in what designers today call 'UX' can have significant impacts on the market, and on the public's perception of what is the most successful design. Through mediamorphosis, these design enhancements have changed society's 'common sense' understanding of what writing and communication is, and what it should be over time.

Utterback (1994) argues that the Underwood No. 5 remained the dominant design, largely unchanged for 25 years up until the arrival of electric typewriters (p. 18). Unlike the traditional machines of that time, these new machines allowed for even faster writing and made its users less tired comparatively (Richards, 1964, p. 16). Although typewriters of visible type used both top-mid-strike and mid-strike, the typewriters that used the mid-strike were most present in offices around the mid-1900s (Richards, 1964, p. 15). However, that too changed with the emergence of personal computers.

However, what did not change was the typewriter's trade-off with the pen, where the input of the typewriter and subsequently the computer keyboard were no longer in direct view of its output on the paper or computer screen. This meant that the users had two options in order to type. One would require that they constantly look at the keyboard section and recognise what is otherwise a very familiar set of characters. The other meant that they would need to recall the location of each key from memory

and then type while looking straight ahead. A user could even use a combination of both.

Obviously memorisation was the price to pay at the expense of typing while viewing the output. In this situation, the problem need not have been had the input and output been within the same line of vision. In fact, in the typewriter or keyboard the action of pressing the key resulted in the printed letter appearing elsewhere instead of directly within the area of vision as with a pen. Imagine writing with a pen on a paper only to find yourself looking for the just-written words elsewhere. However, in the case of the typewriter this was the cost of finally providing a writing machine that was faster than a pen. Although speed became less of an issue when it came to the computer keyboard, the influence of the typewriter on the keyboard design meant that this misalignment issue carried through as well. This was later alleviated through the development of other input devices, such as computer mice, touch screens and graphical user interfaces which were more aligned with the UXD philosophy of visibility.

3.2 GUI & Interaction Design

Long before the establishment of the personal computer (PC), an essay was published on July 1945 in *The Atlantic Monthly*, where Research Director Vannevar Bush spoke of a device with computer features that remarkably resemble what we now call the personal computer (Bush, 1945a, 1945b). One of the key features of the device, termed Memex, was associative indexing, which Bush described as the automatic selection of an item as a result of the immediate selection of another item at will (Bush, 1945a), similar to hypertext or hyperlinks today.

However, more interestingly, Bush envisioned that such a device would be fast and flexible and used individually by people to hold storage of the entirety of their books, records, and communications (Bush, 1945a). This device sounds much like PCs and smartphones today, and unlike the piles of physical records that a printing press or typewriter would produce. Although Bush's ideas were published in 1945, the PC and the convergence of media content that the PC enabled were decades away from commercial fruition.

This section traces some of the developments of the graphical user-interface (GUI) and some of the different input devices with which the GUI has become associated, leading to the common conception of a PC in the late 20th and early 21st century. It also shows how the design of some input devices were favoured for the PC over others. Further, it shows the role of UXD in the development of these designs through the notion of immediacy of Bolter and Grusin (2000) and the UXD principles of familiarity and recognition instead of recall (Nielsen, 1994b, p. 153), the latter principle used specifically to “minimize user memory load” (Nielsen, 1993, p. 129). These principles have played an important role in the development of GUIs.

3.2.1 Early HCI, GUI, & Indirect Control

In the early 1960s, electrical engineer and PhD student Ivan Sutherland developed an interactive computer-aided graphics design system called Sketchpad (Sutherland, 1964). Prior to Sketchpad, computers were operated through a command-line interface, which means interacting only through typing commands (Stone et al., 2005, p. 3), usually using the standard keyboard with its remediated QWERTY layout. Indeed, human-

computer interaction was typically mediated through typed text, and no matter how quick keyboards were, or how visible monitors made typed text, Sutherland felt the overall experience was not positive. In his 1963 paper, Sutherland stated that “most interaction between man and computers has been slowed down by the need to reduce all communication to written statements that can be typed; in the past, we have been writing letters to, rather than conferring with, our computers” (Sutherland, 1964, p. 329).

Sutherland argued that a better experience of using computers could be facilitated through “the medium of line drawings” (Sutherland, 1964, p. 329). Sutherland sought to provide computer users with the immediacy of allowing them to create and manipulate geometric shapes such as circles and hexagons by drawing *directly on the screen* as opposed to through the use of textual commands that need to be recalled from memory. This approach ties to the immediacy concept of Bolter and Grusin (2000, p. 23) as well as the concept of ‘direct manipulation’ coined by HCI and UXD pioneer Ben Shneiderman (1982).

Direct manipulation is a kind of interaction with core ideas such as “visibility of the object of interest, rapid reversible actions and replacement of complex command language syntax by direct manipulation of the object of interest” (Shneiderman, 1982, p. 246). While this overlaps with Bolter and Grusin’s conception of immediacy, Shneiderman’s concept associated this kind of direct manipulation, with a pleasant and delightful user experience (pp. 246, 251). In fact, Sutherland’s Sketchpad may be thought of as the first direct manipulation interface in HCI (Myers, 1998, p. 45), empowered by a new input device. The Sketchpad interface used a light pen for users to point it at a screen and line draw entire objects, such as electrical circuits for engineers

and other forms. Objects could be moved, resized, rotated, extended, duplicated, and deleted (Sutherland, 1964).

The power of the Sketchpad backed Sutherland's belief that the experience of using computers could be improved with visual rather than textual inputs. Sketchpad actually combined two kinds of input devices. Shneiderman et al. (2018) present a classification that separates them into two. First are 'direct control' devices, where physical contact is made with the screen such as touchscreens, discussed later, and 'indirect control' where contact is made off-screen (p. 348). Users of Sketchpad touched the screen with Sutherland's light pen to set points on a drawing, this can be considered direct control, but telling the computer what to do with those points involved manipulating a series of mechanical switches off to the side of the screen, a much more indirect means of control. In fact, there were several 'indirect control' input devices proposed for what later became the personal computer, such as the 'mouse'.

The computer mouse was invented by American engineer Douglas Engelbart in 1963, formerly referred to in his notebook as the "bug" (Bardini, 2000, p. 95). As explained in its patent, the device allowed the user to control via an X and Y axis a tracking symbol on a screen (Engelbart, 1970), later known widely as a mouse cursor. In March 1967, a study was published by Engelbart and his peers at the Stanford Research Institute in California. Its findings aimed at uncovering which of several devices was best at controlling the cursor. Among the devices tested were the mouse, a light pen, and a device which allowed control through the knee (English et al., 1967). The study found that in comparison to other devices tested such as a joystick, these three were generally faster and more accurate (p. 13). Similar to how a pen writes on paper, the light pen was aimed by the user towards the same area of vision where the

output would appear, the screen. In fact this has been noted early in HCI/UXD history by English et al. (1967) stating that “[t]he major advantage of the light pen appeared to be its psychological ‘naturalness’ of operation in pointing at the item to be selected” (p. 14), adding that novice users could learn how to use it quickly.

The mouse on the other hand, did not physically point at the screen nor was it within direct vision of the screen. The mouse was like the typewriter and computer keyboard in that its input and output were not directly aligned physically, though the cursor was a reference point for all pointing devices. In fact, for mice in general, users need to coordinate their attention between their physical hand and the display (Shneiderman et al., 2018, p. 351). However, in the study, subjects that used the mouse said that its operation caused them little fatigue and that they were satisfied with its use. This contrasted with the light pen that, despite its more ‘natural’ pointing approach, still needed to be picked up and held by users, whom reported fatigue after prolonged use. Interestingly, the knee control device gave the advantage of freeing up both hands for the keyboard and reported high speed and accuracy (English et al., 1967, p. 14). However, it was the mouse that later became the dominant pointing device usually associated with the personal computer in the minds of its late 20th century users and beyond.

Apart from his mouse invention, Douglas Engelbart and his peer William English presented an interactive computer system at a conference in December 1968. Engelbart’s session had such an impact on people that it was later given the name *The Mother of All Demos* (Bardini, 2000, pp. 138-139; Engelbart & English, 1968). The system included a window-like screen that presented a basic graphical user interface capable of interaction using Engelbart’s mouse invention, a keyboard, and a handset of

5 keys similar to a piano (Engelbart & English, 1968). This graphical user interface may be thought of as the beginning design of the GUI for PCs, which similar to Surtherland began a focus on recognition as opposed to recalling commands.

Engelbart's interactive interface enabled the editing of text and incorporated hypertext (Engelbart & English, 1968), a novel feature at the time. Hypertext was an important innovation for the GUI and brought Vannevar Bush's vision presented over 20 years earlier closer to actualisation (Bush, 1945a). The term 'hypertext' was coined in 1962 by Engelbart's peer Ted Nelson (Bardini, 2000, p. 39), though many credit both for its invention (p. 38). At the conference, Engelbart demonstrated the function of a hypertext link. Using the mouse, a text heading was expandable into a body of text revealing relevant information (Engelbart & English, 1968). In one graphical example, different headings symbolised different locations on a map and each heading/location was expandable to a list of tasks that needed to be done at each location throughout the day (SRI International, 2008).

Indeed, the commodity-form of the GUI and its input devices were beginning to move closer to the modern day conception. In fact designers continued to develop the mouse in the 1970s (Rider, 1974) and 1980s with one notable technological development being the use of infrared light for tracking (L. M. Williams & Cherry, 1988). Similarly, developments in the UXD and HCD of both the GUI and input devices in those decades greatly assisted the commercialisation of personal computers (PCs) and later smartphones.

3.2.2 A Familiar System

In April 1981, Xerox Corporation (Xerox), introduced a new computer system named the 8010 Star Information System (D. C. Smith, Irby, Kimball, & Harslem, 1982), or Star for short. It was intended to assist workers in office environments, where users could create and manage digital documents and information, send internal mail between office computers, and print text and graphics (D. C. Smith, Irby, Kimball, Verplank, et al., 1982, p. 242). The computer used a similar system setup to that of Engelbart and included a window style screen, QWERTY keyboard, and mouse with two buttons (p. 244), however, the Star was much more advanced overall.

The Star's hardware was an upgrade from its experimental predecessor the Xerox Alto (D. C. Smith, Irby, Kimball, Verplank, et al., 1982, p. 242). However, more importantly, contrary to the traditional design methodology used at the time that focused on the interface-design last, the Star interface design began two years before any code was written and continued to be designed prior to arriving at a final list of system functionalities, and even before its hardware was constructed. In the words of its designers, the project began by "defin[ing] a conceptual model of how the user would relate to the system"(p. 246). In retrospect, this may be thought of as the beginnings of a HCD process that included the use of HCD principles, as discussed in Chapter 1. In any case, the approach of Xerox Star designers of designing and prototyping an interface separately from the code or technical specifications of the system has since become championed with UXD methods as a way of ensuring a high quality user experience.

The design of Star's GUI was made to mimic the idea of an office, and it was done through the use of physical office *metaphors and analogies* presented on the

screen, as opposed to introducing new understandings (D. C. Smith, Irby, Kimball, Verplank, et al., 1982, p. 252). An example of this was the initial screen called ‘desktop’ which included clickable applications presented as familiar visual representations called ‘icons’ such as documents, folders, and file drawers (p. 256). For Bolter and Grusin (2000), this is immediacy in representation (p. 23), the representation of what’s familiar. Designers of the Star also incorporated the metaphor of windows. Windows were opened by clicking on icons and contained internal content (D. C. Smith, Irby, Kimball, Verplank, et al., 1982, p. 256).

Indeed, designers capitalised on the user’s *familiarity* with the office environment, however, this was also married with other UXD principles (D. C. Smith, Irby, Kimball, Verplank, et al., 1982, p. 248). For example, the Star interface was designed with a focus on qualities that would become touchstones of UXD practices as advocated later by Cooper, Norman, Nielsen, et al, such as the *visibility* of elements and tasks, aimed at minimising the user’s need for memorisation of actions through *recognition instead of recall*. In fact, providing a familiar and visible interface enabled users to accomplish tasks more efficiently (pp. 258-264). The interface used *universal commands* such as copy, delete, undo, and move. In addition designers strived for *consistency* in interface operations, a simple example was keeping the function of the mouse’s left hand button exclusively for the selection of objects (p. 268).

Despite some contention regarding the history of some of Xerox’s inventions (Jørgensen, 2006), the company had made incredible contributions to the GUI and interface style known as WIMP, an abbreviation for windows, icons, menus, and a pointing device (A. Dix, 2009). Though the company was slow to capitalise on its

inventions, the work done by Xerox designers lay the foundation for the commodity-form of future PCs (Preece et al., 1994, p. 18).

Apple Corporation (Apple) played a major role in the popularisation of the WIMP system and GUI. The first stride towards commercialisation began with the Apple Lisa computer that much like the Star was also geared towards office professionals and shipped out in June 1983, however Apple Lisa was not a commercial success. However, the following year, Apple introduced the mass-marketed Macintosh computer that did become a commercial success (Perkins et al., 1997), serving Apple's economic interests and supporting commodity fetishism. This is interesting because unlike the features of the Apple Lisa, the Apple Macintosh only displayed black and white colours and only allowed for the use of one program at a time. However, the Apple Macintosh was designed to be faster, easier to use, and much less costly, which greatly contributed to its popularity (Guterl, 1984).

Due to these products, Apple had made its mark as a leader in technological innovation (G. Williams, 1984). Both Apple computers utilised a WIMP system and GUI that included metaphors similar to that of Xerox's Star computer system, however this was no coincidence. In actuality, the similarities between the Xerox and Apple designs were a direct result of Xerox's 1970's developments with the Star and the Smalltalk programming language (Jeff Johnson et al., 1989, p. 26) that originally ran on the Star's experimental predecessor the Xerox Alto (p. 22). To explain, in 1979, Xerox attained 100,000 shares from Apple as part of a deal that granted Apple engineers access to Xerox's Palo Alto Research Center (PARC), where the WIMP GUI system existed. This event is said to have influenced the design of the Apple Lisa and subsequently the Apple Macintosh (Perkins et al., 1997, p. 44). It is thought that had it

not been for the influence of the Xerox's technology on Apple's computers, the GUI with its WIMP may not have been known as they are today (Jeff Johnson et al., 1989, p. 26).

3.2.3 Same Mouse Different Considerations

The GUI and mouse were developed alongside each other and the latter became the main pointing device for PCs in the conceptions of people during the latter decades of the 20th century and into the 21st century. However, mice introduced by designers during the development period had some different features, most notably is the varying number of buttons used by different companies and communities (Cooper et al., 2014, p. 468) of hegemonic networks. In fact, some of these design rationales are grounded in a UXD philosophy.

The experimental Alto computer from Xerox included a mouse with three buttons. However, Xerox designers took a different approach when designing the Star. After various tests on three, two, and even one button, decided to use two buttons as users found two buttons to be simple and unproblematic (D. C. Smith, Irby, Kimball, Verplank, et al., 1982, p. 276). However, the mouse buttons on both the Apple Lisa and Apple Macintosh were reduced to one (G. Williams, 1984, p. 43), quite a reduction from the three buttons used for the original Alto prototype from which the design of those computers were inspired.

Similar to the research approach of Star designers, the Apple Lisa team too conducted user testing (Perkins et al., 1997, pp. 46, 47). Apple designers recognised that for experienced users, using three and two buttons was slightly more advantageous than

one. However, they eventually settled for one button as a way to make the interface easier to use by users who were operating it for the first time (p. 47). Indeed, the aim was to reduce the confusion that came with using more than one button. Norman (2011) argues that this was a wise decision at that time given that the mouse was a completely new device for users and that the only two other computers that used a mouse (the Star and Lisa) had failed commercially (p. 48).

Shortly after, the designers at Microsoft, Apple's competitor, decided to use a two button mouse, and these practices largely remained (Cooper et al., 2014, p. 468). However, Norman (2011) reflects on his time spent working at Apple in the 1990s stating:

When I was at Apple, I tried to get them to switch to a two button mouse. I suggested that by that time, everyone was familiar with the mouse, so the earlier objections would no longer apply. Microsoft had proved the virtue of a two-button mouse by using the right button to provide contextual information: menus and help. But the use of a single button was an important branding symbol for Apple and my efforts to change this went nowhere. Today, however, Apple uses a multiple-button mouse (p. 49).

Indeed, it took 22 years before Apple designers would move away from their 'common sense' conception and introduce multiple buttons, presented in their Mighty Mouse product (Apple, 2005), which was another mouse product that sat alongside the keyboard as the two essential input devices for the PCs. Interestingly however, the introduction of the mouse in the Apple Lisa in the early 1980s led some of its designers to question whether or not the keyboard was required at all. However, some felt that,

due to deadlines, such drastic changes would need to be left out (Perkins et al., 1997, p. 45).

Indeed, the WIMP system and GUI made it possible for the mouse to become the primary means of interaction over the keyboard. This bias can even be seen in the abbreviation WIMP which is used for computers and includes the letter P for pointing device but not K for keyboard. In contrast with the keyboard, using the mouse did not require users to lay their eyes off of the screen, however as Shneiderman et al. (2018) put it “Despite receiving much criticism over the years, the keyboard is very successful and still represents the most efficient text-entry mechanism” (p. 340). Indeed, the mouse and its button/s were not designed to handle efficient typing. This meant that both devices in the past and today not only coexist, but users were co-dependant in their use (Shneiderman et al., 2018, p. 355). This reflects the idea presented by Jenkins (2006) that while software converges, hardware diverges and are useful in different ways (pp. 14-15).

Eventually, both principle input devices of PCs, mouse and keyboard, would be subsumed by the touchscreens of mobile phones with the introduction of the iPhone. However, the legacy of keyboards and the WIMP setup has persisted in the interfaces of smartphones and tablets, as seen principally in the remediation of the QWERTY keyboard as a key input interface. However, while touchscreens became popularised in the 21st century, they have been around as a developing technology since Engelbart’s inventions in the 1960s. To better understand the mediamorphosis of older technologies that influences social media application interfaces on smartphones, it’s crucial to circle back to the 1960s and consider the historical and cultural development of touchscreens.

3.3 Early Touchscreens & Direct Control

Many developments in touchscreen technologies occurred in the 1960s and following decades in parallel to the developments discussed in the previous section about the WIMP system and GUI. In fact, there have been different kinds of touchscreen technologies developed that differ mainly in how they detect touch. This section traces the developments of some of the different touchscreen technologies and the UX designs they provided. This includes some of the technologies and practices that have become associated with the modern-day conception of smartphone touchscreens. Further, the section continues and concludes the cross-medium comparison of the UXD of various input devices that has been discussed throughout this chapter.

3.3.1 The Final Component

In the same decade when different input devices were being considered and Sutherland and Engelbart had presented their work (Engelbart & English, 1968; Sutherland, 1964), a capacitive touchscreen was being developed as possibly the first practical touchscreen technology, later placed under a category of capacitive touchscreens (Fihn & Phares, 2016, p. 1434). In 1965 Eric Arthur Johnson from the Royal Radar Establishment in England wrote about ‘touch display’, an input and output device that enabled interaction via a computer’s display via touch (E. A. Johnson, 1965). He later described its inner working stating that the computer display had at its face a transparent mask containing copper wires aligned horizontally and well-separated from each other. When one of the wires was touched, it created an unbalance in the electrical signal. The signal was then

received by the computer triggering a specific programmed occurrence based on the touched location of the wire on the screen (E. A. Johnson, 1967, pp. 272, 273).

In Johnson's design the wires are touched by a finger. In fact, the finger is the final component necessary for the operation of Johnson's invention due to its capacitance (E. A. Johnson, 1967, pp. 272, 273), or ability of the human body/finger to carry an electric charge. In fact, from the time of Johnson's writing till now, this characteristic in the design of this technology has remained the same in the category of capacitive touchscreens (Phares, 2016b, pp. 1468, 1476).

Johnson's device was designed to improve the HCI experience, more precisely between human operators and Air Traffic Control data-processing systems. The method of communication used at the time included a keyboard consisting of letters & numbers for inputting information and/or some control-related function keys (E. A. Johnson, 1967, p. 271). However, in a similar way to Sutherland (1964, p. 329), Johnson argued that this experience of communication was slow, inefficient, and time consuming. For Johnson this was especially the case in big systems, where the user has many buttons and ways to input data, seen by its designers as making the system more flexible (E. A. Johnson, 1967, p. 271), though they achieved the opposite.

Johnson explains how his Touch Display system is capable of improving communication through three points. First, the Touch Display system can present to its user only what is relevant by continuously limiting the options presented, thereby simplifying a rather complex path. For example, as opposed to presenting the user with the complete alphabet, only relevant and applicable letters to the task at hand would be presented (E. A. Johnson, 1967, pp. 271, 272). Secondly, the system must provide a list

of options to each task at hand and know the steps of what happens next and what has happened before as a result of a chosen option. This enhances the operation of the system and reduces user error. The last and significant point presented by Johnson is that the Touch Display design allows for the meanings of keys to be changed. Unlike the keyboard, which has fixed alpha-numeric controls (p. 272), the Touch Display provides the ability for different controls to appear and disappear depending on the context at the time (p. 277).

Although Johnson's invention presented and used text as the target for touch, he did note the possibility of incorporating images within the system (E. A. Johnson, 1967, p. 277). Further, Johnson conceived his invention in the context of Air Traffic Control data-processing systems, but strongly believed that it could be applied beyond this context, to the field of data-processing more generally (p. 271). Indeed, touchscreen technologies were later being developed in other fields. Johnson received the patent at the turn of the decade (E. A. Johnson, 1969), however, three years into the 1970s Beck and Stumpe (1973) from The European Organisation for Nuclear Research (CERN), presented similar developments. Beck and Stumpe stated that the operator of a system would be confused if presented with an overwhelming and unnecessary amount of buttons. They too understood the advantages and importance of limiting options and presenting contextualised buttons and information (p. 1). Similar to Johnson, their 'touch screen' was capacitive, transparent, and the pointing device was the hand, and when the screen was touched a signal was detected and an occurrence instigated (Beck & Stumpe, 1973, pp. 3, 4). Although Johnson's invention used text or characters for touch interaction (E. A. Johnson, 1967, p. 277), Beck & Stumpe used the button metaphor and termed their buttons 'touch-buttons', a term referring to specifically nine

button areas that fit on the screen and where action was possible. These button metaphors were visually basic, a rectangular box with text that fits a few words in 2 rows (Beck & Stumpe, 1973, p. 6), however they still exemplify the concepts of direct control and immediacy that would eventually make touchscreen interfaces appealing to the UX designers of smartphone social media apps.

The work through the 1960s and 1970s was focused on developing capacitive touchscreens to improve man-machine communication. However, other kinds of touchscreen technologies were also being introduced in the 1970s.

3.3.2 Other Touchscreen Technologies

Resistive touchscreens were first developed in the early 1970s by researcher Samuel Hurst. Although the technology wasn't developed with touchscreens in mind (Hurst & Parks, 1972), a following patent after the original clearly shows a shift in focus (Hurst & Colwell, 1975). The touchscreen's inner workings comprised of two rectangular conductive sheets on opposite sides separated by small insulating objects distributed in a grid-like fashion to create space between the two layers (p. 1). Unlike the bottom sheet that needed to be "resistive" (p. 4), the sheet facing the user needed to be "flexible" (p. 4) so that when physical pressure was applied on its surface, it would be able to slightly bend inwards, seep between the small insulating objects and touch the back layer (p. 1). This connection created electric signals that identified the location on the screen where the interaction occurred (p. 4). Indeed, the overarching technical concept of a touchscreen is that of a signal of a location being delivered to a computer and initiating a certain program.

The commercial introduction of resistive touchscreens in their commodity-form occurred in the mid-1970s alongside the infrared (IR) light system, another touchscreen technology that was the first to be presented as a product (Fihn & Phares, 2016, p. 1434). IR touchscreens are placed today under a category of optical touchscreens (Phares, 2016c). As revealed in an early patent, IR touchscreens worked by emitting multiple beams in front of a display that can be interrupted by the hand/finger (Ebeling et al., 1973). By a similar logic, Surface Acoustic Wave (SAW) touchscreens, developed in the 1980s and placed today under a category of acoustic touchscreens (Phares, 2016a), depended on the use of sound waves where a change in wave frequency on a surface allowed for the location of the interaction to be discoverable (Brenner & Fitzgibbon, 1987). SAW became commercially successful at the time and maintain that position till today.

Further, resistive and capacitive touchscreen technologies developed in the 1980s by hegemonic groups were also successful, such as resistive touchscreens of five-wire and especially the widely adopted and low cost four-wire (Fihn & Phares, 2016, p. 1434). Surface capacitive (SCAP) touchscreens became the primary choice for lottery games and were a successful substitute to resistive touchscreens. They were more durable due to having a glass upper surface and not plastic (Phares, 2016b, p. 1466) that more easily damaged when used with a stylus as afforded by the four-wire resistive design (Phares, 2016d, p. 1452) and resistive touchscreens overall.

In fact, even Hurst's original invention was designed specifically for applying *pressure* with “[a]ny conventional writing instrument such as a ball-point pen or pencil” (Hurst & Colwell, 1975, p. 4). Although resistive designs may allow for a finger to be used as a pointing apparatus, SCAPs had “[l]imited non-finger input” (Phares, 2016b, p.

1468), with very few exceptions. This disadvantage of only working with a conductor of electricity that *touches* the screen, remains from the time of Johnson's invention in the 1960s (E. A. Johnson, 1965). Some have argued that using the finger for interaction was a much superior method when compared with using a physical object that may break or be misplaced (S. Lee et al., 1985, p. 21). However, for a long time in the touchscreen industry resistive touchscreens were the most sold (Phares, 2016d, p. 1440) and were the 'common sense' way of interaction in the minds of its users.

Interestingly, all these technological developments occurred in the decades when other input devices were being developed and Apple launched in 1984 the first successful computer product to include a mouse, an important period of mediamorphosis that marked the beginning of many developments that would transform the way that society envisioned its relationship with computers. Unlike touchscreens, the mouse was more ready to be the main input device for computers of the late-20th century. Prior to 1993 the software of operating systems was not reliable enough, which limited the ease with which touch applications could be developed (Fihn & Phares, 2016, p. 1435). Further, none of the touchscreen technologies mentioned so far even included multi-touch capabilities, and gestural interaction was only surfacing as a practical possibility within the 1980s following some early developments in multi-touch as the next section shows.

Moreover, the mouse was being used for the PCs despite the touchscreen's more intuitive design concept. Although using the hand may potentially cover areas of the touchscreen, the touchscreen provided 'direct control', meaning physical contact with the screen and ease of use and learnability (Shneiderman et al., 2018, p. 348), unlike the mouse and its button/s. This is reminiscent of typewriters that produced text output that

was distant from the input, and the pen's text output and input that were in complete alignment, but the touchscreen went one step further by allowing for the pen to disappear altogether.

3.3.3 The Birth of Multi-touch

The first attempt at achieving multi-touch was conceptually very different to how touchscreens operated at the time. In 1982 as part of her Master's thesis, Nimish Mehta from the University of Toronto controlled a digital system through the use of a multi-touch device that interpreted shapes of shadows. Hands would move over a translucent layer, and due to applied lighting, shadows would appear from the bottom of the layer's surface. The shadows would then be optically captured by a mounted video camera and translated digitally (Mehta, 1982). In continuation of Mehta's work, a capacitive multi-touch screen tablet was prototyped by HCI pioneer William (Bill) Buxton and other team members in the mid-1980s (S. Lee et al., 1985). In addition to detecting the exact location of a finger, the prototype was also able to simultaneously detect multiple fingers upon contact with a physical screen. Moreover, the device was sensitive to touch and continuously knew the degree to which contact was made for each touch point based on a value of pressure. The ability to sense pressure expanded the possibilities of interaction which were otherwise deemed limited (p. 21).

S. Lee et al. (1985) point out that unlike the mouse, where the user drags a cursor across the screen and clicks in order to make a selection, in a pressure sensing touchscreen one would be able to drag their finger across the screen and apply extra pressure where needed in order to push a button (p. 21). This shows that while Apple

was making its move with the mouse used in the Mac, pressure sensing in touchscreen technology was still in its infancy. Further, the development of touchscreen practices was still underway, most notably in the work of Myron Krueger.

In 1970 Krueger's original system design merged visual computerised art with the live silhouettes of people, but Krueger realised that "[w]hen people see their image displayed with a graphic object, they feel a universal and irresistible desire to reach out and touch it [and] expect the act of touching to affect the graphic world" (Krueger et al., 1985, p. 36). This motivated the development of Videoplace, which was presented at a CHI conference in 1985 by Krueger and his university colleagues (Krueger et al., 1985). Videoplace was an interactive system that enabled the user to physically interact with computer generated graphics through motion (Krueger & Wilson, 1985, p. 145). While this was a landmark development for UXD methods, in that the system brought visibility, direct control and immediacy together into an indelible experience, it can also be understood as increasing commodity fetishism, as the users of the system were able to interact with the system in a way that felt 'natural' but was in fact heavily mediated through computer systems.

In order for interaction to take place in the Videoplace system, first the computer needed to interpret the user's silhouette, so a neutral background (Krueger et al., 1985, p. 36) that was back-lit (Krueger & Wilson, 1985, p. 146) had to be placed behind the subject to define the user's shape. The user could see his actions due to having a large screen situated directly in front of him. A camera placed underneath that screen was able to detect and capture the silhouette of the user before delivering it to the computer system to be interpreted and projected back in front of him. The computer system

calculated the interactions between the user's silhouette and other computerised objects before presenting them back on the screen (p. 147).

Among the many interactions that a user could conduct, a basic one was the ability to move a graphical object (Krueger et al., 1985, p. 36). A more complex one, was playing with a digital creature the size of a fist whose body was circular and included four limbs and eyes. The creature itself acknowledged the presence of the user and interacted with his silhouette out of its own perceived freewill, such as by running towards the user and climbing up the user's silhouette (p. 37). Although Krueger's work dealt with full human figures, it also focused on hand gestures.

Krueger introduced the idea of using Videoplace for a desk, calling it Videodesk. Rather than having the camera pointed at the user, it can be placed in a top position and pointed downwards towards a desk. In Videodesk, users had the ability to move their hands and touch responsive virtual objects. Krueger affirmed that human hands could be used to operate any conventional graphical application. In fact, the Videoplace system was capable of point and select interactions, and allowed menu selection, typing, and painting via the finger (Krueger et al., 1985, p. 39).

Further, Krueger argued that through Videodesk, the user is presented with a superior interaction method of eight or more degrees of freedom due to being able to use both hands simultaneously. This was an advantage when compared to other pointing devices of that time that used two degrees of freedom with the exception of three-dimensional input devices (Krueger et al., 1985) such as the development in touch pressure-sensing introduced earlier (S. Lee et al., 1985).

Having said that, Krueger's invention was not designed for any physical contact to be made with a screen, but was really focused on capturing and showing the effectiveness of human gestures under the Videoplace system. In fact, Buxton (2010) highlights that the technology Krueger used was secondary to the underlying idea of using gestures for interaction. He adds that Krueger's work on gestures was easily adaptable by professionals to the context of touch systems (p. 447), and has in fact laid the foundation for a lot of subsequent work (p. 446). For example, apart from the interactions discussed earlier, one interaction allowed the user to manipulate the size of an object by using their index fingers and thumbs. As the fingers are moved further apart the object gradually expands, and when they are moved closer to each other, the object decreases in size (Krueger & Wilson, 1985, p. 150). This interaction is common in smartphones today, used for zooming in and out.

However, the pairing of this interaction, and others, with a multi-touch screen was not a commercial reality at the time. In fact, in the 20th and 21st centuries, resistive touchscreens were the dominant selling technology over others (Phares, 2016d, p. 1440), including the SCAP capacitive touchscreens. However, this began to change with the introduction of touchscreen smartphone devices in the late 2000s, especially by Apple.

3.3.4 The First iPhone: A Continued Convergence

At the Macworld Conference in 2007, Apple's co-founder Steve Jobs introduced Apple's new product and its core features, stating that:

Every once in a while a revolutionary product comes along that changes everything... Today, we're introducing three revolutionary products of this class. The first one is a widescreen iPod with touch controls. The second is a revolutionary mobile phone. And the third is a breakthrough Internet communications device... These are not three separate devices, this is one device, and we are calling it iPhone. Today Apple is going to reinvent the phone (Wright, 2015).

Indeed Apple brought significant changes to mobile phones and consolidated its legacy of being a company that focused on the user, as evident through its revolutionary iPhone and the UXD philosophy that it embodies. Apple designers integrated into the iPhone important features from their desktop OS, such as the Safari web browser that made using the internet in the mobile phone context easier (West & Mace, 2010, p. 276). In fact, this was also enhanced through Apple's own touchscreen technology. Apple designers developed existing technologies to produce a projected capacitive (PCAP) touchscreen, the first commercially successful PCAP used in the first iPhone (Fihn & Phares, 2016, p. 1436). In fact by the mid-2010s the sales of resistive touchscreen technologies were already surpassed by PCAP touchscreens that were used primarily in smartphones and tablets (Phares, 2016d, p. 1440). This benefitted Apple's economic growth over other hegemony and further promoted its UX design ideology through commodity fetishism.

Touchscreens became the primary input device for such mobile devices. In fact, in a similar way to how the mouse was chosen by designers for desktop PCs, the touchscreen became favoured for smartphones. However, with the benefit of hindsight, touchscreen technologies today have even converged with personal computer systems,

such as touchscreen monitors in desktop and laptop computers, leading to more diversity in the ways users can interact with PCs.

Regardless, the PCAP technology introduced in the iPhone was a significant technological development that allowed multi-touch, unlike other commercial touchscreen technologies at the time that only allowed single touch operation (Fihn & Phares, 2016, p. 1436). Further, PCAP had “[e]xcellent sensitivity with bare finger activation” (Phares, 2016b, p. 1476), and by then its use was also made possible through a writing instrument, a stylus that was capacitive.

The PCAP technology introduced through the iPhone gradually shaped the ‘common sense’ conceptions of millions of users in terms of the kind of touchscreen experiences that could be expected from smartphones, and has continued to do so till today. Further, its significant market growth was an indication of the PCAP touchscreen’s dominant technological design. Indeed, a superior touchscreen had converged with a mobile phone to form the iPhone. However, this was only one of the other elements that had come together within the iPhone.

The iPhone introduced an aesthetically pleasing GUI that was based on a HCD/UXD philosophy, with its familiar and considerate design, including app icons and gesture interactions. Further, at the time of the iPhone’s announcement, its screen size was considered larger than its competitor’s phones and in comparison to the traditional phones at the time the iPhone lacked buttons. In fact, through software, the iPhone keyboard had converged with the touchscreen, unlike the physical keyboards of competitor phones, which in the words of Steve Jobs, are there even when you don’t need them (Wright, 2015). Indeed, the programmed QWERTY keyboard, originally

developed by Sholes, only needed to appear in relevant contexts, such as writing a text message. This was a point similarly highlighted by E. A. Johnson (1967) forty years earlier (p. 277). While the keyboard converged with the touchscreen in the iPhone, the mouse was not useful for such *mobile* devices.

This chapter has traced the role of UXD in the development of technological inventions that shape digital media today and the formation of different ‘common sense’ practices and standards across typewriters, input devices, personal computers, and smartphones. However, it has also showed the cultural contingency of design that occurs through a process of mediamorphosis that includes the convergence of different inventions and the development and changes in dominant designs. This chapter has demonstrated the value of doing a cultural/historical UXD analysis. Similarly, the analysis chapters that later follow bring understandings of cultural practices and historical developments but by focusing on the design standards of social media apps within the 2016 context. Prior to that however, the next section presents the methodology used to capture the design standards of social media apps in the 2016 context.

Part Two: Methodology & Case Studies

Chapter 4 - Methodology

The initial exploration of the design standards of social media apps was done through a content analysis method. As argued in the thesis introduction, content analysis is the appropriate methodological approach for capturing the design standards of social media apps from both the text-driven and image-based subgenres. Content analysis contrasts with other methods where user involvement is necessary, such as evaluating design effectiveness via user performance as seen in some studies (Aula et al., 2010; Gatsou et al., 2011; González et al., 2015; Park & Sundar, 2015). Instead of involving users, a content analysis allows the observation of design standards *directly*, as applied in other related studies such as (Crescenzi-Lanna & Grané-Oró, 2016; Herring et al., 2004; S. L. Jones, 2015; S. L. Jones & Thorpe, 2014). A content analysis via observation lays the foundation for all the questions of this study to be answered, starting by answering **RQ2** about the differences between text-driven and image-based social media apps.

This chapter details the process I undertook to answer **RQ2**. It began by selecting an app sample from the 2016 market that passed an eligibility criteria and then presenting the ‘move’ method introduced by Swales (1990, p. 141; 2011, pp. 1, 82) that allowed the surveying of app design features/standards through content analysis, and the formation of ‘move’ schemes. The work of scholars that have used the ‘move’ method is also presented. The final section details how the design features/standards were stratified to produce five ‘move’ schemes and highlights some research limitations. The differences between the design features of the two subgenres were then enhanced via a chi-square (x^2) test to reveal their statistical significance.

4.1 The Corpus

In order to begin the process of answering **RQ2**, a reliable software platform and hardware needed to be chosen that could see the project through. The software platform needed to be stable, integrate well with apps built into its framework, and capable of handling multiple apps. The apps provided by the platform needed to be quality controlled to rule out any glitches and bad designs, and so that the inspection of app design features/standards could be done on a sample of apps that had already passed some level of HCD. In addition, the chosen platform needed to provide popular apps, which would allow the observed app design features/standards to reflect the common design practices of the time. However, the platform also needed to provide a sufficient number of apps that could be identified as text-driven and image-based. Further, since the focus of the research was on the app design features present within the 2016 market and apps were always being updated with more recent versions, it made sense to choose a hardware that was similarly of that time, so Apple's iOS was chosen.

4.1.1 The Platform & Hardware

The chosen operating system for this study was Apple's iOS and all the apps were selected from Apple's App Store. Before apps are published inside the App Store, they are reviewed by Apple officials (Apple, n.d.-a) and are expected to meet Apple's long list of standards including their iOS Human Interface Guidelines that are available on the Apple website (Apple, n.d.-f). The App Store's competitor, Google Play, had a less stringent process when it came to publishing and so the App Store was the prime choice

for quality designs. The device used throughout this study was an iPhone 6s, chosen for being the latest smartphone device brought forth by Apple at the time of this study.

4.1.2 Corpus Eligibility & Selection

Prior to the data collection process, the corpus eligibility criteria needed to be defined.

This was important for maintaining consistency across the data sets and for the appropriate selection of apps. I selected apps from within the App Store based on the following eligibility check list:

- Apps needed to be available in either the Australian or U.S store. This rule was placed because the most popular social media apps are produced by designers in western countries for western markets primarily and other popular apps compete in such markets.
- Each app was required to provide information mainly in the English language. This was specifically in relation to user-interface information provided by the app designers such as button texts, lists of options, or descriptions. This filter was set in order to make sure that the app designs were intended for English-speaking users. User-generated content such as text posts, image descriptions, or captions could be in any language.
- The most popular apps at the time needed to be considered first. This was based on a list of popular apps retrieved from the Apple website. If not enough apps from the most popular apps fitted the complete eligibility criteria, then the apps next in line could be selected.

- Both free and paid app versions could be considered. However, each app was required to have at least 5 user ratings and a bare minimum of 2 stars out of 5.
- Finally, the social media apps needed to be categorised under text-driven and image-based as per the definitions developed in the thesis introduction. The definition used for the genre of social media sites is:

applications that enable users to connect by creating personal information profiles, inviting friends and colleagues to have access to those profiles, and sending e-mails and instant messages between each other. These personal profiles can include any type of information, including photos, video, audio files, and blogs. (Kaplan & Haenlein, 2010, p. 63).

Although it is not necessary for such platforms to be equipped for sending emails, a defining feature that does need to be added is the ‘feed’ feature, originally used by Facebook. The text-driven and image-based apps are subgenres of this social media genre and are distinguishable by an eligibility criteria I discovered based on media prioritisation, whereby text-driven apps allowed for the publishing of text without an image media file such as photos or videos, while image-based apps deemed it a requirement to have at least one image media file published with text or without. A total of 60 applications were therefore carefully selected from the App Store. They were divided equally to include 30 apps under each of the two categories, text-driven and image-based, and were selected from different categories within the App Store, as discussed in the next section.

4.1.3 Data Collection

In June 2016 at the Apple Worldwide Developers Conference (WWDC) Apple CEO Tim Cook announced that the number of apps in the App Store had grown to 2 million (Apple, 2016), half a million more than what was announced one year earlier (Apple, 2015c). The Apple App Store had 25 main categories where apps were allocated, these included Social Networking, Photo & Video, Games, and Education, to mention just a few. Although the App Store did have a category uniquely titled Social Networking for social media apps such as Facebook, this did not mean that social network apps were only limited or found within this category. To the contrary, social media apps were allocated in different categories depending on their theme/purpose. For example, a social media app used for weight loss could be found in the Health & Fitness category. Based on this, the apps sampled for this study were collected from different App Store categories, leading to a more comprehensive sampling of the apps.

The app collection process began in mid-March 2016 and continued into the month of April. In the App Store, all apps were presented with 2 kinds of ratings. One was with regards to the current app version that was available for download from the store, and the other included a single rating combining all previous app versions into one value. The rating of the current app version was taken into account first. However, in the event that an app did not make the selection criteria due to a lack of recent ratings, then it's 'all app versions' rating became the determining factor in its eligibility. In such a context however, an app would rank low due to having a recent app update made available which would not leave enough time for users to conduct a rating of the current/updated app version. For example, at the time of the data collection, a 2016 update of the Vimeo app was made available. When I encountered the app version it had

not received any user ratings yet, as seen in Figure 4.1. However, by looking at the rating in the app’s “All Versions” category, the app had clearly fulfilled the required star rating, as seen in Figure 4.2.

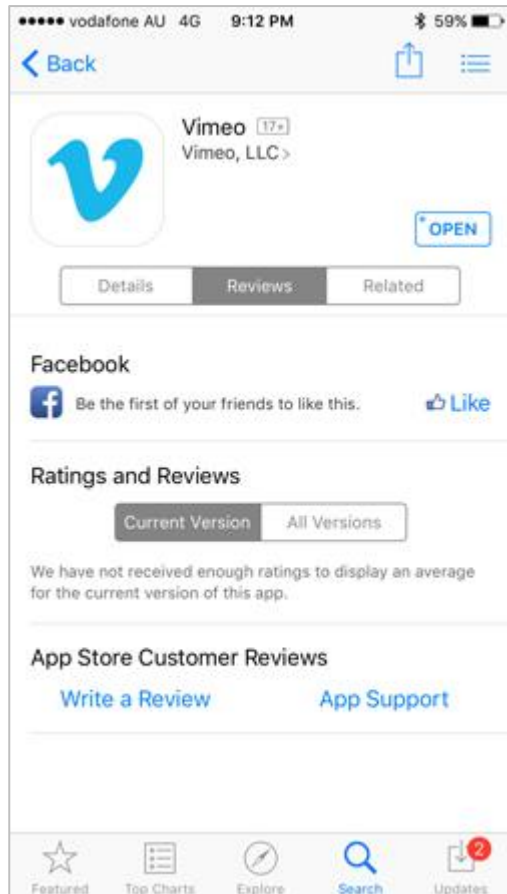


Figure 4.1: The Vimeo app page in the App Store showing no rating under the “Current Version” tab/category.



Figure 4.2: The Vimeo app page showing a rating of 2.5 stars with 339 user ratings under the “All Versions” tab/category.

Apps under the Social Networking category were the first to undergo the eligibility test. Some popular apps did not meet the eligibility criteria due to not belonging to the specified social media genre of this study. An example is direct messaging apps such as

WhatsApp that at the time were generally designed for private conversations between users rather than allowing for content to be posted in an open feed. Afterwards, I explored the Photo & Video category where many image-based social media apps were collected. Over 230 apps were checked from each of the two App Store categories and their functionalities were tested in order to provide an accurate categorisation. These two categories recorded as having the highest number of collected apps, despite having some of the lowest overall percentages of apps in the App Store. The Social Networking and Photo & Video categories contained only 2.09% and 2.3% of apps respectively (Statista, n.d.). Afterwards, the most popular apps from 22 other categories were also investigated and additional app collection occurred from the Health & Fitness, Travel, News, Finance, Entertainment, and Lifestyle categories. The Games category held the highest number of apps in the app store with a percentage of 22.99% (Statista, n.d.), however, none of its contained apps were included in the study. Although some of its apps were very social in nature, their game-type interfaces which included graphical virtual worlds for instance, made them too distinct of a genre from the image-based and text-driven apps being compared in this study. It is worth noting that the number of selected apps was 60 not due to any arbitrary reason but because the eligibility criteria did not allow for any more apps to be added. In addition, a reduction in the bar of acceptance with regards to user ratings may have potentially opened the door for apps of far lesser quality.

The download and installation of the apps was conducted via an iPhone 6s, which was the only device used from beginning towards the completion of the study. The process of selecting the apps that fit the eligibility criteria required that I become familiar with the apps and immersed in their understanding. The cut-off date for any

new software updates was the 11th of April. The final updates were checked to make sure that no radical or disqualifying changes were made to the apps. Afterwards, precautions were taken in order to preserve the installed versions which included disabling automatic app updates and paying close attention to any changes in software settings. The apps which were collected for this study are as follows:

- **The text-driven category** included Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, YikYak, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu, and Reddit.
- **The image-based category** included Snapchat, Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly (later known as TikTok), YouNow, Flickr, WeHeartIt, BeFunky, Keek, Periscope, GifBoom, Boomcast, Camera360, Magisto, WedPics, Fling, Whisper, WeddingParty, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, beme, and 9GAG.

Once the app sample was finalised, the next step was to choose an appropriate method for the categorisation of app design features/standards. The next section introduces the concepts of affordance and the ‘move’ method used in this study with its relation to understandings of genre theory, followed by related work.

4.2 Affordance, Genre & ‘Move’ Framework

The idea of categorising app features ties in with the concept of affordances. The term ‘affordance’ originated with the work of the eminent ecological psychologist James J. Gibson (1979), whom used the term to provide an understanding of the perception and navigation of environments. Norman (2013) reintroduced the notion and appropriated it for design practice, defining the term as “a relationship between the properties of an object and the capabilities of [an] agent that determine just how the object could possibly be used” (p. 11). For example, a user that is capable of swiping within an app is using the swipe function afforded by the interface as enabled by its software designer (p. 20). The concept of affordances has also been used by digital media scholars to explore design features and understand how different digital platforms afford (Davis, 2020), as influenced by the earlier landmark work of Winner (1980) that emphasised that the design of artifacts has political underpinnings. While this thesis considers cultural factors, and the surveying of app features follows an understanding of affordances, it also incorporates understandings of genre theory.

According to Linguistics Professor John Swales (1990) communicative purposes are not the only criterion for inclusion within a genre, but also similarities in “structure, style, content and intended audience” (p. 58). The distinction I formed between the two social media subgenres was based on differences in relation to media prioritisation. However, the apps collected under each subgenre category also contain design features that are both different and similar. Bazerman (1988) states that apart from a genre being socially recognised, it is also a “repeated strategy for achieving similar goals in situations socially perceived as being similar” (p. 62). Therefore, socially repeated

situations contribute to the formation of these similar forms which become agreed upon and standardised. When other similar situations come forward, similar forms are the typified representatives (Swales, 1990, p. 58) which can determine inclusions in a genre. Similar and different forms of design features are assembled by designers across apps of both social media subgenres.

Design features of apps from the two subgenres are categorised using the ‘move’ method originally introduced by Swales (1990, p. 141; 2011, pp. 1, 82) in his 1981 book *Aspects of Article Introductions*. Swales used two metaphors to describe parts of research articles in a functional manner, the ‘move’ (category) and its inclusion of specific ‘steps’ (subcategories). Parodi (2010, p. 146) describes the ‘move’ approach as operationalising texts into identifiable segments and Bhatia (2001, p. 84) states that “moves are rhetorical instruments that realise a subset of specific communicative purposes associated with a genre” (p. 84). Indeed, each ‘move’ carries a unique semantic unit of text that connects to the genre’s overall communicative purpose. Multiple ‘steps’ can exist within a single ‘move’, which allows the differences and similarities between the subgenres to appear at more specific levels.

Since there is no limit on the amount of ‘moves’, or the ‘steps’ within a ‘move’, a very detailed and exhaustive analysis and ‘move’ scheme can be formed. This makes the ‘move’ scheme analysis method most suitable for accounting for multiples of design features and enabling the formulation of a comprehensive overview of the design practice of social media apps. In addition, the ‘move’ scheme analysis can allow for a better understanding of the political and hegemonic dimensions of design features through the examination of the similarities and differences between features of different apps. As the next section shows, the study I conducted is similar in methodology to

several other studies where the ‘move’ method is used (Ahangar & Dastuyi, 2017; Bremner & Phung, 2015; Chang & Huang, 2015; Cheung, 2011; Kanoksilapatham, 2005; Loi, 2010; White & Cheung, 2015). However, it is worth noting that different scholars have put forth varying methodological models for gathering data and analysing the user interfaces of digital media platforms. For example, Light et al. (2018) proposed the use of a ‘walkthrough method’ that was inspired by a classic HCI approach and was incorporated within a cultural studies framework. Dieter et al. (2019) presented their ‘multi-situated app studies’ research style and Ash et al. (2018) introduced their post-phenomenological approach for interface analysis. While these are all useful approaches depending on what a researcher is trying to achieve, this project’s ‘move’ analysis is designed for genre analysis, meaning that it incorporates a genre-based lens that can be used for viewing apps and their design features at both qualitative and quantitative levels. This is an important aspect for this research given the changes that occur to media genres under mediamorphosis including the move towards more frequent image-based communication.

4.2.1 Related Work

To my knowledge, via exhaustive search, no other research has appropriated the ‘move’ analysis method within the context of smartphone apps. As mentioned, the ‘move’ analysis originated with Swales (1990, p. 141; 2011, pp. 1, 82) where he functionally described the introduction sections of articles as a genre, used within English writing. Since then, the ‘move’ analysis method has been used across different parts of articles and subjects. For instance, Kanoksilapatham (2005) conducted a ‘move’ analysis on 60

research articles from the biochemistry discipline. ‘Moves’ were given to the different sections of research articles, such as the introduction, methods, results, and discussions. This resulted in the development of a ‘move’ template for research articles in that field. Another study by Loi (2010) compared the similarities and differences of introductions within 20 English and 20 Chinese research articles in the field of educational psychology using a set of ‘moves’ developed by Swales (1990, p. 141).

The ‘move’ analysis has also been conducted on the contents of new media. Bremner and Phung (2015), for instance, used the LinkedIn platform to examine the rhetorical structure of 50 summary sections. The sections were found within user profile pages and belonged to professional resume writers. An existing set of ‘moves’ from a similar genre was modified to be used within the context of LinkedIn summary sections. ‘Move’ analysis also extends to spoken discourse. Chang and Huang (2015) analysed 58 video talks from TED conferences with regards to their structure in order to discern the commonalities and differences between three sections. Seven ‘moves’ were identified and utilised. The findings showed that across the TED videos the conclusion section was the shortest, followed by the introduction and body sections. Further, the conclusion sections of the videos had the closest number of words and time taken for delivery in comparison to the other sections.

My study is closely modelled after the work of my former supervisor Cheung (2011) who successfully developed a ‘move’ scheme that she used to compare 160 mails of a sales genre divided between electronic direct mails and printed letters. A chi-square test revealed that there are significant differences between the message-design strategies of the 2 corpus sets. Cheung put the ‘move’ scheme forward as a template for the analysis of such sales genres and her scheme has been used by Ahangar and Dastuyi

(2017) who adapted it to the subgenre of Persian sales emails and suggested new ‘steps’ that they found to be applicable within their genre. Further, the results of the study indicated that the choice of advertising strategies are culturally related. Similarly in another study, White and Cheung (2015) developed a custom ‘move’ scheme and also applied a chi-square probability test. The corpora of 60 fantasy sport texts, 30 from professional and 30 from Amateur journalists, were compared and underwent a discourse analysis. Significant differences in discourse strategies were found between the 2 corpus sets, such as the presentation of a more balanced spread of information amongst amateur writers.

The study I present is modelled methodologically in a similar way to these lines of study. The ‘move’ method allows the surveying of app design features/standards and their categorisation into ‘move’ schemes across both text-driven and image-based subgenres. This allows the comparison of the differences and similarities between the two data sets thereby addressing **RQ2**. However, although the ‘move’ method allows for quantitative insight by accounting for apps at both ‘step’ and ‘move’ levels across different ‘move’ schemes, it also allows for individual pieces of data to be looked at qualitatively and in relation to other relevant data. Qualitative data can also be used to address **RQ1** that asks how the development of social media app interfaces—their design features and UX designs - can be understood through a cultural/historical lens. Further, the ‘move’ method allows data to be collected not only with regards to the ‘what’ (i.e. design-features) but also the ‘how’, meaning the interaction itself (Hassenzahl, 2010, pp. 43-45; n.d.), through descriptive semantic units of text and also the use of captured app screenshots. The next section details this data collection process of design features and interactions.

4.3 User-Interface Standards Analysis

This section shows how the design features/standards of the apps were comprehensively explored to produce five ‘move’ schemes and reveal the differences between the text-driven and image-based subgenres. It begins by presenting the five design aspects that were used as a window to view the data and formed the basis for the ‘move’ schemes, followed in a separate section by a detailed description of how the schemes were developed. The third section discusses the limitations of some of the used methods, and finally, the last section explains how the differences between the two data sets were enhanced by applying a chi-square (χ^2) test and presents a brief overview of the results.

4.3.1 Aspects of User Experience Design

The comparison of the differences and similarities between the design feature/standards of the two data sets allows **RQ2** to be addressed. However, although design features/standards form part of an app’s UXD, they are organised through the user interface (UI) in a functional manner to meet design objectives and not necessarily based on a UXD organisational rational. Therefore, an organisational framework was needed to categorise the app design features. Many studies have categorised design features of software based on different aspects (Ali & Lee, 2010; Herring et al., 2004; Hsieh et al., 2013; S. L. Jones, 2015; S. L. Jones & Thorpe, 2014; Scheidt & Wright, 2004; Thorpe & Lukes, 2015; Youn et al., 2017). However, the organisational framework I used was based particularly on a practitioner understanding of UX through the work of Cheung (2016) who presented five service design aspects that can influence

the user experience (p. 334). The aspects and their definitions as worded by Cheung are as follows:

- The *information* aspect refers to the amount and quality of the service or service-related information available to users.
- The *navigation* aspect refers to ease-of-use and the accuracy with which users can navigate and locate service information.
- The *engagement* aspect refers to users' involvement and interaction with the stimuli appearing on the digital medium.
- The *entertainment* aspect refers to the enjoyment and pleasure a user obtains from an interaction experience.
- The *personalisation* aspect refers to the style and features of media content that match a user's personal preferences (p. 334).

These design aspects were derived as part of a 2014 study that aimed to discern the components and processes in digital service innovation that could inform effective design for UX. In-depth interviews were conducted with design professionals with the role of User Experience Design Manager from forty two digital services companies in seven major cities (Cheung, 2016, p. 333). The interview results contributed to the development of Cheung's Media Perception-Reaction Model (MPR) that included these design aspects. The aspects were found to be most relevant from the perspective of practitioners in influencing the UX (p. 334). I utilise these aspects in this research as a lens through which the app interfaces are observed and design features categorised under 'moves' and 'steps'.

4.3.2 ‘Move’ Scheme Formation

As a start, a pilot ‘move’ scheme analysis with 2 ‘moves’ and ‘steps’ was tested on each of the information and engagement design aspects. This was done to assure that an expansive scheme of ‘moves’ could be developed, which would further illuminate the differences between the two data sets not only at a macro ‘move’ level but at the more specific micro ‘step’ level. The pilot study allowed a peek into the results that could expose whether or not there were some significant differences between the two data sets at both these levels. The pilot study was very important following two much less successful earlier pilot studies on different data sets that revealed very little differences. Most notably, the comparison of design features between the corpora of 20 amateur vs professional image-production apps beginning in October 2015. After months of developing many ‘moves’ and ‘steps’ across all five design aspects, the results still failed to reveal worthy differences between the data sets. This warranted a change of the data sets and a new direction for the thesis towards social media apps specifically. After significant differences were found between the two social media data sets in the most recent pilot study, relevant ‘moves’ and ‘steps’ were developed across all five design aspects forming five separate ‘move’ schemes. In the beginning the schemes were developed one at a time but were later further developed in parallel.

In order to determine the ‘moves’, I accessed the apps one by one and their interfaces were observed thoroughly which enabled the recognition of patterns. This allowed the careful selection of ‘moves’ either based on their perceived significance, and/or their complexity which allowed the incorporation of many ‘steps’. The overall selection of ‘moves’ and ‘steps’ across all 5 design aspects made for comprehensive schemes. Once a ‘step’ was recognised, the 60 apps were carefully and thoroughly

observed for whether or not they fit the description of that ‘step’. If the design feature described by the ‘step’ was found within an app, then the occurrence was listed, as seen with the listed apps in the ‘move’ sample seen in Table 1. In addition, some app screenshots were taken for each ‘step’. Through this process, other ‘steps’ were realised and again the 60 apps were re-observed and their occurrences listed. This process meant that previous ‘steps’ were also being re-evaluated as the registration of apps under new ‘steps’ commenced.

<p>Move A: Presenting information regarding user interactions in the main feed page</p>	<p>Step A1: Presenting the number of emotional responses received by a post</p>	<p>Text-Based: Facebook, MyFitnessPal, LinkedIn, Twitter, Google+, etc. (Total: 28)</p>
		<p>Image-Based: Instagram, Flipagram, Pinterest, Vine, musical.ly, etc. (Total 17)</p>
	<p>Step A2: Presenting the number of comments associated with a post</p>	<p>Text-Based: Facebook, MyFitnessPal, LinkedIn, Google+, Tapatalk, etc. (Total 25)</p>
		<p>Image-Based: Instagram, Flipagram, Vine, musical.ly, YouNow, etc. (Total 12)</p>
	<p>Step A3: Presenting the number of shares associated with a post</p>	<p>Text-Based: Facebook, Twitter, Google+, Kiwi, KakaoStory, etc. (Total 8)</p>
		<p>Image-Based: Flipagram, Pinterest, Vine, Keek, GifBoom, Fling (Total 6)</p>

Table 1. Sample of the first ‘move’ and ‘steps’ from the Information aspect. For the complete and detailed ‘move’ schemes, see Appendix B. For an overview of all the ‘move’ schemes see Appendix A.

To provide an example of the relationship between ‘moves’ and ‘steps’, consider ‘Move A’ from the ‘information’ aspect in Table 1. ‘Move A’ reads “Presenting information regarding user interactions in the main feed page”. ‘Step A1’ is a subcategory of ‘Move A’ and reads “Presenting the number of emotional responses received by a post”, such as the number of appearing Facebook ‘likes’ (see Figure 4.3). The context as semantically described in ‘Move A’ is that of *user interactions in the main feed page* and therefore all the ‘steps’ of this ‘move’ need to be based on that pre-categorisation. For example, ‘Step A1’ describes the user interactions of *emotional responses* and the context is a *post* that is specifically within a main feed page, as seen with Facebook in Figure 4.3.



Figure 4.3: A Facebook post presenting the number of emotional responses (666) and comments (10).



Figure 4.4: A Tumblr post presenting a cumulative number (369,862) of a combination of interactions.

Similarly, ‘Step A2’ reads, “Presenting the number of comments associated with a post”. In this instance the focus has shifted towards comments, and within the post’s design a ‘comment’ button can be seen in close proximity to a ‘like’ button. This is a simple exemplification of how ‘steps’ were realised and derived one after another. This undertaking kept reoccurring across all ‘moves’ until all possible ‘steps’ were exhausted. Afterwards, some ‘steps’ which were closely related to each other within each ‘move’ were grouped together into a single ‘step’ to provide a more coherent meaning. For example, in reference to ‘Step A1’, some apps allowed more than just a

‘like’ emotional response, such as a ‘love heart’, or ‘surprised’ response (see Figure 4.3). However, all emotional responses were merged into this one ‘step’.

The resulting number of apps listed in the ‘steps’ provides a comprehensive account of the similarities and differences between the two subgenres at both ‘step’ and ‘move’ levels. The ‘move’ level is a higher level which means that it accounts for all the app occurrences within all of its ‘steps’. In addition, the number of unique ‘steps’ within a ‘move’ showed the extent of the ‘move’. On that note, in the ‘move’ scheme analysis all the ‘moves’ and ‘steps’ are unique. This means that there are no overlaps in the specified purposes of the ‘steps’ or ‘moves’ as dictated by their semantic and functional meaning within the context they are presented. The apps however, can be accounted in multiples within any of the unique ‘steps’ depending on whether they fit the meaning.

Building on the previous examples, ‘Step A1’ deals with the *number* of emotional responses, ‘Step A2’ with the *number* of comments, and similarly ‘Step A3’ with the *number* of shares. Each of these ‘steps’ deals with a numeric representation of a design feature where the represented number is also a design feature itself. In Facebook all 3 design features were present and therefore Facebook was accounted for within these 3 ‘steps’ of the ‘move’ and other ‘steps’ where observed. A different example is ‘Step A7’ that reads “Presenting the *combined number* of hearts, comments, and shares associated with a post”. Only one application, Tumblr, fits ‘Step’ A7’s description. Tumblr is special because it combines all these numeric features and presents them as one feature with one number (see Figure 4.4), unlike ‘Steps’ A1, A2, and A3, that each presents a number feature. In fact, Tumblr is not amongst the observed apps in ‘Steps’ A1, A2, and A3 due to Tumblr not having any of those 3 numeric design features separately within its interface. In an imaginary scenario where Tumblr did fulfil ‘Step

A7' and also 'Step A2' for instance, then the app would be accounted for within both 'steps'.

To affirm the validity of the 'move' and 'step' formations, my former supervisor and I revised the drafts of the 'move' scheme analysis from each of the 5 design aspects several times throughout the development process. This was done by going through each 'move' and 'step' and coming to agreement on their formation based on their context and in light of other 'moves' across the five 'move' schemes in order to avoid overlaps. I continuously modified the drafts one after the other before they were considered suitable.

Throughout the development process, I listed the app occurrences under all of the 'moves' and 'steps' for all five design aspects. The apps were continuously accessed and observed one by one. While the method used for this research is innovative in the context of social media apps, it was labour intensive. This work resulted in the formation of a total of 34 'move' categories, and 179 'step' subcategories each of which symbolised a design feature (see Appendix B). These formations do not include the earlier work on pilot studies and different corpora. The 60 social media apps were initially crosschecked more than 10,600 times against all the design features (not including later revisions), of which 2,757 occurrences were listed. The listed apps revealed the numeric results with regards to the differences between the text-driven and image-based apps. Finally, the schemes underwent an overall general review where they were scrutinised separately by both reviewers and then amended accordingly. Although the results of the 'move' scheme revealed the differences between the text-driven and image-based corpus, a chi-square test was used to provide a lens into the statistical significance of the differences, as expanded on in the next section.

4.3.3 Chi-square Analysis & Overall Results

After the results of the 'move' schemes revealed the complete numerical differences between the two subgenres, the numbers were channelled through a chi-square (X^2) probability test. The purpose of the test was to reveal the significance of the differences that were observed between the two corpora statistically. This included the differences at both the 'move' and 'step' levels. A chi-square value was calculated for each 'move' and 'step' based on the chi-square formula. An alpha probability value of 0.05 was established, and based on one degree of freedom, a chi-square cut-off value of 3.841 was set. This meant that significant 'steps' and 'moves' needed a chi-square value which was greater than 3.841 in order to be considered statistically significant, or a probability (p) value of less than 0.05.

The 'Step A1' from the information aspect, as an example, and as seen in Table 2, indicates that the frequency of occurrence (n) within each of the text-driven and image-based corpus were 28 and 17 respectively. Based on this, the result derived via the chi-square formula dictated a 2.689 chi-square value which was less than the cut-off value of 3.841. This rendered the difference between the two corpora for this 'step' as statistically not significant. 'Step A2' however, registered a chi-square value of 4.568 which was higher than the cut-off value. This rendered the difference between the text-driven (n=25) and image-based (n=12) corpora within this 'step' as statistically significant. This similarly applies at a 'move' level, as seen in Table 3. The frequencies of app occurrences (n) within each of the two corpora of 'Move A' are the totals of all the 'step' frequencies for each corpus.

Table 2. Step-level sample of the first ‘move’ from the Information aspect with the calculated chi-square value for each ‘step’. For the complete chi-square results for all the ‘move’ schemes at both ‘step’ and ‘move’ levels, see Appendix A.

			Text-Driven (n)	Image-Based (n)	Chi-Square Value
Move A	Step A1	Presenting the number of emotional responses received by a post	(28)	(17)	2.689
	Step A2	Presenting the number of comments associated with a post	(25)	(12)	4.568*
	Step A3	Presenting the number of shares associated with a post	(8)	(6)	0.286

Table 3. Move-level sample of the overall ‘moves’ from the Information aspect with the calculated chi-square value for each ‘move’. For the complete chi-square results for all the ‘move’ schemes at both ‘move’ and ‘step’ levels, see Appendix A.

			Text-Driven (n)	Image-Based (n)	Chi-Square Value
Move A	Presenting information regarding user interactions in the main feed page		(73)	(47)	5.633*
Move B	Presenting information regarding user interactions inside a single content page		(53)	(30)	6.373*

Significance: Chi square value > 3.841 cut-off value. Significance levels: * p<.05 (High); ** p<.01 (Highest).

‘Moves’ and ‘steps’ were allocated to fit under 2 levels of significance. The first being the aforementioned and exemplified 0.05 p-value, the second was a 0.01 p-value. The latter meant that if a ‘step’ or ‘move’ had a p-value lesser than 0.01 then it would rank amongst the highest in significance. For example, ‘Move E’ “Adjusting privacy

settings” from the personalisation aspect, has a qualifying chi-square value of 13.893 or a p-value of less than 0.01 which renders it as statistically highly significant.

The overall results of the study revealed that the design features were largely common among the two subgenres. However, they also uncovered that many significant differences exist. This is true for each of the 5 design aspects individually. The three analysis chapters that follow use portions of the quantitative data to provide support for the different case studies. Although the results provide data for many case study topics, I selected the topics of the three chapters primarily based on the differences within the data and some consideration of trends. Similar to the historical analysis chapter, the chapters that follow view social media apps through a lens of culture, history, and historical developments towards the formation of standards. By conducting a cultural/historical UX design analysis on the social media design features/standards, I demonstrate that the UX designs of social media apps are culturally contingent and shaped beyond the mere application of technical know-how. Before this, however, I feel it is important to acknowledge the limitations of the study methodology.

4.3.4 Limitations

The content analysis approach (via the ‘move’ method) used for this study was appropriate for the observation of apps and their design features. However, there were some research limitations. Importantly, the observation of the design features/standards only illustrate the design features/standards that can influence the user experience but not about the experiences of users as they use these features, which is a core value in UXD.

There are also some limitations with regards to how data was collected. ‘Moves’ were formed through a careful selection process based on their perceived significance, and/or their complexity which allowed the incorporation of many ‘steps’. Indeed, increasing the number of ‘moves’ and ‘steps’ does widen the scope of understanding. However, the formation of ‘moves’ and their associated ‘steps’ is to some extent also dependent on any researcher’s presupposed understanding of what counts as a significant or complex aspect or portion of the interface. This makes the ‘move’ formation process in that regard somewhat subjective, despite being comprehensive and undergoing several reviews by two individuals including myself.

Another research limitation is with regards to how data was documented. In contrast with interactions with contents that are static, such as texts or photographs, interactions with social media app interfaces are much more dynamic. The approach I used to document app interfaces was via iPhone screenshots. While the screenshots were very useful, they provided as standalone images a limited understanding of the app interfaces. For example, some features could only be described semantically through ‘moves’ and ‘steps’, such as ‘Step B1’ from the ‘navigation’ aspect that reads “Swiping left and right between main menu tabs and via single tap”. Further, in order to attain a better understanding of exactly how the interfaces functioned and the relations between pages, I sometimes needed to go back and observe the apps directly (if still available at the time) or fill in the gaps from my own prior experience of usage.

With regard to these issues of data collection and documentation, another limitation is that of unanticipated app changes. Unforeseeable changes could affect the design of the observed apps without a researcher’s knowledge. For example, although precautions were taken to make sure that apps were not updated to later versions, the

possibility for some design changes still remained. These changes could occur not based on any new app updates provided by developers through the App Store but by developer alternations to a linked app code located on a separate independent server. In some instances, app developers can alter image sizes and entire page layouts by replacing certain files/scripts from a database on the server. Another example of unforeseeable changes is where later app versions are released to an app's user community, which includes new features. This can affect what appears on older app versions. For example, if an app introduces another photo format for user-generated photos, then the new format/shape will start appearing within the interface of the older app version which may lead to some confusion.

Further, during the data collection process some apps unanticipatedly dropped out of the App Store and others, such as Quora, demanded an app update by disabling areas of their app. This occurred well into the data collection process. The first apps to shut down in 2016 were WeddingParty in July and Tsu in August, in 2017 it was Vine in January and YikYak in May, and others later followed. As a contingency plan for the continuation of the data collection process of these apps and later 'move' scheme revisions, I first checked the availability of particular design features within the remaining shell/structure of apps and explored screenshots taken from previous 'steps'. As a final resort I sought available and credible online sources regarding the design features.

Chapter 5 - Entertainment through

Frames of Inconsistency

Computers and the World Wide Web (or Web) provided an infrastructure where users can view different digital media content. Indeed, the Web “borrow[s] from and remediate[s] almost any visual and verbal medium we can name” (Bolter & Grusin, 2000, p. 197), including images (i.e. photos and videos) of a variety of conflicting formats. Today, smartphones bring together these different media standards that users can access through the confines of a pocket-sized screen. However, the convergence of these various forms of media presented UXD practitioners with challenges.

Designers needed to capitalise on established and familiar standards brought by older mediums and innovate or adapt them to the newer smartphone medium and its different screen formats. These innovations, as shown in this chapter, were carried out using varying modes of remediation, dominant design, and immediacy. The image and screen formats in this chapter generally refer to ‘aspect ratios’. An aspect ratio is a mathematical concept describing the relationship that exists between the width and height of a screen (Zettl, 2014, p. 87), unlike the term ‘size’ which refers to the extent of the dimensions of an object.

Importantly, this chapter explores the image presentations afforded by social media apps through the opposing UXD strategies of ‘consistency’ and ‘user freedom’, with an understanding of critical-cultural perspectives that include hegemony and the

creation of a ‘common sense’ understanding about design features. Social media apps vary in the number and format of image content that they allow users to upload. These variations play a role in defining the visual design of parts of the app interfaces. While the UXD approach used by some app designers is focused on the principle of consistency by providing users with the ability to upload only single uniform images, other apps lean towards the principle of user freedom by providing the ability to upload multiple and/or different image aspect ratios. A tension exists between these two principles, for instance while uploading various image formats provides flexibility, it also threatens the consistency of the interface.

The chapter also focuses on how the consistency approach used by designers benefitted some popular and emerging apps at the time, despite them not following the dominant user freedom approach used by the majority of apps as revealed by the collected 2016 data. Further, it shows how despite the use of these two UXD approaches by designers, designing for the iPhone 6s context has been a challenge due to conflicting standards that have accumulated through a culturally-driven process.

This chapter is divided into three parts. The first part sets up the entire chapter by introducing an understanding of the two opposing UXD approaches through a select literature. It then contextualises the chapter in light of two conflicting iPhone screen standards that diverged amidst a market of even more conflicting image standards. The understanding of these complexities also provides the necessary context for later interaction design analyses of app interfaces and their images in relation to the limited screen space of smartphones. The user freedom approach used traditionally by the Facebook website is explored through the small screen of the Facebook and KakaoStory

apps, while simultaneously introducing the important interface mechanisms through which different image contents are laid out and made visible.

While the user freedom approach appeared to be the dominant standard in the 2016 period, part two and three of this chapter are dedicated entirely to the minority apps that have used the consistency approach, where the cultural and historical underpinnings of their designs are explored. Part two focuses on horizontal rectangles and demonstrates how the YouTube design was the most effective example of well thought out UXD trade-offs in comparison to other apps in the market, all of which follow a dominant convention of horizontal-only rectangles. While this part focuses on horizontal video content only, the third part of the chapter is mixed between photo and video content of square and vertical formats.

Part three first shows how both Instagram and the two conflicting iPhone screen standards have played a significant role in the adoption of the square format by other social media apps. Further, the consistent use of square-only in that context limited designers in their design choices and in maintaining a consistent cross-screen design that could communicate the same emphasis on the visibility of images. Finally, this part shows how the vertical-only apps Musical.ly and Flipagram presented an interaction style that was more strongly focused on posts and images and easily accessible, over the Snapchat app and others like it.

Part 1

5.1 User Freedom & Consistency

There are two emphasis within UXD literature regarding the principle of user freedom or control, the first is narrower in focus. Many scholars and practitioners have emphasised narrow or specific applications (Nielsen & Molich, 1990; S. L. Smith & Mosier, 1986, p. 274; Stone et al., 2005, p. 176). For example, Nielsen's (1994a) user freedom principle is focused on responding to errors made by users. Nielsen (1994b) states that users "will need a clearly marked 'emergency exit' to leave the unwanted state without having to go through an extended dialogue" (p. 156). For example, instead of feeling trapped within an extended data-entry sequence such as an online form, the ability to abandon the form via an exit button provides the user with control out of that situation.

While it is important to provide users with the ability to escape out of such situations, the notion of user freedom in this chapter is more closely in line with the second emphasis that is broader in its outlook and application (Shneiderman et al., 2018; Tognazzini, 2014). In their eight golden rules of interface design, Shneiderman et al. (2018) advise designers to maintain the user's control of an interface and explain that "[e]xperienced users strongly desire the sense that they are in charge of the interface and that the interface responds to their actions" (p. 96). They add that those users favour familiarity and oppose change, and are irritated by struggles to find important information, boring lists of data-entry, and the "inability to produce their desired result" (p. 96).

What makes the principle of Shneiderman et al. (2018) even more important for consideration is that it implies that designers should become knowledgeable regarding the user's expectations and implement familiar design features in order to avoid an undesirable experience. Indeed, designers need to maintain consistency in their designs especially when designing products across different platforms and intra platform.

Although the principle of consistency for interface design has been criticised by some (Grudin, 1989; Spool, 2018), it is highly cited by scholars as an important principle within UX design (Nielsen, 1994b; Norman, 1983b; Schlatter & Levinson, 2013; Shneiderman et al., 2018). For example, Tognazzini (2014) recommends that designers maintain consistency in look and feel across platforms and services in order for adoption to be quick and easy, and in the use of official standards and ones developed through norms. With regards to intra-platform, Shneiderman et al. (2018) state that designers should strive towards achieving consistency within an interface and that “[c]onsistent sequences of actions should be required in similar situations; ...and consistent color, layout, capitalization, fonts, and so on, should be employed throughout” (p. 95). While these recommendations are commonly presented by scholars and applied within UX design practice, Norman (1983b) highlights that inconsistencies lead to design-errors and learning-difficulties, and that a solution to these symptoms is achievable not only by making consistent the action structure but also the “instrument format” (p. 256).

Both the principle of consistency and user freedom are incorporated within this chapter. However, the trouble with employing these principles together is that they create a tension, especially in relation to image formats that are an essential feature within social media apps. For example, while having a fixed and uniform aspect ratio of

images helps to preserve consistency in interface design, it limits the users' freedom in the kinds of images they can share. Conversely, allowing users the freedom to upload an image of any aspect ratio means that the interface may display different kinds of images in variable ways, threatening the consistency of a UI. Apart from these technical UXD concerns, there are cultural hegemonic considerations with regards to how technological corporations use these strategies for their own benefit, which plays into their broader attempts to control and police the activities of their consumers. Social media company designers and owners control individual agency within their platforms by setting the affordances and UXD strategies of their products that reflect their 'common sense' understandings, the ones that everyone should follow. Their power is given to them via the consent of consumers/users that do so by using their platforms and invariably supporting the design ideology that works to further their commercial economic interests under commodity fetishism. The next section provides some context regarding different screen and image aspect ratios.

5.2 Aspect Ratios 2016: An Overview

Screens and images vary in their aspect ratios and sizes. According to Zettl (2014), there are four standard aspect ratios in relation to computer screens, television, and film (p. 88), which are all rectangular in shape. Indeed, in the 2016 market there were many different standards with regards to image formats including different aspect ratios for photography. These standards come from old traditions that are briefly discussed shortly in this chapter.

Image contents of a screen are always bound by the screen's dimensions, meaning that the smartphone's screen frame limits an image and its aspect ratio to the confines of its vertically oriented screen. Images with their aspect ratios are essentially screen UI elements. Visual and interface designers Schlatter & Levinson (2013) highlight in their book *Visual Usability*, the importance of considering UI elements in relation to different screen sizes (pp. 103, 104), which in the broader sense also extends to images of different aspect ratios. However, much like other screens, phone screen formats have also been inconsistent and developed over time.

In order to gain a better understanding of the presentation of image formats within the context of the social media iPhone apps, it is important to have an overview of the iPhone screen diversity present within the market in the years leading to 2016. Knowledge of this diversity is important because the iPhones developed over that period make up the body of iPhone devices used in 2016 and through which app designs are presented.

The sizes of mobile phones have been changing over the past few decades. The original devices were bulky and large but producers of subsequent devices were able to design smaller phones. This movement led to smaller devices with small screens, but as phone functionalities increased (Crestani et al., 2017, pp. 45, 46), screen sizes again began to grow as exemplified in Figure 5.1. This section analyses specifically the historical development of the iPhone screen size and aspect ratio because Apps distributed by Apple's App Store including the ones used in my data can only be downloaded from an Apple device. The diversification of iPhone screens within the market was a process that occurred gradually over several years and led to the creation of two conflicting screen aspect ratio standards.

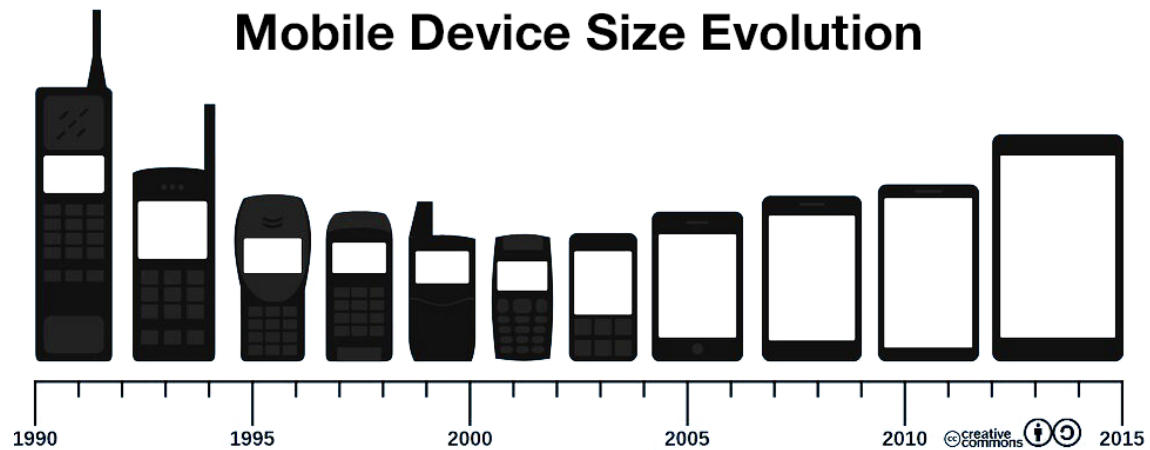


Figure 5.1: An increase in the size of mobile phone screens over the period of 25 years (Crestani et al., 2017, pp. 45, 46) A modified Creative Commons image. "Phone evolution" by Matti Mattila is licensed under CC BY-SA 2.0 (Mattila, 2015).

Major changes to the mobile phone market began on the 9th of January 2007 when Apple introduced its first iPhone. The smartphone possessed a 3.5 inch screen size (Apple, 2007a), and screen aspect ratio of 2:3, as seen in Figure 5.2. The screen size, measured in inches, is a number attained by measuring the screen not vertically or horizontally, but diagonally. The screen size of the first iPhone is recognisable today as being small due to the screen-size developments which gradually followed in later years (Silver, 2018).

However, consecutive releases directly after the first iPhone (Apple, 2007b) continued to provide customers with upgraded features while maintaining the same 3.5 inch screen size and 2:3 aspect ratio. This continued for four years through the following models, the iPhone 3G & 3Gs in 2008 and 2009, and the iPhone 4 & 4s in 2010 and 2011 (Apple, 2008a, 2008b, 2009a, 2009b, 2010a, 2010b, 2011a, 2011b).

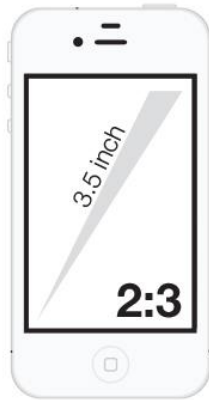


Figure 5.2: This image represents the measurements of all screens prior to the iPhone 5, beginning with the first iPhone in 2007 and moving through till 2012.



Figure 5.3: This image represents the measurements of the **iPhone 5 series** screens, beginning in 2012 until the release of the iPhone 6 in 2014.



Figure 5.4: This image represents the screen measurements of the **iPhone 6** released in 2014 and the 6s in 2015.



Figure 5.5: This image represents the screen measurements of the **iPhone 6 Plus** released in 2014 and the 6s Plus in 2015.

However, the consistency in screen formats changed in 2012 with the release of the iPhone 5 that boasted a large 4 inch (diagonally measured) screen size (Apple, 2012a, 2012b) and a 9:16 screen aspect ratio, adding height to the screen as can be seen in Figure 5.3. This was also the case with iPhone 5s and 5c that followed after (Apple, 2013a, 2013b, 2013d). This situation presented Apple developers and designers with an inconsistent screen market to consider when designing, and app developers needed to configure their app designs so that they would fit the new dimensions (Hamburger, 2014). The design of the subsequent iPhone 6 and 6 Plus models maintained the new aspect ratio but presented 4.7 and 5.5 inch screens respectively (Apple, 2014a, 2014b, 2014c), as did the 6s and 6s Plus the following year (Apple, 2015a, 2015b, 2019a, 2019b), as seen in Figures 5.4 and 5.5.

The diversity of screen formats in the market in early 2016 are reflected via these historical developments where conflicting standards were created by Apple designers that presented app designers with the challenge of designing for both 2:3 and 9:16 aspect ratios. However, even designing for one aspect ratio needed mindful consideration, especially since screen real estate is something valuable but also limited.

Zettl (2014) points out that despite the iPhone's distinct ability to present content in both vertical and horizontal orientations, the limitations of the screen are nonetheless fixed (p. 87). The limitations and challenges that the screen real estate presents are recognised by designers. Shneiderman et al. (2018) acknowledge that "[s]mall mobile devices have limited screen sizes (p. 236). Potamianos & Perakakis (2008) mention that the limited screen space of mobile phones is regarded as a common design restriction (p. 75). With regards to the early 2:3 iPhone screens, experienced UI developer and designer Bondo (2009) pointed out that the limited screen space brings challenges and stated that "[t]he cost of the iPhone's portability [was] obviously screen size, and there's only so much you can show with just 320×480 pixels available" (p. 29). Even with the iPhone 5 being around, Morson (2014) provides best-practice recommendations, of which was the need for designers to take into consideration the little space provided by smartphone screens (p. 129). The iPhone 6s was the device used for my study in 2016. Although it has a larger screen size than the iPhone 5, the screen of the pocket-size 6s is still small, providing more or less similar limitations to its predecessors. Screen size plays a role in shaping a user's experience during product use. However, so do the UXD approaches of consistency and user freedom used by app designers.

5.3 A Tradition of User Freedom and Facebook

This section explores the design approach that has been long used by Facebook, and also presents a framework by which image presentation within smartphones can be understood. Facebook was founded in February 2004 (Facebook, n.d.-b) long before smartphone proliferation. While some interface elements within social media apps such as Facebook are pre-set by designers, others such as text and images are published by users and have been termed User-Generated Content (UGC) (Wyrwoll, 2014, p. 15). Two years after its launch, Facebook introduced its novel design feature ‘news feed’ (D’Onfro, 2016), which revolutionised how UGC were viewed by users, and is a core area where Facebook’s user freedom approach was visually represented.

Facebook’s news feed was a page where a vertical stream of personal information from multiple users was foregrounded (Statz, 2006). Despite pushback by some Facebook users, the news feed later became widely accepted as the go-to page for immediate updates about other users, including images. Social media platforms have since contributed to the popularity of this feature, generally referred to as a ‘feed’, beginning as early as 2007 with rival platform MySpace reported to have been implementing a similar feature (Arrington, 2007).

In fact, much like other platforms at the time, Facebook was designed to be mainly accessed through personal computers (PCs). In addition, the image formats that could be uploaded and posted to these platforms came only from images produced by digital cameras and transferred to computers, or computer-scanned photos originally captured through film cameras. Such images were uploaded to other platforms that too used a user freedom approach.

Facebook's 'user freedom' design approach has been maintained by Facebook designers since its beginnings, for whom it is the 'common sense' approach for the upload of content. Its founder Mark Zuckerberg stated in a 2013 keynote (Hensel, 2013) that Facebook's service is distinct from other services that allow the upload of one kind of content. Zuckerberg added that "From the beginning our goal with news feed was different from what any other social service was trying to provide. Our view is that if you are going to contribute to this personalised newspaper you need to be able to share any kind of content that you want, status updates, photos, videos, links, locations, ... whatever you want" (1:55 – 3:24). Indeed, while this approach makes the platform seem easy to use, it also serves Facebook's economic interests by maximising the potential of engagement from users who can upload any content regardless of its original source.

However, despite its seemingly all-encompassing nature, Facebook's user freedom approach is still a controlled approach. For instance, while the MySpace platform has historically given its users the ability to add and edit html code and craft their own profile (Codecademy, 2020), Facebook has always withheld such control from its users and reserved it only for its programmers.

Having said that, Facebook designers/programmers do provide an ample amount of control. For example, the Facebook design allows the upload of multiple photos with different aspect ratios in a single post as seen in Figure 5.6 from 2006 and has continued to do so till today. This is shown in the next section through several examples of the Facebook app from 2016 while also showcasing and analysing the mechanisms through which content is presented to users.



Figure 5.6: A screenshot of the Facebook platform in 2006 from a personal computer. The news feed is the page that is currently active and shows a post with multiple images and formats newly added together to an album, and presented together at the bottom-centre part of the screenshot. These images are presented in a way that reflects their varying aspect ratios. *This image was taken in its modified and censored form from an article published by Business Insider Australia (D'Onfro, 2016).*

5.3.1 The Visibility Mechanics of Mobile Social Media

As part of a reflective design process, a user-interface designer notes that the iPhone screen size plays a role in determining how the interface is designed (Kemper, 2009, p. 108). This includes the visibility of interface elements. Norman (2013) emphasises the importance of the visibility of “relevant components” (p. 3) within an interface. Components are interface elements and designers need to prioritise their visibility and negotiate the screen space between them and other surrounding content.

The remediation of the PC-based Facebook platform to the mobile-based app platform brought with it the news feed and its chronological list format. However, the vast screen estate of personal computers through which content was presented was no comparison to the limited screen space of iPhone screens. Moreover, Zuckerberg announced in the 2013 keynote (Hensel, 2013) that the new Facebook news feed design would emphasise image contents more, due to the increase in image sharing supported by inbuilt smartphone cameras (3:24 – 4:20). This led to the presentation of significantly larger images within the news feed of both desktop and mobile devices (4:50 – 5:13), despite being originally meant for mobile (20:08 – 20:50).

However, the significant increase of image-sizes within the news feed further reduced the amount of surrounding UGC visible to the user on both desktop and 2:3 ratio smartphone screens. It is worth noting however, that the introduction of the iPhone 5 later in 2012 with its elongated 9:16 aspect ratio (Apple, 2012a) and subsequent 9:16 iPhone releases supported more visibility of surrounding UGC.

The emphasis on images as implemented by some social media apps such as Instagram (2015b) and adopted by Facebook meant that images played a significant role in the visibility of onscreen content. In addition, UGC such as text and images adapt differently when presented on different size screens. While text generally wraps around the area in which it occupies and is usually capped at a specified amount, images increase and decrease in size proportionally and can generally occupy a more significant portion of the screen. Therefore, the format of an image has a strong influence on the visibility of its surrounding content.

Norman (2013) affirms that the “physical layout and visibility of the items convey information about relative importance” (p. 79). This means that the amount of space occupied by an image on a screen and its visibility allude to its importance with respect to other elements. However, when users are presented with an ‘important’ image that occupies a significant portion of the iPhone screen’s space, it means that less space is dedicated to the visibility of surrounding content and vice versa, as demonstrated by comparing Figures 5.7 and 5.8 of the Facebook app in 2016.



Figure 5.7: A post within the news feed page of the Facebook app, where the image used occupies a significant share of screen space leaving little to no trace of surrounding UGC.



Figure 5.8: The news feed page of the Facebook app. The sections/contents tinted in green are examples of surrounding UGC.

The nature of such interactive social media apps is that content is always subject to change. For instance, users can journey through different pages of the interface. However, even within the same page the visibility of interface elements can constantly

change, such as when swiping up and down through a feed. In fact, the variance in the image aspect ratios that Facebook allows its users to upload threatens the visual consistency of the news feed and works against the ‘common sense’ understanding held by its designers. When users are viewing an image, or browsing and swiping through a feed, they are constantly made aware of the presence of upcoming and/or previous content. Mobile strategist Morson (2014) recommends that designers need to make decisions on the visibility of UI elements depending on their necessity as part of the user’s journey (p. 129). The visibility of these surrounding contents are important for a user as they continue their journey through a feed.

These surrounding contents act as ‘signifiers’, a term introduced by Norman (2013) that refers to “any perceivable indicator that communicates appropriate behaviour to a person” (p. 14). The reappearing surrounding-contents act as moving signifiers, reaffirming to the user that more content is to follow, as highlighted in green in Figure 5.8. Using Norman’s wording, these contents are ‘components’ of the interface, the visibility of which is essential to guide users on their browsing part of the journey. However, their appearance is predicated largely on the image aspect ratio of UGC, which threatens the visual consistency of the user’s feed journey.

5.3.2 Multiple Images, Thumbnails, and Layers

Image aspect ratios play an important role towards the visibility of an image and its surrounding content, and can be generally categorised under square and horizontal or vertical rectangles. However, apps differ not only in the image formats that they enable users to upload but also the number of image uploads per post. For example, as

mentioned, Facebook allows its users to upload multiple rectangular formats together within a single post, unlike the Instagram app that was originally programmed to allow the upload of only a single image in a uniform square format (Instagram, 2015b). In fact, several apps provide a similar approach to Facebook as seen in Tables 1 & 2, with the exception of Flipagram and Magisto which allow the user to curate multiple images into a single video output file for upload.

Table 1	
Engagement Step C1: Providing the ability to post multiple photos and videos associated with a text, all at once	Text-Driven: Google+, Tapatalk, LINE (3)
	Image-Based: Flipagram, Flickr, Magisto (3)

Table 2	
Engagement Step C3: Providing the ability to post multiple photos associated with a text at a time	Text-Driven: Facebook, Twitter, Tumblr, Google+, Tapatalk, KakaoStory, Zalo, LINE, VirtualSpace (9)
	Image-Based: Flickr, WedPics, Behance (3)

Included among these apps is KakaoStory, a Korean app that launched in 2012 and quickly became Facebook's competitor within the Korean market (Mu-hyun, 2012) with one study indicating that Korean KakaoStory users utilise the photo posting feature more than Korean Facebook users (S. W. Lee & Lee, 2017, p. 228). In fact, the design

that Facebook uses to present its multiple images, seen in Figure 5.9, is almost identical to the visual design of KakaoStory, as seen in Figure 5.10. Even the interaction design of KakaoStory with regards to such posts is also almost identical to that of Facebook, therefore I have used screenshots from both to explain their interaction styles.



Figure 5.9: This image shows a post that includes three thumbnail images within the news feed page of the Facebook app.

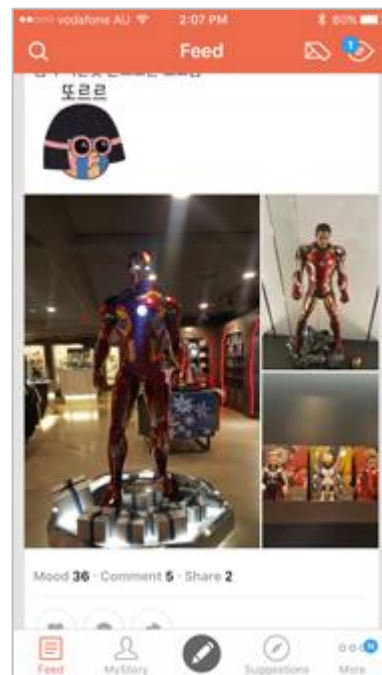


Figure 5.10: This image shows a post that includes three thumbnail images within the feed page of the KakaoStory app.



Figure 5.11: This screenshot shows the second layer accessed after tapping on an image thumbnail. In this layer, user can scroll through images in their true aspect ratio.



Figure 5.12: This screenshot shows the third layer accessed after tapping on an image with a true aspect ratio but smaller in size.

When multiple images are uploaded to KakaoStory, the resulting published images appearing in the feed are usually presented through grouped thumbnails that don't represent the images' true aspect ratio, as seen by comparing Figure 5.10 and 5.12 from 2016. In fact, when more than a specific number of images are uploaded, only some thumbnails are presented while others are completely hidden from the feed as seen in Figure 5.13 that presents a plus (+) symbol together with a number indicating how many more images are available within the post.



Figure 5.13: This image shows a post with multiple image thumbnails, including the bottom right thumbnail that has a text overlay of '+14' indicating to the user that 14 more images are available within the post.

The design approach of grouping multiple images as thumbnails within a single post is useful for organisational and thematic purposes. However, the approach also results in preventing a flood of multiple images from the same user in the feed, which is both considerate of the limited screen real estate and the user's experience as they journey through the feed. Although this approach is also used by other apps such as Twitter, the majority of the collected apps support a consistency approach by only allowing the user to present a single piece of content at a time, as can be deduced from Tables 1 & 2 and as revealed throughout this chapter.

Despite the benefits of the user freedom approach that allows for the upload of multiple images within a single post, the trade-off is the additional interface layer that is produced as a result of having multiple images as seen within KakaoStory, Facebook, and generally within other such apps in that period. In order to access the true aspect ratio of the images, users need to tap on the thumbnails and then navigate their way through the different images by scrolling as seen in Figure 5.11. However, users can

also go one step deeper by tapping on an image from Figure 5.11 to transition to Figure 5.12. The layer in Figure 5.12 allows full access to an image in its largest screen size possible and true aspect ratio where the user can transition through the post's images via swiping left and right. Further, although the user experiences the interface in a hypermediated state, a single tap on the image rids it of its interface elements, such as buttons, and foregrounds the image thereby achieving immediacy.

Although KakaoStory or Facebook users can upload multiple images, they may also choose to upload only one. When a single image is uploaded as part of a post alone, the result in the feed is either a capped representation of the image (i.e. a single thumbnail) or the image in its true aspect ratio as seen in Figure 5.8. Interestingly, the choices given to users mean that they also play a role in the type of post interactions presented to other users.

In summary, the true aspect ratio of images within different apps are presented within different page layers of an interface's architecture. In order to level the playing field, this chapter focuses primarily on the layers from which images are in their true aspect ratio, for example, viewing an image after tapping on its thumbnail or in its true aspect ratio within a feed.

As shown, the approach of user freedom traditionally used by Facebook is also used by Kakao and other apps. In fact, although the results from my 2016 data show that the majority of apps do not allow multiple image uploads, they also show that an overwhelming number of apps do allow the upload of different aspect ratios, as seen in Table 3. Indeed some of the user freedom ideas set by designers of Facebook and others

from hegemonic networks shape the ‘common sense’ understandings of consumers with regards to media sharing.

Table 3	
Entertainment Step D4: Providing non-uniform or various shaped photos and/or videos	Text-Driven: Facebook, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, YikYak, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Flurv, Swarm, Fiesta, Flipboard, VirtualSpace, SixString, Scutify, tsu, Reddit (25)
	Image-Based: Instagram, Pinterest, Flickr, Keek, Periscope, GifBoom, WeHeartIt, BeFunky, Boomcast, Camera360, Magisto, WedPics, WeddingParty, VSCO, Behance, DeviantArt, 9GAG (17)

While the majority of apps are on the ‘freedom’ side of the debate for uploads of various image aspect ratios, the remaining apps are on the ‘consistency’ side of the debate. The low count of these apps draws attention to their interfaces which are examined in this chapter. Further, this chapter investigates why and how these minority apps have adhered to a consistency approach that contrasts with the dominant approach, especially since some of these apps are of great popularity, such as YouTube, or have been influenced by historically popular apps such as Instagram.

The sections that follow explore some of the already established design standards and conventions that have influenced the design of the apps that use the consistency approach, and demonstrate how they have been adapted or innovated into the smartphone context. From this point onwards, this chapter is divided into two parts, the first focuses on the UXD of horizontal-only rectangles as used by YouTube and

others. The third focuses on apps that use square-only images as influenced by market leaders, and then the UXD of the contentious vertical-only rectangle format seen through apps such as Snapchat and musical.ly (known today as TikTok).

Part 2

5.4 Horizontal Rectangles & Consistency

Amid conflicting standards, the YouTube design was the most effective example of well thought out UXD trade-offs in comparison to other apps in the market such as YouNow and Shou, all of which follow a dominant convention of horizontal-only rectangular aspect ratios. This section starts with a historical analysis of the conventions that form the foundation of these current horizontal-only design formats and then provides an interaction design analysis of the interfaces. This insight reveals an understanding as to why and how the consistency approach was used in the design of the 2016 apps under the horizontal-only category.

Table 4	
Entertainment Step D2: Providing only horizontal photos and/or videos of a uniform aspect ratio in each app	Text-Driven: (0)
	Image-Based: YouTube, Vimeo, YouNow, Shou (4)

The apps collected under the horizontal rectangles category (seen in Table 4) are all from the image-based subgenre. During the time when desktop social media platforms such as YouTube and Vimeo were being established, most desktop computers had a rectangular screen interface, and this has echoes in the traditions of film and television. In fact, images of a horizontal rectangular format have a strong historical

grounding traceable to as early as the 19th century and shaped by decades of design decisions. However, despite the commonality in their horizontal shape, inconsistent horizontal rectangle standards have been developed historically.

5.4.1 Early Historical Inconsistencies

The 4:3 aspect ratio with the 35mm film gauge can be traced back to as early as 1889 (Belton, 1992, p. 15). The aspect ratio became the norm within the film industry and was used for decades into the 20th Century under the name Academy Ratio (pp. 44, 45) despite the experimentation and introduction of different formats by some designers (p. 16). Academy Ratio was adopted in 1941 as a standard for broadcasting television based on the recommendations brought by the National Television System Committee (NTSC) (Fink, 1943, p. v). One of the reasons given for its adoption was that the format would be consistent and compatible with the standard used in the motion-picture industry (p. 196), meaning that there would be no image compromise such as images that are blown up and partly cut off from the sides, or reduced in size and not occupying the entirety of the frame (pp. 203, 204).

However, as the television medium spread and grew in popularity it became a threat to the economic growth of the film or cinema industry (Bazin, 2002) that under mediamorphosis needed to adapt. The introduction of wider film formats was a way in which designers made cinema more distinct as seen in the 1950s through projects such as Cinerama, CinemaScope, VistaVision (Belton, 1992, p. 159). The introduction of the wider 70mm film format in the 1950s was the beginning of another wide film standard alongside the 4:3 ratio, the latter remaining the dominant film format into the 1990s

(Belton, 1992, p. 158). This rise of conflicting standards within the film industry has similar echoes in the television industry.

In the late 1980s and 1990s, debates occurred in advanced nations and regions such as the U.S, Western Europe, and Japan over the change from analogue to digital television (DTV) (Hart, 2004). In the U.S, the switch to DTV began in 1996 with the cut-off date for analogue signal broadcasts being June 2009 (FCC, n.d.). Resolutions of DTV were referred to in terms of standard definition (SD) and high definition (HD). SD was more similar to analogue TV due to its 4:3 aspect ratio (p. 6), while HD or HDTV had a wider aspect ratio of 16:9 (p. 7). The 16:9 aspect ratio became the standard for manufacturing television sets and distributing them around the world. The conflicting standards that had developed historically meant that there would be inconsistencies when viewing older film and video productions on the new and wider 16:9 aspect ratio. In fact, these inconsistencies have similar implications within the social media context. This is due to the remediation of television and film by some social media websites, such as YouTube and Vimeo in the 2000s, that have capitalised on the cultural and social significance of prior mediums by presenting familiar and consistent designs, as shown next.

5.4.2 YouTube & Vimeo: Remediation of TV & Film

The image-based YouTube website was launched in 2005 (Wooster, 2014), preceded by Vimeo in 2004 (Vimeo, n.d.). Both desktop platforms are for sharing videos online, but differ in focus. While YouTube appealed to a more general audience, Vimeo was created by filmmakers and fostered a small community of generally supportive

filmmaking professionals and enthusiasts (Larson, 2013). In the mid-2000s the practice of videoblogging was still in its infancy (Björkmann Berry, 2018, p. 14). There was no template for the creation of video blogs, and “[b]oth technically and aesthetically, the media form was very much open to experimentation” (p. 94). However, for the YouTube video player, designers adopted the conventional 4:3 aspect ratio as a fixed frame for all video content. However, the 4:3 standard used in traditional television was not the only television aspect that YouTube designers emulated.

YouTube’s remediation of television has been discussed by several media scholars (Grusin, 2009, p. 61; Snickars & Vonderau, 2009, p. 15), and television’s influence on YouTube brings forth obvious parallels between the two. YouTube co-founder Steve Chen discussed in an interview the original rationale for naming and registering YouTube stating that while the ‘You’ in YouTube was in reference to viewers and creators of UGC, the ‘Tube’ was “sort of synonymous with television” (Computer History Museum, 2019, 1:44:25 – 1:45:56), or the cathode-ray tube component of television. Further, Grusin (2009) points to the metaphoric aspect of YouTube’s slogan ‘Broadcast Yourself’. The YouTube website’s remediation of television brought with it two distinct aspects.

The first aspect was the horizontal format that had been a dominant design convention for video for many decades. The second was that while there were many videos to choose from, the interface only presented one media player at a time. This goes in parallel with YouTube’s upload style. Unlike Facebook, which has traditionally allowed users to upload multiple images into a single post, the YouTube website has remained consistently faithful to the commodity-form of television and prior mediums by displaying a single uploaded video post (and video player) within a video page at a

time. Further, the platform is distinct from other social media platforms such as Facebook that have traditionally presented multiple video players within a scrolling feed.

These distinct aspects have been maintained in YouTube's desktop version and also appear in the apps of the horizontal-only category, as shown later in this chapter. The focus so far has been on the remediation of television. However, television and film content are not necessarily exclusive to any one platform. Although the Vimeo platform caters more specifically to professional film makers, Vimeo and YouTube remediate elements of both television and film. For instance, YouTube can be used by filmmakers to present films of different aspect ratios and by professional broadcasters to present a vernacular of even broadcast television. Indeed, users upload varying and inconsistent video formats to the YouTube and Vimeo platforms. YouTube designers have attempted to manage the digital and visual presentation of these inconsistencies as shown next, however, conflicting aspect ratio standards has made it difficult.

5.4.3 Consistency at the Cost of 'Boxing'

At the time of YouTube's establishment in 2005 the video formats present online were diverse due to a lack of consensus by developers. The diversity of formats meant a lack of consistency in the files overall and specifically with regards to aspect ratios. However, YouTube designers managed to bring some consistency to an environment of conflicting standards. In fact, co-founder of the YouTube platform, Steve Chen, details the great difficulties that were involved in producing a desktop application capable of

providing a streamlined process of content viewing and creation (Computer History Museum, 2019, 1:43:57–2:03:51).

Chen explains that before YouTube it was not possible for users to directly upload a video from ‘any source’ and have it viewable and sharable with anyone across different systems, and that this immediacy was achieved in part by developing a transcoder capable of understanding and transcoding, separately and together, the audio and video codecs of a multitude of video file formats, thereby creating a consistent and shared format for all videos (1:45:56 - 1:47:57). The work of YouTube designers undoubtedly provided an indelibly UX, however much like with Facebook’s user freedom approach, it served to further YouTube’s business interests. Although this unification process brought consistency with regards to the file format, it simply could not apply to the hardwired mathematical constraint of a video’s aspect ratio.

The varying aspect ratios meant that there was a need to manage video presentation on the desktop screen. Early on, the YouTube website designers managed the varying aspect ratios by creating a video player that had a fixed frame. The website displayed videos with wider aspect ratios by scaling them so that their horizontal borders fit within the player’s 4:3 frame (YouTube, 2008) as seen in Figure 5.14 from 2006.

However, as Figure 5.14 also shows, this constraint sometimes resulted in letterboxing, meaning the appearance of black bars at the top and bottom of a video (Zettl, 2014, pp. 94-97). In fact, in 2008, two years after a hushed bidding war resulted in Google’s acquisition of YouTube (Hartmans & Leskin, 2020), YouTube changed the default size of their video player from 4:3 to 16:9 (YouTube, 2008) in order keep up

with the change to HDTV within industry. However, YouTube was not the first video sharing platform to make this transition, for instance in 2007 Vimeo had already transitioned to HD with 16:9 as a default aspect ratio (Vimeo, n.d.).



Figure 5.14: A screenshot of the YouTube platform in 2006 from a personal computer. The page is that of a video page where the video player is set to a default aspect ratio of 4:3. The video is a different aspect ratio to the video player and has therefore resulted in a letterboxed video. *The screenshot is a modified Creative Commons image. It was modified to appear complete by including the header section that contains the menu items on top of the search bar on the right, the search bar, and YouTube logo on the left. The image "youtube_wii.jpg" by uemura is licensed with CC BY 2.0 (Uemura, 2006).*

As companies gradually accepted the change in standard, the 16:9 aspect ratio was being further established as a dominant design feature for moving images. In fact, the concept of dominant design according to Utterback (1994) is defined as “the one

that wins the allegiance of the marketplace” (p. 24). As a consequence, all the existing 4:3 YouTube and Vimeo videos at the time were now displayed with a ‘pillarboxing’ effect. Unlike ‘letterboxing’ where the black bars appear on the top and bottom, in ‘pillarboxing’ two black bars or ‘pillars’ are present on the sides of a video (Zettl, 2014, pp. 94-97), as seen in Figure 5.15 and as occurs when presenting an Academy Ratio (4:3) film on a new 16:9 television set.

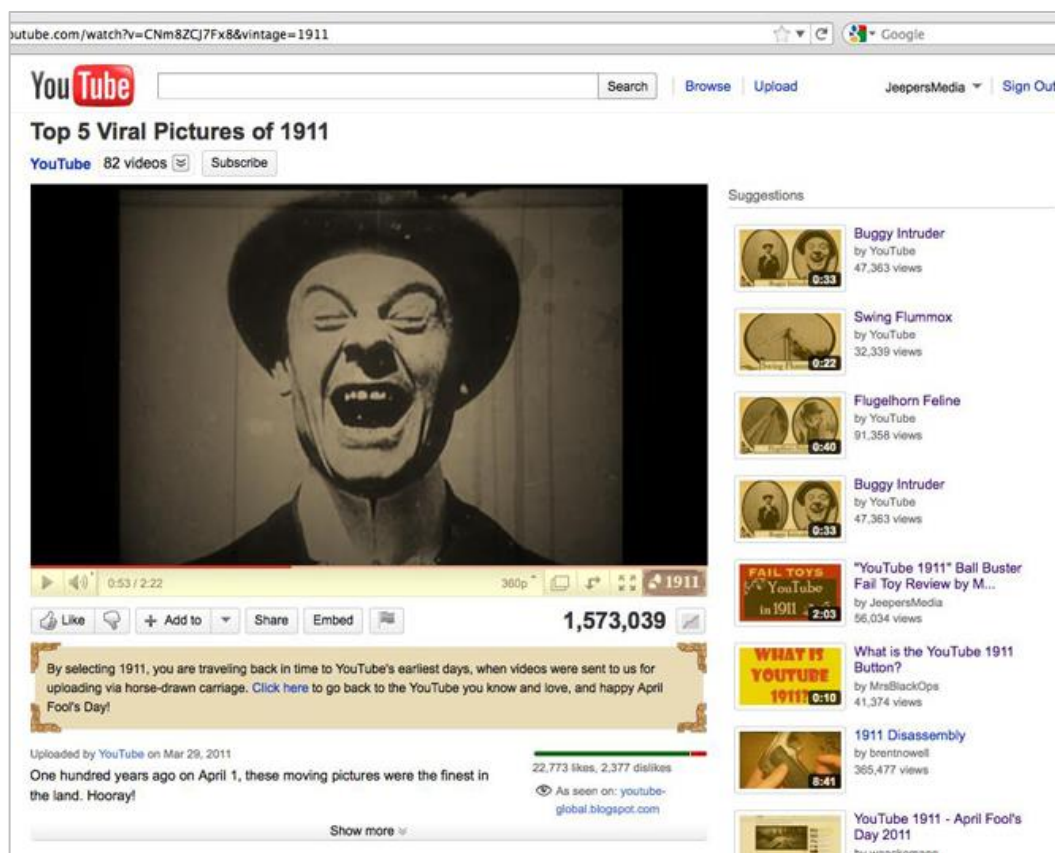


Figure 5.15: A screenshot of the YouTube platform in 2012 from a personal computer. The page is a video page where the video player is set to a default aspect ratio of 16:9. The video is a different aspect ratio to the video player and has therefore resulted in a pillarboxed video. *A modified Creative Commons image. "YouTube Top Viral Videos 1911 Screen Cap" by JeepersMedia is licensed with CC BY 2.0 (Mozart, 2012).*

To summarise, website designers from hegemonic groups YouTube and Vimeo focused on horizontally oriented videos as an optimal mode for viewing by building on the

already established ‘common sense’ conventions of viewing images through horizontal rectangles. However, the presence of conflicting aspect ratios due to variety and shifts in design standards has left inconsistencies that resulted in some form of ‘boxing’. In fact, these issues also reside in the context of the iPhone.

5.4.4 Recreating Experiences: Influence and Familiarity

The advent of the iPhone and App Store motivated the designers of existing social media platforms to undertake the challenging task of recreating their desktop experiences within a smartphone context. The YouTube app was among the native apps that came out with the first iPhone introduced in 2007, however the YouTube app design was primarily under the control of Apple (Kincaid, 2010). It was not until 2012 that Head of YouTube Mobile, Andrey Doronichev (2012), announced the first YouTube-designed iPhone app. The Vimeo app on the other hand became available only after Apple allowed the submission of third party apps to its App Store by developers in 2008 (Apple, 2008c).

The challenge for the designers in the face of this mediamorphosis was that they needed to maintain consistency with the website interfaces, but on completely different hardware, and within a new OS architecture. The results from my 2016 data analysis reveal that much like their preceding mediums both YouTube and Vimeo still utilised a by-default horizontally formatted video player for video pages and horizontal thumbnail images for their feed page, as seen in Figures 5.16 and 5.17 of Vimeo respectively, and YouTube, presented in the next section. While the YouTube and Vimeo app designs were developed for a new OS architecture, they were very much another step down the

line in the remediation process, traceable from film and television down to desktop websites and then smartphone apps.

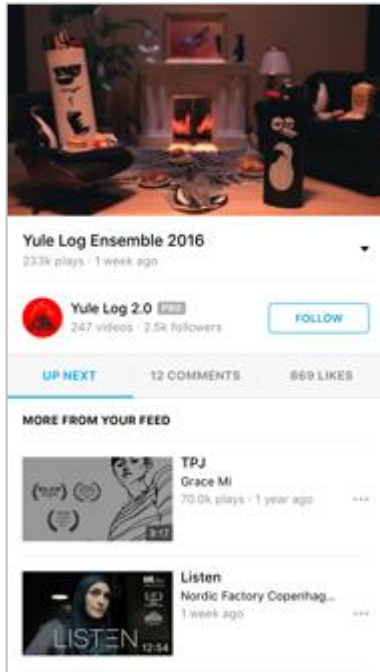


Figure 5.16: This screenshot shows the Vimeo app's video page with the main video at the top being presented as a horizontal rectangle.

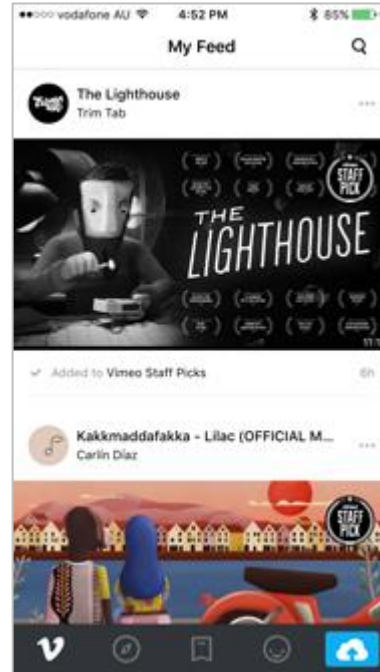


Figure 5.17: This screenshot shows the Vimeo app's feed page with thumbnails being presented as horizontal rectangles.

Therefore, it can be understood that designers of these apps maintained a horizontal aspect ratio for video as a capitalisation on the cultural and social significance of prior mediums and a historically dominant video convention that reflects their 'common sense' understanding. Importantly, this is a UXD strategy that utilises the principle of consistency and maintains cross-platform/medium familiarity. In fact this can also be said of other social media platforms in this category that came into existence only after the introduction of the App Store in 2008 (Apple, 2008c), such as YouNow and Shou. Both of these apps are 'live streaming' apps but differ greatly in the kind of content they present.

YouNow was launched as a website in September 2011, with its app versions set to be launched weeks later (Siegler, 2011). The social media platform allowed users to broadcast themselves on camera performing activities such as dancing and cooking to its community of viewers who could engage with the performers via live chat and use the platform's gamified features (YouNow, n.d.). This is exemplified in Figure 5.18 from 2016 where a broadcaster is seen hosting a live music and singing session while holding a guitar. YouNow was distinct from popular apps such as Facebook and YouTube that introduced live streaming in their platforms several years later. In fact, YouNow founder Adi Sideman pointed out in a conference presentation that a distinct YouNow feature was that an audience is guaranteed for every broadcaster, meaning that broadcasters have a chance to retain viewers and grow a fan base (All Things D , 2013, 1:15 - 4:00).



Figure 5.18: Screenshot of the YouNow app’s video page with a live broadcaster singing, playing guitar, and interacting with her fans who communicate with her through a chat feature.

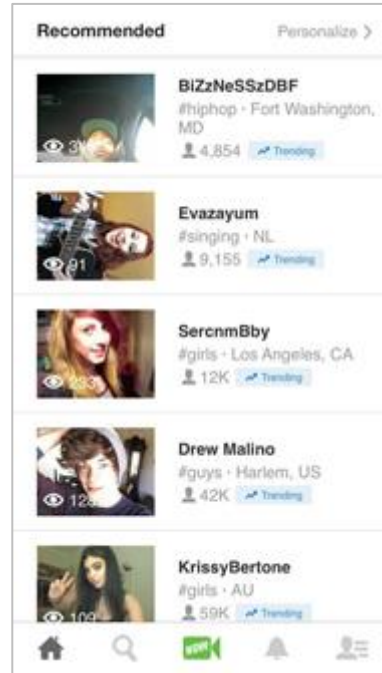


Figure 5.19: Screenshot of the ‘home’ page of the YouNow iOS app. *The screenshot as presented in its unmodified form is taken from a news article from Business Insider in November 2015 (Kosoff, 2015a)*

Despite the uniqueness of the YouNow app, it has been likened in news articles to a hybrid of different social media platforms (Siegler, 2011) that have far-reaching hegemonic influence on the commodity-form of other digital products. In one article, YouNow was described a ‘live streaming’ version of YouTube that had a young audience of under 24 years (Kosoff, 2015a). As Figure 5.18 has shown, much like YouTube, YouNow designers have chosen the conventional horizontal rectangle for their app design. However, YouNow’s resemblance of YouTube goes ever further.

The ‘You’ in YouNow emulates the ‘You’ in YouTube not only in wording, positioning in the name, but also in reference to UGC. As opposed to YouTube’s ‘Tube’ emphasising television, where televised images are not always live, the ‘Now’ in

YouNow emphasises the immediacy achieved through television when it is live. However, the user-generated nature of the YouNow platform meant that the live contents produced were closer in genre to the UGC of YouTube than the professionally produced and curated videos of traditional television broadcasters. Nonetheless, the influence of YouTube and the horizontal-only convention on the YouNow platform is apparent, as seen in Figures 5.18 and 5.19. While the live streams of YouNow were filmed by a smartphone camera, the live content provided by the Shou app were streamed directly from the smartphone screen itself.

Shou was established as an app-only platform sometime in the first half of 2014, as indicated through a search of the historical web archive WayBack Machine (Shou.TV, n.d.-a) and its Twitter account that was created in May 2014 (Shou, n.d.). The concept of the Shou app was innovative for its time, allowing users to livestream themselves playing video games straight from their smartphones. This was achieved by downloading a separate app named AirShou from third party websites that allowed users to record, save, and broadcast a mirrored image of the smartphone screen (iEmulators, n.d.) to the Shou app where spectators could view and engage with the broadcast via live chat (Shou.TV, n.d.-b). The immediacy achieved through Shou was that of a firsthand experience of another user's interactions with the smartphone including game time. Regardless of the type of immediacy achievable, the horizontal convention has been maintained throughout the Shou interface, as can be observed in Figures 5.20 and 5.21.



Figure 5.20: Screenshot of the Shou app's 'home' or feed page with thumbnails being presented as horizontal rectangles.



Figure 5.21: Screenshot of the Shou app's video page with a horizontal video frame mirroring a video game being played live by a broadcaster.

The designers of the apps presented so far have relied solely on the horizontal orientation for image presentation that ultimately serves their economic interests. They have further established a dominant design standard for video presentation while simultaneously leveraging on the principles of consistency and familiarity. However, this approach has brought forth challenges for designers to overcome. The next section demonstrates and analyses how the implemented designs fit into the vertical smartphone context amid conflicting standards.

5.4.5 Convergence within a Vertical Space

The apps in the horizontal category all use a consistency approach. Interestingly however, although the horizontal shape had been transferred from other previously established mediums, it appears coincidentally fitting for the iPhone context. In light of the valuable yet limited screen real estate discussed earlier, the app designers' use of the horizontal video player appears considerate of the visibility of surrounding on-screen content within iPhone screens of both 2:3 and 9:16 aspect ratios. This is the case for all the horizontal-only apps of this section shown earlier and finally exemplified through the horizontal format of YouTube's video thumbnails and player seen in in Figures 5.22 and 5.23 respectively.

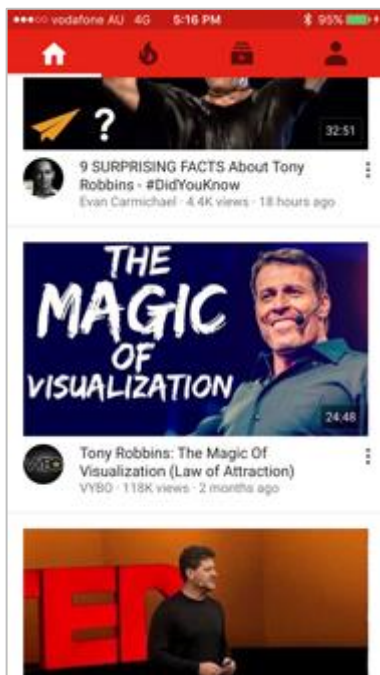


Figure 5.22: This screenshot shows horizontal thumbnails in the feed page of the YouTube app and its size in relation of other content.

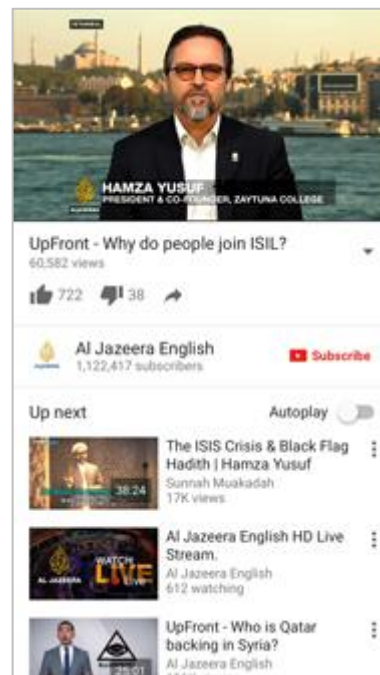


Figure 5.23: This screenshot shows the horizontal video player within YouTube's video page and its size in relation of other content.

Despite these supporting UXD considerations, the appropriation of the historically dominant horizontal video format within the vertically oriented iPhone screen has presented designers with challenges. Although the aspect ratio of the horizontal video player allowed for a large portion of the screen to be reserved for other engaging content that together made up the hypermediated page (Figure 5.23), it also meant that the size of the video being viewed was significantly smaller due to the vertical orientation of smartphones.

However, this was cleverly balanced out by all of these apps via the use of the ‘full screen’ feature that allowed the videos to be viewed in a large scale, often when users tilted their smartphones horizontally, as seen in Figure 5.24. Apart from size, full screen mode allowed videos to be viewed outside of the hypermediated environment of the video page and into a focused state of immediacy that foregrounds the images being presented and hides the interface elements into the background. For example, In the case of YouTube (Figure 5.24), the immediacy achieved is that of the television channel Al Jazeera. In the case of Shou (Figure 5.25), the immediacy is that of a live streamed video game.



Figure 5.24: A horizontal video within the YouTube app accessed in full screen mode on the TV news channel Al Jazeera.



Figure 5.25: This screenshot shows a live stream of a video game on the Shou app displayed in full screen mode.

Although app designers tried to present a balanced image presentation approach, their designs lacked in vertical videos that have traditionally and historically been neglected.

YouTube & Vimeo: Balancing Out Inconsistencies

This chapter has focused primarily on the visual presentation of images, with the understanding that the apps in the horizontal-only category maintain a consistent and familiar horizontally oriented design for image presentation. However, the YouTube and Vimeo app designs are distinct from all the other apps in this category in that they also use a user freedom approach.

Although the YouTube and Vimeo designs have provided users with the ‘freedom’ to upload images of different aspect ratios, albeit consistently one at a time, the end result is always displayed in a horizontally oriented video player frame (YouTube, 2008), as seen in Figure 5.26. In this way, these apps have leveraged the two

UXD approaches together for their own economic benefit and in order to provide their users with a better user experience, though not one clear of limitations.

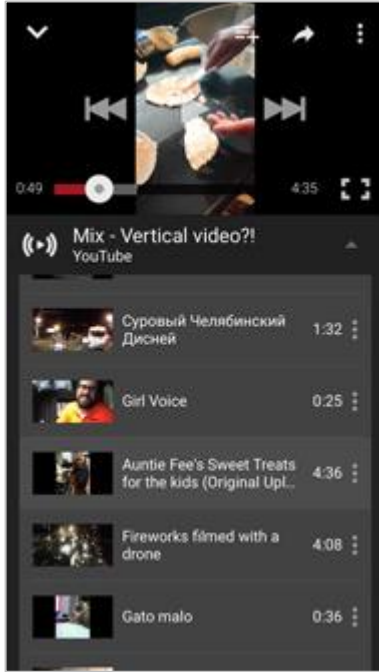


Figure 5.26: The video page of the YouTube app presenting a confined vertical video. *This is a modified (cropped) image retrieved from a news article from The Next Web (Dove, 2015)*



Figure 5.27: The vertical video seen in Figure 5.26 but in full screen mode. *This is a modified (cropped) image retrieved from a news article from The Next Web (Dove, 2015)*

When presented in the horizontal video player, vertical videos appear even smaller with pillarboxing occurring on the sides, as seen in Figure 5.26. In fact, prior to July 24th 2015 the same pillarboxing also happened in full screen mode up until the developers allowed for vertical videos to fill the full width of the phone in a new YouTube app software update (Darby & Amarilio, 2015; Dove, 2015) as seen in Figure 5.27. However, unlike YouTube, the Vimeo app did not allow full screen viewing of vertical videos (Ryan, 2018, p. 256) without pillarboxing.

In the case of YouTube, vertical full screen videos appeared to occupy the entire screen even prior to July 2015 when accessed through a smartphone web browser (Ghoshal, 2015). This is an interesting situation given that Google owns YouTube, meaning that while Apple tends to focus on its users accessing apps through its iOS system, Google may be more interested in maintaining access to applications through the Web.

In the case of the YouTube iOS app, while pillarboxing within full screen mode would have meant the loss of screen space not used by any other on-screen content, pillarboxing within the video page made room for other on-screen content. The ability of the YouTube design to provide users with a complete vertical full screen video as seen in Figure 5.27 meant that despite the small video presentation on video pages users could still enjoy both a complete full screen vertical presentation and more of other on-screen content on video pages as permitted by the screen real estate.

Although YouTube designers provided a UXD that was more considerate of vertical full screen, both YouTube and Vimeo app designers presented designs with well thought out trade-offs in spite of their ‘common sense’ disposition. They did so by capitalising on established conventions, leveraging on ‘user freedom’ through a consistency approach, and providing a UXD that was considerate of other on-screen content.

The YouTube and Vimeo designs are similar in their overall advantages and constraints, and some of the challenges that their designers have been faced with can be seen in the design of the Shou and YouNow apps. However, these apps also have their own challenges due to their ‘live streaming’ nature.

Shou & YouNow: Accommodation vs. Hard Consistency

The AirShou app allows its users to choose between landscape and portrait orientations prior to broadcasting live. The chosen orientation becomes fixed throughout the duration of the broadcast. For instance, if the user sets the broadcast to a fixed landscape orientation, then the broadcaster is able to record/stream themselves playing a game that is oriented horizontally by tilting their smartphones horizontally. Consequently, this means that for the viewer the image presented occupies its space of the video player and full screen mode, as seen in Figures 5.21 and 5.25 from the Shou app earlier.

The design approach of constraining the recording to a landscape orientation was ideal for games that were designed to be played horizontally and especially when viewed through full screen mode. However, the fixed orientation meant that when a user broadcast their screen as they moved through a vertical interface, such as the iOS prior to accessing a gaming app, the vertical interface and all its elements are presented awkwardly through a 90 degree tilted screen, as shown in Figure 5.28 and its cropped and zoomed version in Figure 5.29.

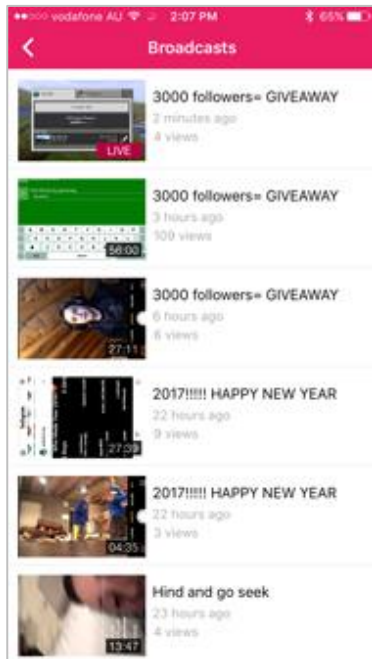


Figure 5.28: Screenshot of a user's 'Broadcasts' page within the Shou app, where thumbnails of video streams are presented in horizontal rectangles.



Figure 5.29: This cropped screenshot of Figure 5.28 highlights how video streams pre-set to a landscape orientation can appear when used by apps that are oriented vertical-only such as Instagram on the bottom and the iOS Camera app on the top.

Although video games have been played traditionally through horizontal screens, such as those that used television and computer monitors, the smartphone provided game designers with the ability to present games vertically, with some games at the time existing in vertical mode. However, when AirShou users chose to screen-record and broadcast in a vertical orientation, a small vertical image was displayed in a pillarboxed format, similar to YouTube earlier (Figure 5.26). In fact, the same pillarboxed layout was even mirrored within Shou video thumbnails and full screen mode, like Vimeo.

A counter example to the issue of vertical streaming is the Twitter owned app Periscope. Periscope video streams can be viewed in a vertical orientation within both the video player page and full screen mode because they are both the same page. However, unlike Periscope and the difficult design challenges faced by Shou app

designers, the YouNow app designers used a hard consistency approach that allowed it to avoid any type of boxing from occurring within its video player page.

A distinct feature of the YouNow app was that broadcasts were always restricted to a horizontal orientation. In addition, live streamed images always filled the entire horizontal rectangle of the video player regardless of the dimensions of the camera input, thereby eliminating boxing. This hard consistency approach within the interface also meant that regardless of the orientation of the iPhone, the image rendered to viewers within a video page and in thumbnails would always fully occupy the horizontal rectangle and without pillarboxing, as seen in the top video of Figure 5.30.

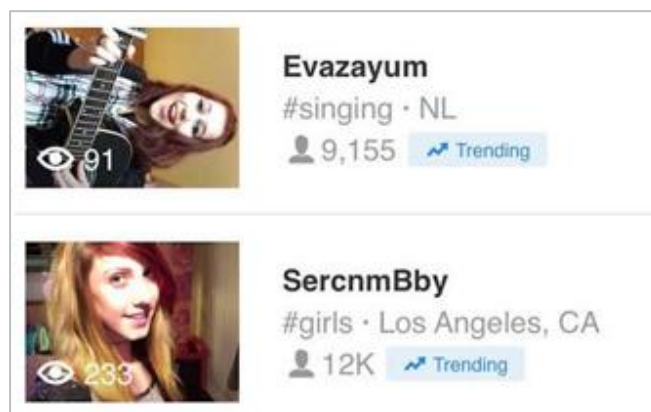


Figure 5.30: This cropped screenshot of Figure 5.19 highlights that regardless of the orientation of the iPhone, all YouNow streams are displayed horizontally. *This is a modified (via crop) screenshot taken from a news article from Business Insider in November 2015 (Kosoff, 2015a)*

This contrasts with Shou, YouTube, and Vimeo, where vertical videos always lead to pillarboxing within the video player/page. Having said that, the apps are all similar in that their video thumbnails are all horizontal and considerate of the screen real estate. Interestingly, unlike the other apps, the hard consistency approach of YouNow designers brings their app closer in remediation to the horizontal consistency of

traditional live television broadcasts, especially since the aspect ratio of its video player at the time was closer to the 4:3 dimension than the newer 16:9 one. In fact, as of this writing, YouNow designers still maintain a hard consistency approach.

In a market of conflicting standards, YouNow designer's hard consistency approach was an attempt to bring visual stability to the interface by eliminating boxing within the video player/page. However, in doing so it removed the user's 'freedom' of being able to stream videos of different formats. Conversely, providing users with options of different aspect ratios and orientations within a horizontal frame resulted in several inconsistencies in the aesthetic presentation of videos. Although inconsistencies such as boxing and conflicting screen and image formats made difficult the aesthetic presentation of videos, the approach used by YouTube designers allowed the production of a more well thought out design. The design leveraged two UXD approaches and managed the presentation of culturally-manifest conflicting video formats in a balanced manner given the challenges presented by the limited screen estate and iPhone context in general.

At a time when the iPhone screen real estate was valuable but limited, app designers' use of the horizontal-only video player was considerate of the visibility of surrounding on-screen content. As mentioned, the thumbnails of these apps within 'feeds' conveniently fitted within the vertical screen context. However, this brings into question the design of some apps within the 2016 data that used the square-only aspect ratio which occupies a greater portion of the screen than the horizontal rectangles discussed in this section. The next section investigates why and how some apps have used a 'consistent' square aspect ratio for images, a minority category in direct opposition of the dominant user freedom approach used by most apps as revealed by the

collected 2016 data. The YouNow app introduced earlier uses a ‘hard’ consistency approach. In fact, all the apps in this chapter moving forward also use such an approach. Further, while the apps in the previous section provided video-only content, moving forward the apps are mixed between providing video and photo content.

Part 3

5.5 Squares & Consistency

In this section I show how both Instagram and conflicting iPhone screen standards have played a significant role in the adoption of the square format by other social media apps. Further, I argue that the use of square-only in that context limited designers in their design choices and in maintaining a consistent cross-screen design that could communicate the same emphasis on the visibility of images. This section starts with a historical analysis of the conventions that form the foundation of the square-only design formats used in the apps of this category and then provides an interaction and visual design analysis of the interfaces. This insight reveals an understanding as to why and how the consistency approach was used in the design of these apps.

Table 5	
Entertainment Step D1: Providing only square shaped photos and/or videos	Text-Driven: MyFitnessPal, Moodswing, InstaMine (3)
	Image-Based: Vine, Wishbone (2)

The apps collected under the square rectangles category can be seen in Table 5. These apps were created between 2008 and the early 2010s, a time when the square format was being popularised by apps such as Instagram. In fact, images of a square format have a strong historical grounding, albeit one that is shared with other rectangular formats.

5.5.1 A Shared History: Square & Vertical Rectangles

Unlike film standards, there has historically been no official aspect ratio standard for photographs, and users have been able to capture images through different devices of differing format capabilities, starting as early as the 1800s (Gustavson, 2009, pp. 35, 100, 108, 352). In the 1900s however, square-image producing cameras increased in popularity. Although film theorist S. Eisenstein (1982) in 1930 strongly proposed the use of the 'dynamic' square (pp. 47, 48), highlighting the equal length of its sides (1:1) irrespective of horizontal or vertical orientations (p. 52), the square format was not adopted in the film industry, rather it became popular in photography.

Although the 35mm horizontal/vertical rectangle format had been a dominant design feature in popular cameras in the 1900s, such as the Leica of 1925 (Pritchard, 2014, p. 89), the square format cameras that were designed in that century revolutionised the photography industry. Some of these cameras became known over time as medium-format models and produced $2\frac{1}{2} \times 2\frac{1}{2}$ square images (Gustavson, 2009, p. 286), such as the original Rolleiflex camera of 1929 (N. Smith, 2014) and the innovative Hasselblad 1600F of 1948 (Gustavson, 2009, pp. 285, 286). Kodak also introduced square formats beginning in 1963 through the No. 126 cartridge used in the innovative Instamatic 100 and subsequent camera models (Pritchard, 2014, pp. 168, 169) and the 110 cartridge in 1972 that produced a vertical/horizontal aspect ratio (p. 182). Indeed, under mediamorphosis the vertical/horizontal and square formats have continued to coexist with a shared history.

Edwin Land, owner of Polaroid Corporation, is often credited for the invention of instant photography through his 1948 invention, the Polaroid Land Model 95

(Pritchard, 2014, pp. 142, 143). However, Land's oversized portrait-producing invention was succeeded by the Polaroid SX-70 of 1972 that allowed square photos (p. 187) to pop out of the camera after being shot (without the use of negatives) and instantaneously resolve into colour before the user's eyes (pp. 184, 185). Square film packs were also used in subsequent models (p. 186). Towards the end of the 1970s, more than a billion Polaroids were shot every year, and more than 200 million cameras had been unleashed into the world (Kaps, 2016, p. 105), further establishing the norm of square formats.

While square format cameras were in demand, in parallel, cameras that used horizontal/vertical (35mm film) rectangles, such as the Nikon F series beginning in 1959 (Gustavson, 2009, p. 312), were also being sought by working professionals (p. 325). However, beginning in the late 1970s, such "[c]ameras had become smaller, lighter, cheaper, easier, faster... [i]n a word... smarter" (p. 325) and the horizontal/vertical cameras continued as a dominant feature throughout the 1980s and 1990s (pp. 325-332). The spotlight had moved away from Polaroid and other square format cameras, threatening their legacy.

Polaroid cameras, however, had transformed the market and changed the way people interacted around cameras through their novel immediacy approach of instant physical sharing of photos. Decades later Polaroid's legacy was threatened yet again by the advent of faster digital photo sharing (Kaps, 2016, p. 113) and digital cameras that began to gain popularity in the 1990s and 2000s (Gustavson, 2009, pp. 340-349) that captured photos of horizontal/vertical aspect ratios. However, the photography culture that came through the use of square format cameras inspired designers to bring back the format within a different medium, the mobile phone and its variety of apps.

5.5.2 Instagram Design: From Novelty to Norm

The popularity of the square image format led to its incorporation within iPhone social media apps. Among the first apps to utilise a square-only format was the Hipstamatic app launched in 2009. The app was designed as a metaphor of several old school cameras and produced images that emulated the look and feel of old photographs. In fact, as mentioned in the description of its app-listing today, Hipstamatic was “[t]he inventor of square filtered mobile photos” (Apple, n.d.-e, para. 1). However, Hipstamatic was not a social media app, rather it allowed users to produce photos that could then be shared in social media platforms.

The Instagram app followed in October 2010 (Instagram, 2010) and provided square images as the only image format throughout its early years as a start-up leading up until August 2015 (Instagram, 2015b). Unlike Hipstamatic’s strongly metaphoric camera-like interface, Instagram was a social media interface, with some features that resembled analogue cameras.

Visual and cultural studies scholar Alicia Chester (2018) argues that Instagram designers knowingly refashioned various features of the analogue Polaroid camera in order to imply “instantaneity, sociality, and nostalgia” (p. 10). Simultaneously however, Instagram also benefited economically from the distant yet lingering influence left by the hegemonic networks of the instant photography industry. The word ‘insta’ used in Instagram shows a resemblance to the popular Kodak Instamatic 100 camera of 1963 that also produced square photos through its No. 126 cartridge (Pritchard, 2014, p. 168) and the Pocket Instamatic of the 1970s (p. 182) However, the logo used by Instagram designers emulates the Polaroid brand, specifically the Polaroid OneStep camera of

1977 with its widely recognised rainbow stripes (Chester, 2018, p. 10), the colours of which have been maintained despite a redesign in 2016 (Klara, 2018).

Further, the Instagram design allowed users to alter the colour composition of a regular photo into the old school image style of analogue square-format cameras and then directly post it into a feed. In its early years, the Instagram design was a novelty and this can be attributed in part to the combination of social and square filter features. Some of Instagram's effect filters evoked feelings of nostalgia. For example, Instagram's effect filter "1977" was described by an online media outlet as being "like the pictures your parents took on the beach in the '70s" (Buck, 2012). However, the Instagram designers did more than merely imply immediacy by refashioning analogue cameras. As stated by Chester (2018):

By emulating the look of Polaroid, however nostalgic in appearance, Instagram signalled its intention to fulfil the same social role in the age of digital reproduction that Polaroid did decades previously: to produce instantaneous photos created to share with friends and family (p. 10).

This plan of course served to increase Instagram's popularity and economic standing. By 2012, however, image filters had increased in popularity and were used by several apps. In addition, it was reported that due to the numerous number of apps that provided the square shape, several start-up businesses such as StickyGram and Zazzle were willing to specifically cater for these dimensions by offering printing services ("Camera-phone portraits? There's an app for that," 2012, p. 4). Similarly, the creative platform Blurb aimed to lure Instagram users with its automated and simple integration process which resulted in the production and compilation of enhanced quality photos

into a printable book ("Blurb Enables Instant Instagram Books," 2011). Square shaped online social media photos made their way to the physical world where they originally began, but what did that mean regarding their own tenure in the virtual world of social media?

The popularity of the square format and image filters meant that they could extend beyond their original production as design features present only within image production and social media apps. In June 2013, Apple announced that its upcoming iOS 7 would include among its camera design features the ability to both capture square shaped photos and apply effect filters (Apple, 2013c). This decision by Apple further established the importance of these design features within the market and their position as dominant design features. Utterback (1994) highlights that dominant design-features are originally presented as “unique features in models that preceded the dominant design [but now] these features are implicit in designs that the market expects and that all producers find themselves compelled to emulate... [t]hey are subsumed within the popularly accepted design” (p. 26). The introduction of these Instagram-inspired features made clear that what was once considered unique for Hipstamatic and Instagram (i.e. the square ratio with photo filters) had conveniently reached the very framework that maintained Instagram’s presence, namely the iOS. The popularity of the square format historically through social mediums and its culmination in iOS meant that for many people its use in social media platforms was ‘common sense’, a part of the everyday user experience.

Although Instagram’s square-only approach was part of its design from its inception, the consistency of the square format was removed (Instagram, 2015b) after Facebook’s acquisition of Instagram in 2012 (Facebook, 2012) and users were given the

‘freedom’ to choose to upload images of different aspect ratios. The user freedom approach traditionally used by Facebook designers appeared to have crept into the design of the now Facebook owned Instagram platform. However, the collected 2016 data reveals that in contrast with the dominant user freedom approach a few apps have continued to use the consistency approach of presenting square-only images. The next section outlines when the square-only format was incorporated in their designs and shows some indications of Instagram’s influence on these platforms.

Among the platforms, the first to appear as an app was Vine. The app allowed users to create and upload videos that last up to 6 seconds. It was acquired by Twitter in late 2012 prior to being released to the public (Kafka & Isaac, 2012), and launched on January 24th 2013 (Sippey, 2013). Screenshots of Vine from the App Store in 2013 clearly show that Vine’s square-only format had been a part of the interface from its inception (Apple, n.d.-1). Interestingly, Vine’s square and video-only design made it reminiscent of standard television and its 4:3 ‘academy’ ratio. However, Vine’s feed layout including the square format resembles the Instagram design.

Another square-only app that also launched in 2013 (August) was MoodSwing, a platform designed for users to express and share their life emotions through posts (Apple, n.d.-b). From the beginning, the square format was the main aspect ratio for MoodSwing photos, as shown in a video promotion for the app (Moodswing, 2013). However as indicated by the ‘version history’ link on the App Store website (Apple, n.d.-b), the layout of its UI and feed page were changed in August 2014 to provide more emphasis on photos making it closer in resemblance to Instagram.

The next app from the square-only category was InstaMine, an app introduced in May 2014 for fans of the Minecraft game where users are able to publish Minecraft-related content (Apptopia, n.d.). The use of square-only and the word 'Insta' in its name are some indications of Instagram's influence. Similarly, the photo-comparing app Wishbone appears to go back as early as October the 4th 2014 with screenshots from that early period clearly indicating that the app displayed square image content (Wishbone, 2014) and continued through its success in mid-2015 (Kosoff, 2015b).

The final square-only app MyFitnessPal was a health and nutrition tracking platform. It allowed users to easily log the food that they consume daily. The app was established as a website in 2005, but gained strong momentum only after becoming available for iPhone users in 2009 (Orin, 2014). MyFitnessPal began rolling out the feature that allowed users to upload photos to a feed in January 2016 (Coursey, 2016). Although MyFitnessPal incorporated this feature much later in comparison to Instagram and the rest of the apps in this category, the square feature trend was still being consolidated as a format specifically suitable for social media use.

For instance, the camera company Nikon known for its 35mm film cameras with a horizontal aspect ratio introduced its D850 camera model in 2017 that included the ability to use a 1:1 square ratio with a sales pitch focusing on social media use (Anonymous, 2017). Further, Apple's very own website support section viewed on April 30th 2017 described the square feature as "the optimized photo size for many social media apps" (Apple, n.d.-k, Square section). It is not surprising that the 'common sense' square feature was being adopted and maintained by some app designers for the benefit of their employers. However, unlike the iOS 7 and the many apps that use a

square format, the apps I have introduced in this section use the square format as their ‘only’ aspect ratio for images similar to pre-Facebook Instagram.

As I have argued, Instagram has capitalised on the familiarity and social significance of previous mediums and played a part in influencing the adoption of the square format by many platforms. However, the presence of two conflicting screen aspect ratio standards is another cultural factor that has also played a role in the adoption of the square format, especially since the investigation in this section has revealed that all the apps in this category presented a square-only format at a time when the newer 9:16 screen aspect ratio had already emerged in the market. The next section explores the implications of the square-only approach across both 2:3 and 9:16 standards through an interaction and visual design analysis.

5.5.3 Interaction Design Analysis: From 2:3 to 9:16

As mentioned, it is important to consider both the size of the interface elements as they relate to one another and also different screen sizes in relation to interface elements (Schlatter & Levinson, 2013, pp. 103, 104), such as the spatial relationship between the vertical space of the user-generated content area and the square format within both the 2:3 and 6:19 aspect ratios. Although the 2016 data was collected through the newer 9:16 aspect ratio of the iPhone 6s, many of the iPhones in the market were still older 2:3 screen models. This section shows how the square format of the 2016 apps fit within the 2:3 context by using Instagram as a representative app and at the same time analysing the original Instagram design as it appeared on such screens.

Instagram was launched in October 2010 (Instagram, 2010) when the latest Apple smartphone available, the iPhone 4, came on the market in June 2010 (Apple, 2010b). This means that all the Apple iPhones being used at the time had a screen aspect ratio of 2:3 and square-only images were presented within the confines of those small screens. In fact, Figure 5.31 shows a square photo within an old version of the Instagram app accessed via an old smartphone (the iPhone 4s model) that also uses the 2:3 screen aspect ratio. Therefore, the screenshot in Figure 5.31 is used as a reference for all iPhones prior to the iPhone 5, the first iPhone to use the 9:16 aspect ratio screen.

When a square image is being viewed by a user, as seen in Figure 5.31, it occupies most of the user-generated content-area. The header and bottom menu do occupy some portion of the overall content area, however they are static in their positioning. The square's spatial dominance emphasises its importance in that setting.



Figure 5.31: The Instagram app presenting square content in a feed, seen through an iPhone 4s.

In fact, Norman (2013) points out that the importance of items is understood through a comparison of the items in light of their arrangement and visibility (p. 79). Therefore, the surrounding content within the user-generated content area of Figure 5.31 can be understood to be of lesser importance than the image being viewed. Further, while swiping through the feed, only two photos can be seen at any one time, meaning that parts of both photos are always concealed until a single photo takes over or occupies most of the screen. The consistency approach of the Instagram app at the time appears to have been designed to draw the user's attention primarily to the contents of the image with minimal focus on surrounding content when the image is fully visible. This design approach is interesting particularly because the square format in the 2:3 context seems to somewhat take the role of full screen mode. Unlike the apps from the horizontal rectangles category, such as YouTube, where full screen mode is two taps away from the feed, Instagram's full screen mode is immediately in the feed. In fact, the latter can be said of all the 2016 apps in the square-only category.

In the newer 9:16 context, when the image is being viewed fully, more of the surrounding content is visible than in the 2:3 context, as seen by comparing Vine in Figure 5.32 and Instagram in Figure 5.31. Therefore, it can be understood that in this context the design focus on the full-screen-like image is threatened due to the increased visibility of potentially more engaging surrounding content. This analysis reveals that although the designs provided by designers of the 2016 apps are the same, the conflicting screen standards resulted in unavoidable differences in the presentation of content and an inability for designers to implement a presentation strategy for one screen without influencing the design of the other. Designers needed to design for both screens. This contrasts with Instagram that first used the square-only approach in 2010,

a time when the iPhone 2:3 screen was the only standard. Further, given that a new standard emerged, the decision made by designers of the 2016 apps to use a format not larger than a square meant that they could also accommodate for users of the older 2:3 iPhones by allowing images to be viewed one at a time in their full aspect ratio as opposed to a stream of larger images that appear visually cut-off.

Although the screen and square aspect ratios play a role in the visibility of other on-screen content, so does their organisation and type of content. With this in mind, the next section's visual design analysis shows how designers' decisions have affected the app design in the 9:16 context. These decisions include maintaining the square-only format that accommodates for two conflicting aspect ratios. Further, while designers of some apps from the horizontal category faced video player boxing challenges due to conflicting standards, designers of the square-only apps faced screen-related issues.



Figure 5.32: The Vine app presenting media content in the main feed prior to any interaction with the feed.

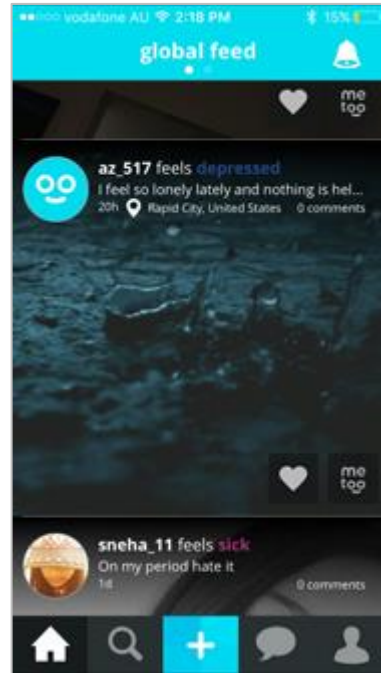


Figure 5.33: MoodSwing presents square format photos within feed areas, allowing surrounding UGC to be seen.

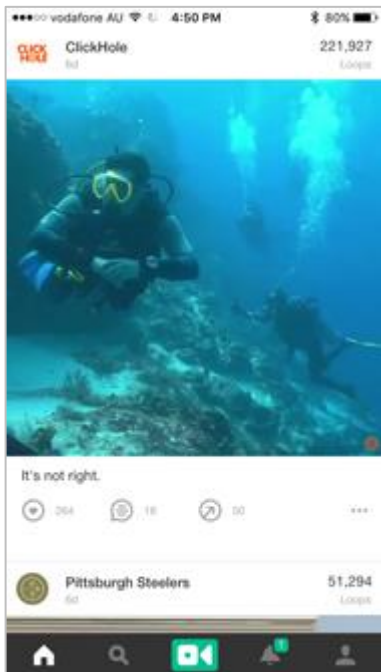


Figure 5.34: The Vine app presenting square format videos within feed areas during browsing.



Figure 5.35: The main feed in the MoodSwing app presents posts of square format photos with text, and text-alone.

5.5.4 Negotiating between Space and Presentation

The new 9:16 standard allowed for more surrounding content to be presented in the screen. Using principles of visual design, this section demonstrates how these apps have managed the spatial presentation of content in light of the valuable yet limited screen real estate. Furthermore, it appears that a tension exists between screen space and image presentation that designers have to contend with in the 9:16 context, as a result of maintaining a ‘common sense’ square-only format. This is exemplified through a case study on the Vine and MoodSwing apps. Digital media designer and teacher Angie Taylor (2011) states that “[t]he space where nothing exists also forms shape” (p. 100), in fact, the way in which space is distributed can and does have an influence on the UX.

Schlatter & Levinson (2013) recommend the use of ‘white space’, defined as “empty areas, whether [they are] spaces between columns, around elements, or bordering the screen itself” (p. 106). They state that these are also interchangeably called ‘margins’ and that the justification for their use is that prior to moving from one UI element to the next white space provides the eye with an area to rest that is “vital to creating designs that feel comfortable and pleasant to use” (p. 106). Further, they add that margins “can make the difference between a comfortable layout and a crowded one” (p. 109). Mobile strategist Morson (2014) also emphasises the importance of the use of negative space for app design, stating that “[i]t allows the eyes to focus on precisely what it needs to” (p. 129). Indeed, designers need to organise the layout of a page in a way that meets their objectives. However, for a layout to be perceived as an

organised form, it is important that designers apply alignment (Schlatter & Levinson, 2013, p. 111).

It is generally the case that the individual elements of a hypermediated post (i.e. the username, square image, image caption, interaction buttons, etc...) are aligned and separated, as seen with Vine (Figure 5.32). The separation in Vine creates a 'pleasant' and 'comfortable' UXD, however by implementing these separations more of the surrounding photo or video contents get pushed further away from the centre of the screen and become less visible. This is noticeable in Figure 5.32 where part of the upcoming post at the bottom of the screen is barely visible, seen as a light grey coloured horizontal line. The MoodSwing app has a very different style of presentation when compared to Vine.

In contrast with the Vine design layout, the MoodSwing design maximises the visibility of its surrounding media content. This is done primarily by overlaying the user-related information and interaction buttons over the square image content, as seen in Figure 5.33. Schlatter & Levinson (2013) state that "anytime an element contains smaller elements, there need to be margins separating the child elements from their parent, as well as from each other" (p. 109). In that regard, the use of margins is indeed preserved between these elements and the square shape that contains them. However, MoodSwing designers maximised the visibility of surrounding content even further by eliminating the margins between the UGC that took on a look similar to photo strips. Although the MoodSwing design maximises the visibility of surrounding content, it lacks in white space. Rather than supporting a layout design that feels more "pleasant and comfortable to use" (p. 106), it supported one that feels more "crowded" (p. 109).

For MoodSwing designers, a crowded layout was the cost of maximising the visibility of surrounding content, conversely for Vine, having less content visible on the screen was the cost for having a pleasant layout to use. However, designers of Vine appear to have acknowledged and addressed this shortcoming. This is implied by designers' utilisation of a feature that hides the header menu after the user scrolls through the feed thereby opening up an additional small portion of the content area for viewing, as can be observed by comparing Figure 5.32 with 5.34. The examples of Vine and MoodSwing employ distinct styles of presentation. Although the apps in the square-only category are closer to the Vine layout design, their designers would have faced a similar challenge of negotiating between space and presentation. However, this is more frequent for apps of the image-based subgenre.

While the image-based apps that use square-only images present UGC consistently throughout the feed, the apps from the text-driven subgenre that use the square-only format provide an inconsistent stream of content. This is because text-driven apps provide users with the added ability to publish text-only posts, exemplified in Figure 5.35, therefore the patterns of UGC that appear in the feed are largely dictated by user behaviour. To this end, image-based apps that use the same aspect ratio for UGC generally provide a more consistent flow of content in the feed. Up until now, a total of six image-based apps have used the consistency approach from both the horizontal and square rectangles categories, double that of the text-driven apps. However, this number also increases significantly when we expand the cohort to include vertical rectangles.

5.6 Vertical Rectangles & Consistency

In this section, I show how the vertical-only apps Musical.ly and Flipagram presented an interaction style that, compared to Snapchat and other apps like it, was more strongly focused on posts and images by presenting them instantly in the feed. This section provides an interaction design analysis of the apps that use the vertical-only format in light of the historical contexts and conventions. This insight reveals an understanding as to why and how the consistency approach was used in the design of the 2016 apps under the vertical-only category.

Cameras that use vertical and horizontal aspect ratios have a history going back as early as the 1800s, beginning with daguerreotype cameras first introduced in 1839 (Gustavson, 2009, pp. 8, 352) that later became popular for portrait photography (pp. 11, 17). The vertical/horizontal format was also popular in the early 1900s through 35mm films (pp. 274, 275, 312) and continued to be a dominant format throughout the 1980s, 1990s (pp. 325-332) and into the age of digital photography (pp. 340-349).

In fact, the vertical/horizontal format was used in all iPhones beginning with the camera of the first iPhone in 2007, and in the first iPhone to have both a front and back camera, the iPhone 4 in 2010. The front camera in the iPhone 4 came with an Apple face-to-face video chat app named FaceTime (Apple, 2010a). However, the front camera also meant that users could immediately view themselves while taking a photo to produce what became commonly known as a selfie. In the years that followed, photo-sharing apps exploited the front camera feature.

Table 6	
Entertainment Step D3: Providing only vertical photos and/or videos of a uniform aspect ratio in each app	Text-Driven: APEX (1)
	Image-Based: Snapchat, Flipagram, musical.ly, Fling, ShotsApp, Beme, Whisper (7)

The apps collected in 2016 under the vertical rectangles category (seen in Table 6) show that contrary to the dominant user freedom approach the vertical format was being used by several apps, the majority of which are image-based. Five of the apps were further consolidating the convention of vertical format photos that had existed for over a century, while six were contributing to the normalisation of the use of vertical video (revealed through Engagement Steps C2 & 4), which had not been a common or popular convention up until the introduction of smartphones in the late 2000s onwards.

The new vertical video format was frowned upon by traditionalists who had their own ‘common sense’ understanding of what a video format entailed or possibly a vested interest in maintaining the status quo. The addition of the vertical aspect ratio for video meant more conflicting standards, as had been cleverly incorporated by YouTube designers earlier. However, despite the format’s contentious position, many apps adopted it, and several used the vertical format as the only format for videos. Although the apps in the vertical format category all use a consistency approach, they vary in their vertical aspect ratios. Some of the app designers went further though, to the extent of presenting full screen images as the only mode of viewing (revealed through

Entertainment Step E3). They include Fling, Snapchat, Flipagram, and Musical.ly. The latter three are taken as case studies throughout this section.

5.6.1 Vertical Video: Snapchat, Flipagram, and Musical.ly

Introduced in September 2011, Snapchat was unique because it allowed users to share photos that only lasted up to 10 seconds before disappearing (Apple, n.d.-i), unlike other apps at the time that permanently stored photos. Importantly though, all Snapchat photos at the time were vertical rectangles because the app's designers only allowed users to publish photos made through the iPhone camera on the spot and not ones created prior. This meant that the vertical content was always freshly created and reminiscent of the immediacy of Land's Polaroid and 'instant photography', though in the case of Snapchat, content that was temporally limited and communicated over distance rather than in a physical form.

By the end of December 2012, Snapchat iOS designers had incorporated the app's first video-capturing ability that too used the vertical orientation (Gallagher, 2012). In fact, other social media apps had also incorporated the vertical-only format for video, such as the Flipagram app introduced in 2013, that allowed users to curate image content and sound into a single video for sharing on social media platforms, however the app later gained popularity and became a social media app with a video duration of 60 seconds rather than the previous 30 seconds (Olanoff, 2015). The similarity between the name of Flipagram and Instagram is not surprising given Instagram's influence at the time, however the original 2013 version of the Flipagram app also used the iconic

Polaroid stripes as its logo and produced square-only videos, as seen in a YouTube demo of the app (J. Jones, 2013).

Unlike other video-playing apps in the early 2010s though, such as YouTube (horizontal) or Vine (Square), designers of the original Flipagram gave video creators the choice to either allow image content to fill the space of the square aspect ratio or for the content to remain in their true aspect ratio within the square frame (Werner, 2014, 0:50-1:17), the latter leading to letterboxing and pillarboxing of image content. In spite of Flipagram's considerate approach, its designers later implemented a design that used the vertical rectangle as the only format for videos.

Unlike Flipagram and its change of direction and Snapchat's delayed video entrance, the Musical.ly app used vertical video from its inception. The app allowed users to immediately record 15-second videos to already existing music, leading many users to perform and lip-sync in front of the camera (Roof, 2016). By providing viewers with such content, Musical.ly capitalises on the social significance as a form of remediation of music videos. This is somewhat similar to what Instagram did with Polaroid and what YouTube did with traditional television, especially by adding the social media and UGC elements. Although music video producers have traditionally used horizontal formats, Musical.ly designers' choice to use the vertical consistency approach shows no allegiance to prior horizontal rectangle standards and strong allegiance to the smartphone medium that came about through a process of mediamorphosis and convergence. This is not surprising given that the app began as a smartphone app, however, so did the majority of apps presented in this chapter. The next section explores the implications of the vertical-only approach in comparison to others, amid conflicting standards.

5.6.2 Interaction Design: Snapchat

The interaction style of the Snapchat app in 2016 was somewhat similar to the apps from the horizontal rectangles category, such as YouTube, in that users were presented with thumbnails prior to accessing the full image. However, unlike the rectangular and horizontal thumbnails of the horizontal category apps that seemed considerate of the limited screen real estate, Snapchat presented circular much smaller thumbnails in list format, as seen in Figure 5.36. Although the list structure in Snapchat’s feed page is understandably designed based on a ‘contact list’ format, nonetheless, the list format used by its designers was considerate of the limited screen real estate.

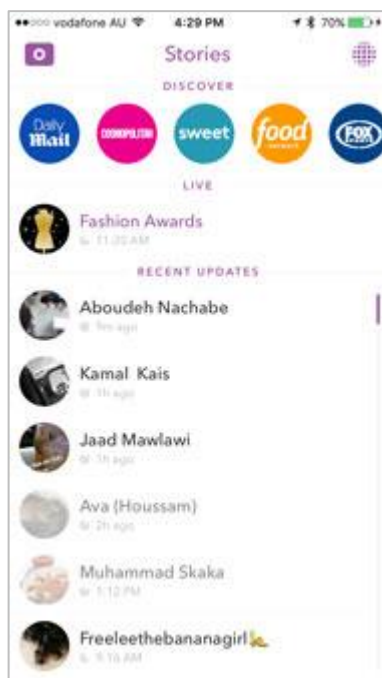


Figure 5.36: Screenshot of Snapchat’s feed or ‘Stories’ page.

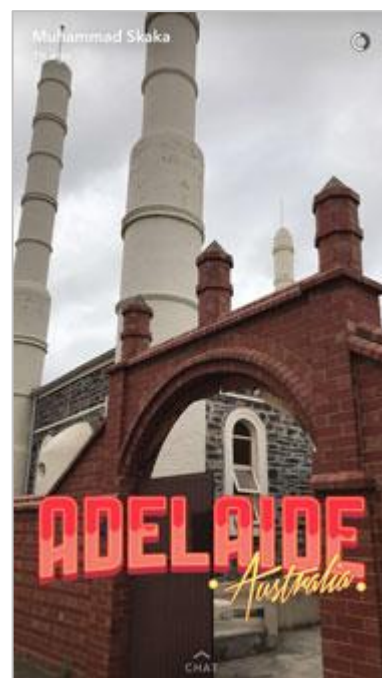


Figure 5.37: Screenshot of a 10 second Snapchat post accessed from the feed page.

The miniature size of Snapchat’s circular thumbnail is generously balanced out by the vertical image format that is not only vertical but also full screen, as seen in

Figure 5.37. The jump to full screen in Snapchat is more immediate than the design of the apps that use horizontal rectangles where an intermediary step (video player page) between thumbnails and full screen mode is used. Further, the consistency approach used by Snapchat designers and others results in inconsistencies. While boxing occurs in some of the apps of the horizontal rectangles category when conflicting standards are used together, capturing a Snapchat photo on the 16:9 iPhones leads to a visually cut-off photo when viewed on a 2:3 iPhone. This also applies to other apps from the vertical-only category.

5.6.3 Interaction Design: Flipagram & Musical.ly

The interaction styles of the feed within the commodity-form of both Musical.ly and Flipagram are very similar. Although all the case study apps provide full screen as the default format, Flipagram and Musical.ly differ from Snapchat in that their images are immediately within the feed (Figures 5.39 & 5.40) without using any intermediary thumbnail step, or in the case of YouTube, without needing two preceding steps.

However, Musical.ly and Flipagram's full screen images are noticeably hypermediated with an overlay of buttons and functionalities, which contrasts strongly with YouTube where full screen hypermediacy depends on the contents of the video or film section being viewed. In fact, Musical.ly and Flipagram's hypermediated designs resemble MoodSwing's overlay layout style that appeared more in line with a 'crowded' rather than 'comfortable' design (Schlatter & Levinson, 2013, p. 109). However, the immediacy of images being accessible in their full aspect ratio directly

from a feed is a shared feature between Musical.ly, Flipagram, and all the apps from the square format category including Vine.

Despite these commonalities, the interaction style of Musical.ly and Flipagram is distinct from the square-only apps. In the square-only context there was tension in the designs, where designers needed to negotiate between image presentation and the space made available to surrounding content across two conflicting standards. However, the full screen vertical-only approach used by Musical.ly and Flipagram designers ensured that no surrounding posts would appear because the focus in the feed was on one piece of full screen video content at a time. This was reinforced in the navigation interaction design. After a user swipes up or down the screen locks in the next post within about a second and continues to act in that manner upon each swipe, as seen mid-swipe in Figure 5.41. This interaction style resembles using a TV remote to switch up and down between channels. In fact, this interaction style was also used throughout these interfaces even in non-feed pages as seen in Figures 5.38 and 5.43, even after being accessed through a vertical thumbnail (Figure 5.42).



Figure 5.38: Screenshot of a Flipagram post accessed through a 'profile' page.

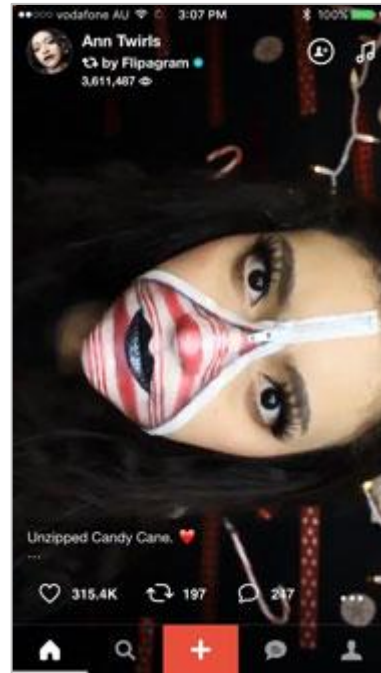


Figure 5.39: Screenshot of a Flipagram post accessed from the feed or 'home' page.



Figure 5.40: Screenshot of a Musical.ly post accessed from the feed or 'home' page.



Figure 5.41: Screenshot of the transition between Musical.ly posts in the feed page, achieved via swiping up or down.

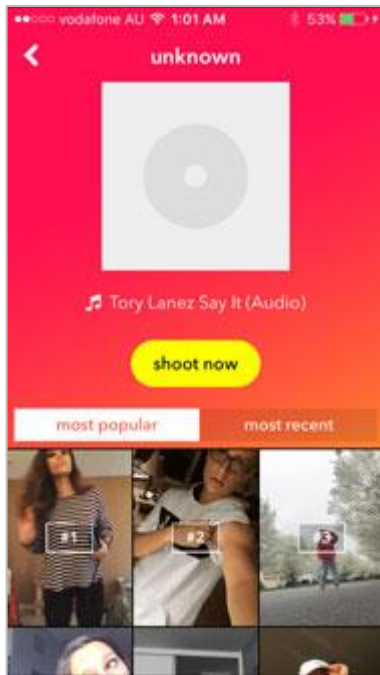


Figure 5.42: Screenshot of an audio track page in the Musical.ly app, with post thumbnails of the track’s most popular performers at the bottom.

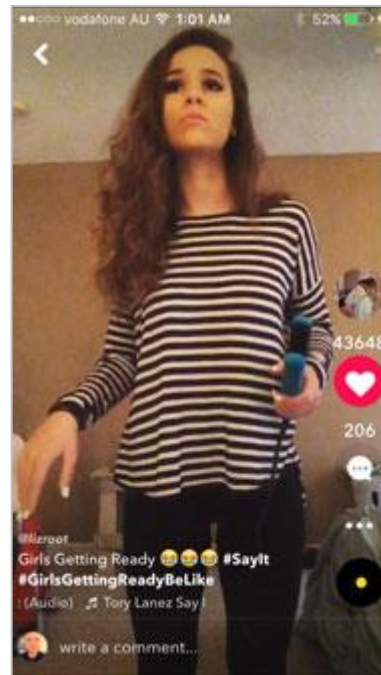


Figure 5.43: Screenshot of a Musical.ly post accessed from the audio track page seen in Figure 5.42.

5.7 Conclusion

Social media companies use UXD strategies to try and provide users with a good UX despite the array of conflicting standards. While this appears to have good merit, companies use these strategies to further their economic interests and maintain hegemonic power through ‘common sense’ ideas about what good design is. The user freedom approach grasped as ‘common sense’ by designers and users is used in the majority of the collected 2016 apps, while designers of minority apps have used a ‘common sense’ consistency approach ranging across horizontal, vertical, and square formats for image presentation within the vertical iPhone context. App designers of the

three categories have built on already established conventions and capitalised on the social significance of previous mediums. YouTube built on television that built on film, square-only apps built on Instagram that built on Polaroid, while Snapchat built on historical photography conventions.

While this cross-medium consistency meant that newer designs remained familiar and therefore were quicker and easier to use, the consistency of using only a single aspect ratio for UGC per app meant that the vertical smartphone medium would pose designers with challenges. However, it was not just the vertical smartphone context, but generally, conflicting standards that emerged through culturally-driven processes. For instance, YouTube designers had to contend with boxing due to conflicting image standards and managing the presentation of vertical formats within its horizontal rectangle video player while being mindful of the visibility of surrounding content dictated by the iPhone screen restrictions. The consistency of square-only apps meant that boxing was largely not an issue, although the two conflicting screen aspect ratios limited designers in their design choices and in maintaining a consistent cross-screen design that could communicate the same emphasis on the visibility of images. While the UXD approach of app designers of horizontal and square category apps did capitalise on familiarity, this was met with design issues due to conflicting standards.

Although the designs all have different trade-offs and the vertical-only format design does get impacted by the conflicting screen standards, apps that used long, full-screen aspect ratios were met with less friction due to the closer consistency between them and the vertical orientation of the iPhone. However, although photographs had a long history of being vertical, video did not, but in the case of app designs, the use of vertical video followed the same benefits and drawbacks as its photo counterpart.

From a UXD perspective, designers mostly aim to provide the design elements that support achieving a positive, quick, and easy interaction with a product and its features. An ideal situation may be the use of a single aspect ratio for images that matches the screen consistently on every device, but that is far from reality. Designers have used a consistency approach as a way to bring order into an interface. However, their designs are met with tension due to conflicting standards that are formed under a process of mediamorphosis and hegemonic pursuits that get in the way of achieving consistency. Conflicting standards are even found in navigational patterns, as explored in the next chapter.

Chapter 6 - The Intersection of Primary

Navigation Designs

This chapter explores the navigational design standards afforded by social media apps of hegemonic networks, especially in relation to elements of primary navigation. It is understood in UXD practice that an interface design is well-thought of when it helps users rapidly gain comfort and familiarity with a system's operations, including navigation (Cooper et al., 2014, p. 245). Having a consistent and familiar design standard supports achieving this UXD ideal. In fact, Norman (2010) highlights that the QWERTY and AZERTY keyboard designs are not optimal but have become world standards, emphasising that “standards are more important than optimization” (p. 10). However, while standardisation is indeed important, conflicting standards can be seen as getting in the way of achieving a consistently familiar design. Conflicting navigational standards may negatively impact the experience of users who have already been accustomed to a certain navigational standard, and may challenge the objectives of platform owners who care about maintaining a consistent UXD in order to satisfy a larger user base. This chapter provides an understanding in relation to the intersectionality of conflicting navigational standards as they appear in the designs of apps. It focuses on YouTube and the parent iOS platform, using the theories of remediation and dominant design with an understanding of critical-cultural perspectives that include hegemony and the creation of a ‘common sense’ understanding about navigational design features.

The first section introduces some of the navigational elements used by designers of the Apple iOS platform and those of competitor platforms while identifying the Tab bar as a primary navigational element. Further, it reveals the apps within the Apple App Store that have gone against the standard encouraged by Apple, before analysing the historical conventions from which these standards are built and from where a sense of familiarity is derived. The third section of the chapter shows why the YouTube design goes against the dominant Apple menu design standard and how by doing so the YouTube UXD benefits its users. The YouTube design capitalises on historical conventions while maintaining a consistent design for its users, thereby catering to a diverse user range. In addition, it caters to users of different experience levels and provides a flexible navigation system that can be used by diverse users.

6.1 Identifying Navigational Elements

There are different navigation elements used throughout the interfaces of social media apps. This section presents the type of menus usually found within what I term ‘main feed’ pages. Although there may be different feed pages within an interface, the ones I focus on are ‘home’ or landing pages. For example, Twitter uses the term ‘home’ page for the first page that appears after logging into a Twitter (n.d.) account, and that page is also the timeline or feed page, seen in Figure 6.1. However, page names across apps differ, for example Facebook refers to the ‘home’ page as the ‘News Feed’ (Facebook, n.d.-a). To maintain terminological consistency and differentiate these ‘home’ pages from other feed pages in an app, the term ‘main feed’ page will be used.



Figure 6.1: This image shows the ‘main feed’/home page of the Twitter app that contains a Nav bar at the top and Tab bar at the bottom.



Figure 6.2: This image shows the Twitter app after the ‘create a post’ button is pushed. The new page covers the previous page entirely.

During the ‘move’ scheme formation process, the top and bottom sections of the screen were identified as main areas where ‘main feed’ page menus are present and through which different sections of the interface are accessible. Indeed, these are common locations for menu *bars* (Cooper et al., 2014, p. 529). The two areas are home for several types of navigational design elements. This chapter focuses mainly on the primary navigational elements usually found in ‘main feed’ pages. Cooper et al. (2014) state that:

Since the early days of the commercial web, the term *primary navigation* has signified how the user gets to the major areas or sections of a website or application (p. 572).

At the time of the data collection, the main focus was on identifying primary navigational elements and their locations. The elements were identified as being mainly the Tab bar. However, any other navigational elements that fit the description of a primary menu are also referred to in this chapter as ‘main menus’, and all other menus are referred to as ‘additional menus’. An example of the latter would be a single floating button for creating posts that is usually circular, or menus such as the navigation, or ‘Nav’ bar. It is important to explore the differences between some of these app menus and ‘main menus’ in order to gain a better understanding of the function of primary menus.

The Nav bar allows users to navigate interface hierarchies and is usually located horizontally at the top of the screen in iPhone apps. Nav bars frequently include “function menus or buttons” (Cooper et al., 2014, p. 532) such as a ‘back’ or ‘create a post’ button, the latter can be seen on the top far right corner of the Twitter app (Figure 6.1). When the ‘create a post’ page is launched in Twitter, it appears in the form of a ‘dialog’. A ‘dialog’ is a pop-up laid over the main window that engages the user in a specific task. The user is able to leave the pop-up window and return to the main window either by completing the required task or exiting the pop-up window (Cooper et al., 2014, p. 625), as seen in Figure 6.2. The Apple (n.d.-h) website in 2016 used the term ‘modal view’ for these kind of temporary interactions, emphasising that while they can help the user focus on one activity only, they also isolate them from the rest of the interface. This aspect of Nav bars makes them less fitting of a primary menu status.

Similarly, hegemonic Apple competitors Google (owning Android phones) and Microsoft (owning Windows Phone) also use a Nav bar, though Android developers have termed it the Action bar (Cooper et al., 2014, p. 532). The iPhone Nav bar standard

conflicts with that of Android and Windows Phone. Unlike the Apple standard where Nav bars are situated horizontally at the top of the screen, the Nav bars of Android and Windows Phone are located at the bottom of the screen, as seen comparatively in Figure 6.3. Although the location of the Nav bar differs between Apple and its competitors, it functions in a somewhat similar way. However, the Nav bar is not the only navigational design standard that conflicts within these interfaces.

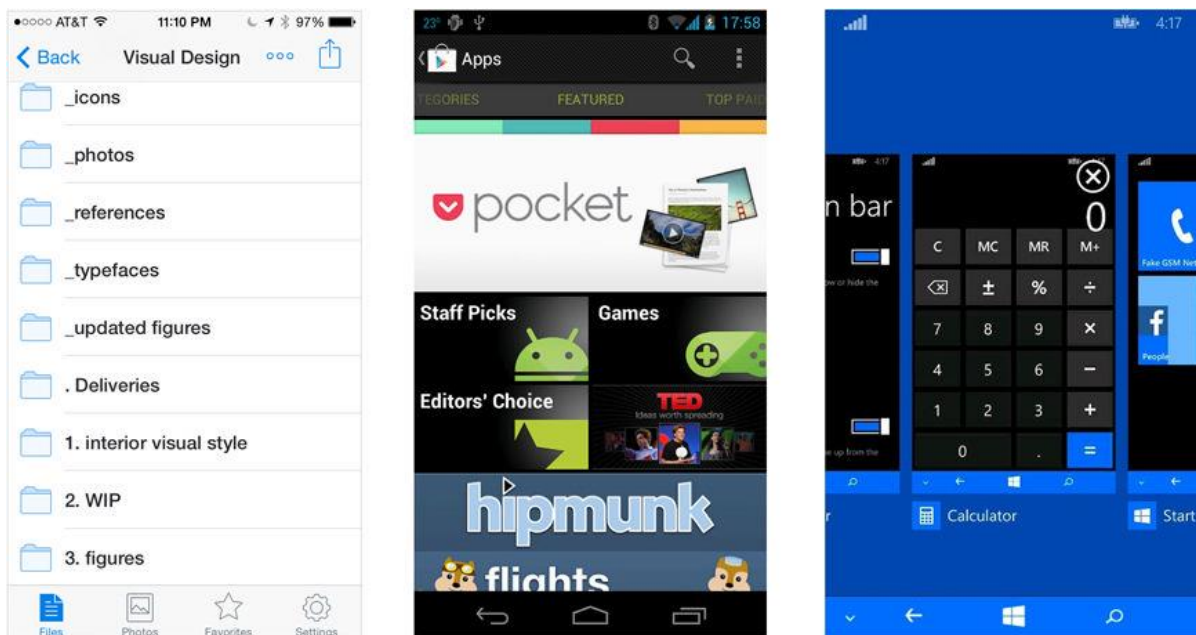


Figure 6.3: These screenshots show the Nav bar when viewed from iOS, Android, and Windows Phone, from left to right (Cooper et al., 2014, p. 532).

The Tab bar is another essential navigational element within iPhones. It consists of different tabs lined up together horizontally, as seen in the bottom of Figure 6.1. In fact, the bottom sections of Apple screens is where Tab bars are frequently discovered (Cooper et al., 2014, p. 529). Based on the Apple (n.d.-c) website in 2016, it was advised to “[u]se a tab bar to give users... different subtasks related to the overall function of your app” (Tab Bar section, para. 3), much like a primary menu. In addition:

In general, [to] use a tab bar to organize information at the app level. A tab bar is well suited for use in the main app view because it's a good way to flatten your information hierarchy and provide access to several peer information categories or modes at one time (Apple, n.d.-c).

Indeed, Tab bars are set up by designers to provide users with an overview of core areas, and do not usually contain the 'function' features that are found in Nav bars. In addition, Apple (n.d.-c) does not encourage the use of a 'modal view' for Tab bar buttons. The Tab bar usually remains fixed as the user navigates through its pages, meaning that only the content above or below the Tab bar changes. This can be seen via a cross comparison between Figures 6.4 & 6.5.



Figure 6.4: The home page of the LinkedIn app as indicated by the blue house symbol on the bottom far left of the fixed Tab bar.



Figure 6.5: The profile page in the LinkedIn app as indicated by the circular blue symbol on the bottom far right of the fixed Tab bar.

The Apple (n.d.-j) website today acknowledges that Tab bars allow users to “switch quickly” (para. 1) between different interface areas. Indeed, unlike Nav bars, the consistent visibility of Tab bars during interaction assists in navigating quicker, which is supported by user feedback. Constant feedback regarding a user’s location within an interface is important and can be achieved by giving feedback visually through navigational elements (Cooper et al., 2014, p. 575). This can be seen via a cross comparison of Figures 6.4 & 6.5, where the currently active page is indicated via a blue highlighted symbol in its menu tab.

The Tab bars of Apple competitors Google and Microsoft function in a similar fashion. However, they present a Tab bar standard that is different from Apple. Most notably, the Tab bars of Android and Windows Phone are located at the top of the screen, instead of at the bottom as seen comparatively in Figure 6.6.

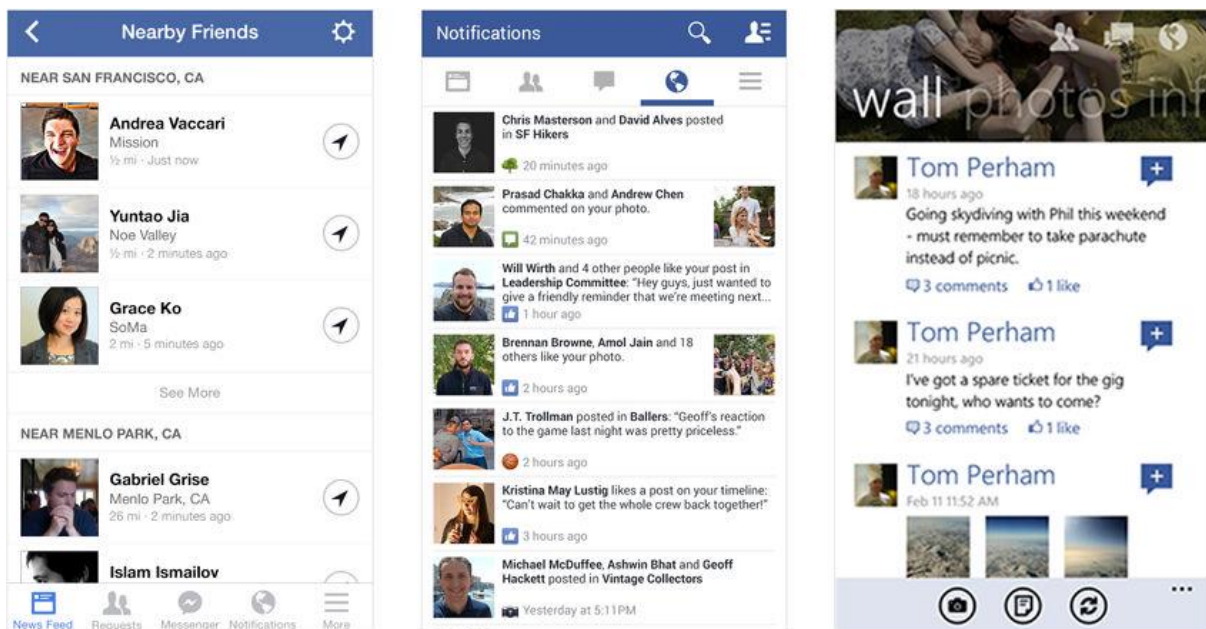


Figure 6.6: These screenshots show the Tab bar when viewed from iOS, Android, and Windows Phone, from left to right (Cooper et al., 2014, p. 529).

However, Apple Tab bars are not found at the bottom of the screen due to happenstance; they are encouraged directly by Apple on their website. The first paragraph on the Apple (n.d.-j) Tab Bar page leads with “A tab bar appears at the bottom of an app screen...” (para. 1). In fact, the data reveals that the overwhelming majority of apps do utilise a ‘main menu’ at the bottom of the interface as seen in Table 1, all of which are Tab bars.

Table 1	
Navigation Step A1: Presenting a horizontal bottom main menu bar or symbols which may be action driven	Text-Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, YikYak, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, InstaMine, SixString, Scutify, tsu, Reddit (28)
	Image-Based: Instagram, Flipagram, Pinterest, Vimeo, Vine, musical.ly, Flickr, WeHeartIt, Keek, Periscope, GifBoom, Boomcast, Camera360, Magisto, WedPics, Fling, Whisper, WeddingParty, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, 9GAG (25)

However, the dichotomous top and bottom sections of the screen are not individually exclusive to Tab bars. As the data reveals, contrary to Apple’s efforts in encouraging designers to locate the Tab bar at the bottom, some app designers have gone against Apple’s established convention by providing a top section Tab bar or ‘main menu’, as seen in Table 2.

Table 2	
Navigation Step A2: Presenting a horizontal header main menu bar or symbols which may be action driven	Text-Driven: Hike, VirtualSpace (2)
	Image-Based: Snapchat, YouTube, YouNow, BeFunky, beme (5)

Interestingly, some of the apps from this category that use a Tab bar are prominent, such as YouTube and Snapchat, Figures 6.7 and 6.8 respectively. A different example is the VirtualSpace app that provides an expandable type of menu usually referred to as drawer or hamburger menu (Cooper et al., 2014, p. 535) and is accessible from a top bar, as seen in Figure 6.9.

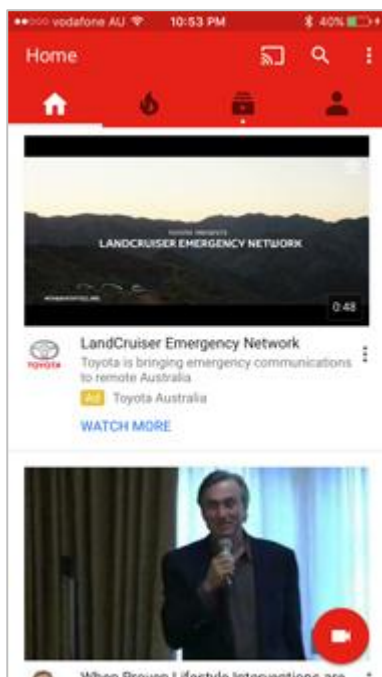


Figure 6.7: The YouTube app contains a Tab bar at the top of its iOS interface.

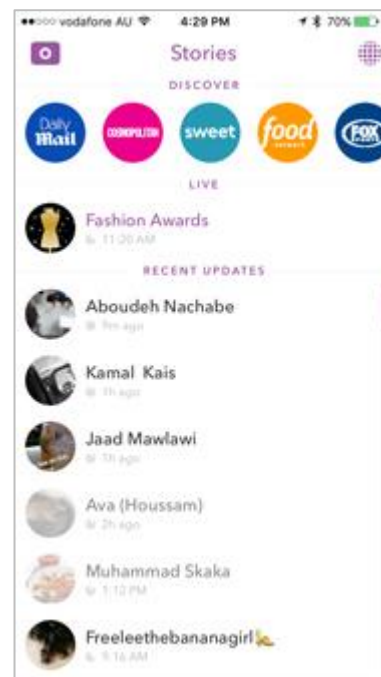


Figure 6.8: The Snapchat app contains a 'main menu' at the top of its iOS interface.

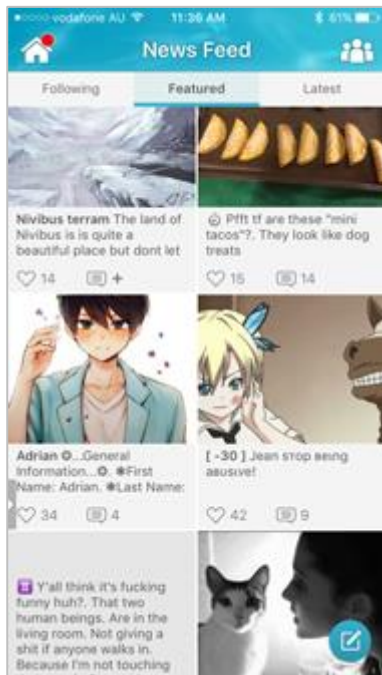


Figure 6.9: The VirtualSpace app menu is accessible from the house symbol/button at the far left-hand side of the top bar. The button expands a vertical list-menu sliding from the left.

While these examples show a broad view of what was happening in app design at the time, this study focuses on the YouTube Tab bar as a case study and finds that its design follows the standard used in the Android and Windows Phone operating systems despite being presented in an iOS context. The presence of these conflicting standards is an important issue, especially since different commercial companies choose to utilise one UXD pattern over others for their own benefit. The next section explores the historical standards of navigational elements found in smartphones today to reveal how the conflicting designs have capitalised on familiar desktop patterns.

6.2 Familiar OS Navigation Elements & Bars

The design of commercial desktop typewriters throughout history generally consisted of keys located underneath a produced-content area. This can be seen in the designs of early manufactured typewriters such as the Underwood No. 1 in 1897 (Richards, 1964, pp. 35, 36). The QWERTY layout of typewriters has been almost identically remediated in computer keyboards and, via association, so is the bottom location of the keyboard menu. However, in comparison to the early typewriters, the computer keyboard's smaller, mostly electronic rather than mechanical, inner-workings allowed it to lay even flatter on the surface of a computer desk alongside a computer mouse. The mouse sat on a bottom surface which "minimiz[es] hand fatigue" (Shneiderman et al., 2018, p. 350). Indeed, the location of these devices follows an ergonomic rationale and also highlights a tradition where primary navigation and input devices have been located at the bottom of a computer interface while undergoing a process of mediamorphosis.

This tradition also extends to on-screen navigational elements where some menu bars within the GUI itself appear to build from that same notion of menus laying at the bottom, underneath a visible and produced-content area, as this section shows. However, other navigational elements in different locations also build on their own respective traditions, such as desktop icons and pull-down menus seen in early Apple computers.

The Apple Lisa and Macintosh PCs were introduced in the early to mid-1980s and were the first Apple computers with a GUI. The desktop of the Apple Lisa interface consisted of icons and folders (Perkins et al., 1997, p. 42) and these were the primary means by which users navigated the interface (pp. 52, 53). Although both computers

had an intuitive GUI, the design did not include a bottom menu. In fact, the Apple Lisa used pull-down menus for programs or applications which were accessed via a horizontal menu bar located at the top of the desktop page (pp. 42, 46). Importantly, the top menus were not for navigation between different areas of the operating system, rather they were program specific and changed depending on which program was currently active. Similarly, Windows 1.0 released in August 1985, possessed a top section pull-down menu (Cohen, n.d.-a). In fact, top menu bars with pull-down menus have remained a desktop standard within both operating systems till today (Apple, n.d.-g; Cooper et al., 2014, p. 448). However, unlike Apple's early PCs, Windows 1.0 also had a bottom horizontal menu bar that was reserved for minimised applications, where the user could switch between different applications/areas (Cohen, n.d.-a). However, this feature was discontinued but reintroduced ten years later (Cohen, n.d.-b). In fact, bottom menu bars became consolidated in the following decades as a popular and dominant design standard, alongside desktop icons in both Apple and Microsoft systems.

The 1995 Windows operating system, Windows 95, allowed its users to add program and folder shortcuts/icons to its desktop for quick access to different interface areas. Windows 95 included the pre-set icons 'My Computer' and 'Recycle Bin' (Cohen, n.d.-b), which like all desktop icons launched an active window upon initiation. However, as Cooper et al. (2014) point out, overlapping windows can lead to confusion and are "somewhat impractical without the addition of other idioms to aid navigation between multiple applications and documents" (p. 439). While the Apple Lisa design suffered from this issue, Microsoft designers avoided this problem in Windows 95 by reintroducing a bottom-located bar, named the Taskbar (Cooper et al., 2014, p. 439).

The Taskbar design allowed users to minimise programs into visible tabs within the bar, functioning similar to a shortcut. The Taskbar and traditional bottom-section menus generally are similar to the Tab bar used in iOS due to their location, fixed horizontal bar visibility, and the versatility of design that allows users to quickly switch between different tabs. The Taskbar design also provided system information on the far right and access to shortcuts for all programs via a ‘Start’ menu on the far left side (Cohen, n.d.-b). Indeed the ‘Start’ menu also provides users with quick access to different areas of the interface. Further, in Windows 98 designers incorporated Quick Launch, a visible toolbar inside the Taskbar next to the Start menu dedicated for placing shortcuts to frequently used icons, though Quick Launch already came pre-loaded with useful shortcuts (Boyce, 1998, p. 38). After the release of Windows 95, Apple designers incorporated shortcut features into the design of subsequent operating systems.

Apple’s System 7.5.3, released in January 1996 (Pogue & Schorr, 1999, p. 304), included a horizontal menu bar called the Control Strip with a sequence of tiles that was located on the bottom left side of the interface. The Control Strip presented users with a list of control options that appeared upwards as a small pop-up initiated via the mouse (p. 154). Although the Control Strip was only available for Apple’s PowerBooks 500 computer series (p. 307) through earlier operating systems (p. 305), by System 7.5.3 it was available for users of all PowerBook models and also all Macs (p. 312).

Mac writers and experts Pogue and Schorr (1999) state that the Control Strip was “one of the most important and useful features ever added to the Mac. Over the course of your computing career, it can save you thousands of trips to your control panels to change everyday settings” (p. 154). In fact, a user could even customise the Control Strip by adding and removing tiles with a few steps (p. 157), similar to the

Quick Launch feature of Windows 98. Control Strip was a popular feature and remained at the bottom of subsequent operating systems such as the Mac OS 8 (p. 154).

However, by 1996 Apple's CEO was in desperate need for change which led to the purchase of computer and software company NeXT in 1997 (Steidler-Dennison, 2009, p. 10). Design features present in the NeXTStep operating system were ported straight into Apple's new operating system Mac OS X, including the Dock menu and Finder browser view (Steidler-Dennison, 2009, p. 11). The Dock menu, as described in its 1999 patent is able to "provide greater access and consolidation to frequently used items in the graphical user interface" (Ording et al., 2008, p. I), by adding or removing icons from the docking bar (p. 4).

The horizontal and bottom-located Dock menu appeared in Apple's latest and most powerful operating system, the Mac OS X in March 2001 (Apple, 2001). More than 15 years later, the Dock remains part of Apple's operating system, functioning in largely the same way (Apple, n.d.-d; W. Wang, 2016, p. 40). Similar to the Windows Taskbar, the Dock menu is essentially a group of shortcuts that save the user from having to go through several steps in order to activate a program (W. Wang, 2016, p. 127) or reach an area of the interface (p. 133). In fact, the Dock even contains Finder, a program that helps list and locate applications (p. 37), somewhat similar to the Windows Start menu. Furthermore, although the location of the Dock can be customised to sit vertically on either right or left side of the screen, its default location is always at the bottom (p. 128).

As shown in this section, the development of bottom-located menu bars has been associated with designing visible shortcuts on the main/landing pages (i.e. desktops) of

operating systems. This was also the case in the design of the first iPhone (Apple, 2007a). The icons of apps presented in the iPhone refashion the style of desktop icons developed in early PCs as seen in the Apple Lisa. The iOS app icons were located based on a grid system where every four app icons occupied a row on the home screen. However, while the user could swipe the top rows left and right as a unit (Cooper et al., 2014, p. 520), the very bottom row was designed in a fixed position, remediating the function of the Dock menu found in Mac operating systems not only in location but also by allowing the replacement of apps with ones more frequently used. Although Tab bars found in social media apps have traditionally been pre-set by designers, they function in a similar manner, by keeping tabs visible to the user on tab pages including ‘main feed’ pages.

Earlier I mentioned that pull-down menus are a standard in desktop applications. However, when desktop applications are being used, the Taskbar and Dock menus with their OS-related functions usually remain visible at the bottom of the screen. Similarly this occurs in Android smartphones, where an Action bar with OS out-of-app functions remains present at the bottom during app use, despite the presence of a top-section tab bar (Cooper et al., 2014, p. 529). In Apple’s iOS, social media applications are also programs within an operating system, but when they are launched, they occupy the entire screen, making iOS-related controls completely hidden. Therefore, it is interesting that despite being programs within an operating system, the Tab bar in iPhone social media apps refashions the style and visibility of the Dock menu found in the desktop operating system. This is somewhat similar to how the bottom menu in iOS remediates the Dock menu. Indeed, the bottom-located Tab bar incorporated by Apple designers in social media apps and encouraged by Apple is a continuation of a

tradition/standard that is historically well grounded. It is also a reflection of the ‘common sense’ ideas that its designers and users accept about primary navigation, which give power to Apple and its self-benefitting ideologies.

Norman (2013) points out that “[o]nce a standard is in place, the vested interests of existing practices impede change” (p. 278). However, as this section alludes, the use of a top-located Tab bar by YouTube goes against the already established standard that Apple and others have been consolidating for years. The next section shows how the YouTube design benefits its users by refusing to follow the native iOS standard, beginning with how YouTube capitalises on a different historical convention in order to maintain consistency.

6.3 YouTube & Users

Historically programs or applications within the operating system of both Windows and Apple have utilised a top menu bar with a pull-down menu as seen with the Apple Lisa and Windows 1.0 (Cohen, n.d.-a; Perkins et al., 1997, pp. 42, 46) and this has remained as such till today (Apple, n.d.-g; Cooper et al., 2014, p. 448). However, these designs are different from the top menu YouTube app design in that they generally do not allow the user to navigate different areas of an interface. In fact, although YouTube is an app, it also belongs to the web tradition where it had originated as a website. Throughout commercial web history, websites and applications have typically included “persistent links along the top or left side” (Cooper et al., 2014, p. 572) that represented the primary means of navigation. Indeed, the menu bar within the YouTube website has

historically been located at the top with some later changes to also include a left menu, as seen in Figure 6.10 from 2016.

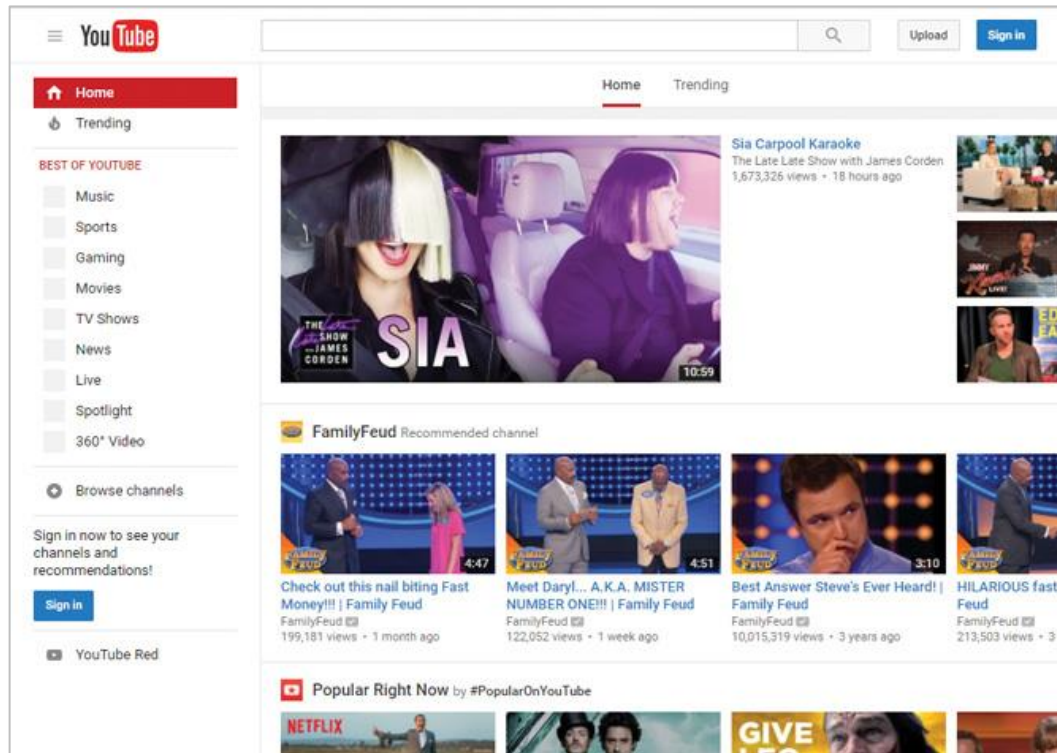


Figure 6.10: Partial screenshot of the YouTube desktop site from February 2016 showing top and left side menus. The fixed top menu includes two tab categories in the centre, Home and Trending. Further, in the top left corner is a ‘hamburger’ menu that controls the visibility of the left side menu (YouTube, 2016).

In light of this information, it can be understood that the top-located Tab bar used by designers in the YouTube app refashions the header menu of its website. Interestingly, this cannot be said of the Snapchat app which began originally as a smartphone app and not a desktop website. However, YouTube designers have gone against the standard that Apple encourages, by capitalising on an established convention that is the ‘common sense’ understanding of web users and YouTube designers. This was done in order to maintain consistency across YouTube’s platforms, which include the YouTube website, the app in Apple’s iOS, and other platforms. Indeed, the YouTube design also appears in line with iPhone competitors Android and Windows Phone, which is not surprising given that Google owns both YouTube and Android. This shows that while Apple is trying to maintain its own standard, so too is YouTube.

However, since Apple iOS users are accustomed to a certain app convention, this raises the question of why the standard most familiar to Apple users is not found in the design of the iOS YouTube app. It is in the best interest of both Apple and YouTube to provide their users with a design that is familiar in their platforms for a better UX and brand consistency. Ultimately however, it is to serve their own economic interests by propagating their own ‘common sense’ design ideologies that secure their hegemonic power through the consent of users. However, having conflicting design standards means that some users are presented with a less familiar standard. This goes against an important principle in UXD about catering to a diverse user range. Indeed, Shneiderman et al. (2018) state that “addressing the needs of all users [is] the ultimate goal” (p. 58). However, scholars recognize that there is no average size that fits all users and that dealing with diverse user needs is inevitable (Cooper et al., 2014, p. 63; Geisler, 2013, p. 20; Norman, 2013, p. 243; Shneiderman et al., 2018, p. 58).

Understanding why the UXD of conflicting standards can exist in relation to how these standards cater to diverse users, is revealed when I show how the YouTube design benefits its users by capitalising on some established conventions and by not following the native iOS standard. It begins by showing how YouTube uses a top-section Tab bar design in order to maintain consistency for a diverse user range, preceded with a select literature on catering to diverse users. The section then presents a select literature on catering to users of different experience levels and shows how this is achieved in the YouTube Tab bar design. Finally, the section shows the flexibility of this design, in terms of visibility and control, in comparison to other apps that have followed the Apple recommendation.

6.3.1 Diverse Users

The UXD literature echoes the idea that the design of interfaces should target specific types of users while also operating on different levels that cater for other types of users. The concept of individuals as ‘personas’ introduced by Alan Cooper in 1998 reflects this idea (Cooper, 2004; Cooper et al., 2014, p. 93). Cooper et al. (2014) state that personas are built in order to inform the design of a product and are defined as “*composite archetypes based on behavior patterns uncovered during the course of [research]*” (p. 62), emphasising that personas are not based on stereotypes and generalisations. They argue that the solution to catering for a diverse range of users is not achieved through broadening the functionality of a product as much as possible, rather it is through employing a design aimed at “*specific types of individuals [personas] with specific needs*” (p. 62). They explain that the result of trying to design a car that

satisfies every driver will only end up pleasing nobody with its various features. On the other hand:

By designing different cars for different people with different specific goals, we can create designs that other people with needs similar to our target drivers also find satisfying. The same holds true for the design of digital products and software. (p. 63).

The assumption that designers would need to broaden the functionality of a product to its farthest limits in order to please users is also opposed by Zappen who refers to it as an “impossible ideal” (Geisler, 2013, p. 20). Zappen advocates providing users with a variety of options and emphasises that designers need to recognise when it is required to develop differential experiences, even if it means providing different groups of people with different interfaces or systems. He adds however, that when different users operate such interfaces in different contexts their experiences might also differ (Geisler, 2013, pp. 22, 25, 26). Indeed, there are many variables that can come into play. Shneiderman et al. (2018) state that designers can expect typical personas such as doctors or storekeepers to possess “various combinations of knowledge and usage patterns” (p. 88) when it comes to technology. This adds to the complexity of designing for even a single type of persona.

A different point of view, opposed by Shneiderman et al. (2018), is that in order to cater for a diverse user range designers need to reduce the interface design to the lowest level of difficulty. However, Shneiderman and his peers argue that in their experience the approach which is often better-yielding for all users is to reconsider how

the interface design can work in different situations (p. 59). They provide an example similar to that of Cooper et al. (2014, p. 63), explaining that:

Measures to accommodate the special needs of one group, such as curb cuts in sidewalks for wheelchair users, often have payoffs for many groups, such as parents with baby strollers, skateboard riders, travellers with wheeled luggage, and delivery people with handcarts (Shneiderman et al., 2018, p. 59).

In a somewhat similar manner, YouTube designers maintain a familiar standard for a diverse user range coming from different platforms. As discussed, for instance, the top-section menu bar design across different YouTube platforms remains consistent. By catering to the users of one platform, YouTube also caters to users that come from different platforms. For example, for Android smartphone users that switch to or encounter a YouTube iOS app, the UXD is one that is familiar and vice versa. This is also the case cross-medium, where desktop YouTube users that also use the YouTube iOS app can see the similarities in menu location.

The tradition of top-section website menus has been historically a dominant desktop standard that is also accessible from the iOS browsers. This standard is one that YouTube users from desktops and apps are familiar with because in 2016 and prior YouTube did not have a bottom-section menu and always had a top-section one. This implies that the persistent YouTube design goes against the bottom-section Apple standard by leveraging on a consistent cross-platform design and long-established convention that reflects ‘common sense’ ideas about the way navigation should work. However, by maintaining a top-section Tab menu design, YouTube designers not only

cater to a diverse user range but also users with different experience levels based on how users interact with the Tab menu.

6.3.2 Different Experience Levels & Interactions

A challenge in the design of digital products is addressing the needs of novice and expert users through the same unified interface (Cooper et al., 2014, p. 237).

Shneiderman et al. (2018) recognise this challenge and add that in comparison designing for simply one level of experience is “relatively easy” (p. 90). Both Cooper et al. (2014) and Shneiderman et al. (2018) present three classes of expertise: a beginner, intermediate, and expert users. However, Cooper et al. (2014) strongly recommends that interface designers should optimise the interface design mainly for the experience level of intermediates (p. 247) due to them being the largest portion of users (p. 243).

Intermediates or as Cooper et al. call them, ‘perpetual intermediates’, are a spectrum.

They state that:

Most users [remain] in a perpetual state of adequacy, striving for fluency, with their skills ebbing and flowing like the tides, depending on how frequently they use the product. (p. 239)

This is backed by the presented understanding of Cooper et al. (2014) that while some beginners quickly become intermediates, they rarely advance to experts (p. 239). However, they also recommend that interface designs should encourage new users (beginners) to “rapidly and painlessly” (p. 243) become intermediates otherwise they will desert the interface. Further, the interface design needs to provide the support

necessary as not to get in the way of intermediates who wish to advance to an expert level. In other words, the design of the interface needs to be flexible (p. 243).

Nielsen (1994b) recommends that the design of an interface should provide “flexibility and efficiency of use” (p. 152). Nielsen (1994a) highlights and explains that such designs can accommodate for both users that have experience and those that lack experience. Nielsen’s recommendation appears less focused on the classes of user expertise and more on whether or not a user has knowledge and experience in a particular matter. Nielsen (1994a) also states that in addition to providing options which are recognisable by users of both experience levels, for the expert user, the use of ‘accelerators’ may often provide a more speedy interaction that will remain unseen by novice users, for example, keyboard shortcuts used on computers (Shneiderman et al., 2018, p. 279). The keyboard shortcut, command C is what the Nielsen-Norman Group call an ‘accelerator’. Although the command C shortcut is not seen by novice users, it is readily available for experienced users and used to Copy items, such as text (NNgroup, 2019, 1:00 – 1:05). Another example of accelerators in the context of social media apps can be seen in Instagram. The Instagram design allows the experienced user to double tap on a post’s image which results in the interaction response of ‘hearting’ a photo. The double tap is “quicker and slightly more efficient than finding and tapping the heart icon” (2:00 - 2:20) as would be required by an inexperienced user. These choices present experienced users with the flexibility to choose the interaction method that “fits them” (0:42 - 0:50).

However, unlike the keyboard where at least the buttons ‘command’ and ‘C’ are always visible, some touchscreen commands or interactions may sometimes be entirely invisible. Norman (2010) states that visibility is the essential design principle of a GUI,

highlighting that menus allow for actions to be discovered with ease and systems to be explored and learned (p. 6). However, he adds, that “[s]ystems that avoid these well-known methods suffer” (p. 6). Indeed, although the touchscreen is capable of providing new ways of interacting with the interface, the user’s ability to exercise a shortcut is to a great extent dependant on their ability to remember the hidden interaction feature that executes their desired command. Norman (2010) emphasises that the “strength of the graphical user interface... has to do with the ease of remembering actions, both in what actions are possible and how to invoke them” (p. 6).

The traditional interaction task of ‘select’, is defined as “[c]hoosing from a set of items” (Shneiderman et al., 2018, p. 347) and is the main interaction task utilised by the typewriter, mouse, and keyboard. Characters such as letters and numbers represent the typewriter and keyboard interface’s primary menu items. Users can choose between these characters and select by pressing their fingers down on individual keys. Similarly, the mouse allows the user to choose between different on-screen menu items via mouse clicks, and tapping is one of the most common interactions used in social media apps. The data reveals that the apps that use a bottom Tab bar also use the tap interaction as the only interaction method for selecting or navigating between Tab menu items, as seen in Table 3.

Table 3	
Navigation Step B3: Using single taps only, on the main menu tabs	Text-Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, YikYak, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu, Reddit (30)
	Image-Based: Instagram, Flipagram, Pinterest, Vimeo, Vine, musical.ly, Flickr, WeHeartIt, BeFunky, Keek, Periscope, GifBoom, Boomcast, Magisto, WedPics, Fling, Whisper, WeddingParty, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, beme, 9GAG (26)

The utilisation of tap as the only interaction method in these apps, coupled with the convention of bottom menu placement, indicates that the navigation strategy employed for navigating between Tab bar items is firmly grounded in well-established conventions. The user's ability to recognise such designs is important as it encourages novice users to continue engaging with the interface and to quickly transition into becoming an intermediate level user, as recommended by Cooper et al. (2014, p. 243). In fact Shneiderman et al. (2018) point out that the interaction style of 'selecting' is suitable for novice or first-time users and experienced intermittent users due to its effectiveness (p. 272). Moreover, the design aimed towards novice users not only satisfies novice users of specific personas (Cooper et al., 2014, p. 62) but also "other people with [similar] needs" (p. 63) who are also novice. This is possible because of the well-established conventions and recognisable menu elements that support the satisfaction of a diverse range of users and which according to Shneiderman et al. (2018) contribute to easier navigation (p. 273).

Tapping is most suitable for novice users, however, frequent users or those seeking a more efficient selection method may not be satisfied with mere tapping. The data reveals that a few apps, including YouTube, provide users with the ability to not only tap but also swipe between menu tabs, all of which are exclusively from the image-based category, as seen in Table 4.

Table 4	
Navigation Step B1: Swiping left and right between main menu tabs and via single tap	Text-Driven: (0)
	Image-Based: Snapchat, YouTube, YouNow, Camera360 (4)

As mentioned, Nielsen’s (1994a) notion of ‘accelerators’ is aimed at providing expert users with quicker interactions while remaining unseen by novice users. In the context of a desktop Windows operating system, users can navigate between different open windows in two ways. The first requires the user to move the mouse to the toolbar, locate and then click on the desired tab, while the second method utilises the keyboard entirely. Users holds down the Alt key and then keep pressing the Tab key to transition through the different open windows until the user releases the Alt key on a certain window to make it active (Boyce, 1998, p. 19). Users that may be unaware of the keyboard shortcut will simply use the first method. However, for users who are experienced, the shortcut may provide more efficiency when switching between windows. This similarly applies to the YouTube app with the exception that instead of two input devices, the touchscreen is only one.

The swipe functionality within YouTube allows experienced users to efficiently swipe between the pages of the Tab menu in order to accomplish their task. However, due to the touchscreen, the swipe interaction is completely hidden from novice users (in the same way that the Command C function is ‘hidden’ on the computer keyboard) who only know how to operate the app by simply tapping on menu tabs. Although the YouTube design of the top-section Tab bar conflicts with the ‘common sense’ standard encouraged by Apple, it provides a more flexible navigation system that is capable of satisfying the needs of both experienced and inexperienced users, and a more diverse user range. In a similar way this also applies to Snapchat. However, the overwhelming majority of iOS apps do not utilise the swipe interaction within ‘main feed’ pages. Further, the swipe functionality in the YouTube design adds more flexibility to experienced users through screen visibility and for more diverse users through user control, as shown next.

6.3.3 Tab Bar Visibility and Control

As mentioned, visibility is an essential design principle especially in a GUI (Norman, 2010, p. 6). This can not only be understood in relation to the design of graphical elements but also their visibility in relation to hand movements. While the computer mouse and keyboard keep the users’ hands off the screen, the nature of the touchscreen is that the hand continuously covers parts of the smartphone screen. Thereby, “rendering a good portion of the device not visible” (Shneiderman et al., 2018, p. 236). The location and interaction capabilities of the Tab bar in both Apple and YouTube standards affects the visibility of on-screen content differently. This section uncovers

how visibility is affected through an interaction design analysis and understanding of how smartphones are held by users based on the work of Hooper (2015a) that shows the three most used handling positions when tapping on links (p. 50).

The first position, ‘Hold & Tap’ is when the iPhone is being held in the palm of the left hand and the screen is being approached via the index finger of the right hand, as seen in Figure 6.11 representing all the positions. Similarly, the ‘Cradle’ position is also where the iPhone is held in the palm of the left hand, however the screen is being approached via the thumb of the right hand. The least used position when tapping links is the ‘1 Hand & Thumb’ position where the smartphone is held with the right hand and the thumb of the same hand is used to tap the screen.

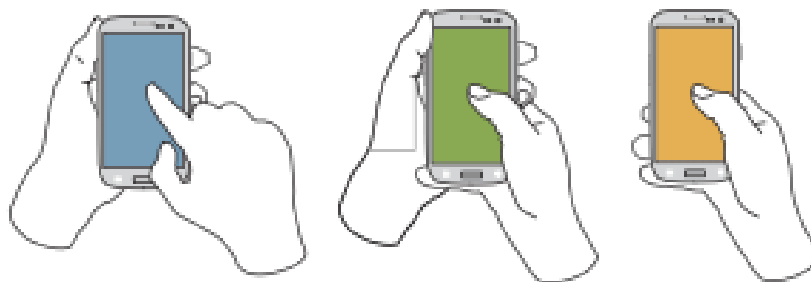


Figure 6.11: Three phone-handling positions. The Hold & Tap (right), Cradle (centre) and 1 Hand & Thumb (right). *Modified illustration from Hooper (2015a, p. 50).*

The Tab bars commonly used in the apps of the iOS platform are located at the bottom section of the screen. In all the hand positions mentioned, Tab bar menus that lay at the bottom leave the user’s hand almost completely off the screen when transitioning between menu tabs, providing full visibility of the content area above. However, menus that exist at the top section of the screen, leave the user’s hand and finger cloaking some portion of the screen’s estate when using any of the smartphone-

handling positions to transition from one tab to the next, as can be imagined by viewing Figures 6.12 & 6.13. This means that for iOS-based apps such as Twitter and the overwhelming majority of apps in the data, more content is visible in the upper sections of the screen to novice users, providing clear visual feedback, as they navigate between menu tabs. This supports the transition of novice users to an intermediate level user. In the case of novice YouTube users, cloaking is experienced during transition.

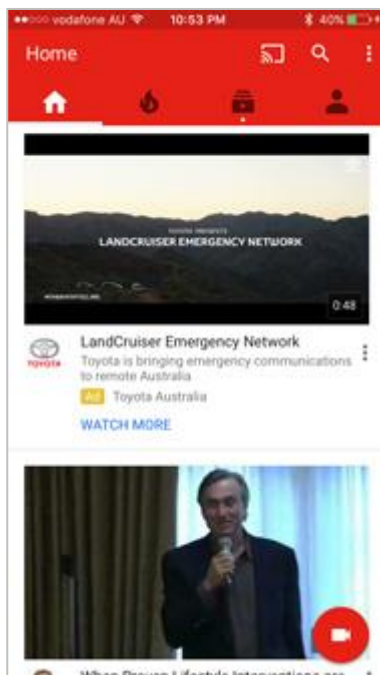


Figure 6.12: The YouTube app ‘home’ page currently active as indicated by its ‘home’ symbol.



Figure 6.13: The YouTube app ‘trending’ page currently active, indicated by its tab symbol.

However, experienced YouTube users know that they can swipe left or right between menu tabs. This means that unlike novice users, experienced users are not limited to a top-section control area and can switch more quickly between tabs simply by swiping from any part of the screen underneath the Tab bar. Indeed, a study by Steven Hooper found that “[p]eople prefer to touch the center of the screen” (2015a, p. 50). Experienced users are free to choose the areas of the screen which they want visible

as they quickly transition between tabs and receive instant visual feedback along the way. The YouTube design provides more of what Nielsen (1994b) calls “flexibility and efficiency of use” (p. 152) in design by catering to both experienced and inexperienced users.

However, the YouTube design also caters for a more diverse user range, not only through cross-platform consistency as argued earlier, but also through its flexible navigation design. Hooper (2015b) points out that people handle their smartphones in different ways while doing different activities, such as opening doors or handling bags, and that this changes their phone grip, and subsequently the way they tap and hold the phone. However, by providing experienced users with the ability to swipe as well, then they can choose the interaction method depending on their situation or condition, for instance, it may be more convenient to swipe during a bumpy car/bus ride rather than tap. This may also be beneficial to some ‘edge case’ users, meaning users that experience situations that the majority of users won’t (Cooper et al., 2014, p. 65), who may at times find that swiping is a more suitable alternative. However, more broadly, Hooper (2015b) points out that “[p]eople and their environments are different enough that all users and use cases are edge cases. Plus, they’re changing all the time” (Conclusion section, para. 1).

To conclude, Apple recommends the use of a navigational design standard throughout their platforms in order not just to provide users with a good UX but to further the company’s own economic interests. Its designers aim to provide users with a consistent design and try to maintain user confidence in the operation of their products over other companies within a hegemonic network such as Google-owned YouTube that pushes its own standard for the same capitalist reasons. However, standards can come

into conflict, as seen with the YouTube iPhone app. Norman (2010) states that “standards are more important than optimization” (p. 10), however while it is relatively easy to identify the UXD benefits that come with basing a design on an existing standard, conflicting standards present designers and users with challenges that add to the complexity of designing for an ideal UXD. The conflicting navigational standards presented by designers of Apple and Google have created an unstable environment where some users are confronted with inconsistent designs that may negatively impact a user’s experience during product use. This chapter has shown how designers have tried to balance between standardisation and optimisation. The YouTube Tab bar design goes against the already established ‘common sense’ standard that Apple has been consolidating for years, but benefits YouTube users by capitalising on other established ‘common sense’ conventions and maintaining a consistent cross-platform top-section Tab bar design. By catering to the users of one platform, YouTube also caters to users that come from different platforms. The design allows YouTube to cater to a diverse user range and also users with different experience levels through the flexibility of using both tap and swipe interactions embedded within its commodity-form.

Part Three: Conclusion &

Recommendations

Chapter 7 - Conclusion

The core principle of the UXD philosophy is to place users at the centre of a product's design. However, as argued throughout this thesis, the design of social media apps is fraught with conflicts that are culturally contingent and shaped beyond the mere application of technical know-how. This leads some of the conventional wisdom of UXD to be lost in practice. UXD plays an important role in shaping technology and society, however, when looked at as part of the wider hegemonic pursuits of capitalist, corporate-driven societies, it is apparent that the merit of the UXD philosophy must give way to what Marx (1976) referred to as the “commodity-form of the product” (p. 713). The incorporation of ‘good’ UXD is therefore dependant on the potential commercial viability (profitability) of the product.

7.1 Culturally Contingent UXD

In the technology field, designers employed by rival companies, such as Apple and Google, use UXD principles to offer alluring product designs that are a manifestation of commodity fetishism, put forward for their exchange-value (Marx, 1976, p. 165). These desirable products are presented as being efficient designs that are for the benefit of the user. However, there are underlying economic and social interests that shape these designs. Corporate rivalry between multinational firms tends to result in competing and conflicting design standards in the market. These inconsistencies not only add to the complexity of the UXD practice of presenting users with familiar and consistent designs but also goes against the UXD philosophy of putting the user first. Although companies

may use conflicting design standards, these standards are different approaches to the same design problems, which negates the idea that there is one perfect design for all, or a ‘black box’ solution according to Jenkins (2006, pp. 14-15), and adds to the complexity of smartphone UXD practices. Adding to this complexity, is the mediamorphosis that occurs, the ongoing transformation of communication media, where new media emerges from old media that “usually... continue to evolve and adapt” (Fidler, 1997, p. 23). Designs are fashioned in a dynamic and ever-changing environment of contested ideologies, and technological and media developments that are understood through other concepts such as dominant design (Utterback, 1994), convergence (Jenkins, 2006), and remediation, which all “means greater diversity for digital technologies in our culture” (Bolter & Grusin, 2000, p. 225). While this greater diversity is true, consequently, it also means more complexity.

The cultural contingency of design and the challenges that designers faced have been highlighted through many examples showing the role of UXD and immediacy (Bolter & Grusin, 2000, p. 30) in the formation of historical standards (across typewriters, GUI, and input devices) and conflicting design standards in relation to media formats and primary navigation. The convergence of media images in the iPhone challenged app designers in the presentation of content due to a complex environment of conflicting image and screen aspect ratios that had already been established as official or de facto standards. The case studies presented in this thesis demonstrate the complexity and challenge of designing for different users and meeting the UXD philosophy of putting the user first. While the majority of app designs employed a ‘common sense’ user freedom approach such as that used by Facebook, the minority maintained a consistency approach with varying ‘common sense’ design solutions to

problems as seen through YouTube, YouNow, Vine, and Musical.ly (former TikTok). In relation to primary navigation, the minority design used in the Google-owned YouTube iOS app goes against the ‘common sense’ dominant standard used by the majority of the apps and that Apple recommends. While the UXD approach used by both companies was to maintain a consistent and familiar design and to cater to a diverse user range, conflicting standards get in the way of achieving that ideal.

In the years since this data was collected, much has changed, the YouTube iOS app, for instance, now follows the Apple standard of placing the Tab bar menu at the bottom and shows larger vertical videos within the video player page. Further, other design features such as Snapchat’s instant ‘stories’ have been developed and become common in the interfaces of many apps, and longer screen aspect ratios were introduced in the iPhone X series in 2017 and have been maintained in subsequent models till today. New media give the appearance that they are always on the verge of becoming outdated, however, they matter the most when their use becomes habitual, after their initial sparkle (Chun, 2016). This reflects the importance of the sampled apps and design features from the 2016 period that have practices still being habitually used today.

While using UXD as the forefront framework, this thesis provides a detailed glimpse into culturally hegemonic pursuits (Gramsci, 1971) and mediamorphic changes that new media undergo (Fidler, 1997). This includes the development of dominant design standards (Suárez & Utterback, 1995) amidst a converging media industry (Jenkins, 2006) where designs are refashioned across time (Bolter & Grusin, 2000). However, regardless of the direction of the changes that occur in the industry, the cultural and media forces that have shaped the complexity of the UXD practice will

inevitably continue to do so in unexpected ways, with new waves of design cultures in conflict. Therefore, it is important that UXD researchers take these factors into account when exploring the media landscape for a deeper and more holistic understanding of the UXD practices used by corporations.

This research project drew on a comprehensive historical snapshot of 60 available social media apps in 2016 and stratified the apps' design features. This data provided a largely holistic overview of the design standards of apps in that period at a quantitative level and in relation to the 'what' aspect of UXD, meaning the design features. However, less investigation was done overall in relation to the UXD standards of apps at a qualitative level and the 'how' of UXD (Hassenzahl, 2010, pp. 43-45; n.d.), despite the presentation of many case studies. The surveyed design features can be used for a plethora of qualitative case studies, but the time restrictions of this research project did not permit for such an undertaking. By conducting more case studies in relation to different design features, such research could provide a broader and more holistic picture of the UXD condition of the apps qualitatively in addition to the quantitative data that has been collected.

This research has used historical understandings about UXD standards in order to deduce how familiar a design may be to users, however, this was done without the involvement of any users in the process, which if done, could provide further insights. Furthermore, comparative knowledge was derived through historical analysis in light of the 2016 data, because comparing two primary source data sets from different time periods was beyond the scope of this project, but could help to gain a better understanding of app transformations. In addition, this research was not able to provide

a deep focus on the relations between the UXD standards of products in light of market forces, or through a market analysis, which could be seen as further areas for research.

7.2 Future Recommendations

Research on UXD is generally focused on presenting practical considerations for designers but tends to lack historical and cultural accounts of the UXD practices and standards implemented within the app industry. This project provides a snapshot of smartphone app designs at a particular moment in time, but more research could be done to document the UXD developments of social media apps for historical value and retrospective insight into dominant designs. It is hoped that the cultural and media theoretical frameworks used in this thesis could be used as models for future research understandings of UXD practices and standards.

The move-scheme analysis method used for this research (Swales, 1990, 2011) allowed for an effective stratification of design features, however, some issues were identified during this research with regards to data collection, as raised in the limitations section of the Methodology chapter. This section presents potential solutions to some of these issues. I have mentioned that the formation of ‘moves’ and ‘steps’ was to some extent subjective due to being dependent on any researcher’s presupposed understanding of what counts as being a significant and/or complex aspect or portion of the interface. A solution for future researchers using this method may be to take a more systematic initial approach before a ‘move’ scheme is moulded. This can be done by dedicating different ‘moves’ within a scheme to different (yet very common) pages

within app interfaces (such as feed, profile, explore, publish, and search pages), thereby forming a more reasoned initial structure that is more readily and easily understood.

Another issue raised in this project was that of knowing how much documentation of data through iPhone screenshots was necessary. The screenshots taken initially provided a solid base for understanding app interfaces and design features, and sometimes required that the actual app interfaces (or whatever was left of them) be re-observed. But the question remained – what if I had taken more screenshots? Would this have provided any further information? To counter this problem, I suggest that video recording interface interactions might be more suitable alternative for documenting app usage, especially when dealing with a large number of apps or data. Indeed, a mounted camera on top of an iPhone screen can show the user's hands as they control the interface through gestures such as tapping and swiping, which are interactions otherwise hidden in iPhone screenshots. Although some of these interactions have been documented semantically through 'moves' and 'steps', the addition of a video recording may provide a more detailed and comprehensive understanding. In addition, while the camera is recording the iPhone being used, a recording app on the iPhone could be used to simultaneously capture a video of the screen interactions, providing a graphically clearer video that could then be used for capturing quality screenshots if required.

The last issue was in relation to unanticipated and unforeseeable app changes generally, for which video recording is an alternative solution. It is important to acknowledge that the design of the observed apps could also be affected without the researcher's knowledge. While sometimes the changes are apparent, such as apps that demand an update while concealing some interface access, some apps drop out of the

App Store without warning, leaving the researcher with an interface shell with pieces of residual information/content.

The use of video recording early in the collection process would likely significantly reduce the possibility of gaps within the data and guarantee that a lot of detail about the apps would be stored. The approach in this project did not involve taking early screenshots of all the apps and all of their functions, rather, many screenshots were taken as a precaution to possible changes later on. Therefore, for future researchers, I recommend that comprehensive recordings of user-journeys are done on all the apps covering all of the app main pages as soon as possible in order to significantly minimise the possibility of losing data on design features/interactions. Recordings would need to follow a set organisational plan for easy access of relevant data and as the researcher moves through the ‘move’ schemes and listing apps, he/she may take video recordings or screenshots of more specific interface areas as these situations arise.

7.2.1 Practical Recommendations for Designers

Designers of social media apps face a lot of challenges. Although technical know-how is essential when designing for a UX, an understanding of cultural and media forces is also important. In this sense, cultural awareness is vital for design. For example, an understanding that designs are partly shaped by the economic and social interests of corporations within a capitalist society gives designers a more conscious lens to view the design patterns that they encounter and implement.

An understanding of cultural and media forces mixed with technical knowledge can enable designers to produce more ‘common sense’ designs that are congruous with user experiences of the past and more in sync with the cultural developments of the time. For example, although the YouTube app originated as a desktop website, its designers were still able to maintain the horizontal format used in prior media that had played a role in shaping the experiences of previous users and capitalise on full screen immediacy and vertical videos which had been a newer development, in spite of the overall imperfections in presentation. Indeed, the nature of design and its cultural contingency means that invariably there is always a compromise in the UXD of a product. However, designers should try to optimise a design as much as possible.

UXD writers often recommend that designers capitalise on standards. However, there is also a level of optimisation that often needs to occur, and designers should take both standardisation and optimisation into account when developing products. For example, the Musical.ly and Flipagram apps that originated on smartphones capitalise consistently on a vertical standard used in portrait photography and adapted to video content, while also, optimising the video content to occupy the entire screen, resulting in hypermediacy, but also eliminating the need for layers of access. For older platforms, while the Vimeo and YouTube design capitalised on past user experiences through a consistent horizontal video player, it also used a user freedom approach where it optimised the horizontal frame to show numerous image formats, thereby leveraging both principles in its design. Similarly, the design of Facebook and others (such as KakaoStory, Twitter, and Google+) allowed the upload of multiple and various photo standards that were optimised for viewing through layers within a single post. Indeed, designers need to be conscious of ways in which consistency can be maintained and

flexibility can be granted. Another example of considering both standardisation and optimisation is the YouTube primary navigation design that was in line with a traditional navigational standard that went against the Apple iOS standard, however, it was also optimised to be consistent across different platforms and catered to different users.

An understanding of cultural and media forces in design is important in understanding new technologies because traditional designs are reused to maintain familiarity through standards. It is interesting that although the principle of familiarity is repeatedly used by designers to evoke a ‘good’ UX, the underlying design itself may not always be an effective design. However, the historical and cultural meanings that are attached to interface elements, such as aspect ratios and primary navigation, still affect users today. This thesis has shown how social media smartphone apps rely on design cultures that are often in conflict with User Experience Design standards. The case studies from a wide range of apps available in 2016 showed how the remediation of existing practices, the mediamorphosis, coupled with the economic imperatives of pushing the commodity-form of the product may have overridden decisions based on UXD practices. Importantly, this thesis has shown that designers may need to put aside their ‘common sense’ understandings to consider the cultural meanings and hegemonic corporate imperatives of design elements that are beyond mere technical understandings.

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Appendix A:

Data Overview & Chi Square Results

Information

RESULTS OF THE CHI SQUARE TEST AT MOVE LEVEL

Move		Text Driven		Image Based		Chi square value
		%	(n)	%	(n)	
Move A	Presenting information regarding user interactions in the main feed page	19.68	(73)	17.54	(47)	5.633*
Move B	Presenting information regarding user interactions inside a single content page	14.29	(53)	11.19	(30)	6.373*
Move C	Presenting user related information in the main feed and/or single content pages	18.60	(69)	20.90	(56)	1.352
Move D	Presenting user information in the profile pages	40.43	(150)	45.15	(121)	3.103
Move E	Presenting a snippet or details of user activity towards others in the main feed	3.23	(12)	1.49	(4)	4.000*
Move F	Providing third-party advertisements	3.77	(14)	3.73	(10)	0.667
Overall		100	(371)	100	(268)	

Significance: Chi square value > 3.841 cut-off value. Significance levels: * p<.05 (High); ** p<.01 (Highest).

RESULTS OF THE CHI SQUARE TEST AT STEP LEVEL

Move			Text Driven		Image Based		Chi square value
			%	(n)	%	(n)	
Move A	Step A1	Presenting the number of emotional responses received by a post	7.55	(28)	6.34	(17)	2.689
	Step A2	Presenting the number of comments associated with a post	6.74	(25)	4.48	(12)	4.568*
	Step A3	Presenting the number of shares associated with a post	2.16	(8)	2.24	(6)	0.286
	Step A4	Presenting the number of views or viewers associated with a post	1.35	(5)	2.98	(8)	0.692
	Step A5	Presenting the number of users following a post, user, or enrolled in a challenge	0.54	(2)	0.75	(2)	0.000
	Step A6	Presenting the number of photos in a post	1.08	(4)	0.75	(2)	0.667
	Step A7	Presenting the combined number of hearts, comments, and shares associated with a post	0.27	(1)	0	(0)	1.000
Move B	Step B1	Presenting the number of emotional responses received by a post	6.20	(23)	4.48	(12)	3.457
	Step B2	Presenting the number of comments associated with a post	4.58	(17)	3.73	(10)	1.815
	Step B3	Presenting the number of shares associated with a post	1.62	(6)	0.00	(0)	6.000*
	Step B4	Presenting the number of views or viewers associated with a post	1.35	(5)	2.98	(8)	0.692
	Step B5	Presenting the number of users following a post or a user	0.54	(2)	0.00	(0)	2.000
Move C	Step C1	Presenting the location of a published post	3.23	(12)	4.85	(13)	0.040
	Step C2	Presenting the time and/or date of a published post	7.01	(26)	7.84	(21)	0.532
	Step C3	Presenting the location of a published comment or reply	0.27	(1)	0.37	(1)	0.000
	Step C4	Presenting the time and/or date of a published comment, reply, or answer	6.47	(24)	6.72	(18)	0.857
	Step C5	Presenting the user's social media handle, job title, age, location, or credentials	1.62	(6)	1.12	(3)	1.000

Move D	Step D1	Presenting the user's username, profile URL, or social media handle	3.50	(13)	7.84	(21)	1.882
	Step D2	Presenting the number of friends and/or followers, or connections of a user	5.12	(19)	8.21	(22)	0.220
	Step D3	Presenting a number or list of mutual friends	1.08	(4)	0.00	(0)	4.000*
	Step D4	Presenting the user's first and/or last login time or date, and/or online status	2.16	(8)	1.49	(4)	1.333
	Step D5	Presenting the user's home town and/or current living location and/or distance away from a user	4.58	(17)	3.36	(9)	2.462
	Step D6	Presenting the user's short biography, description, message, or headline with a certain limit on characters	4.31	(16)	5.97	(16)	0.000
	Step D7	Presenting fields with lengthy text of over 500 characters about the user, such as: biography, about, summary, description and, favourite quotes	1.08	(4)	1.87	(5)	0.111
	Step D8	Presenting the user's posts, and/or activity, and/or re-shares in amount or list format	7.82	(29)	9.70	(26)	0.164
	Step D9	Presenting the user's basic details, such as: birthday, gender, gender interest, marital status, languages, religious views, family members, height, ethnicity, and body type	2.43	(9)	0.00	(0)	9.000**
	Step D10	Presenting the user's personal contact details, such as: website, email, phone, address, other social media handles or links and/or feeds	3.23	(12)	3.73	(10)	0.182
	Step D11	Presenting the user's interests, groups, or forums	2.16	(8)	1.12	(3)	2.273
	Step D12	Presenting the user's post check-in locations or frequency	0.54	(2)	0.37	(1)	0.333
	Step D13	Presenting the user's experience level, job, professional skills, and/or academic certifications	2.16	(8)	0.75	(2)	3.600
	Step D14	Presenting the user's subscription type	0.27	(1)	0.75	(2)	0.333
Move E	Step E1	Highlighting a user's comment or response	1.62	(6)	1.49	(4)	0.400
	Step E2	Highlighting the emotional response to a post by a user or users	1.35	(5)	0	(0)	5.000*
	Step E3	Highlighting when a user subscribes to a channel	0.27	(1)	0	(0)	1.000

Move F	Step F1	Presenting advertisements inside a feed	2.70	(10)	2.61	(7)	0.529
	Step F2	Presenting advertisements in the middle or immediately after initiating a video	0.27	(1)	0	(0)	1.000
	Step F3	Presenting advertisements which are separate from the content and may exist outside the vicinity of the application's layout or in the form of a pop-up	0.81	(3)	1.12	(3)	0.000

Significance: Chi square value > 3.841 cut-off value. **Significance levels:** * p<.05 (High); ** p<.01 (Highest).

Navigation

RESULTS OF THE CHI SQUARE TEST AT MOVE LEVEL

Move		Text Driven		Image Based		Chi square value
		%	(n)	%	(n)	
Move A	Establishing a sense of location or site root starting from the feed page	19.02	(58)	18.12	(50)	0.593
Move B	Utilising hand gestures for accessing menu tabs	21.31	(65)	23.19	(64)	0.008
Move C	Utilising hand gestures for navigating through media content	13.11	(40)	17.03	(47)	0.563
Move D	Utilising hand gestures for navigating out of media content	10.49	(32)	10.14	(28)	0.267
Move E	Utilising the search element in terms of locality	15.08	(46)	13.77	(38)	0.762
Move F	Utilising the search element in terms of its usefulness	20.98	(64)	17.75	(49)	1.991
Overall		100	(305)	100	(276)	

Significance: Chi square value > 3.841 cut-off value. **Significance levels:** * p<.05 (High); ** p<.01 (Highest).

RESULTS OF THE CHI SQUARE TEST AT STEP LEVEL

Move			Text Driven		Image Based		Chi square value
			%	(n)	%	(n)	
Move A	Step A1	Presenting a horizontal bottom main menu bar or symbols which may be action driven	9.18	(28)	9.06	(25)	0.170
	Step A2	Presenting a horizontal header main menu bar or symbols which may be action driven	0.66	(2)	1.81	(5)	1.286
	Step A3	Presenting a horizontal additional header menu which may contain action driven tabs	8.52	(26)	6.52	(18)	1.455
	Step A4	Presenting a horizontal additional bottom menu bar or single tab which are action driven	0.66	(2)	0.72	(2)	0.000
Move B	Step B1	Swiping left and right between main menu tabs and via single tap	0.00	(0)	1.45	(4)	4.000*
	Step B2	Swiping left and right between sub menu tabs and via single tap	2.62	(8)	3.26	(9)	0.059

	Step B3	Using single taps only, on the main menu tabs	9.84	(30)	9.42	(26)	0.286
	Step B4	Using single taps only, on sub menu tabs	7.21	(22)	7.61	(21)	0.023
	Step B5	Swiping left and/or right to access an extension of the header menu or main menu	1.64	(5)	1.45	(4)	0.111
Move C	Step C1	Swiping left and right in specific menu page and feed areas where swiping up and down is the primary browsing interaction	3.61	(11)	3.26	(9)	0.200
	Step C2	Swiping up and down as the only browsing interaction for menu pages and feeds	6.23	(19)	7.61	(21)	0.100
	Step C3	Swiping left and right through different posts and/or comments	0.98	(3)	3.99	(11)	4.571*
	Step C4	Swiping left and right through a single post's images	1.97	(6)	0.36	(1)	3.571
	Step C5	Swiping up and down from one full screen post to the next	0.00	(0)	1.09	(3)	3.000
	Step C6	Swiping in any direction to proceed to the next content	0.33	(1)	0.00	(0)	1.000
	Step C7	Tapping once anywhere on the screen to move through a single post's images or videos	0.00	(0)	0.36	(1)	1.000
	Step C8	Swiping left and right to move through a video	0.00	(0)	0.36	(1)	1.000
Move D	Step D1	Tapping or releasing one's finger only, in order to go back or exit a photo, video or multi-media post	4.92	(15)	6.16	(17)	0.125
	Step D2	Swiping right to go back or exit a photo, video or multi-media post	1.64	(5)	0.72	(2)	1.286
	Step D3	Swiping up and/or down, or left to go back, or exit a photo or video post	3.28	(10)	3.26	(9)	0.053
	Step D4	Swiping in any direction to go back or exit a photo post	0.33	(1)	0.00	(0)	1.000
	Step D5	Closing a video by moving it to the centre of the screen	0.33	(1)	0.00	(0)	1.000
Move E	Step E1	Presenting a main search icon or bar on a main menu or additional header menu that appears at a frequency of 2 times or less	5.25	(16)	3.99	(11)	0.926
	Step E2	Presenting a main search bar or icon that stays constant or appears at a frequency of 3 or more times when moving from one main menu or additional header menu to the next	4.26	(13)	4.35	(12)	0.040

	Step E3	Presenting a search bar on the profile pages of other users	0.98	(3)	0.72	(2)	0.200
	Step E4	Presenting a search filter bar or icon on top of a visible list	4.26	(13)	3.62	(10)	0.391
	Step E5	Presenting a tucked or hidden search bar on a main menu page	0.33	(1)	1.09	(3)	1.000
Move F	Step F1	Providing a dynamic main search bar or icon that instantly presents different custom categories related to a single search and/or presents trending topics, and/or provides a customisable search filter where a single search can be filtered in more detail and/or sorted differently	5.90	(18)	5.43	(15)	0.273
	Step F2	Providing a main search bar or icon which searches through a single category only or at a time	3.93	(12)	3.26	(9)	0.429
	Step F3	Providing a list of previously, recently, or last searched items	3.93	(12)	3.62	(10)	0.182
	Step F4	Suggesting potential search words and/or live filtering as the user types	7.21	(22)	5.07	(14)	1.778
	Step F5	Providing a speech recognition system for search	0.00	(0)	0.36	(1)	1.000

Significance: Chi square value > 3.841 cut-off value. **Significance levels:** * p<.05 (High); ** p<.01 (Highest).

Engagement

RESULTS OF THE CHI SQUARE TEST AT MOVE LEVEL

Move		Text Driven		Image Based		Chi square value
		%	(n)	%	(n)	
Move A	Presenting interaction shortcuts on the main feed page	23.83	(112)	21.79	(78)	6.084*
Move B	Sharing existing media content	11.70	(55)	16.76	(60)	0.217
Move C	Publishing content	24.89	(117)	24.02	(86)	4.734*
Move D	Interacting with user profiles	14.26	(67)	11.45	(41)	6.259*
Move E	Publishing comments or reactions	14.68	(69)	11.73	(42)	6.568*
Move F	Presenting intelligent system generated options	7.87	(37)	9.21	(33)	0.229
Move G	Utilising the element of collaboration for user-generated content	0.21	(1)	0.27	(1)	0.000
Move H	Utilising the element of contribution for user-generated content	2.55	(12)	4.74	(17)	0.862
Overall		100	(470)	100	(358)	

Significance: Chi square value > 3.841 cut-off value. **Significance levels:** * p<.05 (High); ** p<.01 (Highest).

RESULTS OF THE CHI SQUARE TEST AT STEP LEVEL

Move			Text Driven		Image Based		Chi square value
			%	(n)	%	(n)	
Move A	Step A1	Utilising the ability to express an emotion, such as "Like" or voting	6.17	(29)	5.30	(19)	2.083
	Step A2	Utilising the ability to comment, reply, or answer	5.31	(25)	4.74	(17)	1.524
	Step A3	Sharing instantly to an app's internal feed	1.06	(5)	1.39	(5)	0.000
	Step A4	Utilising the ability to save or favour content	1.27	(6)	2.23	(8)	0.286
	Step A5	Utilising the ability of adding or following a user	1.27	(6)	1.11	(4)	0.400
	Step A6	Utilising the ability of subscribing to an interaction or turning on a post notification	0.63	(3)	0.27	(1)	1.000
	Step A7	Utilising the ability of hiding a post	1.48	(7)	0.27	(1)	4.500*

	Step A8	Utilising the ability of unfollowing specific posts	0.63	(3)	0.27	(1)	1.000
	Step A9	Utilising the ability of reporting or flagging a post	3.61	(17)	3.35	(12)	0.862
	Step A10	Utilising the ability of viewing a post's edit history or log	0.42	(2)	0.00	(0)	2.000
	Step A11	Utilising the ability of sending a private message	1.48	(7)	1.95	(7)	0.000
	Step A12	Utilising the ability of unfollowing or blocking a user	0.42	(2)	0.83	(3)	0.200
Move B	Step B1	Sharing internally with the ability of adding text	2.12	(10)	0.55	(2)	5.333*
	Step B2	Sharing internally and to external social networking apps in one action	0.21	(1)	0.27	(1)	0.000
	Step B3	Sharing externally to other social networking apps	3.19	(15)	7.26	(26)	2.951
	Step B4	Sharing via link, such as copying, messaging, or emailing	3.83	(18)	6.14	(22)	0.400
	Step B5	Sharing via internal message	2.34	(11)	2.51	(9)	0.200
Move C	Step C1	Providing the ability to post multiple photos and videos associated with a text, all at once	0.63	(3)	0.83	(3)	0.000
	Step C2	Providing the ability to post a maximum of one photo associated with a text at a time	4.46	(21)	4.46	(16)	0.676
	Step C3	Providing the ability to post multiple photos associated with a text at a time	1.91	(9)	0.83	(3)	3.000
	Step C4	Providing the ability to post a maximum of one video associated with a text at a time	1.48	(7)	5.02	(18)	4.840*
	Step C5	Providing the ability to tag or mention another user in a post	3.40	(16)	2.23	(8)	2.667
	Step C6	Providing the ability to post pre-set multimedia	2.12	(10)	1.95	(7)	0.529
	Step C7	Providing the ability to associate a location	2.12	(10)	2.51	(9)	0.053
	Step C8	Providing the ability to adjust the scope of the target audience	1.48	(7)	1.11	(4)	0.818
	Step C9	Providing the ability to post to one or more external social networks	2.34	(11)	4.19	(15)	0.615
	Step C10	Providing the ability to record and post audio with text	0.42	(2)	0.00	(0)	2.000
	Step C11	Providing the ability to stream a live video	0.42	(2)	0.83	(3)	0.200

	Step C12	Providing the ability to associate a hashtag to a post	2.12	(10)	3.35	(12)	0.182
	Step C13	Providing the ability to associate a tag to a post	0.63	(3)	1.67	(6)	1.000
	Step C14	Providing the ability to associate a community topic to a post	0.42	(2)	0	(0)	2.000
	Step C15	Providing the ability to associate a pre-set categorisation to a post	0.85	(4)	1.95	(7)	0.818
Move D	Step D1	Providing the ability to message a user privately	5.10	(24)	2.23	(8)	8.000**
	Step D2	Providing the ability to interact quickly	1.27	(6)	0.00	(0)	6.000*
	Step D3	Providing the ability to share a user's profile	1.91	(9)	3.07	(11)	0.200
	Step D4	Providing the ability to view all posts associated between two users	0.21	(1)	0.00	(0)	1.000
	Step D5	Providing the ability to publish multimedia content onto another user's profile page	0.42	(2)	0.55	(2)	0.000
	Step D6	Providing the ability to interact with a user's content	5.31	(25)	5.58	(20)	0.556
Move E	Step E1	Providing the ability to post text alone	5.74	(27)	5.58	(20)	1.043
	Step E2	Providing the ability to post multiple photos and/or videos with or without text	0.63	(3)	0.00	(0)	3.000
	Step E3	Providing the ability to post text and a single photo and/or video	1.70	(8)	1.39	(5)	0.692
	Step E4	Providing the ability to post one photo and/or one video without text	1.70	(8)	1.11	(4)	1.333
	Step E5	Providing the ability to post an emoticon, gif, or sticker with text and/or with a photo or video, or just alone	1.91	(9)	0.55	(2)	4.455*
	Step E6	Providing the ability to mention another user using the "@" symbol	2.76	(13)	3.07	(11)	0.167
Move F	Step F1	Suggesting related media content based on a current viewing	1.27	(6)	2.23	(8)	0.286
	Step F2	Suggesting media content based on the user's connections and interactions and/or via a popular and/or trending system algorithm	4.68	(22)	5.86	(21)	0.023

	Step F3	Suggesting popular and/or user-centred media content based on current location	1.91	(9)	1.11	(4)	1.923
Move G	Step G1	Providing a live video stream with two or more users broadcasting at once	0.21	(1)	0.27	(1)	0.000
Move H	Step H1	Providing the ability to shoot a video to existing music which is sourced from another video post	0.00	(0)	0.81	(3)	3.000
	Step H2	Providing the ability to manage an account or page, photo album or media content, with multiple selected administrators or contributors	0.42	(2)	0.81	(3)	0.200
	Step H3	Providing the ability to manage or initiate a multiple user group or chat	2.12	(10)	2.98	(11)	0.048

Significance: Chi square value > 3.841 cut-off value. **Significance levels:** * p<.05 (High); ** p<.01 (Highest).

Entertainment

RESULTS OF THE CHI SQUARE TEST AT MOVE LEVEL

Move		Text Driven		Image Based		Chi square value
		%	(n)	%	(n)	
Move A	Providing connected media content from a single user	8.06	(10)	9.15	(13)	0.391
Move B	Providing connected media content from multiple users	5.64	(7)	10.56	(15)	2.909
Move C	Viewing maximum video duration	9.67	(12)	13.38	(19)	1.581
Move D	Viewing media content through different aspect ratios accessed through a feed	23.39	(29)	21.13	(30)	0.017
Move E	Viewing photo and/or video media content through a 'full screen' viewing mode	22.58	(28)	21.13	(30)	0.069
Move F	Utilising pre-set effects on photos and/or videos	24.19	(30)	21.83	(31)	0.016
Move G	Providing the ability to gamify stature	6.45	(8)	2.81	(4)	1.333
Overall		100	(124)	100	(142)	

Significance: Chi square value > 3.841 cut-off value. **Significance levels:** * p<.05 (High); ** p<.01 (Highest).

RESULTS OF THE CHI SQUARE TEST AT STEP LEVEL

Move			Text Driven		Image Based		Chi square value
			%	(n)	%	(n)	
Move A	Step A1	Providing sequential photo and/or video content upon a quick manual action only	7.25	(9)	7.74	(11)	0.200
	Step A2	Providing sequential photo and/or video content in an auto play and manual sequence	0.80	(1)	1.40	(2)	0.333
Move B	Step B1	Providing sequential photo and/or video content upon a quick manual action only	4.83	(6)	9.15	(13)	2.579
	Step B2	Providing sequential photo and/or video content in an auto play and manual sequence	0.80	(1)	1.40	(2)	0.333

Move C	Step C1	Providing up to 30 seconds of video time	4.03	(5)	6.33	(9)	1.143
	Step C2	Providing up to 1 minute of video time	0.80	(1)	1.40	(2)	0.333
	Step C3	Providing up to 3 minutes of video time	1.61	(2)	0.70	(1)	0.333
	Step C4	Providing more than 3 minutes of video time	3.22	(4)	4.93	(7)	0.818
Move D	Step D1	Providing only square shaped photos and/or videos	2.41	(3)	1.40	(2)	0.200
	Step D2	Providing only horizontal photos and/or videos of a uniform aspect ratio in each app	0.00	(0)	2.81	(4)	4.000*
	Step D3	Providing only vertical photos and/or videos of a uniform aspect ratio in each app	0.80	(1)	4.93	(7)	4.500*
	Step D4	Providing non-uniform or various shaped photos and/or videos	20.16	(25)	11.97	(17)	1.524
Move E	Step E1	Providing a feature that enables the larger viewing of photo and video content to the fullest extent of their aspect ratio in vertical and horizontal orientations	6.45	(8)	1.40	(2)	3.600
	Step E2	Providing a feature that enables the larger viewing of photo and/or video content to the fullest extent of their aspect ratio in vertical and/or horizontal orientations, but never all these four variables together within the same app	9.67	(12)	10.56	(15)	0.333
	Step E3	Providing photo and/or video content that by default occupy the entire screen individually	0.00	(0)	2.81	(4)	4.000*
	Step E4	Providing no 'full screen' feature	6.45	(8)	6.33	(9)	0.059
Move F	Step F1	Utilising effect filters	5.64	(7)	7.04	(10)	0.529
	Step F2	Utilising effect filters with the ability to adjust their intensity	2.41	(3)	3.52	(5)	0.500
	Step F3	Utilising no effect filters	16.13	(20)	10.56	(15)	0.714
	Step F4	Utilising live interactive effects	0.00	(0)	0.70	(1)	1.000

Move G	Step G1	Providing the ability to reach an achievement and/or gather points based on the activities of the user only	3.22	(4)	0.00	(0)	4.000*
	Step G2	Providing the ability to reach an achievement and/or gather and/or purchase points based on the activities of a single user and other users activities towards that user	2.41	(3)	2.11	(3)	0.000
	Step G3	Providing the ability to gift other users via purchase only	0.80	(1)	0.70	(1)	0.000

Significance: Chi square value > 3.841 cut-off value. **Significance levels:** * p<.05 (High); ** p<.01 (Highest).

Personalisation

RESULTS OF THE CHI SQUARE TEST AT MOVE LEVEL

Move		Text Driven		Image Based		Chi square value
		%	(n)	%	(n)	
Move A	Interacting with user profiles	21.97	(58)	28.49	(51)	0.450
Move B	Customising the main feed	4.92	(13)	2.79	(5)	3.556
Move C	Customising notifications	18.94	(50)	22.35	(40)	1.111
Move D	Customising visuals	19.70	(52)	22.35	(40)	1.565
Move E	Adjusting privacy settings	30.68	(81)	22.35	(40)	13.893**
Move F	Adjusting advert settings	2.65	(7)	1.12	(2)	2.778
Move G	Adjusting intelligent settings	1.14	(3)	0.56	(1)	1.000
Overall		100	(264)	100	(179)	

Significance: Chi square value > 3.841 cut-off value. **Significance levels:** * p<.05 (High); ** p<.01 (Highest).

RESULTS OF THE CHI SQUARE TEST AT STEP LEVEL

Move			Text Driven		Image Based		Chi square value
			%	(n)	%	(n)	
Move A	Step A1	Providing the ability to discontinue a user connection	7.95	(21)	13.40	(24)	0.200
	Step A2	Providing the ability to add or remove a user from a list	1.52	(4)	0.56	(1)	1.800
	Step A3	Providing the ability to block a user	7.20	(19)	8.94	(16)	0.257
	Step A4	Providing the ability to report a user	5.30	(14)	5.59	(10)	0.667
Move B	Step B1	Providing the ability to disable a user or connection's updates and/or activities from appearing in your feed	2.65	(7)	0.00	(0)	7.000**
	Step B2	Providing the ability to automatically or manually prioritise a user's updates so they always appear at the top of the feed	0.76	(2)	0.00	(0)	2.000
	Step B3	Providing the ability to choose the type of content you receive in your feed or from a connection	1.14	(3)	2.23	(4)	0.143

	Step B4	Providing the ability to disable a user's re-shares from appearing in the main feed	0.38	(1)	0.56	(1)	0.000
Move C	Step C1	Providing the ability to turn on and off notifications from a user	2.65	(7)	5.03	(9)	0.250
	Step C2	Providing the ability to turn on and off notifications from a specific post	0.76	(2)	0.56	(1)	0.333
	Step C3	Providing the ability to turn on and off a specific notification function relating to all posts and/or alerts	6.82	(18)	10.10	(18)	0.000
	Step C4	Providing the ability to choose the type of audience and/or content you get notified about from a grouping or users	2.27	(6)	1.68	(3)	1.000
	Step C5	Providing the ability to choose the method or location in which users receive their notifications	3.79	(10)	3.91	(7)	0.529
	Step C6	Providing the functionality to disable push notifications at once	1.52	(4)	1.12	(2)	0.667
	Step C7	Providing the functionality to choose the frequency or timeframe at which the user gets notified	1.14	(3)	0.00	(0)	3.000
Move D	Step D1	Providing the ability to add one profile picture or more	10.60	(28)	15.60	(28)	0.000
	Step D2	Providing the ability to add one or more profile banner photos or gifs	4.92	(13)	2.23	(4)	4.765*
	Step D3	Providing the ability to adjust the text size	1.52	(4)	0.00	(0)	4.000*
	Step D4	Providing the ability to change the skin colour or theme of the user's profile and/or app	1.89	(5)	2.79	(5)	0.000
	Step D5	Providing the ability to change the landing page of the app	0.38	(1)	1.68	(3)	1.000
	Step D6	Providing the ability to remove the profile picture, cover photo, and text description sections completely, to change the profile picture's border shape and to allow change to the title text's colour and font	0.38	(1)	0.00	(0)	1.000
Move E	Step E1	Providing the ability to switch between a private and public account or to manage the audience that can view or interact with published content and/or user activity and/or comments	7.95	(21)	8.38	(15)	1.000
	Step E2	Providing the ability to control the visibility of third-party content, that is published to a user's	1.52	(4)	1.12	(2)	0.667

		timeline, tagged to a user, or suggested about a user					
	Step E3	Providing the ability to control the visibility of a user's personal information	4.92	(13)	3.35	(6)	2.579
	Step E4	Providing the ability to control the visibility of a user's personal information when publishing a post	3.79	(10)	3.91	(7)	0.529
	Step E5	Providing the ability to control whether a user wants the private message or call functionality switched on and/or the ability to choose the audience	4.17	(11)	2.23	(4)	3.267
	Step E6	Providing the ability to turn on or off the ability to receive anonymous questions	1.14	(3)	0.56	(1)	1.000
	Step E7	Providing the ability to control whether a user can be found or suggested, via their name/id and/or email address and/or phone number	2.65	(7)	1.12	(2)	2.778
	Step E8	Providing the ability to control the visibility of a user's account on internal searches or external search engines	1.14	(3)	1.12	(2)	0.200
	Step E9	Providing the ability to add a passcode in order to access the app or a section inside the app	2.27	(6)	0.56	(1)	3.571
	Step E10	Providing the ability to control if a user can be followed or can be added as a friend	1.14	(3)	0.00	(0)	3.000
Move F	Step F1	Providing the ability to customise adverts by switching them on or off, partially or completely, and internally or externally	1.52	(4)	1.12	(2)	0.667
	Step F2	Providing the user with the ability to manage the advert preferences/interests	0.38	(1)	0.00	(0)	1.000
	Step F3	Providing the ability to change the audience that can view a user's social action paired with adverts	0.38	(1)	0.00	(0)	1.000
	Step F4	Providing the ability to choose if a video can auto-play	0.38	(1)	0.00	(0)	1.000
Move G	Step G1	Providing the ability to switch on or off the use of intelligent or external data for enhanced personalisation	1.14	(3)	0.56	(1)	1.000

Significance: Chi square value > 3.841 cut-off value. **Significance levels:** * p<.05 (High); ** p<.01 (Highest).

Appendix B:

Detailed Data & Examples

Information

Moves	Steps	Apps	Examples
Move A: Presenting information regarding user interactions in the main feed page	Step A1: Presenting the number of emotional responses received by a post	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Google+, ASKfm, YikYak, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu, Reddit (28)	Facebook displays the number of emotions received by a post, on the post's bottom far left side.
		Image Based: Instagram, Flipagram, Pinterest, Vine, musical.ly, YouNow, Flickr, Keek, GifBoom, Magisto, WedPics, Whisper, WeddingParty, Shou, Behance, Wishbone, 9GAG (17)	
	Step A2: Presenting the number of comments associated with a post	Text Driven: Facebook, MyFitnessPal, LinkedIn, Google+, Tapatalk, YikYak, BBM, Path, Kiwi,	

		KakaoStory, Quora, Zalo, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu, Reddit (25)	on the post's bottom mid right side.
		Image Based: Instagram, Flipagram, Vine, musical.ly, YouNow, Flickr, GifBoom, Boomcast, Magisto, WedPics, Whisper, 9GAG (12)	
	Step A3: Presenting the number of shares associated with a post	Text Driven: Facebook, Twitter, Google+, Kiwi, KakaoStory, LINE, Flipboard, tsu (8)	Twitter displays the number of times that a post has been shared, on the post's bottom mid left side.
		Image Based: Flipagram, Pinterest, Vine, Keek, GifBoom, Fling (6)	
Step A4: Presenting the number of views or viewers associated with a post	Text Driven: Facebook, Quora, FriendLife, Flurv, VirtualSpace (5)	YouTube displays the number of views a video has received, on the bottom mid right hand side of the video.	
	Image Based: YouTube, Flipagram, Vine, YouNow, Keek, Periscope, Boomcast, Shou (8)		
Step A5: Presenting the number of users following	Text Driven: Quora, SixString (2)	SixString displays the number of a user's	

	a post, user, or enrolled in a challenge	Image Based: YouNow, Camera360 (2)	followers, on the top far right hand side of the post.
	Step A6: Presenting the number of photos in a post	Text Driven: Facebook, Google+, KakaoStory, LINE (4)	WeHeartIt displays the number of photos which have been grouped on the far left hand side of the post.
		Image Based: Flickr, WeHeartIt (2)	
	Step A7: Presenting the combined number of hearts, comments, and shares associated with a post	Text Driven: Tumblr (1)	Tumblr displays the combined number of hearts, comments, and shares on the bottom far left hand side of a post.
		Image Based: (0)	
Move B: Presenting information regarding user interactions inside a single content page	Step B1: Presenting the number of emotional responses received by a post	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, ASKfm, Tapatalk, YikYak, BBM, KakaoStory, Zalo, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, SixString, tsu, Reddit (23)	BeFunky displays the number of hearts received by a post, on the post's bottom far left side.
		Image Based: YouTube, Vimeo, YouNow, Flickr, WeHeartIt, BeFunky, WedPics, Whisper, Shou, Behance, DeviantArt, 9GAG (12)	
	Step B2: Presenting the number of comments associated with a post	Text Driven: Facebook, MyFitnessPal, LinkedIn, Tapatalk, YikYak, BBM, KakaoStory, Quora, Zalo,	Flickr displays the number of comments received by a

		Fiesta, APEX, Flurv, Flipboard, VirtualSpace, SixString, tsu, Reddit (17)	post, on the post's bottom mid left side.	
		Image Based: YouTube, Vimeo, Flickr, BeFunky, Boomcast, WedPics, Whisper, Behance, DeviantArt, 9GAG (10)		
	Step B3: Presenting the number of shares associated with a post	Text Driven: Twitter, Tumblr, KakaoStory, LINE, Flipboard, tsu (6)	LINE displays the number of times that a post has been shared, on the post's bottom far left side.	
		Image Based: (0)		
	Step B4: Presenting the number of views or viewers associated with a post	Text Driven: Facebook, Quora, FriendLife, Flurv, VirtualSpace (5)	YouNow displays the number of viewers currently watching a live stream, on the top far right hand side of the screen.	
		Image Based: YouTube, Vimeo, YouNow, Flickr, Periscope, Camera360, Shou, Behance (8)		
	Step B5: Presenting the number of users following a post or a user	Text Driven: Quora, SixString (2)	SixString displays the number of fans following a user, on the top right hand side of the screen.	
		Image Based: (0)		
	Move C: Presenting user related information in the main feed and/or single content pages	Step C1: Presenting the location of a published post	Text Driven: Facebook, Twitter, Path, KakaoStory, Zalo, FriendLife, LINE, Moodswing, Swarm, Flurv, VirtualSpace, tsu (12)	VSCO displays the location from which a post viewed on a single content page has been published, on the bottom right hand side of the screen.
			Image Based: Snapchat, Instagram, Pinterest, Vine,	

		Flickr, Periscope, GifBoom, ShotsApp, Camera360, Fling, Whisper, VSCO, beme (13)	
Step C2: Presenting the time and/or date of a published post	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Google+, ASKfm, Tapatalk, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, LINE, Moodswing, Swarm, Fiesta, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu, Reddit (26)		Tsu displays the time in which a post was published, on the post's top left hand side.
	Image Based: Snapchat, Instagram, YouTube, Pinterest, Vimeo, Vine, YouNow, Flickr, WeHeartIt, BeFunky, Keek, Periscope, GifBoom, Camera360, Magisto, Whisper, WeddingParty, ShotsApp, VSCO, DeviantArt, beme (21)		
Step C3: Presenting the location of a published comment or reply	Text Driven: Path (1)		Path displays the location from which a comment was posted, on the right hand side of the comment.
	Image Based: beme (1)		
Step C4: Presenting the time and/or date of a	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Google+, Tapatalk, BBM, Path,		LinkedIn displays the time of a published comment,

	<p>published comment, reply, or answer</p>	<p>Kiwi, KakaoStory, Quora, Zalo, FriendLife, LINE, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, tsu, Reddit (24)</p> <p>Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, YouNow, Flickr, BeFunky, Keek, GifBoom, Boomcast, Magisto, Whisper, Shou, Behance, DeviantArt, 9GAG (18)</p>	<p>on the post's top far right hand side.</p>
	<p>Step C5: Presenting the user's social media handle, job title, age, location, or credentials</p>	<p>Text Driven: LinkedIn, Twitter, Quora, Flurv, Flipboard, SixString (6)</p> <p>Image Based: WeHeartIt, Periscope, Fling (3)</p>	<p>WeHeartIt displays the user's social media handle in the single content page, on the bottom far left hand side of the screen</p>
<p>Move D: Presenting user information in the profile pages</p>	<p>Step D1: Presenting the user's username, profile URL, or social media handle</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, ASKfm, Tapatalk, BBM, Kiwi, FriendLife, InstaMine, SixString, tsu (13)</p> <p>Image Based: Snapchat, Instagram, Flipagram, Pinterest, Vine, musical.ly, WeHeartIt, BeFunky, Keek, Periscope, GifBoom, Boomcast, Camera360, Magisto, Fling, Shou, ShotsApp,</p>	<p>ASKfm displays the user's social media handle at the top centre of the profile page.</p>

		Wishbone, DeviantArt, beme, 9GAG (21)	
Step D2: Presenting the number of friends and/or followers, or connections of a user	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Google+, Tapatalk, Kiwi, KakaoStory, Quora, FriendLife, Swarm, Fiesta, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu (19)		Instagram displays whom the user follows and the number of a user's followers, on the top right hand side of the screen.
	Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, YouNow, Flickr, WeHeartIt, BeFunky, Keek, Periscope, GifBoom, Boomcast, Magisto, Fling, Shou, Behance, Wishbone, DeviantArt, beme (22)		
Step D3: Presenting a number or list of mutual friends	Text Driven: Facebook, LinkedIn, Google+, Path (4)		Facebook displays the number of mutual friends, on the top mid left hand side of the Friends section.
	Image Based: (0)		
Step D4: Presenting the user's first and/or last login time or date, and/or online status	Text Driven: Facebook, MyFitnessPal, Tapatalk, BBM, Path, Fiesta, SixString, Reddit (8)		Fiesta displays if the user is active and when the user was active last, on the top centre of the profile page.
	Image Based: Flickr, Shou, Behance, DeviantArt (4)		

	<p>Step D5: Presenting the user's home town and/or current living location and/or distance away from a user</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Google+, ASKfm, Tapatalk, KakaoStory, Quora, FriendLife, Moodswing, Swarm, Fiesta, APEX, Flurv, SixString, tsu (17)</p>	<p>Behance displays the user's country and city location, on the top left hand side of the profile information section.</p>
		<p>Image Based: Pinterest, Vimeo, Vine, YouNow, WeHeartIt, GifBoom, Fling, Behance, DeviantArt (9)</p>	
	<p>Step D6: Presenting the user's short biography, description, message, or headline with a certain limit on characters</p>	<p>Text Driven: Facebook, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Kiwi, KakaoStory, Quora, FriendLife, LINE, Fiesta, Flipboard, InstaMine, Scutify, tsu (16)</p>	<p>FriendLife displays the user's description, in the centre of a profile information section.</p>
	<p>Image Based: Instagram, YouTube, Flipagram, Pinterest, Vine, musical.ly, YouNow, WeHeartIt, BeFunky, Periscope, Boomcast, ShotsApp, VSCO, Behance, DeviantArt, beme (16)</p>		
<p>Step D7: Presenting fields with lengthy text of over 500 characters about the</p>	<p>Text Driven: Facebook, Quora, Moodswing, APEX (4)</p>	<p>Facebook displays the user's Favourite Quotes section in the About</p>	

	<p>user, such as: biography, about, summary, description and, favourite quotes</p>	<p>Image Based: Vimeo, Flickr, GifBoom, Shou, DeviantArt (5)</p>	<p>section of the user's profile.</p>
	<p>Step D8: Presenting the user's posts, and/or activity, and/or re-shares in amount or list format</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu, Reddit (29)</p> <p>Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, YouNow, Flickr, WeHeartIt, BeFunky, Keek, GifBoom, Camera360, Magisto, WedPics, Fling, WeddingParty, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, beme, 9GAG (26)</p>	<p>Vine displays the user's posts and re-shares consecutively on the bottom of the user's profile page, underneath the user's profile information.</p>
	<p>Step D9: Presenting the user's basic details, such as: birthday, gender, gender interest, marital status, languages, religious</p>	<p>Text Driven: Facebook, Twitter, Google+, Tapatalk, KakaoStory, Moodswing, Fiesta, Flurv, tsu (9)</p>	<p>Facebook displays the user's basic information along with a relationship status, family members, and other user related</p>

	views, family members, height, ethnicity, and body type	Image Based: (0)	information found in the About section of the user's profile.
	Step D10: Presenting the user's personal contact details, such as: website, email, phone, address, other social media handles or links and/or feeds	Text Driven: Facebook, LinkedIn, Twitter, Google+, ASKfm, Hike, Quora, Swarm, APEX, SixString, Scutify, tsu (12)	Flipagram displays links to the user's other social media accounts on the mid right hand side of the profile.
		Image Based: Instagram, Flipagram, musical.ly, YouNow, Pinterest, WeHeartIt, GifBoom, VSCO, Behance, DeviantArt (10)	
	Step D11: Presenting the user's interests, groups, or forums	Text Driven: Facebook, LinkedIn, Tapatalk, FriendLife, APEX, Flurv, SixString, Scutify (8)	LinkedIn displays the user's joined groups in a groups section on the profile page.
		Image Based: YouTube, Shou, DeviantArt (3)	
	Step D12: Presenting the user's post check-in locations or frequency	Text Driven: Facebook, Swarm (2)	Instagram displays the location in which a photo was uploaded.
		Image Based: Instagram (1)	
	Step D13: Presenting the user's experience level, job, professional skills, and/or academic certifications	Text Driven: Facebook, LinkedIn, Google+, Tapatalk, KakaoStory, Quora, SixString, tsu (8)	KakaoStory displays the user's work and academic information in the user's profile page.
		Image Based: Behance, DeviantArt (2)	

	Step D14: Presenting the user's subscription type	Text Driven: Tapatalk (1) Image Based: Vimeo, DeviantArt (2)	Vimeo displays the type of subscription being used, as indicated on the right hand side of the user's display name.
Move E: Presenting a snippet or details of user activity towards others in the main feed	Step E1: Highlighting a user's comment or response	Text Driven: Facebook, LinkedIn, Google+, Path, Quora, Flurv (6) Image Based: Instagram, Flickr, Magisto, beme (4)	Facebook shows the user a preview of some of the comments associated with a post.
	Step E2: Highlighting the emotional response to a post by a user or users	Text Driven: Facebook, LinkedIn, ASKfm, Tapatalk, KakaoStory (5) Image Based: (0)	LinkedIn displays a content that another user has liked and that they have liked it.
	Step E3: Highlighting when a user subscribes to a channel	Text Driven: KakaoStory (1) Image Based: (0)	KakaoStory displays a content to which another user has subscribed and that they have subscribed to it.
Move F: Providing third-party advertisements	Step F1: Presenting advertisements inside a feed	Text Driven: Facebook, LinkedIn, Twitter, Tumblr, BBM, Kiwi, Fiesta, Flurv, InstaMine, tsu (10) Image Based: Snapchat, Instagram, YouTube, WeHeartIt, GifBoom, WedPics, 9GAG (7)	WedPics presents the user with advertisements in the form of content inside its home feed.
	Step F2: Presenting advertisements in the	Text Driven: YouTube (1) Image Based: (0)	YouTube launches a video advertisement segment within the video at hand.

	middle or immediately after initiating a video		
	<p>Step F3: Presenting advertisements which are separate from the content and may exist outside the vicinity of the application’s layout or in the form of a pop-up</p>	<p>Text Driven: ASKfm, Flurv, InstaMine (3)</p>	<p>Flurv displays a rectangular horizontal advertisement banner layed out at the bottom of the screen.</p>
		<p>Image Based: GifBoom, Wishbone, 9GAG (3)</p>	

Navigation

Moves	Steps	Apps	Examples
<p>Move A: Establishing a sense of location or site root starting from the feed page</p>	<p>Step A1: Presenting a horizontal bottom main menu bar or symbols which may be action driven</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapataalk, YikYak, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, InstaMine, SixString, Scutify, tsu, Reddit (28)</p>	<p>Quora utilises a bottom horizontal main menu bar which includes 4 menu tabs.</p>
	<p>Image Based: Instagram, Flipagram, Pinterest, Vimeo, Vine, musical.ly, Flickr, WeHeartIt, Keek, Periscope, GifBoom, Boomcast, Camera360, Magisto, WedPics, Fling, Whisper, WeddingParty, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, 9GAG (25)</p>		
	<p>Step A2: Presenting a horizontal header main menu bar or symbols which may be action driven</p>	<p>Text Driven: Hike, VirtualSpace (2)</p>	<p>YouTube utilises a horizontal header main menu bar which includes 4 menu tabs.</p>
		<p>Image Based: Snapchat, YouTube, YouNow, BeFunky, beme (5)</p>	
	<p>Step A3: Presenting a horizontal additional</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn,</p>	<p>Twitter utilises a header menu which contains 4</p>

	header menu which may contain action driven tabs	Twitter, Google+, ASKfm, Tapatalk, YikYak, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, InstaMine, SixString, Scutify, tsu, Reddit (26)	action driven buttons including the twitter logo which updates the feed with the latest content.
		Image Based: Instagram, Pinterest, Vimeo, Keek, Boomcast, Camera360, Vine, musical.ly, WedPics, Fling, Whisper, WeddingParty, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, 9GAG (18)	
	Step A4: Presenting a horizontal additional bottom menu bar or single tab which are action driven	Text Driven: Google+, VirtualSpace (2)	VirtualSpace has an action driven button on the bottom right hand side of the screen which allows the user to publish content.
		Image Based: YouTube, beme (2)	
Move B: Utilising hand gestures for accessing menu tabs	Step B1: Swiping left and right between main menu tabs and via single tap	Text Driven: (0)	YouTube utilises the swipe ability, it allows users to navigate between its main menu tabs with ease.
		Image Based: Snapchat, YouTube, YouNow, Camera360 (4)	
	Step B2: Swiping left and right between sub menu tabs and via single tap	Text Driven: Twitter, Tumblr, Google+, Kiwi, Quora, Moodswing, Flipboard, Reddit (8)	Whisper utilises the swipe ability, it allows users to navigate between sub menu tabs of different content categories with ease.
Image Based: Instagram, musical.ly, Flickr,			

		WeHeartIt, Keek, Whisper, VSCO, DeviantArt, 9GAG (9)	
	<p>Step B3: Using single taps only, on the main menu tabs</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, YikYak, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu, Reddit (30)</p>	<p>LINE allows its users to navigate from one menu tab to the next via single taps only.</p>
		<p>Image Based: Instagram, Flipagram, Pinterest, Vimeo, Vine, musical.ly, Flickr, WeHeartIt, BeFunky, Keek, Periscope, GifBoom, Boomcast, Magisto, WedPics, Fling, Whisper, WeddingParty, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, beme, 9GAG (26)</p>	
	<p>Step B4: Using single taps only, on sub menu tabs</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, ASKfm, Tapatalk, YikYak, BBM, Path, KakaoStory, Zalo, Hike, FriendLife, LINE, Swarm, Fiesta, APEX, Flurv,</p>	<p>Vimeo allows its users to navigate from one sub menu tab to the next via single taps only.</p>

		VirtualSpace, InstaMine, SixString, Scutify, tsu (22)	
		Image Based: Snapchat, YouTube, Flipagram, Pinterest, Vimeo, Vine, YouNow, BeFunky, Periscope, GifBoom, Boomcast, Camera360, Magisto, WedPics, Fling, WeddingParty, Shou, ShotsApp, Behance, Wishbone, beme (21)	
	Step B5: Swiping left and/or right to access an extension of the header menu or main menu	Text Driven: Facebook, ASKfm, BBM, APEX, tsu (5)	WeddingParty presents a vertical menu after the user swipes to the right on the home page.
		Image Based: Vine, WedPics, WeddingParty, VSCO (4)	
Move C: Utilising hand gestures for navigating through media content	Step C1: Swiping left and right in specific menu page and feed areas where swiping up and down is the primary browsing interaction	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Tapatalk, Kiwi, Quora, FriendLife, Fiesta, Scutify (11)	Facebook allows users to browse mainly up-down, also left-right through certain areas of its news feed, such as the “People you may know” section.
		Image Based: Snapchat, YouTube, Flipagram, Pinterest, Vimeo, YouNow, WeHeartIt, Whisper, 9GAG (9)	
	Step C2: Swiping up and down as the only browsing interaction for menu pages and feeds	Text Driven: Google+, ASKfm, YikYak, BBM, Path, KakaoStory, Hike, Zalo, LINE, Moodswing, Swarm, APEX, Flurv,	DeviantArt allows its users to browse through its photo feed via swiping up and down.

		Flipboard, VirtualSpace, InstaMine, SixString, tsu, Reddit (19)	
		Image Based: Instagram, Vine, musical.ly, Flickr, BeFunky, Keek, Periscope, GifBoom, Boomcast, Camera360, Magisto, WedPics, Fling, WeddingParty, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, beme (21)	
Step C3: Swiping left and right through different posts and/or comments	Text Driven: Twitter, Tapatalk, Fiesta (3)	Image Based: Snapchat, Pinterest, Vine, YouNow, Flickr, WeHeartIt, WedPics, Whisper, WeddingParty, DeviantArt, 9GAG (11)	Pinterest allows users to swipe left and right through its content.
Step C4: Swiping left and right through a single post's images	Text Driven: Facebook, Tumblr, Tapatalk, KakaoStory, Zalo, VirtualSpace (6)	Image Based: Behance (1)	Zalo allows the user to swipe left and right through a single post's content.
Step C5: Swiping up and down from one full screen post to the next	Text Driven: (0)	Image Based: Flipagram, musical.ly, Fling (3)	Musical.ly allows the user to browse its feed via swiping up and down.

	Step C6: Swiping in any direction to proceed to the next content	Text Driven: Fiesta (1)	Fiesta allows you to swipe in any direction when flipping through other user profiles.
		Image Based: (0)	
	Step C7: Tapping once anywhere on the screen to move through a single post's images or videos	Text Driven: (0)	Snapchat allows the user to either wait for the next content to play or to move to the next via a single tap.
		Image Based: Snapchat (1)	
	Step C8: Swiping left and right to move through a video	Text Driven: (0)	Flipagram rewinds and forwards a video when a left and right swipe is applied, as indicated by the thin horizontal bar on the top of the screen.
		Image Based: Flipagram (1)	
Move D: Utilising hand gestures for navigating out of media content	Step D1: Tapping or releasing one's finger only, in order to go back or exit a photo, video or multi-media post	Text Driven: MyFitnessPal, Google+, Tapataalk, YikYak, Kiwi, FriendLife, Moodswing, Swarm, APEX, Flurv, VirtualSpace, InstaMine, SixString, Scutify, tsu (15)	MyFitnessPal allows the user to go back by tapping once on an arrow located on the top left hand side of the screen.
		Image Based: Flipagram, Pinterest, Vimeo, musical.ly, YouNow, WeHeartIt, BeFunky, Keek, GifBoom, Boomcast, Camera360, Fling, Whisper, WeddingParty, Shou, ShotsApp, DeviantArt (17)	
	Step D2: Swiping right to go back or exit a photo, video or multi-media post	Text Driven: Facebook, Twitter, BBM, Quora, Flipboard (5)	Vine allows the user to exit the comments section

		Image Based: Instagram, Vine (2)	and go back to the video content by swiping right.
	Step D3: Swiping up and/or down, or left to go back, or exit a photo or video post	Text Driven: LinkedIn, ASKfm, Twitter, Tumblr, Path, KakaoStory, Zalo, Hike, LINE, Fiesta (10)	Hike allows the user to exit a photo via swiping up or down.
		Image Based: Snapchat, YouTube, Flickr, Periscope, Magisto, WedPics, VSCO, Behance, 9GAG (9)	
	Step D4: Swiping in any direction to go back or exit a photo post	Text Driven: Reddit (1)	Reddit allows the user to easily exit a photo via a free directional swipe.
		Image Based: (0)	
	Step D5: Closing a video by moving it to the centre of the screen	Text Driven: Facebook (1)	Facebook allows the user to close a minimised video by dragging it to the centre of the screen where a big x symbol appears.
		Image Based: (0)	
Move E: Utilising the search element in terms of locality	Step E1: Presenting a main search icon or bar on a main menu or additional header menu that appears at a frequency of 2 times or less	Text Driven: Facebook, MyFitnessPal, YikYak, BBM, Path, Kiwi, Zalo, Hike, LINE, Swarm, APEX, Flurv, VirtualSpace, InstaMine, SixString, Reddit (16)	Facebook utilises a search bar on its header menu which appears at a frequency of 2 times, once on the news feed page and the other on the more page.
		Image Based: Snapchat, YouNow, BeFunky, Keek, Periscope, GifBoom, Boomcast, Shou, VSCO, DeviantArt, beme (11)	

	<p>Step E2: Presenting a main search bar or icon that stays constant or appears at a frequency of 3 or more times when moving from one main menu or additional header menu to the next</p>	<p>Text Driven: LinkedIn, Twitter, Tumblr, Google+, Tapatalk, KakaoStory, Quora, FriendLife, Moodswing, Fiesta, Flipboard, Scutify, tsu (13)</p>	<p>Behance’s search icon stays fixed in the same header position and appears at a frequency of 4 times as the user taps through the main menu pages.</p>
		<p>Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, Flickr, WeHeartIt, Whisper, Behance, 9GAG (12)</p>	
	<p>Step E3: Presenting a search bar on the profile pages of other users</p>	<p>Text Driven: Facebook, LinkedIn, Twitter (3)</p>	<p>LinkedIn provides a search bar on the header of other user’s profiles.</p>
		<p>Image Based: YouTube, Vimeo (2)</p>	
<p>Step E4: Presenting a search filter bar or icon on top of a visible list</p>	<p>Text Driven: Facebook, Twitter, Tumblr, ASKfm, BBM, Path, KakaoStory, Zalo, Hike, LINE, Swarm, Fiesta, Flurv (13)</p>	<p>WeHeartIt provides a search bar at the top of the screen so that the user can search others.</p>	
	<p>Image Based: Snapchat, Instagram, YouTube, Pinterest, Vimeo, Vine, WeHeartIt, WedPics, ShotsApp, Wishbone (10)</p>		
<p>Step E5: Presenting a tucked or hidden search bar on a main menu page</p>	<p>Text Driven: LINE (1)</p>	<p>Snapchat’s top search bar only appears after the user swipes down for it to appear.</p>	
	<p>Image Based: Snapchat, WeHeartIt, beme (3)</p>		

<p>Move F: Utilising the search element in terms of its usefulness</p>	<p>Step F1: Providing a dynamic main search bar or icon that instantly presents different custom categories related to a single search and/or presents trending topics, and/or provides a customisable search filter where a single search can be filtered in more detail and/or sorted differently.</p>	<p>Text Driven: Facebook, LinkedIn, Twitter, Tumblr, Google+, Tapatalk, BBM, Path, Kiwi, KakaoStory, Quora, FriendLife, LINE, Swarm, Flurv, Flipboard, tsu, Reddit (18)</p>	<p>Facebook provides a dynamic search bar which displays trending topics.</p>
		<p>Image Based: Snapchat, Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, Flickr, WeHeartIt, BeFunky, Keek, VSCO, Behance, DeviantArt (15)</p>	
	<p>Step F2: Providing a main search bar or icon which searches through a single category only or at a time</p>	<p>Text Driven: MyFitnessPal, ASKfm, YikYak, Zalo, Hike, Moodswing, Fiesta, APEX, VirtualSpace, InstaMine, SixString, Scutify (12)</p>	<p>Periscope presents the user with a vertical list of users relevant to the search at hand.</p>
		<p>Image Based: YouNow, Periscope, GifBoom, Boomcast, Whisper, Shou, Behance, beme, 9GAG (9)</p>	
	<p>Step F3: Providing a list of previously, recently, or last searched items</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Google+, Tapatalk, Path, Kiwi, KakaoStory, LINE, Fiesta, Flipboard (12)</p>	<p>Vimeo provides a list of the user’s previously searched topics.</p>
		<p>Image Based: Instagram, YouTube, Pinterest,</p>	

		Vimeo, Vine, WeHeartIt, GifBoom, Boomcast, Whisper, DeviantArt (10)	
Step F4: Suggesting potential search words and/or live filtering as the user types	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Tapatalk, YikYak, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Swarm, Fiesta, APEX, Flurv, Flipboard, tsu, Reddit (22)	Image Based: Snapchat, Instagram, YouTube, Flipagram, Pinterest, Vine, musical.ly, YouNow, WeHeartIt, Periscope, Shou, VSCO, DeviantArt, beme (14)	Pinterest suggests words that could potentially refine the user's search.
Step F5: Providing a speech recognition system for search	Text Driven: (0)	Image Based: YouTube (1)	YouTube presents the user with a useful mic tool located on the top right hand side of the screen, which searches for words or a sentence based on the user's vocalisation.

Engagement

Moves	Steps	Apps	Examples
<p>Move A: Presenting interaction shortcuts on the main feed page</p>	<p>Step A1: Utilising the ability to express an emotion, such as “Like” or voting</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, YikYak, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, SixString, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, Scutify, tsu, Reddit (29)</p>	<p>Keek provides the user with a heart symbol in which they can tap, located on the bottom far left hand side of the post’s section.</p>
	<p>Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, Flickr, WeHeartIt, Keek, GifBoom, Magisto, WedPics, Fling, Whisper, WeddingParty, ShotsApp, 9GAG, Wishbone (19)</p>		
	<p>Step A2: Utilising the ability to comment, reply, or answer</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, YikYak, Path, Kiwi, KakaoStory, Quora, Zalo, FriendLife, LINE, SixString, Moodswing, Fiesta, APEX, Flurv, Flipboard, VirtualSpace,</p>	<p>Kiwi provides the user with the ability to reply by typing. This is done after tapping on the rectangular chat box symbol, located on the bottom mid right hand side of the post.</p>

		InstaMine, Scutify, tsu, Reddit (25)	
		Image Based: Instagram, Flipagram, Pinterest, Vine, musical.ly, Flickr, Keek, GifBoom, Boomcast, Magisto, WedPics, Whisper, WeddingParty, ShotsApp, 9GAG, DeviantArt, beme (17)	
Step A3: Sharing instantly to an app's internal feed	Text Driven: Facebook, Twitter, Tumblr, Kiwi, tsu (5)	Image Based: Flipagram, Vine, Keek, Magisto, Fling (5)	Magisto allows the user to re-share existing content by tapping on the re-share symbol which is represented by a left and right arrow on top of each other, located on the bottom left hand side of the post.
Step A4: Utilising the ability to save or favour content	Text Driven: Facebook, MyFitnessPal, KakaoStory, Quora, Hike, Flipboard (6)	Image Based: YouTube, Pinterest, Vimeo, GifBoom, Magisto, WedPics, WeddingParty, DeviantArt (8)	KakaoStory allows the user to add feed content to their favourites section by tapping on the three dots symbol located on the top far right hand side of the post and then tapping "Add to Favorites".
Step A5: Utilising the ability of adding or following a user	Text Driven: Facebook, LinkedIn, Tumblr, SixString, Tapatalk, FriendLife (6)		Flipagram allows the user to quickly follow another user by tapping on the add user symbol located on the

		Image Based: Flipagram, Pinterest, Magisto, Fling (4)	top right hand side of the screen.
	Step A6: Utilising the ability of subscribing to an interaction or turning on a post notification	Text Driven: Facebook, Tapatalk, Quora (3)	Instagram allows the user to turn on notifications from a post by tapping on the three dots symbol located on the top far right hand side of the post, and then tapping the option “Turn on Post Notifications”.
		Image Based: Instagram (1)	
	Step A7: Utilising the ability of hiding a post	Text Driven: Facebook, LinkedIn, Tapatalk, Zalo, Hike, APEX, Reddit (7)	LinkedIn allows the user to hide a post by tapping on the three dots symbol located on the top far right hand side of the post, and then tapping on “Hide this Update”.
		Image Based: YouTube (1)	
	Step A8: Utilising the ability of unfollowing specific posts	Text Driven: Facebook, LinkedIn, Flipboard (3)	Flipboard allows the user to mute all updates received from a user by tapping on the arrow on the top far right corner of the post and then tapping on the mute function.
Image Based: WeHeartIt (1)			
Step A9: Utilising the ability of reporting or flagging a post	Text Driven: Facebook, MyFitnessPal, LinkedIn, ASKfm, Kiwi, KakaoStory, Quora, Zalo FriendLife, Fiesta, APEX, Flurv, Flipboard, InstaMine, Scutify, tsu, Reddit (17)	GigBoom allows the user to flag content by tapping on the three dots symbol located on the bottom right hand side of the post, and then tapping the “Flag” option.	

		Image Based: Instagram, Flipagram, Pinterest, Vine, Keek, GifBoom, Magisto, Fling, Whisper, Wishbone, beme, 9GAG (12)	
	Step A10: Utilising the ability of viewing a post's edit history or log	Text Driven: Facebook, Quora (2)	Facebook allows the user to view edited versions of a post by tapping on an arrow symbol, located on the post's top right hand side, and then tapping the "View edit history" button.
		Image Based: (0)	
	Step A11: Utilising the ability of sending a private message	Text Driven: Facebook, LinkedIn, Twitter, Tumblr, ASKfm, Quora, Flipboard (7)	Twitter allows the user to privately send a note alongside a piece of content to another user. This process can be initiated by tapping on the envelope symbol on the bottom right hand side of the post.
		Image Based: Snapchat, Instagram, Flipagram, Vine, musical.ly, Whisper, DeviantArt (7)	
	Step A12: Utilising the ability of unfollowing or blocking a user	Text Driven: Tapatalk, Fiesta (2)	WeHeartIt allows the user to unfollow another user by tapping on the three dots on the top far right corner of the post and then tapping on the "Unfollow user" button.
		Image Based: YouTube, WeHeartIt, Fling (3)	
Move B: Sharing existing media content		Text Driven: Facebook, LinkedIn, Twitter, Tumblr, Google+, KakaoStory,	LinkedIn allows its users to associate text with a piece of content that is

	Step B1: Sharing internally with the ability of adding text	Zalo, LINE, Fiesta, VirtualSpace (10)	being shared, by typing in a text section located on the top of the page.
		Image Based: GifBoom, DeviantArt (2)	
	Step B2: Sharing internally and to external social networking apps in one action	Text Driven: Tumblr (1)	Tumblr allows its users to re-share content and to select whether they want it shared to Facebook and/or Twitter, by tapping on the relevant social media logo icon appearing on the top right hand side of the page.
		Image Based: Vine (1)	
	Step B3: Sharing externally to other social networking apps	Text Driven: MyFitnessPal, Tumblr, Google+, ASKfm, Tapatalk, Kiwi, KakaoStory, Quora, FriendLife, APEX, Flipboard, VirtualSpace, SixString, tsu, Reddit (15)	Periscope allows the user to share content to one social network by tapping on the content's share button and then choosing a social network.
		Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, YouNow, Flickr, WeHeartIt, BeFunky, Keek, Periscope, GifBoom, Boomcast, Camera360, Magisto, WedPics, Whisper, WeddingParty, Shou, VSCO, Behance, Wishbone, DeviantArt, 9GAG (26)	

	Step B4: Sharing via link, such as copying, messaging, or emailing	Text Driven: Facebook, LinkedIn, Tumblr, Google+, ASKfm, Tapatalk, Kiwi, KakaoStory, Quora, FriendLife, APEX, Flipboard, VirtualSpace, SixString, tsu, Reddit, Magisto, Whisper (18)	Wishbone allows the user to copy a content’s link by tapping on the three dots symbol located on the bottom right hand side of the content and then tapping the share button followed by the “Copy link to clipboard” button.
		Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, YouNow, Flickr, WeHeartIt, Keek, Periscope, GifBoom, Boomcast, WedPics, WeddingParty, Shou, VSCO, Behance, Wishbone, DeviantArt, 9GAG (22)	
	Step B5: Sharing via internal message	Text Driven: Facebook, LinkedIn, Twitter, Tumblr, ASKfm, YikYak, Kiwi, Quora, LINE, Fiesta, Flipboard (11)	Instagram allows the user to send an existing post privately with a comment to another user, this can be accessed by tapping on the curved arrow symbol located on the bottom left hand side of the post section and then selecting the recipient.
		Image Based: Snapchat, Instagram, Pinterest, Vine, YouNow, ShotsApp, DeviantArt, Flipagram, Whisper (9)	
Move C: Publishing content	Step C1: Providing the ability to post multiple	Text Driven: Google+, Tapatalk, LINE (3)	Google+ allows the user to select multiple photos and

	photos and videos associated with a text, all at once	Image Based: Flipagram, Flickr, Magisto (3)	videos from the user's phone via single taps, afterwards it presents the user with the text and posting page.
	Step C2: Providing the ability to post a maximum of one photo associated with a text at a time	Text Driven: MyFitnessPal, LinkedIn, ASKfm, YikYak, BBM, Path, Kiwi, Quora, Hike, FriendLife, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, InstaMine, SixString, Scutify, tsu, Reddit (21)	Pinterest allows the user to select a single photo from the user's phone via a single tap, afterwards it presents the user with the text and posting page.
		Image Based: Snapchat, Instagram, Pinterest, YouNow, WeHeartIt, BeFunky, Boomcast, Camera360, Fling, Whisper, WeddingParty, ShotsApp, VSCO, Wishbone, DeviantArt, 9GAG (16)	
	Step C3: Providing the ability to post multiple photos associated with a text at a time	Text Driven: Facebook, Twitter, Tumblr, Google+, Tapatalk, KakaoStory, Zalo, LINE, VirtualSpace (9)	VirtualSpace allows the user to select multiple photos from the user's phone via single taps, afterwards it presents the user with the text and posting page.
		Image Based: Flickr, WedPics, Behance (3)	
	Step C4: Providing the ability to post a maximum	Text Driven: Twitter, Tumblr, ASKfm, Kiwi,	Snapchat allows the user to record a short video and

	of only one video associated with a text at a time	KakaoStory, InstaMine, SixString (7)	associate it with text before posting.
		Image Based: Snapchat, Instagram, YouTube, Flipagram, Vimeo, Vine, musical.ly, YouNow, Keek, Periscope, GifBoom, Boomcast, Magisto, WedPics, Fling, Shou, ShotsApp, beme (18)	
	Step C5: Providing the ability to tag or mention another user in a post	Text Driven: Facebook, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Path, KakaoStory, Quora, Zalo, FriendLife, Swarm, InstaMine, SixString, Scutify, tsu (16)	Twitter allows the user to mention another user in a post simply by adding the “@” symbol and then choosing or typing a user’s twitter name.
		Image Based: Instagram, Flipagram, Vine, musical.ly, Keek, GifBoom, WedPics, DeviantArt (8)	
	Step C6: Providing the ability to post pre-set multimedia	Text Driven: Facebook, Tumblr, BBM, Path, KakaoStory, Zalo, Hike, LINE, Moodswing, Swarm (10)	Vine allows the user to associate music with a video by tapping on the note symbol located on the bottom left hand side of the screen and then adding music from a selection.
		Image Based: Snapchat, Flipagram, Vine, musical.ly, GifBoom, Boomcast, Whisper (7)	

	<p>Step C7: Providing the ability to associate a location</p>	<p>Text Driven: Facebook, Twitter, Path, KakaoStory, Zalo, LINE, Moodswing, Swarm, VirtualSpace, tsu (10)</p>	<p>Flickr allows the user to choose a location from a selection of surrounding venues by tapping on the location symbol located on the bottom right hand side of the publishing section.</p>
		<p>Image Based: Snapchat, Instagram, Pinterest, Vine, Flickr, Periscope, GifBoom, ShotsApp, VSCO (9)</p>	
	<p>Step C8: Providing the ability to adjust the scope of the target audience</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Google+, KakaoStory, Zalo, LINE (7)</p>	<p>KakaoStory allows the user to specify who is able to see a post, by tapping on the very top centre of the screen where the default setting is set to public and applying the audience change from there.</p>
		<p>Image Based: YouTube, Vimeo, Flickr, Periscope (4)</p>	
	<p>Step C9: Providing the ability to post to one or more external social networks</p>	<p>Text Driven: MyFitnessPal, LinkedIn, Tumblr, ASKfm, Path, Kiwi, Zalo, FriendLife, Swarm, Flurv, tsu (11)</p>	<p>MyFitnessPal allows the user to post internally and to social networks such as Facebook and Twitter, by tapping on the relevant social network icon and then following its prompts.</p>
		<p>Image Based: Instagram, Pinterest, Vine, musical.ly, YouNow, Flickr, WeHeartIt, Keek, Periscope, GifBoom, WedPics, WeddingParty, VSCO, Behance, Wishbone (15)</p>	

	Step C10: Providing the ability to record and post audio with text	Text Driven: Zalo, SixString (2)	Zalo allows the user to record audio by tapping on the small microphone symbol located on the very bottom mid-section of the post creation page.
		Image Based: (0)	
	Step C11: Providing the ability to stream a live video	Text Driven: Facebook, FriendLife (2)	Periscope allows the user to access the live stream page by tapping on the camera icon on its main menu and then starting the broadcast when ready.
		Image Based: YouNow, Periscope, Shou (3)	
	Step C12: Providing the ability to associate a hashtag to a post.	Text Driven: Facebook, Twitter, Google+, Path, KakaoStory, MoodSwing, Flipboard, VirtualSpace, InstaMine, tsu (10)	Instagram allows the user to add hashtags in the caption text area of a photo or video, the user is presented with hashtag options as they type.
		Image Based: Instagram, Flipagram, Vine, musical.ly, YouNow, Flickr, BeFunky, Keek, GifBoom, Fling, VSCO, DeviantArt (12)	
	Step C13: Providing the ability to associate a tag to a post.	Text Driven: Tumblr, Kiwi, FriendLife (3)	YouTube allows the user to associate tags with a video.
		Image Based: YouTube, WeHeartIt, BeFunky, Behance, DeviantArt, 9GAG (6)	
		Text Driven: Reddit, Tapatalk (2)	Reddit allows the user to associate a post with a

	Step C14: Providing the ability to associate a community topic to a post	Image Based: (0)	community-generated category.
	Step C15: Providing the ability to associate a pre-set categorisation to a post.	Text Driven: MoodSwing, Flipboard, VirtualSpace, SixString (4)	MoodSwing allows the user to associate a pre-set mood categorisation with a photo post while composing it.
		Image Based: Pinterest, Vine, WeHeartIt, Camera360, Behance, DeviantArt, 9GAG (7)	
Move D: Interacting with user profiles	Step D1: Providing the ability to message a user privately	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, Path, Kiwi, KakaoStory, Zalo, Hike, FriendLife, LINE, Moodswing, Swarm, Fiesta, Flurv, VirtualSpace, InstaMine, Scutify, tsu, Reddit (24)	InstaMine provides the user with the option of messaging another user by tapping on a symbol located on the top far right hand side of the user's profile page.
		Image Based: Snapchat, Instagram, Vine, WeHeartIt, Keek, GifBoom, Behance, DeviantArt (8)	
	Step D2: Providing the ability to interact quickly	Text Driven: Facebook, LinkedIn, KakaoStory, Hike, LINE, Flurv (6)	Image Based: (0)

	Step D3: Providing the ability to share a user’s profile	Text Driven: LinkedIn, Twitter, Tumblr, Kiwi, KakaoStory, Quora, Fiesta, Flipboard, VirtualSpace (9)	Beme provides the user with the ability to copy the link of another user’s profile page for use elsewhere, this can be accessed by tapping on the three dots symbol located on the top right hand side corner of the user’s profile page.
		Image Based: Instagram, Flipagram, Pinterest, Vine, musical.ly, Periscope, VSCO, Behance, Wishbone, beme, 9GAG (11)	
	Step D4: Providing the ability to view all posts associated between two users	Text Driven: Facebook (1)	Facebook provides the user with the ability to view all available content of themselves and another selected user together on a single page, by tapping on the “See Friendship” button from the selected user’s profile page.
		Image Based: (0)	
Step D5: Providing the ability to publish multimedia content onto another user’s profile page	Text Driven: Facebook, MyFitnessPal (2)	MyFitnessPal provides the user with the ability to post text onto a friend’s profile page by writing text into the comment box located at the bottom of that page.	
	Image Based: YouNow, GifBoom (2)		
Step D6: Providing the ability to interact with a user’s content	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Swarm, Fiesta, Flipboard, VirtualSpace,	Path provides the user with the ability to interact with content available on a friend’s profile page by commenting and associating emotions such as a heart or smiley face.	

		<p>InstaMine, SixString, Scutify, tsu, Reddit (25)</p>	
		<p>Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, YouNow, Flickr, WeHeartIt, BeFunky, GifBoom, Magisto, WedPics, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, beme, 9GAG (20)</p>	
<p>Move E: Publishing comments or reactions</p>	<p>Step E1: Providing the ability to post text alone</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, Tapatalk, YikYak, Path, Kiwi, KakaoStory, Quora, Zalo, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu, Reddit (27)</p>	<p>LinkedIn allows the user to post comments in the form of text only. This can be achieved by typing text and then tapping the post button located on the far right hand side of the comment box.</p>
		<p>Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, YouNow, Flickr, BeFunky, Keek, Periscope, GifBoom, Boomcast, Magisto, WedPics, WeddingParty, Behance, DeviantArt, 9GAG (20)</p>	

	<p>Step E2: Providing the ability to post multiple photos and/or videos with or without text</p>	<p>Text Driven: Tapatalk, Quora, VirtualSpace (3)</p>	<p>VirtualSpace allows the user to post multiple photos associated with a text, that can be achieved by tapping the camera symbol and selecting the photos, typing the text, and then tapping the post button, all located inside the comment section.</p>
		<p>Image Based: (0)</p>	
	<p>Step E3: Providing the ability to post text and a single photo and/or video</p>	<p>Text Driven: Facebook, Twitter, Tapatalk, Kiwi, LINE, APEX, SixString, Scutify (8)</p>	<p>Whisper allows the user to post replies comprising of only one photo and text, the user is asked to type the text and then automatically a photo is suggested as a background which can be changed.</p>
		<p>Image Based: Snapchat, Fling, Keek, Whisper, ShotsApp (5)</p>	
	<p>Step E4: Providing the ability to post a single photo and/or video without text</p>	<p>Text Driven: Facebook, Twitter, Tapatalk, Kiwi, LINE, APEX, SixString, Scutify (8)</p>	<p>Kiwi allows the user to post a video reply without needing to associate any text with it, after attaching the video the user will then reply by tapping on the paper plane symbol located on the far right hand side of the reply box.</p>
		<p>Image Based: Snapchat, Fling, Keek, beme (4)</p>	
	<p>Step E5: Providing the ability to post an emoticon, gif, or sticker with text and/or with a photo or video, or just alone</p>	<p>Text Driven: Facebook, Twitter, Tumblr, Path, KakaoStory, Zalo, LINE, Swarm, Fiesta (9)</p>	<p>LIINE allows the user to comment with text and attaching either a sticker or a photo, the user can then reply by tapping on the send button located on the far right hand side of the comment box.</p>
		<p>Image Based: Snapchat, Keek (2)</p>	

	<p>Step E6: Providing the ability to mention another user using the “@” symbol</p>	<p>Text Driven: Facebook, LinkedIn, Twitter, Tumblr, Google+, Path, KakaoStory, Quora, Flipboard, InstaMine, SixString, Scutify, tsu (13)</p>	<p>Keek allows the user to mention another user by adding the “@” symbol into the text and then selecting a user from an appearing dropdown.</p>
		<p>Image Based: Instagram, Flipagram, Pinterest, Vine, musical.ly, YouNow, Keek, GifBoom, Shou, DeviantArt, 9GAG (11)</p>	
<p>Move F: Presenting intelligent system generated options</p>	<p>Step F1: Suggesting related media content based on a current viewing</p>	<p>Text Driven: Facebook, Twitter, Tumblr, Tapatalk, Quora, Flipboard (6)</p>	<p>YouTube provides the user with related videos at the bottom of the page listed in a vertical fashion, under the title “Up next”.</p>
		<p>Image Based: Instagram, YouTube, Pinterest, Vine, WeHeartIt, BeFunky, Whisper, Behance (8)</p>	
	<p>Step F2: Suggesting media content based on the user’s connections and interactions and/or via a popular and/or trending system algorithm</p>	<p>Text Driven: Facebook, LinkedIn, Twitter, Tumblr, Google+, Tapatalk, YikYak, Kiwi, KakaoStory, Quora, Zalo, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flipboard, VirtualSpace, SixString, tsu, Reddit (22)</p>	<p>LinkedIn provides the user with trending and popular articles in the main feed page from sources that the user follows, it also recommends jobs based on information provided by the user.</p>
		<p>Image Based: Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, YouNow, Keek, Periscope,</p>	

		GifBoom, Boomcast, Magisto, Fling, Whisper, Shou, ShotsApp. Behance, Wishbone, DeviantArt, 9GAG (21)	
	Step F3: Suggesting popular and/or user-centred media content based on current location	Text Driven: Facebook, Twitter, YikYak, Kiwi, Zalo, Swarm, APEX, Flurv, Flipboard (9)	Facebook provides the user with details regarding places which exist close by, such as restaurants.
		Image Based: musical.ly, Periscope, Whisper, ShotsApp (4)	
Move G: Utilising the element of collaboration for user-generated content	Step G1: Providing a live video stream with two or more users broadcasting at once	Text Driven: FriendLife (1)	YouNow provides the ability for two users to co-broadcast, one user being the other user's guest will share half of the broadcast window.
		Image Based: YouNow (1)	
Move H: Utilising the element of contribution for user-generated content	Step H1: Providing the ability to shoot a video to existing music which is sourced from another video post	Text Driven: (0)	Musical.ly allows the user to use a music or audio track sourced from an existing piece of content for recording a video, this is done by tapping on the CD symbol located on the bottom right hand corner and then tapping the "Shoot now" button.
		Image Based: Flipagram, Vine, musical.ly (3)	
	Step H2: Providing the ability to manage an	Text Driven: Facebook, Flipboard (2)	Facebook provides photo albums which can be

	<p>account or page, photo album or media content, with multiple selected administrators or contributors</p>	<p>Image Based: Pinterest, WedPics, WeddingParty (3)</p>	<p>changed by the owners to include contributing users that can be a part of managing the album, they can be added from within the “Edit Album” page.</p>
	<p>Step H3: Providing the ability to manage or initiate a multiple user group or chat</p>	<p>Text Driven: Facebook, LinkedIn, Twitter, Zalo, LINE, Swarm, Fiesta, APEX, VirtualSpace, tsu (10)</p> <p>Image Based: Instagram, Flipagram, Pinterest, YouNow, Keek, Periscope, WeddingParty, Shou, Behance, Wishbone, DeviantArt (11)</p>	<p>LINE allows the user to create and manage a multiple user group where all members are able to utilise information and share content inside.</p>

Entertainment

Moves	Steps	Apps	Examples	
<p>Move A: Providing connected media content from a single user</p>	<p>Step A1: Providing sequential photo and/or video content upon a quick manual action only</p>	<p>Text Driven: Twitter, Kiwi, KakaoStory, Zalo, Hike, LINE, Fiesta, Flipboard, VirtualSpace (9)</p>	<p>Flipagram presents user-generated content which plays continuously on repeat until the user manually moves to the next piece of content, this manual action is done by swiping up or down.</p>	
	<p>Step A2: Providing sequential photo and/or video content in an auto play and manual sequence</p>	<p>Image Based: Flipagram, Vimeo, musical.ly, Flickr, WeHeartIt, WedPics, WeddingParty, Behance, DeviantArt, Beme, 9GAG (11)</p>		<p>Snapchat presents user generated content which automatically moves to the next piece of content once it finishes, otherwise the user can manually move to the next piece by tapping once on the screen.</p>
		<p>Text Driven: Facebook (1)</p>		
	<p>Move B: Providing connected media content from multiple users</p>	<p>Step B1: Providing sequential photo and/or video content upon a quick manual action only</p>		<p>Text Driven: Twitter, KakaoStory, LINE, Fiesta, Flipboard, VirtualSpace (6)</p>
<p>Image Based: Flipagram, Vimeo, Vine, musical.ly, YouNow, Flickr, WeHeartIt, WedPics, Whisper, WeddingParty,</p>				

		Behance, DeviantArt, 9GAG (13)	
	Step B2: Providing sequential photo and/or video content in an auto play and manual sequence	Text Driven: Facebook (1)	Facebook presents video content which moves automatically to the next piece of content once it finishes, otherwise the user can manually move to the next piece by swiping up or down.
		Image Based: Snapchat, YouTube (2)	
Move C: Viewing maximum video duration	Step C1: Providing up to 30 seconds of video time	Text Driven: SixString, Kiwi, InstaMine, Twitter, Path (5)	Instagram allows the user to upload a maximum video time of 15 seconds, Instagram provides a trim tool that can be utilised by the user to choose 15 seconds from the selected video. Otherwise, the first 15 seconds of the video are used by default.
		Image Based: Vine, Beme, Snapchat, Camera360, Instagram, musical.ly, GifBoom, WedPics, ShotsApp (9)	
	Step C2: Providing up to 1 minute of video time	Text Driven: ASKfm (1)	ASKfm allows the user to upload a maximum video time of 45 seconds. It provides a trim tool that can be utilised by the user to choose 45 seconds from the selected video. Otherwise, the first 15 seconds of the video are used by default.
		Image Based: Keek, Flipagram (2)	
	Step C3: Providing up to 3 minutes of video time	Text Driven: Fiesta, LINE (2)	LINE allows the user to upload a maximum video time of 3 minutes,
		Image Based: Magisto (1)	

			otherwise the user will be prompted with a message.
	Step C4: Providing more than 3 minutes of video time	Text Driven: Facebook, Tapatalk, KakaoStory, FriendLife (4)	YouTube allows the user to upload videos of long lengths, such as 15 and 60 plus minutes.
		Image Based: YouTube, Vimeo, YouNow, Flickr, Periscope, Boomcast, 9GAG (7)	
Move D: Viewing media content through different aspect ratios accessed through a feed	Step D1: Providing only square shaped photos and/or videos	Text Driven: MyFitnessPal, Moodswing, InstaMine (3)	Moodswing only allows square shaped photos on its platform, bigger shaped photos are presented with a square crop tool.
		Image Based: Vine, Wishbone (2)	
	Step D2: Providing only horizontal photos and/or videos of a uniform aspect ratio in each app	Text Driven: (0)	YouTube only presents videos through a video player of a horizontal format, if the video is of a different format then it will be adjusted to fit in a horizontal frame.
		Image Based: YouTube, Vimeo, YouNow, Shou (4)	
	Step D3: Providing only vertical photos and/or videos of a uniform aspect ratio in each app	Text Driven: APEX (1)	Fling only allows for vertical photos and videos to be taken.
		Image Based: Snapchat, Flipagram, musical.ly, Fling, ShotsApp, Beme, Whisper (7)	
	Step D4: Providing non-uniform or various shaped photos and/or videos	Text Driven: Facebook, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, YikYak, Path, Kiwi, KakaoStory, Quora,	Facebook allows users to upload photos of various aspect ratios and provides the ability to edit the

		Zalo, Hike, FriendLife, LINE, Flurv, Swarm, Fiesta, Flipboard, VirtualSpace, SixString, Scutify, tsu, Reddit (25)	aspect ratio of an original photo prior to upload.
		Image Based: Instagram, Pinterest, Flickr, Keek, Periscope, GifBoom, WeHeartIt, BeFunky, Boomcast, Camera360, Magisto, WedPics, WeddingParty, VSCO, Behance, DeviantArt, 9GAG (17)	
Move E: Viewing photo and/or video media content through a ‘full screen’ viewing mode	Step E1: Providing a feature that enables the larger viewing of photo and video content to the fullest extent of their aspect ratio in vertical and horizontal orientations	Text Driven: Facebook, Twitter, Tumblr, Google+, ASKfm, Path, Kiwi, Fiesta (8)	Flickr allows the preview of photos and videos in full screen whether they are horizontal or vertical, if they are horizontal then full screen is achieved by flipping the smartphone sideways.
		Image Based: Flickr, WedPics (2)	
	Step E2: Providing a feature that enables the larger viewing of photo and/or video content to the fullest extent of their aspect ratio in vertical and/or horizontal orientations, but never all these four variables together within the same app	Text Driven: Zalo, FriendLife, LINE, VirtualSpace, Tapatalk, YikYak, LinkedIn, KakaoStory, Hike, Swarm, Flipboard, Reddit (12)	Shou allows for the preview of a horizontal video in full screen after the smartphone has been flipped sideways.
		Image Based: YouTube, Vimeo, YouNow, Keek, Periscope, Boomcast, Magisto, Shou, Behance, DeviantArt, WeHeartIt, Camera360,	

		WeddingParty, VSCO, 9GAG (15)	
	Step E3: Providing photo and/or video content that by default occupy the entire screen individually	Text Driven: (0)	Snapchat provides the user with only full screen vertical photos and videos throughout the platform.
		Image Based: Snapchat, Flipagram, musical.ly, Fling (4)	
	Step E4: Providing no 'full screen' feature	Text Driven: MyFitnessPal, Moodswing, InstaMine, Quora, APEX, Flurv, SixString, Scutify (8)	MyFitnessPal does not provide the user with the flexibility to display photos in full screen and all its photos are confined to a square frame only.
		Image Based: Instagram, Pinterest, BeFunky, GifBoom, Whisper, ShotsApp, Beme, Vine, Wishbone (9)	
Move F: Utilising pre-set effects on photos and/or videos	Step F1: Utilising effect filters	Text Driven: Facebook, Path, Zalo, Hike, FriendLife, LINE, MoodSwing (7)	ShotsApp provides the user with the ability to add a filter to a photo, by swiping right or left the filter appears instantly as the user drags along the screen.
		Image Based: Snapchat, YouTube, Flipagram, musical.ly, Flickr, GifBoom, Boomcast, Camera360, WeddingParty, ShotsApp (10)	
	Step F2: Utilising effect filters with the ability to adjust their intensity	Text Driven: Twitter, KakaoStory, VirtualSpace (3)	Twitter provides the user with the ability to control the strength of the filter

		Image Based: Instagram, BeFunky, WedPics, VSCO, Behance (5)	being applied, by holding down on the selected filter icon until a control knob appears.
	Step F3: Utilising no effect filters	Text Driven: MyFitnessPal, LinkedIn, Tumblr, Google+, ASKfm, Tapatalk, YikYak, BBM, Kiwi, Quora, Swarm, Fiesta, APEX, Flurv, Flipboard, InstaMine, SixString, Scutify, tsu, Reddit (20)	Scutify does not provide the user with the ability to apply a filter when publishing.
		Image Based: Pinterest, Vimeo, Vine, YouNow, WeHeartIt, Keek, Periscope, Magisto, Fling, Whisper, Shou, Wishbone, DeviantArt, Beme, 9GAG (15)	
	Step F4: Utilising live interactive effects	Text Driven: (0)	Snapchat provides the user with live interactive filters which work by mapping the user's face, the user wears the filter and then interacts with it in real time.
		Image Based: Snapchat (1)	
Move G: Providing the ability to gamify stature	Step G1: Providing the ability to reach an achievement and/or gather points based on the activities of the user only	Text Driven: MyFitnessPal, YikYak, Quora, Swarm (4)	Swarm provides the user with the ability to win bonus points by checking in to locations and going up a leader board.
		Image Based: (0)	

	<p>Step G2: Providing the ability to reach an achievement and/or gather and/or purchase points based on the activities of a single user and other users activities towards that user</p>	<p>Text Driven: VirtualSpace, Reddit, Flurv (3)</p>	<p>Reddit provides the user with a score which they have named “KARMA”. The user gets one point for every up vote they receive and lose a point for every down vote they receive. The total number appears on the top far left hand side of the user’s profile page.</p>
		<p>Image Based: Snapchat, Camera360, YouNow (3)</p>	
	<p>Step G3: Providing the ability to gift other users via purchase only</p>	<p>Text Driven: ASKfm (1)</p>	<p>Shou provides the user with the ability to purchase coins which enables the user to buy broadcasters gifts in the form of stickers.</p>
		<p>Image Based: Shou (1)</p>	

Personalisation

Moves	Steps	Apps	Examples	
<p>Move A: Interacting with user profiles</p>	<p>Step A1: Providing the ability to discontinue a user connection</p>	<p>Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapataalk, Kiwi, KakaoStory, Quora, Zalo, FriendLife, Moodswing, Swarm, Flipboard, VirtualSpace, InstaMine, Scutify, tsu, Reddit (21)</p>	<p>FriendLife allows the user to unfriend users by tapping on the “Friends” button on the middle section of their profile and then choosing “Yes”.</p>	
		<p>Image Based: Snapchat, Instagram, YouTube, Pinterest, Vimeo, Vine, musical.ly, YouNow, Flickr, WeHeartIt, BeFunky, Keek, Periscope, GifBoom, Boomcast, Magisto, Fling, WeddingParty, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt (24)</p>		
	<p>Step A2: Providing the ability to add or remove a user from a list</p>	<p>Text Driven: Facebook, Twitter, Google+, Zalo (4)</p>		<p>Google+ allows the user to add or remove users from more than one list. This feature can be accessed by tapping on the “Following” button on the middle section of their profile and then proceeding with the changes.</p>
		<p>Image Based: Flickr (1)</p>		

	<p>Step A3: Providing the ability to block a user</p>	<p>Text Driven: Facebook, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, Kiwi, Quora, Hike, FriendLife, Moodswing, Fiesta, Flurv, VirtualSpace, InstaMine, SixString, Scutify, tsu (19)</p>	<p>Periscope allows the user to block users by tapping on the settings icon on the top left hand side of their profile and then selecting "Block User".</p>
		<p>Image Based: Snapchat, Instagram, Flipagram, Pinterest, Vine, musical.ly, YouNow, Flickr, WeHeartIt, Keek, Periscope, GifBoom, Magisto, Fling, ShotsApp, beme (16)</p>	
	<p>Step A4: Providing the ability to report a user</p>	<p>Text Driven: Facebook, LinkedIn, Twitter, Google+, ASKfm, KakaoStory, Quora, Zalo, Moodswing, Fiesta, Flurv, VirtualSpace, SixString, tsu (14)</p>	<p>Boomcast allows the user to report other users. This option is accessed by tapping on the three dots symbol which appears on the top right hand side of a user's profile page.</p>
		<p>Image Based: Instagram, Flipagram, Vine, musical.ly, YouNow, Flickr, Keek, GifBoom, Boomcast, ShotsApp (10)</p>	
<p>Move B: Customising the main feed</p>	<p>Step B1: Providing the ability to disable a user or connection's updates and/or activities from appearing in your feed</p>	<p>Text Driven: Facebook, LinkedIn, Twitter, Tapatalk, KakaoStory, Quora, Zalo (7)</p>	<p>KakaoStory provides the ability to remove a friend's updates and posts from appearing the user's feed. This feature is accessed by tapping on the three dots</p>
		<p>Image Based: (0)</p>	

			symbol which appears on the top right hand side of a friend's profile.
Step B2: Providing the ability to automatically or manually prioritise a user's updates so they always appear at the top of the feed	Text Driven: Facebook, Twitter (2)	Image Based: (0)	Facebook allows the user to manually prioritise other users by selecting the "See First" option from their profile, making them appear at the top of the news feed. This is achieved by first tapping on the "Following" icon which appears in the centre-left of the screen.
Step B3: Providing the ability to choose the type of content you receive in your feed or from a connection	Text Driven: Tapatalk, Quora, Reddit (3)	Image Based: Whisper, Behance, DeviantArt, 9GAG (4)	DeviantArt allows users to switch on or off mature content from appearing in their feed. This feature is accessible by tapping on the settings icon located on the top right hand corner of their profile page and then making the change via the bottom of the settings page.
Step B4: Providing the ability to disable a user's re-shares from appearing in the main feed	Text Driven: Twitter (1)	Image Based: Vine (1)	Twitter allows the user to turn off the retweets of other users from appearing in his/her feed. This is achieved by tapping on the settings icon located on the top mid right hand side of a user's profile page and then tapping "Turn off

			Retweets” from a list of options.		
Move C: Customising notifications	Step C1: Providing the ability to turn on and off notifications from a user	Text Driven: Twitter, Tumblr, Google+, Tapatalk, Quora, Swarm, Flurv (7)	YouTube provides users with the ability to turn on and off notifications about new videos that are uploaded by users/channels which they are subscribed to. This is done by going to the relevant channel’s profile page and tapping on the bell symbol located on the bottom right hand side of the profile section.		
		Image Based: Instagram, YouTube, Vine, musical.ly, YouNow, Keek, Periscope, GifBoom, Magisto (9)			
	Step C2: Providing the ability to turn on and off notifications from a specific post	Text Driven: Facebook, Google+ (2)		Instagram allows the user to turn on and off notifications for specific posts, by tapping on the three dot symbol on the top right hand side of the post section and then choosing “Turn on Post Notifications” from a list of options.	
		Image Based: Instagram (1)			
	Step C3: Providing the ability to turn on and off a specific notification function relating to all posts and/or alerts	Text Driven: MyFitnessPal, LinkedIn, Twitter, ASKfm, Tapatalk, Path, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Swarm, Fiesta, Flurv, Flipboard, SixString, tsu (18)			LinkedIn provides the user with the ability to turn on and off options in a list of nineteen push notifications. The user is able to customise whether they receive notifications regarding likes, comments, shares, mentions, messages, invites, and others. The “Push
		Image Based: Snapchat, Instagram, YouTube,			

		Flipagram, Pinterest, Vimeo, Vine, YouNow, WeHeartIt, Keek, Periscope, GifBoom, Magisto, WedPic, Whisper, WeddingParty, beme, 9GAG (18)	notifications” page is accessed via the settings.
	Step C4: Providing the ability to choose the type of audience and/or content you get notified about from a grouping or users	Text Driven: Facebook, Twitter, Tapatalk, KakaoStory, Quora, Flipboard (6)	Facebook allows users/members to change the notification preferences of different groups. The user can choose to receive notifications from all members, no notifications, group friends, or friends and suggested posts.
		Image Based: Snapchat, Instagram, beme (3)	
	Step C5: Providing the ability to choose the method or location in which users receive their notifications	Text Driven: Facebook, Google+, ASKfm, Path, Quora, FriendLife, Swarm, Flury, SixString, tsu (10)	Magisto allows the user to choose between receiving notifications via email and/or via the application. The notification page can be found via the settings icon on the top right hand side of the user’s profile page.
		Image Based: YouTube, Pinterest, musical.ly, YouNow, WeHeartIt, Keek, Magisto (7)	
Step C6: Providing the functionality to disable push notifications at once	Text Driven: Tumblr, Kiwi, LINE, APEX (4)	APEX allows the user to disable all push notifications at once with a single tap. This feature is accessible via the settings page.	
	Image Based: Flickr, DeviantArt (2)		
Step C7: Providing the functionality to choose the frequency or timeframe at	Text Driven: MyFitnessPal, Tapatalk, Quora (3)	Tapatalk allows the user to choose between receiving notifications instantly or	

	which the user gets notified	Image Based: (0)	once a day. The push notifications page is accessible via the user's profile page.
Move D: Customizing visuals	Step D1: Providing the ability to add one profile picture or more	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Tumblr, Google+, ASKfm, Tapatalk, BBM, Path, Kiwi, KakaoStory, Quora, Zalo, Hike, FriendLife, LINE, Moodswing, Swarm, Fiesta, APEX, Flurv, Flipboard, VirtualSpace, InstaMine, SixString, Scutify, tsu (28)	BBM allows the user to replace their profile photo with another one, by tapping on the photo's thumbnail in the profile page and then following the prompts.
		Image Based: Snapchat, Instagram, YouTube, Flipagram, Pinterest, Vimeo, Vine, musical.ly, YouNow, Flickr, WeHeartIt, BeFunky, Keek, Periscope, GifBoom, Boomcast, Camera360, Magisto, WedPics, WeddingParty, Shou, ShotsApp, VSCO, Behance, Wishbone, DeviantArt, beme, 9GAG (28)	
	Step D2: Providing the ability to add one or more	Text Driven: Facebook, Twitter, Tumblr, Google+, ASKfm, Path, Kiwi, KakaoStory, Zalo, LINE,	

	profile banner photos or gifs	Fiesta, APEX, VirtualSpace (13)	Profile” button on the user’s profile page and then tapping “Change cover photo”.
		Image Based: YouNow, GifBoom, Shou, Wishbone (4)	
	Step D3: Providing the ability to adjust the text size	Text Driven: Twitter, Tapatalk, KakaoStory, Flipboard (4)	Tapatalk allows the user to choose between small, normal, and large text size. The font size page is accessible from within the settings page.
		Image Based: (0)	
	Step D4: Providing the ability to change the skin colour or theme of the user’s profile and/or app	Text Driven: Tumblr, ASKfm, Tapatalk, LINE, Reddit (5)	GifBoom allows the user to change the theme colour of the platform by tapping on one of five colours. This feature is accessible via the settings icon on the top left hand side of the user’s profile page.
Image Based: Vine, Keek, GifBoom, WedPics, 9GAG (5)			
Step D5: Providing the ability to change the landing page of the app	Text Driven: Tapatalk (1)	Camera360 provides the user with the ability to choose between the application’s home page and the “Viewfinder screen” which gives the user access to an open camera instantly after launch. This is accessible via the “Startup interface” page located inside the settings page.	
	Image Based: Camera360, VSCO, DeviantArt (3)		
	Text Driven: Tumblr (1)		

	<p>Step D6: Providing the ability to remove the profile picture, cover photo, and text description sections completely, to change the profile picture's border shape and to allow change to the title text's colour and font</p>	<p>Image Based: (0)</p>	<p>Tumblr allows users to make exceptional changes to their profile page's appearance, including the ability to change the frame shape of the user's profile photo from square to circular and removing the user's profile photo completely from the profile page. The "Edit appearance" section can be accessed by tapping on the palette symbol located on the top right hand side of the user's profile page.</p>
<p>Move E: Adjusting privacy settings</p>	<p>Step E1: Providing the ability to switch between a private and public account or to manage the audience that can view or interact with published content and/or user activity and/or comments</p>	<p>Text Driven: Facebook, MyFitnessPal, Twitter, Tapatalk, LinkedIn, Tumblr, Google+, Path, KakaoStory, Quora, Zalo, hike, LINE, Swarm, Fiesta, APEX, Moodswing, Flipboard, WeHeartIt, tsu, Keek (21)</p>	<p>9GAG provides the ability to make up votes private, as a result this user activity can no longer be viewed by others. This function can be switched on via the settings page which is accessible via the settings button located on the top left hand side of the user's profile page.</p>
		<p>Image Based: Snapchat, Instagram, YouTube, Flipagram, Vimeo, Vine, musical.ly, Keek, Flickr, Periscope, GifBoom, Fling, DeviantArt, beme, 9GAG (15)</p>	
	<p>Step E2 Providing the ability to control the</p>	<p>Text Driven: Facebook, Twitter, Path, Swarm (4)</p>	<p>Path provides users with the ability to limit the</p>

	visibility of third-party content, that is published to a user’s timeline, tagged to a user, or suggested about a user	Image Based: Keek, beme (2)	audience that can tag them to friends only. This function can be switched on via the settings page which is accessible via the settings button located on user’s profile page at the bottom right hand side of the cover photo.
	Step E3: Providing the ability to control the visibility of a user’s personal information	Text Driven: Facebook, MyFitnessPal, LinkedIn, Twitter, Google+, BBM, Kiwi, KakaoStory, Quora, Zalo, Swarm, Fiesta, tsu (13)	Twitter allows its users to control the visibility of their birth month and day, and birth year separately. For each of the two, the user is able to choose between public, my followers, people I follow, we follow each other, and only me. This edit birthday page can be accessed by tapping on edit profile from the user’s profile page and then tapping on birthday.
	Step E4: Providing the ability to control the visibility of a user’s personal information when publishing a post	Text Driven: Facebook, Twitter, ASKfm, YikYak, Kiwi, Path, KakaoStory, Zalo, LINE, VirtualSpace (10)	YikYak provides users with the ability to choose whether or not to display their YikYak handle on posts before being published. This feature is accessible by tapping on the pen symbol located on the top right hand side corner of the home page.
	Step E5: Providing the ability to control whether a	Image Based: Snapchat, Instagram, Pinterest, Vine, Flickr, Periscope, GifBoom (7)	Text Driven: Twitter, Tumblr, Tapatalk,
			Keek provides the user with the ability to either

	user wants the private message or call functionality switched on and/or the ability to choose the audience	KakaoStory, Quora, Zalo, FriendLife, LINE, Swarm, Fiesta, tsu (11)	switch off private messages or select an audience such as “People I’m following”, “People I’m subscribed to”, or “Anyone”. This is done from within the preferences page and is accessible via the settings page.
		Image Based: Snapchat, Vine, Keek, GifBoom (4)	
	Step E6: Providing the ability to turn on or off the ability to receive anonymous questions	Text Driven: ASKfm, Kiwi, Quora (3)	GifBoom provides users with the ability to enable or disable anonymous questions from being asked. This feature is accessible via the advanced settings page located inside the settings page and accessible via the settings symbol located on the top left hand corner of the user’s profile page.
		Image Based: GifBoom (1)	
Step E7: Providing the ability to control whether a user can be found or suggested, via their name/id and/or email address and/or phone number	Text Driven: MyFitnessPal, LinkedIn, Twitter, Path, KakaoStory, LINE, Fiesta (7)	Beme allows users to control whether they can be found by others via their phone numbers. This function can be found inside the settings page and is accessible by tapping on the settings symbol located on the top right hand corner of the profile page.	
	Image Based: Vine, beme (2)		
Step E8: Providing the ability to control the	Text Driven: Facebook, Quora, Fiesta (3)	Pinterest allows users to hide their profiles from	

	visibility of a user's account on internal searches or external search engines	Image Based: Pinterest, WeHeartIt (2)	search engines such as Google. This function can be switched on and off from within the "Edit settings" page which is accessible via the settings symbol on the top right hand corner of the user's profile page.
	Step E9: Providing the ability to add a passcode in order to access the app or a section inside the app	Text Driven: MyFitnessPal, YikYak, BBM, KakaoStory, Zalo, LINE (6)	BBM allows the user to set a four digit passcode for accessing the app, the user is also able to set a time for when the application automatically locks after exiting, such as 1 or 5 minutes. The passcode page can be accessed via the settings page.
		Image Based: Whisper (1)	
	Step E10: Providing the ability to control if a user can be followed or can be added as a friend	Text Driven: KakaoStory, LINE, tsu (3)	LINE provides the user with the ability to stop receiving friend requests. This function is accessible via the privacy page located inside the settings page and accessible via the settings symbol located on the top right hand corner of the user's profile page.
		Image Based: (0)	
Move F: Adjusting advert settings	Step F1: Providing the ability to customise adverts by switching them on or off, partially or completely, and internally or externally	Text Driven: Facebook, LinkedIn, Twitter, Swarm (4)	9GAG allows users to completely switch on or off advertisements. This function can be in the settings page which is accessible by tapping on the settings button located
		Image Based: Pinterest, 9GAG (2)	

			on the top left hand side of the user's profile page.
	Step F2: Providing the user with the ability to manage the advert preferences/interests	Text Driven: Facebook (1)	Facebook provides users with the ability to customise their advert preferences by choosing the advert interests they wish to receive. This feature is accessible via the advert settings page located inside of Facebook's "Account Settings".
		Image Based: (0)	
	Step F3: Providing the ability to change the audience that can view a user's social action paired with adverts	Text Driven: Facebook (1)	Facebook provides users with the ability to choose between allowing friends and not allowing anyone to view their social actions paired with adverts. This is accessible via the advert settings page located inside "Account Settings".
		Image Based: (0)	
	Step F4: Providing the ability to choose if a video can auto-play	Text Driven: MyFitnessPal (1)	MyFitnessPal allows users to choose whether or not a video advert can auto-play. This function is accessible via the settings page under "Sharing & Privacy" and then "Ad settings".
		Image Based: (0)	
Move G: Adjusting intelligent settings	Step G1: Providing the ability to switch on or off the use of intelligent or external data for enhanced personalisation	Text Driven: LinkedIn, KakaoStory, Swarm (3)	LinkedIn provides users with the ability to disable or change the audience that can see them as suggested connections. This is accessible via the settings
		Image Based: Pinterest (1)	

			page under the privacy section. Users appear as suggested connections to audiences that possesses their email addresses or phone numbers.
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