Integrating Tablet Computers into Daily Life: An investigation of changing practices and interconnections

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Abstract

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Questions about how objects and technologies are appropriated and 'used' inform studies of uptake and 'domestication'. Such studies generally focus on how new devices become normal, how they stabilise and how they reach 'closure'. By contrast, social theories of practice suggest that daily life, and the practices which constitute it, are inherently dynamic. This thesis attends to this tension.

Tablet computers have been spectacularly successful (58% of households now own one (Ofcom, 2018)), despite providing many of the same services as those already available on laptops and smartphones. In working with this example the thesis asks what the tablet is, what it is 'for' and how this changes.

In tackling these questions, the thesis develops an 'integrative' approach that reconceptualises established concepts of 'use'. Empirical chapters based on semi-structured interviews with people who have tablet computers explore different forms of integrating: showing how tablets become part of specific and multiple practices, how they are positioned with respect to other related objects, and how they reconfigure the very practices of which they become a part. The thesis therefore, examines the tablet as a device through which different practices are linked and integrated; treating them as 'extended objects' defined by relations that stretch far beyond the physical qualities of the tablet itself. This analysis argues for reconceptualising concepts of 'use' to better account for these multiple relations, their ongoing transformation, and the consequent de-centering of 'the user'.

Declaration

I hereby declare that this thesis is my own work, and has not been submitted in substantially the same form for the award of a higher degree elsewhere.

Carolynne Lord

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Chapter 1

Introduction: Integrating the tablet computer

Following their re-launch in 2010, tablet computers were rapidly adopted. Ofcom (2011; 2016a), for example, reported a sharp increase in the uptake of the device between 2011 (2% of households) and 2016 (59% of households) in the UK alone. Continuing that trend, it has been estimated that the top 5 tablet manufacturers (Apple Inc., Samsung, Amazon, Huawei, Lenovo) sold an estimated 163.5 million tablets globally in 2017 alone (IDC, 2018) – a figure which only hints at the actual sales of tablets in this time, in not capturing a number of other branded tablets that were also sold that year.

Computing technologies like the tablet computer have become increasingly central in the practices of daily life, even in those practices which previously had little to do with computing devices (Røpke and Christensen, 2013). Cooking, watching television, listening to music, photography, and sport are just some examples of practices into which tablet computers now figure, but there are many others. This thesis argues that the 'integration' and embedding of the tablet computer (as an active, and often innovative, process) into practices is itself a form of change, as the tablet computer acquires roles within practices in which it was previously not a part.

There are three specific reasons why the tablet computer is an appropriate focus for a study of the ongoing processes through which devices are integrated into multiple practices. One is that the tablet represents a relatively novel device (in the mass market), and one that has been significantly successful alongside – and sometimes despite – the many other technologies (computers, laptops, smartphones) to which it

relates. Second, what is interesting is how this object sits at the intersection of many different social practices, allowing for an investigation of the multiplicity of its integration within and across a variety of different social practices. Third, the tablet has no 'one' specific role, and to succeed it had to work its way into many different lives, and many different configurations of existing practices.

There is a long-standing tradition of describing such processes with reference to the 'users' of technology. Rather than following that route, I focus on how tablets feature within the trajectories of different practices as these change over time. In thinking about processes of integration into practice, and not 'use', I ask particular questions about the forms that 'integration' takes. My approach is to consider the tablet computer, by which I mean a small portable computer that primarily accepts input directly onto its screen rather than via a keyboard or mouse, as something that is in essence defined and constituted by the practices that it becomes a part of. This involves recognising that 'integration' is a dynamic and never stable process. In other words, as tablet-related practices change over time, successive moments of integrating the tablet computer entail forms of adapting and responding to also-changing practices. The 'qualities' of the tablet are thus constantly in flux. In viewing practices, and daily life itself, as unfolding processes, I conceptualise integrating as a process of becoming: the becoming of practice, of practitioner, and of tablet computer.

Tablet computers have been widely promoted since 1977. However, in terms of adoption, there have been significant developments since 2010 and the iPad's introduction to the computing market. Since this introduction, there has been an explosion of models as different manufacturers have rushed to produce their own

tablet computers. As of 2018, there are now over 400[1] different models of tablet available, with Ofcom (2018) reporting that 58% of UK households now own a tablet computer.

Despite their recent and rapid adoption, on the face of it, the tablet computer does not appear to provide anything particularly new, especially when compared with other, more 'established' technologies like smartphones (introduced in 1993 (Kilburn, 2011)) and laptops (introduced in 1982 (Brown and Wyatt, 2010)). As with smartphones, the 'affordances' of the tablet depend on the installation of applications (also known as 'apps'), which tailor the tablet's generic functions into specific capabilities, or which provide access to internet-dependent services. However, unlike the smartphone, the tablet has no roles which other computing technologies could not fulfil; whereas the smartphone allows people to make phone calls via cellular networks (in ways that the tablet computer, and laptop, cannot), there are no roles that the tablet computer can take on which cannot be fulfilled by other, similar computing technologies.

My central argument is that the rapid appropriation of the tablet relates to the multiplicity of the roles that it takes within and across practice and the device's ongoing transformation. Critically, and as I show, the tablet has been, in various ways, embedded into a plethora of different social practices. Accordingly, this thesis explores some of the routes through which the tablet has become integral to the conduct of different areas of daily life.

[1] While no exact figure is given for the number of tablet computers available globally, one tablet computer comparison site lists four hundred and forty-two different models that are available for comparison. Available: http://www.phonearena.com/phones/Class/Tablet.

In exploring these processes, I consider what Ihde (1993) describes as the 'multistability' of the tablet computer. Though Ihde makes use of the perceptual example of the Necker Cube to make his point, he asserts that technologies are inextricably linked with what people do with them. It is because of this that, from Ihde's perspective, all technologies and artefacts are multistable, as *"[…] there is no essential essence to technologies"* (1993: 34), and consequently, all technologies *are* what they are used for. While all technologies are multistable, the tablet computer is still distinctive in certain ways. This is not just a matter of perspective but is also due to the transformative potential of the apps that are downloaded and installed upon the tablet computer. In effect, the possibilities of the tablet computer reflect the range of apps installed and the ways in which specific combinations of tablet + app are implicated in what people do. But apps, like the tablet, are multistable themselves. This means that what the tablet computer is, therefore, is a mixture of multiple and multistable technologies, the combinations of which are drawn upon in different ways dependent on the practices and 'uses' in question.

The tablet is also distinctive due to its positioning in relation to other, more 'established' devices (like smartphones and laptops). The provisional qualities of the tablet, which are transformed by the combinations it makes with apps and which relate to its positioning with respect to other devices and objects, mean that it is not obvious what tablet computers are or what they are for. What is particularly intriguing about the tablet computer, especially given its rapid adoption rate, is not its distinctiveness when compared to these other devices but its similarities to them.

Taking these points alongside the idea that the tablet computer has come to figure within a multiplicity of practices at once, the tablet computer represents one appropriate means through which to examine whether the concept of 'use' is the most

applicable means of understanding how devices come to figure in the enactment of daily life. The adoption of different 'technologies' has received much attention in the domains of Science and Technology studies (STS), innovation studies, Human–Computer Interaction (HCI), and Computer Supported Cooperative Work (CSCW). In this introduction, I map out features of this literature that help to represent and describe the multiple 'uses' of the tablet computer and which allow me to develop the idea that the tablet itself is an intersection of multiple multistable technologies working in combination.[2]

One classic, and still relevant, point of reference is Bijker's (1997) analysis of processes of innovation and the diffusion of the bicycle. Though there are, of course, more contemporary investigations of the uptake and subsequent use of technologies, Bijker's examination of the bicycle, and of how it was appropriated by different social groups, highlights some themes which also help to better describe the role of the tablet computer in daily life, its multistability across a number of practices, and its rapid adoption.

In this chapter, I discuss Bijker's (1997) work, and in particular his notion of 'interpretive flexibility', as a means of introducing key themes that run throughout this thesis and of taking stock of different and relevant literatures dealing with the themes of the innovative role of users and the flexibility of technologies.

[2] For the remainder of this chapter I will follow common parlance and refer to the tablet computer as a 'technology', however this is not to deny that the tablet computer is a set of multiple technologies, but to reduce the confusion in referring to a singular item in the plural. Different chapters, dependent on their focus, will either refer to the tablet as a technology (or device) or as a set of technologies.

The Innovative Role of Users

An initial insight to take from Bijker (1997) is that innovation does not stop at the factory gate. While the design and production processes through which devices like the tablet computer have come into being are thought of as an innovation in itself by some (Cockton, 2004), processes of innovation do not cease when 'new' technologies cross over the boundaries from production to acquisition. Rather, things are adapted in use. Franke and Shah (2003) also focus on this interaction, showing how producers follow and work with such adaptations, feeding these back into the design and production processes of an object or device (in their case, snowboarding equipment). Taking seriously the innovative agency of those who use technologies, and seeing these as key figures within processes of innovation, thus further complicates the idea that the tablet is something fixed; that it is something that is simply 'used'. If users are innovative, surely the uses of the tablet computer are even more multiple than suggested by its inherent multistability and its flexibility within and across practice?

In examining the innovative and ongoing role of users, Bijker (1997) followed what he termed 'relevant social groups' and their importance for how 'the bicycle' was understood and interpreted. The idea of 'interpretive flexibility' develops this insight. In brief, Bijker argues that different social groups (young men, the elite, older people) had radically different interpretations of the meanings of the same technology and, thus, of its uses and of the symbolic positioning of its 'users'. One could consider the tablet in much the same way, but bicycles and tablet computers also differ in crucial ways.

Comparing the bicycle and the tablet for one moment, there are some notable similarities. First, that the bicycle and tablet computer are arguably not discrete

objects: both consist of linked components. However, the tablet is entangled in multiple material 'flows'. By this, I am referring to the way in which uses of the tablet computer not only depend on uses of apps but also the (internet-dependent) services that these draw in. For instance, messages and data (e.g. images, videos), as these move through the physical boundaries of the tablet itself via the internet (i.e. mobile or Wi-Fi connection) to other such technologies. It is also clear that bicycles, whatever their interpretation, are still associated with the activity of cycling in some broad sense or another. But with what activities are tablets broadly or specifically associated?

The Flexibility of Computing Technologies

Bijker (1997) considers the design of the object in thinking about how the bicycle's upright format 'enforces' a form of riding. Understanding associations between a technology or object and a particular activity has often been approached by focusing on its design and by considering the designer's 'script' as it is embodied in the object itself (Akrich, 1992). Akrich described the script of an object as follows:

> The technical realization of the innovator's beliefs about the relationships between an object and its surrounding actors is thus an attempt to predetermine the settings that users are asked to imagine for a particular piece of technology and the pre-scriptions (notices, contracts, advice, etc.) that accompany it (Akrich, 1992: 208).

Though useful in pointing to 'settings' and the accompanying materials (pre-scriptions) which surround the tablet computer, it is difficult to pin down the 'scripts' embodied in tablet computers – in part because of their extensive flexibility. On some level, it does make sense to think about how the tablet computer's design (weight,

size, etc.) shapes or 'scripts' its use. In addition, others might argue that the iPad's closed yet networked design ties it to the rest of the Apple 'ecosystem' (i.e. iCloud, iPhone, iMac, MacBook), a networking which some have termed a 'walled garden' (Herther, 2012). Similar forms of 'inscribing' are evident in successive moments of redesign and in the development of new models (e.g. iPad 1, 2, 3) and types (i.e. Air, mini, Pro) of the device.

In the field of science and technology studies (STS), the conclusion might be that the tablet's script is 'open', but this concept fails to give us much purchase on the specific forms of 'interpretive flexibility' involved (Bijker, 1997) or the scale and qualities of the tablet's openness. Further to this, given that the tablet is nothing without its apps, it may make more sense to consider tablet + app combinations. The openness of technologies like the tablet computer, and thus the ability for people to be innovative in their use of them, is more obvious than with objects whose script could be described as 'closed'. But the tablet is not the only technology whose script is open in these ways, and there are other established ways of conceptualising the blurred boundaries between the production and consumption of technologies and the constitutive (rather than passive) role of the 'consumer' or user.

For example, the concept of 'prosumer' (a hybrid of producer and consumer) has been mobilised in investigations of the innovative agency of users, particularly in relation to computing technologies (Ritzer et al., 2012). 'Prosumer', as a term, was first used by Toffler (1980), in his imaginaries of the future, and in thinking about how the number of 'pure' consumers would likely decline as certain societies moved away from the Industrial Age. It has now been taken up to describe those who exhibit innovative agency in their use of relatively flexible (often, but not always, computing) technologies, emphasising the way in which drawing strict boundaries between a

technology's production and its consumption can obscure our understandings of the innovation in using flexible technologies of this type (Seran and Izvercian, 2014). As many internet services begin to 'crowdsource' (i.e. obtain input from a large number of people through the internet, often for free) their content, for instance YouTube (Berrocal et al., 2014), the concept of prosumer becomes more relevant in understandings of how flexible technologies (and their services) come to be 'used' and also of how they develop.

Appropriation, as it is understood in design research, captures the way in which objects are used in ways not 'intended' by their designers (Dix, 2007). The argument is that the 'design' of an object is not completed by designers alone. Other authors (Brand, 1994; Suri, 2005) including Ehn (2008) make a similar point in suggesting that designers cannot know all the potential users of a thing, nor can they envision all potential uses of that thing prior to its appropriation. Ehn (2008) consequently argues that it is important that designers leave space open to allow users to take up existing products according to their own personal needs, and practices, allowing them to design-in-use.

Whether the focus is on the innovative roles 'users' take with respect to technological innovation or not, people only act in ways that make sense in their circumstances, and this is perhaps especially the case when thinking of actions involving the adoption, appropriation, or 'prosumption' of tablets. Suchman (2007) proposes the concept of 'situated action' to capture this feature, specifically examining the interactions of users with a photocopier as a means to better understand what she describes as the 'usability' of that photocopier. For example, when she suggests that *"[…] every course of action depends in essential ways upon its material and social circumstances*" (2007: 70), Suchman shows how problems in usability emerge when the fixed plan of the machine differs from the actual, ad hoc situated interactions of

its users with the 'specialised' (in Akrich's (1992) terms, 'closed') technology. To understand courses of action which are taken with and via the tablet computer, it therefore makes sense to take a closer look at the circumstances in which it is used, but the tablet computer has no fixed plan in the way that specialised technologies like photocopiers do. In addition, the 'use' of photocopiers does not require combining the copier with other technologies in the way that the tablet requires apps. Though Suchman's points about situations and contexts are relevant, more is needed to grasp what the tablet computer is actually for.

That is not to say that there have not been fruitful investigations into other multiple or 'packaged' technologies and their users; there have, and some of these have explored similar themes. For instance, Verhaegh et al., (2016) consider the innovative agency of 'user collectives' through their case study of the Wireless Leiden, whilst Pollock et al., (2016) explore the packaged solutions of software, considering how different forms of software can come to bridge a heterogeneity of activities and organisations at once.

Before moving on to introduce ideas mobilised within theories of practice, it is crucial to emphasise that more relational concepts and ideas about the link between users and objects exist, and have been developed without taking social practices as their central topic.

One of the best known of these is Gibson's concept of affordance. Gibson (1979) proposed the concept of 'affordances' to describe what the environment provides or furnishes (for good or ill) and what uses humans and animals make of these possibilities. This concept has since been extended to consider what affordances objects and technologies (Norman, 1988) offer to humans. Taking this view, tablet computers have many affordances (or action possibilities) that are readily perceived

by those who use them. Whilst this approach recognises that different possibilities will be appropriated in different settings (thus affordances are relational), it also holds fast to a strong distinction between the person and the thing that is being used.

Others seek to break this boundary down. For instance, within feminist technoscience, figurations – like the cyborg (Haraway, 1997) – have been used as performative images which help to displace materialities and cultural imaginaries. In essence, these performative images work in their opposition to metaphor, in that they challenge established ways of thinking through implied comparisons.

In following Haraway's concept of a cyborg, the tablet + practitioner could, for example, be conceptualised as a 'cyborg', a fusion of machine and organism which displaces ideas of a human-technology divides. However, and as Åsberg et al. (2015) implicitly suggests, there is no one figuration which works across all contexts. Similar notions, like those of human-non-human actors capture aspects of the mutual shaping and interdependency that I explore. But it is important to emphasise that these positions tap into intellectual traditions that have distinctive preoccupations, for instance with the status of the human, or the constitution of networks and relations between things. As such they are less concerned with how relations are reconfigured over time, or with the transformations not of individual users/consumers, but of the practices in which people are engaged.

Of these positions, Suchman's (2012) concept of 'configurations that work' is more closely related to my own approach. By configuration and in particular, by the phrase 'configurations that work', she aims to "*[…] recover the heterogeneous relations that technologies fold together*" (2012: 48). Building on these ideas, I am interested in the formulation of not one but of many 'configurations' that work in different ways. More than that, I am interested in what it means 'to work' in this context. That is, in relation

to what sorts of activities, performances or doings is the notion of working, or working well, understood and defined. This is to say, how is the 'configuration' itself implicated in constituting those practices.

Some of these more dynamic aspects are captured by those who consider the shifting interrelations of technologies with one other. For instance, Bolter and Grusin (1996) introduce the double-logic of remediation to capture some of the contradictions of new digital media, whereby 'new' technologies define themselves by borrowing from and refashioning 'older' media; justifying their existence by the lack of 'immediacy' (the erasure of signified and signifier) of their predecessors.

Meanwhile, transduction, as it is explained by Mackenzie (2002) also offers more dynamic ways of thinking about the interrelations of a thing with the wider social world, highlighting the network of relations in which technological objects like the tablet computer are entangled; and emphasising the world as constantly in becoming. As Mackenzie describes: "*[…] to think transductively is to mediate between different orders, to place heterogeneous realities in contact, and to become something different*" (2002: 18). Yet, Mackenzie's focus on the self, again reproduces and reflects an interest in how technologies and users interact, and again does so with only minimal reference to the also changing practices in which 'users' are involved, and of which technologies become a part.

This range of concepts and ideas are indeed relational, and capture many of the features of interest to this study (i.e. human-technology divides, properties of a thing, interrelations of objects with one another, and dynamicity). Yet, they are still ideas which are organised around a figure of the 'user'. Though some approaches and methods do refer to practice (for example: Suchman (2012)) they do not take social

practices, and the constitutive relations that practices have with objects, as the central unit of enquiry in their investigations of technologies-in-use.

This thesis works with that proposition, and specifically with the idea that a focus on social practices provides a distinctive, novel and useful means of conceptualising how technologies and people come together, and how such configurations evolve and change over time.

Before reviewing other ways of conceptualising 'use', it is important to note that what the ideas thus far discussed (i.e. interpretive flexibility, script, prosumers, situated action) have in common is that they depend upon an analytical separation between the users (relevant social groups, prosumer) on the one hand, and the technology (interpretive flexibility, script) on the other. This makes sense when examining interactions or relations between a subject and an object, but it is not the only way of thinking about how technologies (or objects) are connected with what people do in daily life.

Taking stock of the positions I have discussed this far, I take forward the following key ideas. People are innovative in their use of technologies, and though this innovative agency is sometimes contained by the script of the object, the openness of the tablet's script (and the scripts of multiple apps) is so extensive and varied that it is difficult to analyse the tablet computer through these terms alone. At the same time, people only act in ways that are meaningful to them in specific, situated contexts. This is helpful in thinking about the interactions between specific people and specific technologies (like a photocopier in an office), but in thinking about more open or extensively flexible technologies (like tablet computers), more is required to show how such interactions are defined by the practices in which people are engaged and the range of other intersecting technologies. As a means of expanding this

agenda, the next three sections review relevant ideas and concepts from theories of practice.

Reconceptualising Use

Connecting the notion of 'use' with a broader understanding of what people do in daily life requires a shift in how interactions between people and objects/technologies are conceptualised. A key step in this direction is to 'decentre' both the 'user' and the 'technology' and instead focus on the social practices in which both are implicated. This is to say that I connect 'uses' always to the doings of which they form a part, which in turn decentres both the technology and the user, enabling, and to an extent requiring, me to focus on the practice instead. Having taken this step, further questions emerge as to whether it is useful to describe people as 'using' technologies or whether it is instead more appropriate to examine 'uses' as tied up in the achievement of particular practices and practice-related ends and purposes.

Before continuing with a reconceptualisation of 'use', it is important to introduce some of the relevant terms and ideas which relate to the strategy of attending to social practices, as a means of capturing and analysing what people do. Theories of practice (Reckwitz, 2002, Warde, 2005, Shove et al., 2012, Hui et al., 2017) offer some fruitful ideas with which to conceptualise 'use' in relation to doings.

Before we can understand this relation (i.e. between the notion of uses and that of practices), it is first crucial to understand that practices can be conceptualised simultaneously: as entities and as performances (Shove et al., 2012, Schatzki, 1996). The analytic distinction between practices as performances and entities allows for an understanding of how individual actions figure in relation to the social world in which they are taking place, while noting the recursive relation between a doing (or moment

of performance) and a practice (as a more enduring 'entity'). To explain this further, there is a need to relate specific moments of performance alongside the broader pattern of understanding which defines and frames that performance. While practice entities have been defined as *"temporally unfolding, spatially dispersed nexus of doings and sayings"* (Schatzki, 1996: 86), performance refers to the actual carrying out of a practice (i.e. the doing). It is, therefore, in moments of doing that a practice is said to be performed, and these performances are at the same time enactments (and transformations) of practices as entities.

So, how might we think of 'use', or the use of technologies within and as part of social practice? Given that theorists of practice focus on the 'practice' as such, their investigations have revealed that the ways in which people engage with technologies within and as part of the conduct of social practices are not exhausted by questions of use (Schatzki, 1996, Morley, 2017, Shove, 2017). To elaborate, some of these commentators might interpret 'use' as just one dimension in the performance of practices in which technologies or objects figure. Others, like Schatzki (2005), point to the 'chains of action' which, when taken together, compose the performance of a particular practice, situating instances of 'use' as just one part of these. More straightforwardly, the 'user' is not a central figure in representations of social practices and of how these unfold.

The centrality of objects (and, at times, technologies) to doings, as well as this question of 'use', is nonetheless vital. This is explored in the work of Shove and Pantzar, who explain through the example of playing football how practitioners (i.e. those who do) during game-play are not simply 'using' the ball but instead, and through the process of playing, are reproducing the practice of football, actively *integrating* (i.e. bringing together) not only the materials of the game (e.g. balls, nets)

but also its meanings and forms of competences, bodily skills, and rules (Shove and Pantzar, 2005). Similarly, when tablet computers come to figure within the practices of daily life, like those of leisure or work, along with apps and mobile connections, and sometimes instead of things like laptops, smartphones, paper, telephones, cameras, televisions etc., they are not simply being 'used'. Instead, they are actively implicated in reproducing the practices of which they are *now* a part.

This conceptual move from use to practice is essential, as it points to the way in which practices, practitioners, and their tablets come to constitute one another. As an example, watching television through the tablet computer, in this context, is thought of as the enactment of a practice, not as a 'use' of the tablet. Similarly, and as the tablet computer comes to be implicated in television watching over time, the tablet comes to be understood as forming a part of television watching. Equally, television watching is increasingly expected to involve the tablet computer. To reiterate, then, such a focus allows for a decentring of the tablet and its practitioner. From this point of view, the central unit of enquiry becomes the practices into which the tablet computer + app combinations are integrated.

By decentring the tablet computer and its practitioner, and by focusing on the lives of practices into which tablets become embedded, I offer a more refined interpretation of 'use' in relation to practices. This allows me to extend the literature on the user and uses. To understand what the tablet is 'for'; how and why it is 'taken up' and how it has become embedded (i.e. integrated) into daily life, the key methodological move is to focus on practices, but what does that mean; what questions arise and how might they be addressed?

In taking the practice as this central unit of enquiry, specific questions arise about how something like the tablet figures in the performance of not one but several practices. More than that, the relation between people, tablets, and practices is one of mutual and ongoing 'constitution'. In other words, people are not viewed as ready-made 'relevant social groups', 'prosumers', or 'users'. Though, at first glance, this observation may appear to undermine the conclusion of the aforementioned studies; that users are key figures in processes of innovation, the shift in terminology does not deny the innovative processes at play in relation to the tablet computer. In highlighting the role of people as 'practitioners' (i.e. people caught up in the performance of practices) not as 'users' (i.e. people using technologies or objects), this approach emphasises the point that innovation in 'using' is always contained and shaped by the practice in which that 'use' is taking place. Consequently, questions about innovation in use are re-framed as questions about how the trajectories of practices change over time.

One obvious consequence, not only for the tablet, but for studies of other objects-in-practice, is that it is important to go beyond discussion of 'singular' practices in isolation (e.g. playing football, watching television). An individual's everyday life, as constituted through the performance of practices, is an unfolding process, in that many practices (for example, eating, working, watching TV, playing games) are connected together in time and across space (Shove et al., 2012, Hui et al., 2017). But practices do not just connect through moments of performances: practices as entities are also linked in other different and important ways. For instance, Shove et al, (2012) use the term 'bundles' to describe 'loose' connections between practices that are, for instance, co-located in time or space. Meanwhile, the term 'complexes' is used to describe 'stickier' connections between co-dependent practices which includes forms of sequencing and synchronisation. For instance, in practices of

photography, the taking and sending of a specific photograph must occur in sequence, and the particular ways in which practices 'hang' together has been captured through the terminology of the 'nexus' (Hui et al., 2017).

There are many co-existing bundles and complexes, and what is referred to as the nexus of practice is considered to be the totality of social life. This term captures something of the way in which practices hang together across time and space. To return to the tablet, one implication is that it is important to focus not just on how the tablet figures in the performance of 'singular' practices but also in and across multiple practices and how these multiple practices hang together across the nexus.

As I have already mentioned, when compared to other existing devices like smartphones and laptops, the tablet computer does not actually provide much that is new, so one question is how the tablet comes to figure alongside other, more 'established' technologies within any one practice. There are various ways of thinking about this.

Configurations of Practice

Thinking about how the tablet computer and its apps become integrated in practice draws attention to the fact that any one practice relates to a mix of technologies, objects, and services (i.e. to material configurations) (Hand and Shove, 2007, Rossitto et al., 2014). This is clear in that practices like those of watching television have come to involve certain spaces, objects like sofas and chairs, as well as others (electrical power, internet) that enable particular combinations of apps and the tablet (e.g. the Netflix app on the tablet computer depends on the Netflix service). When the focus is on the *multiple* practices into which tablets (+ their different apps) are embedded at once (e.g. work, watching television, sending photographs), further

moves are needed to capture the point at which tablets link to related objects and services in varied ways, depending on the practice and the specific configuration of 'materials' involved. In short, these various interrelations of technologies, objects, and services exist at once, and the tablet is positioned within multiple such relations.

Understanding the roles of the tablet computer in daily life therefore necessitates a conceptualisation of the tablet computer as it enters the home, or in other settings, as an element that is 'out there' and that can come to figure within many of the wide range of practices performed by those who own it. In brief, it has the potential to figure in a number of practices. In thinking about the mixtures of devices and objects that are at our disposal, there is a need to differentiate between those mixtures which are actively implicated within the performance of a practice (i.e. configuration) and those which are available and 'out there' – in the wider world (i.e. family) – to which individual practitioners have access. Understanding how working 'configurations' develop and change is, in part, a matter of understanding how the tablet computer relates to, and perhaps 'competes' or 'cooperates' with, other objects and devices (Nieminen-Sundell and Pantzar, 2003).

In thinking about the configurations of things which come to figure in the conduct of one or another social practice, Yli-Kauhalumoa et al., (2013) draw attention to the transformative potential of what might at first look like relations of substitution. This approach also highlights things that are not included in working configurations. These include instances in which tablets are not used (see discussions of non-use (Wyatt, 2003, Melby and Toussaint, 2016, Satchell and Dourish, 2009)). Paying attention to non-use or to not-substitution is arguably also crucial in understanding what the tablet computer is and what it is for.

As already mentioned, social practices are situated in, and also constitutive of, time and space. Beyond the potentially competitive or cooperative relations that can exist between objects, specific technologies and devices may have the further effect of altering (i.e. 'softening' or 'dissolving') the temporal and spatial constraints of a practice (Røpke and Christensen, 2013). While the literature concerned with users has less to say on this topic, a focus on how objects are integrated into one or more practices requires sensitivity to these temporal and spatial features. To explain this further, I build on the earlier point that everyday life is an unfolding process. Taking this seriously means recognising that spatiotemporal characteristics are integral to practice, not incidental (Shove, 2009), and while some practices are anchored to particular temporal and spatial coordinates (i.e. they are constrained to particular spatiotemporal anchors), others are not. An understanding of the ways in which the tablet computer comes to figure in the conduct of multiple practices therefore requires a comprehension of how the tablet computer influences the spatiotemporal 'features' or 'qualities' of a practice at any one moment, and in relation to other practices. It is, of course, important to note that such 'features' are always changing as practices and relations between them evolve. In what follows, I am therefore interested in exploring the ways in which particular app and tablet combinations serve to alter, soften, or link together the multiple practices in which they come to figure.

Everyday Life as an Outcome of Evolving Practices

One further consequence of a turn to practices is a turn in terminology. Throughout the thesis, I continue to refer to 'uses' and occasionally to 'users'. But as is already obvious, and as the design and substance of the thesis shows, I do not want to reproduce classic distinctions between 'users' and 'technologies'. My focus is instead on how tablets come to be integrated into a range of different practices. This involves a simple but powerful conceptual shift in which 'users' are understood as

'practitioners' – that is, as people involved in enacting, and also transforming and reproducing, specific practices and the connections between them.

In working with the language of 'integration', it is also important to be clear that I take this to be an ongoing, never-ending process; there is no point when the tablet is finally integrated. The notion of integration has some features in common with Hommels' (2005) concept of embeddedness. Hommels argues that we must always recognise that specific technologies fit into larger systems or networks. That is, they are 'embedded' in a set of extensive relations. As I use it, the notion of integration also recognises that practices depend on multiple materials (here, I use 'materials' to include all kinds of man-made or natural objects, digital and other technologies). Compared with the term 'embedding', the language of integration draws attention to how multiple objects come together in the performance of practices: it is not just about embedding the tablet within 'one' network. Another key point of difference is that, as I use these terms, 'integration' supposes that technologies (and objects) and practices reproduce and constitute one another in ways that the terminology of embeddedness does not capture.

I am also interested in how tablets figure in the sequencing of practices. For example, the doing of certain practices may have outputs or consequences that provide input to future or other practices. This is emphasised by Shove (2017), who notes that practices often have material outputs; for instance, taking a picture produces a photograph. This photograph may then figure in different ways within other practices, including those of editing or sharing. Acknowledging the material outputs of what have become tablet-dependent practices allows for a more sophisticated understanding of interrelations between technologies, objects, and materials and of how practices connect and intersect with one another. In exploring these kinds of

connections, I work with a notion of 'flow', using this to help identify and analyse forms of material circulation in which the tablet computer is entangled, My key point here is that as well as being integrated into multiple practices, tablet computers are coming to figure within 'material flows' that connect together multiple practices that hang together across the nexus of practice.

One final but crucial point is to acknowledge that daily life and the practices which together constitute it are dynamic (Shove et al., 2012). Bijker (1997) again offers some initial ideas which help when thinking about integration, or rather integrating, as a never-ending process.

Integrating as an Ongoing Process

Technologies, their uses, and their meanings change over time. This is evident in Bijker's (1997) history of the bicycle, which starts with the drawings of da Vinci and continues through to the development of the safety bicycle. The story is one of successive moments of re-design, often related to shifts of 'use', and of how 'the bicycle' was positioned within and in relation to 'relevant social groups'. Crucially, this story has an endpoint whereby the bicycle's design 'stabilises' and the 'technological frame' settles down (Bijker, 2001). This interest in stabilisation and renewed order is also evident in what is known as the domestication approach (Silverstone et al., 1992). Again, the interest is in describing processes that lead to an object (in this case, the television) becoming 'tamed', which is seen to be the endpoint of domestication. Pantzar (1997) adopts a similar approach, whilst improving its sensitivities to the scales of incorporation that objects must undergo in processes of domestication. This is to say that Pantzar (1997) acknowledges that the evolutionary process of domestication occurs not just at the level of the single households

investigated by Silverstone et al. (1992), but at the general level of a mass consumption society as well.

Like the bicycle and television, the tablet computer has been through its own successive moments of redesign (for instance, for the iPad specifically, there are four different models available, and each model is available as Wi-Fi only or Wi-Fi and mobile data (Apple, 2018)). At the same time, one might argue that certain features have indeed 'stabilised'. The problem is that accounts of the sometimes-key moments of (physical) redesign miss the tablet's always provisional place in practice and within a constantly shifting 'family' of related but also changing technologies and devices. As I show, although the tablet computer is 'stable' in some respects, it is definitely not in many other ways.

In technical terms, the tablet is 'obliged' to change as a consequence of its reliance on a mobile operating system, more commonly known as an OS, or iOS for the iPad specifically. This interaction results in an enforced dynamic, meaning that regular updates are 'pushed' to the tablet computer by its manufacturers. These alter the functions and abilities of the tablet and are important for the functioning of the apps that are, or that can be, installed. Taking the iPad specifically for one moment, and choosing one particular model, as not all iOS's are compatible on all models: the iPad 2 had five major operating system updates, each significantly altering the properties or qualities of the tablet. Beyond this, and as already noted, the character and functions of the tablet computer are also linked to the installation of apps, so when more apps are installed, or if others are deleted, the tablet again provides different opportunities than it did before.

There are other senses in which stability (or the lack thereof) might be discussed. In those cases where the focus is on an arguably more discrete object, like Bijker's (1997) bicycle, it is crucial to emphasise that there is still no point at which stability is finally achieved. Even the bicycle (and especially the bicycle when understood as being part of one or more practices) continues to evolve (Shove, 2012). Similar themes have been discussed with reference to the fridge freezer (Hand and Shove, 2007), a seemingly simple appliance but one that is positioned within different systems of food provisioning. In being associated with the shifting practices of eating, cooking, and shopping, and in sitting at the intersection of these multiple practices, the freezer is continually redefined by changes in such practices. Hand and Shove take what they term an 'integrative approach' to their analysis of the freezer, viewing freezing as an outcome of the active and simultaneous integration of the multiple practices of shopping, cooking, and eating (i.e. freezer, ingredients, meanings of real food or health, and skills of food planning). This is an approach that I seek to develop but with reference to the tablet computer.

It is through processes of integrating (as an action and as a part of doing) that practices are reconfigured, that technologies, objects, and services come to relate to one another in different ways, and that practitioners' experiences are formed and transformed. These are never isolated processes but are always responding and adapting to changes elsewhere in the nexus of practice. As such, integrating is a never-ending process of reconfiguration that is always and inherently unstable.

In working with these ideas, this thesis investigates some of the ways in which the tablet computer has come to be 'established' not once, and not forever, but in many and changing ways. Focusing on the integration of the tablet computer (as an outcome of practices) requires sensitivity to the changing relations of the tablet computer

(which itself is in flux) to practices which are themselves changing, its relations within changing configurations, and to the changing nexus of practice. In summary, this thesis seeks to work with this practice-based re-conceptualisation of 'use' to show how tablet computers have been so rapidly and extensively integrated into so many different practices, and how tablet-related practices change over time.

This approach, and its attendant ambition, generates a number of specific questions:

1. The tablet has become integral to many practices at once. It is 'used' in many situations and contexts. How can the multiplicity of its embeddedness in these contexts be conceptualized and analysed? How has the tablet modified the spatial and temporal qualities of the different practices of which it is now a part?

2. Practices have their own histories, and in some cases specialised technologies (e.g. standalone television) are a part of these histories. How have tablet computers come to figure within ways of watching television? In what ways do tablets compete or cooperate with other, more established technologies?

3. The tablet computer figures within multiple material flows (e.g. data, images, information), and these flows provide a means of understanding tablets as implicated in bridging between practices that 'hang together'. In what ways does the tablet computer figure within the flows and circulation of images through and across different practices?

4. Integration is ongoing, defined by the inherently dynamic qualities of daily life. In what ways is 'integration' maintained (or not)?

In addressing these questions, I will attend to the central 'puzzle' around which this research is centred: what does an investigation of tablet-practice relations reveal about the tablet computer's rapid appropriation? How is it that the tablet has become part of so many different practices, and how have these practices in turn shaped what the tablet has become?

The Thesis Structure

Having positioned my research in relation to some of the literature dealing with themes of use and appropriation, as well as highlighting ideas and concepts that I will be mobilising from theories of practice, I will now outline the structure of the thesis.

In essence, each chapter works through what I consider to be some of the different 'dimensions' of the tablet's integration into practice, these being: integration into multiple practices; integration into configurations of practice; integration into the nexus of practice; and integrating over time. In doing this, I consider the different relations that have formed and reformed around the tablet computer through its embedding into different and multiple practices as these change over time.

Chapter 2 describes the research design that was adopted to address the above research questions. It explains how I went about studying the tablet-practices relation and the strategies adopted to do this. In setting out these strategies, I explain how my research design and methods were informed by the guiding ideas and logic introduced in this chapter.

Chapter 3 'Following Imaginaries of 'Use': Introducing the tablet as a dynamic object' takes a step back and takes stock both of the history of the iPad and of the ideas and

ambitions of the iPad's manufacturers. As an entry point to further, more elaborate discussion of what the iPad 'is' and what it 'is for', I start by reviewing a selection of promotional materials which tap into particular imaginaries that have been developed around the iPad.

As described in Chapter 2 'The Research Design and Methodology: Capturing tablet computers in practice', the remaining empirical chapters of the thesis draw on semi-structured interviews with 20 tablet 'users'. I spoke with people from two age groups – these being (1) tablet 'users' aged 65+ and; (2) tablet 'users' aged 25-35.

Chapter 4 '(Situated) Integrations of the Tablet Computer' investigates relations between the tablet (with the apps that were installed upon it) and the practices of which these app + tablet combinations are a part. I examine particular combinations of tablet + app in detail to understand how they come to figure, in combination, in a multiplicity of practices. This discussion shows how particular combinations of tablet + app influence the spatiotemporal coordinates of selected practices of which the tablet *now* forms a part.

Chapter 5 'Watching Television: Tablets, related devices, and the reconfiguration of practice' focuses on 'one' practice as a means of revealing relations between the tablet and other available devices and objects. Examining ideas of competition and collaboration, I focus on ways of watching television and on whether and how the tablet computer substitutes for other devices in the changing practice of television watching.

Chapter 6 'Following Flow through Moments of Image Sharing: How digital images circulate through the tablet computer and connect practices' recognises that the

tablet itself sits at the intersection of social relations, institutions, and practitioners, and that interactions with the tablet computer hang together through and via chains of action that link other moments of performance (that may involve other co-practitioners but also may not). I work with the example of image management (i.e. the taking, editing, storing, and sharing of images) to think through the ways in which interactions with the tablet hang together and link across other forms and moments of practice.

Chapter 7 'Maintaining Connections: Tablets and the changing relations of practice' follows the changing roles, status, and positioning(s) of tablets as these evolve in practice and over time. It makes use of follow-up interviews (and one 'original' interview) to identify and examine some of the processes involved in the ongoing integrating of tablet computers.

Chapter 8 'Reclaiming 'Use'' concludes the thesis. I summarise the main findings of the research, using these to develop and articulate a more sophisticated understanding of integration, and therefore of 'use', than is presented in the individual chapters. By tying these threads together, this chapter highlights specific contributions to the topics of integration, use, flexibility, and the lack of closure around which the thesis is built.

Chapter 2 The Research Design and Methodology: Capturing tablet computers in practice

Understanding Tablet Computers

Gadamer (1999) describes research as an ongoing process, and in this chapter, I explain how I have come to conceptualise the tablet computer through an iterative process, the series of methodological decisions through which I have developed my approach to this project, and the methods that I have used to capture how different aspects of the tablet in use, and in practice, have evolved. The purpose in doing this is to explain the logic underpinning the methodological approach taken in this project, and to highlight the choices that I have made as a consequence of the aims of this research and the specific features of the object of the enquiry.

My aim in this thesis is to describe and characterise some of the many relations in which the tablet computer is entangled. In approaching this task, particular methodological challenges arose, especially about how to 'see' and study cross-cutting interrelations between tablet computers and other devices and the changing ways in which they figure into a range of different practices over time. The significant methodological issues therefore concerned how to analyse the relations of the tablet to the diverse range of practices of which it has become a part, and how to reveal and analyse the interactions of the tablet alongside other technologies and objects that are also implicated in the performances of the same and/or other practices. These methodological questions are particularly difficult to resolve once it is considered that these multiple relations are continuously evolving, and in flux.

Returning to Gadamer's (1999) ideas of understanding through research as an always shifting orientation, he describes the 'fusion of horizons' which occurs through the ongoing moments of understanding in social scientific research. Rejecting both objectivism and claims to absolute knowledge, Gadamer suggests that the horizon *"[…] is the range of vision that includes everything that can be seen from a particular vantage point"* (1999: 302). The researcher's horizon is consequently less about the personal bias of the researcher and more about the particular questions and priorities of the research itself, dictated by how these influence the framing and understanding of the object that is being examined. Following this kind of orientation to research, it is important to emphasise my own priorities, these being to investigate the tablet's relations across and within multiple practices, with other technologies and associated objects, and across a broader nexus of practice, and to understand how these tablet–practice relations adapt and respond over time. Acknowledging these priorities, however, also means that other features that might be significant for how the tablet has come to figure within the conduct of daily life, for instance the tablet's relations to infrastructures (broadband, internet, electricity etc.), cannot be taken up with the same vigour.

Cerwonka and Malkki (2008: 17) suggest that the process of research is more of a spiral than a linear, cumulative process. I take up their characterisation here of the research process as one of partial understanding punctuated by floods of insight. Though some aspects of the project and research design evolved, the central questions did not shift substantially. Each chapter focuses on a different 'dimension' of the tablet's 'integration' in practice, consequently taking up one particular aspect of the set of relations that the tablet has formed through its embedding over time. Each chapter, therefore, momentarily pushes other 'dimensions' of the tablet's integration into practice into the background as a means of bringing specific questions and

features into the spotlight. Whilst some of the competing approaches reviewed in the first chapter could indeed shine a light on different aspects and dimensions of the tablet's integration into and across practice, a practice theoretical commitment guides both the lines of enquiry I follow, and the methods adopted.

To be more specific, capturing the tablet 'in practice' and doing so dynamically depends on paying attention to the multiple and varied practices in which the tablet features or on which it depends, conceptualising changing configurations of practice, and discovering how processes of integrating develop over time. It is only through capturing all of these dimensions that the dynamics of the tablet's integration across practice can be understood. It is not simply that theories of practice offers strengths over other (and often, competing) approaches to researching technologies-in-use, but that in mobilising this particular theory of practice, that the specific lines of enquiry to be followed are re-defined.

In focusing on particular, 'single' tablet-practice relations one at a time, and in adapting the units of enquiry (and foci) accordingly, I reveal further detail about some of the processes involved rather than seeking to fix or capture a specific state of affairs. In taking up a relational approach in the thesis, there are times when some of the backgrounded tablet-practice relations are of direct importance in the discussion of the relation in focus of a particular chapter's topic. When such 'backgrounded' relations are of importance, I note these in parentheses (e.g. the tablet (+ app) roles in a configuration). The thesis thus interrogates the processes through which tablets are 'integrated' into various practices from different angles, though this is conducted with a sensitivity to the idea that the different processes revealed by taking different angles (or starting points) are, in fact, all occurring at once.

To explain what empirical data was collected and how this was accomplished, as well as explaining how I worked with the data to conceptualise and understand the various dimensions and processes of 'integration', the chapter is structured in the following way. First, I provide a general overview of the research methods through which the empirical data was collected. Second, I explain the analysis of secondary data which informs the next (and third) chapter of the thesis. Third, I discuss the logic of undertaking interviews both in the context of the practice-theoretical framing of the project, and also in relation to the challenge of understanding processes occurring far beyond the experiences of the individual participants involved in this research. Fourth, I explain how the interviews were structured and the strategies I adopted in selecting participants and examining aspects of the tablet-practice relation, as well as the rationale for focusing, in part, on 'images' (i.e. photos, screen shots) in Chapter 6, before commenting on the significance of conducting follow-up interviews with some participants. Finally, I outline the resulting thesis structure to show how the concepts and ideas set out in Chapter 1 inform the research design and the development of the argument.

In brief, the thesis draws on analyses of Apple Keynote presentations (specific to the iPad) as well as articles from the time of the iPad's launch and its subsequent moments of redesign. My research also involved 20 semi-structured interviews with people selected from two age groups: (1) ten interviews with tablet practitioners aged 65+ and (2) ten interviews with tablet practitioners aged 25-35. These interviews were structured around the conversational devices of: App tours (in which I invited respondents to show me the apps on their tablets); personal timelines of acquisition that sketched out the order in which participants had acquired specific devices such as smartphones and laptops; Photo app tours (in which participants talked me through the images stored on their tablets), as well as conversations that detailed the

participants' ways of watching television. Follow-up interviews were also conducted with three participants: two from the first age group and one from the second.

Analysing Imaginaries Created Around Tablet Computers

Though the majority of the thesis draws on empirical material detailing actual and situated uses of the tablet computer, I also work with pre-inscription materials (e.g. Apple Keynote speeches, technological news articles) to examine what producers think tablets are for and particularly how this has changed over time, partly shaped by those situated uses within practices.

This analysis of Keynote speeches contributes to an historical description of the development of tablet-like devices. This is a necessary part of the integrative approach that I am taking, since practices exist beyond specific moments of enactment (i.e. practices are not simply just what people 'do'). The historical trajectory of the tablet is a process in which practitioners are also enmeshed: directly and indirectly, as imagined and envisaged, and in ways that are performed and enacted through the Keynote speeches themselves.

As such an analysis of the Keynote speeches, situated within a historical description of the development of tablet-like devices, enables me to consider the making and shaping of tablet-related practices, and to do so in ways that happen beyond the immediate interactions revealed by studying what respondents were doing with their tablets.

Part of my argument is that this shaping by practice is happening continually as the tablet becomes embedded into new areas of daily life, and while innovation does not stop at the factory gate, it is important to recognise that those involved in 'making' the tablet computer do so with particular imaginaries in mind that have an effect on

that embedding and matter for the tablet's design. One way of getting a grip on this relationship was to examine in what ways official or public (i.e. manufacturer's) representations of the tablet computer have changed over time. In viewing innovation, and subsequently integration, as a negotiation between producers and consumers (Shove and Pantzar, 2005) – as opposed to a process which belongs to the realm of production or consumption alone – it is crucial to attend to some of the imaginaries which exist or have existed around the tablet, seeing these imaginaries as a part of the narrative of the tablet computer's subsequent adoption and rapid embedding.

Gadamer (1999) describes the way in which interpreting and understanding texts can be more complex than understanding speech acts, observing that speech acts usually offer the 'reader' the opportunity to test out their interpretations with other readers or even the speaker themselves. For Gadamer, holistic understandings of texts require that the reader move between their own projections of understanding the part of the text to the projections of the whole successively, ultimately arriving at a 'shared' understanding of the author's message.

Pre-inscription materials (e.g. user guides, articles, speeches) offer a way to get at some of the visions which exist within (i.e. through design) and around (i.e. through the imaginaries of potential) technologies. This is especially true in those cases where a 'holistic' understanding of texts is not intended and the examination of particular texts is instead used as a means of charting representations of a technology over time. Others have undertaken similar exercises; for instance, Carlson (1997) – a proponent of the social construction of technology (SCOT) approach – investigated the 'frames of meanings' put forth by Edison in his development of motion picture technology. More relevant for my purposes, Southerton and Shove (2000) examined freezer representations in freezer cookery books as a means of

understanding how the freezer has become 'normalised' within patterns of domestic practice. Since there are many representations of tablet computers, any picture that I could present would be selective and partial. There is no one 'answer' to the question of what the tablet is and what it is (supposed to be) for. Even so, I am interested in 'imaginaries' of use since they have some discursive power (in defining the field and framing what tablets are and what they are for).

As there are so many tablet computers available, I required some way of limiting which secondary materials could be included in an analysis of the imaginaries which exist around them. I selected the iPad as a consequence of the device's popularity, with one in every four tablets sold (globally) in 2017 being an iPad (IDC, 2018), and because the 'revived' history of tablet computer begins with the iPad's launch. In this context, it made sense to focus on the tablet computers made by Apple Inc.

Companies like Apple (and others) create imaginaries and representations of their products in the ways they present them. I have already described the language of the 'script' in the previous chapter, but having established that the script of the tablet computer is relatively open and flexible, I examine instead some pre-inscription materials that have accompanied its release and subsequent moments of redesign. The visual materials of Apple Keynote speeches, which accompany the launch of every Apple product, provide insight into the imaginaries of use that have been created around the device. A focus on these Keynotes is not entirely new; for instance, Sörman-Nilsson (2013) looks at the introduction of the iPad to think about how 'disruptive' ideas and products are produced. Burgess (2012), on the other hand, examines Apple Keynote speeches, among other advertising materials and public conversations, in her positioning of the iPhone as a 'moment' in the historical development of cultural technologies. While it is common to comment on the issues of

consumerism (Zhang, 2017), business, or marketing (Bergvall-Kåreborn and Howcroft, 2013) (for which Apple are well known) when referring to Apple within investigations of technologies, I do not touch upon those issues in charting Apple's representations of the iPad and the imaginaries of 'uses' which are produced through these.

In examining imaginaries of use as they are communicated through Apple Keynotes, there are also hints to how the iPad relates to our other, more established technologies (e.g. smartphones, laptops, and desktop PCs) as well as information on particular and specific purposes of the iPad (e.g. image-management 'tasks'). This is because, helpfully for my purposes, such presentations are intended to create public interest in a technology by communicating what the iPad is and what it is for. There are also many other co-producers of the iPad's imaginaries who are not related to Apple in any formal capacity. This is to say that there are others who contribute to the establishment of such imaginaries of use but who are not involved in the actual 'making' of the iPad, such as technology journalists. In writing articles about the iPad's introduction and evolution, or about the 'Post-PC era', technology journalists are part of producing an overall discourse which surrounds the iPad. Their writings also inscribed particular visions of the iPad, feeding into the image of what the iPad is for, how it relates to other technologies, and its potential for use in what I term 'image-management practices' (i.e. taking, editing, sharing, storing). I therefore recognise these other authors (i.e. those unaffiliated with Apple) as co-producers of the iPad's image, even if they were not involved in its 'actual' physical production.

I selected materials from the Keynote speeches (2010, 2012, 2014, 2016), and conducted a more selective review of some of the articles available online that specifically discuss the ways that the iPad can figure within the management of

images (i.e. taking, editing, sharing, and storing). The selection period was seven years (2010–2017), as this was the time period between the iPad's launch and when the data collection for the project ended (the final follow-up interview took place in 2017). An analysis of iPad user guides (2010, 2012, 2014, 2016) was also conducted, but this analysis revealed that these user guides focused more on the detail of the apps that come preinstalled on the different iPad models. As a consequence, this analysis did not go on to inform the thesis, but it is included in the appendices (see Appendix 1). Because of my interest in how these imaginaries change over time, I required access to a span of this Keynote data, rather than an in-depth understanding of each Keynote speech within this time. In addition to this, I am not necessarily interested in the iPad alone but in what these imaginaries can tell us about tablet computers more generally. It is because of this that I only review every other Keynote speech rather than every Keynote speech over this period.

These materials (Keynote speeches, technological news articles) have been thematically coded for the units of (1) what the iPad is, (2) what the iPad is for, (3) the interrelations of the iPad with other technologies, and (4) the role of the iPad in image-management 'tasks'. The resultant representation of the iPad given in Chapter 3 is, therefore, one possible representation of the multiple imaginaries which exist around the iPad. I am not arguing that this representation is *the* understanding that Apple Inc. have of the iPad, but it is one representation that I have been able to chart from publicly available documents. Because I focus mainly on Keynotes and not other pre-inscription materials, and especially as I selected some Keynotes and not others, this account is therefore necessarily partial, particularly in its focus on the iPad alone

Investigating People and Their Practices

With a strategy for following produced imaginaries over time in place, I then required a way of understanding the ways in which the tablet computer had become embedded within the conduct of daily life. To do this, I conducted semi-structured interviews with twenty tablet-practitioners. Before delving further into the detail of these interviews: who they were with, how they were organised, and how I worked with the material produced, I comment briefly on how interviewing fits within a practice-theoretical framework, moving on to explain what interviews with tablet-practitioners can tell us about the processes involved in the ongoing figuring of tablets into many different areas of daily life.

There has been a broader discussion within the social sciences as to what interviewing methods can reveal (Schostak, 2005). Specifically, are descriptions and accounts gained from interviews 'adequate' representations of actions and practices as they occur in daily life? (Hitchings, 2011). While the accounts recounted during interviewing are indeed likely to be representations of how tablets come to figure in the enactment of daily life, this is sufficient for my purposes due to the interest that I have in how processes of integrating can be understood both through the tablet and through detailed examples and contextualised instances of 'uses'. Representations or not, the data collected through interviewing is one way of capturing detailed accounts of use through which to examine the workings of processes of integrating.

A second issue is whether it is possible to 'see' or capture changing practices through speaking with specific practitioners (i.e. individuals), especially since practices exist beyond moments of enactment. I argue that the performance of a practice, or of multiple practices, presupposes practices-as-entities (Warde, 2005). In this way,

speaking with practitioners offers a fruitful avenue for understanding the practices into which the tablet has taken on roles, *and* how these roles have come to be (provisionally) embedded within and across particular practices over time.

The way that I understand and work with the interview material produced differentiates my approach from that of those interested in users and their uses. In asking particular questions of practitioners as they relate to the tablet computer and the roles it takes in their daily lives, and understanding their responses alongside the combined techniques of: secondary data analysis, personal device timelines, app tours, photo app tours, and some follow-up interviews, the detail of some of the workings of particular tablet relations (i.e. to practice, to other technologies and objects, to the nexus of practice, and to time) can be revealed. This is because it is *they*, the practitioners, who are actively integrating the tablet computer, and it is *they* who are caught up within broader processes of integrating (and so are also transforming the broader processes of which they are a part).

Beyond discussions of the relevance of interviewing as a means of getting at changing practices, I was confronted with the issue of whether interviews with twenty selected respondents can reveal much about processes which occur far beyond the situated (and thus local) roles of the tablet computers discussed by my participants. I reiterate that, in approaching processes of integrating by working with detailed cases and contextualised instances of 'use', I am interested in the workings of these processes rather than in their outcomes or in putting forth a representative account of them. Having acknowledged that the project is not seeking to represent all situations in which tablets have become important, but that it is instead concerned with capturing and investigating details of specific and contextualised instances, I still need to explain who I spoke to and why.

Selecting Respondents

I required some way of accessing respondents who could provide descriptions of the contexts and details of instances of 'using' the tablet computer. In addition, I was interested in accessing a range of experiences of use of the tablet computer. One way to access diverse experiences was to select participants from two different age groups, but the intention in doing so has never been to compare the experiences of these two groups, given that such comparisons (particularly when conducted at such a small scale) could not contribute to any comparative study of forms of integration.

The decision to focus on the two age categories of those aged (1) 65+ and (2) 25–35, was informed by data from Ofcom (2014, 2015, 2017a). This data points to interesting and (potentially) divergent patterns of the ways that people encounter and 'use' tablets. Selecting respondents from particular age groups was just one way to capture different generative and illustrative cases of use and embedding.

Ofcom's interactive Technology Tracker (n/a)[3] provides a sense of the range of technologies that these particular age groups are likely to own.

[3] As it is an interactive web tool that displays the breakdown of ownership of particular technologies by the age group selected, I am unable to provide a full reference for this technology tracker. Nevertheless, I have reproduced the full graphs (see Figs 2.1. and 2.2.) produced by the interactive tool.

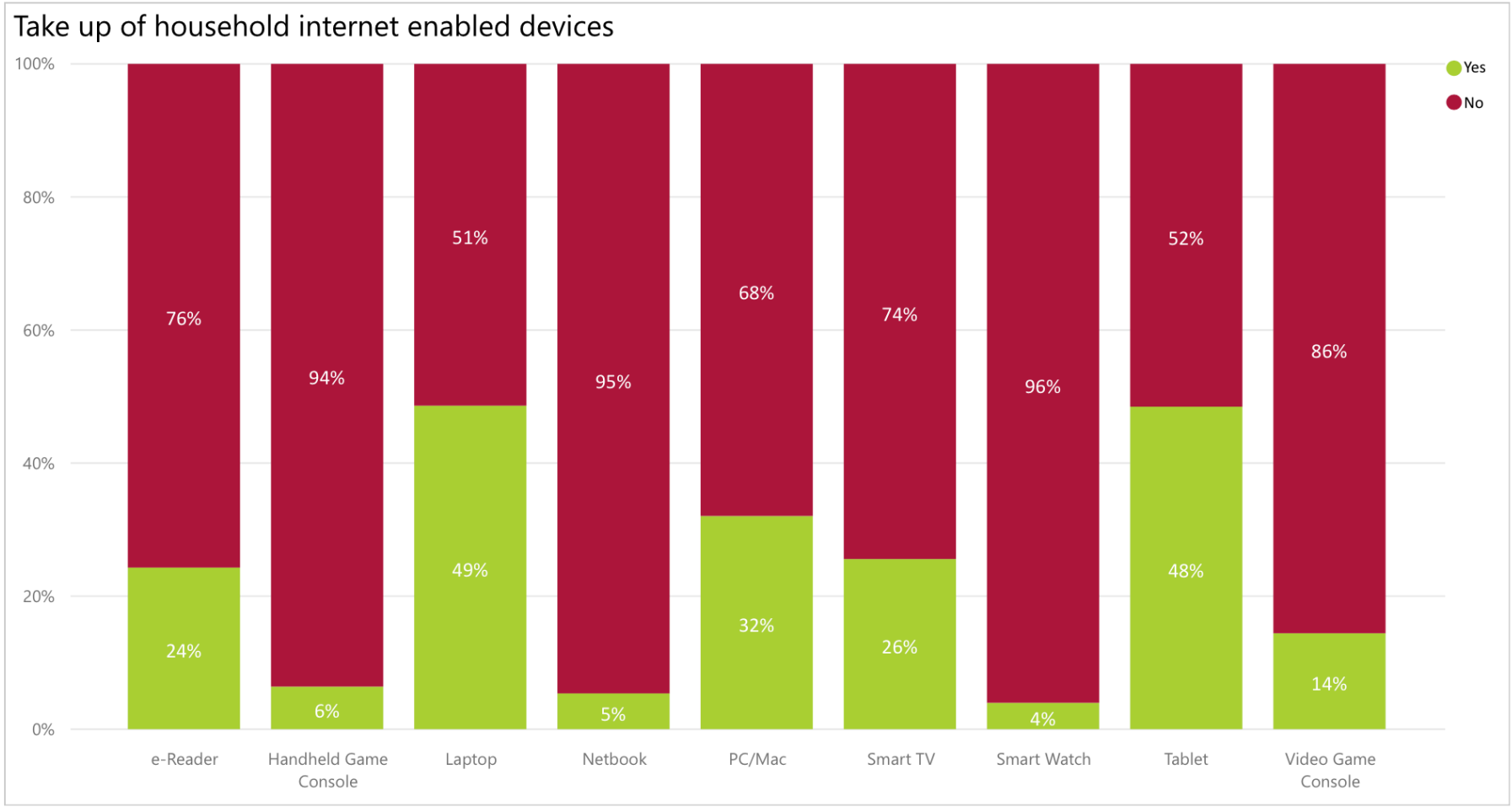


Figure 2.1 – Screenshot taken from Ofcom's (n/a) interactive Technology Tracker web tool, showing the breakdown of technology ownership for those aged 55+

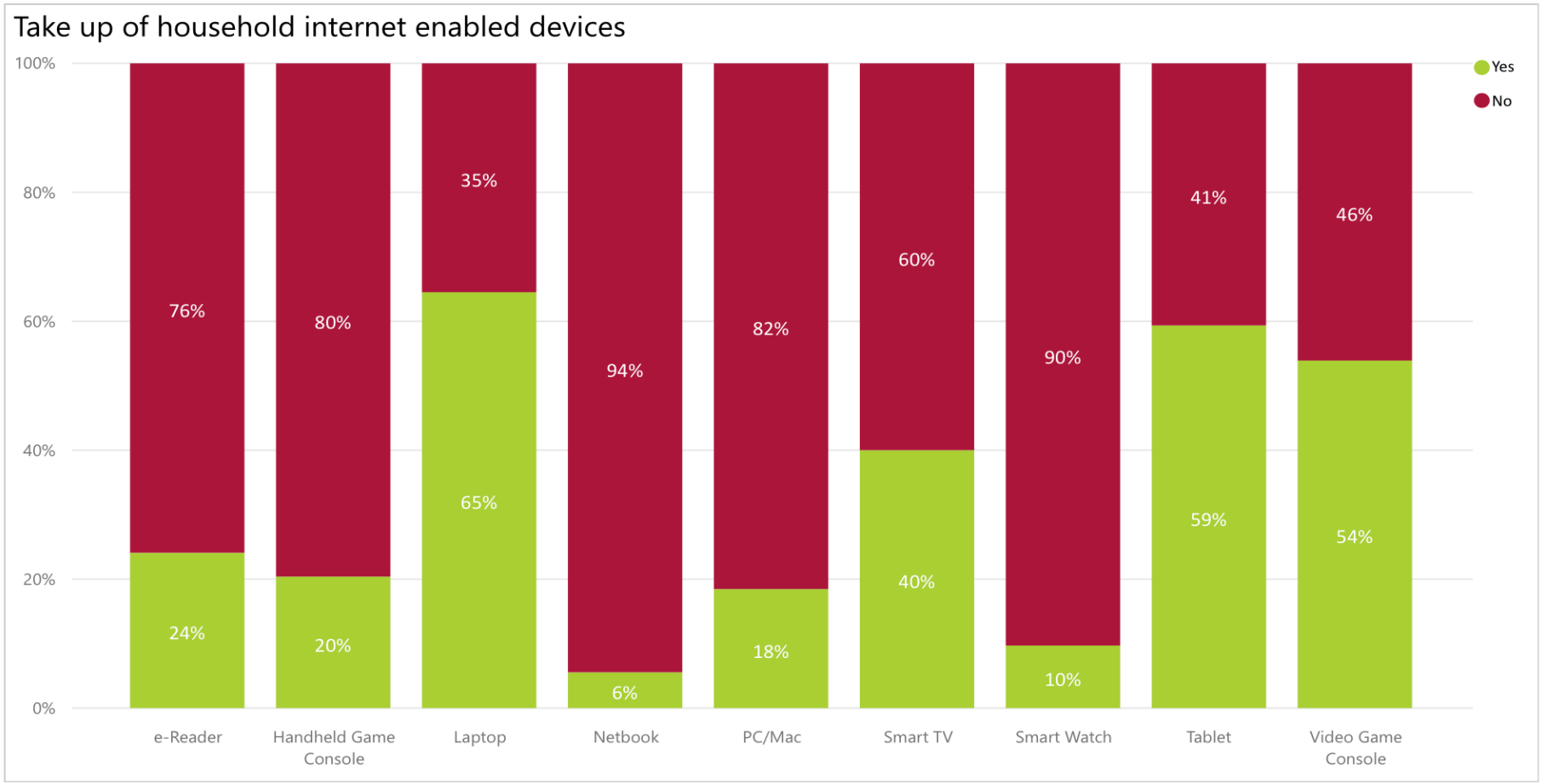


Figure 2.2 – Screenshot taken from Ofcom's (n/a) interactive Technology Tracker web tool, showing the breakdown of technology ownership for those aged 25–35.

Figure 2.2. demonstrates how likely those aged 25–35 are to own a range of other technologies alongside the tablet. In comparing the range for this group with the range exhibited in Figure 2.1, which demonstrates the ownership of different devices for those aged 55+ [4], the likelihood of those aged 55+ owning the same range of other devices drops. In fact, the levels of ownership for all devices was higher for those aged 25–35 than those aged 55+ (barring e-Reader ownership, which was equal, and PC/Mac ownership, which was higher for those aged 55+ (32%) than those aged 25–35 (18%)). Though this is a relatively basic and rough comparison, and the only place within the thesis that draws such comparisons between these age groups, what has been revealed is enough to suggest that taking on these specific age groupings potentially increases the likelihood of my capturing divergent experiences of using the tablet computer that could help to inform the research.

In selecting people to interview who were over 65, I was thus hoping to encounter those for who the tablet was a 'lead' 'internet-enabled device', and Ofcom (2015) have pointed to the relevance of tablets in understanding the increase in those aged 65+ accessing the internet. By selecting respondents aged 25–35, I was attempting to encounter participants who had a wide range of other (but similar) technologies in their daily lives with which the tablet may have interacted. These groups were therefore selected due to the likelihood, based on an analysis of the Ofcom data, of these participants having different levels of access to potentially 'competing' or cooperative technologies but also different experiences of practices (i.e. internet-dependent or not).

[4] The breakdown of age groupings used for the Technology Tracker stops at 55+, differing from the groupings used by Ofcom in their Communication Market and Adults' Media Use and Attitudes annual reports. Regardless, my assertion still stands, though consequently I do not take up specific figures from the Technology Tracker in my own work; recognising that these are not exact nor complete (in that they do not show the levels of ownership of smartphones either).

As it turns out, there seems to be as much diversity (e.g. in prior use of internet, owning other devices, etc.) across the participants in the same groups as there is across age groupings. Consequently, though I selected these two age groups to increase the likelihood of interviewing a range of participants with diverse sets of other devices within their homes – to investigate how the tablet computer forms relations with other and similar types of devices (in differing kinds of configuration, i.e. where there are other and similar types of devices and where there are not) – I give these groups a relatively equal status throughout the thesis, and I do not at all attempt to draw insights about these particular demographics (i.e. 'millennials' and older people) from my own data in the thesis.

The Practicalities of Recruitment

Having selected these particular age groupings, I then needed a viable means of identifying people between 25 and 35, and those over 65, who used tablets. One means of accessing participants aged 65+ was to join in with an adult learning group which taught older adults how to use tablet computers. I contacted the leader and enquired as to whether they would have an interest in taking part in the study. I was invited to one of the classes, where I explained the research and the attendees were provided with an email address. Some interested parties contacted me directly, and one of the tablet class leaders acted as a mediator for others.

I joined the tablet learning group on two occasions during the recruitment process, taking my own tablet computer along and following along with the classes. Though I took notes on the materials of the course, I only noted the words of other attendees during the class when they were directly speaking to me and after I had asked if I could record (by hand) what had been said (e.g. particular themes covered in previous

classes). I ensured to only note down aspects of these conversations when they related to the classes (i.e. nothing that could be considered personal, e.g. what they found difficult in 'using' the tablet computer) and made all of these notes in the open. These notes, and the excursions to the tablet class more generally, have not gone on to inform the thesis in any substantial way (i.e. materials collected here are not included as quotes in any empirical chapter). Instead, attending the class was a means of gaining access to potential participants for the study. However, the experience was significant in shaping the project's thinking about this older group and their experiences with the tablet computer in all of their heterogeneity (e.g. skill levels, their recruitment to different practices). Five participants in total were recruited from this learning course, including a mix of course leaders and attendees. The other five who make up the remainder of the 65+ respondent group were found mostly through enquiring through my own social networks (e.g. colleagues and friends) or through snowballing from the tablet class (i.e. a relative of one tablet group member).

It was easier to recruit those between 25 and 35 through my social networks (e.g. colleagues and friends), and I then used these resulting five participants to snowball to the remaining five. The criteria for selection were relatively simple: respondents solely had to have access to a tablet computer (at home or work) which they made use of in any way, and they had to be willing to take part in the interview process. Though my analysis of producer representations focuses on the iPad, I did not specify which tablet computer model I was interested in during the recruitment process for the interviews. This was because, though I required some way to limit the producer representations of the tablet computer, I did not want to limit the data I could collect on actual and situated uses of the tablet computer. In addition, the interest I have is in tablet computers in general, not specific models or manufacturers.

All interviews were audio recorded, and anonymised transcripts were made from these audio recordings, with pseudonyms used throughout the thesis. Interviews with those participants who did not live locally (seven) were conducted over video call (Skype or FaceTime), with the remainder of the interviews (thirteen) being conducted in person.

Approaching Interviewing

The interview 'schedule' developed, changed, and was adapted as the project unfolded. Though I have recognised in this chapter that the research process is not linear, the following descriptions of interview process presents what became the final form.

One key concern was to understand how the tablet 'entered' an existing 'family' of computer-related devices (Silverstone et al., 1992). To capture this, and to set the scene for the rest of the interview, I invited respondents to construct a personal timeline showing when they had acquired specific devices such as smartphones and laptops. Adriansen (2012) has written specifically about 'timeline interviews' and their value (particularly in life-history research, but also for establishing the chronology of other sorts of events). Unlike Adriansen, the timelines employed within my interviews did not involve both researcher and participant physically sketching a timeline together, but they did provide a clear picture of the 'environments' into which the tablets 'arrived' and into which they had become embedded.

To establish these 'environments', particular attention was paid to the timing of arrival of these technologies. Rather than focusing on the specific date of arrival in the interview, I concentrated on the order in which different technologies arrived in the home, including the tablet. Working with the participant, this first stage of the

interview involved putting together a timeline of when they had acquired different devices. This activity allowed me to specifically enquire as to which devices the tablet was seen to compete and cooperate with in the performance of particular practices. This is because a focus on integrations of the tablet computer also meant zooming out from this particular technology alone to understand the wider 'configuration' into which the tablet was fitting. I then worked with this information to further enquire about how particular practices (in which the tablet *now* figured) were previously performed (e.g. 'before using your iPad to, for example, watch catch-up television, did you use your smartphone or laptop in this way? Did its use differ in any way to how you use your iPad for this?')

A second strategy, designed to provide an overview of how the tablet had been 'customised' – and to what end – was to ask participants to talk through the apps that they had installed. I have been unable to find evidence of this exact approach (i.e. app tours on tablet computers or smartphones) being adopted in other research on mobile devices, but interrogating objects as a means of understanding another object of enquiry is not new. For instance, Hurdley (2006) used mantelpieces as part of an interviewing technique, encouraging participants to recount narratives of how they came to possess the items displayed on such, in order to show how private experiences of the self can be manifested through such items. In addition, using tours as an interviewing technique has been employed to better understand our relations to technologies, with one example being Blythe et al. (2002), who asked participants to take them on 'technology tours' of their homes, using this technique as a means of revealing the biographies of the technologies as put forth by their respondents.

The app tours that I conducted, on the other hand, were usually guided by the home screen on the device itself or by screenshots of this home screen. This is because,

prior to the interview taking place, I would first ask participants if they could send me screenshots of their home screen via email. This technique allowed me to prepare for the interview (e.g. examining which apps they had installed and researching what these apps were for in the cases where I did not already recognise them) and also acted as an intriguing measure of participants' familiarity with the tablet computer. While some were able to do this without help, others required a step-by-step guide of what screenshots were and how to take them on a tablet. The act of asking for screenshots also hinted at the 'level' of questioning I would follow in the interview; [5] this was in recognition of the fact that, in order for me to better understand my object of enquiry, my participants must first be able to understand me (Cerwonka and Malkki, 2008).

Not all participants were able to send screenshots (some could not, and some did not want to out of privacy concerns) [6], and in those cases, these participants were asked to bring along their tablet computers with them to the interview so that we could talk through the apps installed, with these home screens (as a screenshot or on the tablet) acting as a probe to ensure recall of some of the potentially more mundane and daily 'uses' of the tablet computer (e.g. playing games). In cases where no screenshot was

[5] To provide an example of this, whereas some participants were comfortable discussing the ways they would use Cloud storage, it made more sense to enquire of others what they stored on the iPad more generally. This is because questions about some of the more 'technical' qualities of the tablet flustered some more than others.

[6] Screenshots of home screens only show information about the apps that are installed on the tablet computer, but some participants were, at times, unsure of the information that I would be able to see from the screenshots. This is best demonstrated by one participant's concern that I would be able to see pictures of his grandchildren stored on the tablet computer from the screenshots. When the participant was unsure, I attempted to explain how I would use the screenshots (i.e. as probes) and what the screenshots could (and could not) show me. Regardless, I was sure to emphasise that this process was voluntary and that we could instead talk through the home screen on the tablet itself during the interview. This allowed the participant more control over which apps we discussed, though this consequently also limited the way that I could probe the participant for further information about the 'uses' of their tablet.

provided, the process of sharing the tablet screen with participants was more effective when conducting the interviews in person than through Skype or FaceTime.

In acting as a probe for conversations, these app tours aided in reassuring participants that I was interested in hearing about all kinds of apps (i.e. novel and mundane) that they had installed onto the tablet computer. Usually, this was more effective than my vocal reassurances at the beginning of the interview, and during recruitment, that this was the case. While participants were often quick to volunteer information about some of the more novel apps they had installed on the tablet computer (e.g. the FlightTracker app, which shows the flight paths of airplanes) and which were used relatively little in their daily lives, other apps were only mentioned when the participants were directly asked about them (e.g. email: Mail App; browsing: Safari app), even if these had taken more central roles or were used much more frequently (even daily). Often, asking particular questions about specific apps such as the 'Mail' app would prompt the participant to respond that they did not think that such a use would be of interest, but the direct questioning that the app tours facilitated reassured participants of their relevance and allowed for further conversation to take place about these apps' relations to the performance of their daily lives.

A third, more specific line of enquiry – and one that was relevant to all respondents – revolved around ways of watching television. I focused on this particular practice,[7] seeing it as an area in which most participants would have experience and where those experiences might involve competing or cooperative technologies (see Chapter

[7] Asking specifically about participants' ways of watching television was added to the interview schedule after a few interviews. This is because it had already emerged naturally within the discussions thus far, making this 'area' of practice (i.e. television watching) an appropriate means through which to explore the (tablet-)configuration-practice relation.

5 for the relevance of competing and cooperative technologies to the practice of television watching). Participants were asked to explain the ways in which they watched television. In addition to this, apps which related to practices of television watching were noted during the app tour (e.g. television guides, streaming services), and participants were later asked how these apps fit in with their ways of television watching. Their responses were further probed by questions about the conditions which would invoke these particular ways of watching television (e.g. 'Tell me about the ways that you watch catch-up television'; 'Tell me about the ways that you watch Netflix', etc.) In knowing the other devices (e.g. TV, smartphone) to which the participant had access (from the timelines), I was able to ask specifically about the roles of these devices within practices of television watching, if they had not already emerged (e.g. 'Are there any circumstances in which you would watch television through your smartphone?')

Finally, and in order to learn more about the tablet both as a storage device and as a means of linking or bridging between different practices, I asked specifically and in detail about the Photo app, as image storage reveals how, and in what ways, images 'circulate' through the tablet computer. I have already discussed the prominence of tours used in other studies, but photographic tours are another strategy that is often employed as a complementary method within interviewing. Here, participants are asked to take an interviewer on a tour, taking photographs of this process as they go (Einarsdottir, 2005). More relevant to my purposes, looking through photographs has also been taken up, with some interviewers asking respondents to talk them through their own photo albums (Van House, 2009) or eliciting photographs prior to the interview process as a means of prompting participants during the interview itself (Bates, 2015). The way that I used photos echoes elements of these other studies, as I adopt the images stored within the Photo app as a means to prompt participants.

Regardless, given the interest I have in images' movements, not the images themselves, these images are not reproduced in any way in the thesis, like Bates (2015) and Einarsdottir's (2005) work does.

The Photo app tour was carried out by asking participants to show and/or discuss the images they had stored within this app. However, images have been noted to be taking on roles within practices not specifically associated with photography (e.g. communication practices (Ofcom, 2017b)). In this context, it was important to recognise that not all images move onto tablet computers through the process of 'taking'. Consequently, these discussions were followed up with enquiries about which other apps had been involved in the taking, editing, sharing, and storing of images with the tablet computer, and how and where these images moved. This allowed me to emphasise the interest in images of all kinds, including emoticons, memes, and cloud photo libraries. Examples of this kind often prompted further explanations of other images, and it was through these means that participants came to explain the roles of images in practices of remembering and communicating with others (practices which are not always specifically associated with photography).

Recognising the potential privacy concerns that participants may have in directly showing me the images they had stored on their tablet computers, participants were asked the broad question, "Can you walk me through the images that you have stored on the tablet computer by describing the sorts of images you have stored there?" I would then reiterate that they did not need to show me these and that they were instead being asked to explain the sorts of images they had. While some participants were more comfortable simply talking me through the images they had stored on their tablet computers (e.g. landscapes, family photos), others appeared to perhaps even

enjoy the experience of directly showing me the images from their tablet screens while describing how they came to be stored on the tablet computer.

These lines of enquiry (timelines, app tours, ways of watching television, photo app tours) were sandwiched between contextual questions about the participants' daily lives which began the interview and questions about some of the more obvious material relations of the tablet computer in (and out of) practice (e.g. charge, Wi-Fi, mobile data) on which the interview ended. The contextual questions not only aided in building the participants' confidence at the beginning of the interview but also provided crucial information (e.g. work, daily life) with which to engage with respondents' (other) answers, later in the interview. An example of a 'later' stage interview schedule (i.e. after the interview schedule was finalised) can be found in the appendices (see Appendix 2) to show how these strategies organised the interview.

Follow-Up Interviews

The interviews provided some contextualised instances of 'uses' as they related to the participants' daily lives at the moment of interviewing, but I also required a way of capturing how the roles of the tablet within daily life changes. I conducted follow-up interviews with three participants to explore how people adapt with tablets over time, focusing on those who had provided useful detail in the first interview, and who either reported experiencing some kind of change (Ann and Liam) or reported that they were using their tablets the same way (Alan). The resulting participants with whom I spoke were: Ann and Alan (both over 65) and Liam (25–35). To understand the ways in which the tablet computer has come to be embedded, it is also crucial to understand how – at times – the tablet can 'fall out of use' (Wyatt, 2003). In this case, one 'original' interview also supplemented this material, as the data gathered from my

interview with Jill (25–35) provided a detailed account of how her tablet computer had fallen out of use in the time that she had owned it.

The follow-up interviews repeated the earlier schedule, but prior to the follow-up interviews taking place, I prepared by tailoring the interview schedule, taking account of the responses given during the first interviews to focus more specifically on the apps they had reported using, other relevant devices that they said they owned, their ways of watching television, and the types of images that they had discussed in the first interview. In the follow-up interviews, I enquired specifically into these kinds of tablet-practice relations, to understand the ways in which these had changed in the time since the last interview.

Follow-up interviews are a relatively common strategy because they provide the opportunity for further questions as the research design is solidified. But in this case, they also proved to be extremely important for exploring changing tablet-practice relations over time. Working with three follow-up interviews (as well as one 'original' interview) provided the detail necessary to catch sight of the unending embedding of the tablet, revealing contextualised insights into aspects of change of which the respondents themselves were often unaware.

Using this material, the thesis investigates many different instances of change – changes in design, in practices, in relations between technologies, as well as in software, and in more distant relations between things and people – and follows these at different scales. This is to say, that there is no one, or consistent conceptualisation of change that is used throughout the thesis, nor in its analyses, and instead, there are multiple forms of change, which the approach I have taken suggests are occurring simulataneously. This makes any general and definitive positioning of 'change'

somewhat of a challenge, and especially if that concept is understood in relation to some notion of stability or fixity.

However, the point of this thesis is not to categorise and classify these practices, or to estimate or measure the changes they have undergone over time. Nor is the purpose to attribute the cause and effect of any one or more of the specific changes that are described in my analyses. Though critics often expect or hope for such an explanation (Turner, 1994), in focusing on practice performances into which the tablet computer has been integrated, my account acknowledges the indeterminacy of such actions. This is because – in taking Schatzki's (1996; 2010) view – there is no predetermined causality between the conditions of life (i.e. mental phenomena, desire, motivation) and action itself; and instead "*The bodily acts are the conditions of life being made manifest and present*" (Schatzki, 1996: 23). What Schatzki (1996; 2010) means by this, is that such actions (e.g. integrating the tablet computer into performance) are not fixed or established in reality prior to these moments unfolding. In lieu of determining action, practices simply circumscribe what people do: whether or not they do it, and what factors affect this doing settle only during the moment.

Instead of categorising or explaining cause and effect then, the thesis seeks to show how the tablet is involved in instances of reconfiguration and mutual adaptation that occur far beyond the user–technology relation, and that occur simultaneously, or in parallel and sequence across a variety of linked domains. More positively, this thesis suggests that it is these processes of integration themselves which define (and so also redefine) the contours of a practice (or of multiple practices) over time, not the object (i.e. tablet) nor the subject (i.e. practitioner) alone.

Outlining the Thesis

Having outlined how the empirical material for this research was collected, I will now summarise the aims, research questions, and methods as these combine, then move on to outlining the structure of the thesis.

In this thesis, I am interested in how the tablet computer is becoming embedded into daily life and, through this embedding, how the tablet computer matters for reconfiguring moments of performance and the changing relations of the tablet with devices and objects in moments of performance. In recognising that practitioners do not act independently of one another, I also examine how moments of performance (in which the tablet now forms a part) come to connect with other practitioners' moments of performance. I am interested in the detail behind some of the many practice-relations which have formed around the tablet computer and through its integration into practice, and in how these relations adapt over time as daily life itself changes. In investigating the apps that are installed on the tablet; the co-existence of the tablet computer with other (and similar) devices and associated objects; and the ways in which the tablet figures within the flow of images as these link moments of performance across the nexus of practice, I seek to understand how the tablet computer fits into a wider network that spans far beyond the user and device in focus.

In Chapter 3, I take the initial step of reviewing the presentation of the tablet computer as a consumer good as this is represented by its manufacturers and co-producers. Recognising that the iPad is only the first of *this* generation of tablet computers, and not the first tablet-like device in general, I provide a history of tablet-like devices as a means of situating the imaginaries that exist around the iPad. Having set out this history, I then review some of the Apple Keynote speeches and

technological news articles that accompanied the iPad's launch, as a means of charting the imaginaries that exist around what the iPad is and what it is for. Highlighting the language of substitution and replacement around the iPad's launch, the chapter provides a descriptive backdrop of what the tablet is for while also providing a reference for the remainder of the thesis, which examines actual and situated 'uses' of the tablet computer as these relate to practice.

Chapter 4 recognises that any role that the tablet computer takes up in practice depends upon its combination with particular apps. Apps are therefore what make the tablet 'able' to take on roles within specific and multiple practices. Moving the focus from the tablet alone, these tablet + app combinations are related to practice performances, not isolated 'uses', bringing details of temporality and spatiality to the foreground. This chapter focuses on the experiences of three participants from group one (i.e. 65+), showing the multiplicity of roles that the tablet computer has taken on within and across practices, as a means of prompting an analysis of the spatiotemporal coordinates of performances in which the tablet now figures.

Chapter 5 then zooms in on one particular practice, that of television watching, while zooming out from the technology of the tablet computer (and its apps) alone. Taking seriously the idea that any one practice can draw in multiple technologies, objects, and services, I demonstrate how television watching, often considered as a relatively bounded practice, has been through various moments of transformation. Situating the tablet computer as a part of these transformations, but not the only part, I point to the particular roles that the tablet computer has taken up in relation to television watching, demonstrating how this particular practice has now become detached from broadcast television and the standalone television. Examining the language of competition and cooperation, this chapter interweaves examples from participants'

ways of watching catch-up television, Netflix, and broadcast television with a brief history of online streaming, analysing the device-device and device-object relations at play in the ways that the tablet computer has come to figure within performances of television watching.

Chapter 6 moves away from the tablet and the combinations of tablet and app, examining the assertion that the tablet computer sits at the intersection of multiple practices. In understanding that images have taken on roles in many practices which previously had little to do with more traditional forms of photography (e.g. communication), the chapter focuses on a broader nexus of practice in which interactions with the tablet computer hang. In doing this, it considers a multiplicity of practices (e.g. remembering, communication, photography) and a multiplicity of technologies at once, demonstrating how a focus on multiple practices and multiple technologies reveal some of the extensive relations in which the tablet computer is now entangled. Recognising the outputs of particular activities, and the way in which images, at times, leave visible traces in their passing through the tablet computer, this chapter seeks to understand the role of the tablet computer in flows of (im)materials (i.e. digital images) across a broader nexus, using diagrams that depict the spatiotemporal flow of images to do this.

Chapter 7 investigates the dynamics of all of the above, showing how tablet-practice interfaces change over time. Highlighting the point that there is no closure in integration, and that all roles are provisional and becoming, this chapter presents data from the follow-up interviews (as well as one original interview), pointing to fluxes in how the tablet computer is figuring within practice and demonstrating how 'uses' of the tablet computer adapt over time. While some of these adaptations may appear to be small, they are in fact responses to broader institutional changes. Other 'uses' may

appear to be stabilities in daily life, and yet they reveal that there is work to maintain 'integration' (or the embedding of the tablet computer) in practice.

In the concluding chapter of the thesis, I develop the insights gained through exploring different aspects of uses of the tablet computer as they are described in each chapter, building up a framework of practice and of integration that provides a subtler and more encompassing understanding of the processes of integrating the tablet computer than presented by any one of the individual chapters when taken alone. In doing so, I go beyond the argument that processes of integrating tablet computers are active and ongoing achievements within multiple practices, suggesting that these processes are also transformative of those practices. This is in contrast to narratives that surround the launch and positioning of technologies in general, and the tablet computer specifically, as 'revolutionary' (Levy, 2010) or transformative (Sutton-Gee, 2012). I argue instead that it is the processes of integrating themselves, and not devices, which have cumulative and, in very different ways, transformative qualities in the enactment and constitution of daily life.

Chapter 3

Following Imaginaries of 'Use': Introducing the tablet as a dynamic object

Situating Efforts to Establish the iPad

Objects, and how they subsequently come to be embedded within and across practice, depend on negotiations being made between their producers on the one hand and their consumers/users or practitioners on the other (Pantzar and Shove, 2010). This is to say that the formation of an 'innovation' depends partly on those who make and promote an object or device and partly on those who make use of it. Having established that the script of the tablet computer is relatively open and flexible (i.e. the tablet has no inscribed uses), it is especially revealing to examine some of the pre-scription materials – that is, materials that explain or describe what the iPad is for (Akrich, 1992) – to show how this positioning has occurred. Though the remainder of the thesis shows how tablet computers are taken up in what people do, this chapter considers the 'voice' of the iPad's manufacturers, demonstrating the way that Apple has made connections between the iPad and daily life, creating imaginaries about what the iPad is and what it is for in the process.

Drawing on pre-scription materials released by Apple, this chapter provides a sense of these imaginaries – by which I mean anticipated worlds and settings in which the iPad figures – and charts how they have developed over time. It is crucial to situate the imaginaries presented through these pre-scription materials historically, particularly as the tablet, and subsequently the iPad, is a product of a longer history of development than simply the moments in which iPads have been presented to the

public. Consequently, this chapter also provides a longer-term history of tablet computers, contextualising the moments in which the iPad (and some of its successor models) were launched and the strategies adopted by Apple Inc. (its manufacturers) in presenting the iPad to the general public.

A Potted History of Tablet-Computer-Like Devices

Presenting the history of a specific 'technology' can be challenging due to the competing narratives which are told by different players in these histories. This is particularly demanding when trying to establish 'firsts' (e.g. first tablet, first portable tablet) (Atkinson, 2008). Since the purpose of this history is to sketch out the 'scene' in which the iPad arrived, this is not necessarily problematic, but I do avoid presenting the tablets (and other tablet-like devices) discussed in this history as 'firsts'. Instead, I acknowledge that the particular models and devices discussed within this potted history are those that were likely more publicised at the time.

I draw partly on historian of technology Paul Atkinson's history of the tablet computer as a series of failures (Atkinson, 2008) prior to the 2010 arrival of the iPad. Atkinson's article was informed by the definition of tablets as *"[…] a form of mobile personal computer with large, touch-sensitive screens operated using a pen, stylus, or finger; and the ability to recognise a user's handwriting – a process known as pen computing"* (Atkinson, 2008: 3). This definition prioritises aspects of tablet computers (i.e. pen computing, handwriting recognition, pens and styluses) that are perhaps less relevant to descriptions of the tablet computers that have been adopted more recently. As a consequence, I also draw on other sources which are less restricted by the above definition (e.g. Linzmayer, 2004, Atkinson, 2005, Godwin-Jones, 2008, Atkinson, 2010, Manley and Holley, 2012).

Early Tablet-Computer-Like Devices (1977-early 2000s)

Histories of the tablet computer are themselves intertwined with the history of laptops (including netbooks) and Personal Digital Assistants (PDAs), with their conceptual roots having been accredited to Alan Kay. Kay conceived of a portable computer (i.e. The KiddiComp (Kay, 1969)) for his doctoral thesis, bringing together his work on flat-screen technologies, programming developments, and handwriting recognition.

In the same year (1969), Canada's National Research Council decided to develop a computer animation suite. After a couple of years of its development, in what has been considered one of the world's first computer-animated films (the 1974 film *Hunger*) this computer-assisted key-frame animation system was made use of, supported by input through a graphics tablet (Myers, 1998, Graber, 2009). Lasting only eleven minutes in total, the animated short took director Peter Foldes – with partners from the National Research Council – over a year and a half to produce (National Research Council, 1996).

Meanwhile, Alan Kay was still thinking through his design ideas for a portable computer which combined flat-screen and handwriting technologies, and specifically how this could be achieved through a self-contained design that did not depend on the support of a mainframe computer. Working alongside colleagues at the Xerox Palo Alto Research Center (PARC), he later developed these ideas into a concept that this group called the 'Dynabook'. Though such a product was not 'technically' possible at the time, Kay and Goldberg (1977) wrote a paper in which they promoted such an idea:

> Imagine having your own self-contained knowledge manipulator in a portable package the size and shape of an ordinary notebook. Suppose it had enough power to outrace your senses of sight and hearing, enough capacity to store for later retrieval thousands of page-equivalents of reference materials, poems, letters, recipes, records, drawings, animations, musical scores, waveforms, dynamic simulations, and anything else you would like to remember and change. We envision a device as small and portable as possible which could both take in and give out information in quantities approaching that of human sensory systems. (Kay and Goldberg, 1977: 31)

Alongside developing these imaginaries around the Dynabook, Kay and colleagues began working on a prototype for the product, named the 'Alto' (Barnes, 2007). Problematically, the resulting prototype cost $10,000 to create, and despite being intended as a model for a notebook-sized computer, it was in actuality the size of desktop computers of the time (Manley and Holley, 2012). Toshiba ultimately marketed a 'Dynabook' in 1989 (Manley and Holley, 2012).

The vision of a portable, notebook-sized computer was not achieved until the release of the GRiD Compass in 1982 by GRiD Systems Corporation, weighing 20% less than any other computer with similar capabilities (at the time) (Manley and Holley, 2012). Though it was rugged, its designer William Moggridge stated that *"the design was aimed at trying to make sure it was very prestigious and elegant with the executive in mind"* (Atkinson, 2005). At double the cost of desktop computers ($8000), a number were sold to executives, but other markets were considered as well, and the device was adapted for the American military, for NASA for use on its space shuttles, and for use on Air Force One planes by the President of the U.S.A. (Atkinson, 2005).

Building off the back of these products, Jeff Hawkins, working for GRiD Systems, sought to market the GRiDPaD to specialist and vertical markets, like medical professions (Atkinson, 2008), releasing it in 1989. This device was not considered as a full replacement for a desktop computer either, and Wilburn (1999), reviewing the GRiDPaD for the magazine *Computing Canada*, suggested that the greatest impediment to non-office working with computers was the keyboard, with the $3,437 GRiDPaD aimed at non-typists who were hoping to bring automation into their field with the 'easy-to-carry' unit. Much like the tablet computers of today, the GRiDPaD had a graphical keyboard for data entry, though input did depend on the interaction of this graphical keyboard with a specialist stylus.

By this point, much thought and development had gone into the form and concept of a mobile device like a tablet computer, though these ideas were not specific to what became the tablet. There was a developing popularity behind PDAs of the time, following the introduction of devices like the Psion MC400 (introduced in 1987 (Tilson et al., 2011)) as well as the Lotus Agenda which allowed its users to enter 'real life' (i.e. diary/scheduling data) information into databases but required a steep learning curve to do so (Kaplan et al., 1990). At this point, developers and interested parties were realising that it was not the form of tablet-like devices that required work, but rather the pen-based interfaces (or operating systems) that supported these devices (Atkinson, 2008).

Microsoft, alongside GO Corporations, began to invest effort into the design and production of such an interface. As a result, 'Windows for Pen Computing' and the handwriting recognition interface software 'PenPoint' came into being. Alongside this, a new start-up, Momenta, put out their own pen-based laptop in 1991 (Reinhardt, 1991), aiming this device at mobile executives. Though Momenta garnered much

publicity at the time, with the device appearing on many magazine covers, a little less than a year after the launch of the Momenta Pentop, the company ceased trading (Atkinson, 2008).

Jeff Hawkins (of GRiD Systems Corporation) attempted to develop his GRiDPaD in 1993 with the ambition of creating a device that offered the best of both the laptop and the tablet. Known as the GRiD Convertible, it could be used either as a slate tablet when closed or as a laptop when open, but in reflecting on his career in an interview with Atkinson, Hawkins commented that *"people wouldn't pay for, or compromise the qualities of, a laptop for a pen interface"* (Atkinson, 2008: 15). This took others a little longer to realise, and IBM released their ThinkPad 2521 (later renamed the 700T) which ran the PenPoint operating system, while Apple also worked on a number of products which could be considered tablet computers: PenMac, the Macintosh Folio, and SketchPad (all in 1992) and the WorkCase and Newton MessageSlate in 1993 (Atkinson, 2008). But, feeling that a tablet computer might divert sales away from their Macintosh (desktop), and perhaps inspired by the popularity of the PalmPilot (created by Jeff Hawkins after he left GRiD Systems (Clayton et al., 1999)), which became widely recognised as one of the most successful consumer product launches in history (Golden and Geisler, 2007), Apple ultimately marketed the device as a PDA; converging these projects and unveiling them as the Apple Newton MessagePad in 1993 (Linzmayer, 2004). After receiving poor reviews outside of a very committed user-base (Muñiz and Schau, 2005, Muñiz and Schau, 2007), some of these technological innovations were ultimately integrated into the Apple eMate laptop in 1997, but this was discontinued the year after (Moggridge, 2006).

Other tablet computer models appeared in the period between 1998 and 2010 (e.g. the Sony VAIO Slimtop Pen Tablet PC and Microsoft's Tablet PC), however, outside of their testing within specialist environments, like classrooms, (Olivier, 2005) or in clinical settings (Pace and Staton, 2005), these received a similar reception to those that had preceded them (Atkinson, 2008, Godwin-Jones, 2008). Also notable within the history of tablet-like devices was the introduction of the netbook, considered to be a small 'specialist' laptop computer which was designed primarily for accessing internet-based applications. The evolution of these netbooks is itself complicated. The One Laptop Per Child (OLPC) machine was envisioned by Nicholas Negroponte and designed by Mary Lou Jepsen, alongside the Taiwanese firm Quanta Computer Inc., with the goal of the machine and the accompanying initiative to simply create a very cheap, efficient, and subsequently limited laptop that could be rolled out in developing countries with little access to electricity (Thompson, 2009). Rivals of Quanta, Asustek were inspired by the resulting XO laptop and released the Linux-based Asus Eee PC in 2007, selling out of these in a matter of months (Smith, 2007). However, the Eee PC was not being purchased by people in developing countries but by those in Western Europe and America who wanted a second laptop for travel and internet use on the move (Godwin-Jones, 2008).

Netbooks experienced a brief period of popularity, with other device manufacturers releasing their own versions of the netbook following the Asus Eee PC's market success, but this success did not last long. By 2012, many netbook manufacturers (including Asustek) had halted production due partly to the emerging success of tablet computers and partly to the limitations that manufacturers had placed on these netbooks as a means of ensuring that their sales did not undermine the marketing of other more expensive, and profitable devices (like smartphones and laptops) (Tofel, 2013). It was as a consequence of these various attempts by many tablet-like device

manufacturers (e.g. Microsoft, Apple) over the years to produce this 'type' of device, and particularly given the tablet's own overlaps with other sorts of similar devices (e.g. laptops, PDAs), that more contemporary versions of the tablet (like the iPad I am about to discuss) were expected to fail (Atkinson, 2009).

Having outlined a potted history of early tablet-computer-like devices, I note that the tablet computer, in form and as a technology, is intertwined with the history of laptops, PDAs, and netbooks. But, aside from charting these developments and setting the scene in which the iPad was launched, this history has been revealing in other ways. Many of the devices that I have described have had very particular imagined and/or actual uses, including children's learning (The Kiddicomp), computer-animation (graphics tablet), diary keeping (Lotus Agenda), space travel and use on Air Force One (GRiD Compass), and mobile data entry (GRiDPaD). By contrast, the imagined uses of the iPad, and this later 'generation' of tablet computers, are much more open and wide-ranging, so how do Apple Inc. set about constructing imaginaries of what the iPad is and what it is for?

Changing Representations of the iPad: What is it, and what is it for?

In the following section, I make use of Apple Keynote speeches (2010; 2012; 2014; 2016) to address some of these questions, charting the changing representations of what the iPad is and what it is for. First, though, a word about what sort of pre-scription materials these Keynote speeches are.

Apple Keynote speeches are presentations which accompany the launch of every new Apple product. Speeches of this type are now fairly common, with other manufacturers like Microsoft also launching new products with similar sorts of events

and presentations (e.g. Spring Release (2018)). These events and presentations are a part of the manufacturer's presentation of the final product to the general public and media and are usually conducted prior to a technology's actual release onto the market, as a means of creating public interest in the product.

In practice, the (live) audience of these Keynotes are not members of the 'general public' but rather investors, technology bloggers, partners, channels, and vendors who themselves could create further interest in the iPad (e.g. in writing about it, in selling it, in investing in it) (Sorman-Nilsson, 2013). So, while only a few potential tablet users (iPad or not) will watch these Keynotes or use them to think through how they might take up the device in their daily life, these Keynotes and the imaginaries presented within them are used as a means of creating interest. As such, these imaginaries are designed to permeate public understandings of what the iPad is and what it is for.

There are, however, strong corporate interests (e.g. market competition) which also run through presentations of this type, and these interests do – at times – infuse the imaginaries around a product. For instance, in presenting the iPad 3, Tim Cook (CEO of Apple Inc.) suggests that not only did Apple 'invent' the category of the tablet computer (with the original iPad) but that through the iPad 3, the company was 'redefining' that category (Apple, 2012). As the history of tablet-like devices I have already given suggests, the 'invention' of the tablet computer is not a result of Apple's production efforts alone. I will highlight this language of market competition where relevant in my descriptions of the imaginaries of the iPad, but as my intention is to chart these imaginaries as they develop, I do not dedicate much time to unpacking the details of ongoing competition between producers.

Beyond the obvious ambition of creating interest in their own products without enhancing the market for others, Apple – in their development of devices of many types – face the challenge of not only setting up what the iPad is, and what it is for, but setting up these qualities in a way which positions these in relation to their other available kinds of devices (e.g. iPhone, MacBook, iMac) without diverting interest from these more established technologies. Of course, how these products, and the imaginaries that are constructed around them, are later taken up and used within (and across) the practices of daily life can be another matter entirely (see Chapter 4, Chapter 5, Chapter 6, and Chapter 7).

What is the iPad?: Features and developments (2010–2016)

Before exploring some of the imaginaries of use presented through the Apple Keynote speeches, it is essential to note the areas of the iPad which were focused on during its initial presentation and in subsequent moments of its redesign and redevelopment. An understanding of these areas and how they have evolved may help to reveal something of what the iPad is expected to do. The following table (see Table 3.1) shows the breakdown of features (and apps) highlighted by the Keynote speeches from 2010–2016.

Keynote	*Features Highlighted*	*Apps*
iPad 1 (Apple, 2010)	Display iOS – mobile operating system A4 processing chip Microphone Speaker Compass Accelerometer	*Apple:* (pre-installed) Safari, Mail, Calendar, Contacts, Maps, Photos, YouTube,

	Battery life (10 hours) Wi-Fi and/or data connections + Announcement of new pre-paid data plans, created in partnership with (American telecommunications corporation) AT&T	(available for purchase) (iWork Suite:) Keynote, Pages, Numbers. iPad software/ app development kit (SDK) also launched, that day. *Distribution Services/ Apps:* App Store, iTunes, iBooks *Third Party:* The New York Times, Nova (game app), Brushes (drawing app), MLB.com (major league baseball app)
iPad 3 (Apple, 2012)	Retina Screen Improved iSight (i.e. back-facing) camera A5X processing chip 4G wireless Voice dictation	*Apple:* (available for purchase) iPhoto App *Third Party:* Sky Gambler (game app), Sketchbook Ink (drawing app), Dungeons (game app)

iPad Air 2 & iPad Mini (Apple, 2014)	Display (no air gap) Thinner New barometer A8x processing chip 8-megapixel iSight camera New FaceTime camera Touch ID Continuity (can start tasks on one device, and finish another) Faster Wi-Fi and mobile data connection	*No Apple apps.* *Third Party:* Pixelmator (image editing app), Replay (video editing app)
iPad Pro (9.7 inch) (Apple, 2016)	Pro display (i.e. Night Shift and True Tone: new light sensors) 12 megapixel iSight camera 5 megapixel FaceTime camera A9x processing chip Palm rejection software Pro audio system (4 speakers) Improved sensors	No apps

Table 3.1 - Summary of iPad Features and Apps highlighted by each Keynote speech

I now provide a brief summary of some of the key 'features' or technologies revealed through Table 3.1 that make up what the iPad is, explaining how these have been developed across the six years of redesign and redevelopment and connecting these – at times – with the history of tablet-like devices that I have already given.

Screen Technology

Each successive model of iPad covered in these Keynotes involves development in the screen technology. My account of the historical development of tablet-related innovations highlighted the centrality of the screen, and specifically touchscreen technology, as one of the defining features of what tablets are. Initially, input through this screen did depend previously on its interaction with a specialised stylus. While the first relevant Keynote speech (Apple, 2010) mobilises the 'screen' to establish what the iPad is by comparing it with an already known device (i.e. the iPhone with its smaller screen size), in the latest such presentations (Apple, 2016), reading from the screen of an iPad is compared with the qualities of reading on paper (i.e. reflecting light back, through 'True Tone' technology).

iOS – Operating System or Interface

Histories of the tablet computer also emphasise the importance of the interface (or operating system) of such devices, termed the 'iOS' by Apple (i.e. mobile operating system for touch-based technologies). As Table 3.1 shows, though the first Keynote (Apple, 2010) involved mention of the iOS as a part of what constitutes the iPad, in the later Keynotes (Apple, 2012; 2014; 2016) this is not mentioned as a feature. This is because the iOS forms not only a part of the iPad but also Apple's iPhone and iPod Touch (touchscreen mp3 player), and updates to the iOS begin to be presented in Apple Keynotes of their own, implying that these are perceived by Apple as a technology in their own right, as well as an essential element which defines not only what an iPad is but what much of the Apple ecosystem is (e.g. iPod Touch, iPhone). The interest I have in the iPad leads me to focus on iOS, but Apple's laptops (e.g. MacBook, MacBook Air, MacBook Pro) and desktops (e.g. iMac) also depend on an operating system (i.e. OS) to function, with the OS consequently also being a defining feature of Apple laptops and desktops. While there has been some convergence

between iOS and OS (e.g. Apple announcing in 2011 that the Lion update of Mac OS X would feature some of the qualities of iOS (Apple, 2011)) there are also important differences that separate these devices (e.g. user interface of iOS vs. OS, with one making use of touch input and the other of mouse input). Even so, the details of the interface remain critical.

Wi-Fi and Data Connection

The ability of the iPad to connect to the internet is a crucial feature that allows tasks to be performed on the go, and the mobility (and consequential portability) of the device is vital in defining the iPad. This is clear from the first Keynote's launch of specialist pre-paid mobile data plans (see Table 3.1) alongside its launch of the original iPad. These 'specialist' data plans were developed in partnership with the American telecommunications corporation AT&T for their use specifically with the iPad. Still, these pre-paid data plans are optional, and even when purchased, they are a temporary feature (i.e. used until they run out) of the iPad. However, all iPads do have constant Wi-Fi functionality, meaning that tasks which require internet connectivity can always be performed in Wi-Fi-enabled spaces. The subsequent development of the iPad's Wi-Fi and mobile data connections (i.e. 3G then 4G) that then make the iPad's connection to the internet faster, again suggests that mobility is an important feature in defining what the iPad is.

Camera

As a means of investigating one imagined use of the iPad later in this chapter, I take on the topic of how photographs and images of different forms figure in the world of the iPad. For now, though, it is enough to make the point that each Keynote speech, other than the first, involved some discussion of improvements in camera technologies. While the first iPad did not have a camera, the successive

redevelopments to the iPad suggests that a part of what the iPad is *now* includes camera technologies.

Consequently, the tablet is a combination of multiple technologies embodied by a particular form. The iPad is a (touch)screen, iOS, Wi-Fi and/or data connection, and camera, all at once, but it is also defined by, and host to, other technologies (e.g. compass, accelerometer, microphone, sensors) and forms of software (apps). Though the multiplicity of technologies embodied by the tablet is in some sense a defining feature, the exact combination of 'technologies' has changed over time. For example, it used to be the case that one distinctive feature of tablet-computer-like devices was the pen or stylus, but this feature was not a part of the iPad until much later in its development, with the iPad Pro (Apple, 2016). Even at this point, the Apple Pencil (i.e. not 'pen', as with earlier tablet-like devices) is an optional rather than essential feature of the iPad Pro.

Table 3.1 also illustrates how important applications are in defining not only what an iPad is but also what it is for, and I take a closer examination of these applications next.

Apps

The importance of applications for understanding what the iPad is, and what it is for, is demonstrated by the proportion of time dedicated to explaining apps of different kinds during the iPad Keynote speeches themselves, particularly in the first Keynote.

The history of applications (more commonly known as 'apps') is unsurprisingly intertwined with the history of tablet computers given previously, and early PDAs like the Psion MC400 (released in 1987 (Tilson et al., 2011)) and the Apple Newton

MessagePad (released in 1993 (Linzmayer, 2004)) ran basic, built-in applications like a diary, calendar, and address book. But the apps available for use with the iPad are not limited to those that come pre-installed or built into the iPad. As is reflected in Table 3.1, the Apple App Store was itself a part of presenting what the iPad is, as it is the App Store that is key in providing access to such applications.

Yet the App Store is itself tied to the Apple iPhone. Before the creation of the App Store in 2008 (Laugesen and Yuan, 2010), developers could only release third-party apps for the iPhone by creating web apps[8], which were then accessible only through the Safari (internet) browser app. These web applications were limited in that they could not access the device's hardware, which led to hackers 'jailbreaking' Apple's control mechanisms to allow 'native' apps to be installed on the device that were developed by third-parties instead (Tilson et al., 2011). As a means of limiting this jailbreaking, when Apple launched the second iPhone (i.e. 3G), they did so alongside the launch of the App Store and the iPhone Software Development Kit (SDK). It was the combination of SDK and the App Store that meant that not only could third-party app developers now develop apps for the iPhone specifically, but these apps could now be installed onto the iPhone itself. To feature in the store, these third-party apps first have to be approved by Apple.

Since the App Store was in place when the iPad was launched, there were already 140,000 applications available through this in-built distribution service which could be downloaded and installed onto the iPad instantaneously (Apple, 2010). As Tim Cook suggests, the App Store is *"the place to go to discover apps that make your device*

[8] A native app is one that is installed onto and can make use of the hardware of the device, while a web app is one that is accessed through a web browser on the device but cannot access the hardware of the device. Hybrid apps, on the other hand, function through the web browser but are able to make use of the generic capabilities of the tablet computer.

more usable" (Apple, 2012). In fact, it is only through the combination of the iPad and App Store, and the attendant installation of apps, that the iPad is able to be 'for' anything (other than the functions allowed by pre-installed apps). But the iPad is not the iPhone, and a part of its initial launch was also introducing the iPad-specific SDK that would allow third-party app developers to redevelop their iPhone apps or even create and release apps for the iPad's form specifically. This SDK was released on the day of the Keynote (two weeks before the iPad's actual launch), ensuring that a range of iPad-specific apps would be either in development or available by the time the iPad was actually released. Though Apple make their own apps as well, with some of these pre-installed on the iPad and others available through the App Store (see Table 3.1), third-party apps (and their developers) are clearly also key in tailoring what the iPad is and what it is for.

On the day of the first Keynote of the iPad (Apple, 2010), there were 14 iPad-specific apps (see Table 3.1), but by 2012 there were 200,000 apps (Apple, 2012), not including those which were not designed, or redeveloped, for the iPad specifically. Pointing again to the essential relation of the iPad with apps, each Keynote includes some discussion of the App Store and the number of apps now available for the iPad on there, with this number increasing to 675,000 (Apple, 2014) and then 1,000,000 (Apple, 2016). The range of apps available through the App Store is vast, with some providing internet services (e.g. Apple's own App Store), and others tailoring the iPad's general functionalities into specific capabilities focused on particular tasks.

Understanding the range of apps installed on iPads (and tablets more generally) can help to reveal what the iPad is, but it can also start to provide a sense of what the iPad is used for (Chapter 4). Taking a closer look at some of the imagined uses as they are communicated through these Keynotes is also helpful in thinking about what

the iPad is for and specifically for understanding what this 'for' is, as imagined by those designing and developing the iPad during this period.

What is the iPad For?: "Key tasks"

> Browsing the web, doing email, enjoying and sharing photographs, watching videos, enjoying your music collection, playing games and reading e-books […] For there to be a third category of device, it's going to have to be better at these tasks, otherwise it has no reason for being (Apple, 2010).

The first Keynote presents the iPad as the third category of device, with this third category sitting somewhere 'in-between' a laptop and a smartphone. Steve Jobs (who made the presentation) suggests that in order for this device to come into existence, there must be some key functions for which the iPad 'has to' be better than laptops and smartphones, such that this third category of device has 'a reason for being' (Apple, 2010).

In thinking about these distinctive tasks in relation to the history of tablets, it is clear that these defining functions have evolved. While the activities which tablet computers are associated with have clearly changed, both in character and number, they nonetheless tap into the conceptual roots of tablet computers in general (i.e. Kay and Goldberg's (1977) definition). By this, I mean that surfing the web, doing email, enjoying and sharing photographs, watching videos, enjoying your music collection, playing games and reading e-books are – for the most part – consumptive activities (i.e. activities performed for their own sake (Klumb, 2004)). In addition, and perhaps increasingly, some of these activities can be undertaken together as a form of multi-tasking.

As noted above, while earlier tablet computers were marketed at specialist markets, such as medical professionals and mobile executives, with fairly specific tasks being associated to these markets (e.g. data entry or diary entry), the first part of the 2010 Keynote establishes that the iPad is not specifically aimed at these 'specialist' audiences. The point is that it can be used by anyone carrying out 'typical' (i.e. everyday but often internet-dependent) tasks, and consequently multiple tasks.

Though the iPad may be 'better' than a smartphone and laptop at these 'typical', multiple (and often internet-dependent) tasks, Steve Jobs stipulates that it is specifically *"not a netbook"* (Apple, 2010). Netbooks were popular at the time, particularly for accessing web applications, with the aforementioned Asus Eee PC having been released only three years previously. Jobs draws comparisons between the iPad and netbooks, suggesting that while others had considered that the netbook could be this 'new' third category of device, somewhere between a laptop and a smartphone (and in ways better than a laptop or smartphone), Jobs states that: *"the netbook is not better at anything, just cheaper".*

Yet the iPad is not just imagined as better (than a laptop and smartphone) for consumption-related tasks (e.g. browsing the web, enjoying photos, watching videos, listening to music, and playing games), it is also imagined as being used for productive tasks. With the fanfare typical of speeches of this type (Sharma and Grant, 2011), the iWork suite of apps (i.e. Pages – Word Processing app; Numbers – Spreadsheet app; Keynote – Slide Presentation app) is introduced in the second half of the 2010 Keynote speech and presented as a surprising capacity of the iPad:

> I asked the head of our iWork team to take a look at creating a version of iWork for the iPad. And the initial reaction was 'Ah, the iWork apps: Keynote, Pages,

> and Numbers are really heavy-duty apps, they require a lot of horsepower, could the tablet power them?' And the answer was a resounding 'you betcha'… (Apple, 2010).

These 'productive' apps are – in fact – more in line with the imagined capabilities of tablet computers at an earlier phase in their history. Accordingly, the 'new' development is that iPad is now also 'better' than a laptop or smartphone in relation to this much wider range of applications.

As Table 3.1 shows, much of these Keynote presentations revolve around iPad apps, some produced by Apple employees and others by third-party app developers. For example, selected app developers are invited to present their new iPad-specific app, and then Scott Forstall (Head of Apple's Software Development Team) gives examples in which these apps might be used:

> Amazing, imagine an artist with a canvas <Brushes app + iPad> this large that they can carry it anywhere they go with them. And it weighs only a pound and a half. […] Well, I for one know that rather than carrying my transistor radio into the backyard to listen to baseball, I'll be taking my iPad and this <MLB.com> app (Apple, 2010).

In being a part of the iPad's first presentation to the public, this Keynote positions the iPad (and how it combines with particular apps) by making comparisons with already established devices, creating imaginaries in which the iPad substitutes for or replaces them. These examples of substitution and replacement also hint at some imagined spaces of use ('anywhere they go' and 'backyards'), and the examples used extend the range of spaces typically associated with laptops and arguably smartphones as

well (i.e. iPads in gardens and kitchens). But it is not just through examples that spatial imaginaries of use are constructed. A 'lean back' device is considered one which enables passive forms of 'consumption' as opposed to a so-called 'lean-forward' orientation in which more work-like tasks are actively engaged with. Steve Jobs (Apple Inc. CEO) provides a visual representation of the iPad as a 'lean-back' device as he demonstrates the iPad and some of its apps (e.g. New York Times) while reclining on an armchair (Apple, 2010).

Moving onto the next Keynote (Apple, 2012), the presentation of the iPad 3 is bookmarked by descriptions of the 'Post-PC era' and of Apple's 'success' within it, with the language of substitution and replacement becoming more apparent (Apple, 2012). The 'Post-PC era' was terminology that became popular between the 2000s and early 2010s (Topolsky, 2011, Lopez, 2012) as the sales rates of mobile devices like smartphones and tablets overtook the sales figures for desktops and laptops. [9] But this success is not presented as relating to the iPad alone, and Tim Cook (Apple Inc. CEO) [10] points to other technologies which are a part of the iPad world (App Store, iOS, iCloud) which Apple credits for their post-PC 'success'.

Two years later, in 2014, and with desktop sales beginning to pick up again, the Keynote speech is no longer punctuated by such references, and there is a recognition that different devices may take on different roles in daily life. For example:

[9] This terminology has since been abandoned, particularly given the global increase in rate of desktop sales by 2014. But the presentation of the iPad 3 does echo elements of the iPhone's launch (in 2007), where Jobs invoked the image of this Post-PC era as a way of further promoting in that case the iPhone but in this one the iPad.

[10] Tim Cook took over the CEO position from Steve Jobs at Apple Inc. in 2011.

> Sometimes, you want to sit at your desk in front of a huge, beautiful screen packed with powerful technology. And we've made that much better today with the Retina 5K screen for iMac. Sometimes, you want to take that powerful technology with you where you go, and we've made our notebooks even better this year with MacBook Air and MacBook Pro. Sometimes, you want to be close to your content, touching it, and we've made that experience even better today with the iPad Air 2, more powerful and incredibly thin. Sometimes, you want to hold that powerful technology in the palm of your hand, and there's no better thing for your hand than the iPhone 6 and the iPhone 6 Plus (Apple, 2014).

As this excerpt shows, these differing roles relate more to spaces (i.e. 'desk', 'take that… with you') and – in ways – experiences of use (i.e. 'touching' content, 'hold that powerful technology') than tasks at which particular devices are 'better' (i.e. when compared to 2010 – *"better than a laptop or smartphone"* for certain forms of activity related to leisure consumption).

By the time of the final Keynote considered here (2016), the comparisons to other and more established technologies has almost fallen out of view, suggesting that there has been some kind of 'public' establishment of what the iPad is and what it is for. I say 'almost' as there is still the occasional comparison of the iPad to Windows PCs, though this relates more to market competition than it does to establishing what the iPad is (i.e. not a Windows PC) and what it is for. This is evident in the statement that *"There are over 600 million PCs in use today that are over five years old. That's really sad. It really is. These people could really, really benefit from an iPad Pro"* (Apple, 2016).

In practice, however, comparisons of the iPad to other kinds of materials (i.e. aside from computer technologies) has not ceased. And once again, it is relevant to bring in elements of the history of the tablet computer to understand these developments. For example, the qualities of the iPad (Pro) are now being described with reference to those of paper. Highlighting the combined potential of the Apple Pencil (launched the previous year (Apple, 2015)) together with iPad Pro, this redeveloped iPad is capable of offering features (e.g. handwriting recognition) that once defined early tablet computers and that arguably led to the failure of some of these earlier models (e.g. the Newton MessagePad was widely ridiculed for its poor handwriting recognition (Linzmayer, 2004)).

What is intriguing in considering the imagined uses of the iPad, and how these have evolved over time, is that while the first iPad is almost unrecognisable as a tablet computer when thinking about the definition given by Atkinson (2008), the imaginaries of what the iPad is now hark back to some of the earliest interpretations. In some respects, the iPad Pro appears to be more strongly associated with previous ideas about what tablets might do (e.g. pen-based computing with handwriting recognition) than with immediately preceding generations of iPads.

The positioning of the iPad against and in relation to other technologies and materials is itself interesting and part of this ongoing story. In effect, narratives of substitution and replacement evolve alongside the changing imagined uses of the iPad but also as smartphones, laptops, and desktops themselves evolve through their own moments of redevelopment and redesign. There is, then, a need to understand in what ways tablets compete or cooperate with other devices like smartphones, laptops, and desktops (Chapter 5), recognising that if the iPad is not substituting for these other devices, this may suggest that it is instead cooperating with them in some way.

Having provided an overview of some imagined uses of the iPad as constructed and represented through these Keynote speeches, I now zoom in on one specific imagined use: that of image 'management'. I focus on this imagined use specifically because the *"enjoying and sharing of photos"* (Apple, 2010) is one of the key tasks at which the iPad is supposedly 'better than a laptop or smartphone', but also because the topic of image sharing provides the basis for a later chapter (Chapter 6).

Image Management with the iPad

I begin my focus on image management through the tablet computer by reiterating an aforementioned point: the first iPad did not have a camera (Apple, 2010). Jobs suggests that the iPad is *"better than a laptop or smartphone"* for enjoying and sharing photos despite the fact that, without a camera, it did not have the capacity to take photographs. What appeared to make the iPad (+ Photo app) *"better"* for viewing photographs was the size of the screen, as well as the pre-installed Photo app. While the size of the screen is not that different from that of a laptop, touch is referred to on a number of occasions to differentiate the abilities of the iPad from those of laptops. The ability to view photographs on the iPad is further emphasised with reference to accessories launched alongside this original iPad, with one being a camera adaptor (allowing images to be directly transferred from cameras onto the iPad) and another a charging dock which makes *"a great picture frame, while your iPad is charging on the desk" (Apple, 2010).*

Two years later and the iPad 3 had not one camera but two (Apple, 2012). Launched alongside the iPhoto app[11] (see Table 3.1), Apple's more 'advanced' photo-editing

[11] This iPhoto app did not replace the Photo app but was available for purchase for those who *"truly love their photographs and want to do more with them"* (Apple, 2012).

software, that year's Keynote (Apple, 2012) makes much of the potential to edit photographs due to the iPad's increased power (i.e. processing chip). The examples of use provided here even hint at the potential of the iPad (+ iPhoto app) to edit photographs on the move (*"no need to lug around a laptop"* on a photo shoot). Again, the language of substitution and replacement appears as the iPad's portability is defined in relation to the portability of other technologies.

An essential part of this narrative of substitution for other technologies in relation to the taking, editing, and sharing of images concerns the iPad's form and especially its portability. There are clearly efforts to make the iPad more portable over time (see Table 3.1), but as referred to earlier, this quality of portability is often defined by invoking comparisons to other technologies or materials. The original iPad was already more portable than desktops and laptops, and, as discussed above, examples were given of spaces for iPad use (i.e. kitchen, garden) in which other, less portable technologies could not be used. Despite this portability, efforts were being made to make iPads even more mobile (i.e. thinner, lighter), in line with efforts to make the rest of the Apple ecosystem more portable (i.e. thinner, lighter).

At the same time, there is a history of associating the idea of taking photographs with tablet computers with awkwardness, particularly in the earlier years. By this, I am referring to the various articles and blogs where such a use appears to be frowned upon or even mocked (Stopera, 2011, Dean, 2013, Pachal, 2014, Jaccoma, 2015). Though the tablet computer is indeed portable, it is still fairly large for taking photographs, and its form differs substantially from that of a camera. Though this supposed awkwardness could, of course, be related to the lack of association of the iPad with taking pictures, likely initiated by it having no camera at its inception, there is more at stake than the larger-than-a-camera format. For instance, following the

2014 launch of the iPad Air 2, journalist Pachal (2014) warns:

> It's the bane of anyone attending a museum, sports event, or concert: People holding up their iPads (and other tablets) to take photographs. Apple just gave those people a far more powerful weapon with the iPad Air 2 (Pachal, 2014).

Elements of this perceived awkwardness seep into the 2014 Keynote (Apple, 2014). While the iPad is clearly more portable than a laptop, these devices are not generally used to take photographs, and when comparing the iPad to a smartphone or camera, the portability of its form comes into question. In response, alongside developments in the camera technologies within the iPad, there are various (emphatic) references to the potential for the iPad to take not just photographs but *"unbelievable"* photographs.

> You're going to be blown away that these were taken with an iPad. […] People are just not going to believe that these are taken with the iPad you bring with you to do work and you're taking incredible pictures with it. […] Take your iPad on vacation, you can share the mountain scenery with all of your friends (Apple, 2014).

Prior to this moment, imagined uses tended to focus on the iPad as a device for viewing images due to the large and high-resolution screen (i.e. Retina), but as the camera is improved, allowing people to take high resolution photographs, there is a shifting recognition of the varied roles that the iPad can take within the management of photographs. In effect, the iPad is now able to take the high-quality images that its screen has always been able to display. This Keynote (Apple, 2014) also brings with it another (third-party) image editing application (i.e. Pixelmator), which began as Mac software, with three of the four Keynotes involving the introduction of image-

editing applications (i.e. Photos, iPhoto, Pixelmator). In the final Keynote that I examine, there is no mention of anything awkward about taking pictures with iPads. This theme has fallen out of view not only within Apple's own imaginaries (*"Customers love taking pictures with the iPad for personal use"* (Apple, 2016)), but more generally, with fewer online articles taking on the topic. But beyond this, there is an increasing centrality of images to other tasks typically not conventionally associated with photography: *"But more importantly, they can use the camera for work as well[…] scan documents, […] constellations in the sky […] video conference calls […]"* (Apple, 2016). Rather than just photographs, it is now images (and their management) in which the iPad has a range of potentially critical roles. And it is at this point in its development that the iPad is imagined and represented as a device with the potential for taking, editing, sharing, and storing images, depending on particular combinations of app + iPad, or iPad + accessory + app for these particular roles. How the iPad is actually taken up within the actual management of images is another matter (Chapter 6).

The Dynamic Positioning of the iPad (and the Apple Ecosystem)

> As we pack more and more power, and more and more performance and more capability in iPad, our customers and developers have begun to use it in ways we could not imagine. And now as you look around, iPad is everywhere. It's transforming the way we work, the way we learn, the way we play. And it's transforming the way we communicate. With so many people using iPad for so many things in so many different places, it's not surprising that we've sold more iPads in the first four year than we've sold any product in our history. In fact, we've sold over 225 million iPads around the world (Apple, 2014).

As this extract illustrates, and as this chapter demonstrates, not only the iPad but tablet computers more generally have been dynamically positioned over time. Though the iPad is presented in these Apple Keynote speeches as an innovation in itself (i.e. a product with transformative qualities), tablet computers are transformed through app development and installation, and it is clear that the development of particular imaginaries are not solely a product of Apple's efforts alone (i.e. as occurring through the iPad's development and redevelopment). Instead, a part of this development is passed on to the third-party app developers who populate the App Store with the apps which the iPad requires to fulfil new and changing roles, though Apple retains some control over these imagined roles and the apps that enable them (Tilson et al., 2011). At the same time, aspects of how the iPad is positioned – and what it is 'for' – are also passed on to customers who not only take up the iPad but some of the apps available for their use in combination with the device.

It is clear, then, that what the iPad is, and in turn what it is for, is not fixed. Over the six years of developments followed here, new versions of the iPad can be seen to respond to observed uses. What consumers are 'doing' is fed back into Apple's design and development processes and their resulting imaginaries of use are presented through Keynotes. As with much of Apple's business model, it is difficult to determine the exact means through which Apple collect user feedback or work with users to understand their actual appropriation of Apple devices. Nevertheless, there is some evidence (including the above quotation) that Apple observe actual uses and feed this information into their redevelopment processes. An example is Gomall and Wong's (1994) (ex-managers of Apple's user studies and user-aided design) writing about their experiences of User-Aided Design in the process of developing the PowerBook (laptop) at Apple.

The development of tablet computers, then, has not been a linear nor cumulative process. In fact, while the first iPad had few of the elements which defined tablet computers previously (e.g. handwriting recognition), and while its promoters emphasised qualities and capacities previously un-associated with tablets (i.e. lean-back and uses for entertainment, as well as its use in wide-ranging, rather than specific, tasks), it is not until the iPad Pro that what was initially highlighted as a distinctive feature of early tablet-like devices (pen, handwriting) enters the iPad scene with pen, or rather 'Pencil', input.

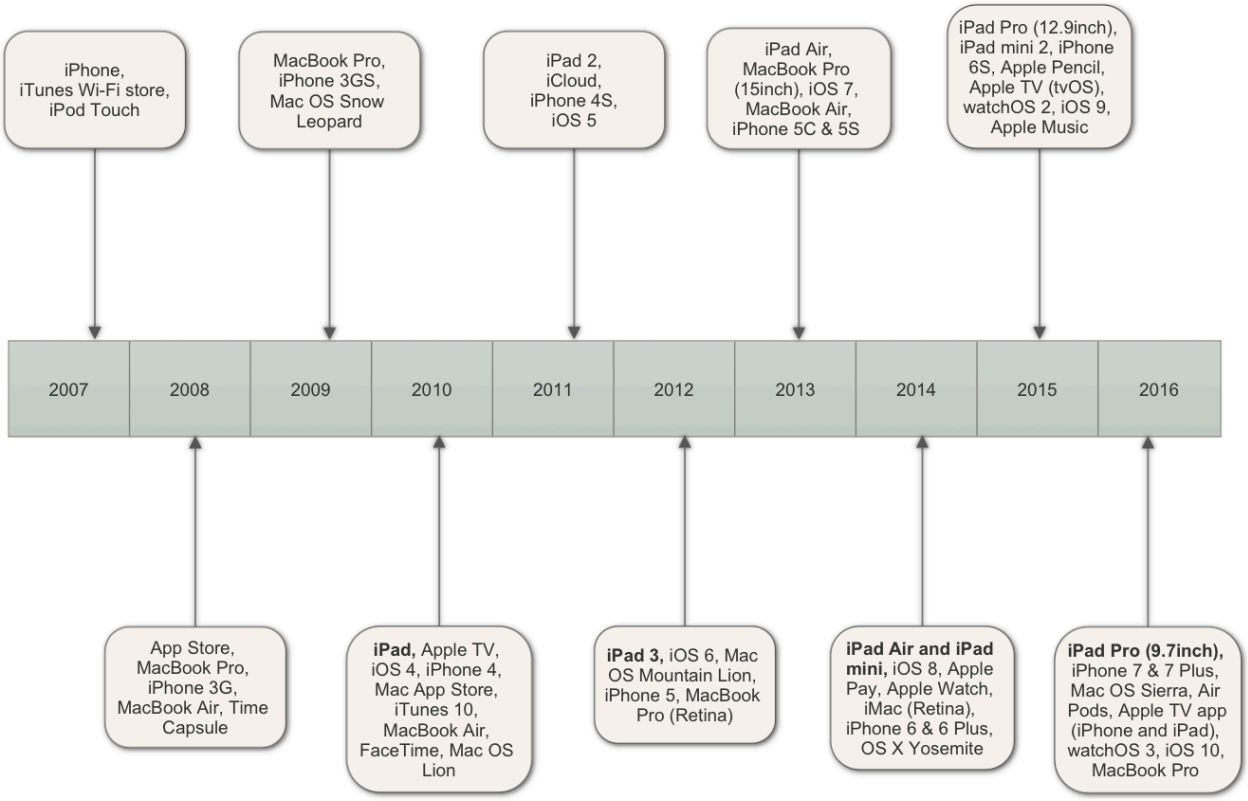


Figure 3.1- A Timeline of Developments and Redevelopments to the Apple Ecosystem

Of course, the iPad was not the only Apple device under development during this time, and Figure 3.1 provides an overview of Apple's other (re)development projects. This provides a sense of how ongoing and co-evolving these redevelopment and redesign processes are. (Re)developments to the iPad, then, evolve alongside the

(re)developments to other Apple devices. Though I have highlighted a couple of examples in this chapter whereby developments in one 'area' spill into another (e.g. Mac apps being redeveloped for the iPad: iWork Suite, Pixelmator, iLife Suite; iOS features being integrated into OS updates), these examples do not do justice to ongoing processes whereby these devices co-evolve alongside, and feed into, one another.

What is occurring, we can conclude, is an evolution of the entire Apple family, or 'ecosystem' as Apple refers to it; an ecosystem that is linked by the apps installed on specific devices, the operating systems which support these apps, as well as the technologies of iCloud, App Store, and iTunes which form a part of the wider ecosystem.

This review of histories of the tablet computer and how ideas around these devices were developed, and of how the iPad is positioned within these histories, has two roles within the thesis. First, it presents a narrative of 'improvement' from the perspective of the iPad's manufacturers. For example, it shows how Apple have followed and caught up on actual uses out in the 'real world' and how these are fed back into subsequent phases of redevelopment and redesign. As such, it illustrates processes of recursive development between the multiple producers (i.e. Apple and app developers) and consumers of the iPad.

Second, it is a point of reference, a benchmark in relation to which I will examine a selection of actual and situated uses of the tablet computer (see Chapter 4). In using this chapter as a point of reference, I take up two prominent themes (i.e. substitution and transformation) and examine one particular application (i.e. image-management, discussed in Chapter 6) as well as the ways in which these play out in practice and in

the experience of people who have and who use tablet computers. This allows me to address specific questions: for instance, about how different configurations of devices (including tablet computers, apps, and other technologies) are implicated in the performance of different social practices. I am also able to examine whether the tablet is in some ways substituting for other devices, or whether it has, or is acquiring, a distinctive role (within its wider 'family') (see Chapter 5). I also take up the topic of 'transformation' in the conclusion of this thesis, focusing especially on whether and how the tablet is transformative of practice (i.e. transforming the way we work…) (Chapter 8).

Having reviewed some of the anticipated and imagined 'users' represented in a succession of Apple Keynotes, and having shown how these imaginaries have changed, the next chapter (Chapter 4) focuses on the necessary interrelation of the tablet with specific apps. In what follows, I am especially interested in how certain tablet + app combinations come to figure within the performance of multiple practices and, in turn, how these combinations come to influence the spatiotemporal experiences of practice (e.g. on the go or what happens in gardens and kitchens).

Chapter 4

(Situated) Integrations of the Tablet Computer

Lucy Suchman (2007) has argued that interactions with devices are situated; that they are *"tied in essential ways not to individual predispositions or conventional rules but to local interactions contingent on the actor's particular circumstances"* (2007: 52). In this chapter, I suggest that the embedding of the tablet computer into daily life is similarly influenced by the local social and material contexts in which the tablet is 'used'. However, in developing a reconceptualisation of 'use', I consider the social circumstances of this embedding by focusing on the reconfiguration of multiple practices into which the tablet computer now figures. In doing so, I reconceptualise 'use' as a series of contingent interactions of a practitioner with a device that forms a part of the performance of many social practices. Yet how the tablet is 'used' also depends specifically on its apps, as these are crucial in defining not only what the tablet is but also what it is for. The focus of this chapter is thus to understand some of the material circumstances in which the tablet is 'used' by concentrating on the combinations of tablet and apps, as well as their spatiotemporal influence on the performance of practices.

In what follows, the tablet is primarily positioned and understood in relation to (a) the apps that are installed on it and (b) the practices into which the tablet and its apps now come to figure. However, as the rapid adoption rate of the tablet computer suggests that it has not given rise to any 'new' practices, any practices into which the tablet computer and its apps *now* figure are assumed to pre-exist the arrival (and subsequent embedding) of the tablet computer. These practices are wide-ranging and multiple (e.g. entertainment, watching television, researching, travel, playing games),

and it is unlikely that the way the tablet computer and its apps have moved into such practices can be neutral. Invoking tablet + app combinations in performances is consequently associated with some form of reconfiguration (i.e. flux), however subtle. One way in which practices can be reconfigured is by the spatiotemporal location of their performance. Røpke and Christensen (2013) argue that mobile technologies, like the tablet computer, 'soften' the temporal and spatial 'constraints' of a practice. This is to say that they extend the spatiotemporal possibilities of performance from specific spatial and temporal coordinates to less limited spatial and temporal coordinates. For instance, instead of (physically) visiting the bank between 9am and 5pm, online banking can be enacted through the tablet computer (and a relevant banking app) at any time and from any place. Since spatiotemporal coordinates (and their reconfiguration through the tablet + app) are a central theme to this chapter, it is useful to comment briefly on how time, space, and practice have been considered in what follows.

I draw on a simple concept of time as a finite resource in everyday life, whereby practices compete with one another and consume time in their performance (Southerton, 2003). By this, I mean that certain practices take longer than others, and while multitasking is certainly possible in the enactment of certain practices (e.g. watching TV while 'checking' Facebook), there are issues of ordering (e.g. sequencing, synchronisation) which temporally anchor certain practices and affect the temporal organisation of the performance of others. Discussions of time are, therefore, integral to analyses of practice (Shove, 2009), and following Southerton (2006), I will refer to Fine's (1996) five dimensions of time: (1) duration; (2) tempo; (3) sequence; (4) synchronisation; and (5) periodicity. Alongside this, I mobilise a notion of space as the spatial locations of uses. These temporal dimensions and spatial locations– within the particular and multiple practices described in each of the

three cases – will allow for an initial analysis of ways in which the tablet computer is now embedded and the roles it takes on through this embedding.

Before I go on to consider these cases, it is first useful to provide an overview of the apps that participants had installed on their tablets as well as how I define what an app is in this context; in its relation to the tablet and the practices that tablet + apps fit into and enable.

Apps and the Tablet

Understanding the role of apps and how they relate to practices and devices is a challenge. Morley (2018) makes a similar point in her conceptualisations of software, suggesting that software 'enlivens' performances in complex ways that otherwise de-centre practitioners. This is to say that it can be difficult to situate the role of materials like software (and, consequently, apps) which are not directly engaged in the performance of a practice. My focus, however, is only on how these apps combine with the tablet computer, not in apps in their isolation from the device. From this perspective, apps of many kinds are drawn into performances that invoke the tablet computer, and it is only when apps are combined with the tablet computer (or 'enliven' it) that spatiotemporal qualities of performances have the potentiality to be reconfigured.

In the previous chapter, I stressed that apps were central to the functioning of tablet computers. However, there are different kinds of apps that matter for the different ways that the tablet computer fits into practice. Some are pre-installed, with a subset of these pre-installed apps running more or less in the background (e.g. Settings), while others are downloaded onto tablet computers after acquisition. I provide some

context about the different kinds of apps that are discussed in this chapter as background for the overview of apps 'used' by the participants that I give below.

Pre-installed apps are those which are already on the device when it was acquired. As the specific apps that are pre-installed change by model, OS, and manufacturer of tablet, I give an example of one set of pre-installed apps to provide a sense of the range of these apps. The Apple (2016) iPad User Guide[12] stipulates that the pre-installed apps for the models it relates to are: Messages, Safari, Settings, Mail, Music, FaceTime, Calendar, Photos, Camera, Contacts, Clock, Maps, Home, TV, Videos, Notes, Reminders, News, iTunes Store, App Store, iBooks, Podcasts, Photo Booth, and iCloud Drive. Other apps are downloaded onto the tablet computer from the App Store, which acts as a distribution platform for third-party apps and apps which have been developed by the manufacturers of the tablet computer in question.

Some of these apps provide access to online services; for instance, the pre-installed iBooks app is a distribution service for purchasing and/or downloading eBooks, and the Facebook app (not pre-installed) provides access to the popular social media service. Others tailor the generic capabilities of the tablet computer into specific functions; for instance, the pre-installed Clock app not only displays the time but can set alarms and act as a timer or stopwatch, and the (not pre-installed) Torch app allows the camera flash light to be turned on, transforming the camera flash into a light that can be used as a torch. The browser app (i.e. Safari on iPad, Google on other tablets) is slightly different, in that it can also provide access to online services, and the internet more broadly, but it does this in ways that do not allow these

[12] This user guide describes iOS 9.3 for the iPad Pro (9.7 inch and 12.9 inch), iPad Air, iPad Air 2, iPad (4th generation), iPad (3rd generation), iPad 2, iPad mini, iPad mini 2, iPad mini 3, and iPad mini 4.

services to access the some of the constituent technologies of the tablet computer (e.g. camera, microphone). It is when an app is able to make use of the generic capabilities of a device that it is said to be a 'native' app. These are just some examples, though they are the most relevant for the analysis undertaken in this chapter. It would be impossible, however, to give a sense of the full range of types of app which are available through the App Store.

A Catalogue of Apps Installed on the Tablet

Despite the size and variety of the App Store, it *is* possible to get a sense of the full range of apps which are installed on any given tablet computer. The full range of apps (pre-installed and installed) is displayed on the 'home screen' of the device. I collected screenshots of participants' home screens prior to interviews, and I use these as a means of illustrating this chapter. The screenshots help to reflect the 'life of the tablet' and also reveal, to some extent, how the tablet has come to figure in practices (current and past). I also work with the screenshots of participants' home screens to reflect a part of the life of the practitioner. Consequently, these screenshots provide further insight into the multiple roles occupied by tablet computers in the multiple practices of practitioners. Still, this is only a snapshot captured at the moment of interviewing.

Based on the screenshots and the interview data, Table 4.0 provides a sketch of all the practices into which the tablet computer has come to figure in the lives of each of the practitioners, as well as a list of the apps which facilitate the tablet's role in these practices. While there are many ways in which I could 'define' (i.e. categorise) the practices enacted by these practitioners and their tablets, I have chosen to approach this in the first instance by defining the practices as whatever the participants themselves described they were doing. I take this approach following Hitchings

(2011), who has argued that people know of their practices and are able to speak about them.

Two of the participants (Alan and Ann) had help with the process of installing apps since they acquired their iPads. By this, I mean that certain apps had been installed as a consequence of advice from proximate others (e.g. friends or fellow members of their adult education group) about the kinds of apps that these practitioners might need or like. These have been noted as 'not installed by participant'. I have only included pre-installed apps that were on the tablet computer when these were 'used' by the participant, and I note in Table 4.0 when an app was pre-installed. In reflecting traces of how the tablet computer has come to figure within practices, there were also traces of practices in which the tablet computer no longer figured, especially where practitioners had yet to uninstall apps which had been previously associated with practices from which the practitioners had since 'defected' (Shove and Pantzar, 2007). What can now be considered redundant apps have been noted in the table as 'past traces'. In addition, some of Derek's 'apps' were actually shortcuts to websites, which I come back to where relevant - these are noted as 'web' in Table 4.0.

	Practice(s)	App Name	Folders
Derek	Family		
	communicating	Facebook	n/a
		FaceTime (pre-installed)	Video Calling
		Skype	Video Calling
	Shopping		
	research	moneysavingexpert.com (web)	Martin Lewis
		speedtest.com (web)	Martin Lewis
		Amazon	n/a
	purchase	Amazon	n/a
	Travel		
	research	Flightradar24 – Flight Tracker	Travel
		unspecified website	Travel
		TripAdvisor	Travel
		unspecified website	Travel
		SeatGuru	Travel
		SeatGuru (web)	Travel
		unspecified website	Travel
		Cheap flights from Vueling, EasyJet	Travel
		Plane Finder - 3D	Travel
		unspecified web	Travel
		unspecified web	Travel
	Entertainment		
		BBC News	News

	Practice(s)	App Name	Folders
Derek		News (pre-installed)	News
		BBC Sport	News
	news and weather	News App	News
		BBC Weather	News
	television	ITV Hub	Television
		4oD	Television
	searching for information	Wikipedia	Wikipedia
		Flightradar24 - Flight Tracker	Travel
	Adult Education Groups		
	attending	unspecified web	Nmap & Aircrack
		unspecified web	Networks
		unspecified web	Hacking
		unspecified web	Win 10
		unspecified web	Kali Linux
		unspecified web	Linux
		OneDrive	Microsoft
		OneNote	Microsoft
		Microsoft Word for iPad	Microsoft
	leading	PowerPoint for iPad (past trace)	Microsoft
		iBooks	Wikipedia
		Mail	Contacts
		Mail Shot	Contacts
	Organisation		

	Practice(s)	App Name	Folders
Derek		Reminders (pre-installed)	Contacts
		Messages (pre-installed)	Contacts
		Contacts (pre-installed)	Contacts
		Notes (pre-installed)	Contacts
	Other	Photos (pre-installed)	Photography
		Camera (pre-installed)	Photography
		Photo Booth (pre-installed)	Photography

		Total: 33	Total: 16
Alan	Moving House (past trace)		
	researching houses/areas	Zoopla	n/a
		Google Earth	n/a
	decorating house	Dulux Visualizer	n/a
	Social Groups		
	communicating	Mail (pre-installed)	n/a
		Facebook	n/a
	Family		
	communicating	Mail (pre-installed)	n/a
		Skype	n/a
	playing games	Word Lookup	n/a
		Descrambler	n/a

	Practice(s)	App Name	Folders
Alan		ScrabbleFree (not installed by participant)	n/a
	Entertainment		
	news/weather	BBC Weather	n/a
		BBC iPlayer	n/a
		BBC iPlayer Radio	n/a
	playing games	Sudoku (not installed by participant)	n/a
		Jigsaw Box (not installed by participant)	n/a
		Brushes	n/a
	language learning	Duolingo	n/a
	exercise	Yogaia	n/a
	Shopping (past trace)	Tesco Groceries	n/a
		Total: 19	Total: 0
Ann	Entertainment		
	playing games	Candy Crush Saga	Time wasters
		Panda Pop	Time wasters
		Alphabetty Saga	Time wasters
		Candy Crush Soda Saga	Time wasters

	Practice(s)	App Name	Folders
Ann		Cookie Jam	Time wasters
		4 Pics 1 Word	Time wasters
		Two Dots	Time wasters
		unspecified app	Time wasters
		unspecified app	Time wasters
	listening to the radio	TuneIn Radio	TV
		BBC iPlayer Radio	TV
	news/weather	BBC Weather	n/a
		News (pre-installed)	n/a
		BBC News	TV
	watching television	Slate.fr Netflix (not installed by participant)	n/a TV
		ITV Hub	TV
		BBC iPlayer	TV
		SkyGo	n/a
	reading books	BorrowBox Library	Books
	Family		
	communicating	Facebook	n/a
		FaceTime (pre-installed)	n/a
	babysitting (past trace)	Hair Salon	Children

	Practice(s)	App Name	Folders
Ann	Travel		
	researching location/ accommodation	TripAdvisor	n/a
		Facebook	n/a
		Safari (pre-installed)	n/a
		Mail (mailing lists) (pre-installed)	n/a
	Adult Education Groups		
	communicating	Mail (pre-installed)	n/a
		Gmail	n/a
	information	iBooks (pre-installed)	Books
	Church Group		
	communicating	Mail	n/a
	Sleep	Relax M.HD	n/a
		TuneIn Radio	TV
		BBC iPlayer Radio	TV
		Total: 26	Total: 8

Table 4.0 - Summary table of practices into which the tablet (+ app) has been integrated by each participant

Although Table 4.0 could be considered a quick sketch of the practices and apps related to the tablet, it immediately presents distinctions in the way that these tablets had come to figure within the conduct of their owners' daily lives. Both Ann and Derek have arranged their apps into folders, while Alan has not, and Alan has relatively fewer apps than Derek and Ann. The number, range, and type of app also differs for each of the respondents, as well as those practices into which these apps now fit (e.g. entertainment, sleep, church group, travel, family, photography).

Though this catalogue reveals certain details about how the tablet computer (and the apps installed on it) are 'used', it still disguises the very important point that apps work in different ways and – given different entry points into a participant's performance of a given practice – can come to figure within the same practice differently. For instance, within practices of travel, the Mail app could be used to find information about holidays (i.e. mailing lists) and to communicate with family and friends while on the holiday. The same app can also come to figure within very different practices. For instance, the participants described using the Mail app within travel, family, and adult group practices (see Table 4.0).

Having sketched a brief overview of the range of apps and related practices in these three cases in Table 4.0, I will use the next section to consider each practitioner in turn, focusing selectively on a different set of practices. I work with detailed accounts of 'use' from my interviews with Derek (and Julie), Alan, and Ann, informed by the understanding that describing the social and material circumstances of the situated roles that the tablet takes up within and across practices requires detail and context about performances that invokes the 'use' of tablet (+ apps + …). In selecting participants from one group (i.e. 65+) and not the other (i.e. 25 -35), this chapter and the approach it takes work to further emphasise that this is not a comparative study,

and there is as much variety within the age groups chosen as between them. The examples discussed have been selected to demonstrate the myriad of shifting roles that the tablet computer can occupy in a practice, rather than because they are representative of the roles that the tablet takes in general.

Derek (and Julie): Integrator of practice

79-year-old Derek had worked in electrical engineering for the majority of his working life. Since his retirement, he has had an active interest in learning about ICTs and teaching others about how to use them. Derek's active interest and engagement with information technology was clear in the screenshot he provided (Fig 4.1). Derek had a variety of folders into which he had organised his apps. Some supported his attendance of the Computer Group[13] (Win 10, Hacking, Karl Linux, Linux, NMap & Aircrack, Networks and Freeware) and others supported his role as leader of the Tablet Group[14] (Microsoft). He also had *Contacts*, *News*, *Photography*, *Travel*, and *Video Calling* folders, as well as a range of other apps that had not been organised into specific folders.

[13] An adult learning group focused on the uses of desktop PCs.

[14] An adult learning group focused on the uses of tablet computers.

Figure 4.1- Derek's home screen

From left to right: Contact folder, News folder, Photography folder, Television folder, Travel folder, Facebook, Clock, Wikipedia folder, Video Calling folder, Microsoft folder, Amazon, Martin Lewis folder, Win 10 folder, Kali Linux folder, Linux folder, Hacking folder, Nmap & Aircrack folder, Networks folder, Freeware to… (shortcut).
Apps in Dock[15]: Settings, Safari, Kindle, App Store, Mail.

Derek's folders did not consist solely of apps downloaded from the App Store (i.e. native apps) but also contained websites of interest, as he had created internet 'shortcuts' on his home screen.[16] Derek said that *"as a source of information, it's an absolute miracle"*, and this enthusiasm had obviously translated over to the way he organises and interacts with such information. In particular, Derek valued the tempo at which he could access the various forms of information available on the internet, creating his own shortcuts as a way of increasing the periodicity and tempo of accessing information (in researching).

I have already discussed the fact that there are different types of apps, and while native and hybrid apps allow for the generic capabilities of the tablet computer to be integrated into practices like playing games, websites (and mobile web apps) often provide information on a specific topic instead (Budiu, 2013). Derek had, through his creation of shortcuts, essentially created mobile web apps of his own which were populating his home screen, providing quick access to information that was available online. Table 4.0 demonstrates that at least thirteen different shortcuts had been

[15] The dock refers to the bar across the bottom of the iPad's home screen. This dock allows the choice of a maximum of six apps which can then be accessed from any page of the home screen (Apple, 2016).

[16] Safari (Apple's internet browser) provides the ability to add specific websites to the iPad's home screen, displaying the option 'Add to home screen' on every website that is navigated to through the iPad + Safari app.

created (i.e. web). Information obtained through his researching was then later available for 'use' within the performance of other practices (e.g. adult education groups, shopping, and entertainment), and it was clear from the interview data that Derek would often make use of the information sourced from the internet in not one but many distinct practices (i.e. adult education groups (learning and teaching), travel and shopping).

While some of these folders were specifically related to the educational groups he was a part of, others were more related to his 'domestic' practices. For example, in speaking to Derek about his shopping practices, he described his *Martin Lewis* folder, which allowed him to quickly access moneysavingexpert.com (web). Derek said of this:

> The site initially was to advise people on the best deals for everything, and it certainly does that. And even when you do something through them you get something like a £50 voucher. Anything that you can think of, banking and saving, utilities and phone, travel and motoring, and he gives guides – now, the other day, there's guides on how to negotiate to get the best deals, and he says who are the best people to negotiate with.

Derek spoke of the way in which he would visit this site when researching vendors and their products, especially at times when he was making expensive or long-term purchases (e.g. cars, digital devices, utility providers). At the time of interviewing, Derek was interested in switching his internet service provider, believing that he could find another with a better deal and coverage for his area. He described how he would check moneysavingexpert.com, researching to find the best deals. To ensure that he could compare these deals accurately with his current plan, Derek had also

created a shortcut to speedtest.com which he used to periodically check the upload and download speeds of his current internet provider.

Although Derek had always conducted his own research before purchasing expensive products, citing Which? (an independent consumer review service which began as a magazine in 1957) as the source of this information before the iPad, this researching was reported to be more periodic since he acquired his tablet computer. Moreover, Derek was using the knowledge gained from his research to support not just his shopping practices, but also those of travel (researching, booking) and education (researching, learning and teaching). However, the 'dominant' role of the iPad across these practices was to expand his access to information, which he would then use across these different practices (shopping, travel, education).

This was the greatest advantage of the tablet that he reported: providing quick, reliable, regular access to information which then went on to fit into so many different practices. In essence, the tablet computer intersects or 'integrates' these practices (i.e. researching and these other practices of shopping, travel, and education), bringing together the possibilities of performing multiple practices in one specific place (i.e. the tablet) while adding to these in diversifying their possibilities (e.g. adding forms of feedback and additional sources of information). While Derek could presumably access some of the information he had stored on the tablet from books in the local library, or from other physical resources, some of these other sources of information and feedback (e.g. speedtest.com, moneysavingexpert.com) would be unavailable there. For instance, moneysavingexpert.com does not just provide information about shopping and purchasing but access to vouchers and offers as well as 'tips on haggling', which change his successive moments of shopping. The access to different sources of information then meant that, beyond simply increasing the

tempo and periodicity of these performances, the tablet computer diversified the ways in which these practices were performed through the various forms of information that were used.

Providing information was one important role of the iPad for Derek. Yet another role for the tablet emerged in relation to Derek's family relationships. Having family who were not physically near had meant that both Derek and his wife Julie had become used to working with different communication apps, describing how different apps had become reserved for different family members. In interviewing Derek in his home, Julie was also able to participate during the interview, providing further detail about the ways they used their iPad. While Derek and Julie would often use FaceTime when their grandchildren returned to their parent's home during University holidays to video-chat with multiple members at the same time, their communication with their grandchildren outside of these visits was usually reserved for the (Facebook) Messenger app. Julie remarked that:

> I've just Messenger-ed them last week and I was saying 'Are you going home for Christmas?' because they live in Cornwall, and both of them said 'yes' so I said 'right, I'll get your vouchers down there' and the younger grandson said 'Have you got our new address in Cornwall?' he was so worried it wouldn't get there.

The role of the tablet here relates to practices performed between distant practitioners. So, while the sending of Christmas gifts will continue to rely on the infrastructures of mail delivery, the tablet computer allows for the *mediation* of these practices within the relationship between grandparents and their grandchildren. The Messenger app provided distinct temporal dimensions to their communication practices when compared to telephone-based communication, such as the ability to

send and respond to messages at their leisure (i.e. asynchronous communication (IJsselsteijn et al., 2003) as opposed to setting aside a dedicated time frame (i.e. synchronous communication) in order to do this, as is necessary when speaking over FaceTime or the phone.

While the tablet computer can indeed be thought of as a mediator of social relationships, stepping back to consider what these two examples (i.e. access to various forms of information and mediation of social relationships) together alongside Table 4.0 tell us about the tablet computer, I suggest that we might think of the tablet computer as an *integrator* of practices.

Chapter 3 revealed that the tablet computer is a set of technologies. In sitting at the intersection of these multiple technologies, tablet computers make it possible to bring many different apps, affordances, histories, forms of coding, cultures, traditions, and possibilities together in a single device. As such, they are also integrators of a sort, covering these many different aspects of social history and current forms of organisation. The tablet is a site for multiple forms of intersection. In being so many things at once, it is not surprising that the tablet fits into daily life in ways which intersect across practice and which bring together not only many sources of information but also many possibilities for performing multiple practices, all accessible together through the one device. The coupling of Derek and his iPad had thus not only increased the periodicity and tempo of his researching practice, but in no longer having to rely on information from the library, or from Which? magazine, these practices had diversified in form.

In bringing together access to the performance of many different practices in one place, the ways in which the tablet computer 'integrates' practices can differ. I show

two forms of this in exploring Alan and Ann's accounts of their tablet computers and apps.

Alan: Time-shifting and spatiotemporally expanding practice

Alan, an 83-year-old man from the South of England, had owned his iPad for two years. At the age of around 80, Alan had purchased an iPad on the advice of his wife's carers, who believed that a tablet might help them (carers, Alan and his wife) to keep in contact during his wife's illness. Since it was increasingly difficult for him to leave the house, even to go out shopping, he was also keen to get an iPad in order to learn how to shop online. Beyond that, he had little or no idea of what the iPad might be for.

Following his wife's death, Alan had moved to a smaller house and was now living alone. These major changes in his life had equally significant consequences for the range of activities in which the tablet was involved. Alan was now finding new roles for his tablet beyond communication with the carers, or limited email alone. He was also finding that the iPad was becoming an absolutely essential means of making and maintaining social relations, and of doing a vast range of previously unimaginable 'tasks' – from photographing the water meter, through to sharing pictures of his plants with his family and friends.

Alan's new home was situated in a quiet cul-de-sac, and he was reliant on reviving and renewing his social networks at the Rotary and the over-41s (dinner) club. Now that he had an iPad, he was no longer left out of the Rotary emails; papers arrived in PDF format, and after a while he also learned how to use email to respond to more than one person at a time. Though he bought a printer for making copies of really important papers, it is rarely used – the inks dry up and it is in fact not easy to (wirelessly) link to the iPad.

The iPad has also been key, following his wife's death, in keeping in much closer contact with the rest of his (geographically distant) family than ever before. This takes a curious form – although the family had played Scrabble years ago, and at Christmas, online scrabble is now a more-than-daily pursuit. He plays with his older brother (now 92); with his sister in law, and his nieces and has about four games on the go all the time. It is a quiet but vital form of 'co-presence' in his life: often phone calls are prompted by the ending of a game. When he goes off on holiday, for instance, on a cruise trip, he lets everyone know he'll be off Scrabble for a while, and that there is no need to worry. Online shopping is still beyond him; checking the weather is a regular event, as is catching up on the news. And different possibilities are still being explored.

Figures 4.2.1 and 4.2.2 provide a sense of the apps that he had installed onto his iPad during that time, especially because Alan did not delete apps that he no longer used (see Table 4.0 for Alan's past traces of performance).

Figure 4.2.1 – Alan's home screen (1)

Apps: Calendar, Photos, Camera, Contacts, Clock, Maps, Videos, Notes, Reminders, Photo Booth, News, Game Center, iTunes Store, App Store, iBooks, Settings, Google, Podcasts, Tips, Word Lookup.

Figure 4.2.2 - Alan's home screen (2)

Apps: Tesco Groceries, Sudoku, Find Friends, Find iPhone, ScrabbleFree, BBC Weather, BBC iPlayer, iPlayer Radio, Skype, Google Earth, Brushes, YouTube, Facebook, Zoopla, Duolingo, Dulux Visualizer, Descrambler, Yogaia, Jigsaw Box.
Apps in Dock: Messages, Mail, FaceTime, Safari, Music

During the interview with Alan, he described how he spent some of his time attending social groups which included an ex-magistrates' club, an over-41s' (dinner) club, and a Rotary club, alongside the time he spent playing games and seeing family and friends. In fact, the attendance of social groups was common to both Ann and Derek as well. The groups that these three participants attended were either social, educational, or religious in nature.

While the Rotary, over-41s, and ex-magistrates were groups that Alan physically attended at least once a month, Alan described that much of their communication (e.g. arranging events, meeting minutes, and communication between the group) was conducted by email, which he accessed through the Mail app (Fig 4.2.1). The iPad also helped Alan to be part of these groups in other ways. For example, on his return from their meetings, Alan would sometimes find that he had missed the national television news. He said of this:

> If I got home from Rotary, let's say, and it's half past ten and the news has finished you can say 'Oh well, I'll see it straight away online'.

Previously, failing to synchronise his daily life with the timing of the national news would have led to Alan having to wait until the next live broadcast to catch the news. However, Alan described how, now that he had a tablet computer, he was able to use

the BBC iPlayer app to 'time-shift' (Levy, 1983; Wajcman, 2009) this practice and extend his time at the Rotary club. Alan would watch the news (BBC iPlayer) and check the weather (BBC Weather) at his leisure, and on his return (Fig 4.2.2), allowing him greater control over his time in the evening. In this case, the entry point of the tablet (and BBC iPlayer app) into Alan's practices of attending social groups like the Rotary Club was supportive (i.e. not directly implicated in the performance of this), but on other occasions, Alan's tablet was more directly drawn into his performances of daily life.

For instance, Alan spoke about the way his tablet computer had become centrally embedded into his Scrabble practices (ScrabbleFree) with his niece, Elizabeth (Fig. 4.2.2). Though they had previously played the Scrabble board game at Christmas as a family, this had not been done in *"many, many, many years".* The board game had required that all players be present and in the same place as the game itself, but the app version meant that moves could be played over a longer duration (instead of during a dedicated slot of time) and that it could also be played at a distance. ScrabbleFree also allowed for multiple games to be played at once, which meant that Alan *"[had] one game on the go, all the time. Sometimes two, if not three".* Though the app offers the ability to play against people not in the contacts list (i.e. unknown others), Alan chose to play this app only with members of his family.

In this example, the tablet computer had allowed for the practice of playing Scrabble to be spatiotemporally expanded, whilst also drawing (former) participants, such as Alan and Elizabeth back into the practice itself. By spatiotemporally expanding the practice, I am referring to an extension of the times and spaces in which Scrabble playing now takes place. Previously, playing Scrabble had been reserved for Christmas time, with this taking place wherever Christmas was being held for the

family. Now, Scrabble for Alan was a regular, if not daily, performance that took place across distinct time and distant spaces for both players. This is to say that, in playing Scrabble from his home while his niece played from hers, the game of Scrabble no longer required that both practitioners share a space and time for gameplay to take place. This instance of use once again points to the role of the tablet computer as a mediator of social relationships, as Alan would use his iPad to play games with his niece at a distance, performing new forms of socialising with his family that were less dependent on the temporalities of Christmas.

The tablet thus had a role in the 'softening' of spatiotemporal constraints of practice for Alan in two distinct ways: time-shifting certain practices and spatiotemporally extending others. But how does this relate to a discussion of the role of the iPad as an integrator of practice?

For Alan, the tablet computer (+ apps) is at once a Scrabble board, a catch-up television service, the weather forecast, and a means of communication (both familial and otherwise). In bringing together the possibilities for performing a wide range of practices in one place, the combination of Alan, his iPad, and the range of apps discussed allowed Alan to make use of the pockets of time that he had free after attending his social groups instead of performing one practice or the other (i.e. watching the news or attending the social groups). However, beyond this, Alan was now also able to perform practices that usually depend on a time and space being shared with other practitioners at his leisure and on his own (e.g. Scrabble playing). Without other ICTs available, he would have been (and previously was) unable to read the emails sent by these social groups, watch the news on his late return from the Rotary, or play Scrabble outside of forms that involved the physical board.

Ann: Layering, and intensifying practices

Figure 4.3.1 – Ann's home screen (1)

Organisation folder, Clock17, Game Center, Music, iTunes Store, Photography folder, TV folder, Books folder, FaceTime, Time wasters folder, BBC Weather, News, Children folder, Sky Go, Podcasts, Newsstand folder.

Figure 4.3.2 – Ann's home screen (2)

Tips, Maps, Slate.fr, Find Friends, Find iPhone, Gmail, Facebook, Relax M.HD, Messages, TV folder 2, TripAdvisor.

Apps in Dock: Settings, App Store, (Facebook) Messenger, Safari, Mail.

Other participants also played games on their iPads; 69-year-old Ann's *Time wasters* folder (which contained games) is particularly worthy of mention (Fig. 4.3.1) in the context of a discussion of the role of the tablet in 'integrating' practices. Ann, however, played different games to Alan, as Ann preferred single player games (e.g. Candy Crush Saga, Panda Pop, Alphabetty Saga). These kinds of games do not depend on a sequence of turn-taking, so Ann was able to 'dictate' the tempo and periodicity of her game play. But the tempo and periodicity with which she would play these

[17] Items in this list, and in the following (Derek), refer to specific apps unless otherwise specified. For an idea of the apps contained in each folder, see Table 4.0.

games had clearly influenced her opinions of how she was making use of this time; hence the folder name 'Time wasters'.

Whereas Alan's account demonstrates the way in which the fitting in of the tablet computer (as a set of technologies) can allow for a time-shifting of certain practices, and spatiotemporal expansion of others, Ann could be seen to make use of the tablet computer's role as integrator in other ways. This is to say that she would integrate the performances of multiple practices together at once. Ann described the way in which she 'layered' (Crang et al., 2007) the 'use' of apps in the *Time wasters* folder into her television and travelling practices. This example provides further context for my previous assertion that the same app can enter very different practices. While Alan had made 'use' of the tablet computer in his game-playing practices, and while it had enabled tablet-dependent forms of Scrabble, Ann was 'integrating' her game-playing with practices (previously) unrelated to games, such as television watching and travelling.

This was because, though Ann's husband enjoyed watching TV at home, this was not something that Ann particularly liked doing, preferring instead to listen to the radio. Yet to 'spend time' with her husband, Ann played games on her iPad while he watched television, making this time more enjoyable for her. Again, the tablet computer acts as a mediator of social relationships in facilitating time spent with her husband, allowing for Ann to increase her enjoyment of a practice that they often performed together. Ann described this in the following way:

> My son, who is into a lot of these games, and when I first got the iPad he suggested one or two and I used to be playing these games and think 'I can't believe I'm doing this, this just isn't me at all' and yet there's just some element

> of, not addiction <laughs> and I find now because I'm not a real television fan, that I can't just sit and watch television unless I've got – you know – this in front of me and playing some stupid timewasting game.

In this case, the tablet had taken on a role in reconfiguring the practice of television watching for Ann, allowing her to 'layer' practices (i.e. perform multiple practices in the same time and space) by bringing the possibilities to perform these together.

Up to this point, I have discussed the timing of singular practices, but the way that the iPad (+ game app) had moved into television watching and game playing links together these minimally related practices. Minimally related practices are those which are only related by their co-location and co-existence in time and space (Pantzar and Shove, 2010). A language of *bundling* has been used by those interested in the linkages between such minimally related practices (Shove et al., 2012). As a consequence of this bundling, Ann's tablet (and the practices it allowed her to layer, such as game playing) now had an association with the television and the time that her husband spent watching it. I extend the language of bundling here by defining a material which does this 'bundling' of practice as an integrator of practice. This is consistent with my use of the term throughout the chapter in that, even in those moments where the tablet is not used to actively 'bundle' or integrate multiple practices at once (i.e. as in the case of Alan), by being so many different things at once and in sitting at the intersection of multiple practices, the tablet computers 'use' still impacts on performances in important and 'integrative' ways. It is because the tablet computer is at once a television and the internet that Alan was able to time-shift his television watching to a time that was more convenient. Meanwhile, in Ann's case, it is because the tablet computer is many games at once that she was able to layer these capabilities into television watching, creating new forms that were

enjoyable for both her and her husband. Consequently, even in those cases where the tablet does not actively integrate practices (i.e. brings their performances together in time and space), it is still an integrator in bringing together the possibilities of multiple technologies (apps, internet, feedback) to perform otherwise distinct practices in one place (i.e. the tablet).

Playing games was not the only practice bundled together with Ann's television watching, and she described combining television watching with researching future holiday destinations and accommodation. Much of the interview with Ann focused on how the iPad had come to fit into the multiple activities that together formed her travel practices, and it became clear that her iPad had found a central role in organising and planning her holidays. These 'uses' of the tablet relied on apps which were more obviously associated with 'travel' (i.e. TripAdvisor) as well as some others which were not (e.g. Mail and Facebook), rearticulating the point that apps can have very different entry points into practice. The examples of Mail and Facebook in particular demonstrate how inherently flexible the tablet's apps are. On the face of it, Mail and Facebook are apps associated with forms of communication, but Ann did not 'use' them for this practice, instead finding that mailing lists and Facebook groups were in fact excellent alternate sources of travel and accommodation information.

Though Ann did have the TripAdvisor app installed on her tablet, she described how she accessed the online service more frequently through the browser, having only installed the app as a consequence of advice from the Tablet Group course that she attended.[18] Before owning the tablet computer, Ann had used brochures and guides to check reviews for potential holiday locations. Now, her search for information had

[18] The infrequency (i.e. lack of periodicity) of use of this app is demonstrated by the blue dot which signals that the app has not been accessed since its last update.

migrated online to Facebook groups and websites. This kind of active searching for offers and reviews was also supported by the various mailing lists that Ann had signed up for and which were sent to her Mail inbox: *"Cruise First, Cruise Direct, another one from Cruise Direct, Cruise Critic, Travel Zoo <laughs> Royal Caribbean".*

Owning an iPad meant that, for Ann, even though (and perhaps because) she could research future holidays from the comfort of her living room, it took her longer because she now had access to a far greater amount of information. Ann said: *"[t]hat's where I'm up to at the moment. Going 'round in circles".* Though this arrangement was more convenient in the sense that she could combine her holiday research with the performance of other practices that she did not particularly enjoy (e.g. watching television and travelling by car), and in that she did not have to go to the *"other room"* where the desktop she shared with her husband was kept, the searching and planning for these future travel practices was now more extensive and diversified. From this example, we could infer that the tablet computer, and the various apps (e.g. TripAdvisor, Facebook, Safari, Mail) which are brought together in researching future travel locations and accommodation, have played a role in the *intensification* of this particular practice. This is because Ann performed certain practices more periodically (game playing) and took longer (i.e. duration) in her performance of others (researching holidays), diversifying Ann's practices and, in turn, her daily life.

The Tablet in Practice: Integrator of Practice, Mediator of Social Relations

By illustrating some of the spatiotemporal qualities of tablet + app combinations as these are invoked in practice(s), I have described aspects of how the tablet and its specific apps have become embedded into Derek (and Julie), Ann, and Alan's practices

and daily lives. In doing this, two roles of the tablet computer have emerged: (a) tablet computer as integrator and (b) tablet computer as mediator. I have described various spatiotemporal reconfigurations which the tablet computer (and its apps) can bring about through these roles. This is not an exhaustive account of all the roles that the tablet can take in the lives of people, nor of all the effects that the tablet computer and its apps can have upon the performance of a practice, but from this initial discussion, a number of generic points arise.

First, that the tablet computer is an integrator of practice. In being so many different things at once, and as a set of technologies that goes beyond simply the device of the tablet computer itself (i.e. through its apps, and other constituent technologies), the tablet brings together the opportunities for performing a wide range and number of practices together in one place. The ways that the tablet and its apps are used can have various effects, including diversifying particular practice performances, time-shifting or spatiotemporally expanding practices, or even acting as an integrator by linking together otherwise separate performances of practices.

Because the tablet computer depends upon the internet for many of the roles within practices that were described above, it is no surprise that an analysis of some of its situated roles has revealed the way in which it enables the time-shifting of certain practices. Since acquiring the tablet computer, Alan has been able to access online streaming services through his installation of apps such as BBC iPlayer. While it is the tablet that has afforded access, it is in fact the service itself (i.e. online streaming) which affords the practitioner this potential. There are other, similar services which allow for the time-shifting of practices (e.g. online banking, online shopping, online health care, online postal services), and in so far as this allows for practices that were formerly constrained by timing and spatial location, it is easy to

appreciate how, as an internet-connected device, the tablet enables a certain 'shift-ability' within these practices.

The second reconfiguration of practice was that of spatiotemporal extension (in Alan's Scrabble practices), which again relates to the role of the tablet computer in spatiotemporally expanding practice. In this case, the constraints of the previous configurations (i.e. how a practice was previously performed) are extended. While this may appear similar to 'time-shifting', there is a difference in that, though these constraints are expanded, the practice they relate to still features temporal dimensions which affect the ordering of its performance. By this, I mean that while Alan did not need to be in the same space to play Scrabble, nor play at the same time as his niece, the temporal qualities of having to play in a sequence (i.e. turn-taking) for the game itself meant that the game still depended upon another player taking their turn before he could take his. While the possibilities of the internet integrated through the mobile device of the tablet do indeed 'soften' spatiotemporal constraints, this softening should not be assumed to be a matter of simply shifting the timing of performance (as in the case of Alan's news watching).

There is a certain shift-ability of the spatial features of practices interrogated here also, but the spatial shifts of the tablet computer in the instances described appeared to relate more to a movement of these performances into the home instead of outside of it. This is not to say that the tablet computer was not mobile within the home, with examples of the bedroom (Derek and Ann), the living room (Derek, Ann, and Alan), and the dining room (Alan) given in explaining particular roles of the tablet. Despite this, these participants did not often make use of the tablet computer outside of their homes. I will continue to question the mobility of the tablet later in the thesis.

Thirdly, the tablet allows practices (such as those of television watching and game playing) to bundle together. This chapter adds to the language of layering and bundling that is already used within theories of practice (Shove et al., 2012), developing the term 'integrator' to describe a material device whose use can have the effect of bundling or layering practices. Though it is impossible to know, at this point, whether the connections made between Ann's television-watching practices and game playing will be of lasting significance, it has been argued that, on a wider scale, relatively loose connections made between practices that are initially born of co-location can prove relevant for the course of social change (de Wit et al., 2002, Shove et al., 2012). A broader pattern of this bundling between practices of television watching is evidenced by Ofcom (2013), who noted the rise in what they termed as 'second-screen use' (which includes not only the tablet's 'use' but smartphones' and laptops' also) with television watching, pointing to larger scale changes in the practices of watching television.

Fourth, it is also clear that the tablet can have an active role in the intensification of practices. By 'intensification', I am referring to both an increase in the periodicity in which the practice is performed (as in the case of Ann's game playing) and the diversification of the activities involved in that practice (as in the case of Ann's and Derek's researching practices) which thereby requires more time from the practitioner for its performance. While the intensification in the periodicity of performance of practices could be a consequence of the layering of the tablet into other practices, and the tempo at which certain apps can be accessed (e.g. Safari for fact checking something heard on the TV), the intensification brought about by the diversification of activities involved in that practice appears to link more to the idea of the tablet as integrator. Given that the tablet brings together so many different sources of information (Facebook groups, websites, forums, apps), the practitioner is

able to diversify the sources of information used (as in the case of Ann's holiday planning and Derek's researching) as access to these is all intersected through the iPad.

Finally, there is the idea of the tablet as mediator (of social relationships). In this chapter, I have attempted to focus on the ways that the tablet computer and its apps now figure within the performances of practices without considering the wider networks into which these practices are themselves embedded (social relationships, infrastructures), as these wider networks will be the subject of subsequent chapters. However, the cases that I have explored have shown how the tablet computer mediates forms of communication between family members (e.g. Derek's communication practices), enables forms of spending time with loved ones (Ann's television-watching practices), and provides new ways of performing the family at a distance (Alan's Scrabble-playing with his niece). It is almost impossible to analyse the roles of the tablet within practices without uncovering some of the linkages of social relationships, as these links are sustained and potentially remade as the tablet moves into performances that rely on the participation of co-practitioners.

To conclude, there is plenty of variety in how the tablet's embedding into practice had come to diversify these participants' performances and, in turn, their daily lives. I have highlighted a handful of examples which illustrate the different temporal (and some spatial) features of processes of integration. An important feature of these roles and reconfigurations, however, is that they are non-discrete. When compared to the physical board game, Alan's Scrabble practices spatiotemporally expanded the practice of playing Scrabble, but they also intensify his playing of the game. Similarly, while Ann's researching for future travel plans had intensified when enacted through the tablet computer, the tablet computer also had a role in time-shifting these

performances into moments when her husband was watching television. It is precisely because the tablet *has* many roles and *is* many things at once that it can be referred to as an integrator of access (and opportunities) and of practices (performing multiple practices at once). I carry the notion of the tablet computer as an integrator into the subsequent chapters, taking forward the language of time-shifting, spatiotemporal expansion, and intensifying performances where relevant. I also explore the role of the tablet as a mediator of social relationships, exploring how the device sits at an intersection of such relations and of practices, though other language is used to explore this in Chapter 6.

Chapter 5

Watching Television: Tablets, related devices, and the reconfiguration of practice

Prior to the arrival of the tablet computer, daily life, and the lives of the practices which together constituted it, formed already 'established' ways of doing with configurations (sets of devices, objects, and services) of their own. This is to say that the tablet computer did not arrive into the life of practitioners in isolation from the other devices and objects to which people already had access and which were already embedded in the conduct of various social practices. Although sometimes critical, tablet computers (+ apps) do not figure in the performances of practices by themselves either, and other objects and services, and potentially even other tablet-like devices (like smartphones and laptops), are also drawn into these performances.

This complicates the account of the tablet's arrival that I gave in the last chapter, in which I focused upon the apps installed on tablets as a way of gaining insight into how tablet computers are used and what they are used for. In doing this, I developed an account of how the tablet has come to figure in and across a number of specific practices, but I did so without considering the wider configurations of devices, objects, and services within which the tablet computer is also situated.

This is because there are more 'material'-practice relations at play than simply the tablet-app relation, and while a focus on the tablet-app relation alone is useful for understanding some of the roles taken on by tablets and apps within and across multiple practices, it does not reveal whether the tablet (+ its apps) have substituted or replaced the 'use' of other, similar types of devices in the performance of practice,

as implied in Apple's imaginaries of using the iPad and so often presented in their Keynotes. Whereas I have previously focused on multiple practices to better understand the tablet-app relation, here I consider multiple devices and objects at once using one specific 'practice': that of television watching as means of accessing the tablet-practice relation within and as part of a more extensive complex of material-practice interaction.

Television watching represents an intriguing case through which to examine these relations because it has undergone various transformations over time, transformations which I argue are a consequence of changing sets of devices, objects, and services as they become successively implicated, and later embedded, within performances of television watching. While, at its inception (i.e. with the arrival of the television, and broadcast television services), television watching represented a fairly 'bounded' practice which could be defined by paying more or less consistent attention to the television (i.e. watching depended on the presence of the television alone), there are now various forms of what I describe as 'television watching', many of which do not involve an actual television nor the television broadcast service at all. The arrival of Betamax, VHS, DVD players, and cable and satellite television are all examples of television-related technologies which, through their successive embedding, have changed the qualities, forms, and, in turn, experiences of television watching.

To sketch out some recent changes to the practice of television watching, I outline a brief history of streaming services. Video streaming refers to the sending of compressed video content over the internet and through particular internet services (like Netflix and BBC iPlayer, but also ITV Hub, All 4, My 5, etc.) which is then displayed to the viewer in real-time; this is to say that the content is not downloaded to the device through which it is watched, and the content is 'hosted' by these

particular services instead (Qiu and Cui, 2010). In concentrating on the streaming services of BBC iPlayer and Netflix alone, the history I give is necessarily selective and is by no means intended as a comprehensive account of the history of television watching (see Abramson, 1987, Smith and Paterson, 1995, Gray and Bell, 2013) nor really of online streaming either, as there are various other streaming services as well as other forms (i.e. illegal streaming as well as the legal services of Amazon Prime, ITV player, etc.).

The examples I consider (BBC iPlayer and the Netflix streaming service) were selected because these were especially important in respondents' accounts of television watching, but beyond addressing what was clearly an important aspect of the iPad in use, my purpose in exploring these services is to outline the development of one particular transformation in which practices of television watching become detached from both the 'television' itself and from broadcast services.

A Brief History of the BBC iPlayer and Netflix Streaming Services

The history of television watching begins over ninety years ago (Brown and Barkhuus, 2011) before there was any possibility of online streaming. My account begins in 2007. At this point, smartphones were beginning to gain significant market share. In 2007, Ofcom (2007) suggested that mobile phones were beginning to 'replace' other devices such as cameras, portable music players, and games consoles. BBC iPlayer was released in beta in December of that year. In the same month of its launch, BBC iPlayer surpassed the expectations the British Broadcasting Corporation (BBC) had set for it and attracted over 1 million visitors, with this number rising with each passing month. While BBC iPlayer was accessible (only) through its website at its inception, in February 2011, BBC iPlayer launched its own app for the Apple iPad

and for selective smartphones. [19] In its first twenty-four hours on the Apple App Store, the BBC iPlayer app was downloaded 54,511 times and moved to the top of the (App Store) download charts, with the total number of iPlayer requests from iPads growing 111% between February 9th and February 10th (Laughlin, 2011). By February 2017, the BBC iPlayer service was receiving 128 million requests by television devices, followed in second by 70 million requests by tablet computers (Bell, 2017).

Alongside these developments, Netflix, which launched in 1997 as an online DVD rental service, introduced a new streaming service in 2007 that was available alongside these rental services. This allowed subscribers to access and watch television series and films direct from their website for the first time (Anderson, 2007). This is one important difference between Netflix and other streaming sites such as BBC iPlayer, and while BBC iPlayer can be accessed by anyone within the UK[20] – once they have signed up for the service – individuals must subscribe to Netflix and pay a monthly fee to access the content available on this service. While only 28% of subscribers were streaming content from Netflix in 2008 (with others making use of Netflix's DVD rental service instead), in 2009 this had risen to 48% of subscribers (Netflix, 2010). This rise in the share of subscribers using Netflix for streamed content rather than to rent DVDs was also complemented by a year-on-year rise in the number of subscribers to Netflix itself. By the end of 2010, Netflix had surpassed 20 million subscribers internationally (compared with 9.39 million at the end of 2008) (Netflix, 2011), but at this point, Netflix was only available on selected continents including North America and Latin America. When Netflix did

[19] Running a particular OS (Google Android 2.2; with Flash 10.1 installed).

[20] Anyone within the UK could use the BBC iPlayer service to watch television until September 2016, when licensing changes were brought in that meant the television license also covered the BBC streaming services, as well as their broadcast services. This shift in licensing provisions is important and will be referred to later in the chapter.

launch in the UK in 2012, the company only made their streaming service available (BBC, 2011). As of 2017, Netflix has yet to offer UK subscribers the ability to rent DVDs (Sulleyman, 2017).[21] This is perhaps as a consequence of the competition that existed already in the UK market for DVD rentals (and limited online streaming), with the Amazon-owned LoveFilm having a total of 1.6 million UK subscribers in 2012 (Barnett, 2012). LoveFilm later became Amazon Prime Instant, dropping its DVD rental service to focus on online streaming alone, but by April 2013, Netflix was experiencing 3,930 unique visitors to their UK service in one month, compared to LoveFilm's 738 streaming visitors in that same month (Ofcom, 2013). As of 2018, more than 7.5 million UK households have a Netflix subscription (BARD, 2018).

It is crucial to note that online streaming services like BBC iPlayer and Netflix, and others included, do not provide access to the same content (i.e. films, television series). They are not interchangeable services, with Netflix in particular being recognised as representing a shift in digital television, in that it is also involved in producing and releasing its own content, with other streaming services like Amazon and Hulu (not considered in this chapter) following suit and now also producing their own content (Jenner, 2016).

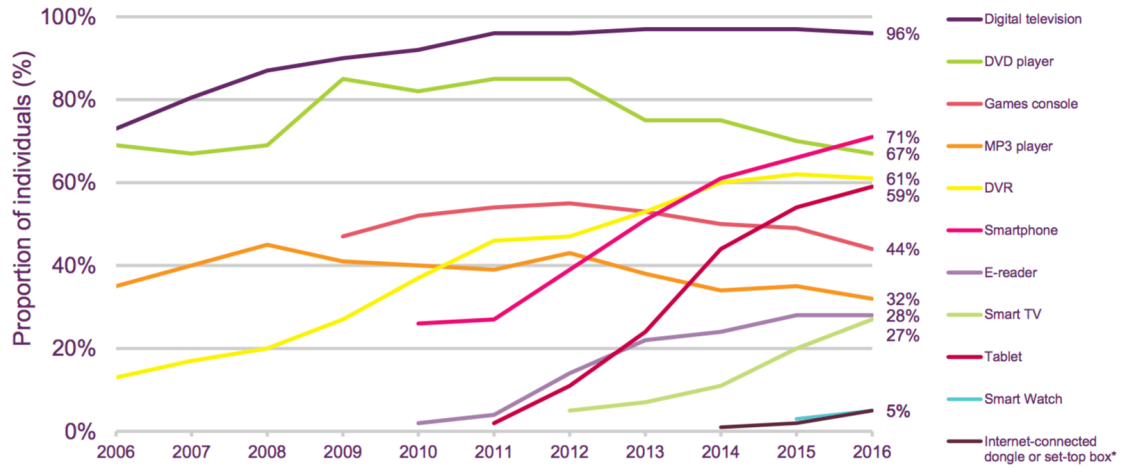
The point in summarising these developments has been to not only contextualise some of the forms of television watching that I examine in this chapter, but to show that the practice of television watching now includes forms which go far beyond live and conventional broadcast television, which depend on the (standalone) television, and to make the point that many, if not most, of these services predated the

[21] The UK launch of Netflix followed their 2011 controversy in America, whereby the company had attempted to split their services (DVD rental and online streaming) onto two separate subscription plans and across two separate websites. The company received much criticism for this attempt, and around 1 million subscribers cancelled their plans, with Netflix quickly abandoning this idea in response to those losses.

introduction of the tablet computer. Online streaming represents just one shift in the broader history of television watching, and there are of course other services and devices with their own particular histories which have become associated with the practices of television watching, and have also transformed the possibilities of viewing performance (e.g. Freeview television, set-top boxes, DVDs, etc.). In combination, the intersecting histories of these different (television-related) devices and services points to the evolution of practices of television watching from a bounded activity (i.e. watching broadcast television) to a far more diversified practice. So, where does the tablet fit within this history?

Uptake of Television-Related Devices in the UK

As my brief history of the BBC iPlayer and Netflix streaming services has shown, the forms of television watching that I go on to describe are by no means a consequence of the tablet computer alone. Accounts of services like Netflix make little mention of the devices that are used for viewing streamed films or shows, though the *BBC iPlayer Performance Report* (Bell, 2017) did note that the device with the second most requests to the BBC iPlayer service was the tablet computer. To understand how the tablet figures in 'television' viewing we need a better sense of already existing arrangements, of the range of devices involved, and of how these interact with the tablet computer with regards to television viewing. More specifically, can we identify competitive (i.e. replacement, substitution) or cooperative relations between televisions, laptops, etc. and the tablet computer with regard to practices of television watching?



Source: Ofcom Technology Tracker. Data from Q1 of each year 2006-2014, then H1 2015-2016.
Base: All adults aged 16+ (2016 n=3737).
Note: The question wording for DVD player and DVR was changed in Q1 2009, so data are not directly comparable with previous years.
** Internet-connected dongle or set-top box includes NOW TV set-top box, Roku, Google Chrome, Amazon Fire TV stick, Amazon Fire TV, Apple TV*

Figure 5.1 - Household take-up of digital communications/AV devices: 2006-2016 (Ofcom, 2016a)

Figure 5.1 has been taken from *The Communications Market Report* (Ofcom, 2016a). It shows the take-up of various devices by UK households between 2000–2016, demonstrating that digital televisions are owned by the greatest proportion of households in the UK (96%) out of the devices represented, with the smartphone following second (71%). While some of the devices shown are not associated with the practice of television watching (e.g. MP3 player, E-reader, smart Watch), many are, such as DVD players, DVRs, smartphones, smart TVs, tablets, internet-connected dongles, and set-top boxes. Most of this latter category are used in combination with another device to enable television watching to occur (e.g. DVD player requires the TV). Practices of watching television, then, already entailed various configurations of devices, and many of the devices which together constitute these configurations were already owned by many households in the UK prior to the 'arrival' of the tablet.

Chapter 1 already introduced Nieminen-Sundell and Pantzar's (2003) relational concepts of competitive and cooperative 'products'. Given their importance in my

account of the relation between the tablet and television watching, I provide a brief summary of these terms here. For Niemimen-Sundell and Pantzar (2003), competitive relationships form between those 'products' within the same 'product category' (e.g. a tablet and a laptop) and, at times, products from different product categories (e.g. a tablet and a television). Competition is said to exist between products when the more there is of commodity A (e.g. tablet), the less there is of commodity B (e.g. television). On the other hand, cooperative relationships refer to the associations which form between 'products' and the way in which these groups stabilise into forms of sociotechnical 'closure' (Nieminen-Sundell and Pantzar, 2003, Bijker, 1997); that is, into arrangements which are then taken for granted. In other words, in a 'cooperative' situation, using the tablet computer to watch television does not replace the television but instead contributes to, and collaborates with, the TV's use, extending the forms of television watching and introducing new variants (e.g. using the tablet computer to watch YouTube videos and using the television to watch live broadcast television).

Borrowing these ideas, at least initially, my questions are these: when and how does the tablet computer form competitive or cooperative relationships with other devices, objects, and services involved in television watching, and how do they come to fit within established configurations? More specifically, when does the tablet computer compete with other similar devices as it moves into practices of watching television, and when are uses of the tablet computer cooperative with respect to other devices and associated objects?

Configurations of Television Watching: Watching catch-up, Netflix, and broadcast television on a tablet

I begin by reviewing some of the device-device and device-object practice relationships which constitute forms of watching television. The installation of apps such as BBC iPlayer, ITV Hub, All 4, and My5[22] onto the tablet computer allows for the possibility of watching broadcast television live (and direct) through the tablet computer. They also allow for a time-shifting (Chapter 4) of television watching, meaning that content can be viewed any time after it has been broadcast. The tablet computer can thus potentially take the place of, or substitute for, the television itself in the practice of watching television. But since smartphones also allow for these same viewing apps to be installed, they might also be thought of as competing with other devices which are used for watching television. So, has the tablet computer formed competitive relations with the television and other established computing devices like the smartphone, or are these relations better described as forms of cooperation, or even, perhaps, as something else? The experiences of those I interviewed provide some insight into these questions.

Ways of Watching Catch-Up Television

60-year-old Jane owned fewer devices than most of her counterparts, only having a laptop (shared with her husband, Eric) alongside her tablet computer. Though the television set was her first choice for watching television, Jane also had the BBC iPlayer app installed on her iPad. This BBC iPlayer app allowed Jane to watch broadcast television directly through her iPad. In principle, then, Jane's tablet computer could have a competitive relationship with the television itself in her

[22] These apps provide access to the main five (broadcast) channels: BBC One, BBC Two, ITV, Channel 4, and Channel 5.

practices of watching television, in that both devices (TV and tablet) offer this facility.

Despite this, in following Nieminen-Sundell and Pantzar's definition of competitive relationships, a further question arises: had the iPad in fact led to a decline in the use of the television itself (2003)? In her account, Jane explained that there was only one television within the home. While Jane enjoyed watching television programmes with Eric (her husband) in the evenings, she admitted that *"we have a different taste in television programmes"*, and sometimes Jane would forgo her own personal preference in order to spend time with Eric in the evening, watching something that they both enjoyed instead.

However, instead of having to miss out on her favourite programmes, Jane would make use of the BBC iPlayer app to catch up on these programmes at another time, when she was alone or her husband was reading.

Jane said of this:

> It's a question of, for instance, if my husband is sitting down and we are in the same room, and he's reading a book or whatever, then I can just watch whatever I've missed that he doesn't like. … In the mornings too, Eric might be out, and I can just use the BBC app to just watch those programmes that I know he doesn't like.

This use of the tablet (i.e. catch-up through BBC iPlayer) is therefore a 'new' use or, alternatively, a new form of television watching for Jane.[23] To understand this, I refer to another of Nieminen-Sundell and Pantzar's (2003) ecological concepts, this being 'colonisation'. In effect, Jane's iPad appears to occupy a 'new' role that was previously unoccupied by the television (i.e. the use of the iPad for television watching had not contributed to less use of the television). However, the tablet did not simply colonise some kind of 'vacant' space in the ecology of practice: instead, it was instrumental in creating this new 'space'. In this case, the roles taken up by the television and iPad in practices of watching television differed and were related to differing forms of practice (e.g. live broadcast television with Eric: television; catch up services and alone: iPad), as opposed to a singular form of television watching (i.e. watching live broadcast television through both the iPad and the television).

While Jane's account at first pointed to a competitive relationship of sorts, in that both the iPad and the television are used for television watching, it emerges that the iPad has enabled new and different variants of the practice (i.e. viewing through the iPad). As such, the language of competition does not adequately capture the relations between these devices: each is instead positioned within different and non-competing forms of television watching.

Watching television live remains the most popular "viewing activity" of UK adults (with 72% of adults watching live TV between the hours in which TV attracted the most views; 8-8.30pm) (Ofcom, 2016b). But the language used by Ofcom (i.e. 'viewing activity'), as well as the above account, demonstrates a diversification of

[23] Though Jane had access to the laptop she shared with Eric, this device had a very specific role in their daily lives. As the couple owned property abroad and travelled frequently, this laptop had 'specialised' as a device for storing their important and confidential documents, and it was not used for anything else. The term 'specialisation' will be referred to in Chapter 7.

television watching. Both the device and content (i.e. what is being watched) of television watching has become more varied (i.e. diversified) as differing forms have emerged. Tablets, smartphones, laptops, and desktops have all become associated with the practice of watching television, as has recorded-, streamed-, and broadcast-content services. Although practitioners may still speak of 'watching television', this no longer needs to involve a television set, nor live broadcast content, at all. I have provided just some examples here of how variants of television watching have developed. What is clear from this case is that the tablet computer is not simply substituting for the television.

In speaking about the 'effect' of 'new' 'technologies' on the printed book, Duguid said that *"[…] like an exasperated gardener, we snip triumphantly at the exposed plant forgetting how extensive, established roots can be"* (Duguid, 1996: 64). These roots, or rather these older ways of watching television, inform newer ways of watching television. As such, it is more consistent when thinking about performances of practices to consider what happens when a 'new' device comes to figure within an established practice. In some instances, new variants arise, perhaps because the integration of specific technologies bifurcates the practice (Yli-Kauhalumoa et al., 2013, Schatzki, 2013). More importantly, and as illustrated above, the growing range of what counts as 'television watching' is constituted by diverse combinations of devices and services.

Practices of watching television are arguably marked by moments of transition, in which new forms arise or in which the practice evolves. The introduction of streaming services of BBC iPlayer and Netflix is one such example, but others might include the move from black and white to colour, the shift from analogue to digital television, the evolution of televisions themselves, and the introduction of television-related

technologies (e.g. Betamax, VHS, DVD players). This is consequently not simply a process of 'bifurcation' or a splitting into two. As represented above, there is a more complex process of 'multifurcation'. 'Multifurcation' is a term used to describe the splitting of ancestral branches of trees into multiple branches. By extension, this term can be used to represent the multiplicity of this ongoing branching and splitting of practices as new forms emerge. In fact, I argue that the practice of television watching, originally positioned in this chapter as a 'practice', is better understood as an area of practice that has experienced what is best understood as a form of ongoing multifurcation.

This far, I have considered divisions, differences, and the emergence of new forms of television watching. In the next section, I focus on those ways in which the relations between devices (and associated objects) could be described as cooperative or synergistic.

Ways of Watching Netflix

In many respects, the form of television watching considered above (i.e. catch-up) is not that radically different from watching live television. The watching that Jane was doing was still related to broadcast television services, though the form of catch-up television discussed involved apps and tablets, not the standalone television and not the live broadcast television service. The case of Netflix, however, represents a more significant shift in the quality and field of television watching.

The experience of 26-year-old Natasha provides an illustrative example of some of the more 'radical' transformations that television watching has undergone in more recent years. Though she stated that she enjoyed 'watching TV', Natasha also said of herself and her housemates that *"[they] don't really watch TV [they] just like plug*

the laptop in […]". By this, Natasha meant that while she and her housemates did indeed watch video content, they did not depend on broadcast television for this content, nor was it delivered by the television set alone. Instead, Natasha used Netflix, which provides what it describes as a *"streaming service that allows customers to watch a wide variety of award-winning TV shows, documentaries, and films on thousands of Internet-connected devices"* (Netflix, 2017).

When asked whether Netflix was something she watched via her tablet (Kindle Fire), Natasha replied:

> No, I watch it on anything, well not my phone, just my laptop or my Kindle <Fire>. It depends on what I'm doing, where I am. So, if I'm downstairs in the front room I tend to put my laptop more 'cause I can plug it in into the TV, whereas if I'm in bed and I'm just like having a lazy Saturday or something, I might put my Kindle on.

Though both her Kindle Fire and laptop were implicated in the 'same' practice, and took on 'similar' roles in that they provided access to Netflix, again I argue that these devices were starting to define different forms of that practice: Kindle-based and laptop-based television watching. These forms occur in different circumstances (times and spaces) depending on what Natasha was doing and where she was.

In combination, these forms of practice illustrate a cooperation of sorts, in that both constitute and enable Natasha's access to Netflix. To reiterate, these forms of practice do work together and combine in relation to the broader achievement of television watching (and the many forms that this now implies). Critically, and in this context, 'cooperation' refers to connections between variants of practice (i.e. the

relationship between these forms in collectively contributing towards the achievement of television watching), as opposed to the relationships between the distinct devices and objects making up these configurations. This is an important distinction because it suggests that there might be other cross-cutting relationships between devices and objects within and between these diverse configurations of practice. To elaborate, Natasha explicitly mentioned two distinct configurations for television watching through Netflix: one laptop-based and one tablet-computer-based.

Which of these two configurations was involved depended on a range of other material elements, including rooms and people, not just devices and objects. This allows me to make the point that crucial aspects of the configuration need not be devices. Living in a house share, Natasha described the way in which she would spend her evenings in her bedroom unless specifically socialising with her housemates that evening. As she did not have a television in her room, Natasha would use her Kindle Fire while sitting on her bed, explicitly mentioning this as a part of 'lazy Saturdays'. Thinking about the connections between devices and objects here, Natasha's Kindle Fire arguably had a cooperative relationship with her bed for the configuration of lazy Saturdays watching television – at least in so far as both were necessary. In this sense, they 'work together', cooperating to co-constitute this distinctive configuration of lazy Saturdays of television watching.

Interestingly, however, this tablet-bed relationship extended beyond the practice of watching television. For instance, when asked about where in her home her tablet computer was used, she explained: *"I tend to use my Kindle in bed, it probably doesn't tend to be anywhere else really"*. Natasha was not the only participant for whom the tablet-bed relation appeared as a strong link, and Liam also spoke of the importance of this combination for his Netflix use.

Liam had completed his University education (undergraduate and Master's degree) a few years prior to my first interview with him. During the time since his graduation, Liam had spent a year living alone in a small Northern town having moved there for employment as a Statistician, before quitting this job to move to an urban centre where his university housemates were now residing in a house share.

In this time, Liam's ideas about his future had very much changed, and his interest was now in finding work that could finance his ability to travel, with his more imminent plans being that of a trip around Latin America to not only learn the language, but to also see more of the world. These plans were now superseding his desire to follow a more formal or traditional career path. He noted how this one year of living alone, and particularly the lack of sociality at work there had led to radical changes in his ideas about what he wanted to do.

On hearing that Liam was planning on travelling in the near-future, his parents had purchased him an iPad, believing that the device could be a valuable tool for helping him to keep in contact with family and friends whilst abroad, and for learning the Spanish language before his travels. Liam, however, had admitted that it had taken him sometime to find a use for the device, at first believing it to be little more than a 'big iPhone'. Though certainly not a Luddite, Liam confessed that his interest in devices was specific to those for which he could perceive a value. However, in not wanting to upset his parents, he had feigned interest in the iPad and its uses, though it had taken him sometime to actually find a space for it in his daily life.

However, in the previous year or so, a variety of 'uses' had emerged for the device in his daily life and at home, though Liam had found that it was most useful in those

moments when he was on-the-go. Specifically, Liam would take his iPad when travelling to visit friends and family, making use of a DJ-ing app, and his headphones to activate the deadtime of travelling, entertaining himself by 'mixing' (i.e. the process of blending together individual tracks to create a version of the song) on-the-go and on the train. Another crucial role that the iPad had taken, however, was that of watching television in bed.

Liam's description of using Netflix as background noise to fall asleep to also hints at a symbiotic relation between his iPad and his bed. Liam said of this: *"[…] you know, I quite often fall asleep watching TV series, and I would use my iPad for that, because it's just nice to have a little mini iPad rather than a big fat laptop".*

As a means of understanding these connections, I borrow another term from the previous chapter, this time: spatiotemporal extension. I now take that concept further. Though the tablet computer does expand the spaces in which television watching can take place (i.e. bed), there is, at the same time, a contraction (i.e. shrinking) of the spaces in which the tablet is a part of television watching. This is to say that the tablet computer is used in, and only in, particular spatiotemporal circumstances (Chapter 7). For example, the tablet and bed are strongly connected in this configuration of television watching for both Natasha and Liam. Equally, this connection was crucial in defining and limiting the role of the tablet computer for Natasha, for whom the iPad was a predominantly bed-related device.

This resonates with claims about the tablet computer as a 'lean back' device (Chapter 3). As Natasha said:

> You're just chilling out and watching it, it's kind of like if you're in bed and it's just like you can roll around with it and get more comfortable, whereas if it's a big massive laptop and you're uncomfortable then you're like, 'Oh my God, I've got to move it, and then I've got to move my big massive charger', 'cause the charger for the Kindle is really small as well so I don't have to move it.

This excerpt highlights another cooperative relation, this time between not only the tablet and its charger, but within a separate configuration that is between Natasha's laptop and its charger.[24] This raises further questions about where tablets and laptops begin and end. In detail, there are forms of dependency between the charger–tablet and charger–laptop relation which are also part of the story.

Though the tablet computer and its charger (seen as a separate device) do indeed cooperate in a sense, in that they work together to enable the same ends (i.e. uses of the tablet), uses of one without the other are impossible (i.e. without charge, the tablet does not work, and without the tablet, the charger has no use). Here, the language of cooperation does not capture further important distinctions (including dependency, synergy, etc.) between the various relationships that the tablet has with other devices and objects. To extend this idea, there are other materials that have 'background' relations within a practice (Morley, 2017, Shove, 2017), in that they are not directly implicated in the performance of a practice but are instead drawn into performances in that they are essential for the functioning of some other object or

[24] It is important to differentiate between the device of the charger and the immaterial of the charge which moves through it to power the tablet. I also point here not only to the plugs that provide the electricity through which the charge is carried, but also the cables, networks, and power plants that cooperate in the production of this. The boundaries of my investigation, however, lie in the devices and objects of practice, and as such, I will be focusing more on the systems of provision directly related to the practices of watching television (e.g. streaming service provision) than those which support daily life more generally (e.g. networks of electrical provision).

device. Such 'background' features might include electrical power and internet connectivity. Without power and internet connectivity, the tablet would not function. So, while a bed and tablet *can* co-exist and have qualities which come to define one another, there are those other relations on which the tablet is dependent and these *must* co-exist for the tablet to figure within various practices.

The term 'co-requisite' helps refine the overly broad language of cooperation. It does so in that it helps specify relations (with devices, technologies, etc.) on which a practice depends. By co-requisites, in the case of television watching (and other practices), I am referring to those (im)materials[25] (e.g. charge, WiFi/mobile data, broadcast or streamed services) without which the tablet cannot be used, and though not all uses of the tablet require all co-requisites at once (e.g. reading a book on a tablet computer does not require the internet once the book has been downloaded), in many cases (e.g. watching BBC iPlayer to catch up on the news) the tablet does require the specific co-requisites of app (Chapter 4), charge, and internet data (either WiFi or mobile data), without which it could not access internet services, like those of Netflix or BBC iPlayer. It is important to note that many other devices (e.g. laptops, smartphones) have co-requisites of their own and that these co-requisites are not distinctive to forms of television watching, but apply across all practices (even if some practices may not depend on all of them at once).

Attending to this more extensive range of relations is important to understand precisely where, when, and how the tablet figures in television viewing. For instance, the smaller charger of the tablet computer is a distinctive feature of this device when

[25] Immaterials are those co-requisites (e.g. charge, Wi-Fi) without a direct materiality, though they may depend on direct materialities (e.g. chargers and Wi-Fi antennas) on which devices like the tablet computer concordantly depend.

compared with the laptop. And for Natasha, the connection between both the tablet computer and its charger is part of the configuration of 'lazy Saturdays' (i.e. prolonged and 'comfortable' television watching in bed). But as I highlighted earlier, this was not the only configuration through which Natasha would watch Netflix.

It should be clear by now that the service of Netflix requires an internet connected device. As Natasha and her housemates had only a digital terrestrial television (i.e. a television which is not capable of connecting to the internet) in their living room, film nights and evenings spent 'binge watching' television series through Netflix necessitated the connection of a laptop to the TV in order to access these services, though they would watch these films and series through the larger screen of the television itself. In order to do this, Natasha would connect her laptop to the television through a HDMI cable. There is, then, in Nieminen-Sundell and Pantzar's (2003) terms, the formation of a working group or alternatively the formation of a material configuration between Natasha's laptop, the TV, a HDMI cable, and (the service of) Netflix, as well as Natasha's housemates and their living room here.

This role was revealed to be specific to the laptop (and not the tablet) due to the connection ports that the laptop had and the tablet computer did not (i.e. a HDMI port). Connection ports can vary between models of tablet computers, and while some models and variants do include a HDMI port (e.g. Seth's Lenovo Yoga tablet), others, including widely used models such as Natasha's Kindle Fire (and the iPad owned by fourteen of my participants), do not. The relation between the laptop, television, and HDMI cable could be described as cooperative, given that it is only through the formation of such a 'working' group of devices (and objects, rooms, and practitioners) that Netflix can be watched in this way.

Natasha was not the only participant to highlight the connective relation between laptops, HDMI cables, and televisions. 69-year-old Dan also described the interdependency between all three when watching BBC iPlayer through his (non-internet enabled) television. He said: *"I've tended to use the laptop more for that, because I can connect it to the TV. You just put the HDMI lead in, for some of the Olympics we watched it that way - it wasn't available on some of the normal channels, some of the sailing"*. I discuss this example here not only because it emphasises the connective relation between HDMIs and laptops, but because the content that Dan was watching through BBC iPlayer was, like the content available on Netflix, not available on broadcast television either; it was additional content, though it was still provided by the BBC. So, unlike Jane (and Alan, from Chapter 4), Dan was not making use of the BBC streaming service in order to catch up on television that he had missed (i.e. time-shifting content through catch-up services). Rather, he was using it to watch television programs that were available only online.

The diversification of content described earlier is particularly apparent in the above quotation. As streaming services such as BBC iPlayer and Netflix[26] have become more embedded in daily life, broadcasters have made efforts to expand the content that they offer, with some of this content now only being made available online. Dan, using the iPlayer services (accessed through its webpage on his laptop) had been able to watch the sailing during the Olympics by connecting this laptop to his television with a HDMI cable, and this was despite the fact that this content had not been shown on the broadcast television service at all. BBC iPlayer has now created a section on its streaming services which allows access to streams of 'live events' which are

[26] At least among my participants, most of those from the younger group mentioned having a Netflix subscription or making use of the subscription that a friend or family member had for Netflix.

offered only online (BBC, 2017), and in 2016, the BBC moved what had previously been a broadcasted channel, BBC Three, to their iPlayer service alone (BBC, 2016). This suggests the blurring of boundaries between forms of television watching such as broadcast television and online streaming, as particular streaming services like those of the BBC adapt to an increasingly populated and diverse television landscape (Grainge and Johnson, 2018).

Ways of Watching Broadcast Television

So far, I have described forms of television watching which have not depended upon the live broadcast television service at all, and I have used these examples to describe the diversification of services (provided through apps on mobile devices like tablet computers) and devices (televisions, tablets, laptops, smartphones) through which television watching – in all its many forms – is now done. Ofcom reports that the UK is experiencing a year-on-year decline in the average minutes a day that people spend watching live broadcast television, but alongside this there is an increase in the amount of time-shifted broadcast television (as seen in this chapter with Jane but also with Alan from Chapter 4) and alternative streaming services (as with Natasha and Dan) (Ofcom, 2016c).

This is not to say that watching live broadcast television has disappeared. However, as the interviewees made clear, the ways in which this is done pointed to configurations in which the tablet computer was also situated. 74-year-old Paula had three televisions around her home: one in the bedroom, one in the living room, and one in her conservatory. Given all these existing opportunities, it was perhaps not surprising to discover that her HP tablet was not used for watching television. Despite this, Paula described the tablet as: *"for when the TV's on"*. In what was previously a role for her laptop, Paula would often use her tablet computer for online

shopping while watching television with her husband. Paula's tablet, then, was seemingly working alongside the TV, but this was not for her 'own' watching. Instead, it augmented the practice and experience of television watching with others.

I introduced the idea that the tablet might be conceptualised as an 'integrator' (i.e. a device with the potential to bundle together otherwise separate practices) in the previous chapter. It is now possible to elaborate on this role and to see how the tablet is positioned at the centre of merging configurations of both (broadcast) television watching (television, sofa) and of online shopping (tablet, sofa). This way of thinking highlights novel and perhaps surprising points of connection. For instance, and in Paula's case, the details of this bundling or integrating have to do with connections between the sofa (where Paula is sitting) and both the television and the tablet. This conjunction enables Paula's performances of practices but there are also other important forms of connectivity.

It is not the sofa alone that allows Paula to do online shopping and television watching at once, rather it is the three-way sofa-TV-tablet configuration that enables the 'integrating' of otherwise distinct practices in the times and spaces in which television watching is done. This was not the only instance of the combination of television watching and other, ostensibly unrelated, practices which were facilitated by the tablet's presence, and in its connections with other technologies (e.g. TV) and objects (sofas).

For instance, Ann and Jane also described situations in which the tablet-sofa-TV configuration integrated the otherwise separate practices of television watching and entertainment, shopping, and reading. As Ann explained, when her husband was watching television, Ann would play games on the tablet. Likewise, Jane would make

use of the iPad to read the news or a book. These moments in which the tablet-sofa-television configuration integrates separate practices with television watching thus redefine not just what it means to watch television, to read a book, to play a game, and to shop online but also redefine the space of the living room.

In 2014, Ofcom reported that nearly all adults (99%) did what they term 'media multitasking' (Ofcom, 2014) and that the most common version of this was watching television while making use of a second screen (53%). The use of second screens is not solely a phenomenon of the tablet computer though, and there is a history of multitasking around television watching, for example in the use of the television as background noise while cleaning or hoovering (Silverstone, 1994). Nevertheless, it was clear from the interview data that the tablet computer follows in this history and has a specific role in the bringing together of otherwise unrelated practices; that is, in the 'integrating' together of practices in time and space, but this is when it is combined with objects like the sofa, technologies like the television, and even spaces like the living room where multiple performances of entertainment and leisure are known to come together.

These sorts of object-device-space connections can lead to the acquisition of new objects or devices. For instance, Paula spoke of previously using a laptop-sofa-television(-living room) configuration to integrate online shopping with her practices of television watching, but when describing how she had come to acquire her HP tablet in the first place, she said:

> Um, I think probably because I was finding using the laptop all the time, I didn't think was very good for me really and I didn't want_ I originally I had a sort of, like a table or a desk in the lounge with the laptop on, and I wanted to get it out

> of the lounge basically. So I thought well the tablet is going to be a lot more useful to me, because I can use the tablet, and when it wasn't in use I could put it in a drawer. […] I can sit with a little more comfort in my lounge rather than sat staring at a screen. So I thought well I don't want to get rid of the laptop because I knew that could still be useful to me, so it got put into the spare room and that's where it is at the moment.

Interestingly (and ironically, given the name of the device ('lap-top')), the previously used laptop had a strong relationship with the table on which it was routinely used in the living room. In fact, Paula herself points to the strong connection between the two in the interview excerpt and in her desire to move the bulkier table-laptop configuration from the lounge. As a smaller device which had a stronger relation with Paula's knees (in use) than the laptop did, the tablet could be placed into a drawer and out of sight when not in use. Because of this, the roles previously assigned to the laptop (i.e. to be used in front of the TV) migrate from this device to her tablet computer, and the laptop acquires new roles within Paula's practices of daily life; mainly, as a way for Paula to manage her photograph collection. Importantly, this shifts the laptop-table configuration out of the living room to the little-used spare room upstairs instead.

The size of the tablet computer enables it to form relations with other materials and practices from which laptops are excluded. This was not the only example in which the tablet became part of one or more practices because of its compatibility with other objects and arrangements (people, things, spaces) often not considered in the analyses of technologies in use. For instance, 30-year-old John described how, when his smartphone had stopped working, he had taken to carrying around his iPad mini within the large pockets of his coat. This iPad-pocket relation had become crucial in

allowing for the migration of roles from his now defunct smartphone to his iPad. At the same time, his (Wi-Fi only) iPad challenged and engendered change in other related practices, in that John could not connect to the internet outside of Wi-Fi enabled spaces on his tablet.

The connections between devices and an extremely diverse range of objects are then also of importance when considering how differing configurations arise and how practices like those of television watching evolve. John could not carry his laptop in his pocket, but he could carry his iPad mini. And even in those cases where the relation between 'things' is not dependent (i.e. they are not co-requisites), as in the case of the laptop-table, tablet-knees, tablet-pocket, these interrelations can – at times – influence which configurations come to define the performance of a practice. Of equal importance, these sorts of object-device connections may also influence the acquisition of new devices, as in the case of Paula's tablet.

Having explored respondents' accounts of television watching, and having done so as a means of illustrating the complex positioning of tablets within changing configurations of practice, I now synthesise some of the insights arising from this exercise.

Collaboration, Multifurcation, and Diversification

A first step in answering the question of how 'uses' of the tablet computer competed or collaborated with the 'use' of other objects or devices was to consider how different configurations relate to the broad area of 'watching television'. This investigation showed that tablets (and a range of related services and technologies) are together implicated in the emergence of different forms of television watching. Representations and accounts of what tablets are 'for' typically focus on how such

devices might substitute for or replace other technologies, but on closer inspection, there is much more at stake.

The simple notion of competition, and related narratives of replacement and substitution that dominate manufacturers' visions of how tablets will be used, quickly falls apart when following, in detail, precisely how the tablet computer (and the rest of tablet-based configurations) and other devices (and the rest of their device-based configurations) are dynamically embedded in what people do. Similarly, the language of cooperation does not go far enough in capturing the complexity of how different devices and objects form relations through their ongoing figuring within practice.

Sometimes, the connections formed between the constituent components of different configurations of television watching are strongly interdependent (e.g. tablet and charge, tablet and internet connectivity), as in the case of Natasha's laptop-based and Kindle-based Netflix watching. These are consequently better thought of as co-requisites in that they *must* co-exist (and must co-evolve) with the tablet in order for the configuration to 'work'. Other times, as in the example given of Paula's 'integrated' practices of television watching and online shopping, certain objects like sofas, tables, and knees form crucial connections (i.e. form configurations) and it is these wider configurations, and not the device in question, that binds otherwise loosely connected practices together. Components of these configurations can be as diverse as rooms (e.g. bedroom, and living room) and co-practitioners (e.g. housemates and husbands). These diverse components prove to be of direct importance for the enactment of television watching and for how otherwise separate practices are 'integrated' together with forms of television watching.

Not all such connections are always required for the configuration to 'work', but these examples demonstrate that wider conjunctions of objects and practices are critical for

understanding how tablet computers are situated and integrated. In short, such inter-material connections are constitutive of the practice itself. Accordingly, it is important to examine these relations and not simply focus on connections between one device (e.g. tablet) and the practice itself. Though the processes through which different devices are taken up in a practice, their roles in these, and their connections with other related devices and objects are admittedly complex and difficult to separate out, a focus on (tablet)-configuration-practice relations with respect to television viewing (broadly defined) has revealed further detail about the tablet: its connections to the sofa and knees, and the dependent relations it forms with some objects (e.g. co-requisites: chargers) and not with others (e.g. drawers, pockets).

What this case shows is that the integration of a 'new' device into pre-existing practices can serve to bi- or multifurcate that practice. This is not a novel observation, and others have shown how variants of the same practice come to co-exist and co-evolve with one another (Yli-Kauhalumoa et al., 2013). What *is* novel in the cases I have discussed is the point that these different forms come to be enacted in different settings (e.g. catch-up, live broadcast, Netflix) and in different times. That is to say that particular configurations are 'specialised' (a theme that is expanded upon in Chapter 7) in that they are linked to particular spatiotemporal conditions.

As such, it would be wrong to claim that tablets (alone) have led to the splitting or diversification of the previously singular practice of watching television. Television watching has undergone various bi- and multifurcations as new configurations of technology, content, and means of viewing have brought about new forms of this practice. This chapter extends these ideas as a means of conceptualising the ways in which the tablet fits into these histories. More specifically, the tablet figures within an

ongoing process of multifurcation as various forms of television watching come to exist and as meanings and forms of television watching diversify.

The Shifting Roles of Things in Television Watching

To conclude, I return briefly to Nieminen-Sundell and Pantzar's (2003) definition of cooperation and specifically to the notion of closure within working groups that is a part of their account. While some forms of watching television appeared to be 'established' in the lives of the practitioners with whom I spoke, I contend that 'closure' as a concept implies much more stasis than exists in practice. Equally, though I have referred to other technologies as 'established', this establishment is constantly up for negotiation within the performance of practices. While the topic of ongoing integrating is dealt with more specifically later in the thesis (Chapter 7), this chapter also hints at and has demonstrated how forms of practices, and the configurations amidst which these transpire, are themselves subject to ongoing change.

These working groups or 'configurations', as I refer to them, can never reach closure. I have demonstrated this throughout the chapter in establishing the making of new working groups (and the breaking of others) that define and are associated with the tablet's arrival into provisionally 'established' configurations. To take this idea a little further, I return to broadcast television for one moment to consider the infrastructures of this service. I have already noted that a television license is required in the UK to watch broadcast television. This license fee was first introduced in 1904 to cover the reception of radio broadcasts, but it was later expanded to include television as well (Iosifidis, 2005). Income from this fee is put towards funding the television and radio content and services of the BBC. More recently, organisational efforts have been made to ensure that this license

encompasses the new and increasingly diverse ways of watching television (BBC-based: catch-up, streaming, and additional content) that I have discussed in this chapter. Given the proliferation of streaming services, and the popularity of their own BBC iPlayer service, the BBC revised their licensing provisions in September 2016 to cover these streaming services also (BBC Press Office, 2016).

Whereas previously these catch-up (e.g. time-shifting of broadcast content) and additional content services (e.g. online streaming of sporting events) were available to all, even those without a television license, it is now illegal in the UK to watch any BBC program without a license, whether this be live broadcasted from the television, recorded from the television (i.e. using a PVR), downloaded, or streamed directly through BBC iPlayer from devices like the tablet computer (Grainge and Johnson, 2018). With organisations like the BBC drawing new boundaries in response to developments in their streaming services, and laws being revised to enforce such boundaries, this again signals a formal redefinition of what it means to 'watch television', with online streaming services now forming a 'formal' (and legal) part of this practice.

Several participants (Steve, Natasha, John, Tom) mentioned television licenses while discussing their ways of watching television. While Natasha had said that she did not really 'watch television' (when referring to broadcast television), she later mentioned the use of BBC iPlayer, stating: *"We only recently got a TV license. So it's more one of the things of going, 'Oh, I've paid for the TV license now', so I'll purposefully watch things on iPlayer to feel like I'm getting my money's worth".* 'New' (im)materials such as the license fee (though these are materialised as documents and administrative infrastructures) can enter the home, sometimes as a consequence of broader changes (i.e. such as the revisions to television licensing provisions) and

bring about change in 'established' ways of television watching, even – at times – intensifying performances (see Chapter 4). Though Natasha preferred the television series which were available through Netflix, she had begun to watch more of the programs available on BBC iPlayer to ensure the money she had spent on the television license was not 'wasted'. Although a television license is neither a device nor an object, it appears that the redefinition of (im)materialities like this television license can disrupt 'established' patterns of doing and bring about revised forms and practices of watching television. That this change in licencing was needed is, of course, itself an outcome of shifts in practices including those that tablets have, in parts, enabled.

Stepping back, then, to consider what this chapter contributes to the question of how the tablet computer has come to be embedded in daily life, part of the answer lies in an understanding of the practice–material connections between the tablet computer and other devices, objects, and services. The tablet computer fitted into the lives of those participants who owned no (Alan), few (Ann, Jane), and many (Paula, Natasha, Steve) other digital devices, and it forms strong connections with widely owned technologies like the television, but it also enables new links to be made with other 'materials' like knees, sofas, and beds, and with their related sites and temporalities. Accordingly, an understanding of how the tablet computer has come to be embedded into daily life should be informed by not just the simple idea that the tablet computer serves to integrate a wide range of pre-existing practices (considered in Chapter 4) but also that the tablet becomes embedded in differing and changing configurations of these practices (i.e. where there are other similar devices and where there are no such similar devices).

So far, I have considered relations between the tablet and other devices and objects as these are formed within the home, but I have yet to move beyond this space. While I have shown how the tablet computer enables the relocation of practices within the home (e.g. living room, bed), I also need to follow and engage with some of the more extended threads and relations in which the tablet is entangled as they reach beyond the boundaries of the home.

Chapter 6

Following Flow Through Moments of Image Sharing: How digital images circulate through the tablet computer and connect practices

Image Sharing and the Nexus of Practice

In this chapter, I further develop the idea of the tablet computer as an integrator of practice; a technology that enables opportunities for the performance of multiple practices in one place. In developing this idea, I now consider how the tablet computer connects with the wider nexus of practice (Hui et al., 2017, Hui, 2017, Morley, 2017, Shove, 2017), working with practices of image sharing to investigate these connections and how the tablet is implicated in their formation. By 'nexus of practice', I am referring to what Giddens described as the *"basic domain of study of the social sciences"* (Giddens, 1984: 2). If practices are comprised of organised sets or chains of action, and these practices are themselves linked and connected, there is a totality to this interconnectedness (i.e. social life) which has been termed the 'nexus' (Schatzki, 1996). This nexus extends across broader systems of provision (e.g. electricity, internet, social media) that are themselves spread over a multiplicity of spaces (e.g. home, work, conference location, UK, abroad), some of which exist far beyond the confines of the participants' homes. Thinking about the practice nexus that is entangled through the tablet computer thus allows for an analysis that goes beyond the tablet (+ app + practitioner + …), decentring the device to understand how it comes to hang within social life more broadly. From this view, the tablet is just one of many components within the nexus of practices.

To better understand the relations of the tablet computer across this wider nexus, I focus in this chapter on practices related to image sharing. Following forms of sharing, whether these forms relate to the sharing of images or otherwise (e.g. goods, messages), provides the opportunity to follow connections as they are made between moments of performance, whether these moments take place within the performance of the same practice or not. This is because moments of sharing represent instances in which a flow of (im)materials occurs between one moment and another. These moments may occur between distinct practices (i.e. between moments of performing separate practices), but they may also occur between distinct practitioners, and sometimes they will occur between distinct practices and practitioners at once. Forms of image sharing do not stand alone, and they connect with other processes which I describe as image-management practices, these being the acquisition, editing, and storing (and viewing) of images. It is these image-management practices which themselves have come to connect with other practices of daily life, some of which have relatively little to do with more formalised forms of photography.

Images, and how they move through computing devices such as (but not exclusively) the tablet computer, as well as within and between practices, represent an intriguing case. This is because a focus on image-management practices, rather than say, practices of photography, allows me to put the digital image (dynamic: video call; static: screenshots, digital photographs, digital art) at the centre of the analysis. Ofcom (2017) have noted the increasing power of the online image, a shift which they attribute – in part – to the tablet computer and, more generally, the changing communications market. As practitioners come to own a range of computing devices, many of which have camera technologies as a constituent part, digital images are

coming to serve as inputs for a great range of practices and are also the material outputs of other practices within this range.

It is in following the outputs of particular performances as these are transformed into inputs of others that sharing can be understood. I am interested in those practices in which image sharing has become a part and whereby the sharing of the images is not enacted for the sake of photography alone; rather, that the sharing of these images is tied up in the aims and achievements of another practice.

Processes of Image-Management: Acquisition, sharing, and storing

There are a number of interrelated processes which are useful for understanding how chains of action in which image sharing forms a part come to be sequenced. Understanding these sequences allows for an understanding of the ways in which the tablet computer figures within chains of action that connect otherwise separate moments of performance (of the same practice or of other practices). What happens in one moment directly impacts the possibilities for future courses of action (Nicolini, 2017, Hui, 2017). For example, an image cannot be shared until it is acquired (i.e. taking or storing).

Despite the necessary sequences of particular chains of action, it is crucial to note that – at times – these processes are non-discrete in that, as an example, the acquisition of an image may be carried out through that image being stored onto the tablet computer. In spite of this interrelation, I will now outline the processes of sharing, storing (and viewing), and acquiring in turn. The key process, sharing, is an increasingly important one in understanding how digital (im)materialities – a concept which includes, but does not exclusively refer to, images – flow not only within and

between particular devices, like the tablet computer, but also for how they flow across the internet, and within and through particular internet services, like social media and email (Belk, 2014). Image sharing is commonly understood to refer to the posting of images or to their transfer between practitioners, particularly in online spaces. The forms that this image sharing can take, however, can differ, and this process can sometimes involve the transfer of images between known and unknown practitioners. Though some social media platforms are usually used to connect with known others (e.g. communicating with friends and family on Facebook (Ellison et al., 2007)), others are more commonly used to connect and share across unknown others (e.g. public figures, institutions, and celebrities on Instagram and Twitter (Jin and Phua, 2014, Phua et al., 2017).

Storing also represents an important process in understanding image sharing. This is because it refers to an accumulation of (material) outputs of performances. When discussing storing, I will refer to the (material) destination of this accumulation as images come to be stored on devices (+ apps) and peripherals like hard drives or memory sticks. Cloud storage is also a possible (material) destination, though this particular destination points to a specific location which is often unknown (Benson et al., 2011). In storing an image, and in creating a material destination for that image, there is the implication that this image (i.e. output of a prior moment) has the potential to be transformed into an input for a later moment of performance. This is because creating a material destination for an image creates the possibility that this image can then be 'used' in later moments of performance. Storing an image is thus generally a moment after which image sharing with the self can take place. Related to storing, there is therefore the process of viewing an image which I describe in this chapter as a form of a sharing with the self. The moments in which viewing, or in my terms sharing with the self, can occur are often multiple and indefinite.

The third process is the acquisition of an image. This is a crucial process in that it denotes the start of the chain from which the sequence of image-management begins, though it does not refer to the start of the chain of action in general. It also does not necessarily refer to the origin of the image. For instance, an image can be acquired through storing from social media, though this is not its origin in that this is not where the image was 'made'. I will, at times, refer to the taking of an image, as opposed to its acquisition, as though 'taking' is a common process within practices of photography, taking on the broader focus of image-management requires an understanding that not all images move onto tablet computers through the process of 'taking'. Others are instead acquired through storing or by being shared from, or to, known or unknown practitioners. To reiterate, then, while all images found on the tablet computer are acquired, they are not all 'taken' with the tablet computer itself.

I have already made the point that 'sharing' is important for the flow of digital (im)materialities (like images) within and across online spaces (Belk, 2014). I emphasise the importance of image sharing to understanding flow through the tablet computer by organising this chapter around different forms of image sharing: sharing with self, sharing with known others, and sharing with unknown others. Each instance of image sharing explored will be accompanied by a diagram which represents the flow of images as they cut across different space-time relations in which the tablet computer has now come to figure, showing how the tablet figures within chains of action which link together moments of performance that may involve others but also may not.

Though I organise the chapter around these different kinds of sharing, I will highlight other interrelated processes where they are relevant. Crucially, not all forms of

image sharing explored will involve the acquiring, storing, or viewing processes, but the point here is not to provide a sense of the pathways that image-management takes, but to instead understand how connections are made between practices in which image sharing is a part. Mobilising the language of the tablet as integrator helps to show how connections are made between daily practices and forms of image sharing. In examining the flow of images as they circulate through and – at times – beyond the tablet computer, I will explore some themes of time (e.g. sequence, synchronous, asynchronous) space (e.g. location: place or (material) destination), and of the public (i.e. known others) and private (i.e. unknown others); central themes that emerged in following the flow of images as they circulate through the tablet.

Image Sharing with the 'Self': Memory aides across moments of performance

Photographs have been considered part of different ways of memory making (Langford, 2001, van Dijck, 2008, Sutton, 2009, Hand, 2012). Sontag (1977), writing about the information that is contained within photographs, suggests that the reason photographs come to be valued is exactly because of the information that is 'stored' within them. Others, like cognitive psychologists Sacchi et al. (2007), have examined the power of the information contained within photographs, investigating how the editing (and doctoring) of these photographs can go on to inform the memory of those who were present at the moment of capture. But are digital images different to photographs? Can they be considered to capture information itself (i.e. an image of the information) rather than containing it (i.e. a representation of something from which information can be interpreted)?

In talking me through the images stored in the Photo app on his iPad mini, 30-year-old John was able to describe how images, and in turn his iPad mini (+ Photo app +

…), figured as a shorter-term memory aide. In part of my interview with John, he described using his iPad in this way when attending a conference. As his tablet was Wi-Fi only, John had accessed a (internet dependent) conference website as well as a (internet dependent) train service website from his (Wi-Fi enabled) home to take screenshots of both the conference programme and train timetable.

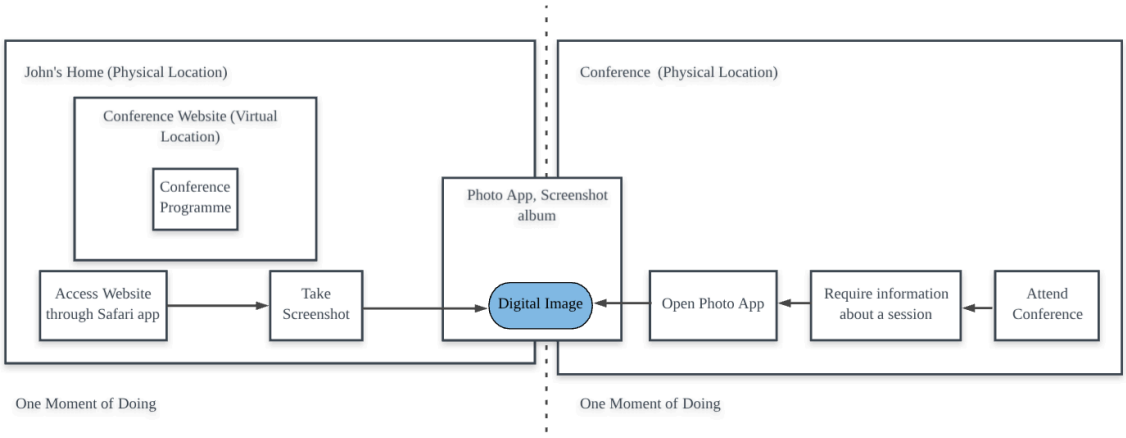


Figure 6.1 – Image Sharing with the 'Self': Screenshots as a form of memory aide

The accompanying diagram (Figure 6.1) represents the moment in which John 'acquired' the conference programme (i.e. at home, taking screenshot) as well as the next moment in which this image was viewed (i.e. at the conference itself, shared with the self). In not being able to connect to these particular websites (i.e. train service site and conference site) outside of spaces where Wi-Fi was available, John would have been unable to access the information stored on these sites from his tablet without taking screenshots of the information there.

These screenshots copy the contents of the iPad's screen in that moment, and the acquisition of these is carried out by holding the home and side buttons of the device at the same time. Following this chain of action, John takes the screenshot and the device automatically stores the information contained within the screenshot into his Photo app and a 'Screenshot' album. The album itself is created automatically when a

screenshot is taken for the first time, and later moments in which screenshots are taken simply populate this album. There is, therefore, a compounding of the processes of taking, storing, and sharing in the taking of the screenshot (i.e. tablet as integrator), in that taking stores the image and, in turn, provides the potential for that image to be revisited.

In another moment and in a distinct time and space (i.e. at home vs. train station/at conference), John is able to share this image with himself (i.e. viewing the image) and make use of the information stored within it. The output from that first and compounded moment (i.e. screenshot) is transformed into an input (i.e. source of information) for later moments of performing further practices of train travel and conference attendance.

The image flows through this chain of action, connecting otherwise separate moments of doing in distinct times (i.e. different moments) and spaces (i.e. different places). There are necessary co-requisites for being a conference attendee (+ iPad + …), this being information about the conference such as the timing of sessions and the spaces in which these sessions are taking place. There are also necessary co-requisites of being a train traveller (+ iPad + …), these being the departure times and platforms for trains. John was able to take information from a public source (i.e. the internet) and transform it through acquisition (which, in turn, stored the image, providing the potential for it to be shared with the self) into a private source of information. He could, then, access this information in later moments of performance without the co-requisites (i.e. internet connectivity) of looking it up on his tablet in a space without Wi-Fi.

This was not the only example of a participant acquiring images (or taking screenshots) of information for similar purposes, and Liam also described taking photographs of the rota at work, while Ann had stored the user manual for her boiler onto her iPad. In each case, this process allowed them to access temporally specific forms of knowledge in any later moments (in which they had their tablets) where such were required.

Sharing with Known Others: Email attachments and video calling

Email: Asynchronous forms of image sharing

Having considered a form of imaging (i.e. screenshots) not traditionally associated with practices of photography, it is then interesting to think through how more traditional forms of images (i.e. photographs) flow through computing devices like the tablet computer and how image sharing intersects with forms of photography. Family photographs have extended temporalities (Rose, 2002) which I argue that screenshots captured for shorter-term recording processes do not. This is to say that the moments in which family photographs are successively shared (i.e. through sharing with the self) are, usually, more multiple and extended (in time) than those associated with screenshots or other forms of digital imageries (e.g. emoticons, memes, screenshots).

Grace's daughter, Hannah, lived in New Zealand with her husband and son. Grace would communicate with her family there through phone calls and email. In an interview with Grace, she described how she shared images with her family: *"[…] the emails are amazing for pictures, because like my grandson is swinging on things in the park, and I get a picture that day. The whole thing for me is marvellous".*

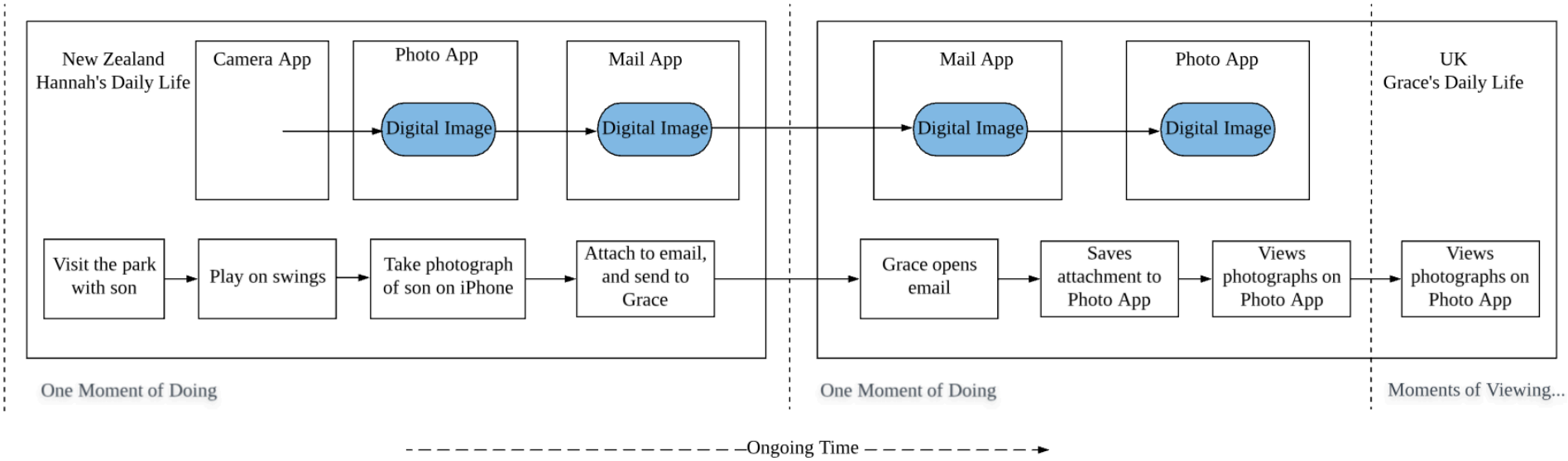


Figure 6.2 – Sharing with Known Others: Email attachments as a form of asynchronous sharing

This diagram (Figure 6.2) shares some similarities with the first, as these types of sharing occur across otherwise separate moments of doing, linking together across time and space. However, in this case, these moments of doing are enacted across different practitioners (i.e. Hannah and then Grace).

Thinking through the sequence in this chain of action, the diagram thus shows the way in which the first moment involves Hannah using her iPhone to take a photograph of her son playing in the park. The resultant output of that moment (i.e. a digital photograph) is attached to an email which is then sent. Grace is able to receive the email and download the image, and in doing so, she 'acquires' it by storing the image on the iPad. The output from Hannah's visit to the park thus becomes an input to successive and indefinite moments of viewing whereby Grace is able to revisit the photograph in sharing with self asynchronously, both from the moment in which it was taken and from the moment in which she received it. In these distinct moments of sharing, however, there is a duplication of the origin image. In Hannah sharing to Grace (through email attachment) and then later Grace sharing the image with herself (by storing onto Photo app) the image is multiplied, existing now in three new material destinations as well as the first destination which was the origin of that image (i.e. Hannah's iPhone, Hannah's email, Grace's email, Grace's iPad (i.e. Photo App)).

Grace spoke of receiving emails of this type at least once a week and storing these from her Mail app to the Photo app, which had consequently become populated with photographs sent by Hannah. Sharing images in this way helped to connect the physically distant (but socially close) daily lives of Hannah and Grace. It is through Grace's sharing of the image with herself that she is able to visit (and revisit without limit) the particular moment of Hannah and her son at the point of capture. There is

thus a transformation of a public moment (i.e. playing in the park), which occurs in taking and sharing the photograph, into a private resource for Grace's successive moments of viewing photographs. Crucially, and as a consequence of Grace's lack of access to other and similar types of devices to the tablet computer (e.g. laptop and smartphone), these successive moments of receiving and viewing photographs are tablet-dependent. The result of this is that the tablet is further embedded into Grace's daily life because her access to these images relies on the presence of the tablet computer (Mail app + Photo app + …), particularly as Grace did not have access to other devices.

Moments of sharing with the self by Grace, however, also co-exist and co-evolve alongside her more 'traditional' photograph albums. Having acquired a tablet, Grace no longer had to wait for Hannah to have photographs either developed (film photography) or printed (digital photography) as she had had to in the past, before the arrival of the tablet computer into her daily life. Images now flowed much more frequently (once a week) and quickly (instantaneously) than the photographs that travelled via the postal system (i.e. a couple of times a year and taking weeks at a time). Hannah's iPhone and Grace's iPad form new kinds of connections which somewhat dissolve the connections between the slower and less frequent forms of 'photograph-sharing' that are dependent on international postal systems and the systems of provision (film) of photograph development or (digital) printing.

Skype and FaceTime: Simultaneous image sharing

Other forms of image sharing which occur across known others can be more simultaneous than the asynchronous forms of sharing considered in the previous examples. Video calling (i.e. the sharing of dynamic and real-time images) is one example of this. Video calling has always depended on the presence of desktops and

laptops (+ webcams, inbuilt or not), but tablet computers (and smartphones) more recently also have the potential to take on roles within video-calling practices. Ofcom (2017) have noted that the Skype (mobile) app received 3.5 million[27] unique visitors during the month of March 2017. The same Ofcom report does not include the figures for FaceTime (i.e. Apple's own video-calling app), which was more popular among my own participants (eight participants) than Skype (four participants). This preference is perhaps best explained by the popularity of iPads in the participants who I recruited. It is worth noting that, out of the twenty participants who I interviewed, twelve described the significance of their tablet within their practices of video calling. This points to a developing association of the tablet computer to video-calling practices.

Like Grace, married couple Derek and Julie had family who lived abroad. They also used their iPads in order to communicate with their family. Specifically, they used FaceTime to do this. Derek and Julie also described using FaceTime to communicate with friends who lived more locally when they would visit their family abroad.

> And our <son> in <the South> actually, because he's divorced, his children, well Zoe and Jack, they're now, he's just turned 20 and she's just turned 23. They come and stay with him – so over a weekend, you know when they come home from uni for holidays, we usually get a FaceTime with them. […] And friends too. We went to <Country>, once via <Country> and we stayed there for five days and it was a friends of ours' wife's birthday, and he said "Would you come through on the FaceTime for her birthday?" And he had a crowd of people in the house and we were in <Country> and they were there.

[27] Unfortunately, this figure does not differentiate between the number of unique visitors to the smartphone app and the number of unique visitors using the tablet app. As such, I cannot specify how many of these unique visitors used their tablets in making use of the app.

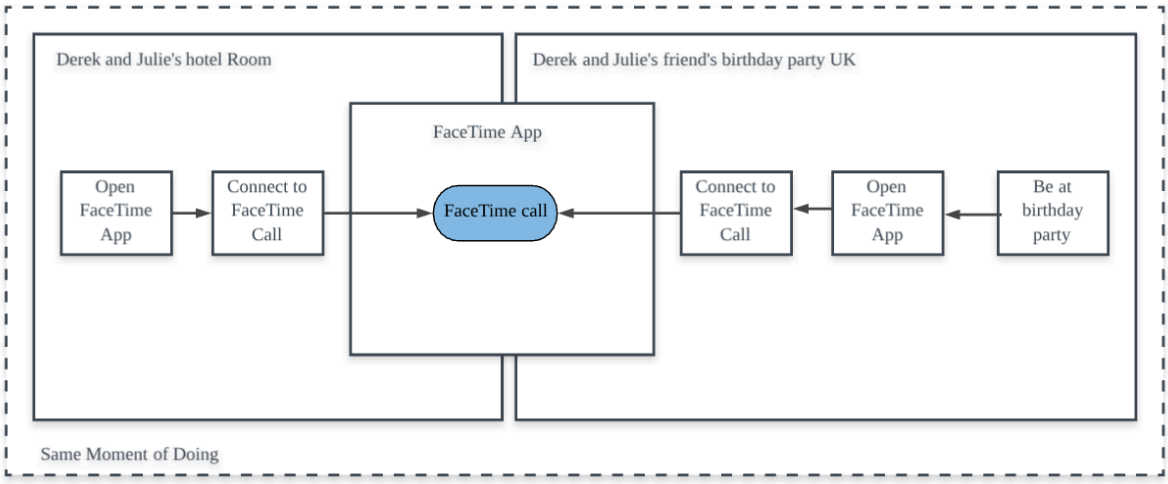


Figure 6.3 – Sharing with Known Others: Video calling as a form of simultaneous sharing

Unlike the other examples, there is little sequence to follow in this chain of action (see Figure 6.3). The only action is sharing the image simultaneously. Both practitioners, in the same moment, create this shared (virtual) space by connecting to a shared call in FaceTime. Unlike the other examples so far considered, there is no storing of the image and, as a consequence, the resulting (and real-time) images have no potential to be transformed from output (i.e. dynamic image) to input in later moments of performance. This is, then, the one example of image sharing that I examine which does not feature the spatiotemporal expansion of one moment brought into being through the flow of images themselves. Instead, it is the FaceTime app (+ iPad + other device + …) that expands space but does not alter the qualities of time in this moment. By this, I mean that, though the video call occurred in the exact same moment (though across different time zones), there is a bridging of space between the UK and elsewhere.

It could be argued that these FaceTime calls are more similar to a phone call than to sharing photographs, but in connecting together co-practitioners over distance, the

video call conversation and this form of simultaneous image sharing provides a moment of shared (virtual) presence that phone calls do not. This virtual shared presence provides some of the critical aspects of co-presence (i.e. eye contact) (Boden and Molotch, 1994) not supported by phone calls because they allow face-to-face conversation to take place across a distance, with image sharing proving key to this. It is therefore through this ability to simultaneously share real-time images that practitioners are able to perform forms of sociality at a distance (e.g. attending a birthday party).

Through the creation of shared virtual space, there is a bridging, or an 'integrating', of moments and of daily lives of otherwise physically distant practitioners. Forms of image sharing like this allow for the performance of practices which typically depend upon the sharing of a physical space (e.g. socialising and attending a birthday party) to occur outside of a shared physical space. Simultaneous and real-time image sharing enables Derek and Julie to connect from a private space (e.g. home or a hotel room during a visit abroad) to a public moment of a birthday party, dissolving the boundaries of public and private performance in the process.

Both simultaneous and asynchronous forms of image sharing with known others allow for an integration (i.e. a bringing together) of distinct places, but while simultaneous forms allow for a bridging of times, more asynchronous forms of image sharing, like those associated with images shared through email attachments, allow for a revisiting of these moments in ways that simultaneous forms cannot. There is a sharing, then, of virtual space and of 'actual' time which occurs through simultaneous image sharing that more asynchronous forms cannot bridge.

Sharing with Unknown Others

Thus far, I have described examples of sharing which have occurred either with the self or with known others. Though the internet is typically considered a public space (Papacharissi, 2002), it is important to recognise that there are spaces which are more private than others, some of which (e.g. email inboxes, FaceTime conversations) have already been considered in this chapter. Alongside this, some spaces typically considered private (e.g. Facebook profiles) are in fact more public than they may first appear (Barnes, 2006). Even those public spaces of the internet (e.g. social media platforms) have private pockets located within them; take, for instance, the instant messaging services that are embedded within social media platforms. So, how do images flow through the tablet computer to or from the more (yet not entirely) public spaces of the internet (e.g. social media)? And how do these forms of image sharing connect with other practices?

Social media represents an intriguing case because sharing images across these kinds of platforms can occur with and from (mostly) unknown communities. There are a wide range of social media platforms (e.g. Skype, FaceTime, Facebook, Pinterest, Instagram, Tumblr, Twitter, Flickr, Reddit, and LinkedIn). Some are more visual mediums (e.g. Skype, FaceTime, Pinterest, Instagram, Flickr) than others (e.g. Facebook, Tumblr, Twitter, Reddit, and LinkedIn), but even these 'less' visual mediums very often still involve some sharing of images.

Social Media Apps: Connecting moments of doing between unknown practitioners

Pinterest is one such 'visual' social media platform. It describes itself as a *"visual bookmarking tool"* (Hansen et al., 2012). This platform, and the app that provides

access to it from mobile devices (like the tablet computer), allows people to upload, 'save', and organise images (which it calls 'pins') onto their own semi-public virtual spaces (known as 'pinboards'). I describe these pinboards as semi-public because, though they are mostly searchable by anyone who has access to a Pinterest account, pinboards can be made private by changing the default preferences of Pinterest. The images available on Pinterest are uploaded to the platform by people who either want to pin that particular image to their own pinboard or by those who want to make an image available for others to pin. The images available on Pinterest are therefore a subset of the images which are available more generally online.

One of my interviewees, Jane, would use her iPad and the Pinterest app to acquire (i.e. search for and 'pin') images to use as inspiration (i.e. input) for decorating ideas, but before Jane could share these images with herself, an unknown other first had to upload (i.e. share) this image to Pinterest itself. As Jane was regularly pinning many images, multiple unknown others had to first image share to Pinterest for Jane to be able to make use of these images (i.e. inputs) as inspiration in her decorating practices. In pinning (i.e. storing) a collection of images (i.e. inputs) to a decorating pinboard (i.e. output), Jane is able to access these multiple pins from one specific online location as opposed to having to acquire all these different images from their specific and potentially diverse online locations (from which they have been shared by unknown others). This sharing with the self, however, once again occurs only after the storing of images onto her pinboard.

Jane was not the only participant to discuss Pinterest and image sharing with herself using this app on her tablet. Phoebe had recently quit her job as a newly qualified math's teacher in a high school, to start work instead as a teacher in a women's prison. Finding the work of being a (high school) teacher highly stressful, and fairly

unrewarding, Phoebe was hoping to find more fulfilment in her new role; though she did note that her time as a high school teacher, who was living at home with her parents, had allowed for her to save enough money to buy her own home.

Her tablet, however, which was purchased on advice given during her math's teaching training, had lost a number of its previous roles with this move; specifically given the security restrictions about types of devices (e.g. Wi-Fi tablets and smartphones) that could and could not be brought into the prison. But beyond these restrictions, and without an available internet connection in the prison, many of her apps no longer functioned at work.

Following sometime of acclimatisation, the device was now being repurposed for more leisurely practices, and was predominantly used within her home. But in now living alone, Phoebe was having to make do with a smaller set of devices and objects, than those that were available in the family home. Whilst Phoebe had a TV in her living room, she no longer had access to a television in her bedroom, and for the most part, the tablet was used to allow her to watch television as she fell asleep. She noted how she preferred this to a standalone television in the bedroom though, as her watching had become more purposeful in no longer using the television as background noise unless she was sleeping. But beyond this, Phoebe also noted that this form of watching meant that she could remove her glasses earlier in the evening, as she could hold the screen at a distance that she could see it without them.

Outside of these new forms of watching, the device had taken on crucial roles in her 'use' of Pinterest within some of her more leisurely practices (e.g. researching).

Phoebe (see Figure 6.4) would use the Pinterest app through her Samsung tablet to collect ideas on decorating her new home in her 'decorating' pinboard and photographs of different tattoos to provide inspiration for tattoo ideas. To do this, she had created two new pinboards, one of tattoos that she liked and another of tattoos that she disliked.

> Yeah, so I wanted a mandala <a circular symbol representing the universe in Hindu and Buddhist symbolism> tattoo, and there's so many different types of mandalas, and pictures of mandala tattoos online. And it sounds picky, but I knew what I really didn't want, and I sort of knew what I kind of wanted, but you know sometimes it's like better to let them <tattoo artists> do what they're good at you know instead of being really specific about what you want or how you want it. […] So, I made two boards, one of mandalas I didn't want and didn't like, what I definitely didn't want, and then another of mandalas that I liked bits of, or colours or styles, so we could talk about them before he did his own design. […] so, then when I went to talk about the design with him, I took my phone with me, as my tablet only has Wi-Fi, and I have my phone with me when I'm out anyway.

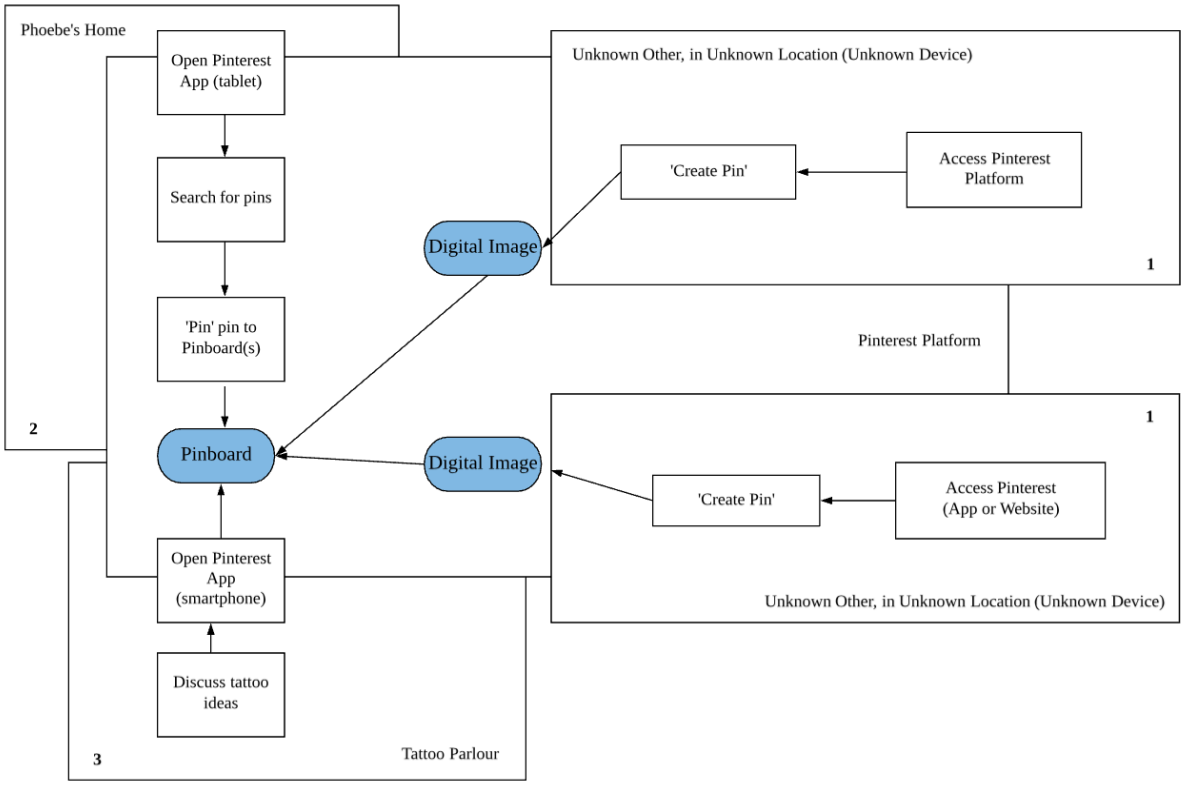


Figure 6.4 - Sharing with Unknown Others: Pinterest connecting together moments of doing

Though she had populated the pinboards from her tablet computer, when it came to discussing designs with a tattooist, Phoebe would use her smartphone. The smartphone's mobile connectivity outside of Wi-Fi spaces allowed her to bring up the specific (and internet-dependent) boards. Consequently, she was able to discuss these ideas with the tattoo artist, scrolling through these two collections (i.e. pinboards as outputs) to provide visual representations of what she liked and what she disliked. The lack of internet connectivity in having a Wi-Fi-only tablet limited the movement of the device outside of her home, but having organised these images into a specific (though) virtual location, she was able to access this location using her smartphone, allowing these boards to serve as inputs to conversations with the tattooist.

As the number of images available online increases (Ofcom, 2017), curation emerges as a part of image-management practices. Organising images is by no means new, with curation long being associated with film photography (i.e. organising into albums (Durrant et al., 2009)) and, more recently, with the need of digital photographers to manage much the larger collections of digital photographs that the shift from the more expensive analogue and film photography to digital photography has allowed (Shove et al., 2007). This form of curation differs, however, in that it is not the curation and organisation of photographs depicting family members, friends, events, and important moments in life. Instead, these are images of furniture, carpets, meals and their recipes, and body art, alongside a number of other diverse objects and categories. Another crucial point of difference is that the images being curated are also not 'made' by the person curating them, nor by their known others, but by unknown others instead.

In a sense, image sharing of this type allows for the time spent doing internet research on a topic like decorating or body art (i.e. output) to be stored and transformed for its use as an input in another practice (e.g. decorating the home, getting a new tattoo) instead. Jane and Phoebe were able to make use of these semi-public resources, but in pinning them onto their pinboards, these were not entirely private now (as in the case of the screenshots, Grace's photographs, and the FaceTime call) but were instead 'semi-public' and available to their known others on Pinterest. There are some similarities here with the first form of image sharing as performed by John (i.e. screenshots) in that the images are a form of (visual) information. However, as opposed to screenshotting information for its use in other moments of performance, these images are acquired *from* unknown others, and the pinboard (serving as an input for other moments) is not only accessible through the

tablet (as in John's case) but from any internet-enabled device, like Phoebe's smartphone. When asked, both Phoebe and Jane said that they had not changed the default settings of their pinboards, and as such, it is worth noting that their known others (i.e. people they had connected with on Pinterest)[28] could also access these pinboards and make use of them (i.e. inputs for their practices).

Digital Art on Instagram and Tumblr: Strategies for increasing the visibility of images online

Having considered one instance of sharing where images flow *from* unknown others, it is then interesting to consider how image sharing *to* unknown others occurs and how the tablet computer can figure within this type of image sharing. With the increasing numbers of images available online, practitioners develop strategies to boost the visibility of their images, increasing the likelihood that they may come to serve as inputs to another's performances (e.g. sharing with self (i.e. storing and viewing) or, alternatively, as a part of another practice completely unrelated to digital imaging).

In sharing his digital art through Instagram and Tumblr apps on his Lenovo tablet, Seth provided an intriguing example of this, especially as his digital art was also created with his tablet computer. Seth would first use his smartphone to take photographs while on walks and then use these photographs, or others found through Google Images, as the base for his art. Using the Picsart app (+ Lenovo tablet + …), Seth would take days, sometimes even weeks, creating his art by distorting the images and creating errors to achieve differing patterns in the images. Once he was happy with the final image, he would share this art through his tablet computer to his

[28] Pinterest uses Facebook accounts (via email address) to connect 'users' to their known others. Users can also add individual known others directly, if they already have a Pinterest account, by entering their email addresses.

Instagram and Tumblr apps. Both of these platforms (and the apps that support access to them) are image-based social networking sites, and though the communities which make up these platforms are similar in certain regards (i.e. both image-based), they also have differences which Seth would capitalise on, diversifying the ways that he would share his digital art.

Seth's strategies were developed as a means to increase the spatiotemporal flow of the digital art (i.e. output from digital art practices) on these public platforms and, in turn, to increase the amount of unknown others who would see his images. Consequently, I argue that such strategies are, in turn, developed in order to increase the likelihood that his digital art may come to serve as inputs in the performance of unknown practitioners' moments of viewing or sharing, or even as inputs for other sorts of practices instead.

> I might just give it a name on Instagram and post it like that, with a load of hashtags. That's what it's about really, searchable hashtags that people can be looking at, and trying to capture current words being used to describe the sort of thing that you're doing, such as glitch art. […] Whereas with Tumblr, it's more something that I'd signpost people to and then hopefully they'd get more out of the work by reading about it, and I even post YouTube videos to stuff that might seem a bit unrelated to my art but to me makes perfect sense.

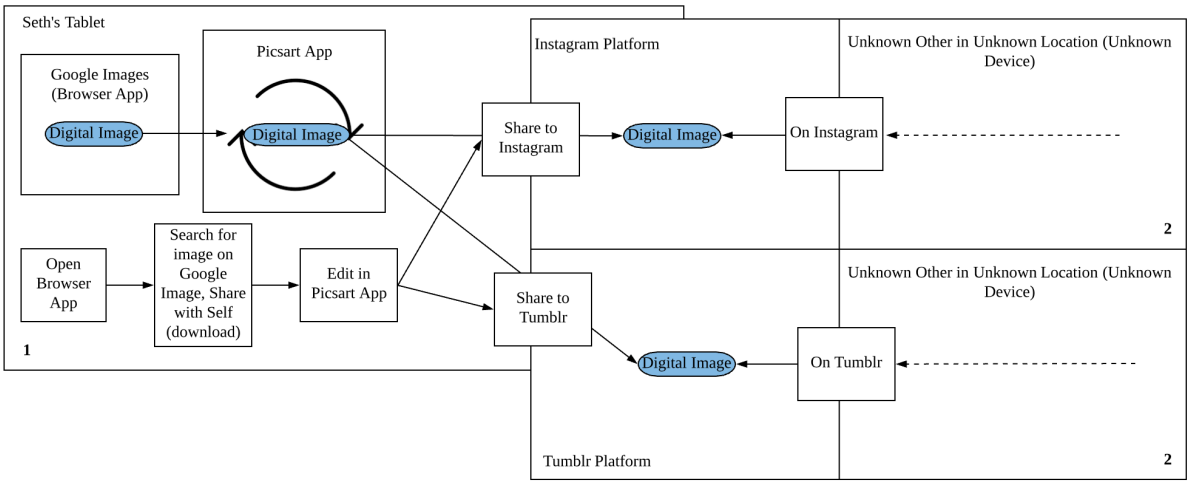


Figure 6.5 – Sharing with Unknown Others: Developing strategies for increasing the spatiotemporal flow of images on social media platforms

To explain this further, on particular social networking sites like Instagram, the hashtag ('#') is used to extend the reach of images (and of other digital (im)materialites) beyond that of the image-sharer's 'followers'.[29] Hashtags are keywords which precede the symbol, thus converting these into hyperlinks which, when clicked on, show all items (images and posts) which have been hashtagged by the same keywords. Interestingly, Seth did not view his art as 'glitch art', but in recognising that his work may have appeal to those interested in this particular genre of art, he would hashtag it in this way. By assigning hashtags which are currently 'trending' (i.e. popular in that moment), Seth hoped to make use of the popularity of a keyword, knowing that these hashtags were reaching more unknown others (i.e. wider audiences) in that moment than others which may have better captured how Seth himself categorised his digital art.

This was not the only way that Seth shared his art. The quote describes how he had developed another strategy to further enable the spatiotemporal flow of his art online

[29] A follower is someone who has linked their Twitter or Instagram to another's. Followers can represent a mixture of known and unknown others.

(i.e. to a larger audiences) on a different platform, particularly in sharing these to multiple platforms in one moment. He would share his art on Tumblr and make use of the (image and text) blogging app's ability to write extended descriptions of the art. At times, he even provided 'links'[30] for YouTube videos that, for him, captured particular meanings behind his art, thus putting forth multi-modal (image, hashtag, writing, video) understandings and descriptions. These ways of sharing with unknown others represent Seth's ways of promoting his art in these different virtual spaces (i.e. platforms) and to the diverse communities that populate such. For artists wanting to extend the reach of their art to the widest number of others (known and unknown), these strategies are increasingly necessary as online spaces become more heavily populated by different forms of images.

Image Sharing in Circuitous Chains and Sequences

So far, I have tried to 'typologise' particular kinds of image sharing as a means of working out what different types of sharing can tell us about how the tablet computer figures in connecting practices (e.g. travel and conference attendance, communication, socialising, decorating a home, decorating yourself, and promoting your art). I have presented supposedly separate types of sharing, but even these accounts point to the multiplicity of forms of sharing that can occur in connected moments of doing.

Still, it is crucial to emphasise explicitly that these are not separate types, and devices like the tablet computer influence circuitous chains through which images are shared. By 'circuitous chains', I mean that chains of action and the pathways these

[30] The diagram I provide here does not include the sharing of the video on YouTube by an unknown other, to which Seth would add a link on Tumblr. This, in turn, would link to another chain of action.

take overlap, loop back, and merge with one another. As they do, other moments of performance come into view, potentially linking ever more practitioners to moments of image sharing in which the tablet figures.

In the final example, I will consider one more instance of image sharing, which demonstrates the extent to which these 'types' of sharing do not exist independently of one another. 68-year-old Dan provides an illustrative example in the way that he shared images (with himself and known others) that had been shared by known others. Again, I highlight that this was not the only case which demonstrated a circuitous sequence of sharing images.

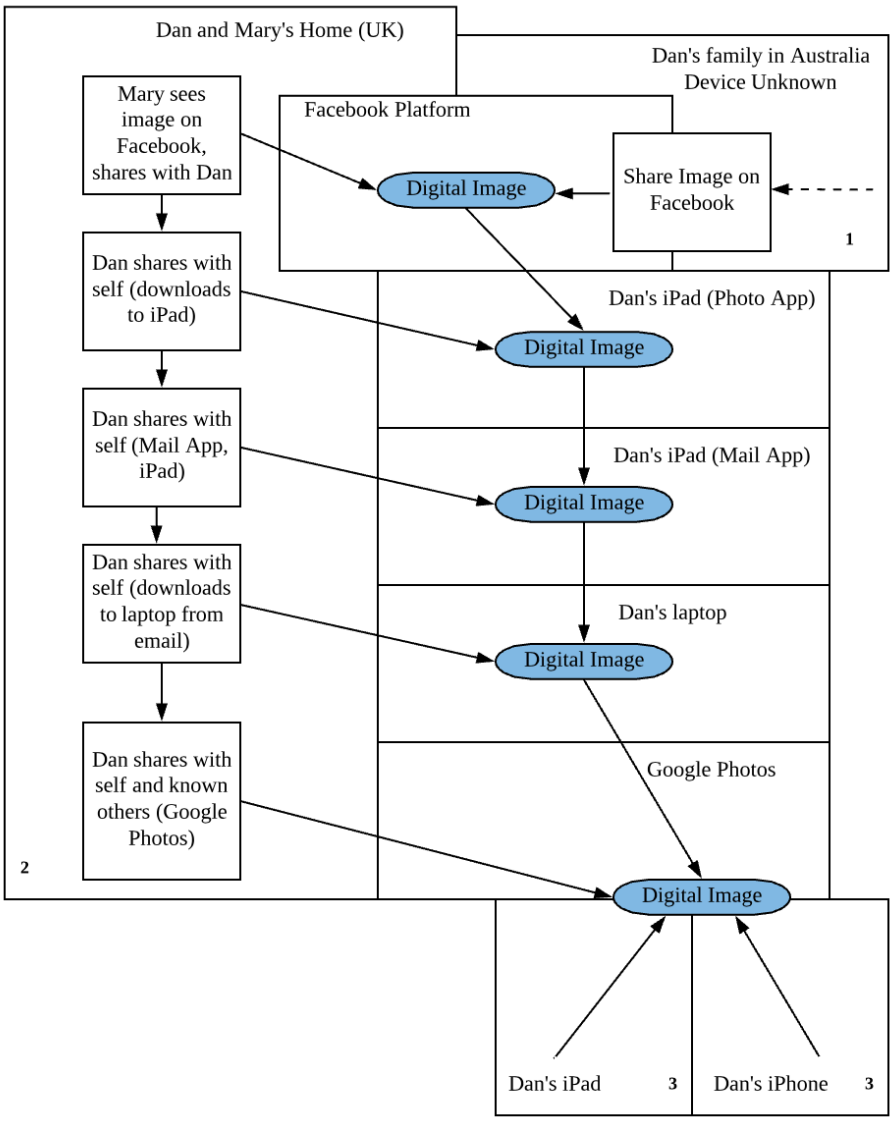


Figure 6.6 – Circuitous Chains and Sequences of Image Management: Facebook, email, multiple devices, and Cloud storage

Dan spoke of his dislike for social media apps and particularly for Facebook. While Dan did not have a Facebook account, his wife Mary did, and this led him to admit that: *"That's where the photos come, you've got to catch them quick before they're lost among all the dross".*

Dan (see Figure 6.6) explained that when his sister, who lived with her family in Australia, would share photographs of his nieces and nephews on Facebook (i.e. to known others), Mary would show these to Dan by physically sharing the screen of her

iPad (i.e. sharing to a known other by showing them the physical screen). In those cases where Dan and Mary liked a photograph, Dan would download the photo (i.e. sharing with self) from Facebook (using his wife's account), email them to himself (i.e. sharing with self), and then store the image on his laptop (i.e. sharing with self) and to his Google Photos app, a Cloud storage service (i.e. sharing with self and known others), for which he had installed the app on both his iPad and iPhone. This allowed both his iPad and iPhone, as well as Mary's iPad, to be used as portable photo albums (i.e. sharing with self and sharing with known others).

Dan was not the only participant to make use of the images shared online by known others, and particularly through Facebook, by downloading (i.e. storing, sharing with self) these to be viewed at other points in time. In much the same way as John expanded the locational and temporal fixity of the train timetable in taking a screenshot with his tablet, Dan and his wife would similarly extend the locational and temporal fixity of these shared photographs, moving these from a location (in the case of Dan) to which he had little access (i.e. in not having an account, Mary first had to tell him about the existence of the photographs), to several locations (i.e. Google Photos and, therefore, to both iPhone and iPad) that he could physically carry around with him from place to place.

Different forms of sharing thus overlap and merge in different ways, and in the life of any one image, there can be a multiplicity of ways in which it may travel, particularly through processes which come to duplicate it within and through practice, but also across a multiplicity of devices (e.g. iPads) and technologies (e.g. Facebook, email, Google Cloud). This is clearly not just an account of the tablet alone, but the tablet computer *has* taken on roles within circuitous chains and sequences of image-management in which different forms of image sharing intersect. These processes

duplicate the image, and it is through this duplication that these multiple images can take on lives of their own.

The Duplication of Images: The image-ification of practice?

The intention of following the flow of images as they circulated through the tablet computer was to decentre the tablet. In positioning the tablet as just one component in the nexus, whereby forms of image sharing can be understood as moments in which flow within and between practices occurs, I have added to the argument of the thesis. I have done this by showing how the tablet cannot be understood only by the practices of which it now forms a part, nor by the interrelations it forms with other devices and objects within configurations of practice. Alongside these already multiple and cross-cutting relations, the tablet exists in relation to a broader system; a nexus in which multiple practitioners, and their practices and configurations, as well as their interconnectedness, hangs together.

A focus on image sharing practices has allowed me to explore how the tablet figures within this broader system. In following different forms of this sharing as these moments connect with other moments of performance, across distinct practices which – at times – involve multiple practitioners, I have shown how such processes can duplicate images as they are enacted. This leads me to note what I am terming as an 'image-ification' of practice. By this, I am referring to the way in which, as the internet and its services, as well as the devices through which we access these, become more and more associated with image-management practices (which include image sharing), the practices of daily life (some of which have little association with formalised forms of photography) are coming to involve the use of images (as inputs) or even producing images as outputs of their enactment.

I have demonstrated that moments of image sharing (as well as moments of the interrelated processes of acquisition and storage) are becoming interlaced with moments of performing other sorts of practices, some of which have very little association with more formalised forms of photography. Still, even in those cases where there were already established associations of the image with particular practices (e.g. family communication, digital art), there has been a clear evolution in the ways that these practices are now performed. This evolution can be partially explained by the roles that the tablet computer has taken within image sharing, but it has also depended upon the integration of ICTs into daily life more generally. As practitioners have more and more cameras at their disposal, as these technologies become a part of an expanding myriad of devices – with their networked capabilities in their connections to internet services – the digital image is developing a centrality within daily life.

The examples explored show how the practices of image-management (i.e. taking, editing, sharing, storing) are becoming a part of conference attendance, forms of communication, decorating a home, and digital art. In sharing these images through email, social media, Cloud storage, and across devices, these practices bi- or multifurcate, and older forms evolve alongside new forms as our understandings of what constitutes a visit to the park (e.g. sharing photographs with known others through email), attending a conference (e.g. sharing screenshots with the self), and digital art (e.g. developing strategies to share with unknown others) themselves change.

The Tablet as a Crossing Point of Practice

Having already examined the ways in which the tablet computer had come to figure within many different practices, and how it – at times – had contributed to integrating

these together, it became important to understand how connections were made between practices in which the tablet computer now forms a part. In exploring how connections were made between practices, it was clear that the tablet computer was doing more than simply 'integrating' diverse practices, bringing together opportunities to perform these from one place. Taking into account the insights from this chapter, it is clear that the tablet computer does not simply just integrate time and space, and the public and the private, but instead moves through, or crosses between, these. Reckwitz (2002) suggests that a unique quality of the individual is that they are a 'crossing point' of practice. By this, Reckwitz refers to the way in which, as performers of multiple and diverse practices which make up their daily lives, practitioners sit at an intersection of practices. Though tablets are not practitioners, I extend the concept of 'crossing point' here to also refer to devices like the tablet computer (incl. smartphones, and laptops).

Similar to the practitioners who make use of the tablet, the device itself sits at an intersection of the practices in which it now figures. But this point alone is not sufficient to claim that the tablet itself is a crossing point. In sitting at the intersection of these multiple and diverse practices, and through the possibility of sharing digital (im)materialities (i.e. with the self, with known others, and with unknown others), the tablet is able to accumulate resources, transforming these into inputs for later moments of performance. In the same way that practitioners, through moments of performance, acquire the competence, skills, and expertise which go on to increase the possibilities in performing those (i.e. increased competence can lead to more skilled performances) or other practices, tablets accumulate resources which also go on to increase the possibilities for performance.

In these moments of accumulation, the tablet computer thus transforms particular resources for their later use in other moments of performance. This, in turn, increases the potentialities for performances in which the tablet computer now forms a part. In sharing images with the self (i.e. storing) through the tablet computer, there is a transformation of possibilities of the tablet computer, as this form of sharing means that this image can now not only be shared with the self (i.e. viewing or input to some other practice) but with others who may be known or unknown.
Carrying forth a language of crossing points to synthesise the insights I have gained in relation to the themes of time and space and the public and private, I have demonstrated how the tablet crosses through time and space. This observation provides further details to the question of whether the tablet computer is, in fact, a mobile device. Particular instances of image sharing interrogated here have demonstrated how the tablet computer is not as mobile as other sorts of mobile devices (e.g. Phoebe's smartphone going to the tattooist with her instead of her tablet). At the same time, and in other ways, the tablet computer integrates otherwise distant geographies, bridging distance to provide access to moments of shared co-presence (e.g. simultaneous sharing through FaceTime). In some ways, the mobility of the tablet depends upon it being physically carried with a practitioner, as in the example of John. However, even those 'uses' which require internet connectivity can be made more mobile by the ability of the tablet computer to store and accumulate the necessary resources for (internet-dependent) moments of performance outside of these moments.

This accumulation of resources also points to the ability of the tablet computer to be a crossing point of the public and private, though these themes are themselves interrelated with ideas of time and space. This is because the boundaries between the public and private are becoming increasingly dissolved, and there are pockets of

private space within the public and vice versa. This is particularly evident when thinking about the internet. In light of this, I take on Nippert-Eng's (1996) conceptualisation of the public and private, seeing these dimensions as being dependent on boundary work as opposed to inherent characteristics of particular times and spaces. It is through the performance of practice that we construct, dissolve, and merge these boundaries. The tablet computer, as a crossing point, allows for practitioners to transform public moments and resources into private resources, bringing together these resources in one place. In the case of images, the Photo app tours (see Chapter 2) revealed how these apps were populated with a mixture of family photographs, boiler manuals, train timetables, and work rotas, with no neat or fixed boundary between work-related images and those more associated with the home.

Potentially, then, a part of answering the puzzle of how the tablet computer has come to be so rapidly appropriated may be that this appropriation rate is a consequence of not just how the tablet computer is becoming essential in the conduct of both the public and private (e.g. work and home) but in its ability to cross through, and contribute to, the dissolution of such boundaries.

Representing particular chains of action in the performance of image sharing practices, and showing how these connect otherwise-separate moments in the performance of other practices in the form of diagrams, has been analytically useful for demonstrating how the tablet computer is one component of a greater whole. However, the usefulness of describing and explaining how particular practitioners' chains of action come to connect with the chains of actions performed by other practitioners should not betray the point that these pathways, or chains of action, are not fixed. Though I explore some of the ways in which 'uses' of the tablet computer

are responsive and adaptive to the dynamicity of daily life in the next chapter, here I simply make the point that the diagrams presented in this chapter over-stabilise the pathways discussed. These are by no means fixed, and instead 'new', evolved, or even different pathways in image-management have emerged and continue to do so, as these pathways and their sequences become interweaved into an expanding number of practices.

Rather than separate types, these pathways co-exist, intersect, and merge in different ways, leading to what I describe as circuitous chains of image-management. By 'circuitous', I am referring to meandering pathways of image circulation and sharing whereby one image can come to take on multiple lives at once, flowing, in each of these lives' through different pathways, between moments of performance and linking otherwise separate practices and diverse practitioners. A second limitation of the diagrams above is that they construct artificial and rigid boundaries around the cases of image sharing presented in this chapter. These diagrams are actually partial snapshots of these instances of sharing, which likely connect to other moments and, in turn, these moments could connect to other moments. Forms of image sharing thus overlap with one another, connecting multiple practices and duplicating their outputs (i.e. images) in the process, which in turn could serve to connect other practices.

What these examples together highlight is that technologies like the tablet are caught up in chains of action alongside practitioners making use of particular inputs which have previously been outputs from other practices. Practices transform materials (tablet, app, image, practitioners), and in so doing alter opportunities for later performances. Understanding 'use' of an object is not just about understanding how those uses are never extricable from the performance of practice or just how those

performances depend on differing mixtures of objects and devices (and services). It is also necessary to acknowledge how performances hang together in a broader nexus, where chains of action impact and transform the possible course of action for the here and now. From this, it is clear that the societal embedding of the tablet has not just depended upon specific tablet–practitioner interactions, but also on how these interactions have become entangled with sequences of other practitioners' performances.

Chapter 7

Maintaining Connections: Tablets and the changing relations of practice

Each chapter of the thesis so far has exposed some of the practice-connections into which the tablet computer has become embedded. In order to expose such tablet-practice connections, I have had to stabilise them, at least analytically, so that further detail about their workings could be revealed. While stabilising connections in this way is not an uncommon strategy, it tends to obscure the dynamics of integration (i.e. how forms of integrating change over time). This chapter is designed to attend to these dynamics, showing how the embeddedness of the tablet computer is never fixed but rather adapts and shifts over time. This is important in that, if the tablet is to survive and maintain its various roles in daily lives, it needs to do so within and across a range of fluctuating practices.

Up to now, I have worked through different ways of thinking about how the tablet 'fits in' to existing practices, into configurations, and into the nexus of practice. But these relations are themselves constantly on the move and as Hand and Shove (2007) have shown, there is work involved in maintaining embeddedness in practice. Though these points together are enough to justify a focus on embedding as a process that takes place over time, it is also important to notice that the tablet computer itself is not stable.

By the tablet's lack of stability, I am referring to the ways that the constituent technologies of the tablet computer develop (i.e. apps, OS), and some of these

changes involve the 'user' in only minimal ways (e.g. responding to notifications). For instance, tablet computers sometimes notify their 'users' to update their mobile operating systems, representing a kind of enforced dynamic. Exactly which qualities will be 'updated' and how they will change is often unknown until the update is installed. Developments in the tablet's qualities that occur as a result need not be great (e.g. the placement of onscreen buttons, menu options), but the disruption in moments of doing, and in daily life more broadly, can be experienced differently. The previous chapter described how images flowed to Grace's iPad from her daughter, and how these images enabled mother and daughter to keep in touch across a distance. Grace noted in the same interview that a recent iOS update had altered the placement of the 'Save' onscreen button, and how she had been recently unable to share these images with herself outside of the emails stored within the Mail app.

Looking beyond the changing technical qualities of the tablet itself, and to counteract ideas about the stabilization of the tablet–practice connections, this chapter presents empirical material collected through follow-up interviews with Alan, Ann, Liam, and one original interview with Jill. In working with this data, this chapter focuses on how the embeddedness of the tablet computer (in different practices) has developed over time. In taking this approach, I do not aim to provide an exhaustive account of all the ways in which the tablet, and its positioning within different practices, might shift over time. Instead, I work through five illustrative vignettes that allow for further engagement with these dynamic processes, arguing that changes in 'uses' are often related to developments that occur beyond both the 'user' and the tablet itself.

The Tablet Computer in Flux: The dynamic character of practice relations

In this section, I draw on these interviews to identify five forms of development over time: increased participation, extended services, shifting relations, the changing associations of apps, and the changing associations of devices. These illustrate just some of the 'circuits' of embedding that I observed. The first has to do with the ways in which participation engenders further participation and in which forms of tablet-enabled practices become increasingly embedded in daily life.

Participation Engenders Participation

When interviewed for the second time (eighteen months after the first interview), Alan, who was introduced in Chapter 4, still enjoyed playing ScrabbleFree through his iPad with three of his family members. Here, I draw attention to the social relations that mediate the playing of Scrabble in this context (i.e. tablet as mediator). Between the first and second interviews, Alan had continued to play the game with these same three family members, representing what, on the face of it, appears to be a now stable practice in Alan's life (i.e. same game, same co-participating others). Despite this, he said of the device:

> Well I think [the iPad has] become much more, an essential part of my life now - as you might say. And I certainly use it much much more than I did. And I dare say I could use it for more things and I don't do it but anyway, it's certainly a relatively important part of my daily life.

This increasing importance related to the frequency with which Alan was playing Scrabble. As described, this increased frequency depended – in part – not on Alan and

his iPad alone but also on the continued and frequent co-participation of (physically) distant familial others. Since turn-taking games, like this one, depend upon the co-participation of (at least) two players, it is crucial to note that in playing Scrabble with his family members, Alan was not only drawing them into Scrabble playing, but that through their continued participation (i.e. response to his turns) they were, in fact, drawing Alan further back into the game of Scrabble playing and into a still-deeper connection with his iPad.

In this context, it makes no sense to concentrate on Alan's playing Scrabble without connecting this game play to the other co-practitioners with who he interacts and without who this particular form of game-playing could not take place. It is only in following this connection; in understanding 'frequency', or rather an increasingly intensive cycle of move and response, as the interplay of action – reaction, that the new and changing significance of the tablet in this account can be understood.

This is not the only example through which the embeddedness of the tablet computer was constituted via the co-participation of distant others. Another obvious example is email (and other forms of communication, e.g. instant messaging); again, it is through co-participating others that the tablet computer comes to be (further) embedded in daily life. But, for Alan, these combined practices (i.e. iPad integrating email and Scrabble) were not independent. In other words, when Alan was checking for notifications for his turn, he would often turn to other activities associated with his iPad, like those of checking email. He said of this: *"Well yes, I mean I probably pick it up during the evening sometime, just to see if someone has played Scrabble or if I've got any messages"*.

These distant, (analytically) invisible but co-participating others (i.e. Scrabble players and email senders), and the role of the tablet computer in 'integrating' diverse practices, combine and interact in this example, further embedding the tablet computer into Alan's daily life and increasing its multiple significance.

Such accounts of increasing dependence are not about the apps themselves (ScrabbleFree, Mail) but about the extended family and extended network of obligation and response that take hold as these apps and the tablet become part of daily interaction. As Alan's chains of action (Schatzki, 2005) interact with the chains of actions of others, the connections between Alan's iPad and the devices of his family members, and their moments of doing (Scrabble) become more tightly bound. It is through each successive moment of making use of his tablet within Scrabble and emailing that the tablet, Scrabble, and Mail app becomes further embedded and more frequent in Alan's use. This does not necessarily mean that Scrabble (and the devices through which these co-participating others used the app) became embedded equally within the lives of the others with who he played. Indeed, it is worth noting that, from Alan's point of view, some players are more reliable than others, with Elizabeth, one of Alan's nieces, being a more frequent player (and emailer) than the other.

The next example depends – in part – on the co-participation of others as well, but this instance depends less upon the interplay of action and reaction. Instead, the process of embedding is more strongly related to organisational initiatives and to a notion of service provision.

Extended Services

My second example of embedding over time revolves around the acquisition of a new app, though as I argue, the acquisition of apps (or devices) can be in response to

developments and innovations occurring far beyond the confines of the home or the daily life of the participant in question.

In the seventeen months between interviews, 71-year-old Ann had installed five new apps onto her iPad 2, but she was particularly enthusiastic in explaining one specific app from this set: the MarvellousMe (Parent) app. In what perhaps builds on broader changes within the education sector, particularly in relation to institutional strategies to draw mobile (and 'smart') devices like the tablet computer (see Enriquez, 2010, Blackwell, 2014, Bird and Edwards, 2015) and apps (Berge and Muilenburg, 2013, O'Bannon and Thomas, 2015) into classroom environments, the school attended by two of Ann's grandchildren had introduced the MarvellousMe service. MarvellousMe[31] describes itself as:

> a simple solution that helps teacher and parents to improve children's learning and character development. As well as offering many classroom benefits, MarvellousMe makes it easy and fun for teachers to share wonderful new[s] with parents about their children's activities and achievements, and for parents to provide better at-home support and motivation (MarvellousMe, n/a).

Initiated as a means to further engage parents and guardians in children's learning, the MarvellousMe app acts as a reporting interface, where parents or guardians can check on updates added about their child's learning progress and school day,

[31] The service is delivered through two apps: MarvellousMe parent and MarvellousMe teacher app, as well as the School Pack which delivers an online administration, management, and reporting portal to support a whole school approach for the service. I will be discussing the MarvellousMe parent app in this chapter, but I do note that Ann's use of the parent app (i.e. viewing entries) does have as a co-requisite that the teacher app is being used (i.e. inputting entries).

uploaded by teachers in the form of comments, photographs, and school rewards (e.g. certificates). Ann said of this:

> Well, their school subscribes to this and it's really [meant] to be a connection point between home and school, parents and school. And grandparents and other involved people can be involved in it, there's a special code that they give you so only you have access to that child or whatever. So, this morning when I opened my iPad, there's a little message across the top and it says something like '<First Name> <Last Name> has done something special today', something like that. […] So, there's <Child1> you see, Math's Magic, there's a photograph, and it says "Ask your child to show you our dancing twos tonight", so they've obviously been learning in Maths about counting in twos, that must be why they've got their hands like that, so they're involving the parents in the learning process.

Ann would access these multimodal reports (i.e. images, comments, school rewards) through the MarvellousMe app on her iPad 2 when notified of new entries, but, unlike the active part taken by both sets of practitioners in the account of Alan's Scrabble and emailing, Ann was a relatively 'passive' consumer of these updates and the interactions she would have with this app were fairly minimal.[32] So, while this is an account that surrounds the acquisition of a new app, it is clear that broader institutional changes and strategies that take place far beyond the confines of Ann's home reverberate, drawing Ann's tablet computer into 'new' ways of being involved in her grandchildren's learning.

[32] The MarvellousMe app is designed to limit a parent or guardian's interaction with these entries, as there are no response features for parents/guardians beyond sending a virtual 'Hi5'.

These new ways involve Ann simply viewing notifications and the accompanying photographs and messages uploaded by the teacher about her grandchildren's day, but, from the teacher's perspective, apps of this type transform certain parts of the work required in order to be a teacher. There have always been forms of evaluation (e.g. annual reports, parents' evenings) which constitute aspects of the work required in being a teacher (Hargreaves, 1994), but as the MarvellousMe app provides the ability to instantaneously share evaluation with parents and guardians, the frequency of evaluation (i.e. daily or ongoing), how this is presented (i.e. messages and photographs), and the means by which it is communicated (i.e. through apps on smart devices), as well as the range of those who are considered as interested others (i.e. grandparents as well as parents, or anyone with the code) are all in flux.

One consequence is that the work of being a teacher, particularly in Ann's grandchildren's school, now involves some photographic activities (i.e. taking and sharing photographs). Ann's account demonstrates how even the relatively formalized (i.e. institutionalised) practices of learning and teaching are becoming increasingly 'image-ified' as devices like smartphones and tablet computers come to figure not only in performing school-related practices (by teachers, students, and guardians) but in bringing these together and 'integrating' these with other image sharing practices. This service, and the apps which provide access to it, are not the only services and apps available for use by teachers and schools. While it is difficult to provide the exact number of educational apps available through the (Apple) App Store now,[33] in 2015 there were 80,000 apps in the education category (New America, 2015).

[33] The Apple App Store no longer provides the total number of apps per category, a feature it once did.

Phoebe, who took part in the first round of interviews, explained that she had acquired her tablet computer as a consequence of a talk delivered during her teacher training, stating: *"It was maths teaching that I was training for, he came in to do a talk on how his tablet can be used to help his maths teaching, like different websites you can go on and different apps you can use, that were just good teacher tools [...] it got me thinking that a tablet could be useful"*.

In understanding Ann and Phoebe's accounts alongside one another, it is clear that tablet computing is having an impact on forms of teacher training and on the range of materials (objects and devices) involved in school environments.[34] As this example shows, the kind of 'embedding' experienced by Ann, and in a different sense by Phoebe, are linked to shifts in teaching and learning strategies developed by organisations beyond the home. There were, of course, other instances in which new apps were installed, but as the follow up interviews also showed, the roles of, and the 'need' for, the tablet changed for other reasons as well.

Shifting Relations in Practice: Specialisation and differentiation

The relative significance and status of the tablet shifts not only when new apps are installed but also when additional digital devices are introduced into the home. My third example revolves around the arrival of a new device, in this case an iPad mini.

In Chapter 5, I argued that digital devices rarely simply 'take the place' of other, previously important technologies, but what happens when incoming devices are not just similar (e.g. tablet computer and laptop) but of the same type (tablet computer

[34] In the three years since this teacher training (and the acquisition of her tablet), Phoebe had transitioned from teaching in classrooms to teaching in prisons instead, and noted that her tablet had consequently become a device that she only used at home. This was because the prison had very limited Wi-Fi and all teaching materials subsequently had to be carried into the classroom on USBs or paper instead.

and tablet computer)? Does a 'new' tablet computer substitute for an 'older' or different tablet computer, and does the existence of multiple tablets further embed tablet-related practices?

I return again to Ann, though the tablet in focus this time is not her iPad 2 but a 'new' iPad mini that she had acquired in the time since the first interview. The iPad mini had quite clearly taken on some of the roles previously associated with the older tablet. Ann said of this:

> My husband and I both have an iPad, and we were going on holiday and we just wanted something that was going to be easier to pack than two big, old-fashioned, heavy iPads, so we bought the mini and we jointly both downloaded apps that we might want while we were away, and now that's what I do, if we're going on holiday I don't take my big iPad I take my mini.

Even though the 'new' device is of the same type (i.e. they are both iPads), the iPad mini was used in, and only in, a particular spatiotemporal context: when Ann and her husband went on holiday. What it was used 'for', and the apps subsequently installed, replicate (but only partly) the range available on the 'old' iPads.

In thinking about these relations in more detail, I introduce a term sometimes used in historical descriptions and economic analyses of industrial or national production processes (Storper, 1989, Vertova, 2001, Aiginger, 2004): 'specialisation'. This notion of specialisation helps explain the distinctive parts that these devices come to play in their owners' daily lives. As the 'family' of related digital devices grows, processes of specialisation and differentiation prove crucial in the formation of practice relations with specific devices and objects.

For example, Natasha's Kindle Fire (mostly used in bed, Chapter 5) and Ann's new iPad mini (mostly used on holiday) had become specialised in that they were only used in specific spatiotemporal circumstances. This type of specialisation differs from the kind that industries are said to undergo over time. As in an industrial context, specialisation occurs when manufacturers focus on the production of limited goods as a means of increasing the efficiency of their production. By contrast, and in relation to something as flexible as a tablet (+ apps + …), specialisation refers to the ways in which such configurations occupy specific 'niches' in the practices and spatiotemporal ordering of daily life. Like Ann, 67-year-old Jack had specialised iPads, owning a 'night' (iPad mini) as well as his 'day' iPad, but his use of this specialised iPad was for particular spatiotemporal coordinates (i.e. at night and in bed) rather than for particular practice-phases, like those of holidays. These iPads also had different apps, reflecting the ways in which they had been differentiated.

The specialisation of Ann's iPad mini as a holiday tablet must also be understood alongside the notion of multifurcation (see Chapter 5). Ann's first iPad had transformed and created new relations between some of Ann's daily practices (e.g. television watching, research, listening to radio), creating what became tablet-dependent forms of such as apps, the internet, and its services were, bit by bit, embedded in each of these activities. Given that Ann's only other available internet-enabled device was the rarely used desktop (which does not support apps, nor can it 'travel'), it became clear that some of her practices were (prior to the iPad mini) more tablet-dependent than others. Tablet dependence emerges, then, from the specific roles taken by the device, the internet, and apps within it, in multiple practices, and materialises through the interrelations of the device (and its apps) in the course of accomplishing one or more practices.

Holidays, and the need to reduce the weight and space of what was carried during a trip, act as an intriguing measure of tablet-dependence and consequently of the embeddedness of the tablet computer in Ann's daily life. On booking a cruise, Ann and her husband sought to reduce their luggage weight by sharing this new iPad mini between them. Though their two iPads were not that heavy, purchasing a smaller device allowed this 'new' tablet to specialise as a tablet-for-holidays, further differentiating between already multifurcated practices (i.e. creating a new category of tablet dependent practices on holidays). The successive embedding of different devices is evidence of the ongoing multifurcation of Ann's now tablet-dependent practices. As already mentioned, there are further forms of differentiation in that the holiday iPad has different apps installed, some by Ann and some by her husband. Exactly which apps are downloaded on the holiday iPad reflects which aspects of Ann and her husband's daily lives have become tablet-dependent and which are specifically associated with holidays and leisure. For instance, while Ann's 'Time waster' games (discussed in Chapter 4) had been installed on the (new) iPad mini, the aforementioned MarvellousMe app was not, reflecting some of the boundary-making that goes on through the tablet computer.

This example captures some of the stabilities and differences that are simultaneously at play. In acquiring this new iPad, there is a specialisation of roles: the holiday tablet becomes a part of the kit (alongside passports and travel documentation) required for travel abroad. At the same time, new distinctions are drawn: the holiday iPad and the old iPads did not have the same apps installed. Exactly which apps are 'needed' on holiday, in turn, reflects ongoing processes of embedding of different apps in daily life and Ann's growing dependence on some, but not all, of these. As her daily life becomes more tablet-dependent, there is a need to continue practices that depend on

the tablet and to do so even when on the move and in situations in which the first iPad was not typically used (i.e. outside of the home and on holiday).

These three examples give a sense of the dynamic relation between tablets and practices. More than that, they emphasise the extent to which such processes depend on events and people beyond the immediate interface of 'user' and device. They also provide a telling reminder of what amounts to a shifting and inherently unstable 'ecology' of devices and practices.

How Apps and Devices Fall Out of Use

So far, I have considered instances in which the tablet computer has formed new connections in practice (e.g. Ann's holiday tablet or her installation of the MarvellousMe app) or in which particular practice connections have evolved (e.g. the increased frequency with which Alan was now playing ScrabbleFree). I have also considered instances in which apps (+ the tablet) take on different meanings over time. In this part of the chapter, I consider similar situations but with an emphasis on how connections and associations are 'broken' along the way.

Threads of Becoming: Apps and their associations

Liam, a subject of Chapter 5, had been travelling during the two years between my first and second interview with him. During this time, he had spent four months in Columbia, taking only his iPad with him (and leaving behind both his laptop and smartphone). As with Ann's holiday tablet, Liam's tablet was, for a while, customised for a relatively specific role – that is, as a device useful during Liam's stay abroad. In this (temporary) role, his iPad had taken on all of the parts previously (and subsequently) satisfied by a range of different devices: watching television, communication, listening to music, DJ'ing, reading, and Spanish-language-learning.

Liam had travelled to Columbia, in part, as a means to improve his Spanish-language skills, and there were traces of this specialisation on his iPad (and his apps) from his time there:

> <Netflix being in a folder named 'Español'> was basically a sort of leftover from Columbia, the Spanish folder had a Spanish dictionary, I think there was a couple of Spanish dictionary apps in there, there was maybe something like Babel, and then Netflix was in there as well, because when I was in Columbia I got a Spanish account so the video was in Spanish by default, because I was using a Columbian IP address, so Netflix was in there because I was using it to watch series and stuff with Spanish audio and Spanish subtitles, which is impossible to find in England. So that's why that was in there. And then as I've sort of gradually abandoned the Spanish I've deleted the Spanish dictionary apps to like make room for other stuff, but Netflix has just stayed in the folder.

The above excerpt, as well as material presented in Chapter 5, allows me to make the point that over the two years between interviews, Liam had been consistently watching Netflix on his iPad. At first sight, this looks like a stable practice, but it turns out that the ways in which he was using Netflix were not at all the same.

As described in Chapter 5, Netflix (as an app and as a service) has come to be broadly associated with practices of television watching and with forms of online streaming, but with Liam having been in two different continents, the services to which this same app had been connected (i.e. when in Columbia, when in the UK) differed. Though maintained by the same company, some of the content, as well as the languages and subtitling available, were different. In living in Columbia for a period of time, the connection that this app was making to the Latin American Netflix

service contributed to the ongoing multifurcation of Liam's ways of watching television, creating a narrower form of Spanish language television watching than the form he was used to at home, i.e. using the iPad for bedtime Netflix viewing. As the Netflix app was placed within a folder called 'Español' (i.e. the Spanish word for 'Spanish'), the traces of this past association of the app with Spanish-learning were apparent from his home screen.

In thinking about the significance of this arrangement, I borrow some ideas from Tim Ingold, an anthropologist who suggests that it is through close engagement with a material that a practitioner's knowledge of the properties of that material grow (Ingold, 2012). That is to say that it is when a material (object or device) is engaged with (i.e. when it comes to figure within the performance of a practice) that specific features of these materials emerge. To return to Liam's experience, while Netflix may be conventionally understood as forming a part of television-watching practices (Chapter 5), Liam's associations of the app with his Spanish-learning practices were projected onto and over these more general associations. However, on Liam's return to England, he was once more watching television through the English-language service, and Netflix the app was once more re-associated with forms of television watching outside of Spanish-language-learning.

While on his travels, Liam's daily life had become tablet-dependent as he used the device to not only communicate with his friends and family back in the UK, and to continue his Spanish-learning practices, but also to watch television, practice his DJ'ing, listen to music, and research the areas that he was travelling through. Without access to a wide range of other devices available in his UK home, the tablet acquired a temporary role in many other practices that he previously associated with his smartphone and laptop. On returning to the UK, and with these other devices again at his disposal, these older connections (e.g. smartphone with communication, laptop for

DJ'ing) reformed, and the temporarily extensive tablet-practice associations withered.

In thinking of this account alongside the others already discussed, the interrelated themes of specialisation and tablet-dependence are both important. During his time abroad, Liam's iPad became a more 'generalised' device, enabling him to continue previously IT-dependent practices (e.g. email) but via the iPad. On his return, these roles 'migrated' back, leaving the iPad as a specialised (Netflix at bedtime) rather than generic device. The details of these forms of migration (some temporary, some long term) underline the importance of relations *between* IT and tablet-based forms of 'dependence', and *to* related forms of specialisation in space and time.

What this example, and the alternating practice-tablet associations within it, demonstrate is that the meanings and, consequently, the parts that tablets, apps, and services play are made through their successive figuring within practices. These configurations (and the technologies and other materials that constitute such) should thus be considered as configurations that are constantly in becoming and where this becoming involves not only the redefinition of parts but of the understanding of these parts (e.g. figuring within television watching or figuring within Spanish-language television watching) as well.

Rather than considering the tablet computer and its apps as bounded objects, it helps to consider them instead as flows of becoming which flux and change through their continued and ongoing figuring into practices, as these practices themselves evolve and take on new(er) meanings. The parts and understandings of the device, and of the apps installed upon the tablet, are therefore always provisional, shifting, and relational to the practices of which they are forming a part. This analysis helps explain how and why tablets and apps fall out of use.

Falling Out of Use

In this thesis, I have worked towards a reconceptualisation of 'use', demonstrating how tablet computers not only maintain their embeddedness within practices over time but also how they become further embedded in specific practices. I have also demonstrated how they relate to forms of specialisation in terms of function as well as in relation to arrangements in space and time. Such a reconceptualisation would not be complete without some form of understanding of how devices, and the apps that they support, can sometimes 'fall out of use'.

There is evidence to suggest that some tablet computers have 'fallen out of use'. For instance, while tablet ownership was 59% in 2016 (Ofcom, 2016b), this figure has since dropped slightly to 58% (Ofcom, 2018). Though tablet ownership has not changed significantly, it is possible that roles previously associated with tablets have migrated to other objects and devices.

The tablet's positioning at the intersection of multiple technologies means that it is possible and useful to think about how different parts of this arrangement might 'fail' or fall out of use. As Liam's experience showed, apps are deleted as well as installed. In his case, he has either deleted or no longer uses apps that were especially associated with learning Spanish (something he no longer does). There were many other such examples. For instance, in the first interview, Alan's tablet already demonstrated 'traces' of practices from which he had already defected (e.g. Dulux Visualizer and Zoopla apps remain on Alan's home screen from when he moved house (see Figure 4.2.1)) as he was yet to delete any apps on his tablet since acquiring it.

There are other, more obvious ways in which the device of the tablet computer (i.e.

device and its apps) falls out of use, as practitioners defect from particular practices (into which the device and its apps previously played a part) and/or take up new(er) devices (therefore embedding these instead) or when devices fail or break down. Among the participants with who I spoke, Jill and Harry both talked about how their tablets had fallen out of use.

24-year-old Jill explains that roles previously associated with her iPad (like television watching and listening to music) shifted when she acquired an iPhone, meaning that the iPad fell out of use. In her words:

> So, I broke [Samsung smartphone], and then the next phone I got was an iPhone 5C, which is obviously the same sort of format and software as an iPad, and I was doing everything that I could do on my iPad, just on my iPhone in a smaller version basically. […] I forget about it, I forget that it's there. I guess the iPad was there for convenience but if it's not_ well it's just not convenient anymore really, the phone is more convenient.

Though the iPad was not often in use – Jill only had the Brushes app on her tablet (and not on her laptop and smartphone) and there were times when she would charge her iPad for this one purpose alone – there are two points to make here. One is that even if the iPad is not in regular use, it is still accessible, and when charged up again, it still has a role in Jill's art practices, even if those only occur with relative rarity. This is an instance of 'extreme' specialisation: in effect, the capabilities of the tablet computer have resolved into just one app.

The potential for expanding (as when Liam stocks the iPad with all he needs for his travels) and shrinking (with Jill only using one app) represent a particular form of

flexibility. This means that tablets are well positioned to 'endure' in one role or another. More subtly, the tablet 'endures' in the abstract; that is, in the idea of a device that relates to and enables many practices at once. This is especially clear for Jill: in her case, it was almost inconsequential whether it was the iPhone or the iPad through which she performed a suite of practices now associated with some tablet- or phone-like device. In other words, it seems that the tablet has done its work in 'integrating' together the different practices that Jill has to maintain. At the same time, the iPhone appears to make some of this integrative work 'easier'. Because it does not need Wi-Fi, the smartphone is said to be more 'convenient', and because she can use the same apps on both her new iPhone and on her older iPad, the iPhone quickly takes over Jill's (previously) tablet-dependent practices (i.e. social media, work, and watching television), leaving the tablet only figuring within practices of digital art (i.e. specialised).

Faced with these kinds of accounts, it makes sense to think of tablet computers and similar sorts of devices (like smartphones) not as singular devices but as sets of technologies linked to arrays of practices. These 'sets' may be coherent and overlapping or they may not. In Jill's case, there was little or no resistance to the migration of particular roles from iPad to iPhone, since both the iOS and the apps overlapped. At the same time, the fact that this migration took place at all was significantly related to the fact that the iPhone allowed her to reproduce (previously) tablet-dependent practices[35] on the move.

[35] I explained a notion of 'tablet-dependent' practices earlier in the chapter by suggesting that those practices into which the internet and apps have been integrated can become tablet-dependent if a practitioner does not have other devices which support these co-requisites of particular performances. However, in those cases where a practitioner has other devices which can support these co-requisites, like in the case of Jill, these forms of practice are perhaps better termed as 'internet-dependent', 'app-dependent', or IT-dependent.

What this case shows is that, even in those cases where a device may fall out of use, particular aspects of the tablet (as a set of technologies) may still come to figure within particular practices. At the same time, the way that particular roles of the tablet computer migrate to other devices, like Jill's iPhone, still points to the idea that this is not a complete substitution, as the forms of practices enacted through the iPhone were different than those enacted through the tablet. The tablet remains 'in use', even if this particular use is far more specialised than the roles it occupied previously.

The Dynamics of the Extended Tablet

To conclude, this chapter and the accounts it presents indicate just some of the dynamic threads and processes in which the tablet computer is entangled. The intention in following these threads as they change over time was to demonstrate just some of the different ways in which the tablet computer's use, and its integration within and across different practices, is in constant flux. Despite, and arguably because of, these ongoing transformations, it has been shown how the tablet computer remains 'needed' as it (and its apps) adapt to new and changing circumstances and practices, some of which arise as a result of 'tablet-dependence' itself.

I have already suggested and worked with the idea that the tablet computer is better understood as a set of technologies (i.e. device, iOS, its apps, data connection etc.) than one device or technology alone (i.e. the tablet computer). I have shown that it is this multiplicity of technologies (that exist as the tablet) that enables the device to take on roles in which it either 'integrates' (i.e. as a material that bundles otherwise separate practices together) (Chapter 4) and/or acts as a 'crossing point' of practice (Chapter 6). The examples of change – and of acquiring and losing roles – explored in

this chapter enable me to add to these ideas in recognising that such processes can be conceptualised with reference to what I refer to as the 'extended tablet'.

This notion draws on Wallenborn's (2013) idea of the 'extended body', and it is intended to emphasise the extensive reach of the practice connections with and through the tablet, connections that are formed not only through each successive moment of practice in which it features, but which reform as tablet-practice connections contract and expand over time.

This differs from my earlier conceptualisation of the tablet computer as a relatively 'fixed' object that stands at the crossing point of practices. It is different in that I am not simply suggesting that the tablet enables connections between practices across time and space (including the spheres of the public and private). Instead, and as a consequence of these movements, I suggest that the tablet is more dynamically entangled in multiple and constantly evolving tablet-practice connections. This distinction is relevant in that, alongside my suggestion that uses of the tablet matter for the here and now (see Chapter 6), my further point is that the settings in which tablets become enmeshed in practices are constituted by often distant and often unknown practitioners and institutions (e.g. Ann's grandchildren's school). It is in this sense that it is appropriate to talk of the 'extended' tablet.

In mobilising the idea of the extended tablet, I am thus referring to the connections enabled with, through, and by the tablet and which extend far beyond the surface of the physical device. This analysis helps make sense of the many transformations described above: as it has been shown, tablets-in-practice are changing all the time. In the cases described, such changes relate to distant sets of co-practitioners, broader institutional services, the arrival of other materials, the shifting contours of

specific practices, and the range of related technologies and devices to which practitioners have access.

Nevertheless, there are some challenges in understanding the tablet computer in this way, in that difficulties emerge in defining exactly where the boundaries of the tablet's extensions lie. In practice, it is only by following specific practice-tablet relations (as these change) that further detail is revealed of not only what the tablet is *for* (e.g. Netflix for Spanish-learning) but also what it *is* (e.g. a device for particular practice-phases such as holidays or longer-term travels). This is because, as it adapts and responds, the extended tablet also envelops these seemingly external forms of change. In doing so, it maintains its status as something that is embedded within and across a range of practices. As such, and over time, changes in tablet-related practices themselves become part of what the tablet computer actually *is*. The limits of the tablet's extension are therefore defined by the sets of relations to which the tablet adapts, as these are incorporated into the tablet and as they then become a part of it.

In conclusion, this chapter has shown how instances of change, some of which may appear small (e.g. installing a new app) and others which may appear to be larger (e.g. the embedding of apps within the education sector), as well as instances which may at first appear to be stabilities (but are themselves always on the move), are an outcome of processes of integrating. This is to say that change is not separate from the successive figuring of a device (or object) within performances of practices but is rather a part of these ongoing processes.

The embeddedness of an object thus depends on that object adapting and responding to changes. This is due to the fact that embeddedness cannot be maintained without

ongoing adaptations and responses. Practices, practitioners, tablets, and daily life itself are not static and neither is the 'use' of an object, nor is its embeddedness within practice. Accordingly, the instances of 'falling out of use' that I have explored are as much about the birth of new connections, their evolution, and the continued survival of older connections (e.g. use of Brushes app on iPad) as they are about the one-sided dissolution of specific roles.

Even in those case where one part of the set of technologies of which tablets are comprised falls out of use (e.g. one app or even the device of the tablet), others remain embedded within related devices (e.g. iOS, apps) and practices. Instead, we see movements of specialisation and differentiation (i.e. iPad for holiday), of migration (e.g. the migration of parts within Jill's practices from iPad to her iPhone), and of provisional customisation (Liam). That said, such movements can have lasting consequences; as noted above, Jill now has a set of iPhone and not iPad dependent practices and, in being able to perform these on the move, is unlikely to turn back the clock.

In sum, what does an investigation of the ongoing integrating of tablets over time reveal about one of the opening puzzles – namely, how and why was the tablet so rapidly appropriated? It not new to suggest that the tablet computer is flexible, in fact this is an assertion around which much existing research revolves. What is new here is the idea that this flexibility allows tablet computers (and their practitioners) to 'ride', embrace, and be defined by the ebbs and flows of daily life, and that this feature contributes to the tablet's continued, and in some cases deepening, role across a range of practices. The addition and deletion of apps that adapt the tablet is part of this story, but other features are key, including those of weight and size. All are relevant in understanding how tablets come to be used in highly specialised ways,

in relating only to particular forms (bedtime Netflix viewing, Brushes art work), specific spatiotemporal coordinates of practice (in bed or at night), or even particular events/settings (on holiday or for longer-term travels).

The next and final chapter of the thesis brings together the insights that I have presented across its empirical chapters, synthesising these to show not only what I have discovered about forms and processes of integration but also about the tablet computer and its embeddedness in, and through, practice.

Chapter 8

Conclusion – Reclaiming the Concept of 'Use'

Introduction

> *" […] there is no essential essence of technologies […]"* (Ihde, 1990: 34).

I began this thesis with the claim that while all 'technologies' are multistable (i.e. they have no essential essence) (Ihde, 1993), the tablet computer represents a particularly intriguing case of multistability. This is because the tablet is often positioned in relation to other multistable technologies (smartphones, laptops) which, in pre-dating the tablet's arrival, make the tablet's rapid rate of adoption especially puzzling. I also noticed that the tablet computer is fluid in that it is transformed by the apps (multistable technologies in themselves) which are downloaded and installed upon it. This means that it is difficult to know what the tablet computer is and what it is for by merely examining the device in isolation from what people are doing with it. Having focused on the fluidity and multistability of the tablet computer in daily life, this research thus raised a number of questions about whether notions of 'use' are appropriate for understanding how devices like the tablet computer have been taken up and how they have become embedded in daily life. Specifically, does a concept of 'use' adequately capture the myriad of roles taken on by the tablet computer in daily life? And if 'use' is not sufficient, how might we better understand how such a multistable and fluid device as the tablet computer has come to be implicated in so many areas of daily life?

Drawing on work within theories of practice, I have explored ways of reconceptualising 'use' as always a part of, and never divorced from, the 'doings' in which specific 'uses' figure (Schatzki, 1996, Shove and Pantzar, 2005, Rinkinen et al., 2015, Morley, 2017). In keeping with this approach, I have explored forms and processes not of 'use' as such, but of how tablets have been variously integrated into specific practices, into configurations of practice, and into the 'nexus' of practice more broadly. These ideas emphasise the ongoing relation between the tablet computer and what people are doing. This led me to recognise that the ways that devices come to figure within and across practice simultaneously involves forms of stability (i.e. integration into existing practices) and change (i.e. the dynamic process of integrating).

In focusing on the tablet in this way, I have sought to contribute not just to a literature which is concerned with the tablet and its 'uses' but also to social scientific understandings of the appropriation and uptake of technologies and devices more generally. I began the thesis by discussing some of the themes discussed in this literature, including interpretive flexibility, closure, and the user. I now conclude by showing how I have developed and worked with these ideas before summarising the general contributions of the thesis. I finish by outlining future research directions that build on the research agenda and the insights developed in this project.

The Fluidity of the Tablet Computer in Daily Life

Returning to the opening question about what the tablet is 'for', it is now evident that tablets, along with other such flexible technologies as the smartphone (and laptops and desktops) have no one 'use' with which they are specifically associated. This means that it is difficult to know what they are and what they are 'used' for. Looking at the possible uses of a device as imagined and represented by their manufacturers

helped to show how things like tablet computers are situated in the 'market' and how this changes. Following this strategy allowed me to show how the iPad and tablet computers more generally have been positioned, and how manufacturers have developed these products often in response to consumers' changing understandings of what the tablet computer is and to how it relates to other, also changing technologies in the field.

In addition, and as I have argued throughout the thesis, the fast rate at which tablets were appropriated suggests that they were rapidly embedded in not one but many different practices (Ofcom, 2017). In other words, tablet computers *must* be fitting within pre-existing practices rather than necessarily 'creating' new practices (as was, for instance, the case with the Walkman and the formation of on-the-go music listening (Bull, 2006)). Recognising that the tablet computer has not given rise to obviously 'new' practices meant that I had to take the notion of two-dimensionality, as proposed by Ihde (1993), seriously.

Ihde (1993) suggests that there is a two-dimensionality to all technology (i.e. 'modern' and otherwise) in that all technologies can be put to multiple purposes and, equally, that all purposes can be satisfied by multiple technologies. To this, I add the point that the tablet is distinctive in having become embedded in, or become part of, so many areas of daily life. This has led me to explore different kinds of association. For instance, I have shown that there was a developing association of the tablet computer with video-calling practices among my own respondents, an association that has also been evidenced on a broader scale (Ofcom, 2017). But how do such associations become established?

To explain the development of associations between an object and particular practices, I highlight Elias's work (1939), which explores how social attitudes and standards which surrounded table manners, violence, and forms of speech were gradually transformed by increasing thresholds of shame in *The Civilising Process*, demonstrating how materials can become associated with activities through changing expectations and standards. These ideas, and particularly the relation of the fork to standards and expectations of table manners, can also be taken up through a focus on the practice of eating (Warde, 2016). I take up this specific (though rudimentary) example for one moment in order to make the point that some objects are more centrally (or specifically) associated with particular practices than others. These associations are not accidental but are developments that are formalised and made durable through practice.

In the practice of eating, particularly in the Global North, the lifting of food and the holding of it while cutting is predominantly associated with the object of the fork. While there are, of course, other tools which can take on this role, with fingers, spoons, and chopsticks being some of the more obvious examples, the fork is centrally implicated in practices of eating for many. Not only is learning to use a fork a step in a child's development, but rules and skills have been developed around the 'proper' manner of using such an implement in the conduct of different types of eating (Elias, 1939, Warde, 2016). There has been no equivalent 'formal' development of understanding in relation to the tablet, or regarding its associations with other objects or with particular and specific practices. Put differently, the fork is specifically associated with the practices of eating. By contrast, the more fluid technology of the tablet computer has multiple actual and potential associations with a vast range of practices. While some such links appear to be established, others are newly formed

or in the process of becoming. As I discuss below, there is no obvious closure since processes of integration continue to unfold over time.

Prior to that discussion, I step back to comment briefly on what my approach has allowed me to say about the tablet computer's fluidity in and across practice. As already mentioned, the tablet computer has become a part of a wide number of practices. It is fitting into daily life, forming and reforming relations with other and similar sorts of devices and associated objects through successive moments of being picked up, and coming to figure within performances of multiple practices. Secondly, many of these practices pre-existed the tablet computer's arrival and, as such, have been reconfigured not only by the tablet but by the apps that are run on it. The types of reconfiguration involved often entail changes in when and where specific practices are enacted and, sometimes, also a change in the qualities or understanding of what such practices involve.

Alongside the tablet's apps, there are other capabilities embodied in and through the tablet's design and its form (e.g. Wi-Fi, compass). Different practices draw on these capabilities (and their possibilities) in different ways. It is because the tablet computer is itself composed of multiple technologies that it is fluid in ways that other, more discrete objects are not (e.g. the fork). It is this fluidity of the tablet computer within and across practice that allows the device to act, on occasion, as an integrator or crossing point of different social practices. More specifically, it brings together the possibilities of performing multiple practices in one 'place'. Still, in order for the tablet to act in this way, to actively integrate practices, it must be combined with other objects like sofas, chairs, or televisions. It is when the possibilities of the tablet computer are combined with other objects and technologies, and their possibilities, that multiple practices can be performed at once (e.g. television watching and playing

games on the tablet). There are other senses in which tablets figure as the 'crossing points' of different practices. For instance, this same object can accumulate data, images, or resources – including apps – that transform possible courses of action in several 'directions' at once.

In a literal sense, the tablets that I studied were not especially mobile. Though they are often characterised in this way (Martin and Ertzberg, 2013, Ventola, 2014), none of my respondents had mobile-data-enabled tablets and were, as a consequence, 'tied' to the reach of the Wi-Fi. In other senses, tablets were highly 'mobile' in the sense of shifting roles and of losing and acquiring 'functions' as they were linked to or detached from the performance of different practices, often in association with other related systems and devices.

In representing the tablet computer as a potential crossing point of practice, I recognise that it can act as a medium and source for multiple digital (im)materialities, like apps and images, which themselves serve to spatiotemporally expand moments of doing; for instance, bridging between different ways of maintaining family relations at a distance. At the same time, it can end up becoming what amounts to a single-purpose device tied to a specific location. This was the case with the tablet that was solely used (i.e. specialised) for watching TV in bed. The concept of the tablet as a 'fluid' device helps capture these varied possibilities.

(A Lack of) Closure in Use and in Practice

Moving on from the tablet's fluidity, I was also interested in understanding the tablet computer as something that was, in various ways, integrated within and as a part of one or more practices. This required acknowledging that the routine performance of daily life (Reckwitz, 2002) is an adaptive and responsive process. Crucially, the

routine or repeated enactment of a practice does not involve its replication (i.e. the exact repetition of chains of action). That is to say that during successive moments of integrating, there will always be some variety (Hui, 2017) or diversity (Morley, 2014) in the exact detail of performance.

This is because daily life itself is constantly evolving and changing, and even the ongoing integrating of 'not so fluid' objects must adapt and respond to these changes or else potentially lose their roles within particular ways of doing. Hand and Shove (2007) make a similar point in their investigation of the freezer, demonstrating how there is work involved in maintaining 'closure' (or, in my terms, the embeddedness) of an object within a practice. Each successive moment of bringing an object into the performance of one or more practices strengthens the associations of that object with those practices. Maintaining integration is therefore an active achievement.

To complicate matters, I have already made the point that there is no single practice with which tablet computers are specifically associated, nor has the introduction of the tablet computer engendered any obviously 'new' practices. So, any moment in which the tablet is initially appropriated and integrated into a pre-existing practice is a moment in which there is the potential for change in that practice. But what do these insights allow me to say about closure or the lack thereof it? Alternatively, and from another perspective, do processes of integrating the tablet computer themselves change over time?

It is clear that you cannot separate forms of change (e.g. modification, alteration, flux, transformation) from processes of integration. When a practitioner appropriates a 'thing', digital or otherwise, and makes 'use' of it within the practices of their daily life, the insertion of that 'thing' rearranges other existing material relations and, to

some extent, reconfigures the contours of the practice itself. I offer an example from the thesis to explain this further. When a tablet is 'integrated' into the practice of watching films on Netflix, other previously significant links (e.g. between the laptop connected to the television via HDMI cable) are broken or reconfigured. Not only does the relative position of the tablet shift, in relation to other elements of the ensemble, but so do the competences and skills required to perform this way of watching Netflix and the spaces in which Netflix can be watched. I have shown, for example, how the tablet has formed crucial relations with beds and knees in ways that the laptop + television + HDMI cable combination has not, and I have shown that this new combination has generated new opportunities and spaces in which specific practices are enacted. Bringing the tablet computer into such practices brings about the possibility of watching television in new and different times and spaces. Other pathways are possible. For instance, practitioners may cancel their Netflix account or spend more time reading instead, thus displacing the tablet computer's significance, at least in this aspect of their life. Most of the participants in this research were able to point to a particular app on their tablet computer they had downloaded, tried out, but had not used since.

However, many also described situations in which the tablet computer regularly and repeatedly figured as an essential 'element' (often alongside other devices) which had become integral to the conduct of specific practices. It is in these ongoing moments that the associations, for instance of the tablet computer (+ Netflix app + …) with a particular way of watching television, are strengthened.

I suggested earlier in the chapter that there has been no 'formal' development of understanding around the tablet computer and that it is not a device that is strongly associated with particular practices (as is the case with the fork, for example).

However, some of the practices that I have discussed appear to be becoming 'tablet-dependent'. I have, for instance, recognised the centrality of the tablet computer in the video-calling practices of my respondents. I have also noticed legal and regulatory shifts that signify the growing importance of tablet computers in watching television and in related activities like those of online streaming. These point to a redrawing of boundaries around what constitutes television watching as well as the means through which this takes place.

In this thesis, I have sought to explore the ways in which tablets have become embedded in daily life. Although this question suggests an interest in normalisation and stability, I have argued that the processes involved are inherently dynamic. In other words, forms of change entailed by the process of integrating and emerging forms of stability (i.e. integration, embeddedness) are two sides of the same coin, and are both necessarily interrelated terms. There is no change without stability and vice versa. To elaborate, if there were no stable features, the practices into which the tablet computer is now integrated would be totally transformed – they would be best described as different practices, not as modified or reconfigured versions of pre-existing practices.

My point is that it is the ongoing integrating of an object or device into a practice that leads to its embeddedness or 'integration' into that practice. Alongside this, the embeddedness of that object or device (within a practice) is always provisional: it must also adapt to other forms of change if it is to remain important for the conduct of that practice. Put differently, the roles that objects and devices take in practice are necessarily tenuous. What holds them in place is the formation and reformation of practice-relations around them, lending durability to objects and devices within and across practice. As the boundaries around what constitutes a particular practice

evolve, and as these accommodate new object relations, new meanings, or new forms of competence, such redefinitions variously enhance or undermine the status of things like the tablet computer within these practices.

In writing this thesis only eight years after this second 'generation' of tablet's (re)introduction to the social world, the accounts I have provided of the tablet computer's integration are necessarily partial snapshots of transformations that are ongoing. Just as important, in seeking to describe and account for these processes of 'transformation', we must first move beyond the figure of the user. This is because transformation cannot be understood through a focus on individual users alone.

Revisiting the Figure of the User

A part of the positioning of the thesis involved a distancing of my work from those who write about the figure of the user, or of user communities, and who do so in focusing on how technologies are taken up and appropriated (Oudshoorn and Pinch, 2003, Hyysalo et al., 2016). I deliberately rejected this approach on the grounds that discourses of use typically focus on the individual user (consumer, prosumer, etc.) or user collectives (relevant social groups, etc.) rather than on the specific and multiple practices which exist beyond such 'users' and of which the tablet has become a part.

This did not prevent me from collecting and working with detailed analyses of respondents' accounts in which I sought to connect contextualised instances of use in relation to the practices of which they are a part. In doing this, I have demonstrated that it is possible to extrapolate broader narratives of practice from local accounts of appropriation and use. Precisely how these connections are made depends on how the research is designed and on the questions that are being pursued. In my case, this

involved a focus on practices, and relations between practices, in which the tablet is entangled.

It is not simply that other (and often competing) approaches (as reviewed in Chapter 1) do not allow for a consideration of some of these tablet-practice relations. Rather, the point is, that in mobilising theories of practice, I am obliged to look beyond the user-technology relation alone, to consider some of the more extensive processes that the tablet computer is entangled within, and to investigate the very meaning and constitution of what counts as 'use', as that evolves. This is to say that the specific lines of enquiry followed are a consequence of my theoretical approach.

In challenging and decentering the figure of 'the user' in this way, I was able to focus on different tablet-practices relations; specifically, the practice-material relations that are revealed when exploring different dimensions of integration. In working with notions of integration and integrating, I was prompted to follow new lines of enquiry – for instance, into how configurations of tablet-related objects form; into tablets as crossing points and integrators, and more broadly into the nexus of practice. These reveal tablet-material relations which are crucial in understanding how the device has come to be embedded within social life. In short, concepts of integration, as mobilised here and elsewhere (Shove and Pantzar, 2007, Morley, 2017), broaden the focus from the tablet (+ app) + user relation alone to the remainder of the configuration in which the device is situated. Attending to the tablet-configuration dimension of integration allowed me to develop and work with the proposition that any one practice draws together a mixture of devices and objects in moments of enactment (that is, in doing). It is this configuration that takes centre stage in my analysis, not the user-object relation.

This move, in turn, points to other, also relevant considerations. The tablet computer is also fitting into a broader nexus of practice which is brought into view through my approach. For example, I was able to examine the tablet not in relation to one or another discrete practice, but as a node in forms of materiality that link together a great range and number of practices. This was key because it is not enough to connect 'use' to singular practices in which these 'uses' are implicated. It is also necessary to recognise that our performances of practices often link together with the performances of practices of others (i.e. chains of action involving other practitioners). We do not act independently of one another, and understanding that our own moments of performance can feed into other practitioners' moments of performance allows for an examination of how the tablet computer figures within broader forms of social life: the tablet is not only relevant in the daily life of one practitioner (i.e. user). Still, it is not enough to say that I have studied such relations; the further challenge is to show that these relations matter and directly impact accounts of how the tablet computer has come to be embedded in daily life.

By working through different dimensions of the tablet's integration into practice and then taking a more longitudinal view of some of these relations, a further challenge arose; namely that of conceptualising what I refer to as the 'extended' tablet. The key point here was the observation that tablet computers (and apps) were being reconfigured by (and were also reconfiguring) relations and changes that were occurring far beyond the single device and practitioner in focus at any one moment. Such developments were of relevance for the tablet itself, not only for its design or for the range of apps installed, but also for how it was positioned and understood in practice.

In thinking about the tablet computer's integration (and thus uptake, appropriation, and transformation) in these terms, the figure of the user becomes less and less relevant. Not only does the label of the user bring into focus the user–technology relation at the expense of other, broader, yet still crucial relations, it also focuses the analyst's attention on the local interaction between the user and their device as opposed to the broader workings of how the tablet computer becomes a part of social life. By viewing the tablet computer as a node within the nexus of practice, it became clear that the tablet computer is entangled in relations which are occurring far beyond any one user or user community. The success of the tablet computer, and one reason why it has been so rapidly appropriated, might therefore be as much about these other and extended relations, and their continued success (including their reconfiguration over time), as it is about the user–device interaction.

The discussion thus far has concentrated on a handful of core themes, highlighting insights the thesis has contributed to debates about interpretive flexibility; closure; and the user. I now bring these together through a discussion of 'transformation'.

The preceding paragraphs have underlined the ongoing dynamic processes of integrating, showing that the tablet computer is as much about other people (e.g. family) and institutions (e.g. schools) as it is about the practitioner and the device in isolation or at one point in time. I now suggest that these processes constitute ongoing forms of 'becoming', some of which have 'transformative' effects on the practices and relations of which they are a part. Making such a claim depends on defining the extent of change and on taking a view about when that change becomes 'transformational' of practice. For instance, when, and on what basis, can we claim that a 'new' practice has been formed by the integration of a 'new' object?

One response is to return to the idea of classification. Issues of categorisation and classification have been a common concern in social studies of science and social life (Bowker and Star, 2000). Classification – or at least the analytic naming and bounding of practices – is also of concern to researchers seeking to describe and follow particular practices and arrangements over time. Methodological decisions have to be made about how to name and categorise particular arrangements, stabilising these analytically (at least temporarily) to enable description and analysis. In some cases, and in much of this thesis, such decisions are informed by the kinds of categories and terms that practitioners (manufacturers, tablet owners) themselves use (Hitchings, 2011).

Through these and other means, it is possible to identify instances in which specific practices change *and* to categorise and discuss the different forms of change involved (Shove et al., 2012, Hui et al., 2017). For instance, and as Schatzki notes *"[…] where multiple mutations are accompanied by continuities in other components, a practice lives on",* but *"when changes in organisation are vast or wholesale, or a practice's projects and tasks are simply no longer carried out, former practices expire"* (2002: 244). Thinking back on the practices examined in this thesis – for instance, watching television – it is clear the practice of television watching has evolved because of changing sets of devices and objects (which include, but are not specific to, the tablet computer), allowing for new forms and possibilities in the spaces of watching television. Whether it makes sense to say that entirely 'new' practices have emerged, or that television watching has been reconfigured, depends, following Schatzki, on the extent of continuity (i.e. embeddedness) and change (i.e. adaptation and diversification in ways of doing). However, this approach is further complicated by the conclusion that television watching is multiply 'anchored' and shaped by ongoing and successive moments of integrating diverse sets of changing devices and objects,

of which the tablet is only one part. As described above, a huge range of other devices (e.g. LCD televisions, smartphones, PVR boxes, streaming services) have diversified the forms of, possibilities in, and qualities of 'watching television'.

This observation reinforces the argument that practices and their respective configurations come to constitute one another through processes of integrating that continue over time. In effect, it is the processes of integrating themselves (i.e. not just one device but a range of different devices and objects) that have the potential to 'transform' or radically change the contours of a practice. As increasing numbers of tablet-related devices become available, and as these are integrated into a wider number of practices (which includes practices of television watching), so (at least some of) these practices experience ongoing forms of multifurcation and diversification, changing what it means to perform a practice, as well as the means of that performance.

It is important to reiterate here again, however, that I do not define, nor work with, one consistent form of 'change' across the entire thesis. Instead, I am interested in how changes, adjustments, and also forms of ongoing if momentary stable processes operate at different scales. None of the chapters is explicitly concerned with evaluating or measuring different forms of 'change', but in practice each provides important insights into the many dynamic processes involved in integrating tablets in practice (e.g. Chapter 4, 5, 6). This is because in focusing on relations that occur far beyond the user and their technology, daily life (now including tablet-linked or tablet-enabled practices) emerges as a dynamic entity that is constantly evolving and changing.

Yet such claims about the extent and character of change can only be applied in hindsight as the 'mutations' and multifurcations mentioned above expand and interact with one another and accumulate over time. What is interesting about all of this is not so much the scale of 'transformation' itself but the pervasive and also persistent nature of ongoing adaptation. Although they have appeared in different guises, issues of reconfiguration and mutual adaptation run through all of the empirical chapters in the thesis.

With these observations in mind, what can I now say about the tablet's arrival and subsequent appropriation that adds to existing, and usually more linear and specific, accounts of users, 'uses', and 'uptake'?

Contributions and Insights

I now highlight some of the broader contributions the thesis has made, but first I will draw attention to one specific limitation of my research. In first positioning this thesis, I made the point that concepts of 'use' capture little of the complexity of how objects and devices come to be implicated in the performance of daily life and that it is difficult to describe the multiple, and also ongoing, appropriations of objects and devices in these somewhat static terms. This is especially so given that one of the aims of this research was to ensure that 'the user' and 'the technology' were not analytically separated in my work.

At the same time, and even given my focus on processes of 'integrating', I have had to specify a subject and object in order to describe how successive moments of doing contribute to the integration of a tablet within one or more practices. This has the unintended effect of artificially stabilising both subject and object and doing so in ways that do not quite capture how things come to be embedded within practices. As

such, the terminologies that I use appear to betray my intention of not separating the object and subject in my analyses.

While practitioners do indeed bring together the resources required to perform a practice, there is a recursive relation between practitioner–tablet–practice which often slips from view. Throughout this thesis, I have sought to work with a conceptualisation of 'use' which does not separate the practitioner from the device. I have therefore worked with the more active language of integrating, but even so, it is impossible to escape the problem I want to address. Similarly, my ambition of broadening the analytic frame – and of moving away from the tablet alone – is arguably betrayed by the need to start from and work with the object of the tablet itself. I have repeatedly made the point that any one practice draws in a mixture of objects and devices, but this is not always clear when there is a need to determine exactly how specific 'things' are integrated into practice. I have tried to counteract this by using parentheses throughout the chapters (e.g. tablet (+ app + …)) to highlight the interrelations which are of importance in my discussions though potentially not directly in focus.

Some of these difficulties are hard to overcome, particularly given that, in describing their daily lives, people do perceive themselves to be 'using' a technology. For instance, the interviews were conducted with participants who often talked about the ways that they 'used' their tablet computers in daily life. This was helpful language, especially when trying to explain my research (Cerwonka and Malkki, 2008). However, beyond the interview situation itself, my methodological and analytical processing of what appeared to be instances of 'uses' was conducted with an eye on understanding the tablet's dynamic integration into practice.

I believe that this thesis has shown that it is possible to connect instances of 'use' to daily life more broadly and to thereby reveal processes of integration and embedding. The point here is that although my participants could indeed be viewed as users, and they do – in ways – use their tablet computers, they are drawn into and are part of more extensive processes through which tablet computers are embedded into social life and through which tablets are also implicated in changes in social life. These relations only come into view when we connect instances of 'use' to the doings and practices in which these 'uses' are implicated.

Having highlighted some of the dilemmas involved in mobilising concepts of integration, I take stock of some of the more general contributions of my research and finish by outlining specific propositions which might inspire others to take a similarly integrative approach to themes of 'use' and appropriation.

Firstly, it is clear that understanding use in relation to the practices in which these uses figure brings other and essential relations to the foreground. Setting aside the 'user' to instead focus on how technologies become embedded within and across practice has led to insights that contribute to literature which is especially concerned with tablets and their uses, and with understanding the tablet's effects on different spaces and areas of daily life (Barjarin, 2010, Enriquez, 2010, Ifenthaler and Schweinbenz, 2013, John et al., 2012, Blackwell, 2014). Unlike much of this literature, I have shown how the tablet 'cooperates' with other devices, changing but often not replacing their roles in, and as part of, the conduct of specific practices.

Though it is not unprecedented to notice that the tablet computer needs apps, I add the further point that it is these apps and their combinations with the tablet computer that make the device particularly or distinctively fluid or open to reconfiguration. This

was evident not only in the cases explored in different chapters of the thesis but also in the way that the tablet computer, and specifically the iPad (and its apps), have been positioned by its manufacturers. This positioning has been dynamic over time and necessarily so; the iPad's actual and imagined 'uses' evolve, taking into account not just the feedback (from 'users') about their 'actual' use of the tablet but also the shifting configurations and suites of other devices (e.g. smartphones, laptops).

I have also shown that the tablet has taken on a great number and variety of roles across and within many different practices, and is contributing to the diversification of the practices of which daily life is made. I have also paid attention to the point that processes of integration often involve things falling out of use; established connections are broken as new ones are made. Again, this is a complex process. Something like the tablet can indeed 'fall out of use', as some of its newly established roles can migrate across to other devices and objects. In this sense, although not in active 'use', it has arguably changed the landscape of practice. In addition, there are instances in which only parts of the tablet configuration fall out of use (e.g. apps, device) rather than the totality of the tablet computer. One account of the tablet falling out of use is not necessarily indicative of a broader trend, and as I have explained, such trends are made by multiple integrations dispersed over time and space. Integration is therefore not just about the figuring of an object or device within a practice, but also the formation and reformation of practice relations through ongoing integrating which lends durability to the association of that object within a practice over time.

While I have argued that there is rarely a neat or complete substitution of one material object for another, and that new ways of doing develop around particular configurations of devices and objects, the dependence of the tablet computer on

particular co-requisites like charge and Wi-Fi or mobile data connectivity is important. Where these co-requisites are not available, other devices like laptops or phones are sometimes 'used' instead. The roles of the tablet computer shift in relation to the remainder of this 'family', and when other devices are picked up and come to figure within the performance of a practice instead of the tablet computer, new practice-based dependencies may form.

Again, this is not a process in which one device is neatly or simply substituted for another. Instead, and as described, new forms of practices (and new configurations) often emerge and co-evolve alongside these older forms. In taking a more longitudinal view of how practices adapt, I have described the branching and splitting of practices as forms of multifurcation. This allows me to recognise that histories of practice often – if not always – involve changing sets of devices, objects, and services which engender a multiplicity of branching relations, not simply processes of splitting or hybridisation.

Stepping back from these particular insights to consider what they reveal about how and why the tablet was so rapidly 'taken up', I argue that explanations of this process require a reconceptualization of 'use' along the lines outlined above. In bringing the thesis to an end, I outline four propositions which underpin a more integrative and relational approach.

1. Technologies, devices, and/or materials are never integrated in isolation. Their 'use' always depends on the use of other objects and services. Understanding the use of a particular object or device therefore requires an understanding of the relations it has formed with other objects or devices. Some of these relations are more essential than others (i.e. co-requisites) and

are key in understanding the embedding of an object or device. Other material relations are less dependent, but this is not to suggest that they are not crucial in understanding how devices come to figure in practice and so in the conduct of daily life.

2. The use of a technology or object never completely or neatly substitutes the use of other technologies and objects. ICTs are said to be transforming daily life (Wacjman, 2008), but I argue that this is as a consequence of the ongoing multifurcation of practices which make up that daily life and the diversification of ways that constituent practices are performed. Things may 'fall out of use', and roles may migrate to other objects or devices, but this process is more about the formation (and reformation) of relations with a 'new' object than simply the dissolution of established links.

3. Our use of objects and devices do not occur in isolation from the practices which make up our daily lives. Further to this, our daily lives do not occur in isolation from the daily lives of others, and chains of action in which uses of technologies are implicated can be seen to impact or contribute to the chains of actions in which uses of other objects are themselves involved.

4. Using an object is both an adaptive and responsive moment in daily life. At the same time, these moments are also characterised by forms of stability. Use is thus a form of change and of stability in daily life.

These four propositions enable me to reconceptualise and thus reclaim the notion of 'use'. As presented here, use always occurs in relation to one or more practices. As such, the concept of 'use' needs to be detached from the singular figure of the user

(e.g. as represented by Oudshoorn and Pinch (2003) and Hyysalo et al., (2016)). I have argued throughout this thesis that this figure focuses the analyst's attention in ways that divorce people from the contexts in which they are situated and in which they are acting. In other words, the category of the user tends to focus analysis specifically on interactions with a device, abstracting these from the contexts of daily life and of many other objects and practices in which such objects are situated.

New Research Directions

Having made the point that integrating is an adaptive and ongoing process, I believe one especially fruitful avenue for further research would be to carry out a more longitudinal study into the ways in which such processes develop over a longer period of time. Though I conducted follow-up interviews with some of my participants over a year after the initial interviews, the accounts that I have provided of the tablet's integration are partial snapshots of moments which are still in becoming. By this, I mean that the tablet's roles, as described in this thesis, are not stable. More importantly, over a longer period of time, the ways in which tablets are, and continue to be, integrated may have cumulative, compounding, and (potentially) transformative effects on daily life. These lie beyond the scope of the present work.

Secondly, in analysing particular dimensions of the tablet's integration into diverse practices, I have not examined others with the same vigour. For instance, the relations between tablet computers and relevant infrastructures (e.g. of data, Wi-Fi, etc.) are not taken up to the same extent. This is a limitation in that infrastructural relations are clearly a part of the story of how tablet computers have become embedded within daily life. There is therefore scope to address these issues in the future, and there are opportunities to examine these relations in greater depth.

Thirdly, I call on others to conduct investigations into the shifting relations between tablets and related devices, especially including smartphones and laptops. Understanding how these devices are continually repositioned in relation to each other would contribute further to an understanding of the processes through which tablets are being integrated. This is because these processes are not mutually exclusive but rather interact with one another, simultaneously impacting on the trajectories of similar sorts of devices. Understanding how these trajectories intersect, merge, and contrast with one another would provide a more detailed understanding not only of the tablet but of the integration of ICTs in daily life more generally.

Finally, a last word on the question with which the thesis began. Is it still a mystery how the tablet computer found its way into so many peoples' lives and with such speed? To some extent, yes. But in describing the tablet's chameleon-like qualities, and in explaining how it found its way into such diverse areas, it is evident that it exemplifies forms of specialisation (sometimes taking on unique roles) and of generalisation (being one of a range of devices with which to view images, do email, etc.). Although I have concentrated on the tablet, this narrative of embedding and becoming within and as a part of multiple practices, and of mutually shaping practices that are themselves in constant flux, might well apply to a wider range of consumer goods than is usually recognised.

Appendices

Appendix 1 – iPad User Guide Analysis: Table of contents over time

User Guide	'iPad User Guide' (iOS 3) (2010)	'iPad User Guide For iOS 5.1 Software' (2012)	'iPad User Guide for iOS 7.1. software' (2014)	'iPad User Guide for iOS' (2016) now an eBook available through iBooks, instead of a PDF, or web page on Apple.com
Categories added	See contents, below.	Basics Messages Camera	Siri Clock Podcasts.	What's new in iOS 10 Personalise your iPad Sharing

		FaceTime Photo Booth Reminders Newsstand Game Center, Appendix B: International Keyboards	Appendix D: Safety, Handling, & Support	iPad and other devices Privacy and security Home TV iCloud Drive Restart, update, reset, and restore Copyright

Categories added (cont'd)		Appendix C: Support and Other Information		
Categories deleted	n/a	None.	YouTube Settings Tips and Troubleshooting	iPad at a Glance. Games Centre Siri iPad in Business International Keyboards Appendices gone.
Categories altered	n/a	iPod now 'Music' iPad in enterprise to iPad in Business	Accessibility now in appendix.	Getting started to Set up and get started. Newsstand to News

Contents, with sub categories removed	Chapter 1: At a Glance Chapter 2: Getting Started Chapter 3: Safari Chapter 4: Mail Chapter 5: Photos Chapter 6: Videos Chapter 7: YouTube Chapter 8: Calendar Chapter 9: Contacts Chapter 10: Notes	Chapter 1: At a Glance Chapter 2: Getting Started Chapter 3: Basics Chapter 4: Safari Chapter 5: Mail Chapter 6: Messages Chapter 7: Camera Chapter 8: FaceTime Chapter 9: Photo Booth Chapter 10: Photos	Chapter 1: iPad at a Glance Chapter 2: Getting Started Chapter 3: Basics Chapter 4: Siri Chapter 5: Messages Chapter 6: Mail Chapter 7: Safari Chapter 8: Music Chapter 9: FaceTime	Set up and get started What's new in iOS 10 Basics Personalise your iPad Sharing iPad and other devices Privacy and security Messages

Contents, with sub categories removed (cont'd)	Chapter 11: Maps Chapter 12: iPod Chapter 13: iTunes Store Chapter 14: App Store Chapter 15: iBooks Chapter 16: Accessibility Chapter 17: Settings Appendix A: iPad in the Enterprise Appendix B: Tips and Troubleshooting	Chapter 11: Videos Chapter 12: YouTube Chapter 13: Calendar Chapter 14: Contacts Chapter 15: Notes Chapter 16: Reminders Chapter 17: Maps Chapter 18: Music Chapter 19: iTunes Store Chapter 20: App Store	Chapter 10: Calendar Chapter 11: Photos Chapter 12: Camera Chapter 13: Contacts Chapter 14: Clock Chapter 15: Maps Chapter 16: Videos Chapter 17: Notes Chapter 18: Reminders Chapter 19: Photo Booth	Safari Mail Music FaceTime Calendar Photos Camera

	Index	Chapter 21: Newsstand Chapter 22: iBooks Chapter 23: Game Center Chapter 24: Accessibility Chapter 25: Settings Appendix A: iPad in Business	Chapter 20: Game Center Chapter 21: Newsstand Chapter 22: iTunes Store Chapter 23: App Store Chapter 24: iBooks Chapter 25: Podcasts Appendix A: Accessibility Appendix B: iPad in Business	Contacts Clock Maps Home TV Videos Notes Reminders

Contents, with sub categories removed (cont'd)			Appendix C: International Keyboards Appendix D: Safety, Handling, & Support	News iTunes Store App Store iBooks Podcasts Photo Booth iCloud Drive

				Restart, update, reset, and restore Accessibility Safety, handling and support Copyright

Appendix 2 – Finalised Interview Schedule

Participant Context; age, occupational status; employment; living situation;

Work Context; what activities make up your time at work; what sort of hours do you work; is your work flexible at all; what sorts of 'things', digital or otherwise, do you use to carry out work?

Everyday life context; how do you enjoy spending your time outside of work?; how often do you do X?

Technologies Context; Other the tablet what sorts of technologies do you have access to? Can you give me a sense of when you acquired these technologies, in relation to your tablet?

Tablet Context; Tell me about your tablet? (length of ownership, reasons for getting a tablet; type)

What is a tablet and what is it for? (intended uses when you first got it)

How did you choose which tablet to get?

Use: Can you walk me through the apps on your tablet. *Times and spaces for using X app.*
How does using x differ from the ways that you do Y with your other technologies?
What apps do you have?
Which are your most used?
Which are your least used?
(music, TV, maps, work, social media, communication)
Do you have any folders; which do you have?

TV Watching – Tell me about the ways you watch television. how often do you watch TV, what sorts of things do you watch, when do you watch TV and through what technologies; does your tablet computer figure in any of the types of watching you do?

Photography; do you often take or send photos in your daily life? In what sorts of situations? What device do you use to do this? Can you walk me through the photos that you have on your tablet computer? How did they come to be stored on your tablet?

Images - I'm particularly interested in images, and photography in daily life, so anything from photos and videos, emoji's, GIFs, memes; that sorts of thing. Can you explain if you use any of these in your daily life, and how? How often? In what circumstances? What kinds of apps, other than your Photo app, involves the sharing of images?

used on the move: purpose; location of use; frequency of use; length of use; perception of competence; has this changed how you do this in any way; how;
not installed by you: who; purpose; shared use?; frequency of use; location of use

Are there other things that you do regularly on your tablet that you don't access through an app? Is there anything that you do on your tablet, that is specific to your tablet alone – you don't do this through anything else?

Do you have the same apps on both your tablet and phone? How do they differ? Why?
Do you do certain things on your tablet over other technologies? Why?
Are there things that you won't do on your tablet that you will do on your other technologies?

Where (in and outside of the home) do you tend to use your tablet?
When and how often in the day do you use the tablet? Do you have such a thing as a typical day of use? Could you walk me through that?

new apps: *How do you learn about new apps? Does your tablet model have its own specific App Store? How does that work?*

Storage: *Do you know how to store things on the tablet computer?*

Tell me about what you store on the tablet computer.

what; under what circumstances; how; memory capacity; **Cloud**: perceptions of competence;

Transfer: *Have you had to move anything onto the tablet from another technology, or vice versa?*

perceptions of competence; how often; under what circumstances; how

Limitations: *Is there anything you would like to do with your tablet computer and feel that you can't?* what; why;

Charging: regularity; schedule?; when; where; on the move charging

Is there anything else about your tablet that I haven't already asked you, but that you think I might like to know?

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