Manufacturing the Digital Advertising Audience

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Declaration

I certify that the thesis I have presented for examination for the MPhil/PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extent of any work carried out jointly by me and any other person is clearly identified in it).

Abstract

How does a new medium create its audience? This study takes the business model of commercial media as its starting point and identifies industrial audience measurement as a constitutive operation in creating the sellable asset of advertising-funded companies. The study employs a qualitative case study design to analyse how a mobile virtual network operator (MVNO) company harnesses digital behavioural records generated by computational network infrastructure to turn network subscribers into an advertising audience product. The empirical evidence is based on a three-months intensive fieldwork at the company office.

The analysis reveals *comprehensiveness*, *openness* and *granularity* as the historically new attributes of computational data vis-à-vis traditional audience measurement arrangements. These attributes are then juxtaposed with four kinds of business analytical operations (automatic data aggregation procedures, the use of software reporting tools, organizational reporting practices and custom analyses) observed at the research site to assess how does computational media environment rule key audiencemaking practices. Finally, the implications of this analytical infrastructure are reflected upon three sets of organizational practices. The theoretical framework for the analysis is composed by critically assessing constructivist approaches (SCOT, ANT and sociomateriality) for studying technology and by discussing an approach inspired by critical realism to overcome their limitations with respect to the objectives of the study.

The findings contribute toward innovating new digital services, information systems (IS) theory and the study of media audiences. The case opens up considerable complexity involved in establishing a new kind of advertising audience and, more generally, a platform business. Sending out advertisements is easy compared to demonstrating that somebody is actually receiving them. The three computational attributes both extend and provide summative validity for mid-range theorizing on how computational objects mediate organizational practices and processes. Finally, the analysis reveals an interactive nature of digital audience stemming from the direct and immediate behavioural feedback in an audiencemaking cycle.

Acknowledgements

Knowledge does not grow when people politely agree with each other but from constructive disagreements. Since it is usually more effective to disagree with the others than oneself, scholarly knowing cannot be a solitary exercise. Here are listed some of the people I have had my constructive disagreements as well as occasional agreements over the last five years.

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Finally, there are costs to acquiring a doctorate. Not only one has to survive through the years, but I could have also spent my time doing something else. In terms of personal survival, my move to London to pursue postgraduate studies was made possible by the British Scholarship granted by the British Council Finland in 2006; the Information Systems and Innovation Group at LSE supported me in 2007, 2008, 2009 and in 2010 with the Information Systems Research Studentship; finally, Aktia Bank plc loaned some money so that I could finish the thesis. Also, there are social costs. A number of social relationships have faded; some have got simply broken. However, I have also found new ones – the most important being my lovely wife Wanida.

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Acronyms

I have generally avoided using acronyms except where the argument would have otherwise become unwieldy; the acronym has come to serve as the primary denomination of concept, or the acronym is embedded in the excerpts.

ANT	Actor-Network Theory
API	Application Programming Interface
BBC	British Broadcasting Corporation
CEO	Chief Executive Officer
CPA	Cost Per Action
CPC	Cost Per Click
CPM	Cost Per thousand views (M from Roman numerals)
EPOR	Empirical Programme Of Relativism
HTTP	HyperText Transfer Protocol
IS	Information Systems (an academic research subject)
IT	Information Technology
ITU	International Telecommunication Union
KPI	Key Performance Indicator
LSE	The London School of Economics and Political Science
MVNO	Mobile Virtual Network Operator
OTS	Opportunity-To-See
ROI	Return On Investment
RSS	Really Simple Syndication
SCOT	Social Construction Of Technology
SIM	Subscriber Identity Module (also known as a SIM card)
SMS	Short Message Service
SQL	Structured Query Language
SST	Social Shaping of Technology
VR	Videocassette Recording
W3C	World Wide Web Consortium
XML	eXtensible Markup Language

1 Introduction

How does a new medium create its audience? The question may sound somewhat misplaced. Common sense would suggest simply taking the audience as the people at the receiving end of transmission infrastructure. Apart from the obvious fact that the amount and composition of audience members may vary, the idea of audience itself would seem a rather uncomplicated construct. Take for instance the practices of journalists, marketers and politicians, which all depend on the capability to harness the media as a vehicle for delivering messages to the people *en masse*. For these and many other practical purposes, the audience stands for the sum of individual persons attending to the medium by their habits to watch television, listen to the radio or browse the internet. In other words, the audience is usually assumed to exist independent of the parties interested in it or the arrangements that have been set up to measure audiences.

Media audiences are, however, more complex entities than the habitual usage of the term suggests. Academic audience research has occasionally deconstructed the audience if not to a verge of non-existence, at least seriously problematizing straightforward assumptions underpinning the black box of audience (e.g. Bratich, 2005; Ettema and Whitney, 1994; Morley, 2006; Turow, 2005)[1]. The primary interest of this study is neither in managing audiences more efficiently nor to deconstruct them; instead, I hope to shed light on the process of how people are summoned as the sellable asset for commercial media companies, that is to say, as audiences for advertising operations. The study is both relevant and timely. Understanding the audiencemaking business in the contemporary media environment can contribute to digital service innovation, information system (IS) theory and media studies. The interdisciplinary nature of IS provides a good starting point for analysing how the novel commercial opportunity emerges in the environment characterized by technological information.

[1] A black box refers here to a phenomenon commonly encountered in the science and technology studies (Latour, 1987, Latour, 1994; Pinch and Bijker, 1984; Williams and Edge, 1996). Black box happens when an artefact has been incorporated into a practice as a simple input–output transformation disregarding its internal complexity and inherent capacity to alter the intentions technology is supposed to serve.

Commercial media depends on revenues from selling consumer audiences to advertisers, and as such it is a typical example of multi-sided platform business (Evans, 2009). This study revolves around an attempt by a start-up telecommunications operator company to turn its subscribers into an advertising audience, that is, the product of a commercial medium. The case is not merely about a new outlet targeting a particular consumer segment – although segmentation is an important aspect of any advertising audience today – but a new kind of audience and, therefore, commercial medium. The research site provides a relatively compact setting in which the evolution of media, information systems, and managerial concerns converge in a number of ways.

The process of creating a new audience product is most readily observed while still in progress. The mobile phone has until recently been largely free of advertising, but the industry is keen to transform mobile communications into an advertising platform that has the potential to reach five billion people across the full spectrum of their daily activities[2]. At the same time, the new underlying technological infrastructure is disrupting traditional audiencemaking arrangements in a manner, which can be understood to reflect broader trends in the role of technological information in service innovation. For instance, Varian (2010) identifies new contractual forms and combinatorial opportunities as sources of technological innovation emerging in the computational environment; Yoo, Henfridsson and Lyytinen (2010) point out how shifting product architectures can change the dominant logic for organizing in the industry.

No advertiser is ready to make a significant investment for sending advertisements to an audience of unknown quality and quantity, that is, without knowing the audience product. Advertisers buy measured audiences that constitute the institutionally effective entity in the media industry (Ettema and Whitney, 1994). In contrast to the ultimately unknowable actual audience, the measured audience is based on analytical procedures along industrially accepted variables and traditionally elaborate methodological arrangements to sample people's media

[2] International Telecommunication Union press release "ITU sees 5 billion mobile subscriptions globally in 2010" on 15 February 2010, available at http://www.itu.int/net/pressoffice/press_releases/2010/06.aspx (accessed 11 April 2011)

usage. Even if the measured audience may sometimes closely approximate the actual audience, the distinction between the two is not just conceptual hair-splitting. A whole industry of ratings companies and auxiliary services has emerged around the problem of audience measurement, which has had a significant impact on the historical structuring of media industry and content.

The average time people spend with various media is growing, but at the same time pinning down coherent new audiences in the fragmented media landscape has become a rather complex task (Napoli, 2001; 2003). The mass audience brought into existence by the means of early broadcast media has seen a significant demassification, posing considerable problems for whoever needs to reach out to the masses. The proliferation of media outlets, channels and devices has exploded the individual choice in consuming media consequently making it increasingly difficult to justify knowledge claims about audiences. More powerful measurement would seem an obvious answer to this problem, but the progressively more sophisticated measurement arrangements have not been able to put the problem of constructing coherent audiences to rest. On the contrary, in the long run the solution would seem to perpetuate the very problem it is supposed to solve. Improved measurement makes it economically feasible to set up media outlets for narrower consumer segments triggering further fragmentation. It is this constitutive relationship between the measured and the actual audience that is at the centre of this study.

Numerous studies have analysed the end-user side of new media as well as shifts in content production and consumption, which are both arguably going through significant changes as the access to production and publishing tools have become cheap, decentralized and operable in a peer-to-peer mode (Benkler, 2006; Shirky, 2008; Weinberger, 2007). Zittrain (2006; 2008) discusses the generativity of end-to-end architecture that empowers consumers to take up the role of content creators. Much less scholarly attention has been paid to how the interconnected information environment shapes the audiencemaking arrangements and the kinds of audiences that can be summoned in it. Given the impact advertising has on the sustainability of digital services, this can be considered a significant shortcoming in the literature.

Take, for instance, the recent enthusiasm for free services (Anderson, 2009) that are in fact often multi-side advertising platforms (Evans, 2009).

Audience measurement is fundamentally a technological operation. The recent developments in information and communication technology are disrupting the conditions under which the relationship between the measured and the actual audience has been traditionally established (Bermejo, 2009; Napoli 2001; 2003; Precourt, 2009). More specifically, a digital communications network can record a trace of every click, call and message relayed through its elements (Sørensen, Fagrell and Ljungstrand, 2000). Subscription-based online services and telecommunications networks constitute what Spurgeon (2008) calls registration media, which embed the monitoring of advertising reception into the medium itself. The audiencemaking practices neither have to rely on second-order monitoring technologies nor be constrained to statistical estimates from sample data limited by the cost of data collection. The network captures automatically relevant data into its log files. In some respects this may sound like a minor improvement to the technical capacity to measure audiences. However, the analysis shows that the common computational underpinnings may come to support significant changes in the media industry. In order to understand the potential technological discontinuity, the investigation approaches the main research question from three perspectives. These can be summarized as the following subordinate questions, which are present throughout the study. I will return to the subordinate question explicitly in the final chapter.

1. How does the company manufacture the audience product?
2. How do computational data influence the audiencemaking practices?
3. How does the digital audience differ from traditional media audiences?

Given the type of question and my interest in a changing phenomenon, case study research strategy provides an applicable overall template for the study. The empirical investigation aiming to answer the research question is designed as a qualitative single-case study that is particularly suitable for exploring complex, new phenomena with little extant literature (Benbasat, Goldstein and Mead, 1987).

Contributions from this type of research usually aim at the elaboration of theoretical knowledge instead of empirical generalisations. Theorizing plays thus a dual role in the study. First, it provides necessary scaffolding for obtaining and analysing empirical data, and, second, the findings are developed into contributions at the level of mid-range theoretical concepts (Yin 2003). The study does not attempt to validate a theory in the sense of testing empirical hypotheses deduced from the theory but engages systematically in developing and discussing propositions of a theoretical nature.

The theoretical scaffolding for the analysis is built by critically assessing tenets underpinning social constructivist approaches for studying technology, and by suggesting a way inspired by critical realism that can overcome some of the limitations of the former. Importantly, critical realism posits that the empirically observable things and events are understood as a subset of reality that is largely made of unobservable entities and mechanisms underlying the studied phenomenon. There is a domain of reality beyond direct observation that can be captured only in theory. However, no rigid procedural steps exist for this type of theorizing, which can nevertheless be assessed for its formative and summative validity (Lee and Hubona, 2009). These considerations provide the backbone for an attempt to unpack the manner in which the computational data tokens generated by the network infrastructure mediate organizational practices and processes.

The empirical fieldwork took place at the head office of an advertising-funded mobile virtual network operator (MVNO) company. In 2009, I spent three months as a participant observer working along the employees developing and managing business operations mostly outsourced to a number of contractors and a local sales office. The company had been incorporated in 2006 after succeeding in raising millions of euros in venture capital to support the development and launch of a new platform bringing consumers and advertisers together in an exciting new way (Evans, 2009). Operating as an MVNO but making money from advertising, the organization had "the soul of media, but the body and muscles of a telecoms operator" as one of the informants phrased it. Consumers could sign up for the service by providing profiling information and opting in to receive marketing

messages to their mobile phones. In exchange, the company offered monthly free voice call minutes and text messages. The idea was to deploy the business model of commercial media in the telecommunications industry by turning the network subscribers into an advertising audience. The lack of industrial standards and established business practices in mobile advertising meant that the organization had to engage in an active search for ways to manufacture the audience product.

The fieldwork produced a rich data corpus. The systematically collected empirical material includes 62 days of participatory observation notes, 34 semi-structured interviews covering the head office staff, 26 press releases and 60 blog posts on the corporate website. In addition, hundreds of documents, photographs and other types of material were gathered as the opportunities arose during the fieldwork period. This raw evidence is used to construct an analytical narrative that brings together pertinent observations to uncover the kinds of mechanisms that would make the observed events intelligible. The key analytical procedure could be called writing-with-evidence, the act of narrating evidence through the research questions and a set of theoretical ideas about the specificity of the computational medium. Given the nature of research design, the findings are not suggested to be generalizable to a population of other cases. Instead, the study suggests both extensions and summative validity for a few middle-range theoretical concepts in the literature. The study connects with practice-based studies of organizing and builds on the idea of medium-specific organizational practices (Lanzara, 2009) by pinning down the specificity of computational data in mediating the audiencemaking process.

Reasoning from the empirical observations to the unobservable domain of reality entails necessarily some sort of theorizing, that is, positing conceptual models to capture that which cannot be observed. The approach differs in this respect, for instance, from the popular actor-network theory (ANT) and its recent sociomaterial incarnation in IS. Nevertheless, I will use the constructivist studies of technology in general, including ANT and sociomateriality, and the social construction of technology (SCOT) in particular, as reference points in my attempt to construct an approach to understand the specificity of the computational medium in audiencemaking practices. In contrast to SCOT, which generally refrains from

moving beyond the customary admission that technologies enable and constrain human practices, I will attempt to empirically theorize the substantive rules embedded in the computational mediation of organizational matters. The approach may raise some objections.

First, a narrow theoretical lens may amount to turning a blind eye to other equally important aspects of commercial media. Looking at a novel advertising medium, an economist might see an emerging two-sided market (Parker and Van Alstyne, 2005) or a sociologist might observe the advancement of consumerism (Bauman, 2007) as a result of their disciplinary perception, whereas I wish to analyse the technology. The general point is that different theoretical framings bring up different aspects from the research domain, but without a preconceived idea of what to look for the empirical evidence will not reveal itself to the observer. An attempt to observe without a theory is merely held hostage to a conventional theory (Pugh, 2007a). Theorizing a novel research object is therefore not only useful but also necessary. The rationale for taking technology seriously with respect to the audiencemaking business will become clear against the historical evolution of audience measurement in Chapter 2.

Second, even if technology matters it may only account for the residual variation after more important economic and social factors. Oftentimes and at some levels of inquiry this may be true. However, the rise of productive activity beyond markets and organizations (Benkler, 2006; Kallinikos, 2011a; Weinberger, 2007), the generative aspects of the internet (Zittrain 2006; 2008), and the perpetuation of unintended consequences (Ciborra, 2004) arriving with the new layers of organizational technology point to mechanisms that are not adequately captured in sociological or economic theory. For instance, economic theory has little to say about circumstances in which the boundaries between what is technologically possible, imaginable and impossible are unclear or shifting (Metcalfe, 2010). The commercial media would seem to exist in a sort of informational double bind between evolving measurement technology and audience fragmentation that conventional theories are not tailored to analyse. The issue of theorizing computational technologies is covered in Chapters 3 and 4.

Third, even if we assume an independent, causal existence of technology, under the mainstream social constructivist conception it is categorically subordinated to human intentions and meaning making. Bijker (2010) suggests explicitly that the analysis can remain agnostic about the thorny issue of what exists outside the realm of social construction. A common answer to this problem has been to turn to the ANT (Latour, 1999; 2005; Law and Hassard, 1999) that counters such social determinism by arguing that agencies, that is to say, entities capable of performing various doings, are neither social nor technological, but unfold from the coming together of ontologically variable elements. From the perspective of this study, the problem with the ANT and its recent sociomaterial incarnation in management studies (Barad, 2003; Orlikowski, 2010) is that the approach is based on localist tenets that hinder the examination of technology beyond its context-specific appearances. This topic is discussed in more detail in Chapters 3, 6 and 9.

The thesis is structured as follows. Chapter 2 introduces the industrial setting, institutional dilemmas and the traditional approach for measuring audiences against which the study takes place. Chapter 3 takes it as the point of departure that technology matters in the audiencemaking business, but also argues that the approaches based on social constructivism may not be able to capture the shift from the dedicated audience measurement devices to using computational data from the common information infrastructure as the basis for audiencemaking. Chapter 4 builds the theoretical scaffolding for analysing the role of computational data in shaping organizational practices and processes in the context of the audiencemaking business. Relevant literature on audience measurement is discussed in Chapter 2 and on IS theory in Chapters 3 and 4. Chapter 5 makes an excursion to the concept of business model, and I will visit relevant case studies throughout the discussion. These are then used to elaborate the findings in the final chapter.

The empirical investigation is divided into Chapters 5, 6, 7 and 8, which build on top of each other. Chapter 5 introduces the research site by outlining the organizational evolution and makeup at the time of fieldwork, and by discussing the details of its media business model. Chapter 6 describes the case study research

design inspired by critical realism and sheds light on the implementation of empirical investigation. The chapter also constructs three methodological guidelines that underpin the main analysis presented in the form of an analytical narrative over the two subsequent chapters. Chapter 7 makes a theoretically informed cut into the technological infrastructure underpinning the audiencemaking business. The chapter analyses the technological discontinuity and distinguishes between the layers of analytical operations through which the digital data cascades into the objects representing consumers' media consumption in everyday organizational practices. Chapter 8 builds on these findings and analyses three processes that contribute centrally to manufacturing the advertising audience and how they are differently mediated by the analytical infrastructure. Chapter 9 summarizes and discusses the contributions of the research, provides some thoughts on the limitations of the study, and draws conclusions with respect to pursuing the topic further.

2 Manufacturing advertising audiences

In contrast to many other industries producing goods and services for consumers, the media industry plays an important dual role in the democratic market society. It is supposed both to generate profits for the owners of media companies and to support participation in public matters by covering diverse topics of civic interest. A market-based understanding of media captures the former function while the latter evokes what might be called the public sphere perspective (Croteau and Hoynes, 2006; Küng, 2008). In the context of empirical research, these views should neither be taken as mutually exclusive nor be understood to necessarily imply judgements regarding the paramount role of media; despite their different objectives, the journalistic and commercial functions have traditionally supported each other. A balanced treatment of the industry takes often both into consideration even while placing the analytical emphasis on the other. For instance, it can be helpful to employ an econometric analysis of media markets to understand mechanisms shaping the diversity of programming in the public sphere (Hoskins, McFayden and Finn, 2004; Mangàni, 2003).

It is not easy to give a concise account of the media industry. To begin with, there is a lack of consensus over what kind of firms should exactly be considered as media companies (Hoskins, McFayden and Finn, 2004; Küng, 2008), and the literature is littered with epochal writings about new media and its societal impacts (e.g. Castells, 2000; Negroponte, 1996; Shirky, 2008; Tapscott and Williams, 2006). Instead of attempting to survey all this literature, I will pick out just one inconspicuous observation by Brown and Duguid (2000) to start with; a remarkable amount of business and new services are predicated on the continuation of large-scale advertising. Take for instance the apparent freeness of internet which is to a significant degree based on either real or projected advertising revenues. A recent study by a major consulting company found that the consumers enjoy at the moment

a considerable web surplus that the companies may try to claw back by increasing the intensity of advertising[3].

This study views the media industry primarily through the lens of the market-based view. Historically, advertising dates back to the early days of electronic mass communication and remains as one of its primary business models today. With some notable exceptions such as the BBC, the media industry is organized as commercial companies that generate significant revenues by incorporating third party marketing messages into their consumer offerings. The technical capability to relay advertising messages to consumers constitutes, however, barely a necessary precondition for the existence of a viable advertising medium. This is because the advertisers do not, in the first place, pay for the access to the media space but for the attention of specific audience it attracts.

The business of advertising-funded media is about packaging people into audiences and selling those audiences to advertisers (Barnes and Thomson, 1994). Given a generally competitive market environment, most commercial media companies are pressed to organize according to the demands of this basic institutional logic. The contours of media industry look from this perspective somewhat different than for instance from the definition based on the content type and function (e.g. Küng, 2008). Importantly, the business model perspective suggests that any company attracting the attention of consumers and then selling it to the advertisers can be seen as a media company. Much of the commercial media organizations can be understood by taking their business model as a starting point, which, curiously enough, accords the actual content production a somewhat secondary role in media (Napoli, 2003). Not all commercial media is funded by advertising, but there is a considerable overlap suggesting that major shifts in the audiencemaking business may have implications for the media in general.

This chapter introduces the industrial arrangements that are responsible for maintaining audiences and, as a result, types of commercial media. I will first open

[3] See Bughin (2011). The study compared the amount of money people say they would be willing to pay for using email, search, social networking etc. services with the actual revenues companies are currently making by offering those services.

up the economic underpinnings of commercial media and describe the history of audience measurement dating back to the beginning of electronic mass communication. The discussion will deconstruct the idea of audience as a monolithic concept into more useful constructs of predicted, measured and actual audience, and, importantly, the relationships between the three (Napoli, 2001; 2003). It will be of a particular interest how sophisticated data collection, measurement and analysis techniques are at the heart of audiencemaking arrangements shaping what is conceivable and can be economically justified from the perspective of commercial organization. Advertising audiences exist as institutionally effective entities by virtue of industrial measurement operations (Ettema and Whitney, 1994), and a brief excursion into the power of classifications in rendering the organizational reality suggests that the audience measurement may not only describe but is also involved in generating the audiences.

Against this background the mobile phone stands out as an intriguing device with an almost universal reach yet until recently largely devoid of advertising. However, the situation is likely to change, since a number of industrial behemoths have committed their interests in the mobile advertising space[4]. Surprisingly perhaps, it would seem that many important questions in this respect are less related to the mobile handsets as technological artefacts, their users, and the communicative function of media in general than to a new apparatus inconspicuously monitoring and analysing people's media consumption. From the perspective of traditional commercial media, online advertising in general and search engine marketing in particular have already introduced cracks into the traditional audiencemaking practices (Bermejo, 2009), some of which the mobile platform may take even further.

2.1 The business of advertising-funded media

Advertising is an intrinsic part of contemporary society. Its pervasive character in our everyday environment suggests that a whole range of content, products and services people take for granted depend on advertising. Media firms generate revenues by various mechanisms such as premium rate services, subscriptions fees,

[4] See, for instance, CNET News article "Apple acquires Quattro Wireless" on 5 January 2010, available at http://news.cnet.com/8301-13579_3-10425465-37.html (accessed 18 January 2011).

and one-off sales, yet advertising "continues to be crucial simply because it accounts for the largest proportion of revenues for most commercial media business" (Spurgeon, 2008, p. 103). Advertising can be found in a variety of settings letting consumers enjoy products ranging from the internet search engines to newspapers and television channels seemingly for free. In practice, such content and services are subsidized by media firms who package users, readers and viewers into audiences sold to the advertisers. In other words, the commercial media sells people's attention to organizations interested in having their marketing messages delivered to prospective buyers.

Scholars have found advertising to be involved in societal matters in a number of ways beyond its immediate purpose to foster product sales and indirectly sustain the journalistic function of media. At a very general level, large-scale advertising can be seen as a mechanism regulating consumption. It reduces the risks of overproduction and underproduction (Beniger, 1986; Bermejo, 2009) and has indeed been used for this purpose even in socialist societies (Spurgeon, 2008). Economists ascertain advertising a role in informing consumers about available options and affecting the perceived utility of products (Hoskins, McFayden and Finn, 2004; Nelson, 1974). On top of its persuasive dimension, advertising has been shown to carry information – if nothing else than a signal that the product is considered to be worth advertising. The content of advertising is a symbolic resource used in everyday interactions and reflects cultural values shaping how we relate to ourselves (Ritson and Elliott, 1999; Shields and Heinecken, 2002). Regardless of what we think about particular advertisements, as a whole, advertising is an important mechanism implicated in a number of settings and issues beyond its customary associations with marketing and journalism.

Consumers encounter advertising in a variety of formats, mediums and genres some of which may not even be immediately perceived as advertising. The most common advertising vehicles are various forms of print such as newspaper and magazine advertising as well as advertising in traditional electronic mediums such as the broadcast and narrowcast television, and the radio. The role of internet as an advertising medium has grown dramatically over the last ten years displacing for

instance newspapers as the primary medium for classifieds and giving rise to whole new genres of advertising (Bermejo, 2009). Physical places and gatherings of people ranging from sports events, cultural festivals, cinemas to public transportation infrastructure, and indeed virtual worlds of computer games and online social environments have been turned into advertising spaces. Direct marketing efforts attempt to reach people at their homes and working places by telephone, traditional and electronic mail. In general, the myriad of advertising mediums share the function to connect the advertisers with an audience of consumers. This may, but as the current study exemplifies, does not have to rely on producing subsidized content for the consumers[5]. Embedded inside a virtual environment, the advertisement itself may become part of the content enriching the experience of, say, a racing game.

2.1.1 Permission-based digital direct marketing

The idea of sending advertisements as text or picture messages to mobile phones is among the traditional genres of advertising reminiscent of direct and direct response marketing. The two approaches have traditionally had a low status among different types of advertising, which has prompted many well-known advertisers to avoid such methods. Few people enjoy answering poorly targeted telemarketing calls, the daily routine of cleaning up email spam, or sorting the important letters out of the colourful junk piling at the front door. Despite their appeal as selective forms of approaching consumers, these forms of advertising used to be hampered by a number of factors that interactive online media is supposedly able to overcome (Spurgeon, 2008).

More sophisticated targeting techniques and the dramatic reduction of transmission costs largely brought about by the contemporary information and communication technologies would seem to favour direct and direct response marketing – if not without qualifications. To begin with, the cost of distributing material and collecting responses to the advertising using mail or telephone is relatively high, whereas digital messages are virtually free to deliver, receive and process. An unintended side effect of this and until now perhaps the most prominent form of digital direct

[5] From this perspective, the popular idea of user-generated content means outsourcing the content production to the consumers.

marketing has been the excessive amount of email spam. Targeting advertising efforts at an individual level or using a personal medium such as the telephone are also easily perceived to be too intrusive. Even if the offered product would be relevant to the recipient, questions easily arise, such as where did the advertiser get the contact information and was the contact made in an appropriate manner. Finally, the low quality of available recipient data has often exacerbated the problems. Calling up a penniless student to offer investment services does neither good for the consumer nor to the business, whereas the wealth of consumer data that can be collected in the online environment may help to avoid such mistakes[6].

Spurgeon (2008) believes that the direct and direct response marketing will play an increasingly important role in advertising in the future. The interactive online medium offers a range of new possibilities for direct marketing, which may remedy its weaknesses while bringing some important benefits from the advertiser perspective. For instance, the computational infrastructure makes it possible to interact efficiently at the level of individual consumers paving the way for so-called permission-based marketing, which is also the approach adopted by the studied company. In this form of advertising the consumer provides targeting information along with a sort of informed consent to be approached by advertisers on a trusted medium in exchange for receiving tangible benefits. Despite concerns over how personal information might cascade in the institutional arrangements, at least some consumers segments have been willing to enter into such semi-contractual relationship with media companies (Haggerty and Ericson, 2000; Spurgeon, 2008; Turow, 2005). It is not difficult to conceive the potential improvements of permission-based approach over, say, direct marketing based on crude demographics associated with postal code areas or manually compiled lists of addresses – in the worst case bought from a third party. From the perspective of advertiser, the digital direct response approach has also the benefit that it associates the advertisement with action. This is most readily seen in the evolution of pricing models for advertising in the online environment.

[6] The use of increasingly powerful data collection methods raises obvious concerns about privacy. The topic falls, however, largely outside the scope of this work.

Online advertising such as website banners adopted originally a pricing model based on website visitors' exposure to advertisements measured in cost per thousand page views (CPM). The approach follows the traditional offline pricing based on the number of consumers who potentially saw the advertisement, sometimes known as the opportunity-to-see (OTS). However, the computational environment has made it possible to complement this model with pricing based on the measured actions triggered by the advertisement, which is captured as the cost per click (CPC) or the cost per action (CPA). The latter two approaches have been made feasible largely by the ability of computational transmission infrastructure to capture the totality of user behaviour – an important aspect that will be discussed more thoroughly against the historical evolution of audiencemaking arrangements.

2.1.2 Two-sided markets

The rudimentary logic underpinning advertising-funded media can be understood by looking at the industrial environment and the business model that captures the commercial prerequisites for sustaining the existence of companies in a relatively competitive environment. In the following I will focus on the overall industrial context in which the advertising-funded companies operate and return to the concept of business model in Chapter 5 along with the introduction to the research site.

The media industry represents a typical example of platform business (Cusumano, 2011; Evans, 2009). From the economic perspective, advertising-funded companies operate on two-sided or dual markets, as they create value by bringing consumers and advertisers together in a coordinated fashion (Croteau and Hoynes, 2006; Hoskins, McFayden and Finn, 2004; Küng, 2008; Mangàni, 2003; Napoli, 2003). The media companies offer free or heavily subsidized products to the consumers in order to attract their attention that can then be used to sell advertising space for the advertisers. Profits are made by leveraging network externalities between the consumer market and the market for advertising audiences[7]. This generally explains why many content products and services such as broadcast television channels, radio stations and websites are offered at seemingly no cost to the consumer (Parker and

[7] The more the company product is used on the consumer market the more valuable the medium becomes on the market for advertising audiences.

Van Alstyne, 2005). The larger audience attending to the outlet and available to be sold to the advertisers is seen to offset the potential for other types of revenues.

In terms of the generic business model, the communicative content of medium (e.g. news, entertainment or peer-produced material) and the resulting consumer attention are thereby but intermediary inputs to the process of manufacturing advertising audiences mapping specific lifestyles, consumption patterns and product categories. This has occasionally motivated arguments that watching advertisements is a kind of labour the consumers provide for the media corporations (Turow, 2005)[8]. The advertising-funded business model has important implications for the media institutions and is closely associated with the historical developments that exemplify the role of measurement and sophisticated analytical operations in the process of manufacturing the audience product. Creating a recognized advertising audience has traditionally incorporated inputs from a number of parties in an industrial setting that originated in the early 20th century (Webster, Phalen and Lichty, 2006).

2.1.3 The promise of the mobile phone as an advertising medium

It is not difficult to perceive the appeal of mobile telephony as an advertising medium (Friedrich, Gröne, Hölbling and Peterson, 2009; Harkin, Sørensen, Quilliam and Gould, 2007; Laszlo, 2009). The mobile phone is a distinctly personal device usually tied to an individual person who often carries it constantly with him or her. The digital telecommunications infrastructure affords the interactivity and personalization of content; the targeting and measurement of advertising at a level of detail that can go beyond what is possible even in the internet. The potential reach of the mobile medium is huge as the number of mobile phone subscriptions has been projected to surpass five billion making it possible to advertise to almost the entire global consumer population[9]. For new players such as telecommunication operators, mobile advertising represents a potential new source of revenues to supplement

[8] In fact, in the case of permission-based marketing in general and the current research site in particular, consumers enter into a sort of contractual relationship with the media.

[9] International Telecommunication Union press release "ITU sees 5 billion mobile subscriptions globally in 2010" on 15 February 2010, available at http://www.itu.int/net/pressoffice/press_releases/2010/06.aspx (accessed 11 April 2011)

increasingly competitive voice, text and data transmission prices (Eaton, Elaluf-Calderwood and Sørensen, 2010).

However, advertising in mobile phones has been, until recently, mainly motivated by an interest to learn about the new channel. Despite its appeal to the variety of marketers, the new medium has still some way to go before it will carve out a share of annual marketing budgets of large-scale advertisers. One reason for this has been the industrial fragmentation resulting from different carriers, the variety of handset devices, idiosyncratic advertising formats etc. that, taken together, have made purchasing mobile advertising a laborious task for marketers (Laszlo, 2009). Nevetheless, the mobile telecommunications infrastructure provides opportunities that potentially distinguish it from most previous forms of electronic media.

2.2 Audience as a product

The idea of selling media space to advertisers sounds deceptively simple, yet the electronic mass media has always faced the problem that the audience it sells is largely invisible (Webster, Phalen and Lichty, 2006). In contrast to live audiences, there is no inherent way to verify the reception of messages relayed by an electronic medium and thus to know if the assumed audience is paying any attention. How big and what kind of audience does an advertiser buy by placing an advertisement into a particular media outlet? There is no straightforward answer to this question, since the social behaviour that constitutes the crucial input for making up the audience is generally not controllable by contractual mechanisms in a manner similar to many other factors of production (Napoli, 2003)[10]. The media companies cannot force consumers to watch advertisements and thus have to harness a kind of labour force that is not bound by an employment contract.

The inherent complexity of advertising audience is usefully theorized by Napoli (2001; 2003) who distinguishes between three dimensions of the audience product: the predicted, measured and the actual audience. First, advertising space is generally sold on the basis of *a priori* predictions on the amount and type of consumers

[10] However, see the previous remark regarding the permission-based marketing.

attending the media content during a specific period of time. This is the predicted audience. Second, the final audience composition can be known only after that period by making statistical inferences from a sample of consumers enrolled to industrial measurement activities. It is this, the measured audience, that constitutes an institutionally effective entity with social meaning and economic value in the media industry (Ettema and Whitney, 1994). Third, given the inherent shortcomings of any existing method for observing people's media consumption, the measured audience may always differ from the ultimately unknown actual audience. The scheme is illustrated in Figure 1 incorporating some further distinctions helping to understand the dynamics of audiencemaking process.

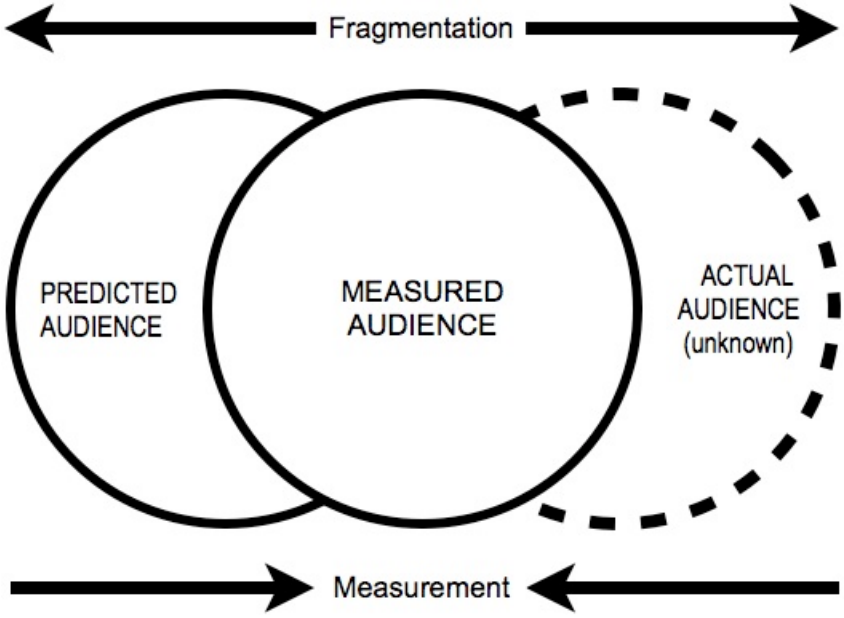

Figure 1. *The dimensions of advertising audience (modified from Napoli, 2001, p. 67)*

It is important to recognize that the three different spheres of audience overlap but do not match each other. The actual, predicted and the measured audience may always differ from each other. The advertisers are generally ready to tolerate discrepancies up to a point, but if the obvious disparity grows too large the audience product starts to fall apart (Napoli, 2003). The task of holding the audience product together is not made easier by the fact that its substance is attention that is particularly difficult to quantify compared to many other industrial goods. Take for instance the aforementioned discussion on the different pricing models. What does it mean that a person has had an opportunity to see (OTS) the advertisement? Even the

wording of the concept would seem to testify to the difficulty of measuring attention. In the following I will mainly focus on the measured and the actual audience, and their relationships that are the most relevant to the current case.

Since the actual audience is essentially unknown, the attributes of the audience product are the attributes of the measured audience. These attributes derive from the measurement arrangements that are set up to estimate audiences for commercial purposes and thus to hold the two spheres of audience together. For sure, advertising audiences have a lot to with the people following or encountering various forms of media, but the variables along which an audience product can conceivably exist have been conditioned by the available methods and observational technologies since the early days of electronic media. Napoli (2001) identifies larger samples and new measurement technologies as the means of increasing alignment between the actual and measured dimensions, whereas declining response rates in commercial audience research and the fragmentation of media tend to pull the spheres apart. The relationship between the actual and the measured audience is therefore both constitutive and inherently problematic, and, consequently, audience measurement is a fundamental operation making up a particular form of audience (Ettema and Whitney, 1994).

The audiences are measured along numerous variables, which classify consumers into relevant segments from the perspective of advertiser. The measured variables and their specific operationalizations reflect therefore the commercial purposes of audiencemaking, not some kind of neutral description of external reality. The original, and still today the single most important, attribute defining the audience product is its size. The traditional conception of advertising has by and large been that of one-way transmission of messages to a mass audience (Spurgeon, 2008), and thus knowing the quantity of attention a particular audience can provide is paramount for making any serious investment in advertising on the medium. However, echoing the technological and methodological evolution of commercial audience research, the composition of audience along demographic, geographic, behavioural and psychographic variables matters a lot today (Webster, Phalen and Lichty, 2006).

2.3 Measuring up audiences

The inherent difficulty of knowing the audience and industrial solutions to this problem have been an important factor in the evolution of media industry, or as Napoli (2003, p. 83) puts it: "Changes in the techniques and technologies of audience measurement significantly affect the structure and behaviour of media organizations and media industries, as well as their relative economic vitality." Barnes and Thompson (1994, pp. 91-92) note "without that [sic] data, the audience has no reality for advertisers and, consequently, no value", while Napoli (2003, p. 33) largely agrees that "the measured audience represents the central economic currency in the audience marketplace". Recording, analysing and making predictions about the actual audience are central practices in fabricating the sellable asset for commercial media (Ettema and Whitney, 1994). To elaborate this point, I will make a brief excursion into the history of commercial audience measurement in the United States[11].

2.3.1 Early audience estimates

The story starts from the beginning 20th century when early radio broadcasters started to sell airtime for commercial messages. In contrast to newspapers and magazines that could provide their subscription data to substantiate claims about the readership for the advertisers, radio stations had no evidence about the size of their listenership. By early 1920s, a practice known as toll broadcasting had nevertheless evolved into a viable source of revenue to support radio station operations. The mere capability to broadcast commercial messages to the devices owned by consumers was not, however, enough to create modern media markets.

The audience estimates remained largely unsystematic and sporadic until 1930s based on station fan mail, occasional mail surveys or simply on the population information within the reach of the transmitter. The marketers had an interest to reach out to the consumers and the broadcasters had an interest to sell airtime, but,

[11] Choosing to discuss the evolution of ratings industry in the United States is mainly out of convenience as the developments have been readily summarized in the literature (e.g. Barnes and Thomson, 1994; Napoli, 2003; Webster, Phalen and Lichty, 2006). The US represents also undoubtedly one of the most developed media markets.

in order to facilitate market exchanges between the two parties, the electronic medium had to be able to come up with evidence if anybody was listening to the relayed messages. Developing solutions to this problem gradually brought the industrial ratings companies into being (Webster, Phalen and Lichty, 2006).

2.3.2 The systematic measurement of radio networks

The first methodological attempts to measure the size of radio audiences took place in the late 1920s in the United States and were soon turned into a systematic measurement of listenership, making it possible for the radio stations to compete with the print media for advertising revenues. Initially supported by the National Association of Advertisers, Archibald Crossley launched in 1930 a regular ratings service for national radio networks based on telephone interviews asking sample respondents to recall what programs they had heard. The service was originally paid by the advertisers, but the radio networks started to use the ratings first unofficially and later on became subscribers to the service. Over time, the media companies became the most important customer for the measurement services (Napoli, 2003).

The telephone recall method had the problem of having to rely on people's memory of what programs they had listened to. Picking on this problem Claude Hooper and Montgomery Clark launched in 1934 a competing service, later on known as Hooperatings, based on an arguably more reliable telephone coincidental method inquiring what people were currently listening. It took, however, years before Hooperatings took over the Crossley ratings despite the methodological advantages, since the latter had already become entrenched in the industrial practices. Many of the patterns and basic concepts of commercial audience research were established by the turn of the 1940s. Most importantly, during this period syndicated studies across competing media outlets compiled by the ratings companies became established as the trustee of the currency, the ratings points, in which advertising audiences are bought and sold still today.

Sydney Roslow developed a personal interview based roster recall method and started publishing audience estimates known as the Pulse of New York for local

radio stations in 1941. In contrast to the telephone coincidental, the method could reach households without telephones and provide data on out-of-home listening as well as during the hours when the coincidental approach was not possible. It could also provide more demographic information, which was interesting especially to smaller local stations that could not compete with the overall size of their audience. The measurement of local radio moved later on to a diary-based data collection by American Research Bureau[12] that started measuring local radio and television using diaries placed in people's homes in late 1940s. The company took over Hooper's local business in 1950s and the use of diaries remained the basis for measuring local radio until recently.

2.3.3 The introduction of dedicated metering devices

The earliest mechanical meters able to continuously capture the reception of media date back to late 1920s, but the technology was mainly developed in 1930s and put into a regular use by the end of 1940s. In 1938, Arthur C. Nielsen first tested a metering device known as the audimeter for recording the station a radio set was tuned in and based on a sample of 800 households equipped with the device launched Nielsen Radio Index in 1942. By 1950, the approach had taken over the telephone coincidental based Hooperatings as the ratings method for national radio networks. Cutting out a human element in data collection solved a number of problems related to the quality of data obtained through interviews and diaries, but it also introduced other methodological issues – not the least the cost of maintaining the metering devices. Technicians had to initially visit the households where the meters were installed to obtain the data and to maintain the devices, and relying on dedicated metering devices has put a considerable premium on the approach even after the introduction of technical capability to read the meters remotely. The metering device approach was extended to the emerging medium of television in 1950s and provided the original foundation for Nielsen Television Index used to price televisions spots and to rationalize programming decisions still today. Nielsen started also measuring local radio and television stations but withdrew from radio measurement in 1964 while gradually perfecting the metering technology for

[12] American Research Bureau changed its name to Arbitron in 1973.

television for which the company has remained the sole supplier of ratings in the United States.

2.3.4 Computational data processing and further developments

In the 1960s, the decreasing price of digital computers made it feasible to use statistical approaches to break the overall audiences down into consumer segments prompting major advertising agencies to invest in computer equipment – long before the age of layout software and desktop publishing (Assael, 2011). The pioneers of audience research had already in the 1920s made attempts to capture the characteristics of consumers beyond the mere size of audience, but it was not until the increasing computing power made it possible to analyse the mass audience into progressively more detailed segments, which in turn made the idea of specialized media a commercially viable option. This contributed arguably to the slow but undeniable decline of media aiming to serve as large audiences as possible and to the rise of specialized media outlets (Barnes and Thomson, 1994).

The 1980s saw again two significant methodological advances in audience measurement. First, faced by a competitive threat from a market entry by a foreign competitor, Nielsen introduced a more advanced metering technology know as the peoplemeter in the United States. The new device could capture not just the tuning of television set but also data on who was watching it. This effectively increased the granularity of audience measurement from the household level to the level of individual people. The second important development was the increase of sample size so that the measurement enabled reliable audience estimation for narrowcast cable television bringing it on par with national broadcasters in the eyes of advertisers.

The ratings companies provide today generally two types of products. First, the syndicated studies dating back to 1930s provide recurrent, in some cases daily, analysis on how people consume a particular medium. These numbers are known as the ratings points and constitute the most important currency of traditional electronic media. They are produced consistently and are comparable across competing outlets

providing a key input for making decisions regarding investments in advertising across different outlets. The higher the rating the larger the audience, and, consequently, the higher the price of advertising space. Second, the ratings companies sell customized studies for individual customers wishing to understand or highlight a particular aspect not captured by the syndicated studies. Around the central ratings companies have emerged a market for various auxiliary services including companies that audit reporting methods, provide sampling frames for studies, offer dispute resolution services etc. (Webster, Phalen and Lichty, 2006).

2.3.5 Problem with the internet audiences

The internet emerged as a major new advertising medium in 1990s, and companies such as NetRatings and Media Metrix started to measure the usage of websites using software installed on the personal computers of sample users. In other words, the companies extended the old metering device concept to the new environment by implementing software applications tracking the browsing habits of the consumer. The fact that comScore bought Media Metrix in 2002 and Nielsen NetRatings in 2007 could perhaps be seen as a testament to the tendency of provisioning of industrial ratings to become centralized into a few companies. Historically, the industry has often converged to a single system of ratings for a particular type of medium that all the parties on the same market are then forced to take as the basis for selling and buying audiences (Napoli, 2003).

However, the online media has introduced cracks into the traditional audiencemaking arrangements that have had difficulties in adapting to the interactive and massively distributed environment (Bermejo, 2009). For instance, lucrative search engine marketing has established a novel approach to audiencemaking that bypasses the ratings companies and generates significant revenues from small and medium size advertisers that have traditionally been less interesting customers to the media corporations. The interests of search engine users are inferred in real-time from the keywords typed into the search box instead of static profiling data. The audience effectively selects itself for the advertisements placed among the search results (Spurgeon, 2008), and there is no need for the

statistical estimates on how many people might have seen the advertisement. The transmission infrastructure generates a trace of every page view (Sørensen, Fagrell and Ljungstrand, 2000) making it a matter of counting the entries in the server log to come up with the exact number of times somebody has had the opportunity to see the advertisement. Also, as it was pointed out earlier, the advertisements can be charged on the basis of actual clicks they triggered.

Extending the old metering device concept used for the television and radio to track people's internet usage faces considerable problems in the new media environment (Napoli, 2003). On the one hand, the online environment fragments the media landscape to an extent that even with significantly increased sample sizes it is becoming impossible to provide reasonable estimates about the audience attending a particular outlet. The number of television channels and radio stations available to the consumers has also expanded, yet the number of outlets in traditional media is nevertheless small compared to the vast number of websites and online services accessible through the internet. On the other hand, the proliferation of devices and social settings in which people access media content has made it increasingly difficult to observe the totality of individual's media consumption (Assael, 2011). Finally, the interactivity built into the online media has made it difficult to conceive the measured behaviour as a one-way reception of messages (Spurgeon, 2008).

2.4 Industrial patterns in the audiencemaking business

The landscape of commercial media is changing, but the problem of how to create and maintain coherent audiences persists. There is no advertising medium without an audience, since the audience is the very product it sells to the advertisers. Advances in information and communication technologies are an important factor in the evolution of media not only in terms of delivery and production of content but also in shaping what kind of audiences are possible to measure into existence.

I have so far opened up the business of commercial media, made important conceptual distinctions in the audience product, and provided an excursion into the history of audience measurement. This section brings the three perspectives together

by first carving out four patterns in the industrial setting and then discussing an arguably broader dynamic that stands out in the long term view. The evolution of measurement technologies would seem to resemble a sort of double bind. New measurement capabilities underpin the proliferation of choices in media consumption that in turn fragments the audiences further, necessitating even more sophisticated measurements to hold the audience product together (Napoli, 2001).

2.4.1 Four industrial patterns

The historical excursion presented in the previous section is admittedly short and selective, yet, together with its preceding discussion, the excursion allows us to identify four patterns underpinning the business of audiencemaking. Table 1 summarizes four institutional dilemmas, traditional reactions, and recent technological developments in respect to them.

Institutional dilemma	Traditional reaction	Recent developments
It is difficult to observe the largely invisible consumption of electonic media	The rise of ratings companies and the development of second-order measurement technologies	Some success in bypassing the ratings companies by search engines providing in-house measurement
Sampling people's media consumption using dedicated metering devices is expensive	The reliability and validity of sample-based audience estimates are a perennial concern for advertisers	The use of server logs to capture the use of media eradicates the need for dedicated metering devices
There is a need for comparable information to facilitate buying and selling audiences on the market	Syndicated measurement across competing outlets provides authoritative measurements shared by buyers and sellers	New pricing models such as Cost Per Click (CPC) do not depend on the sample-based audience estimates
Media consumption patterns become progressively more fragmented	Increasing sample sizes and the development of new technologies able to capture individualized media consumption	The availability of masses of detailed traces of human behaviour at the level of discrete actions

Table 1. Institutional dilemmas, reactions and recent developments in the audiencemaking business

First, data collection has been a persistent challenge for audiencemaking since the very beginning. The problem is conceptually relatively simple, how can an industrial actor obtain observations on people's media consumption, but providing valid and reliable solutions to it is remarkably difficult. New ratings companies have

often arisen together with new methods for capturing the audience as they devised innovative approaches for obtaining data on the use of a particular medium. With each new medium come new kinds of content, advertising formats and consumption practices that are not easily captured by existing measurement arrangements. An important recent development is the ability of search engine companies to bypass the ratings companies in the measurement of certain types of online advertising.

Second, the measured audience has been and still generally is a statistical estimate based on sample data limited by the costs of data gathering making the validity and reliability of measurement a perennial concern (Napoli, 2003). Changes in the size and composition of sampling have historically had implications for the evolution of media such as the example of narrowcast television shows (see section 2.3.4). Unless a particular consumer segment can be estimated statistically it cannot exist as an audience product, and hence a medium serving the segment will not be able to tap into large-scale advertising revenues. For this reason, the ability to measure a particular segment is a crucial precondition for targeting that segment with advertising and consequently building a specific outlet for it. The use of server logs from the computational transmission infrastructure eradicates the need for dedicated metering devices and represents thus a major shift in the way data are gathered for the audiencemaking purposes.

Third, there has been often a trend toward one source of ratings per medium. A single company has usually come to dominate the measurement of a particular medium within a particular market. Despite the inherent methodological problems in measurement, it seems to be more important to have a single set of *de facto* official statistics as the basis for decision-making than to continuously enhance the accuracy in competition between different measurement methods. Indeed, at times when there have been competing ratings available they have often suggested audiences different enough to cast doubt on both measurements. Furthermore, having more accurate but possibly smaller audience estimates is not in the immediate interest of media companies that fund the majority of ratings. New pricing models based on behaviour triggered by the advertisements can, however, do away with the need to predict the audience accurately in the contemporary online environment.

Fourth, despite inherent methodological limitations in any measurement approach, there has been at least moderately successful move toward more granular and integrated measurement of media consumption. The unit of analysis has generally shifted from the household to the individual level and the local outlets have been brought on par with national media in terms of the reliability of sample-based audience estimates. However, at the same time media consumption has moved to a considerable degree outside the home and takes place today across a variety of devices making the methods tied to a single location or device increasingly problematic (Assael, 2011). Also, the commercial audience research has throughout its history generally estimated the audience of the programs in which the advertisements are embedded, not the advertisement proper (Napoli, 2003). The server log approach does not solve the former problem, but it makes possible to observe not only how many times an individual advertisement was displayed but also how many times it was clicked or triggered some other behavioural reaction.

Together these four industrial patterns form a starting point for Chapter 7 analysing the technological discontinuity brought about the computational data in audiencemaking practices. People are today using various media more than ever (Croteau and Hoynes, 2006), but at the same time the advances in audience measurement have in part motivated the proliferation of media outlets, channels and devices. This poses together with the associated changes in media consumption behavioural considerable challenges for the media companies (Iyer, Soberman and Villa-Boas, 2005). The historical excursion suggests thus a more general dynamic taking place in the long term.

2.4.2 The double bind of audience information

The increasingly sophisticated data collection and analysis methods have made it economically feasible to set up media outlets with narrowly defined audiences offering the advertisers opportunities to target only those consumer segments that are likely to buy their products and to avoid wasting money by advertising to the others (Iyer, Soberman and Villa-Boas, 2005). For instance, significant investments

have been made to capture the increasingly affluent segment of young consumers who are unlikely to be attracted by the same media as adult populations (Napoli, 2003, p. 5). Such developments have recurrently contributed to the proliferation of outlets, channels and devices fragmenting the media landscape to a point where both academics and practitioners view the idea of mass audience as increasingly problematic (Croteau and Hoynes, 2006). Better measurement approaches have therefore not been able to ultimately solve the problem they are developed for. More effective technologies and methods to pin down the audience at an increasing level of detail would seem to feed systematically back to the media by making it feasible to set up specialized outlets for ever more narrow consumer segments. Importantly, the seemingly opposing forces of new measurement technologies and larger samples on the one hand, and the fragmentation of media on the other are thus not necessarily separate phenomena but may act as catalysts for each other. It is this, the long-term relationship between the actual and the measured audience and its interaction with the needs of everyday business, that resembles a sort of double bind. In order to open up the contradictory dynamics against which a new medium is built, I will make a short excursion into the double bind concept.

The idea of double bind was introduced by Bateson, Jackson, Haley and Weakland (1956) to describe a pattern of contradictory situations in which an individual has to make a decision or to solve a problem by choosing between alternatives that will both result in unwanted outcomes. According to their original theory schizophrenia, the recurrent experience of contradiction becomes then internalized over time into the individual psyche and behaviour. The argument, as it is transposed to the context of audience measurement, can be summarized as follows. It is of utmost importance for any advertising-funded company in the media industry to know its audience, yet the audience is always inherently elusive. A standard solution to this problem has been to introduce progressively more sophisticated measurement technologies and analytical procedures to capture people's media consumption, but instead of disappearing, the problem of pinning down coherent audiences seems to have paradoxically grown along with the measurement arrangements. Better measurement, while being the only feasible solution in the short term, would at the

same time seem to contribute to the perpetuation of the very problem it is supposed solve.

Transposing a psychological concept into the analysis of institutional field is far from a straightforward task, and I do not intend substituting organizations for individuals in the context of such theory. If nothing else, however, the idea of double bind provides a metaphor for how technological information may shape an institutional logic in the media industry. It hardly manifests itself at the level of everyday decision-making but appears as an evolutionary pattern over time. This is not to say that the specialization of media, its associated fragmentation and the increasing complexity of media landscape would be caused by the measurement arrangements, but suggests that the characteristics of an underlying measurement technology are seriously involved in shaping the medium. At the same time, the current study shows that while comprehensive and extremely detailed measurement can solve some of the issues related to knowing the audience, it also creates new ones. Also, these observations connect the study with recent research commentaries suggesting that new product architectures and infrastructures are involved in restructuring whole industries and thus call for broadening the traditional unit of analysis in IS (Tilson, Lyytinen and Sørensen, 2010; Yoo, Henfridsson and Lyytinen, 2010).

2.5 Measuring, classifying and making up people

In this chapter I have argued that measurement is a constitutive operation in terms of manufacturing the audience product. The excursion into the history of audience measurement demonstrated that it is not always clear which one came first: the more specialized medium or the increasingly sophisticated measurement. An audience can exists as an institutionally effective entity only if it can be measured, and in this respect the measurement arrangements must exist before a media outlet can claim to have an audience. "Before any new vehicle [media outlet] is launched there must be a reasonable assurance that the audience to support its goals will be there" summarizes the President and CEO of Nielsen Media Research the relationship between media and the measurement of audiences (Whiting, 2006, p. xvii).

However, once there is a medium targeting a specific consumer segment the content of that medium can become a common denominator between those consumers. Figure 2 maps the suggested relationships between the actual and the measured audience visually.

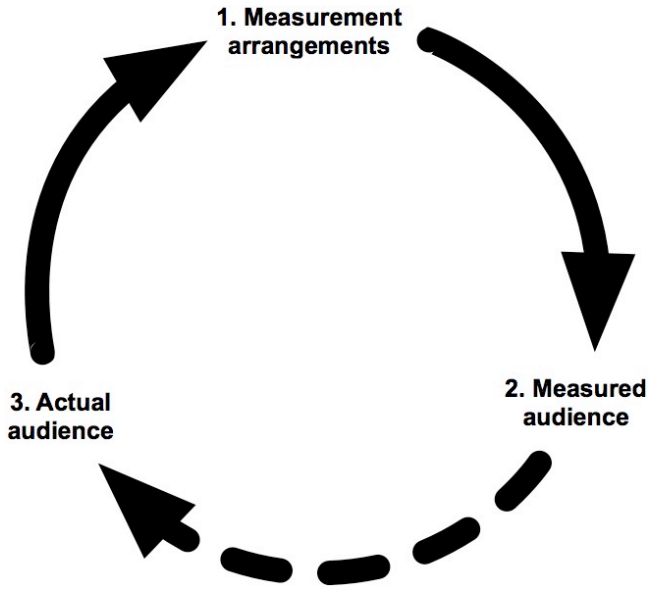

Figure 2. Relationships between the actual and the measured audience

This chapter has so far unpacked how the measurement arrangements (1) mediate the relationship from the actual audience (3) to the measured audience (2). These relationships can be understood to be largely present also in Figure 1 (see section 2.2). However, the figure incorporates also a third relationship from the measured audience (2) to the actual audience (3) suggesting to close the loop. Is there any reason to assume such looping effects could exist? In the following I take one step further and question to what extent the actual audience pre-exists the medium and to what extent the medium may come to generate the behaviour its respective measurement arrangements capture. The discussion is mainly based on general literature on classificatory arrangements not specific to the study of media and communication. The term classificatory arrangement refers here to an institutionalized setting classifying certain entities such as books, diseases or consumers for a specific purpose.

2.5.1 The need for classificatory arrangements

As a generic organizational operation, measurement is typically coupled with the intention to assign and order the measured entities into meaningful groupings. The latter is usually required to turn the measured entities into objects that can be acted upon efficiently in an institutionalized setting (Hacking, 1990, p. 6). This applies to things such as books (Weinberger, 2007) and diseases (Bowker and Star, 1999) as well as to human beings that are processed in an organizational setting. The measured entities are cleaned of any idiosyncratic qualities and made commensurable along a few institutionally relevant dimensions describing the known attributes of the entity. Organizations cannot generally deal efficiently with the rich existence of human beings, and thus the way the commercial media interacts with the consumers is mediated by classificatory arrangements that constitute a powerful infrastructure shaping social and organizational reality (Bowker and Star, 1999; 2000; Kallinikos, 2009b; 2011b). For instance, an attempt to know the target group of advertising campaign *qua* persons would not make much sense. It would be simply too costly to study and pick people individually for target groups that are instead compiled on the basis of predefined variables (age, sex etc.) geared to distinguishing relevant consumer segments within a population.

Surveillance scholars talk about data doubles that emerge from the traces people leave in the computational network environment (Haggerty and Ericson, 2000). While the double ostensibly refers back to the individual person, it is the computational entity that becomes the prime target of various operations and the ways of making informative distinctions in the organizational environment. Metaphorically speaking, persons are made into positions in the matrix of organizational relevancies and acted upon as things in those positions[13]. The development of classificatory arrangements is often motivated by a practical need to describe a part of reality and make it possible to act upon that reality in an organizational setting, but their implications tend to go further than that.

[13] This is not a particular shortcoming of media organizations. In fact, not even health care institutions are able to deal with the matters of life and death personally. A serious health problem is a unique tragedy for an individual person, but in order to be treated by a health care organization the problem must be first recognized as an illness, syndrome or trauma and the person classified along institutionally relevant attributes to become a case in the health care system (Wieviorka, 1992).

2.5.2 The consequences of classification

A classificatory arrangement can come to prescribe the entities it is supposed to describe. Classifications tend to feed back on human subjects in various ways – if no other than by people acting out the labels attached to them in virtue of being aware of the labelling (Sparti, 2001). "If institutions classify people in particular ways that are tied to rights and obligations, it is very likely that people will take onboard the classifications and act accordingly" points out Kallinikos (2009b, p. 233). The argument may give rise to the objection that mere monitoring and institutional knowing about person's conduct hardly forces his behaviour into a certain pattern. van Langenhove and Harré (1999) point out that people are not tied to any fixed role or set of roles but adapt and position each other dynamically in the unfolding of everyday interactions. However, the repertoire of sensible positions arises more often than not from the institutional matrix such as employment, education or family in which the interaction takes place (Hacking, 2002; 2004; 2006). This is because behaving meaningfully from the perspective of others requires making it possible for those others to associate one's acts consistently to a broader context and, indeed, a role in that context[14]. To act is to act under description in the eyes of others (McMillan, 2003).

2.5.3 Making up people

The advertising industry is "largely engaged in trying to make up people" points out Hacking (2002, p. 113), who has studied how institutional classifications can come to shape individual persons. Hacking discusses in several of his studies the recursive shaping of people as particular kinds of individuals, but he neither offers a general theory of looping effects nor analyses advertising in any detail. The idea is that a classification not only shapes the world from the institutional viewpoint, but it can also affect how the people being classified are seen by themselves (and others). The power of classificatory arrangements to process people into a limited number of behavioural moulds stems from the fact that people are what Hacking calls

[14] Goffman (1959; 1983) made it clear that in order to enter a social setting as a competent actor a person must adopt a behavioural template the other participants recognize and can relate to (see also Hacking, 2004).

interactive kinds. The institutions not only subject individuals to different treatments such as advertising campaigns according to their slot in the classificatory matrix, but people tend to be also aware of the classificatory labels attached to them and react to the meanings these labels carry (cf. Lakoff and Johnson, 1980, p. 3). Others have argued that under certain conditions the particular subjects being classified do not even need to be aware of the classification to become interactive and feed back to the classification itself (Drabek, 2009; Khalidi, 2010). The day a person turns eighteen he or she shifts in a number of social classifications making it possible for instance to advertise a whole range of new products suggesting the behaviours of a young adult. The interactions between classifications, people, institutional arrangements and knowledge can result in looping effects that influence all of the elements while not being reducible to any of them.

2.6 Technological change in audiencemaking

In this chapter I have discussed the advertising audience as a product manufactured by the commercial media. The monolithic idea of audience was deconstructed into the more useful concepts of predicted, measured and actual audience, and audience measurement was identified as a constitutive mechanism holding the audience product together. The relationship between the measured and the actual audience was then shown to be historically contingent on the measurement arrangements and underlying technologies; it was recognized to give rise to four industrial patterns. Finally, literature and casual observation suggests that the online advertising in general and the mobile advertising in particular may represent a technological disruption in terms of audiencemaking processes.

Digital telecommunications networks and subscription-based internet services constitute what Spurgeon (2008) calls registration media. They embed a system-wide data capture of transactions identifiable at the level of individual users. In other words, the mobile telecommunications infrastructure not only keeps track of network usage automatically but it also associates disparate acts with uniquely identified network subscriptions, that is, individual people. The computational infrastructure offers thus a novel solution to the problem of how to obtain

observations on media consumption. Measuring behaviour for audiencemaking purposes from the transmission infrastructure, instead of the consumer end, has its limitations (Napoli, 2003; Webster, Phalen and Lichty, 2006), yet the raw data obtained from the server logs has some distinct advantages in contrast to traditional measurement approaches.

First, the data tokens are not a sample limited by the economics of second-order measurement techniques, but they represent the totality of audience behaviour. Since the monitoring function is embedded into the very medium itself, the measurement information can be harnessed to enhance the advertisement formats and content and not just to support *post hoc* the estimation of advertising reception. Second, contrary to the carefully selected variables of interest aimed at preconceived ratings analyses, the masses of digital data tokens are agnostic; they do not answer any specific question or serve a particular organizational purpose. Third, the measurement takes place on a new level of granularity of minute details of human behaviour. In contrast to the peoplemeter that enabled recording media consumption at the individual level, the data emanating from the network infrastructure splits observations into ephemeral clicks, calls and messages. These attributes will be analysed in detail in Chapter 7.

Morley (2006) argues that the digital age should probably be understood to have started already with the invention of telegraph in 1840s implying that the recent computational and networking breakthroughs are best seen as a gradual evolution of arrangements that originated in the early modern period. On the one hand, there has undoubtedly been a lot of bloated rhetoric surrounding every new media, which, in the historical perspective, has kept repeating itself since the 19th century Victorian Internet (Mattelart, Cohen and Taponier, 2003; Standage, 1999). Indeed, Beniger (1986, pp. 4-5) lists over seventy sea changes that have taken place since 1950s according to different authors. On the other hand, shallow as such ahistorical claims often are, they do not preclude new technologies from genuinely shaping, often in unexpected ways, the evolutionary trajectories of specific institutional arrangements. Pollock and Williams (2008) caution against exaggerating short-term changes as a result of not being able to perceive broader long-term patterns. Nevertheless, it also

possible to discount technology as a mere expression of other societal forces (see Bauman, 2007) and lose sight of how social structures may change as a result of unintended effects of purposeful actions mediated by technological infrastructures (Faulkner and Runde, 2010).

In this chapter I have tried to navigate around the aforementioned pitfalls by focusing on a particular industrial setting and unpacking the historical evolution of key institutional logics underpinning the audiencemaking business. Against this background I have argued that the computational network technology amounts to a potentially significant technological discontinuity or disruption that may render some of the earlier arrangements and organizational capabilities less relevant in the industry. Different scholars have suggested frameworks and research agendas for studying technologically induced industrial and organizational change. For instance, Tushman and Anderson (1986) discuss competence-destroying and competence-enhancing technological breakthroughs, Lyytinen and Rose (2003) distinguish between service innovations and IT base innovations, and Yoo, Henfridsson and Lyytinen (2010) analyse the layered modular product architecture that is made possible by the internet, in contrast to the modular architecture of physical products. While these streams of research offer some useful ideas and overall framings of the research problem, in this study I wish to look more closely at organizational practices.

Simple arguments that the codes used by the very first telegraph systems were indeed digital miss the point that the processing of those codes was thoroughly embedded in human practices and comprehension[15]. For instance, it was not until the advent of digital computers enabled the automatic and programmable processing of sign tokens in 1960s that it became feasible to break overall audiences down into specific consumer segments contributing to the diversification and perhaps unintentionally the fragmentation of media. Finally, the computational network infrastructure used to convey the advertising messages embeds the vital monitoring function into itself making the second-order metering technologies potentially redundant and breaking away from some of their inherent limitations. In the next

[15] In fact, any written language is based on digital distinctions between its sign tokens.

two chapters I will set up the theoretical scaffolding for analysing how the relationship between the actual and the measured audience is forged in a computer-mediated environment, that is, in a setting in which organizational practices and the objects of work are largely based on computational information.

3 Technology and organizational practices

Carr (2003) argues that information technology has turned into commodity and little competitive advantage can be reaped by making strategic investments in IT. Assessing whether Carr is right or wrong is probably less interesting that the fact that his assertion exemplifies the difficulty of pinning down the implications of contemporary information and communication technology on organizational matters. Technology is everywhere, yet it tends to disappear from the view in organizational analysis. Indeed, a review by Orlikowski and Scott (2008) shows that just five percent of recent articles published in the leading management journals address technology.

Is information technology really like electricity, a necessary but both strategically and intellectually trivial factor of production? This is the position assumed for instance in the mainstream economic theory that views technology as an external condition for decision-making represented by a production function. This effectively reduces technological arrangements into a menu of what can be produced with given inputs (Metcalfe, 2010). IS scholars may be tempted to disagree, but the field has not been able to pin down a paradigmatic understanding of its research object (Benbasat and Zmud, 2003; McKinney and Yoos, 2010; Orlikowski and Iacono, 2001). In some sense, the controversy can be understood to boil down to whether one understands technology simply as a tool or alternatively as a more complex phenomenon. The evolution of commercial media infrastructure discussed in the previous chapter would seem to point to the latter, and I take it as a point of departure that technology matters – in itself.

The previous chapter revealed the dual role of technological development in the media industry. Most obviously, communication technologies provide the essential transmission infrastructures and shape the content formats and devices used for the consumption and production of media content. Somewhat more inconspicuously, however, also the arrangements used for measuring media consumption exist largely by virtue of information technologies. It was shown that the latter bear significant implications for the basic economic rationality of the media business, and from this

perspective technology would not seem reducible to the production function or any other simple conception. Technological development shapes what is calculable in the first place and thus can inform decision-making in the media industry[16].

The question is then how to account for technology in a particular organizational setting. I adopt the position that in order to analyse how technology matters it is useful to theorize the distinct technological form against specific historical circumstances (cf. Smith, 2006). In this respect, I start from the general view of technological form as "'standing possibilities' that 'invite(s) specific courses of action' and excludes alternative paths of actions" as Smith (2006, p. 205) paraphrases Kallinikos (2002). The idea is admittedly rather abstract so let me elaborate with the help of Faulkner and Runde (2009) who conceptualize technological change in terms of an evolving relationship between changing technological forms and functions. A technological change may happen as a change in the form with an existing function, a change in the function assigned to a form, or as the combination of the two. From this perspective, the current work focuses on the transition from one technological form (dedicated metering devices) to another (data capture embedded into the common computational infrastructure) in order to analyse the relationship between the technological form and its industrially assigned function (audience measurement). It is particularly during such transitional periods when static assumptions about technology made by many established disciplines do not serve empirical inquiry well (Metcalfe, 2010).

The specific historical circumstances of the transition were covered in the previous chapter, unpacking the constitutive role of measurement arrangements in the business of audiencemaking. However, it is more common than not to refrain from substantively theorizing technology in organizations. The usual approach has been either to assume a straightforward causal influence or to avoid engaging with the admittedly difficult question altogether (see however Runde, Jones, Munir and Nikolychuk, 2009). This and the next chapter build the theoretical scaffolding for

[16] Recent enthusiasm on data-driven thinking would seem to suggest that the trend is not necessarily limited to specific industrial settings (Ayres, 2007; Davenport, Cohen and Jakobson, 2005; Hubbard, 2010; Redman, 2008).

the empirical analysis and lays the ground for a contribution toward IS theory. The theoretical review and discussion is divided into two parts.

This chapter foregrounds the difficulty of pinning down technology in general and then, based on Orlikowski's (2010; Orlikowski and Scott, 2008) work, distinguishes between generic approaches on how technology has been incorporated into the study of organizations. In particular, I will summarize the social constructivist approach for studying technology in organizational settings. The review is intended as a fair, if selective, summary of popular approaches found in the field of IS, science and technology studies, and practice-based approaches to organizations and organizing. The adopted theoretical perspective is in many respects in agreement with the constructivist tenets that alone, however, would seem to unnecessarily limit the study of computational technologies. Following the constructivist perspective I will take up the concept of social practice and practice lens as a successful but, as I will argue, narrow attempt to understand how technology shapes everyday matters in organizations. The myriad of studies on the local appropriation of information and communication technologies typically omit to tackle the fact that the systems being appropriated usually transcend local contexts and thus may not fully reveal themselves in any particular setting (Pollock and Williams, 2008).

The next chapter then fleshes out these considerations in respect to computational information as a specific substratum of organization and organizing (e.g. Borgmann, 1999; Brown and Duguid, 2000; Faulkner and Runde, 2010; Kallinikos, 2006; 2009a; Weinberger, 2007). I will build on the idea of technology as mediation, that is, a particular way to render the objects manipulated by organizational practices. It is of particular interest how the qualities of computational data tokens may become transposed into the organizational practices that revolve on technological information at the heart of the audiencemaking business. The theoretical argumentation will be the basis for the empirical analysis of technological discontinuity in audiencemaking in Chapter 7.

Finally, the discussion betrays that the study is neither conceived along positivist nor constructivist underpinnings. The different components of research design are

brought together under critical realist tenets that accord a central role for the non-observable mechanisms shaping the empirical phenomenon under investigation (Archer, 1998). The approach makes it possible to theorize non-deterministic forms of causation and thus has potential to transcend the weary debate between determinism and social construction in the study of technology (Hutchby, 2001; Smith, 2006). The metatheoretical groundwork is, however, considered here mainly as a matter of methodological choice, and the realist underpinnings of the study are therefore unpacked in Chapter 6 along with the case study research design.

3.1 Technology is more than a tool

New technologies enable people do things they could previously only imagine and let them imagine new kinds of doings. A technology incorporates a distinct instrumental character; it is a tool for doing something. Stripped of this generic instrumentality technology loses its identity making it difficult to identify a piece of technology as such (cf. Introna, 2005). The functions of technological objects are not intrinsic to the artefacts but are apprehended in respect to human intentions in the design and use of technology (Faulkner and Runde, 2009). Following John Searle, Runde, Jones, Munir and Nikolychuk (2009) call this the collective assignment of agentive function. The assignment of technological function derives usually from a broader social and institutional setting transcending individual persons and situations while remaining at least in principle open to negotiation. The latter aspect is known as the interpretive flexibility of technological artefacts (Pinch and Bijker, 1984). A realist holds that the malleability of technological artefacts is limited for instance by precognitive affordances (Hutchby, 2001), whereas constructivists are generally not interested in the exact relationship between social constructions and that what is being constructed (Bijker, 2010).

However, neither a particular function nor the abstract instrumentality exhausts the essence of technology and technological systems (Borgmann, 2010; Ciborra and Hanseth, 1998; Marton, 2009). For instance, a search engine may seem like a simple tool, yet beyond its straightforward user-interface search stands for a complex arrangement making the web navigable not merely by creating a huge index out of it

but by making it worthwhile for the content producers to put out pages that are amenable for indexing (Kallinikos, Aaltonen and Marton, 2010). If it is by and large easy to grasp the search engine as a tool, the latter suggests unintended but nevertheless systemic side effects deriving from the search operations serving the whole spectrum of human intentions (cf. Runde, Jones, Munir and Nikolychuk, 2009). For instance, in the environment mediated by search engines, writing becomes a tool to make oneself globally findable (Morville, 2005).

For thinkers like Heidegger and Foucault the essence of technology is not to be found in the appearance of technological artefacts at all but in the way technology renders the world and its people (Dreyfus and Spinosa, 1997; Heidegger and Lovitt, 1977; Khong, 2003; Willcocks, 2004). Heidegger saw modern technology famously as a ubiquitous enframing in which people encounter the world as a standing reserve, a potential resource that invites goal-driven relating with the entities in our environment and ourselves. Foucault (1988) describes technology as matrixes of practical reasoning producing things, harnessing sign systems, influencing others' conduct and, finally, our own being. More often than not these matrixes work in conjunction with each other, and the important question is not how individuals understand or construct technological artefacts but how technology makes certain kinds of subjects.

It would seem to be all but impossible to pin down the idea of technology in general terms. Any definition arising from a particular context tends to be incomplete, too loose or trivial in another (see Howells, 2005, pp. 2-3). Scholars come probably closest to a common understanding when they admit that technology remains both theoretically and historically contingent and contested idea (Orlikowski and Scott, 2008, p. 437). Nevertheless, the perennial wrestling with the basic assumptions regarding the nature of technology has not helped to establish questions concerning technology in the context of organization theory (Faulkner, Lawson and Runde, 2010; Zammuto, et al., 2007). Also, the findings regarding the role of technology in organizational change have often been inconsistent or even paradoxical (Arnold,

2003; Boudreau and Robey, 2005)[17]. Some successful crossbreeding between IS and organization analysis can be found in the study of organizational practices. Investigations into the actual organizational practices and practices of organizing have resulted in insights regarding the role of technology often underpinned by a constructivist epistemology.

Whether known as the practice-based studies of organizing (Gherardi, 2009), actor-network theory (ANT) in the field of science and technology studies (Latour, 2005), sociomateriality in the IS (Orlikowski and Scott, 2008), or the cultural-historical activity theory in education (Engeström and Miettinen, 1999), a number of approaches often conjoined with detailed studies of real work environments have come to emphasize that the unfolding of activity and intentions is not an exclusive property of human beings but an ensemble of humans and other types of entities. If the mainstream sociological, economic and organization theories generally ignore the particularities of the medium on which human conduct takes place (with the exception of language, see Barad, 2003; Woolgar, 1991), it has on the contrary become commonplace in the study of human action and practices to question the strict separation of human behaviour and its immediate material conditions. Under this conception various mediating artefacts are not supplementary but constitutive elements of action.

3.2 Technology and organizations

How is technology usually understood to enter organizational settings? Orlikowski (2010) summarizes three ways with respect to how technology has been treated in management literature beyond its absent presence, that is, implicitly assuming technology as a simple asset evenly available for economic actors (Douma and Schreuder, 2008). The categorization is somewhat crude and lumps together works that may not have much in common, but it reveals usefully a set of common assumptions regarding the nature of technology across a number of studies.

[17] A relatively generic finding has been that the use of information technology tends to afford an increasing visibility over the entire work process thus shaping the conditions for organizational control and decision-making (Zammuto, et al., 2007; Zuboff, 1988).

First, technology has been studied as an independent or moderating variable that exerts significant *exogenous force* on organizational matters. The approach tends to assume a degree of technological determinism and to lean toward positivistic research designs that incorporate technology through empirical measurement and the direct observation of artefacts. The majority of case studies in top IS journals have historically followed this approach (Dubé and Paré, 2003) that bears the least relevance to the current study. In the following I will focus on Orlikowski's two other categories representing the variety of constructivist technology studies.

Second, perspectives such as the socio-technical systems school, social construction of technology (SCOT) and social shaping of technology (SST) view technology as an *emergent process* defined by its social context (Williams and Edge, 1996). The approaches subsumed under this view are generally opposed to the idea of exogenous force and tend to rely on constructivist methodologies, which assume the reality to be first and foremost as it is constructed in social interaction and interpretations (Crotty, 1998). Constructivist studies do not generally deny the independent existence of technology, but, by virtue of their programmatic dispositions, they are not primarily interested in questions that would risk an essentialist answer. The problem with this perspective is according to Orlikowski (2010, p. 133) that it loses "the capability to posit and theorise the material effects of technological artifacts". Indeed, the studies falling into this category often incorporate a customary admission that technology enables and constrains the ways it can be appropriated but seldom seriously engage the question what these ways might be. This is admittedly a crude simplification of the myriad of works under the social constructivist label but serves to identify the type of questions that are difficult to address within the constructivist program (Hutchby, 2001; 2003; Rappert, 2003).

Third, Orlikowski (2010) identifies an emerging group of studies she calls *entanglement in practice* that seeks a way out of the impasse between technological determinism and social construction. An early version of sociomaterial argument (Orlikowski and Scott, 2008) incorporated a variety of approaches ranging from the empiricist ANT (Latour, 2005) to theorizing the computational rendition of

organizational reality (Kallinikos, 2006). Rather than a radical break from the constructivist perspectives, sociomateriality would seem to represent an evolutionary step taking on board what some have called the material turn in social sciences (Latour, 1992; Pels, Hetherington and Vandenberghe, 2002). It acknowledges that the construction of technology is not an exclusively social process but involves many kinds of entities.

3.2.1 The social constructivist understanding of technology

Meticulous studies exploring everyday work in organizations over the last 30 years have generated numerous insights regarding the role of technology in organizational settings. It is beyond the scope of this chapter to provide a comprehensive review of the literature that includes works such as Barley (1986) describing the restructuring of hospital work triggered by new equipment; Zuboff (1988) identifying the difference between automation by machine technology and informated work resulting from computerization; Suchman (1996) analysing the hidden work that makes technological systems actually function; Knorr Cetina and Bruegger (2002) uncovering a social order in global currency trading based on the interactional structures mediated by a trading technology; and Lanzara (2009) analysing how the change of medium on which juridical evidence is stored causes perturbations across the process of justice. The examples stand for the intellectual power of emergent process approach and highlight the fact that constructivism has established itself as a prominent, if not the dominant, epistemology for understanding technology.

The constructivist studies come in many flavours and under different programmatic labels. At the risk of not doing justice to this variety, I will briefly discuss an approach known as the social construction of technology (SCOT) in order to describe key aspects of constructivist study of technology[18]. To begin with, researchers following SCOT have been mostly interested in how technological artefacts enter and are constituted as a part of everyday work (Suchman, Blomberg, Orr and Trigg, 1999; Bijker, 2010). The inherent aversion toward theorizing the

[18] Williams and Edge (1996) note that SCOT is often used synonymously with the social shaping of technology (SST).

independent existence of technology in SCOT can be understood to run from historical, practical and programmatic reasons that make certain problems less amenable for constructivist analysis (Kling, 1992; Williams and Edge, 1996).

The approach has its roots in the sociology of scientific knowledge and laboratory ethnographies that revealed the local production of scientific facts calling into question at the time received wisdom about theoretical knowledge and knowing (Latour and Woolgar, 1979; Pinch and Bijker, 1984; Woolgar, 1991). Also, constructivist ideas turned out to be often compatible with interventionist methodologies in the settings where the researchers worked alongside the informants designing, maintaining and using technological artefacts. For that purpose studying closely, often ethnographically, the design and use of artefacts produced more applicable knowledge than trying to theorize or measure technologies from afar. Finally, the mission of social constructivist movement has often been to deconstruct the taken-for-granted meanings of various things including technological artefacts (Hacking, 1999). Many constructivist researchers have therefore aligned themselves with a reformist agenda to demonstrate the non-determinist nature of technology against the inherent determinism of studies following the exogenous force perspective (Bijker, 2001; Williams and Edge, 1996).

In their seminal paper Pinch and Bijker (1984, p. 421) made a strong association with SCOT and the empirical programme of relativism (EPOR) in science studies by arguing "in SCOT, the equivalent of the first stage of the EPOR would seem to be the demonstration that technological artefacts are culturally constructed and interpreted – in other words, the interpretative flexibility of a technological artefact must be shown." Bijker (2010, p. 66) points out that the original purpose of focusing on singular artefacts was to show that even relatively simple machines are socially constructed – an argument that was then to be expanded to broader units of analysis. It is not difficult to grasp against this background why under the constructivist conception it is not the technology *per se* but the shaping of technology by social factors that matters and is of interest. The program was built to demonstrate and analyse the human element in technology. The eventual success of analytical precepts such as interpretive flexibility as well as the variability of technological

artefacts may indeed have made any attempt to theorize the essence of technology look a futile undertaking. More specifically, Orlikowski uses the malleability of contemporary information and communication technologies as an argument against the possibility of intrinsic technological properties shaping human conduct.

> "Such assumptions are also inappropriate in the context of the dynamically reconfigurable, user-programmable, and highly internetworked technologies being developed and used today."
>
> (Orlikowski, 2000, p. 406)

However, not all technologies are equally malleable as Orlikowski implicitly admits, and one might ask where do the limits of interpretive flexibility in respect to a particular technology come (cf. Faulkner and Runde, 2009). In other words, to what extent do the limits of interpretive flexibility emerge from the characteristics of technology, or indeed what makes the contemporary information and communication technologies so malleable. Kling (1992, p. 361) takes a realist perspective when he points out "new computerized technologies have expanded the range of economically feasible ways of managing, communicating, and displaying data. These capabilities, as well as associated systems of meaning, open up new possibilities for reorganizing social activities." This sounds hardly controversial from the constructivist perspective, yet Kling argues that the way these technologies shape social arrangements and practices is not merely a matter of human interpretation. An exploratory investigation by the author into the presence information diffused in real-time communication systems serves to illustrate the point.

> "The minuscule digital events informing who is online, in a meeting, at the airport and so forth, both frame employees' attempts to get hold of each other and make their engagement in the work environment visible in a new way. In all of the cases, real-time presence information mediated the engagement of employees with their work environment resulting in different performances depending on, for instance, management culture, spatial arrangements and the type of work."
>
> (Aaltonen and Eaton, 2009, p. 9)

Consistent with the constructivist perspective, I found with my co-author that the presence indicator incorporated into virtually every instant messaging application

was indeed used and interpreted in a number of different ways depending on the organizational context. However, it seemed to be very difficult for the informants to ignore the moral order emerging from the sense of co-presence with the distant other; they had no option but to engage in the interpretive dance revolving around the novel technological affordance. A number of studies have come up with similar findings on how computer-mediated presence alters the local interaction order (Erickson and Kellogg, 2000; Goffman, 1983; Knorr Cetina and Bruegger, 2002; Licoppe, 2010; Mazmanian, Orlikowski and Yates, 2006; Mazmanian, Yates and Orlikowski, 2006). To summarize, while SCOT has generated a number of useful concepts as well as revealing findings, computational network technologies would seem to generate phenomena that are difficult to understand exclusively from the perspective of local interpretation and adaptation.

3.2.2 Sociomateriality

Research associated with Orlikowski's (2010) third category, *entanglement in practice*, attempts to overcome the programmatic limitations of social constructivism by arguing for approach that "privileges neither humans nor technologies […] nor does it treat them as separate and distinct realities" (p. 134). Orlikowski and Scott (2008) suggest the label 'sociomateriality' for the emerging stream of research trying to push beyond the social constructivist understanding of technology and organizations. The sociomaterial approach criticizes the separation of humans from technology inherent in the exogenous force and emergent process approaches. Instead, sociomateriality suggests an anti-essentialist, relational ontology under which "entities (whether humans or technologies) have no inherent properties, but acquire form, attributes, and capabilities through their interpenetration" (Orlikowski and Scott, 2008, pp. 455-456). The somewhat counterintuitive move can be usefully understood as a shifting methodological interest from objects and structures to performing agencies. Taken at face value, that is, in the way the ANT conflates ontology (what is) with epistemology (how do we know it), it amounts to an epistemic fallacy from a realist perspective. "The realms of ontology and epistemology can be grounded in the everyday experience of *not*

knowing about the world what others seem to know, and which seems to be right", points out Sismondo (1993).

Orlikowski (2007) illustrates the sociomaterial approach by describing the temporally emergent internet search results as an object of sociomaterial research. She counts into the sociomaterial assemblage the software engineers, hardware and software components, website authors and other search users, who all influence how the search results are performed in addition to the individual person typing in the keywords. The description demonstrates the monistic foundations of sociomaterial approach and not unlike ANT emphasizes the variety of things that contribute to performing a seemingly simple search engine results page. Yet, one might wonder what is it exactly that we learn from the statement that is after all quite obvious. Despite the ontological claim that resembles to a significant degree ANT, to me it seems that sociomateriality is more usefully understood as a kind of epistemology of practice or a methodological perspective that helps to come up with research designs appreciating the variety of entities that account for practical organizational achievements. As I will discuss in the next chapter, mere practicing or a performace cannot exhaust the relevant organizational reality as it necessary draws from and depends on resources and conditions that transcend the situation.

The sociomaterial approach follows ANT in its conception of agency as a distributed achievement of essentially different kinds of factors, both human and non-human, which mediate each others' acts (Callon, 1986; Latour, 1999). According to the approach, the form of such assemblages cannot be assumed (not to mention theorized) but need to be studied empirically (Latour, 2005). In this respect ANT and indeed sociomaterial approach would seem to lead into perpetual questioning what is it that acts in a particular setting (Aaltonen, 2005). This can work against unwarranted reification of theories and encourage methodological sensitivity to the variety of entities that account for action. Information systems are never merely technological in the sense of hardware and software but entail a range of complementary practices, norms and resources to perform any organizational function. In order to understand a system, it is often necessary to analyse the variable geometry of human and non-human entities in a particular local setting.

To summarize, despite her repeated calls (Orlikowski, 2010; Orlikowski and Iacono, 2001) for theorizing technologies of information, Orlikowski's third category seem to be inspired by thinking that rejects substantive theorizing of non-observable or generic nature of technology. Faulkner and Runde (2010) point out that the sociomaterial approach may have problems in accounting for non-material objects, that is, things that are not defined by their physical underpinnings. Such entities are arguably becoming increasingly important in many organizational settings. Instead, sociomaterial theorizing would seem to take place on a metatheoretical level questioning usefully how should we study technology, while it shares the constructivist aversion toward attempting to pin down any generic characteristic of technological systems. In the age when information infrastructures have a global reach and computing is decoupled from discrete software/hardware artefacts this may turn out to be a somewhat limiting position (Armbrust, et al., 2010; Hayes, 2008; Ozzie, 2010; Vouk, 2008). Yoo, Henfridsson and Lyytinen (2010) discuss layered modular product architectures made possible by loosely coupled digital entities, and Tilson, Lyytinen and Sørensen (2010) call for research on the dynamics of whole digital infrastructures beyond individual systems and organizational settings.

3.2.3 Beyond constructivism

SCOT and sociomaterial approaches do not necessarily deny the independent existence of technology, but due to their programmatic liabilities are not particularly geared to analyse that existence. A question concerning the inherent nature of technology tends to look either irrelevant (SCOT) or misplaced (sociomateriality) from these broadly constructivist perspectives making it difficult to tackle the potentially generic nature of contemporary information and communication technologies (Kallinikos, 2004; Pollock, Williams and D´Adderio, 2007). Could it be that the fear of determinism has come to limit theoretical innovation in the IS? Williams and Edge (1996, p. 869) wrote already fifteen years ago "this critique of technological determinism is perhaps less controversial today than when the SST

banner was first erected. The challenge now is to go beyond a simple critique, and elaborate a model for analysing processes of technological change."

Theorizing the relatively independent existence of technology does not have to imply deterministic, one-way causality. Studying how, say, a hammer makes some things easier to do (than others) and thus perhaps more likely to happen under certain conditions does not mean admitting that those things would necessarily happen. The original constructivist rejection of technological determinism was aimed against two ideas: first, technologies have an agency on their own; and, second, technological development follows a predetermined path (Bijker, 2010). These premises do not, however, have to result in *de facto* anti-essentialism present in many research designs ignoring the possibility of inherent technological tendencies (Kling, 1992). To use the old example of a man wielding a gun, it may be that you are a different actor with a gun in your hand, and the gun is a different gun than in the hand of a terrorist (Latour, 1999, pp. 178-179, 192), but there is ontologically more to the person and the artefact than their common agency or performance (Harman, 2007). This is not to say that a gun as an artefact would not be interpretively flexible, but focusing exclusively on the interpretative dimension would provide arguably a rather narrow view into the societal implications of firearms (Kling, 1992; Williams and Edge, 1996, p. 891). The conjunction of firearms and killings can be interpreted in a number of ways, but it is hard to ignore or interpret away.

The aforementioned example of search engine illustrates how the description of relational ontology may tell only half of the story. Whatever the different types of entities that account for the search results, they are likely to exist in a relatively stable configuration in order to produce consistently non-material objects that are recognizable as search engine results pages (Faulkner and Runde, 2010; Kallinikos, Aaltonen and Marton, 2010). Devoid of a theory, model or at least some conceptualization of this configuration, that is, how do different elements relate to each other, the account hardly contributes to our understanding of the search phenomenon. It would also seem reasonable to assume that the shape of the assemblage may well have some sort of family resemblance between different

search engines, since institutionalized entities tend to express isomorphism, that is, they are often subject to environmental pressures to adopt similar internal structures (DiMaggio and Powell, 1983; Douma and Schreuder, 2008; Scott, 2001).

The famous methodological dictum to "follow the actors" (Miettinen, 1999) has generated insightful studies in predominantly physical settings (e.g. Latour, 1999, chap. 2), yet the guideline is more difficult to carry out systematically in the distributed and largely virtual world of information systems[19]. Even if the researcher could get a physical access to one of the many locations where Google hosts its servers, it would not tell much about computing in the cloud that essentially detaches information processing from any particular place or artefact. Also, it would be important to know if the assemblages predominantly made up in the computational network environment express certain, distinctively similar features that distinguish them from other types of agencies. In other words, do institutional doings that harness the contemporary information and communication technology express patterns that are different from their traditional counterparts? Answering this question requires the type of theorizing that may easily look suspicious from the constructivist perspective[20].

In this section I have discussed SCOT and the sociomaterial approach for studying technology. While appreciating the intellectual power of these approaches, I find the inherent aversion toward the substantive theorizing of specific technologies problematic with respect to questions motivating this study. I will now turn to the practice-based approaches to organizations and return to the problem of theorizing in the next chapter.

[19] At minimum, the principle that distinguishes relevant entities from irrelevant ones should be established (McLean and Hassard, 2004; Miettinen, 1999). Orlikowski (2010, p. 135) suggests an endogenous solution to this problem: "In contrast to the 'Cartesian cut' that enacts a determinate ontology with inherent distinctions and boundaries, Barad (2003) argues for ongoing and dynamic 'agential cuts' that perform and stabilise/destabilise particular distinctions, boundaries and properties within phenomena in practice. Such material-discursive practices thus enact specific local resolutions to ontological questions of the nature of phenomena." The idea of agential cuts that emerge endogenously at the research site is an interesting methodological position and will be elaborated in Chapter 6 in the context of case study research design. There are, however, other legitimate ways to carve the research object out from its environment.

[20] An alternative account on search engines that tries to tackle the latter issue by theorizing the constitutive attributes of computer-mediated objects can be found in Kallinikos, Aaltonen and Marton (2010).

3.3 Practice-based studies of organizing

The practice-based approach evolved in organization studies as a reaction to theories that grasp the organization as a formal and/or static entity understood by analysing its structural aspects (Geiger, 2009). The proponents of the approach wanted to bring the everyday work back into focus and to understand organizations as they happen (Schatzki, 2006). From the perspective of practices, everyday action does not follow in an unproblematic manner from organizational structures. Instead, action is considered essential in maintaining and renewing the organization, which makes the perspective particularly useful for studying innovation and organizational change. The epistemic underpinnings of practice-based studies are generally compatible with constructivism (Orlikowski, 2000), while some related work for instance based on the cultural-historical activity theory have combined the study of practices with interventionist methodologies (Blackler and Regan, 2009; Schatzki, 2006). The practice-based approach was introduced to the study of information systems, among others, by Orlikowski (2000; 2002) who extended her former structuration approach with the practice lens before adopting the idea of sociomaterial practices (Orlikowski, 2007; 2010) from Mol (2002) and Suchman (2007).

From the practice perspective "an organization, like any social phenomenon, is a bundle of practices and material arrangements" (Schatzki, 2006, p. 1863), which entails the "interpretation of organizing in terms of 'recurrent action patterns'" (Gherardi, 2009, p. 117). Orlikowski and Scott (2008, p. 462) view an organization as "a recurrently enacted and patterned set of relations, reproduced over time and space". The approach draws attention to what actually happens in organizations and the acts of organizing, while it assigns less relevance to the assumptions regarding why does the social arrangement we recognize as formal organizations exist in the first place. The practice-based approach adopts therefore a rather loose understanding of organization. It does not incorporate a specific idea of organizational purpose like for instance institutional, resource-based, ecological or transaction cost approaches do (Ackoff, 1971; Douma and Schreuder, 2008; Pugh, 2007b; Williamson, 1994). Contrary to these approaches operating often on the level

of whole organization or industry, the practice-based view is interested in how individual acts fall together into an organized activity.

A practice depicts something that people do, but not all acts constitute a practice. The notion is reminiscent of organizational routines and theories of action yet differs from both in some key respects. First, in contrast to the theories of action that start from the human intentionality and purpose motivating the actions, the practice perspective takes the happening of actions in the mundane settings of organizational life as its point of departure (Blackler and Regan, 2009; Gherardi, 2009). If the former leans methodologically toward theory (e.g. Engeström and Miettinen, 1999), the practice perspective suggests a degree of empiricism. Second, practices differ from routines and human habits in that they have an inherent epistemic character, or as Gherardi (2009, p. 118) puts it "acting as a competent practitioner is synonymous with knowing how to connect successfully with the field of practices thus activated". Organizational routines can be understood as a behaviouristic concept (Nelson and Winter, 1982), whereas the idea of practice entails a knowledgeable practitioner who is able to reflect upon his practice (however, see Runde, Jones, Munir and Nikolychuk, 2009).

A practice is more than a set of disparate acts. It is a pattern of recursive actions; a regularity underpinning identification not unlike organizational routines. Gherardi (2009, p. 117) asserts that "a practice becomes such when it is socially recognized as an institutionalized doing" – meaning that it is intrinsic to a practice to be defined as such – which enables actors to relate to practices as distinct entities in the organizational setting. Organizational practices do not generally belong to individuals, but the production and use of knowledge needed for practicing takes place usually within a community (Wenger, 1998). The responsibility for institutionalized doing is thus distributed and importantly not necessarily seen as an exclusive property of humans. For instance, Schatzki (2006) points out that computer systems are a part of causal infrastructure that along with governance structures and the performances of actors account for organizational happening.

3.4 The medium specificity of practices

The practice-based approach is sensitive to the micro-foundations of organizing where computational technology meets organized action, but the studies often stop short of theorising the findings against a more generic background (Kallinikos, 2009a; Orlikowski, 2000). In order to introduce the step I wish to take beyond the practice-based approach, I will reflect upon an exemplary analysis on what happens to a practice when the infrastructure sustaining the objects needed to perform an institutional doing change. The example comes from an ethnographic study by Lanzara (2009; Lanzara and Patriotta, 2001) on the introduction of videocassette recording (VR) technology into courtroom proceedings. The case illustrates how institutionally sanctioned knowledge is inextricably bound to the medium on which it is being produced – a point I wish to develop further in the context of common computational infrastructure.

The initial introduction of VR technology was motivated (or at least legitimized) by overcoming practical difficulties in bringing people to testify in person for instance in criminal proceedings where transporting the defendants to the court posed a significant risk to their lives. Yet, the introduction of seemingly simple technological aid foregrounds an institutional dilemma. In order to fulfil its institutional function, the court proceedings must reach a verdict based on unequivocal evidence and accountable procedures governed by rules that are constitutive to the idea of justice. Unless these criteria are met the proceedings cannot establish the knowledge of the crime and criminal and, consequently, produce justice.

The introduction of the new medium on which some of the key objects such as testimonies exists reveals, however, the paper-based nature of juridical proceedings (see also Hildebrandt, 2008). With the new medium comes new kinds of objects and possible relationships to which judges, lawyers, defendants, witnesses, officers and back office staff must adapt in their attempt to come up with a legally valid reconstruction of the referent reality. The source of disturbances is the new bearer of legal objects, the videocassette recording, that affords different operations and ways

to perceive the testimonies, some of which are not easily governed by the existing rules underpinning the idea of justice (Faulkner and Runde, 2010). The following passage is but one example piercing into the mesh of organizational conduct and technology.

> "The VR brings about, in the visual medium, a new type of representation of events. Videotapes inscribe not only *more* data than do paper transcripts, but most crucially data of *a different kind*. Events (and the connections between them) reproduced in the video are different from events and connections reproduced in written form. The story *filmed* is not quite the same as the story *transcribed*, as the vignette of the raped woman illustrates. When the medium changes, the actors' perceptions of the data and their relationships in space and time also change; consequently, the modalities in which the data are chunked, selected, documented and used change too. It can be said that switching medium modifies the type of connection between the event and its representation (reproduction), and therefore it changes the perception of the nature and meaning of the real event. For such reasons a one-to-one mapping of events and relationships across the two media cannot be easily done."
>
> (Lanzara, unpublished manuscript)

The passage provides a vivid example on how practices, institutional arrangements they reproduce, and outcomes such as justice depend on objects that are to some degree specific to the underlying material on which they exist; however, note how Lanzara captures the role of technology as the kind of mediation it affords in the institutional context. It is not the material artefact in itself that matters but the rules how the testimony inscribed onto it can be perceived and acted upon. The changes in the underlying medium are unavoidably reflected to the objects that are constitutive to legal practices resulting in disturbances in the whole institutional conduct. There are not just more data but importantly different kind of data that allows the represented reality to be apprehended differently – probably leading to a different verdict in some cases (cf. Goodwin, 1994). The new medium affords new kinds of operations on the testimonies that are unknown to the structural arrangements governing the process of justice built on written evidence[21].

The next chapter narrows the theoretical discussion down to domain specific considerations and takes the idea of medium specificity further in the context of contemporary information and communication technology. It is suggested that the

[21] More generally, Hildebrandt (2008) compares the paper-based nature of law and rule by technological normativity.

computational technology detaches not only the objects of work but also crucially their bearers from the material artefacts by rendering the latter as computational data tokens (Borgmann, 1999; Faulkner and Runde, 2010; Kallinikos, 2009a). This makes a whole variety of things potentially commensurable as well as amenable for computational processing (Tilson, Lyytinen and Sørensen, 2010; Yoo, Henfridsson and Lyytinen, 2010).

4 The specificity of computational medium

The previous chapter discussed technology and its study in organizations at a rather generic level. It was pointed out how technologies incorporate a specific instrumentality yet they are always more than mere tools; the constructivist scholarship was introduced as a family of works that have successfully opened up how technological artefacts mesh with institutional doings under local circumstances. In the context of organization studies, the practice-based approach has drawn from constructivist thinking resulting in intriguing ideas such as the medium specificity of working practices and objects. At the same time, however, I have been critical of the primacy accorded to the local appropriation of technology as if the aspects of technological systems that transcend any particular setting would be less relevant or non-existent.

Pollock and Williams (2008) suggest that the tendency to emphasize locally emergent characteristics of technology may be partly an inconspicuous side effect of case study methodology employed in many studies. Subjecting a technology that is essentially built to transcend local contexts to an empiricist gaze in a particular setting is not always a way to get closer to its reality (Faulkner and Runde, 2009). Indeed, it is worth pointing out that the scholarly exemplars of a hammer (Heidegger and Lovitt, 1977), a gun (Kling, 1992), and even the more recent ontological analysis of a turntable (Faulkner and Runde, 2009) exemplify artefacts whose functioning is first and foremost local. In contrast, the primary function of contemporary information systems is often involved in connecting different settings. The local meaning of an ERP, data mining or communication system derives largely from how it brings remote matters to bear on immediate circumstances. It has also been common to conceive technology by its design, adoption and occasions of use, while less attention has been paid to its constitutive role in mediating organized action (Orlikowski and Scott, 2008). In this respect sociomateriality focuses usefully on the micro-foundations of organizing, yet the approach adopts a position inspired

by ANT that mainly precludes theorizing the generic character of contemporary information and communication technology[22].

This chapter focuses on contemporary information and communication technology. In contrast to constructivist perspectives that, at best, admit the independent existence of technology, I attempt to compose a theoretical framework for unpacking the specificity of computational data in audiencemaking practices and processes. The purpose is not to reject the constructivist study of technology and its appropriations in organization studies but to use them as an established reference point for developing an alternative argument. The idea of medium specificity is pivotal in this respect. It connects the theorizing with the practice-based study of organizations and suggests an approach for understanding the computational foundations of organizational practices. Indeed, it is important to bear in mind that even though the previous chapter started from rather generic considerations about technology and its study, the analysis is limited to the role of computational technology in a particular industrial setting. More specifically, the theoretical interest revolves on the new kind of computational data underpinning audiencemaking efforts.

I generally avoid using the term information that tends to be an elusive and often poorly defined concept (McKinney and Yoos, 2010). However, it is necessary to briefly spell out the difference between information and data as they are employed in this study. Following Kallinikos (2006), information is understood here as a semantic event – an apprehension of novelty against a socially constructed background or a local setting. The approach departs from the token and syntax views in the taxonomy proposed by McKinney and Yoos (2010), since information is distinguished here from the data tokens and understood to depend on the observer. Information is a temporally limited and agent-specific phenomenon; it cannot be frozen into a database. Data, in contrast, is a carrier of sign tokens that embody distinctions with potential to produce "difference that makes a difference" (Bateson, 2000), that is, information. Computational data is of course merely one of the many

[22] Orlikowski seemingly acknowledges the possibility of technological attributes that transcend local settings, but her sociomaterial approach rests to a significant degree on the ANT that epitomizes the constructivist aversion toward substantive theorizing of a particular technology (Kallinikos, 2004).

possible bearers of signs whose signifying potential is nevertheless partly dictated by the operations the particular bearer enables. Following from this, information produced by recourse to computational processes can be called as technological information. The empirical analysis in Chapter 7 revolves largely on the myriad of operations needed to generate audience information out of individually meaningless data tokens. The data are turned into information at the instant when they enter an audiencemaking practice in a meaningful manner.

It is necessary to go beyond the immediate artefactual appearances of technological systems if we are to understand the transition from the dedicated metering devices to using the common network infrastructure for measuring media consumption. The task is admittedly precarious and a certain caution against deterministic statements is surely justified. However, being utterly sceptical about the independent existence of technology runs somewhat against common sense and, as I have argued, may become an impediment for understanding highly interconnected computational infrastructures underpinning modern organizations. The essence of systems that span geographical and institutional boundaries is not exhausted at the user-interface (Kallinikos, 2004; Yoo, Henfridsson and Lyytinen, 2010).

4.1 Audience as knowledge

The historical excursion in Chapter 2 illustrated the role of measurement arrangements in the media industry and their close affinity with the evolution of data capture techniques and metering devices. The constitutive relationship between the all-important measured audience and the ultimately unknown actual audience was found to be contingent upon technology. People using their mobile phones do not constitute a sellable asset, but the information generated by the network infrastructure makes it conceivable to try turning the network subscribers into an audience product. This entails knowing the subscribers in new way.

The media companies extract value from consumers' measured attention that constitutes the scarce resource in the industry (cf. Styhre, 2008, p. xii-xiii). Progressively more sophisticated audience measurement arrangements have been

able to pin down people's media consumption at an increasing level of detail, but at the same time they have contributed to the fragmentation of behaviour the measurement operations are supposed to capture. Nevertheless, from the perspective of a particular outlet the relationship may well look like a one-way analytical operation from the people to the audience; any feedback from the traditional second-order measurement systems to the actual audience necessarily takes place indirectly and with a time lag through programming and editorial decisions. The possible looping effects from the measured to the actual audience in traditional media (see Figure 2 in section 2.5) are mediated, for instance, by decisions to launch, reschedule and kill off programs on the basis of their ratings points. The interactive online environment offers more immediate mechanisms to feed information about the audience back to itself.

Chapter 2 suggested that media companies are generally not able to deal with the idiosyncratic existence of consumers and must rely on classificatory arrangements to manage the audience members. What kind of classifications and acts of classifying does it take to capture the attention of network subscribers in the dual sense of both observing and maintaining their attentiveness? The answer is, in certain respects, analogous to the example of criminal court proceedings in the previous chapter. Both can be understood as the production of explicit knowledge – a process of establishing a set of interlocking facts about the person and turning him into a known subject for the institution. The facts are tied to medium-specific procedures governed by institutional expectations regarding the knowledge-making process (Lanzara and Patriotta, 2001). Neither of the cases entails all-out knowing of every possible detail of the person in question, knowing them *qua* persons, but the consistent production of institutionally relevant facts. After all, the criminal justice is concerned with making up people who are either guilty or not guilty, whereas the commercial media needs to be able to segment people according to their potential for consumption.

Michel Foucault and a considerable literature inspired by his thinking have analysed how the machineries built for observing and recording people tend to not only generate facts about people but also produce people as knowable subjects against the

institutional standards and norms (Foucault, 1984). Take for instance the development of managerial accounting practices and associated technologies that have made fundamental contributions toward rendering the effort of the individual visible and governable factor of production in organizational settings (McKinlay and Starkey, 1998; Miller and O'Leary, 1987). From this perspective, people are turned into individuals by the power of modern technological arrangements to subject them for individualizing treatments[23]. This power results less from any distinct event than from the inconspicuous moulding of people by relations that are present everywhere as a potential.

A legal verdict can move a person from the category of innocent to guilty with a drastic impact on the individual, whereas being subjected to a targeted marketing effort hardly alters the course of everyday life from the individual perspective. Yet, most people are never directly subjected to court proceedings but certainly cannot escape living in an environment saturated with advertising. Although establishing the link between a particular advertisement and a change in consumer behaviour is not easy (Gabriel and Lang, 1995), advertising as a whole provides materials for our everyday life (Ritson and Elliott, 1999), informs us about consumption opportunities (Nelson 1974), and shapes how we perceive ourselves (Shields and Heinecken, 2002; Turow, 2005). Any single advertisement is perhaps easy to ignore, but in general advertising is impossible to avoid.

The idea of watching advertisements as labour suggests an interesting perspective to the audiencemaking business (Bermejo, 2009). Commercial media companies cannot generally own or directly control the key human resource in their business (Napoli, 2003). There is no employment contract regulating the relationship between the consumer and the organization, and yet the mobile network subscribers are supposed to abide by the terms and conditions of the service. While this does not amount to an employment contract, it nevertheless sets up mutual obligations between the subscriber and the telecommunications operator. In fact, not even the

[23] The architectural details of Panopticon that was supposed to make people routinely knowable in the early penitentiary system do not need to be repeated here (see Foucault, 1979), but it is worth pointing out how the disciplinary mechanism it exemplifies have been captured in the context of contemporary information and communication technology by concepts such as information panopticon (Zuboff, 1988) and electronic panopticon (Haggerty and Ericson, 2000).

modern employment contract incorporates employees into the organization in a fully inclusive manner. People enter their workplace "qua roles not qua persons" (Kallinikos, 2003b, p. 597) giving away only a regulated share of their time, skills and personality in exchange for material payoffs. Therefore, while consumers have traditionally had no obligation whatsoever to actually attend to mass media, the terms and conditions of network subscription can be used to grant the media a degree of authority to regulate the behaviour of the audience – a point that I will discuss further in the context of empirical analysis.

To summarize, knowing the network subscribers as an advertising audience may conceivably involve various activities ranging from producing relevant factual statements about the audience to dealing with looping effects and disciplining the subscriber behaviour.

4.2 The habitat of information

The shift from the dedicated metering devices to using the common information infrastructure resembles a transition to a new habitat driven by computational information – a condition under which "technologically driven information processes reassemble reality and, in doing so, reframe the premises upon which individual and collective subjects perceive and act upon that reality" (Kallinikos. 2009a, p. 184). In particular, the data capture function embedded into the computational network infrastructure that records the totality of subscribers' media consumption suggests a discontinuous technological change and a rupture in the history of audiencemaking practices. A preliminary excursion to the research site helps to clarify the starting point for the theoretical discussion.

The employees of the studied company were physically co-located in the same office space, yet the object of their work was accessible only through the screen. However, in contrast to the studies on computerization of work such as Zuboff (1988) or Kallinikos (1999), the production had never existed outside the realm of computational processes. Even if the informants could easily interact face-to-face with each other, cut off from the digitally constituted objects these local interactions

made little sense. Without access to the systems there was nothing to work on. The organizational processes and task structure had been built from the ground up to harness an array of information and communication technologies, and the key input for the operations existed as computational data. The research site would therefore seem to provide ample opportunities to investigate how computational technology shapes the foundations of organizational practices.

I suggest that the technological patterning of audiencemaking practices can be understood as abstract rules on how computational technology mediates the objects of work. Taking the idea of medium-specific practices one step further, this shifts the analytical interest from the particularities of technological artefacts to the form of mediation a group of associated artefacts as a system offers. The move resembles in some respects the position adopted in ANT, for which technology is not a distinct kind of entity but a label for a certain type of mediation (Latour, 1999, pp. 190-191). However, the crucial difference is that the 'ethnographic positivism' of ANT (Kallinikos, 2004) neither allows theorizing the nature of this mediation nor focusing on the entities identified as decisive in historical and institutional analysis, that is, the data tokens from which the relationship between the measured and the actual audience is forged. Suggesting that technologies embed rules that shape social practices may sound crude and deterministic. This is, however, only if we take the rules to prescribe action, whereas they are better understood as regulative or constitutive devices shaping the boundaries of conceivable action (Hildebrandt, 2008).

Weinberger (2007) provides a good example of abstract computational rules. He discusses how contemporary information and communication technology lifts the necessity to store information objects into a predefined order, since various orderings can be imposed at the time of use. In contrast to the physical entities such as library catalogue cards made of cardboard, the computational information processing does not require for the sake of physical storage that the relationships between the entities are fixed for instance according to the alphabetical order. Alternative orderings can be applied to the data at any time. The rule does not obviously dictate what kind of order is applied, but merely says that there is no need

to fix the order at the time of collecting and storing items. Using the terminology of Faulkner and Runde (2010), the material (cardboard) and non-material (database entry) bearers of library records allow and relatively disallow different operations that can be performed on the records. Finally, looking at the example more carefully, one might argue that, by detaching the library records from any predefined order, digital data actually imposes on the user the requirement to choose one. Since the ordering does not take place on the way in, it must take place on the way out. There is no default order to rely on.

Medium-specific rules are not obviously understood here as empirically observable entities akin to written organizational policies and guidelines (e.g. March, Schulz and Zhou, 2000), and in this respect they also differ to a degree from maps and scripts discussed by Schmidt (1999). They are abstract features whose combinations delineate the space of possibilities – such as multiple orderings in the aforementioned case – embedded into the medium on which action takes place (Kallinikos, 2003a). Organizational practices, the ways of knowing organizationally relevant matters and, consequently, acting knowledgeably can be remarkably different under the new technological regime. A passage from Zuboff's workplace ethnography on an industrial processing plant serves to illustrate the point. In the case, new computer equipment had stored and made available a representation of what happened at the facility at an unprecedented level of detail.

> "The data were available on-line for three days and then were stored indefinitely. This meant that it was not necessary to know in advance what data might be important or why; the data could be retrieved and analyzed at a later date, giving rise to ever new interpretative possibilities. People learned more about what they had been doing as they found new ways to engage with this voluminous history of minute events."
>
> (Zuboff, 1988, p. 316)

The increasing accuracy and the level of detail captured in the abundance of data would most likely enable improvements to the business processes. However, Zuboff's analysis goes beyond the obvious as she points out how the data was not bound to preconceived aims, but it opened an unexpected space of interpretive possibilities supporting both organizational learning and surveillance. Reminiscent of Weinberger's observations, instead of embedding a particular organizational

purpose, the computationally mediated entities ruled that various strategic interpretations could be imposed on the records. The data referred at the same time ostensibly back to what happened physically in the plant but also crucially enabled constructing various versions of those events. The data tokens stood rather as a potential instead of answering a specific question. I use the word *rule* instead of *enable* to emphasize this latter aspect that different bearers not only allow certain operations but may also necessitate others in order to make the object useful.

The organizational implications of the two examples discussed in this section are obviously not captured as straightforward automation and increasing efficiency, and, indeed, the digital entities require perhaps more than ever human interpretation and intervention to be of any use. However, the point is that the computational data is not just malleable, but it required the organizations to cope with this malleability in new ways. I make therefore the following, moderately realist assumption. The expansion of interpretive opportunities runs at least to a degree from the nature of digital data vis-à-vis previous bearers of organizational objects – not merely from the act of harnessing that potential.

4.3 Mediation by computational objects

Zuboff (1988) made in her seminal study a generic distinction between automating and informating organizational processes, but she refrained from theorizing the foundations of this difference. More recent literature on technological objects suggests that the computationally rendered entities may share similar qualities across institutional domains due to their common digital constitution (Borgmann, 1999; Faulkner and Runde, 2010; Kallinikos, 2009a; Kallinikos, Aaltonen and Marton, 2010; Varian, 2010). For instance, Yoo, Henfridsson and Lyytinen (2010) describe the functioning of digital devices as reprogrammable, self-referential and based on homogenized data. The argument may sound suspicious from the constructivist perspective, as it posits an independent, non-observable character of technology across settings. Let us accept it as a hypothesis that guides further exploration into the medium specificity of contemporary information and

communication technology. What kind of common qualities could computationally rendered objects possibly have?

Kallinikos (2009a) describes computational objects as vertically stratified and functionally interdependent vis-à-vis entities existing on other mediums. The idea is rather abstract but suggests an avenue of thinking that might help to grapple with the transcontextual aspects of computational mediation. The two concepts can be understood to describe how content is inscribed into digital objects acting as the bearers of content (Faulkner and Runde, 2010).

4.3.1 Vertically stratified, functionally interdependent

Vertical stratification suggests that even if a computational object is perceived and manipulated at the human-computer interface embedded into a local setting, its constitution is stratified through the communication protocols, file formats, layers of application and operating system code down to the binary-processing hardware. Despite the enormous variety of social practices, user-interfaces and technological artefacts, the data tokens constitute an obligatory passage point as the only content bearer the computational hardware knows. Faulkner and Runde (2010) call these bitstrings. A number of implications can be understood to rise from these premises; the most generic being that any entity mediated through computational technology needs to become disassembled according to rules that obey the binary logic of the machine. Substituting the myriad of dedicated bearers (cardboard cards, listening diaries, industrial logbooks, photoreactive paper, vinyl discs etc.) with a common digital infrastructure has increased for instance the recombinability of things dramatically as expressed in the myriad of opportunities to aggregate and mix content in the online environment (Varian, 2010). Importantly, however, the stratified structure is largely beyond the comprehension and control of local practices that have to take it largely as given (cf. Borgmann, 1999).

Functional interdependence refers to the fact that computational objects are often inherently dependent on other computational objects in their functioning and, indeed, existence. Take for instance the search engine results page that is hardly

more than a temporary combination of objects from other webpages, and yet it constitutes a pivotal entity in making the web navigable (Kallinikos, Aaltonen and Marton, 2010). Without the snippets of content produced elsewhere in the web, the results page would be all but empty and useless for its primary purpose. More generally, a computational object may be little more than a procedure bringing a set of other objects together into a new arrangement. The logic of vertical stratification and functional interdependence are, after all, rather generic and remote ideas from the perspective of meaningful human practices. I do not suggest explaining any organizational phenomena by these concepts, yet they are valuable for opening up thinking about the computational technology beyond its artefactual appearance in local settings. In particular, the two concepts shed light on the capacity of modern information and communication technology to disaggregate and make organizational entities commensurable across the variety of contexts (Kallinikos, 2009a).

4.3.2 The commensurability and disaggregation of organizational entities

From the common binary constitution of digital data emerges the opportunity to make a vast array of digitally mediated things *commensurable* by setting up stacks of data formats, communication protocols and other types of standards that progressively reach towards organizationally meaningful matters. Acronyms such as SQL, HTTP, XML, RSS and API are but the tip of the iceberg in the proliferation of standards that make computational entities interoperable[24]. Efforts to standardize information processing across domains are often slow and unsuccessful (Ciborra, et al., 2000), but the scope and perpetuation of such efforts express an unwavering belief that commensurability is achievable. In order to explain such a belief a social constructivist would probably look for social interests and cultural norms; ask who benefits politically or economically from making technologies interoperable. These are quite legitimate concerns but omit the question if there is something specific to the objects living on the computational medium that make them particularly amenable to such efforts. Rejecting such a possibility would seem to risk ignoring a

[24] See the list of acronyms for short definitions of these terms.

relevant aspect of contemporary information and communication technology (cf. Smith, 2006).

The common computational underpinnings tend to also emphasise the opportunity to *disaggregate* the *en bloc* character of organizational entities and hence the tasks and processes revolving on those entities. For instance, a traditional paper-based encyclopaedia can generally handle contributions at the level of comprehensive and completed articles whereas in Wikipedia correcting a single typographic error can amount to a valuable input (Aaltonen and Lanzara, 2011). The disaggregation of task structure is made possible by the specific non-material bearer of encyclopaedia articles, that is, a digital page in the wiki system that allows the reader to edit the article object directly without going through the slow and laborious erratum process required by paper-based production process. The surprising disaggregation of taken-for-granted unity of objects is illustrated by another study by Lanzara (see 1999) on the development of software for teaching musical composition. In the traditional musical notation the tone and length of the sound are combined into notes representing a clearly demarcated space of possible combinations, whereas in the digital domain these two can be easily disaggregated and, consequently, combined in new ways.

> "Unlocking pitch and duration from the staff notation and treating them separately as independent lists of features and values allows one to explore how they interact and to do things that would be hard to do with a musical instrument, but are very easy to do with the computer."
>
> (Lanzara, unpublished manuscript)

In the case of music software, the unbundling of traditional combinations of tone and length as notes effectively rewrote some of the rules how users can engage with the task of coming up with music. Once again, the new rules do not obviously determine how they would be applied as the user could still decide to stick to the combinations representing traditional notes, but it was the computationally

expanded space of possibilities that made such decision necessary and practically thinkable in the first place[25].

4.3.3 The behavioural attributes of digital objects

Kallinikos, Aaltonen and Marton (2010) describe four attributes of digital objects that emerge from their computational composition and illustrate the implications of these for searching and archiving cultural records in the internet. While not equally present in all digital objects, the attributes are suggested to capture features that are commonly found to describe digital objects. First, digital objects can be *editable*. They often incorporate pliability that is in-built in terms of continuous modification of the object. Second, digital objects can be *interactive* and thus embed responses to different approaches upon the object. Third, digital objects are *open* to be modified and accessed by other objects. Fourth, digital objects are not necessarily contained within a single institution but can be *distributed* across different domains. Throughout this chapter I have provided examples on how these attributes give rise to objects of work that behave and lend themselves to rather different operations than their predecessors on non-computational mediums.

The four attributes rely on the *modular* and *granular* compositional structure of digital objects. It is almost always possible to break down a digital object such as a webpage into its constituent parts (images, text, code etc.) and to act upon those parts separately. Digital objects tend to also have weak edges, as it may often be difficult to decide where one ends and another begins. Kallinikos, Aaltonen and Marton (2010) discuss the search engine results page as an example of this. They point out that it may be difficult to tell if the whole set of millions of search results constitute the object or the first ten results shown on the first page or merely its upper part rendered visible in a web browser. Furthermore, if target pages change, also the results page changes making it difficult to draw a definitive line between the two. The data tokens underpinning digital objects tend to be also extremely granular. Their minuscule size makes it possible for digital objects to break the reference

[25] Licoppe's (2010) work on the proliferation of minuscule notifications in the digital work environment could perhaps be seen as yet another example of the disaggregation of organizational processes at an increasing level of granularity.

reality into its constituent parts at the level of minute details. For instance, in the web it has become increasingly difficult to retain the *en bloc* character of newspaper, which tends to become unbundled into parts that are consumed separately (Carr, 2008). In a sense, digital objects are reversible cascades of other objects.

4.4 Technological rules and organizational practices

The views developed here contrast, but do not necessarily contradict, the practice-based views of organization. Schatzki (2006) points out how a computer system is a part of material order that causally supports organizational practices, whereas my discussions has explored the ways in which the computational rendition of organizational entities may come to shape relationships and agency among different parties. In other words, while the practice-based studies generally emphasize how agencies are actuated in practice, the latter perspective focuses more on the conditions that make particular agencies possible, that is to say, what kind of acts are conceivable. In both cases technology is understood to be part of the causal infrastructure making organizational happening possible. The question is then how to account for this background causation in empirical analysis.

In order to elaborate the position adopted in this study, which comes close to the realist views of Runde, Jones, Munir and Nikolychuk (2009), I provide a somewhat critical reading of an influential article by Orlikowski (2000) on using practice lens for studying technology in organizations. Leaning toward social constructivism, Orlikowski denies that technology would embed rules or resources shaping social practices, whereas I wish to argue that technology can, indeed, be understood to some degree govern organizational doings (Kallinikos, Hasselbladh and Marton, 2010). In the following excerpt it is almost as if Orlikowski wants to have it both ways; technology matters but it does not quite matter because it is after all human practices that make it matter.

> "Structure is here understood as the set of rules and resources instantiated in recurrent social practice. Elements of technology (such as voting procedures, stored data, and public display screens), once they have been built into a technology, are external to human action. As inscribed properties of a technology, they constitute neither rules

> nor resources, and thus cannot be seen to be structures. It is only when such technological elements as voting procedures, stored data, and public display screens are routinely mobilized in use that we can say that they 'structure' human action, and in this way they become implicated as rules and resources in the constitution of a particular recurrent social practice."
>
> (Orlikowski, 2000, p. 406)

The quote comes from a ten years old article and the practice lens has arguably moved on, but as I have argued the recent developments in sociomateriality are not necessarily better equipped for substantive theorizing of technology. The latter approach categorically denies the separability of technology and humans and would seem to have particular difficulties in grasping the non-materiality of computational objects and processes (Faulkner and Runde, 2010). It is not necessary to conflate rules and their enactment in practice for the sake of avoiding technological determinism, and, as Archer (1982) points out, it may be more helpful to keep the two analytically separate. I wish to challenge the denial of external existence of rules on three accounts: first, rules do not determine action; second, rules must preexist an occasioning of a practice; third, rules need to be inscribed into a medium (which is not the same as formal, written rules). Furthermore, rules do not merely regulate action but need to be often understood as its constitutive elements (Hildebrandt, 2008).

4.4.1 The idea of rule

First, as it was stated earlier, rules do not determine action (Faulkner and Runde, 2009; Runde, Jones, Munir and Nikolychuk, 2009). It is true that rules need to be enacted in some way, like the rules of chess game, for a practice to happen, but it is equally clear that the rules do not determine the actual course of play and the players may even break a rule. However, breaking a rule and ignoring the rules altogether are two different events (cf. Schmidt, 1999, on deviation from a script). The former case acknowledges the existence of a rule that may indeed become reinforced through the enactment of sanctions, whereas in the latter case the players are not playing anymore chess but merely moving pieces on a checkerboard. I have put forward examples such as industrial processing, legal evidence, library catalogue, musical notation and encyclopaedia production to illustrate how practices may have

to be adapted to the ways a new medium regulates the constitution of organizational reality.

Second, even if the existence of rules in general may depend on their recurrent instantiations, a rule must preexist the occasioning of practice. You cannot invent the rules of the game as you play, or if you do you are not anymore playing chess but a second-order game of re-inventing the rules of chess. The rules may change if they are repeatedly broken or enacted differently, but for any particular occasion the rules are a constitutive element of institutionalized doing (Hildebrandt, 2008). The instances of chess game can only be identified as such because they adhere to the rules that transcend any particular session. It is quite possible to play against an opponent without having a common language and thus the capacity to seriously negotiate how the rules are enacted. In such an occasion, it is the rules of the game that make the interaction possible and meaningful in the first place. In a similar manner, the legal proceedings produce justice because they can be argued to enact the same rules in every case. There is of course local variation in how the courts of justice operate, but it would be hardly called justice if there would be nothing more to the legal proceedings than the local interpretation and enactment of rules.

Third, in order to attain permanence and not to rely merely on individual memory, rules need to be inscribed in matter and organizational arrangements, which makes the rules available within and across settings. All other things being equal, people are likely to have recourse to affordances that are ready at hand instead of starting to contemplate redesigning the causal infrastructure supporting the practices (Schmidt, 1999). Thus, while agreeing that technology is society made durable (Latour, 1991), it also implies a sort of background causation that shapes behavioural patterns both below and above the cognitive threshold of an individual actor (Faulkner and Runde, 2009). In order to understand this background causation, I have tried to theorize the non-observable qualities of computational technology as an alternative to the attempts to meticulously describe the myriads of human and non-human actors associated with any organizational phenomenon.

4.4.2 Medium-specific rules

To conclude the discussion in this chapter, I suggest that analysing the medium-specific rules that shape the conceivable actions on a particular medium could provide an alternative analytical perspective on contemporary information and communication technology. The approach is inspired to a significant degree by the realist take on formal organizational constructs in Schmidt (1999) and could perhaps be seen as an addendum to the transformational model developed by Runde, Jones, Munir and Nikolychuk (2009). In my view, the approach has two benefits.

First, the approach allows us to put forward propositions such as the double bind of audience information regarding the transcontextual nature of technology and to study these under specific circumstances. This can help to counter potential biases in the context-sensitive case studies that, according to Pollock and Williams (2008), tend to overemphasise the idiosyncratic adoption of technological artefacts while downplaying broader industrial patterns. After all, a case study is supposed to be a study of an instance of something more general (Walton, 1992). If nothing else, I hope the approach makes the link between the idiosyncratic and the general more transparent and easier to scrutinize. Second, focus on technological rules may also help to understand the generative aspects of technology beyond its capacity to allow and, respectively, disallow courses of action. Instead of simple regulative devices, technological rules could be understood more broadly as a way of governing institutional conduct (Kallinikos, Hasselbladh and Marton, 2010). Let me briefly discuss where such approach might lead before moving to the empirical part of the study.

Kallinikos (2003a) discusses how different kinds of representational rules embedded into a medium can entail rather different ways to manage the referent reality. He contrasts context-embedded signification with the abstract perception of rules behind shifts in system states as two distinct ways to represent and master the reality. Interestingly, the former case would seem to approximate the Foucauldian idea of mastery based on knowing the subjects, that is, building machineries to aggregate information about citizens, employees or other kinds of subordinates into

a place from which the subjects cannot hide. In the latter case, which alludes to the nature of computational technology, mastery is based less on knowing the subjects themselves by virtue of being able to map individual signs to their referents. Instead, the control of the system is based on mastering the rules that constitute the matrix in which the subjects can exist, that is, knowing and managing the *ars combinatoria* of the medium. According to Kallinikos, such matrices are increasingly constituted in the domain of computation and then channelled back to people as possible courses of action that people live out as their own choosing (Kallinikos, 2011b). We do not stop all the time to reflect upon the fundamental conditions that make some things seem more easy and sensible than others in the course of everyday action.

5 Research site

This chapter opens the empirical part of study divided into four chapters. I will start by describing the research site, outlining the company evolution and the organizational makeup at the time of fieldwork. This includes recounting a short corporate history, introducing the mechanism intended to sustain the business, describing the key elements of organizational structure, and providing a brief excursion into the everyday work at the office. All in all, the aim of the chapter is to paint in a backdrop against which matters of theoretical interest will be analysed in Chapters 7 and 8.

The largely descriptive account in the current chapter follows a generally emic approach based on language familiar to the research site, although this does not mean sticking rigidly to a vocabulary extracted from the informants (Pike, 1990). The intention is to make the narrative readable in the absence of particular theoretical scaffolding as well as understandable to the informants, who found it by and large acceptable as I let them read a draft version. This does not make the description unequivocally right, but reflecting my views back to the informants helped to elicit additional insights and strengthen some interpretations. The approach will also hopefully help to juxtapose the findings with other empirical studies by contextualizing the theory-driven analysis appropriately. As I have already pointed out, it will become clear how the organization was born into the computationally mediated environment without the burden and support of legacy structures. This distinguishes the case, for instance, from studies on the computerization of traditional industrial settings (e.g. Kallinikos, 1999; Zuboff, 1988). Instead, the research site could be framed as an attempt to innovate a multi-sided platform business (Evans, 2009).

In contrast to the emic approach, the main analysis in Chapters 7 and 8 in based on etic concepts[26]. The chapters make together four selective cuts into the empirical evidence to reveal specific mechanisms of interest that are not necessarily

[26] Etic concepts could be understood as the emics of the observer and his scholarly discipline, but it has also been argued that due to their grounding in scientific community the concepts must be categorically different and, hence, called etics (Harris, 1990).

apprehended as such by the actors themselves within the studied arrangement. These cuts are motivated by the historical analysis of industrial setting and the theoretical discussion in the two previous chapters. The manner in which the theoretical framing was constructed and imposed on the empirical evidence will be opened up in a methodology chapter before moving to the main analysis. Thus, having introduced research site in this chapter, the next chapter opens up both the logic of research design and its actual unfolding during the investigation.

5.1 Corporate history

The studied company was incorporated in 2006 by high-profile founders who succeeded in raising millions of euros in venture capital to support the development and launch of an advertising-funded telecommunications operator. The following is a short account of corporate history, past events and decisions that had shaped the overall organizational arrangements. Importantly, the formative stages of organization were not only embedded into the current form of organizational setup but they also entered into the present whenever employees reflected upon and reacted to current events using the earlier developments as reference points. Contrary to incumbent telecommunications operators with a significant vested interest in their current business models, the employees of a start-up company were generally aware of the necessity to establish a new way of doing business. A strong entrepreneurial spirit was present for instance in the way the employees took part in the planning of a thorough reorganization of activities during the fieldwork period.

The business idea was, from the beginning, to build a new kind of advertising medium that would be first launched and developed in one European country and then expanded to other markets. The company positioned itself in both the media and telecommunications industries, whose actors were perceived to share a common interest in mobile advertising while generally being unable to understand the workings of each other. Bringing consumers and advertisers together on a mobile advertising platform was expected to create a considerable amount of new value, from which the company could then extract revenues.

Operating as a mobile virtual network operator (MVNO), but making money from advertising, the organization would "have the soul of media, but the body and muscles of a telecoms operator" as one of the informants described the nature of the platform business. The reasoning was that, if the approach could be shown to work in one country, it would then be easy to attract funding for copying it to other countries, capturing a considerable share of emerging mobile advertising market. It is possible to distinguish from the informants' comments and other available records four different phases in the trajectory of organizational evolution.

5.1.1 Prelaunch period

Prior to launching its mobile telecommunications service for consumers and an advertising offering for advertisers, the company had to design, setup and integrate a number of operations into an enterprise that had no obvious predecessor. The mobile advertising business was at its very early stages in 2006. There were neither clear structural templates nor so-called best practices to follow in terms of organizational arrangements, as no one had so far demonstrated if, and how, the new kind of platform business could reach the critical mass of consumers and advertisers to take off. Nevertheless, the company positioned itself unequivocally as media from its very first public press release.

> Company is a mobile media that offers brands an opportunity to directly interact and engage with young people and receive real-time feedback.
>
> (Press release, November 2006)

The prelaunch organization revolved around executing a number of preparatory actions such as: recruiting employees to take responsibility for various organizational functions, designing the consumer experience and related materials, making contracts with partners and contractors providing parts of the overall system and services, developing the necessary software components and integrating them together as well as with the telecommunications infrastructure, setting up a local sales office, laying grounds for branding the service, planning the advertising sales operations etc. All in all, the company put together a complex operational structure

comprising several interdependent functions and tens of vendor organizations in less than two years.

5.1.2 Commercial launch and ramp up

The commercial launch took place in late 2007. Young consumers considered as being difficult to reach for advertisers could sign up for the service by providing profiling information and explicitly opting in to receive marketing messages to their mobile phones. The subscribers had to accept a terms and conditions document, and their age and address was verified before sending them a SIM card needed to activate the service. The membership agreement summarizes the obligations between the subscriber and the company as follows.

> As a Company member you get:
>
> 1. Exclusive offers, news and more from brands you'll like
> 2. Free credit every month
> 3. Top up offers that reward you if you want to text and talk more
>
> In return you agree to:
>
> 1. Keep your Company SIM in a phone that can receive picture messages
> 2. The settings that Company sends you are correctly saved on your phone
> 3. Keep your phone on so that brands messages can reach you
>
> (Terms and conditions document)

The permission-based marketing approach communicates upfront that people would become a part of advertising audience by subscribing to the service. In exchange the company would give free voice call minutes and text messages every month. Importantly, the contract requires that the members actually keep their phones on and configured so that they can receive advertisement messages, whereas most other advertising mediums are generally happy to let consumers resort to whatever tactics to avoid advertising. A breach of the contractual terms could lead to expelling a member from the service.

After the launch, the organization started to accumulate experience from interacting with consumers and advertisers resulting in various adjustments to the service and organizational arrangements. For example, a number of problems with the complex information systems infrastructure had to be hammered out and the process through which people joined the service was found to be somewhat tedious. Nevertheless, the operations stabilized gradually. The informants perceived that half a year into the commercial operations they were largely running business as usual. In general, the nature of media business made possible sequential entry to the platform business (Evans, 2009). While the consumers do not need advertisements, the advertisers need an audience, and it was therefore imperative to first attract large amount consumers to the service.

5.1.3 Reaching consumer acceptance

The company reached its self-imposed target of hundred thousand subscribers, so-called members, six months early. This was considered a substantial milestone and publicized as a proof that the consumers were interested in the service as well as willing to be targeted with advertisements in exchange for free communications. Indeed, without the consumers subscribing to the service in large numbers there would have been nothing to sell for the advertisers, and thus the uptake of the service was seen as an encouraging sign that the business model could be made to work.

> Company the new mobile network for 16-24 year olds funded by advertising, has signed up over 100,000 members since its launch at the end of September, 2007. Members have embraced the concept so rapidly that annual member targets have been reached six months ahead of schedule, establishing it as a powerful new media for connecting advertisers with young people.
>
> (Press release, April 2008)

Interestingly, unlike most traditional telecommunications operators the company did not generally use expensive advertising campaigns in the mass media to let people know about its service, but it relied mostly on word-of-mouth and one-to-one marketing activities for instance on university campuses to promote its service. This

suggests that young consumers were not only willing to receive advertising messages to their mobile phones in exchange for tangible benefits, but they also promoted the service to their friends. Indeed, it would seem that the company was able to solve the first step in its sequential entry to the platform business.

5.1.4 Crisis and transition toward a new organizational arrangement

The advertising sales were also growing but probably not quite as fast as was initially expected. Toward the end of 2008, the world economy plunged into a recession resulting in severe cuts to advertising budgets in the market where the company operated, making it look increasingly difficult to reach a sustainable level of revenues from selling advertising in the original arrangement. However, the organization did not abandon its business model, but decided to move away from operating its own telecommunications network and instead to partner with traditional telecommunications operators that would offer the advertising-funded service to their existing subscribers. The audience product for advertisers would remain generally the same, while many of the organizational processes and arrangements would have to be restructured to match the new approach. Also, this meant moving from building a two-sided platform to building a three-sided platform including also the partner operator in addition to the consumers and advertisers.

The empirical fieldwork took place during this transition period. The organization was still running the MVNO but, at the same time, planning the move to partnering with established telecommunications operators in order to retain the vital access to the consumers. The plan was to rearrange the service so that the company and the telecommunications operator could share the benefits of advertising to the large existing subscriber base of the latter. The mobile virtual network operations were closed during the latter half of 2009, and the service was reopened in partnership with a traditional telecommunications operator. The partnership-based commercial operations were expanded in 2010 into two more countries with plans for further expansion.

An eventful trajectory is hardly uncommon in a venture organization built on a high risk – high return approach to doing business. In contrast to organizations with a longer history and more stable institutional bottom line, many of the employees had personally experienced these formative events in the evolution of company. The employees were therefore not only aware of the current form of organization but also knew much of the work and reasoning that had shaped the setting in which the everyday work was carried out. In a sense, there had never been a stable status quo but merely an attempt to establish one. It was clear to the employees that the venture-funded organization was on a temporary lease of life or, as one informant put it, a "project" with a finite existential horizon. The lease of life could be extended by attracting another investment or by the revenues reaching the level at which the organization could sustain itself. Alternatively, the company could end up being sold to another company or go bankrupt.

More generally, in the midst of global financial crisis, the existence of the organization was not perceived as an unquestionable background condition apparent in the vast majority of organizational analyses, but a concern that entered commonly into the discussions and organizational practices. This existential anxiety was manifested for instance in a remarkably short temporal horizon ranging from weeks to couple of months at best beyond which it made no sense to plan operations due to rapidly escalating uncertainty. The question of organizational survival was spelled out in a number of ways many of which revolved in one way or the other on the idea of business model.

5.2 Media business model

The informants often referred to the company as "media". It was repeatedly stressed for instance in the workshop discussing the positioning of the company in the new partnership-driven structure vis-à-vis other industrial organizations that the company "will always be a medium". To put it simply, the employees conceived the organization as a media enterprise, that is, a company based on the business model of commercial media. Given the precarious existence of the start-up organization,

this can help to pinpoint the kinds of processes, practices and mechanisms to focus upon in the organizational analysis.

The business model points to the survival mechanism of the organization and thereby helps to distinguish between the vital and less important activities in the empirical analysis. As will be further elaborated in the next chapter, even the most systematic and detailed analysis can hardly account for everything that is taking place at the research site but should instead focus on the aspects that are of specific interest in terms of the research questions. For instance, the importance of measurement and analytics stands out against the understanding of industrial setting and media business model. Furthermore, the idea of a business model is not merely an academic framing imposed on the research site but a part of informants' reflective self-understanding. The construct is not the exclusive property of management scholars as it is widely used by the practitioners across industries.

The idea of different business models has generated copious literature on the field of management studies including a number of ways to understand the concept itself (Perkmann and Spicer, 2010). In general, I take the business model to capture the commercial prerequisites for sustaining the existence of an organization. A review by Rajala (2009) identifies from this perspective a number of definitions most of which incorporate the combination of two aspects: the mechanism for value creation and, consequently, its capture in a particular industrial setting. To put it simply, a commercial organization must produce something that external actors consider valuable and be able to monetize the value as a stream of revenues. Rajala (2009, pp. 20-21) defines a business model "as *a concise representation of how an interrelated set of elements – the offering, relationships, resources, revenue model, and management mind-set – are addressed to create and capture value in defined markets*." Stepping back from the managerial conception, a business model can be understood as the template for the mechanism that is supposed to sustain an organization operating in a competitive market.

Does the concept of business model offer a valid approach for capturing an organizational reality? Perkmann and Spicer (2010) critically review the business

model literature and suggest that business models are perhaps best understood as performative representations, that is, concepts used by the actors to make sense and act upon organizational reality. In this respect the idea of operating as a media company was a fundamental assumption at the research site, whereas having to close the MVNO could be constructed as a matter of more efficient implementation of the model. The template for organizing was a topic of ongoing reflection during the fieldwork, and the idea of commercial media was employed as a sense-making device helping the actors to grasp and act upon the organizational reality in a concerted manner. As I have discussed in the previous section, the employees of a start-up company faced explicitly the question of sustainability of business model. The organization existed to establish a new, yet-to-be-proven way of doing media.

The actual functions and operations of media companies vary considerably in respect to a number of attributes, yet from the market-based view all of them can be understood to produce and sell audiences to advertisers. This generic model entails that a company creates value by attracting the attention of consumers to a media space where it places advertisements paid by organizations interested in having their messages delivered to the prospective customers. In the case of this study, the media space is the messaging inbox in the consumer's mobile phone where the text and picture messages from the advertisers appear along with personal communications. In order to be able to monetize this attention, the company would have to demonstrate how the people using their mobile phones behaved as an audience. The model suggests a relatively narrow analytical focus on the organizational practices and processes, and as such helps to cut through the diverse empirical evidence. It is also worth pointing out that the approach leads to ignoring some admittedly important aspects in terms of organizational survival such as the continuous funding negotiations with the investors.

5.3 Organizational arrangements

In general, the organizational arrangements could be described as a simple hierarchy mixed with a strong sense of peer-group culture, perhaps not unlike many other entrepreneurial organizations (Douma and Schreuder, 2008). The company founders were the ultimate decision making authority while the employees shared a sense of common mission. In the course of fieldwork it was pointed out to me several times that the founders had had the idea that the organization should "fit into a one room". This probably manifested mainly an aspiration to retain some of the entrepreneurial culture in the face of unavoidable bureaucratization as the organization grew. Nevertheless, the spatial metaphor captured some prominent characteristics of the company. The organization revolved around a small number of committed key employees planning and managing a network of contractors and local sales offices responsible for maintaining most of the organizational routines and systems that made up the platform serving hundreds of thousands of subcribers.

Even if the total number of staff had inevitably grown since the beginning, from where I sat during the fieldwork period I could still literally see most of the thirty employees working at the head office. The staff comprised experienced professionals in telecommunications, digital marketing, public relations, software development etc. organized into six teams responsible for various organizational functions. The formal organizational structure was, however, relatively loose. Plans and operations were routinely discussed and coordinated across teams and the employees could make decisions on many everyday matters simply by pulling together the right people from the office. Major decisions were discussed in the management team meetings and ultimately made by the chief executive officer who was also one of the co-founders of the company.

The employees at the head office managed the local sales office and the network of contractors taking care of the bulk of practical tasks involved in operating the service. The sales office was supposed to be responsible, for instance, for local advertising sales and production, marketing and member operations, but in practice the head office had not completely relinquished the control over operations to the

local staff. This sometimes caused tensions and the informants were generally aware of their occasionally paternalistic approach for sorting out local matters when the local staff was felt to be too slow in making or implementing decisions. Tens of contractors provided a myriad of services related to keeping the business running as well as project-based consulting. In order to support the ground up distributed operations, the company had built and deployed an array of information systems and software tools with a relatively open information sharing policy within the organization and its partners. For instance, the employees of contractor companies usually had access to the company intranet and were often assumed to behave as if they were company employees.

During the fieldwork period there were six largely self-managed teams each occupying a group of tables in the open plan office. Most of the informants reported that they were generally responsible for planning and managing their own work, which was largely confirmed by the observation. Indeed, it occasionally caused problems that senior managers were not available to provide guidance for their team members. They were often away from the office for several days to visit prospective partners and customers, or to attend media events and trade fairs. The Brand Office team was responsible for the company brand image, user experience and public relations. Its employees worked closely with the Members team managing the relationship with the network subscribers and for instance the customer service function. The Commercial team developed advertising formats and products for advertisers and was responsible for their sales, that is, generating revenues for the company. The Technology team procured and developed information systems together with other teams to support various organizational functions. Once the systems were ready, they were deployed by the Operations team, which was responsible for maintaining the stable operation of the telecommunications network and the other systems underpinning the company business. The rest of the employees belonged to a group taking care of human resources, financial, legal, administration and general management related matters.

5.4 Daily work at the office

The daily life at the office included both working with specific projects and taking care of recurrent tasks related to maintaining around the clock telecommunications service and the advertising operations. The relative proportion of different types of work varied from one person and time to another, but in general the employees were perceived to be engaged with rather varied tasks. Even the office assistant responsible for maintaining the premises and acting as a secretary for the senior managers argued that no two days were the same at the office. All in all, the overall expectation was that the organization would have to keep changing and the business would not look the same in a few months. Indeed, the employees resorted commonly to humour and jokes in order to cope with the considerable uncertainty present at the organization. The director of user experience development (UED) reflects upon the company prospects in an interview as follows.

> UED: [It is] difficult to say if Company exists in [country] after half a year.
>
> Researcher: At least as a consumer brand…
>
> UED: This is not boring – both in a good and in a bad sense [laughs] […] Change is the only stable condition, and in this market situation we need to be able to change very quickly with our small and risky organization. The kind of person who does not adapt or considers it rather stressful could not work here.
>
> (Interview with User Experience Director (UED) on 9 March 2009)

The employees had been granted with a considerable freedom to use their own discretion in making decisions regarding many operational matters. They often took initiative in suggesting new projects, alternative courses of action and solutions to challenges outlined by the top management. The general perception was that that no one knew exactly what the company should do, and many employees contributed actively to envisioning and planning the company's future. It was as if the company was a big knowledge-creation exercise in terms of new kind of platform business, made possible by the co-founders' experience and contacts in negotiating funding.

Since most of the operational routines and implementation work had been outsourced, managing the work of numerous contractors constituted an important responsibility for many staff members. Implementing any changes to the business processes usually required contracting the needed modifications to the systems from partner organizations and monitoring their work in rolling out the changes. It was, however, the work of envisioning, designing and deploying more effective ways to establish the new advertising medium that commanded the paramount importance during the fieldwork period. The organization was in the middle of transition from a telecommunications operator structure to a new way of building messaging-based advertising medium in partnership with traditional telecommunications operators. In addition to the major internal changes, it was considered extremely important to maintain the public image of orderly transition. An important task for a start-up company building new platform business was to establish its model publicly as a legitimate and effective way to create, sell and buy audiences.

Photograph 1. A view from my desk at the Members team table. The open-plan office provided an excellent opportunity for participatory observation, and yet, despite the constant sense of urgency, there was often curiously little visible action at the office.

Photograph 1 shows the open-plan office providing a rather unhindered and immediate access to any person present at the office. I sat among the Members and Brand Office teams, from where I could also follow the employees of the Commercial team as well as the administrative personnel. Out of 26 informants the most important colleagues during the fielwork were Member Acquisition Business Manager (BMMA) and Member Care Manager (MCM) working for the Members team, and Brand Manager (BMA) working for the Brand Office team. The daily work at the office made a good use of the open-plan setting that enabled setting up meetings, coordinating issues and sharing knowledge across teams in real-time. Given the upcoming transition to a new organizational arrangement, the overarching atmosphere at the office was a constant sense of urgency. The financial crisis had made it look increasingly difficult to reach sustainable revenues in the current organizational setup, and it had also tightened considerably the opportunities for attracting further venture capital. The employees knew that the existence of the organization was at stake, as the success of emerging advertising platform could not

be taken for granted in contrast to the companies working with established business models. Despite this sense of urgency, there was often seemingly little action at the office. The employees worked often quietly for extended periods of time on their own tasks and occasionally just waited for something to happen. However, at the same time they knew that a lot of things were happening elsewhere and those things could eventually coalesce at the office in a manner that would redefine their ongoing engagements and plans.

This led me to think of the physical research site as the tip of the iceberg representing the complex organizational arrangement spanning a number of locations, systems and organizational settings. Even if the vast majority of work took place outside the head office, the research site was the nexus where the distributed practices and processes had to be brought together, managed and rearranged to support the emerging advertising medium. Appreciating the functioning of the audiencemaking arrangement would therefore require understanding how the work at the office connected with its distributed, and in some respects invisible, complement. This, as I gradually came to realise, was achieved by extensive reporting practices and systems that made it possible to pull things together at the head office. Furthermore, in contrast to the studies by Zuboff (1988) and Kallinikos (1999), considerable parts of that arrangement existed only in the digital realm and could never be acted upon physically. When the office moved to another location at the end of the fieldwork period, the biggest concern was to make sure there would be no disruption to the network connections. Thus, the office, that was in itself rather an informal and uncomplicated setting, was only the immediately visible part of a much larger arrangement constantly observed and assessed through meticulous reporting.

Within the teams I worked mostly closely with it was possible to distinguish different types of work that interleaved with each other. First, there were the recurrent routines and practices related to maintaining the consumer offering and advertising operations. These included managing outsourced functions, taking care of various run-of-the-mill issues, and providing reporting to the organization. Second, occasional incidents in the network infrastructure or, for instance, in public

relations sometimes required the immediate attention of an individual employee or a quickly assembled task force. If the issue was severe enough, it was then escalated to the organization in general. After the initial ramp-up phase such incidents had, however, become relatively rare.

Third, a great deal of work was conceived as projects ranging from informal undertakings of individual employees to officially acknowledged entities with committed financial resources and external contractors. During the observation period the most important project-type activity revolved around the transition to the new partnership model. This activity, which I generally refer to as business development in this study (although it was not explicitly called as such at the office), cut across the teams and had implications for almost any other project in the organization. The paramount importance of business development tasks was manifested in the way they often dictated the priorities and reset the schedules whenever the discussions between the senior managers and potential partner operators were fed back to the office. Such news usually energized the entire office as the employees tried to assess the impact on their ongoing work and to adjust their plans to the unfolding situation in the negotiations.

Given the different types of work, rapidly shifting priorities and complex interdependencies between tasks, coordinating activities at the office relied heavily on what Thompson (1967) calls mutual adjustment, that is, constant dialogue between various parties approaching the common issue from different perspectives. It was often necessary to get a diverse group of employees, including members of senior management, around the same table to achieve a working consensus on how to proceed. Organizing such opportunities to coordinate was not always easy and were seized sometimes at a very short notice requiring the participants to reschedule their other tasks and engagements at the last minute. Indeed, occasionally coordinating the opportunities to coordinate became a major task in itself. Every Monday morning there was a meeting for the whole staff in which the senior managers gave short updates on the recent developments in the business operations as well as discussed the overall plans for the next few weeks. The most prominent topic in these meetings, which were held as literally standing sessions in an office

lobby, was the evolution of the company business model. Although providing overall direction, there was neither time nor was the weekly cycle quick enough to sort out the details of individual tasks in these meetings. Some teams had their own weekly meetings after the common session. Finally, keeping the relevant external contractors abreast of the developments was not always easy.

The data collection took place during the daily life at the office disturbing the workflow as little as possible. I kept an observation log on my laptop, interviewed people during more quiet periods and participated in meetings mostly as a member of working team contributing to the topics on the basis of my prior experience as a designer. Finally, I usually had a lunch with a group of employees at one of the nearby restaurants. The lunch turned out to be often a sort of breakout session incorporating reflections, debates and occasional frustrations in respect to what was going on at the office. It was this intensive engagement with the everyday matters that made me perhaps first realize that what I saw at the office could hardly exhaust the organizational reality in which we worked. To put it simply, there was often little to see since many of important things took place in the digital environment. The computationally mediated dimension of the organizational environment consisted of at least three aspects.

First, the telecommunications network provided the basic infrastructure for bringing consumers and advertisers together on the new platform. Second, despite the physical co-presence, a significant amount of things were mediated through collaborative information systems. These systems not only stored documents and structured distributed working practices but also provided another layer of individual presence in the organization. Employees used instant messaging applications often to signal their presence in the working environment when participating in meetings and working from outside the office, and they even used it for communicating from one table to another in the office, even when they could directly see each other. A stream of recent updates with the person's name and picture appeared on the front page of the company intranet system providing a sort of digital window into what was happening in the organization.

Third, it turned out that a whole variety of operations produced and relied on a number of reports and reporting systems. Different parts of the organizational arrangement churned out tables, indices, graphs and summaries on a routine basis. In contrast to the collaborative dimension, however, the reporting technology was much more inconspicuous. On the one hand, it did not attract nearly as much attention as many other issues did. Few people got excited about reporting and thus the topic was hardly mentioned in the interviews until I started asking about it. On the other hand, reporting was crucial in making the reality employees acted upon visible. Without knowing what was going on in the infrastructure, member base and relevant partner organizations it was impossible to plan actions and to observe their impacts. Most importantly, the network subscribers providing the raw material for the audience product by receiving and interacting with the advertising messages could never be directly seen. Yet, the employees discussed the audience members almost as if they were present at the office. These observations led me to question how the organizational environment and the objects that the informants acted upon at the office were constructed. How were the employees able to know if their actions made any difference without ever seeing any customers?

5.5 Toward theoretical cuts into the empirical evidence

This chapter has given an overall account of the research site: its corporate history, business model, organizational arrangements and everyday working environment. The setting was characterized by uncertainty, informality and urgency in its search for workable arrangements to turn mobile network subscribers into an advertising audience. The everyday work revolved mainly around recurrent tasks related to running the platform operations and on planning the transition to new organizational arrangement. Building toward the main analysis in Chapters 7 and 8, it is useful to look at the three dimensions of technological mediation identified in the previous section and to connect them with different scholarly perspectives on information systems.

First and foremost, offering the telecommunications service for consumers necessitated operating a massive information systems infrastructure. Even if major

parts of this infrastructure were leased from the host operator, there were still tens of systems that had to be developed and managed by the company and its subcontractors. The unavoidable problems in systems integration and the drifting of the overall arrangement would make a case for information infrastructure study (Ciborra, et al., 2000). Second, a myriad of working practices maintaining different organizational functions depended on collaborative technologies such wiki spaces, real time communications systems, issue management and reporting tools. This would point to a study in distributed work (Hinds and Kiesler, 2002) or, perhaps, in computer-supported cooperative work (Grudin, 1994). Third, in a rather more inconspicuous manner compared with the previous two, it was the computational data generated by the network infrastructure that made the new kind of audience product possible.

It would be possible to tell a number of different stories on how technology was involved in shaping the organizational matters at the research site. My aim is, however, to connect the analysis to the core of the audiencemaking business and therefore it is the last of the three perspectives that is of interest here. It is worth stressing that without the framework put together in Chapters 2, 3 and 4, this dimension would have probably remained largely invisible and difficult to bring together from the empirical evidence. The puzzlement that emerged from the fieldwork would have probably fizzled out without being able to anchor to anything. Nevertheless, I argue that the reporting practices and systems are indicative of some of the most crucial mechanisms if we want to understand how computational technology shapes commercial media. Placed against the history of the ratings industry, the research site becomes, then, not just a story about an individual organization, but an exploration into the latest developments in the evolution of audiencemaking in the media industry. The case is not just about opening another outlet within an established industry, but a new kind of platform business in the making.

The analysis in Chapter 7 makes a theoretically motivated cut into the empirical evidence to understand the reporting practices and systems in the context of computational information. In particular, the chapter discusses how the audience

members were born out of digital data. The omnipresent members were never seen at the office, yet they shaped a broad range of organizational practices and issues. Some of these practices are analysed in Chapter 8. More generally, the recent developments in audience measurement are reminiscent of possible broader trends across a variety of settings in which organizational life is increasingly constituted through digital objects. Scholars such as Beniger (1986), Castells (2000), Ayres (2007) and Kallinikos (2006; 2009a) view the kind of developments taking place across industries and societal sectors as a distinct phase in the history of progressive layering of organizational matters and previous technologies with higher-order technological systems. From this perspective, the question is not so much how technologies are enacted in practice, but instead how the enactment of practices is shaped by technological information. In order to engage the empirical evidence in an appropriately rigorous manner, the next chapter will provide an exposition of the research design and analytical procedures.

6 Case study research design

This chapter unpacks the design and implementation of the empirical investigation. Chapters 3 and 4 made the case for a moderately realist perspective vis-à-vis constructivist approaches, and I will first conclude this discussion by introducing the critical realist metatheory in the opening section of this chapter. The second section outlines the case study research strategy and its applicability for answering the kind of question motivating the study; two subsequent sections describe, then, the execution of data collection and analysis, and finally I will summarize the key components of the research design. All in all, the analysis follows retroductive reasoning under the auspices of critical realism (Mingers, 2004), which I operationalize into three guidelines underpinning the analytical narrative in the following two chapters.

The chapter provides unavoidably a somewhat sanitized account of the actual research process and practices. However, I have opted for not completely hiding my firsthand involvement in the process that incorporated myself into the research site by virtue of intensive participatory observation. The discussion will open up key twists and unexpected shifts in the research design as they unfolded while sticking to an *a posteriori* rationalized account where it seems a reasonable approximation of the actual process. After all, there are good reasons to provide a relatively purified account on what went into the final product. The reader should be able to grasp the logic of argumentation without having to follow all the missteps and dead ends the researcher had to go through before arriving at the results.

The exposition of research methodology could be seen analogous to the documentation of computer software code that often follows rather than leads the act of programming (Parnas and Clements, 1986). In the case of software development, it may be useful to pin down some key aspects of an envisioned software application before producing the actual code, but in any case the specifications have a crucial role in letting the other programmers understand the workings of the application. The task of documentation is, in this respect, precisely to hide the swamp the original author of code had to muddle through in order to arrive at the functioning

application and thus to save the reader the task of having to reverse engineer the logic of the application from its source code. By analogy, the purpose of methodological exposition could be seen to open up the scientific criteria the research is suggested to meet – not to describe the research process as such. The analogy breaks down admittedly in that functioning program is distinguished from one that is not by the software compiler, whereas in the case of qualitative research there are no such hard and fast criteria.

The act of constructing a rationalized account can also be understood as a test of whether the actual research process can be rationalized, that is, if the theoretical constructs derived from the study have formative validity (Lee and Hubona, 2009). This can enhance the research results by making their underlying assumptions more solid and forcing the researcher to reflect upon the details of the research design, but it can also entail glossing over gaps in the evidence and obscuring weak points. A successful methodological exposition makes the argument at the same time refutable by virtue of more explicit assumptions and implications as well as more objective in the sense of difficult to refute by strengthening the reasoning behind the findings.

6.1 Metatheoretical considerations underpinning the research design

In order to establish a valid or at least defensible knowledge claim, one has to demonstrate the procedural correctness of the steps through which the contribution has been fabricated. How those steps are established and what, if any, constitutes the proof that they have been followed appropriately are central concerns for the philosophy of science (Harré, 1972). Most natural sciences but also, for instance, economics are usually considered to be unified by their methodological apparatuses. According to this view, valid scientific knowledge is produced by appropriate techniques over which there is a relatively stable consensus among the community of relevant scholars. Under such disciplinary conditions, it is then enough for the piece of research to demonstrate that the canon has been appropriately followed while working towards substantive contributions.

Social sciences tend to depart from (or do not meet) this ideal of science. In some cases this may express immaturity, but in general there are reasons to believe that the object of social science differs from that of natural sciences to an extent that the fundamental assumptions behind the common scientific method are inconsistent with the nature of research object (Archer, 1998; Mingers, 2004). The argument can be made in a number of ways. Following the discussion in Chapter 2 it is enough to reiterate that human beings are what Hacking (2002) calls interactive kinds. We react to the knowledge about ourselves making it difficult to separate the knowledge and its objects as the latter may change as the result of former. This is not to say that human beings could not be studied as inanimate objects, but making such assumption limits the scientific inquiry unnecessarily. Instead, social arrangements need to be commonly studied as open systems. It is often all but impossible to isolate the studied phenomenon from its context, and people within the system tend to be both reflexive about the research as well as creative about the setting in which they find themselves (Archer, 1998). The object of social science can be said to incorporate an order of complexity not found in natural phenomena.

These observations have some important implications for the research design. Demonstrating the procedural correctness of the study entails reasoning both the choice of each step and how they fit together as a coherent research design – in addition to demonstrating that the research design was executed appropriately. The challenge is that the myriad of theories, methodologies, data collection and analysis methods fit together only in a limited number of ways in respect to a specific question and research domain. Crotty (1998) calls this reasoning behind the research design 'theoretical perspective' whereas I prefer the label 'metatheory'. The latter seems to better communicate the idea of theory about research. The metatheoretical framework provides the overall rationale and guidance within which different parts of the research design are brought together.

6.1.1 Critical realism

This study is based on critical realist metatheory. Contrary to many well known theoretical perspectives discussed for instance by Crotty (1998), critical realism

does not start from the epistemic question how can we know the world, but asks what makes the world knowable (Bhaskar, 1998). While admitting that humans encounter the world through their interpretations of it, a realist assumes those interpretations must carry traces from the external reality. Critical realists believe that there is more to the world than our immediate knowledge of it and thus conflating the latter ontological question with epistemology amounts to an epistemic fallacy (Mingers, 2004). Keeping this transposition in mind it is, however, worth visiting the epistemological question first because this makes it easier to relate critical realism with some other theoretical perspectives.

Epistemology is the field of philosophical inquiry into the nature of knowledge (Crotty, 1998; Harré, 1972). It attempts to answer or, at least, provide ways of tackling questions: What is knowledge? What does it mean to know something? How can we acquire or achieve knowledge? The basic epistemological positions can be described as objectivist, constructivist and subjectivist epistemologies each incorporating different answers to these basic questions. The implications of the chosen or, indeed, often taken-for-granted position for academic research and teaching are fundamental. Any academic attempt to study a particular subject requires a research design, which commits either explicitly or implicitly to a particular epistemology. For instance, the popular idea of science (shared by many scientists themselves) as a progressive revealing of facts about the world is firmly grounded on the combination of objectivist epistemology and positivist methodology. The knowledge is assumed to be a thing out there in the observer-independent world that can be represented by the means of rigorous inquiry.

Critical realism follows a generally constructivist epistemology, but makes some important extensions that distinguish the approach, for instance, from the social constructivist metatheory manifested in approaches discusses in Chapter 3. Within the spectrum of various epistemological and metatheoretical positions the two approaches come, however, close to each other in many respects (Outhwaite, 1998). A critical realist generally agrees with the constructivists that knowledge is socially constructed and thus transitive, but argues that scientific knowledge is about the intransitive domain of reality that exists relatively independent of the transitive

knowledge of it. Furthermore, the intransitive domain is stratified so that the empirical observations capture only a subset of events emerging from essentially unobservable entities and generative mechanisms (Mingers, 2004). The intransitive domain of knowledge can be very much shaped by human action. Its intransitivity derives less from the immutability of entities and natural laws governing human existence than from the social structures of various kinds that make social action possible.

Archer (1998, p. 197) refers to Bhaskar who "states unambiguously that 'social forms are a necessary condition for any intentional act, (and) that their *pre-existence* establishes their *autonomy* as possible objects of scientific investigation'." Indeed, this is largely what I tried to convey in my discussion about computational rules and organizational practices in Chapter 4. Archer also associates the vertically stratified character of the intransitive domain with its historicity. Most arrangements structuring action may be of social origin, but not at the same time as action draws upon them (Archer, 1982). I have pointed out a number of such structures at the varying level of generality. Many of these revolve around the role that audience measurement plays in the media business model; the actors make interpretations and may be ignorant of the industrial dynamics, but this does not make them go away. From this perspective, the discussion on computational objects is an attempt to capture how certain structuring forces that did not originate locally travel and may come to transcend local matters.

Finally, the idea of stratified ontology can be summarized as follows (Mingers, 2004; Outhwaite, 1998). The *empirical* events that can be observed and experienced occur at the surface of intransitive domain of knowledge. They are, however, merely a subset of *actual* events and non-events that are generated by the *real* entities, structures and mechanisms. In contrast to the empiricist approaches that take the observations and established variables as the reality, from the critical realist perspective major parts of the reality are unobservable but in principle not unknowable. Whether the real entities and mechanisms come together as observable events is contingent upon a number of factors, some of which may always remain unknown in real-life settings apart from artificially created laboratory conditions.

From this perspective there is nothing dramatic or deterministic in the argument that organizational practices may be forced to adapt to (among other things) to causal mechanisms embodied by computational objects. I will return to some further implications of the critical realist metatheory in the context of analytical methods.

6.2 Case study as a research strategy

Research strategy (or methodology) can be understood as a general template for doing research; it identifies the overall logic of establishing a knowledge claim (Crotty, 1998; Yin, 2003). Different research strategies include, for instance, surveys, histories, ethnographies, experiments, statistical modelling and case studies. The categories and the categorization of actual studies are obviously to a degree contingent on the observer's philosophical commitments. Some view, for instance, case study as a method akin to participatory observation and interviewing (e.g. Crotty, 1998, p. 5) whereas here it is understood as a comprehensive approach for empirical investigation (Yin, 2003). A research strategy establishes how different kinds of questions, theories, units of analysis, data collection and analysis methods can be combined to maintain the truthfulness of findings or at least make the research results defensible[27]. In short, research strategy represents the methodological principles that regulate the production of scientific knowledge (Lazar, 1998).

On the one hand, research strategies allow considerable freedom in how different aspects of research design can be combined. For instance, this study combines the critical realist metatheory with qualitative fieldwork methods, but it is also quite conceivable to conduct positivist and quantitative case studies (Dubé and Paré, 2003; Ragin, 1992). On the other hand, the idea of research strategy arises precisely from the fact that not every combination makes sense. Different types of questions require different approaches; theories and methods make often mutually irreconcilable assumptions. Take, for instance, the fact that a case study often implies ambiguity regarding the definition of the case. As long as the concept of case remains fuzzy, it will be difficult to operationalize measurable variables and the

[27] This study adopts the latter, more modest position.

idea of population all but loses its meaning. Nevertheless, there are valid reasons to keep the concept of case at least initially open, even if this effectively precludes operations based statistical sampling. According to Ragin, making the case out of puzzling phenomenon can be an important part of the research:

> "What *it* is a *case of* will coalesce gradually, sometimes catalytically, and the final realization of the case's nature may be the most important part of the interaction between ideas and evidence."
>
> (Ragin, 1992, p. 6)

The quotation captures much of the research experience behind this study, which incorporated considerable difficulties in pinning down the unit of analysis and, consequently, the research question until there was some empirical material from the research site (Yin, 2003). The problem was eventually solved by placing the empirical evidence against the history of audiencemaking arrangements and the transition from dedicated measuring devices to using the common digital infrastructure to capture people's media consumption. This helped to uncover the third, inconspicuous dimension of computational technology at the research site, beyond its immediate artefactual appearances (see section 5.5 in the previous chapter). Not all research strategies lend themselves to active theorizing of non-observable mechanisms and entities behind the substance captured by empirical investigation.

A case study makes it possible to study a phenomenon in its complexity instead of reducing it into *a priori* variables, that is, situations in which the number of potentially relevant variables exceeds the number of available data points, (Yin, 2003, p. 13). One might say that case a study does not require fixing the perceptual grid in advance, but makes it possible to try building new ones that can uncover features hidden from the established perspectives. This can be a considerable advantage when the varied empirical material is used constantly to check, validate and correct the theory, but can also lead to an increasing complexity of theoretical constructs (Eisenhardt, 1989). There are no mechanical checks like the ones embedded in statistical analyses to keep the creeping complexity at bay. Keeping the

analysis focused on the most important mechanisms may therefore require more substantial work.

Theory building from case studies does not have to rely on extensive previous literature and empirical exemplars, and can provide a useful approach when the existing theory conflicts with common sense (Eisenhardt, 1989), as I think the crude enactment of constructivist assumptions occasionally does. Finally, the choice was partly due to the tendency at the Information Systems and Innovation Group at LSE to promote case studies as well as the fact that I have previous experience on conducting a qualitative case study (Aaltonen, 2005). Against this background a case study emerged as the approach that seemed likely to deliver a decent thesis within three to four years[28]. This may sound a parochial reason for choosing one approach over another, but it is not. It would be rather odd if the departmental community would not at least implicitly suggest some research designs over others and, hence, afford better support and resources for deploying them.

6.2.1 Establishing the case

One of the most important decisions for a case study is the selection of the case(s). While a case study investigates a particular setting, it studies that setting as an instance of something; establishing the link with that something is conditioned by choices made in choosing the research site (Walton, 1992; Yin, 2003). The pivotal function of a case study between the particular and the general is captured by Walton (1992, p. 122) for whom cases "embody causal processes operating in microcosm. […] the logic of the case study is to demonstrate a causal argument about how general social forces take shape and produce results in specific setting." Mapping the current study to this scheme, the *microcosm* is the audiencemaking business and *general social forces* are supposed to derive from the common computational infrastructure. According to Yin (2003), a single case can provide a critical, extreme, unique, typical, revelatory or longitudinal exemplar of a phenomenon and thus help to develop theoretical understanding of it. This contrasts

[28] The timeframe and available funding for the PhD project did not make it an ideal occasion for trying out an approach I had no previous experience of. Since then I have also ventured into quantitative, computational social science approaches (Aaltonen and Lanzara, 2010; Lazer, et al., 2009).

with the historical approach interested in events, circumstances and trajectories in their singularity, whereas a case study zooms into the particular for the sake of contributions toward theory (Wieviorka, 1992). Finally, in contrast to approaches based on statistical inferences, the cases of a case study are not sampling units representing a population. A case is, instead, analogous to an empirical experiment driven by a theoretical interest.

This study comes probably closest to a revelatory case in Yin's typology, although it is worth pointing out that such a static classification depicts only the outcome of the difficult process of defining the case. The investigation builds broadly on analogies between studies on how contemporary information and communication technologies are harnessed to monitor and account for organizational processes. The role of computational objects goes, however, beyond the representation of referent entities in pulp (Zuboff, 1988) or dairy (Kallinikos, 1999) production outside the information systems. The data tokens originating from the network infrastructure are the raw material for the audience product. In the history of the commercial media business the move away from purpose-built metering devices to using the common information infrastructure suggests considerable technological discontinuities.

The problem with Yin's typology is that it ignores the process whereby researchers arrive at their cases and seems to generally assume that the researcher knows the type of case before embarking on an empirical investigation. The idea of selecting the empirical research site to match one of the rationales only makes sense if the researcher has already established what is it a case of. Even if this may be often a reasonable assumption it leaves out types of case research that are relevant for studying technological change in organizations. In the current case, the research site was chosen as an intriguing, potentially revealing phenomenon, while the actual case was made out of it – not the other way around. Pinning down the unit of analysis was a tedious process that only started to puzzle itself out halfway into the fieldwork. Table 2 summarizes four perspectives into the origins of case definition according to Ragin (1992).

THE CASE IS…	Arrived at by a specific definition	Based on a general definition
An empirical unit	A case is found by the researcher (1)	Cases exists as objects (2)
A theoretical construct	A case is made by the researcher (3)	Cases are conventions (4)

Table 2. Typology on how different research designs encounter the cases (adapted from Ragin, 1992, p. 9)

First, the definition of the case and its boundaries can be taken as an empirical question and approached inductively as a part of fieldwork process. An extreme version of this approach can be found from the methodological dictum of actor-network theory to "follow the actors" (Latour, 2004; 2005; Miettinen, 1999) assuming that the researcher should merely observe how the relevant actors carve themselves out as a case of something. This corresponds to the upper left quadrant in Table 2. Second, the cases can be understood as empirically real entities similar to the previous type, but identified according to the conventions of research literature. A formal organization is a good example of an object that fits this category less concerned with the exact boundaries of each individual case as long as the denomination identifies a relatively stable social form. It does not matter whether actual settings fully agree with each other if they can be argued to show certain distinctive characteristics. This corresponds to the upper right quadrant in Table 2.

Third, a case can be produced during the research process as the result of interaction between ideas and empirical evidence (Walton, 1992). This is the approach adopted in this study. In contrast to the previous approach, demonstrating the theoretical significance of the case emerges as a central concern for this type of study, since, by breaking out from the conventional definitions, the approach may end up building not only illuminative but also eccentric cases dissociated from other studies. Zuboff (1988) provides a successful example of this approach. The seminal case study

demonstrated the disciplinary potential of information technology by constructing modern organizational settings as an information panopticon. The approach maps to the lower left quadrant in Table 2, in which the researcher and theoretical reasoning assume the key role in carving the case out of an empirical phenomenon. Fourth, the cases can be taken as conventions constructed in the collective scholarly work. They are illuminating ways of looking at the world. The idea of the information society would probably fit this category although the distinction with the second type seems to depend to a large extent on the understanding of the 'real'. To me it seems that in former case (2) the researcher looks at a conventionally identified case whereas in the latter (4) he sees it through a conventional definition. This corresponds to the lower right quadrant in Table 2.

Research designs that require *a priori* settlement of what the case is an instance of require relying on conventional definitions of type 2 and 4 while an exploration into the question means keeping the definition of the case open or only provisionally settled. Apart from this commonality, the types 1 and 3 represent, however, quite different approaches to how cases can be made during the research process. The former assumes that the case defines itself and it is the task of the researcher to observe this process. I call this the *endogenous* definition. The idea of "agential cuts" (Orlikowski, 2010, p. 135 paraphrasing Barad [2003]) would seem to place sociomaterial approaches into this category, which, in a sense, pushes the problem to a higher level of abstraction. The question becomes then how does the researcher observe the process of case-making. The latter approach constructs the case within the process of actively theorizing its nature. I call this the *exogenous theoretical* definition leading to selective cuts into the empirical evidence. The approach does not try to avoid the role of researcher in constructing the object of study, but lacking a primary grounding either in the immediate empirical evidence or broadly accepted conventions may end up with an esoteric unit of analysis. Why should the empirical setting be understood as a case of this instead of that? My general answer to this question is that in this study I bring the specific institutional history, theoretical developments and the empirical setting together in a manner that may shed light on each of the elements.

I have so far discussed why a case study is an appropriate research strategy vis-à-vis numerous other strategies and the ways a researcher can pin down the unit of analysis as the pivotal entity between particular circumstances and general knowledge. In terms of the latter task it was argued that the approaches that take the definition of the case as a part of the empirical investigation seems more successful than ones that take a conventional case definition as their starting point. In contrast to popular approaches such as the ANT that advocate endogenous definitions of the case, a theoretically motivated definition would seem more suitable for the interests of this study. There are two reasons for discussing the unit of analysis at some length. First, it remained ambiguous for a significant part of the study. The unit of analysis posed a challenge; it was a central problem to be solved. Second, the unit of analysis cannot be detached from the research questions, and it has an impact on to what kind of theoretical propositions the case can be generalized (Yin, 2003, p. 25). Indeed, instead of a precise research question, for the most part of the study I found it more useful frame the efforts in terms of a story I want to tell.

6.3 Data collection

An initial problem with the fieldwork was to get access to a research site that would yield rich empirical evidence amenable for theorizing computational information. I did two largely unsuccessful pre-study attempts in different contexts; settling finally on emerging mobile advertising media was, in this respect, incidental. Furthermore, given the ambiguity regarding the unit of analysis, it was clear from the beginning that a great deal of empirical evidence would have to be considered as irrelevant once the unit of analysis would be established. In order to have a fair chance of being left with a usable data corpus, the fieldwork had to provide both a broad access to the research site as well as an opportunity to adjust the data collection on the basis of emerging insights. Participatory observation seemed an appropriate method for these purposes.

I had previously worked as an independent designer and design manager for systems development projects, which had left me with contacts in the industry as well as a tradable asset – I could actually provide valuable working hours in exchange for the

access to organization. This was the deal I had suggested to an old colleague working as a director at an ambitious start-up company that had used my services before. The person contacted me in January 2009 regarding my offer and I started as a member of his team in early February. The fieldwork lasted until late May including a total of 62 days of working and making observations at the office. The arrangement required a research contract that I negotiated with the company lawyer mostly regarding the procedures to ensure no confidential material ends up in the publications. I cannot report every detail I observed during the fieldwork, but, even so, the access to company confidential matters contributed to the background understanding of what was going on in the organization.

At the office, my task was to support Brand Office and Members teams in service design while collecting data for my study. My presence was therefore not conceived first and foremost as an observer but as a team member. The dual role was communicated to the employees at the beginning of the observation period by sending out a research introduction sheet by email (see Appendix 1). The position granted me the access to all employees at the head office, various information systems and the daily work at the research site. The place where I sat was located in the open-plan office so that I could see about half of the employees working at the site including the company directors (see Photograph 1 in section 5.4). I did not have access to the numerous contractors or the sales office located in another country (although I had visited the latter several times while working as a consultant for the company). Neither did I have access to the clients or the consumers. As I have discussed in the previous chapter, the research site was clearly the nexus where organizational processes were brought together and managed. It undoubtedly provided as good access to the organization as any single location could.

A useful experience from the preliminary studies was that, from the perspective of a participant observer, the daily life at the office could paradoxically feel overwhelming and dull at the same time. At any moment there could be so many things happening while nothing stood out as relevant. For an ethnographer or a case researcher looking for an endogenous definition of case this might not be a major problem, since the contours of the case would probably start emerging as the

researcher's understanding of local culture and circumstances grows. Such an approach was, however, not suitable for making a case whose contribution is based on its theoretical significance.

It was clear from the beginning that the contemporary information and communication technology played a multivalent role at the research site, but even so establishing the simple typology discussed in the end of previous chapter was not trivial. Computational technology provided at the same time the machinery that enabled offering the telecommunications services for consumers, an environment in which distributed work took place, and the source of key inputs for the making of the advertising audience. The interviews repeated the observation of previous studies that the better a piece of technology works the more it withdraws into the invisible background equipment of everyday doings (Suchman, 1996). The informants found it occasionally difficult to reflect upon software applications that were literally in front of them most of time. Hence, the common-sense idea that people use technologies did not seem the right starting point for understanding how organizational practices are entangled with technology in the flow of everyday work (Heidegger and Lovitt, 1977). The employees often became aware of things underpinning their actions only when those things did not work as expected.

These challenges lead me to develop a provisional filter through which I could judge and focus my observations in real time. This represents a departure from the empiricist approaches such as grounded theory (Strauss and Corbin, 1998) in that the initial categories used to guide the observations were theoretically motivated. I developed the list of generic topics that seemed interesting and categorised the observations immediately as I typed them into the observation log. In addition to focusing the ongoing data collection effort, this supported the preliminary analysis that took place during the fieldwork. The following excerpt illustrates the format of observation log entries. I have generally opted for the following presentational conventions. First, the excerpts from the empirical material are presented in `Courier` typeface to distinguish them clearly from the other materials. Second, square brackets [] are used for short explanations, to anonymize proper names by replacing them with common nouns and to indicate deletions by three dots […]. The

company name is presented as Company without the square brackets. Third, the informants are represented by codes listed in Appendix 2. Fourth, brief contextual information is provided below the excerpt. Since some of the original materials are in Finnish, I have included the original language version of excerpts in Appendix 3 whenever applicable.

> MCM asks about the research and I tell him that I am interested in the coordination of work in a complex situation. At the same time they should run the business and develop a whole new business model. We talk about how much of the work takes place on screen and as data. MCM tells that HBD had pondered that the head office may in fact be closer to the customer [member] than the local sales office. […] The head office follows reporting as well as blogs and discussion forums. The one who has the visibility to these is the closest to the customer. […] MCM says: ”Customers are in the data.”
>
> (Observation log entry, 4 March 2009)

It is possible to pick out a few interesting things from the observation log entry three weeks in to the fieldwork. At this point, the primary research interest had started to shift from the collaborative aspects of technology mentioned in the first sentence to the data-based practices of audiencemaking. I was able to gradually juxtapose the accumulating empirical evidence with the institutional and theoretical framework, which, in turn, gives a whole new emphasis on the remark in the last sentence. Importantly, the observation stands out against the preconceived perceptual grid that was, nevertheless, flexible enough to let the shift in research focus happen.

All in all, the data collection can be divided into systematically employed methods and seizing opportunities as they emerged. Starting from the latter, the daily observation log was constantly open on my laptop computer enabling me to transcribe episodes as they unfolded around me without having to rely on recollection after the observation day. The observations were re-coded after the fieldwork period using the coding scheme, revised to match the emerging ideas and tentative interpretations (see Appendix 4). This resulted in 689 episodes altogether. In addition to the observation log, I interviewed almost all the head office employees, some of them twice. The semi-structured interviews lasted from half to

one hour and were based on a topical guide slightly adjusted for each informant (see an example in Appendix 5). In order to fix the major events in the corporate history and to get an idea of how the organization presented itself publicly I saved all the press releases and blog posts published on the corporate website. Finally, I compiled usage statistics for the corporate intranet giving hints about the overall activity level in the organization at various times. Taken together, these procedures provided a fairly rich and systematic trace of what happened at the organization during the fieldwork period and also, to some extent, before it.

In addition to the comprehensively employed practices, I took opportunities for additional data gathering as they emerged. These include storing publicly available documents and web pages as they were referred in discussions, photographing events in organizational life, taking screenshots from information systems and asking employees to provide examples of their instant messaging logs. The opportunistic data gathering was usually driven either by an idea arising from the preliminary analysis or just to capture an occasion that seemed to exemplify or stand out from the everyday matters at the office. The summary of empirical evidence underpinning the analysis can be found in Table 3.

Type of evidence	Quantity	Remarks
Systematic data collection		
Daily observation log	62 days	13 February 2009 – 15 May 2009
Interviews	34	26 informants (see Appendix 2)
Corporate press releases	26	November 2006 – May 2010
Blog posts on the company website	60	November 2006 – May 2010
Intranet usage statistics	335 days	July 2008 – May 2009
Opportunistic data collection		
Documents	340	Reports, intranet pages etc.
Instant messaging logs	59	Conversations between the informants
Photographs	147	Meetings, people, document, office etc.
In-situ analysis		
Tailored interview guides	34	One per interview
Weekly summaries	14	One per week of observation

Table 3. The types and amount of empirical evidence

The intensive fieldwork period did not allow the profound analysis of accumulating empirical evidence, but it incorporated two reflective practices steering the data collection on the basis of provisional insights. First, every Sunday I wrote a weekly summary reflecting upon the weekly data collection efforts and pinning down any

problems or insights that I should take on board next week. In the ethnographic methodology these are sometimes call analytical memos (Walsh, 1998). Second, I tailored the interview guides for each interview so that the interviews were similar in structure, but the actual questions individually made sense to the informants and capitalized on the recent events at the organization. These procedures contributed to the minor breakthrough that took place halfway into the fieldwork and eventually helped to pin down the unit of analysis.

> I realized that I need to look at the various reports the organization generates as a potentially interesting source of data.
>
> (Weekly summary, 10 May 2009)

The excerpt shows how I had started to question where, after all, was the reality reflected in the working practices. Obviously, various information systems were instrumental in bringing things together and enabling the kind of organizing the company was built on. Yet, I wondered, in what sense the organizational environment existed outside the information systems infrastructure and to what extent it was created within the machinery itself. In fact, the employees were sometimes ambivalent about their grip of the market and consumers. It was sometimes pointed out that the organizational setup was strange in the sense that the employees commonly had to plan and manage day-to-day operations from the head office that was located outside any of the countries where the company was doing business. I decided to take the opportunity to look into how the employees actually knew the environment in which planning and various operations were supposed to have an effect. This led me to observe various reporting mechanisms and eventually pin down the data tokens as the key input for production.

6.4 Data analysis

Apart from the preliminary analysis helping to steer the ongoing data collection, the data analysis took place after the fieldwork period. During the analysis I checked details and filled in few missing pieces, but generally there was little overlap between the data collection and analysis phases. In terms of research design the key

challenge was that, in contrast to relatively clear methodological guidelines on how theories can be used as explanatory devices, refined and rejected, the procedures for theory building are less formalized. Eisenhardt (1989) discusses the process of theorizing in the context of case studies and grounded theory (Strauss and Corbin, 1998) as an attempt to formalize theorizing by delineating the inductive steps from the rich and complex body of empirical evidence toward an increasingly parsimonious conceptualization of observed phenomenon. As an all out research strategy grounded theory is, however, committed to an inherent empiricism reminiscent of positivism (Brewer, 2000, p. 42) making it difficult to reconcile with critical realism recognizing the necessarily theory-laden character of observation (Mingers, 2004). Indeed, as it was already mentioned, the participatory observation activity was supported by a provisional coding scheme derived from the theoretical interests of study.

The role of conceptual exploration in Chapter 4 in this respect is not to provide an explanatory framework, but to equip the analysis with concepts that can be used to bring the empirical evidence together in a theoretically illuminating fashion. Critical realism suggests the logic of reasoning that starts from an observed phenomenon and moves to theorize "hypothetical mechanisms that, *if they existed,* would generate or cause that which is to be explained" (Mingers, 2004, p. 385). For instance, in Chapter 4 I asked, what kind of attributes the computational technologies must share in order to make the proliferation of standards intelligible. The common bitstring object underlying all kinds of digital entities was suggested as a partial answer. This is called retroduction. Retroductive reasoning proceeds by making analytical experiments with the empirical evidence to build a credible account of research problem. The resulting model, theory or conceptualization cannot be said to be unconditionally true, but it should be precise enough so that it is possible to devise a research design to test the argument empirically.

In contrast to inductive reasoning, retroductive analysis does not proceed by aggregating as many confirmatory observations as possible behind the theory – understood as a constant conjunction of events – while trying to account for the contradictory ones. Instead, retroductive analysis makes inferences about the non-

observable entities and mechanisms that account for observed patterns. It tries "to move from experiences in the empirical domain to possible structures in the real domain" (Mingers, 2004, p. 385). Neither inductive nor retroductive analysis can, in a strict logical sense, validate the knowledge they yield. The former has to rely on an unproven assumption about the uniformity of observed reality (Lee and Hubona, 2009). The latter posits that there is no direct access to the significant part of reality that research attempts to understand. As a consequence, a theory can at best obtain a provisional status, meaning that it has not yet been falsified (Lazar, 1998; Lee and Hubona, 2009).

The most important interpretive procedure in this study could be labelled as writing-with-the-evidence. Let me elaborate. The role of writing is simply not limited to the straightforward reporting of findings. There was a preconceived idea what kind of narrative to aim for, but the substantive findings took shape during the actual process of writing up the narrative. Breaking the observations analytically into discrete episodes helped to compare and focus on specific evidence, but it did not instinctively reveal any generative mechanisms that would account for the observations. It would be difficult to isolate the core analysis from the act of writing the theoretically informed narrative that brought the empirical observations together in a systematic manner.

6.4.1 The formative validity of theory-building process

The analysis must amount to more than mere storytelling. Walton (1992, p. 122) argues, "the logic of the case study is to demonstrate a causal argument how general social forces take shape and produce results in specific settings". Lee and Hubona (2009) suggest *summative* and *formative validity* as the criteria for assessing the quality of theories in information systems research. The former refers to the capacity of theory to survive repeated empirical testing, while the latter runs from the soundness of theory-building process. How can this be achieved by virtue of analytical writing?

Analytical writing can be understood as a form of thinking (Becker, 2007, p. xi; Brewer, 2000, p. 133) that follows retroductive logic. It goes beyond mere storytelling in that the resulting narrative is rigorously constructed to reveal objects and generative mechanisms that make the empirical domain intelligible. I have adopted apposite analytical principles from ethnographic research that has traditionally had to deal with similar issues regarding the role of writing in research (Brewer, 2000). First and foremost, this chapter is, to a degree, a reflexive account of the research process discussing the role of the researcher at the research site and, more generally, providing the reader with the means to assess the validity of knowledge claims against the implementation of the research design in practice. Second, the analysis is based on systematic data collection and preliminary analysis including detailed, and often real-time, observation log entries, theoretically motivated coding procedures and regular memos. Finally, before moving to the main analysis, I will devise three substantive guidelines to steer the narrative analysis on the role of computational information in audiencemaking practices.

Brewer (2000, pp. 105-107) suggests that the analysis of fieldwork records (referring here to all kinds of materials stored during the fieldwork) incorporates three types of operations. First, the data needs to be analyzed in the sense of separating the mass of evidence into its constituent parts. This entails reducing, grouping and identifying relationships in the data so that it can be used to construct answers for the research questions. The variety of evidence needs to be made accessible within a common framework. Second, the data needs to be interpreted against the research questions within the chosen conceptual framework, and, third, the presentation of the findings needs to be written up. I have already stressed that in the current study the last two phases cannot be strictly separated from each other. Indeed, even if this advice is instructive and helps to pin down the analytical procedures, it should not be taken uncritically.

6.4.2 Theoretical coding

I first classified and ordered the evidence listed in Table 3 according to the date and the origin of record. The former reflects the temporal order of events, and the latter

identifies the process, either naturally occurring or researcher-motivated, that produced the record thus helping to assess its quality as evidence. For instance, publishing a press release represents a different kind of reporting of organizational matters than, say, giving a research interview. The two pieces of evidence result from different kind of mechanisms for accounting for organizational matters, yet in the critical realist ontology they are assumed to potentially carry traces of common underlying mechanisms. These criteria are admittedly generic, but have the benefit of being applicable across the evidence as well as reconstructing the temporal order of the records.

I used Atlas.ti qualitative analysis software to break the observation log and interview transcripts down into salient episodes. The process was driven by a small number of theoretically informed codes (see Appendix 3) revised from the fieldwork to reflect the unit of analysis that had started to take shape towards the end of the fieldwork period (see excerpts in section 6.3). The revised coding scheme was developed by reflecting the first casual reading of the material against the theoretical themes motivating the study. The coding scheme and the definitions of individual codes were further adjusted during the first coding pass. I ended up adding few codes in the middle of coding and then recoding the already coded material. Starting from open coding was not considered necessary, since retroductive reasoning toward the non-observable aspects of reality does not give primacy to the empirical observations as the representative reflection of reality[29]. The reliability of coding should not be a major issue as the codes mainly provided an efficient access to the material; they were not a key entity for the analysis as such.

The coding procedure both familiarized myself with the evidence and made it readily accessible from a theoretically informed perspective. It also gave clues about which particular ideas behind the revised coding scheme seemed to bring order to the data. I did not, however, use the more advanced features of the software, which was a tool for breaking the evidence down analytically, but this was not useful for the type of synthesis I was looking for. Instead, the main interpretive vehicle was the analytical writing that brought the distinct observations together into a narrative.

[29] A serendipitous advantage of the approach is its relative efficiency. It turned out to be relatively quick to assign predefined codes to the evidence.

6.4.3 Interpretation and reporting

The process of theoretically coding the empirical evidence started to generate insights and ideas about what to write into the theoretical narrative. At the same time, however, it became clear that the narrative had to be more than a catalogue of details. It would have to explore the meaning of the most important patterns while ignoring many interesting, but disparate, details. I settled therefore on three guidelines helping to write a focused narrative. First, the analysis should *focus on necessary (but not sufficient) organizational practices* in terms of the media business model. Second, against the institutional background it is reasonable to *assume that measurement plays a central role* in audiencemaking. Third, given the discussion in section 2.5, *look for possible looping effects between the classifications and people* together. The guidelines are summarized in Table 4.

Guideline	Rationale
Focus on necessary (but not sufficient) organizational practices	The business model of media makes some organizational practices more central than others in terms of organizational survival
Assume that measurement plays a central role	Despite the shift from the purpose-built metering devices to using the common computational infrastructure, the role of measurement in audiencemaking has not vanished
Look for possible looping effects between the classifications and people	Establishing the facts of an audience may entail both measuring and managing it into an entity whose behaviour can be predicted

Table 4. Three guidelines for narrating the evidence systematically

First, in order to avoid inadvertently studying organizationally peripheral activities the analysis should focus on practices that were essential in terms of organizational survival. As a start-up company the research site was on a temporary lease of life. In the short term its survival depended more than anything on the relationships with venture capitalists, but the long-term viability of organization would be decided by the execution of the media business model. In this respect, while looking at practices, the approach differs from practice-based studies in that the focal practices are identified against organizational purposes and broader relevancies in the institutional setting. Furthermore, the idea of a stratified ontology in critical realism entails that theorizing can only hope to map a selected part of the non-observable

reality behind empirical phenomena. Taken together, these constitute the *focus on necessary (but not sufficient) organizational practices* rule.

Second, while the technological underpinnings of the media industry may be changing, the central role of measurement has not vanished. The measurement of audience members must be a central part of any effort to come up with a new kind of audience product. This assumption is suggested by the evolution of the media industry and can be used to further narrow the focus on traces of measurement and analytical operations in the organizational practices. It would seem reasonable to *assume that measurement plays a central role* in key organizational functions.

Third, the measurement data emanating from the network infrastructure do not represent inanimate industrial machinery but human beings capable of reacting to expectations imposed on them. People and the ways they are classified as the result of measurement may interact with each other. Hacking (2002, chap. 6) does not offer a general theory of looping effects, but suggests a template to theorize the interactive classifications and looping effects in different contexts. He points out that "social change creates new categories of people, but the counting is no mere report of developments. It elaborately, often philanthropically, creates new ways for people to be" (Hacking, 2002, p. 100). Furthermore, in contrast to the original idea deriving from labelling theory, it is not the institutional naming of a group of people but the digital behavioural traces that may come to mediate the interactions here. Following these ideas, it makes sense to *look for possible looping effects between classifications and people*.

Finally, I made a conscious decision to start writing the empirical analysis before pinning down the theoretical concepts in detail. In other words, I wrote the first version of the analysis in Chapters 7 and 8 with merely a general idea of the conceptual scaffolding. Only then I moved to back fleshing out the framework in Chapter 8 in detail. The primary reason for this was practical. I wanted to first see if the ideas I was with experimenting with could actually work. Having a meticulous framework in place before trying to empirically theorize the phenomenon would probably also more easily lead to forcing the framework on data. To be more

precise, I had the main theoretical themes in my mind while writing the first version of the narrative, but no idea how they would play out in detail. For instance, while the idea of looping effects in the sense of labelling theory could not be made to work with the evidence I had, it brought up the general idea of subjectification and the motivation to look for other types of loopings.

6.5 A short summary of research design

This chapter discussed the research design both from the perspective of logical argumentative structure and the actual unfolding of research practice. In terms of the former, I first founded the research design on the critical realist metatheory that suggests a way to remedy the shortcomings I identified in the constructivist approaches. Second, a single case study using intensive participatory observation was chosen as the research strategy and the main data collection instrument, since they both fitted with the metatheory and the aims of study. Third, the data collection and preliminary analysis were guided by the coding scheme motivated by the assumptions discussed in Chapters 2, 3 and 4. Fourth, I constructed writing-with-the-evidence as a retroductive reasoning procedure to bring the empirical evidence together in systematic manner. Three guidelines summarized in Table 4 were developed to support analytical writing. In terms of the actual unfolding of research design, I pointed out the conventions at my academic department and previous working experience as factors that influenced the methodological choices and the selection of research site. I also discussed the shift in empirical focus resulting from gradually embedding the research site into a specific institutional and theoretical contexts and the slow process of making the case out of the empirical phenomenon.

Finally, I will discuss the research design against a list of suggested issues that a well-developed case study design should cover. Yin (2003, p. 21) identifies five important components of a case study research design: propositions, the unit of analysis, the logic of linking data to propositions, the criteria for interpreting the findings, and the research question. How does the research design stand up against these criteria?

First, the main *proposition* discussed Chapter 2 was that the computational underpinnings of telecommunications infrastructure may represent a significant technological change in audiencemaking. Chapters 3 and 4 argued then that in order to understand this discontinuity and the developments it may be associated with it is necessary to theorize contemporary information and communication technologies beyond their artefactual appearances and local appropriation. Second, the *unit of analysis* was pinned down during the fieldwork and subsequent data analysis to the audiencemaking operations feeding from, and back to, the behavioural data tokens generated by the network infrastructure. It is worth stressing that the unit of analysis took its final shape during the data collection and analysis as the result of interaction between ideas and the emerging evidence (Ragin, 1992). The case was carved out from the research site by juxtaposing empirical evidence with a theory in an institutional context.

Third, it was acknowledged that there is no broadly accepted method for theorizing the non-observable entities and generative mechanisms underpinning the empirically observable phenomena. The writing of a theoretically informed narrative following retroductive reasoning was constructed as the *logic linking data to propositions* supported by three substantive guidelines to ensure the rigorous treatment of evidence. Fourth, case studies as a research strategy have inherent limitations – the most obvious being that the case can seldom be generalized to a population of cases. A handful of cases may sound intuitively more generalizable than a single case study, but unless they are a large-enough random sample of well-defined population empirical generalizations are based more on faith than logic (Lee and Hubona, 2009). Instead, knowledge from case studies relies on the replication logic of experiments (Yin, 2003) and the falsification of invalid theories. These aspects should be taken into consideration when assessing the *criteria for interpreting the findings*.

Finally, the *research question* was stated in the very first sentence of Chapter 1. It can now be revealed that the question did not emerge until well into the analysis phase of research. The investigation was for the most part guided by an evolving story around an intriguing but elusive phenomenon. In this sense, the research

question was more of an aid for readers than a construct prescribing the research itself.

7 Computational data as the raw material for the audience

This and the subsequent chapter bring together the historical, theoretical and methodological threads into a narrative account depicting mechanisms involved in making the audience knowable and, thus, manufacturing the audience product out of computational data. I will first recap key points from the previous chapters and then move on to the empirical analysis consisting of two parts. In contrast to Chapter 5 based largely on emic observations from the research site, the analysis takes the nature of computational data as its starting point and works gradually toward the organizational practices. In other words, from now on the analysis switches to an etic approach.

The first part of the analysis builds on the recognition of the inconspicuous third dimension of technology at the research site discussed at the end of Chapter 5. I will make a theoretically informed cut into the empirical evidence to shed light on the infrastructure underpinning the reporting practices and systems crucial to the audiencemaking efforts. The analysis explores mechanisms through which computational data emerges as a sort of background causation shaping social agencies at the office. More specifically, the chapter unpacks the suggested technological discontinuity in audiencemaking and distinguishes between the layers of analytical operations by which the digital data tokens cascaded into objects representing consumers' media consumption in the context of everyday organizational practices. The second part of the analysis in the next chapter makes three further cuts into the empirical material to discuss how different aspects of audiencemaking activity were shaped by technological information.

Chapter 2 described the media industry with a particular focus on advertising-funded media. It was recognized that the advertising audience is a sellable asset manufactured by commercial media companies; it can be understood as an institutionally effective entity around which a lot of activity on the industry and media organizations evolves. Without a clearly defined audience, an aspiring media company can hardly hope to generate revenues by selling the advertising space (text and picture messages in the current case) it commands to the advertisers. The

technical capability to send advertising messages to people's mobile phones does not, however, create an audience. Audience measurement and, more generally, various analytic operations are the key to forging the constitutive relationship between the actual behaviour and the measured dimensions of audience, that is, the knowledge holding the audience product together. It was also pointed out that the process of maintaining appealing audiences for organizations wishing to promote their products and services has traditionally depended on the industrial ratings companies operating various second-order measurement technologies. Hence, placed against the historical evolution of audience measurement methods, the computational environment introduces a potential discontinuity in how audiencemaking business may be organized.

The research site described in Chapter 5 provides an opportunity to study the making of a novel advertising audience in an essentially computer-mediated environment. The attempt to create an advertising medium out of telecommunications operations entails more than just launching another outlet, say a new television channel or a magazine, within an established industrial context. Turning the mobile network subscribers into an advertising audience necessitates envisioning a new kind of platform business and, consequently, organizational arrangements. For instance, audiencemaking entails obtaining systematic observations on consumer exposure and reactions to the medium and its content – a problem that is being considerably reformulated in the context of digital communication networks by virtue of their capacity to embed the monitoring of media consumption into the medium itself. A MVNO company is particularly well positioned to benefit from this novel affordance due to its intimate access to the data.

The data-capture mechanism embedded into the network infrastructure generates digital data tokens that differ from the data produced by the dedicated metering devices underpinning traditional audience measurement. Importantly, section 7.2 below opens up the microscopic nature of computational data tokens that not only renders the individual behavioural observations virtually meaningless but also necessitates the multilayer analytical arrangement to transform the data into

meaningful reporting. Finally, as a relatively young organization, the ways of perceiving and doing things at the research site lacked the taken-for-granted character of established business. A whole range of issues and practices were reflected upon and provisionally reworked during the fieldwork period making them amenable to participant observation.

Following the methodological discussion in the previous chapter, the analysis is written into the form of a narrative that systematically brings together relevant aspects of empirical evidence. More specifically, the writing-with-evidence procedure is based on the three methodological guidelines (see Table 4 in section 6.4.3) geared to analysing the informational mechanisms underpinning the emerging commercial medium. Two of the guidelines are particularly relevant to the first part of analysis. First, consistent with the epistemological underpinning discussed in the previous chapter, the analytical focus is on *necessary (but not sufficient) organizational practices* behind the phenomenon. To put it simply, the case is used to explore certain mechanisms of interest rather than attempting to describe the business of audiencemaking in its totality. Following this guideline, the current chapter revolves around the reporting practices and systems crucial from the perspective of the company business model. The next chapter will focus on the member management and advertising operations, public relations and business development functions, which were all central to the attempt to establish the new kind of audience.

Second, the means of measurement may have changed, but there is no reason to assume that its institutional importance would have vanished. Given the sort of double bind that audience information engenders (see section 2.4.2), new measurement technologies are unlikely to put the problem of audience measurement to rest. Quite the contrary, the more the audiences are measured the more there is to measure. Industrial audience measurement would seem to contribute to the perpetuation of the very problem it is supposed to solve by feeding back to the structure of commercial media. Furthermore, the aforementioned technological discontinuity in the measurement apparatus provides a convenient point of departure for the analysis in this chapter and helps to keep the analysis of the three

organizational functions in the next chapter focused. I will start by looking into the organizational mechanisms for observing and reporting on the operational environment and how the different approaches for dealing with digital data supported practices contributing to making up the audience members.

7.1 The member as a pivotal entity in empirical evidence

The unfolding theoretical narrative is supported by excerpts from the empirical evidence that both illustrate and make it possible to discuss the arguments in detail. Take, for instance, the following excerpt from the observation log that summarizes a brief episode in the Members team responsible for managing the member base and customer service operations that were outsourced to a local call centre company. The episode is used here to hint at the sophisticated arrangement the organization harnessed to observe the network subscribers and to construct them as audience members.

> MCM discusses different member reporting models. At the moment there are three levels: ad hoc [manual], using dedicated reporting software and fully automatic. He talks also about the profiling of members for different countries. MCM says that a traditional operator does not care if the subscriber is away from the network for a few weeks, if the phone settings are correct or if the phone model is up to date or not. While the operator may lose some revenue it does not incur any costs. Therefore it does not try to activate the subscriber. For us the consumers are the audience, for which we should have the connection. MCM ponders also if this could be an interesting model for the [partner] operator without the advertising [to increase network service usage].
>
> (Observation log entry, 24 March 2009)

The everyday talk at the office was commonly accompanied by the idea of network subscribers as "members". The concept was evoked habitually across the teams as well as in external communications not unlike the idea of reader and viewer for newspapers and television companies, respectively. The *member entity* performed an important role in many everyday operations as it stood for the customers on the consumer side of the platform and the key resource out of which the advertising

audience was to be manufactured. The members were literally everywhere from casual discussions and whiteboard scribblings to PowerPoint presentations, Excel sheets and all kinds of marketing materials. In contrast to generic labels such as a subscriber, customer or consumer, the idea of member incorporated an aspiration for a particular kind of relationship with the consumers. It encompassed the dual meaning of both implying consumers' emotional commitment to the service and classifying them as the basic unit of advertising audience. All in all, the widespread presence of the member referent across the empirical evidence stands for its pervasive usage at the research site. It is, however, less clear what the construct referred to.

The analysis in the next chapter shows how the members were not equivalent to the network subscribers, nor were they simply treated as flesh-and-blood human beings using mobile phones. One might suspect that the idea of member was a social construction only peripherally related to entities outside the interpretive framework of human practices. This is perhaps partly true, but such a conception would not seem to do justice to the interactive character of the member entity. The members were not just a passive body waiting to be analysed and acted upon by the organization. The members reacted to the organizational interventions in unpredictable ways effectively talking back to the interpretations imposed on them. In order to understand this interactivity, it is necessary to analyse the machinery that granted the member entity its behavioural attributes. In the spirit of critical realism, what kind of structures and generative mechanisms would make the observed member entity intelligible?

The previous excerpt suggests that at least three different kinds of analytical mechanisms were involved in pinning down the members and their behaviour: *fully automatic procedures, employee-operated reporting tools* and *manually executed custom analyses*. The typology would seem to match my observations with the addition of a fourth element, *organizational reporting practices*. The apparent centrality of the member entity and its close relationship with the various analytical and reporting operations provides a distinct motif that forms the backbone of the analytical narrative in this chapter and the three cuts into the organizational practices

in the next chapter. In order to capture the data-based underpinnings of emerging audiencemaking business in general and the member entity in particular, I will next open up how the observing of the organizational environment was organized in itself. In other words, how did the organization keep itself informed about the member behaviour, its operational environment and business in general. I will start from the digital data tokens, which made possible the kind of detailed knowledge needed to summon network subscribers as an advertising audience, and then work toward the local practices and social agency.

7.2 Data tokens generated by the network infrastructure

A digital communications network records a trace of every click, call and message relayed through its elements, generating often millions of records every day[30]. The network needs to keep traffic logs for various purposes such as the optimal allocation of resources, detecting and recovering from malfunctions, and the identification of potentially harmful usage patterns. In the case of a telecommunications network, the data are also the basis for billing individual subscribers. All in all, recording the network activity into so-called server log files is not just enabled by default. Disallowing logging would usually make it difficult to maintain the network infrastructure itself.

The contents of data tokens generated by the internet and telecommunications infrastructures differ somewhat, but the basic format of log files is rather similar. The recording captures the time, type, the sending and receiving end of exchange, and a few technical details about the operation. The resulting log entries carry hardly any reference to the social setting, intentions and activities that triggered their recording. The World Wide Web Consortium (W3C) has published a standard for internet server log files[31] although the details of telecommunications logs vary between equipment manufactures and particular network installations. I am not allowed to reproduce an actual record from the research site, but the following example taken from an unrelated specification document serves to illustrate the type

[30] The network elements refer here broadly to the physical, logical, hardware and software components in the network infrastructure.

[31] See W3C Working Draft document Extended Log File Format at http://www.w3.org/TR/WD-logfile (accessed 26 February 2011)

of behavioural data tokens the network infrastructure generates. The record, which is technically a single line in a log file, is made up of data fields mapping to the aforementioned variables. Semicolons separate the fields.

```
097369D2D7372762D31080000000000000001;1;33668741168;332
2208;6;20081101004923;20081101004923;20081101004923
```

(Advenage SMS Gateway Router 1.0 documentation[32])

The data tokens were the raw material for so-called Advertising Detail Records that the company used to capture consumer interaction with the advertisements. The example shows that individual records are minuscule strings of alphanumeric characters that carry little meaningful content by themselves. As such, the records are obviously far removed from the idea of a member and the rich meanings it carried in the context of organizational practices; a singular reply to an advertising message, for instance, tells nothing organizationally relevant until it is embedded into the context of a particular advertisement, campaign and target group. Also, strict regulatory restrictions apply on who can access the raw telecommunications data.

Such limitations, however, take place against a different space of possibilities compared to traditional electronic mass media infrastructures that do not generally provide any trace if there is actually somebody at the receiving end of the medium. The meaning lost in the granularity of individual data tokens is compensated by the immense opportunities to aggregate, align and juxtapose records against each other. The computational environment represents quite possibly a rather different set of issues and opportunities from traditional media in terms of collecting data for audiencemaking purposes. In the following I pin down these differences as the *comprehensiveness*, *openness* and *granularity* of computational data tokens in audiencemaking.

First, the embedded monitoring function automates much of the painstaking work of data collection that in traditional commercial media is associated with the second-

[32] Available at http://www.advenage.com/documents/SmsGatewayRouterB2BAccounting.pdf (accessed 26 February 2011)

order measurement techniques needed to record observations about media consumption. The latter effectively limited the data capture to carefully planned samples geared to specific purposes. In contrast to the sample-based measurement using separate metering instruments, the digital communications network generates automatically a body of granular data tokens susceptible to flexible surveying. People contribute to the measurement by virtue of using the media; there is no need to distribute and maintain dedicated metering devices required by the traditional panel study approach to audience measurement. Importantly, the massive amount of data produced by the mobile telecommunications network is not a sample but a census of activity in the network.

Second, the digital network infrastructure not only automates the rudimentary data collection but it also provides qualitatively different kind of behavioural traces. The previous example makes it clear that the millions of minute records generated by the network as such were of little value for most organizational practices. While the most intimate look at the consumers' media consumption was granted by looking directly at the database, the operation was limited to a few dedicated employees for a number of reasons. Browsing the data tokens manually was largely useless in terms of understanding member behaviour or any other relevant pattern. Even if the series of numbers and letters separated by delimiter characters illustrated by the example could be mapped to other entities such as phone numbers, time, type of action etc., the composite token is tied to an ephemeral behavioural episode (e.g. a click or a message). As such, it is rather uninteresting from the aggregate perspective of audiencemaking practices. This suggests that the digitally recorded behavioural traces were an incomprehensible heap of data tokens merely amenable to a range of analytical operations. As such they were agnostic; they did not answer any specific question. The data tokens were not coupled to a particular organizational purpose but existed as an open-ended potential to be explored in a variety of ways and to different ends.

Third, the data tokens dissolve people's media consumption into discrete clicks and messages from which a coherent and sensible reality relevant to audiencemaking had to be reassembled by recourse to analytic operations. The monitoring function

itself does not record any ordering scheme or usefully classify the data tokens from the perspective of the company business model, but merely stacks the records onto a hard disk for later exploration. The extremely granular constitution of the data mass mainly affords aggregation, alignment and juxtaposition of data tokens while effectively rendering the individual behavioural observations meaningless. The records generated by the network infrastructure were, nevertheless, the crucial raw material for the machinery maintaining the referent for the member construct referred and reflected upon across teams and corporate materials.

Characteristic	Contrast with the traditional metering systems
Comprehensiveness	The data tokens are not a sample but the census of activity in the network
Openness	The data tokens are not generated for a particular organizational purpose but as an open-ended potential
Granularity	The data tokens dissolve the observed behaviour at the level of discrete clicks and messages

Table 5. The distinctiveness of computational data tokens in audiencemaking

Table 5 summarizes the suggested distinctiveness of the computational data in terms of audiencemaking practices. Placed in a historical purview, the *comprehensiveness* and the ease of data capture set digital network environment apart from the traditional mass media relying on costly second-order approaches to measurement. As a result, the problem of measurement shifts from obtaining the data to analysing it; the latter operation is not constrained any longer by the sampling criteria set by predefined analytical purposes. The two latter characteristics, *openness* and *granularity*, would seem to be closely related with each other. The more granular the data tokens are, the more open they can be in terms of the organizational purposes they support. Taken together, they also necessitate the various analytical operations to reduce the abundance of data into meaningful patterns representing people's media consumption. This is not to say that audience measurement has not incorporated sophisticated statistical operations before, but to suggest that *ex ante* planned analyses would have steered the data collection and hence have limited the analytical opportunities to a considerable degree in contrast to the computational environment, in which the problem shifts to working with extant data.

7.3 The layers of analytical infrastructure

How did the widespread references to members across organizational practices relate to the data tokens discussed in the previous section? In order to open up the ontological depth of the member entity, I will next look at the analytical infrastructure that granted the members some of their objective and interactive characteristics in the context of audiencemaking practices. On the one hand, this is just another way of saying that there was more to the member entity than its enactment in everyday activities. On the other hand, the reasoning follows a critical realist approach to look for general socio-technical forces beneath the immediate empirical observations. As was already pointed out, four kinds of operations can be distinguished within the apparatus that, taken together, provided the visibility into the environment in which the organization operated: *automatic data aggregation procedures, reporting software tools, organizational reporting practices,* and *custom analyses* – each encapsulating and building on top of previous mechanisms.

The data tokens produced by the network provided the raw material for the automated aggregation procedures encoded into various software components and the reporting software applications associated with different organizational functions, whereas the employees did not usually access the data directly for the reasons discussed previously. The two approaches of automatic data aggregation and reporting software tools reflect, however, quite different starting points with respect to how the data tokens were processed and assembled into meaningful categories and patterns serving organizational goals.

The former approach is concerned with hard-coded operations by which a limited number of reliable metrics are forged and stabilized out of the mass of primary data tokens representing a *de novo* description of reality outside the system. Whether about the number of active audience members, the successful delivery of advertising messages or some other event of interest, such a metric makes focal organizational phenomena tangible by turning it into a simple number. Importantly, the open and granular constitution of data tokens did not imply any such categorizations that had to be imposed on the data by virtue of programmatic operations. A successful metric

entailed thus a semantic closure achieved by a rigid formula for filtering and aggregating data tokens under a label recognized by relevant parties. The latter approach, in contrast, enabled the employees to apply filters, order, summarize and visualize data in order to explore whatever patterns could be potentially identified in the mass of data tokens.

Taken together, the two rudimentary strategies to deal with the basic behavioural observations suggest that the malleability of computational data hardly appeared as an unambiguous opportunity from the perspective of organizational practices. It was rather a condition that had to be meticulously dealt with in order to make the data tokens meaningful, that is, informative for audiencemaking purposes. I will first have a look at each mechanism separately and then summarize the analytical infrastructure underpinning the audiencemaking business. This will provide the basis for the analysis in the next chapter of how computational mediation shaped the member object and key practices depending on it.

7.3.1 Automatic data aggregation procedures

Some of the automatic procedures were located within systems provided by partner organizations while others, such as the metrics for measuring the delivery of advertising, had been built by the company itself. Several metrics were used to steer the operations internally, while others such as the measures of advertising success represented answers to exogenous demands of the media business and were consequently widely publicized. As I have discussed at some length in Chapter 2, the advertisers require evidence of advertising efficiency and, hence, robust measurement to rationalize their use of a particular vehicle for marketing efforts. For instance, the measure of members responsiveness to advertising was consistently inserted into public relations and marketing materials. The general problem was, however, that the established industrial metrics for readership, viewership or even website visits were inadequate for describing interactive advertising formats based on mobile messaging. In order to measure the medium it was building, the company had had to devise new procedures not immediately recognized by the industry. I asked about the lack of authoritative measurement vis-

à-vis the syndicated studies provided by the ratings companies, but this was not perceived to be a major problem for the company – probably partly because the employees often likened the approach to successful search engine keyword advertising that generally bypasses the rating companies.

Among the different metrics the procedure to calculate the rate at which the members responded to the advertisement messages was particularly important. Making the measurement of consumers' reactions to the advertisements central to the medium contrasts with more traditional measurement approaches focusing on the use of media content into which the advertisements are embedded. The approach is reminiscent of direct response marketing (see section 2.1.1) and promotes interactivity as the key attribute of the audience and its members; an attribute which may turn out be one of the central implications of the computational network environment for audiencemaking. The key metric was known as the response rate. The following interview excerpt illustrates how the advertising audience could be conceived as an interactive entity beyond static profiling of people.

> BMA: Our [advertising] format is really good. It needs to be fine-tuned but in general it is good: the response rate and all the behaviour we can generate – web traffic increases, coupon redeems and ROI [Return On Investment], for which it indeed culminates.
>
> (Interview with Business Manager, Advertising (BMA) on 13 May 2009)

The audience product is, for the informant, about generating behaviour, which makes sense mainly against the measurability of such behaviour. The computational data made it possible to measure the audience to a significant degree as reactions to advertising messages. In contrast, for instance, the measurement of television has historically had to use the program viewership as a proxy for potential exposure to the advertising spots broadcast during the commercial breaks. In order to be credible, the automatic aggregation procedures had to be as rigid as possible, which is not a simple achievement given the openness and granularity of digital data tokens. The way data were recorded did not suggest any particular metric or classification that had to be meticulously imposed on highly granular data tokens

capturing not only relevant but also a whole range of irrelevant behavioural details. In other words, the raw data did not incorporate any meaningful patterns itself and, furthermore, recorded faithfully all kinds of unexpected behaviour that had to be dealt with. It was not obvious, for instance, if a repeated answer to an advertisement from the same member should be counted as one or two answers.

All in all, it was necessary to remove the utter malleability of the data tokens in an often-painstaking process of developing metrics that could enter as facts into organizational practices. There were no industrially accepted metrics for measuring mobile messaging based advertising, and it was therefore possible to try shaping the rules of the evolving market until a certain way of measurement would settle as the *de facto* standard in the eyes of advertisers. The company publicly put forward not only its interactive metrics but also suggested the level of interactivity to expect from the new kind of audience.

> The response rate of over 25% has now become an internal thing, and if the response rate drops below that figure, we ask questions why.
>
> (Company co-founder in a magazine interview, February 2011)

The automatic aggregation procedures effectively locked down a specific formula for filtering and adding up data so that the result appeared as a fact-like entity for various organizational purposes. Once in place, changing such a procedure was laborious. First, it would require modifications to the interconnected software systems supporting many organizational functions, and second, it was vital for the credibility of metrics that they provided consistent and comparable results over time making it progressively more difficult to change the procedures. It made sense occasionally to question a particular measurement if there was a reason to suspect a glitch in the machinery, but the idea of metrics themselves was hardly ever questioned during the fieldwork period. The measurements of the key metrics generated background assumptions for many organizational practices, and it would have perhaps called too many things into question in a way that was not conceivable in the context of everyday work if they had been problematised.

The automatic aggregation procedures were black boxes in a sense that they provided semantic closure on the data – with one important qualification I have already mentioned. The data were not limited by preconceived sampling criteria. Despite their programmatic rigidity, it was possible to apply the automatic procedures to any subset of comprehensive records representing, for instance, an individual advertisement, time period, or a group of members. The rigidity of key metrics and the comprehensiveness of data was a combination that was brought together by various reporting software applications used by the employees.

7.3.2 Reporting software tools

Various reporting and analytical tools were prominent among the software systems used to support the operations. I identified altogether 11 different applications for retrieving, analysing and reporting data from various sources, many of which figured in working practices on a daily basis (see Table 6 below). These systems essentially enabled the handful of people working from a remote location to routinely present the relevant aspects of the distributed organization and its environment, and thus single out issues with a view to acting on them. Although business intelligence and data mining applications are not uncommon in the telecommunications industry (Nedelcu, 2009), their scope was arguably rather more extensive in this organization, that was built from the ground up to rely on many of these systems. As was pointed out in Chapter 5, the attributes of many organizationally important objects were accessible only through the screen and these applications.

There were systems to track the delivery of advertising messages and member activity, to log and follow up the resolution of network issues and generic work orders from various sources, to create software development items and test cases, to measure the usage of company websites, to keep on eye what was written about the company on the web etc. Some of the systems generated their own data by acting as user interfaces for certain operations such as Incident management and Software issue management systems, while others tapped into external sources such as the data tokens generated by the telecommunications infrastructure.

System	Purpose
Advertising reporting	Report member interactions with the advertisements
Customer service system	Management of customer service request and issues
Incident management	Recording and tracking of network problems
Member experience reporting	The analysis of member behaviour
Online news tracking	Monitoring of company public image in the web
Purchase-to-pay system	Financial management system
Quality assurance	Software development test case management
Software issue management	Management of software development activities
Travel reservation system	Employee business travel management
Web survey tool	A tool for creating and reporting web-based surveys
Website traffic analysis	The analysis of company website visits

Table 6. Different software tools used for analysing data and generating reports

Contrary to the automatic data aggregation procedures, the logic of reporting software tools was to harness strategically the open and granular constitution of the digital data. Indeed, the tools could be understood primarily as user interfaces for querying multidimensional data. They enabled aggregating, filtering and juxtaposing data tokens and representing the results in tabular, as well as in visual, form, often encapsulating metrics produced by the automatic aggregation procedures. The operations made it possible to relatively freely explore and uncover potentially relevant patterns in the data that nevertheless ruled the kind of exploratory opportunities the tool provided. Some of the data sources were maintained by human intervention while others such as the behavioural traces of member activity were constantly updated by the network infrastructure itself. The more data and dimensions a particular source offered, the more the reporting tools could help to reveal. In general, the reporting tools provided the paramount visibility into many organizationally relevant matters.

> Researcher: Who do you think has the best visibility or understanding on how the member base behaves? Where is this understanding created?
>
> QAM: Difficult question. I think most probably MCM and BMMA. It should be [at the local sales office] but I think, after all, it is by and large here [at the head office].
>
> (Interview with Quality Assurance Manager (QAM) on 10 March 2009)

The excerpt suggests that, despite the lack of cultural and physical proximity of the local sales office, the relevant member behaviour could be grasped by using the variety of reporting tools from the head office. The staff at the local sales office might probably have contradicted this view to a degree, but it was indeed possible to interact with the member base and observe its reactions to interventions remotely. The access to the reporting applications was limited by the perceived need for particular information and the learning curve of some of the user interfaces. The employees had, nevertheless, generally unhindered access to those systems they felt they needed to get their work done. This was possible because the reporting software tools filtered out any sensitive information from the presentations they offered. The tools for reporting the advertising delivery and analysing the member base were among the most sophisticated of these systems tapping into the open and granular data tokens generated by the network infrastructure. The following excerpt shows how analytical operations and the use of reporting tools were part of everyday work at the office.

> Researcher: Do you yourself follow some reports on the activity and do you produce them?
>
> BMA: I both produce and follow. I follow reports on a daily basis. At some point I followed those daily reports that we still keep receiving, because they provide good comparative grounds. Or, alternatively, I check from the Advertising reporting the latest couple of days. Not necessarily every day but several times a week.
>
> Researcher: So that you have a sense what is happening there?
>
> BMA: Yes […] and of course it is also important to know if everything is working as expected. And what things have been planned. […] It gives you a good sense and also a sense of what the members are answering there.
>
> (Interview with Business Manager, Advertising (BMA) on 13 May 2009)

Combined with team-specific reporting practices, the use of reporting software tools and underlying data aggregation procedures resulted in information cascades

through which the employees were able to relate to the organization and its operational environment in general and the member behaviour in particular. The malleability of computational data did not suggest a freewheeling social construction of the audience, but instead lead to the distinct strategies of automatic data aggregation and using reporting software tools to turn the data tokens into meaningful technological information. The information could be interpreted in a number of ways. However, before there was anything to interpret, the raw data had to be tremendously reduced in various analytical operations following these two strategies. The next section will complement the analysis of the layered analytical infrastructure by discussing organizational reporting practices adding an increasingly interpretive element to the measurement. The analysis returns thus to the level of organizational practices that was already discussed to some extent in Chapter 5.

7.3.3 Organizational reporting practices

Chapter 5 described the most prominent reporting practice at the research site, the weekly office meeting. Behind the brief verbal summaries given in the meeting the work environment incorporated numerous interrelated reporting procedures, tools and practices operating on daily, weekly and monthly cycles as well as an on-demand basis. It had taken significant investment in time, expertise and money to procure, develop and configure data aggregation procedures and reporting software applications; establish reporting practices, and to maintain their working at the expected level. Why did the few dozen employees working at the head office need such an extensive and complex reporting arrangements?

At some level the answer is obvious if one goes back to Photograph 1 in section 5.4 showing a view from my desk at the office. From where I sat I could see most of the employees managing the multimillion, round-the-clock operations far away in another country. Reports and reporting are, among other genres of internal communication, powerful mediators of action enabling local actors to act promptly upon remote things. In a geographically distributed corporation systematic reporting is a crucial medium of managerial coordination holding the organizational

arrangement together[33]. I have, however, suggested that the role of reporting went even further in the emerging media business. In this section I discuss how the reporting tasks were shaped both by interpretive practices and the computational infrastructure.

The automatic data aggregation procedures and the routine use of reporting applications were the foundation for reporting in the organization. On top of these two rudimentary layers, a number of reporting practices created a third layer in the analytical cascades making the members present in the context of everyday work. It was already pointed out that the analytical operations and reporting culminated regularly at the Monday morning office meetings where the senior management gave brief accounts of their respective functions. On such occasions, reporting was indeed a thoroughly social endeavour with all kinds of interpretive contingencies. It would be difficult to deny that the selection, timing and the framing of facts brought into the discussions were perhaps just as important as the facts themselves. Furthermore, the office meeting was usually reinterpreted afterwards over a lunch session, ranging from employees suggesting slightly different twists to the reported matters to debating diverging personal views on what was really said in the meeting.

Without the computational foundations a great deal of reporting would have, however, been impossible or severely limited in scope and frequency. A research design focusing primarily on the interpretive dimension of reporting would probably reveal a number of discursive practices and strategies in how the facts produced by the analytical infrastructure were shaped by the employees in the course of everyday work. In this chapter I have taken a slightly different approach to organizational reporting practices. The aim has been to understand how the underlying analytical layers and, ultimately, computational data, conditioned the matters that were channelled into PowerPoint presentations, Excel sheets and, finally, discussed in the office meetings. In the following I will analyse how the data created expectations, drew attention and mediated practical action. Let us start from a situation where technological information was unavailable. The following excerpt illustrates a

[33] The managerial function of reporting can be traced back to the early 19th century and the need to orchestrate the movement of trains and cargo safely and efficiently across vast distances (Beniger, 1986; Yates, 1989).

reaction to an occasion when the analytical cascades were perceived to have failed in turning the available data into information as a result of the Customer experience management system (see Table 6 in the previous section) not being updated to reflect changes to certain other systems.

> X1 comes over [to our table] and asks how should the large-scale operation on the member base be targeted. MCM and BMMA point out that the operation should be started immediately because next week it might be too late. […] X1 asks which members are to be terminated. […] MCM ponders what is reasonable and what is not. He points to the coffee table discussion, in which it had been decided that the Member experience reporting tool will not be [immediately] updated. Resulting from this we now lack adequate information to base the decision.
>
> (Observation log entry, 18 February 2009)

The experience of being deprived of relevant information emerges against the informative potential of data tokens that could not be realized using the slightly outdated system. The point is, the lack of information makes sense here, obviously, against the reasonable expectation of having such information – an opportunity eliminated by the changes. The example shows how computational information drew the attention of employees and its absence could generate strong reactions suggesting that a lot of interpretive activity indeed revolved around matters emerging from the analytical cascades.

The advantage of manually compiled PowerPoint presentations and Excel sheets in contrast to the technological operations discussed in previous sections was that the employees were able to combine selectively data from a variety of sources and contextualize it with tactics guiding the interpretation to address specific issues. In this respect, there was often a lot of discussion on what a specific measurement meant for the task at hand; which numbers should be shown on a particular occasion or material. For instance, it was not always clear how the number of active members should be counted against those lying dormant in the database allowing discretion and, perhaps, strategic ambiguity in terms of how the size of the member base was interpreted. Without the data, metrics and reporting software tools such a discussion would have, however, made little sense, as there would have been nothing to

interpret. Table 7 provides a list of examples of the regularly produced reports in the organization.

Report	Content
Ad report	Report on the delivery on individual advertisement
Critical incident report	Report on a critical issue in the operations
Customer care report	Monthly report on the customer service activities
Daily top up report	Weekly report on subscriber top-up etc. activities
KPI report	Report on the organizational performance indicators
Member status report	Weekly report on the changes in the member statuses
Mobile portal report	Monthly report on the company mobile site usage
Operations dashboard	Weekly summary on the critical incidents
Operations monthly report	Monthly report by Operations team
Post campaign report	Report on an advertising campaign consisting of several advertisements
Profile report	Report on the group of members
Promoter score report	Monthly report on the consumers' willingness to promote the service to their friends
Revenue assurance report	Monthly comparison of actual network usage with the wholesale bill from the host operator
Subscriber cohort report	Monthly report on the member cohorts
User experience survey report	Biannual report on the company website user experience
Website report	Monthly report on the company website usage

Table 7. Some regularly produced reports

The employees produced regular reporting to support their own functions as well as to keep the other teams informed. Many of the reports were made broadly available on the company intranet, and the highlights were often summarized in the Monday morning office meetings setting the pace of keeping the organization updated in general. Among the five teams and roughly 30 employees, I observed altogether 10 regularly produced reports uploaded onto the intranet system and identified at least 6 other regular reports by interviews and other indirect clues. Importantly, the analytical cascades combining automatic data aggregation, the use of reporting software tools and, finally, manually combined reports were not confined to specific teams. They supported and shaped operations in one form or another in every team. Operations, Members and Commercial teams produced a stream of consistently formatted reports depicting the evolution and recent events of their respective functions. The Commercial team, or, more specifically, its counterpart in the local sales office, was also responsible for providing reports to advertisers on the delivery of their campaigns. Administration and management generally reported about the financial situation of the company as well as providing the investors with the

reporting they needed. The Brand Office and Technology teams did not produce regular, consistently formatted reporting but reported on an *ad hoc* basis.

These manually compiled reports typically combined and summarized measures from different reporting systems as well as from reports produced by other teams and partner organizations. Reporting supported a number of organizational practices; it was indispensable for the way distributed work across organizational and geographical boundaries was brought together. The capability to manage round-the-clock operations from a remote location required immediate visibility into what was going on in different parts of the distributed setting. More important, however, reporting was not just a medium of coordination, but the audience product existed largely by virtue of reporting to the advertisers.

Each report was arguably produced to serve a particular purpose such as keeping an eye on an aspect of the organizational environment or making decisions about the course of certain operations, but, more generally, they seemed to answer how-are-we-doing questions constantly present in the venture organization. For instance, the gradual stabilization of operations after the commercial launch could be read off from the decreasing number of critical issues submitted to the Incident management system (see Table 6 in the previous section) and the Operations monthly report, and the release dates of updated business system components could be predicted on the basis of open items in the Quality assurance system.

Sometimes making the intangible and changing operational environment visible required organizing a considerable manual effort to reduce the abundance of opportunities offered by the data tokens into usable representations at the level of organizational practices. For instance, during the ramp up period it was crucial to be able to observe the success of member acquisition operations. The following excerpt shows how the practice of aggregating, reducing and compiling data into a report drew together three different parties and systems across the organization.

Researcher: Who compiled the report [on member acquisition] or how it was put together?

HBD: X2 had one chap [in the local sales office] who compiled the statistics. And Operations team aggregated some other numbers and from these it was put together. […] I was perhaps sometimes a little bit sceptical. We had sort of papers that incorporated 20 KPIs [key performance indicator]. For all those I told X3 and CEO that this is too complex. […] In fact, I kept simplifying those numbers into Excel for myself even after we had the more sophisticated reporting, so that I could do the follow up [on member acquisition] compared to the earlier period.

(Interview with Head of Brand and Design (HBD) team on 16 September 2009)

Taken together, the automatic aggregation procedures, software reporting tools and reporting practices rendered the organization and its environment not only visible but also made it possible to act upon it. Interventions were planned, executed and adjusted against information from reports – sometimes almost in real time. In this section I have sought to distinguish between different ways in which computational data were present in reporting practices. I have suggested that the nature of computational data at least partly accounts for how the analytical infrastructure generated expectations and drew attention to technological information. The previous example illustrates yet another dimension, that is, how reporting mediated action. The member acquisition process discussed by the informant was made visible and acted upon by virtue of the dedicated report that required data from different systems, juxtaposing numbers and simplifying the presentation so that essential information stood out and could be used to steer the marketing activities.

7.3.4 Custom analyses

In addition to the three kinds of regular operations previously referred to, there was a fourth type of analytical task that was executed more irregularly but constituted nevertheless an important part of analytical activities. These were the manually crafted custom analyses harnessing the available sources of digital data. Often once-off or rarely needed analyses were tailored to answer specific questions emerging in

the context of various operations and activities. Apparent problems in the network infrastructure, inexplicable member behaviour seen in the reports, or the needs of business development activities could motivate a novel cut into the data to shed light on the particular matter at hand. In this respect, the data tokens existed as a potential that attracted practical attention not unlike the case of reporting software tools. It was always possible to try looking for more information from the data. However, the custom analyses usually required considerable technical expertise and involved executing direct database queries that could only be carried out by certain persons in order to comply with regulatory and privacy requirements.

Even if these analyses were somewhat laborious, the masses of open and fine-grained data tokens meant that there was usually no need to reach out to obtain new data. This effectively meant that the task only required a few hours of work and made the undertaking into a relatively straightforward matter that could be carried out by one or two persons at the office. For instance, it was not always necessary to bother the actual consumers to gain further insights about the members whose behaviour could be explored by looking at the extant data tokens from a novel perspective. This made the approach feasible for a number of purposes. Given the comprehensiveness, openness and granularity of behavioural traces from the network infrastructure, the possibilities for various analyses were mainly limited by imagination and obvious regulatory restrictions. Finally, in addition to serving specific tasks, the custom analyses fed into the development of the reporting apparatus itself. Although it did not make sense to automate every idiosyncratic analysis, these novel explorations served as a source of ideas for the further refinement of automatic data aggregation procedures, software reporting tools and the organizational reporting practices.

7.4 Analytical infrastructure underpinning the audiencemaking practices

In this chapter I first discussed the member construct as an empirically observable feature present across organizational practices and then analyzed the computational data tokens underpinning many of the measurement activities granting the audience members their key attributes. The rest of the chapter then opened up the analytical

operations through which these attributes were stratified from the digital data to the context of everyday action. To summarize the key argument of this chapter, I argue that the way the member entity could be enacted in the context of organizational practices was considerably shaped by the underlying analytical infrastructure and, ultimately, the kind of raw data fed into the system. Before moving to assessing this argument in the context of key organizational practices, let me reflect upon the kind of reasoning used to arrive at the findings, and elaborate the suggested technological change in audiencemaking business by juxtaposing the nature of computational data with the layers of analytical infrastructure.

Reporting and analytical operations seldom commanded paramount interest among the employees, but whenever they failed, the objects of interest became suddenly inaccessible. The relevant consumer behaviour existed by virtue of digital data tokens and could not be grasped, for instance, by observing people using their mobile phones. Indeed, despite its geographical and cultural proximity with the consumer market, not even the local sales office had a direct, unmediated access to the members. The case differs thus from a number of studies on the informatization of industrial processes in that the crucial technological information did not originate as the representation of physical machinery, processes and materials but as the raw material for manufacturing the audience. Unlike pulp (Zuboff, 1988) or milk (Kallinikos, 1999), the audience members hardly existed outside the reports and analytical operations. Stacked on top of each other and often relying on the output from the underlying layers, automatic data aggregation procedures, reporting software tools and reporting practices created analytical cascades that connected to an ostensible, geographically distributed environment and, at the same time, were involved in generating the reality against which a great deal of organizational practices took place.

7.4.1 Reflections on the critical realist reasoning

This line of thinking does not necessarily contradict the constructivist approach placing paramount interest on the local enactment of technological artefacts, but suggests a different perspective for understanding how technologies perform social

agency. Indeed, an increasing human involvement was observed from the automatic data aggregation procedures to the use of reporting software tools and organizational reporting practices, and, finally, to the manually crafted custom analyses. Even the automatic data aggregation procedures appearing at the time of fieldwork as black boxes had once been carefully designed and implemented to objectify metrics serving various organizational purposes.

Nevertheless, the analysis shows that the computational mediation was not only involved in how employees acted upon a remote and distributed setting, but it also shaped the ways in which some of the central objects in the organizational reality were enacted. The analysis followed a retroductive reasoning pattern from the necessary precondition for audiencemaking business, that is, measurement data, toward immediate observations on social practices at the research site unpacking on the way the deep structure of the member object. The difference from constructivist approaches is perhaps only a matter of degree, but nevertheless assumes that it is possible to analyze how technology shapes the ways in which the reality becomes socially constructed. The computational data could be understood as a condition of possibility for the member object as it appeared in the context of working practices. This was expressed perhaps most clearly in occasions when one of the systems could not turn the data into information about members against seemingly reasonable expectations.

The company business revolved to a significant degree around the digital members, who were conceived first and foremost through the reports and software tools. These, in turn, were constituted by recourse to the underlying data. The relevant consumer behaviour existed as traces in the computational network environment and the access to the central object of work was granted through the screen; various analytical cascades were involved in making the members accessible to the working practices. A member had a physical counterpart, a human being using his or her mobile phone, but, as I will discuss in the next chapter, many of the working practices indeed targeted and interacted with the former, a kind of data double (Haggerty and Ericson, 2000; Lyon, 2003) measured and analysed together from the behavioural traces of the latter.

7.4.2 Discontinuities at the four levels of analytical infrastructure

The chapter made an attempt to elaborate the generic idea of medium specificity by analysing the characteristics of computational data tokens in supporting reporting systems and practices at the research site. What, if anything, makes the computational network infrastructure special in terms of how it mediates audiencemaking practices? New technologies tend to make production processes more efficient, increase precision and to enable new forms of collaboration, yet the argument here is not about the immediate instrumentality of technological systems but the qualitatively different set of generative rules embedded in the computational data. Drawing together the observations on the four layers of analytical cascades I argue that the changing technological underpinnings of audiencemaking and the associated business opportunity can be understood to evolve around the three attributes of digital data not present in the previous systems. The attributes would seem to capture important aspects of the novel condition of possibility that emerges from the computational network infrastructure. These are the *comprehensive*, *open* and *granular* nature of behavioural traces generated by the network infrastructure (see Table 5 in section 7.2). The attributes were identified by placing the research site against the relevant industrial setting and applying a theoretical lens sensitive to the computational underpinnings of organizational practices. Table 8 summarizes the implications of the computational characteristics at the different levels of analytical infrastructure.

Level	Comprehensivess	Openness	Granularity
Automatic data aggregation procedures	*Removes* the need to know relevant segmentations and groupings prior to the data collection	*Requires* meticulously pinning down formulas for achieving closure on specific metrics	*Requires* dealing with microscopic idiosyncrasies captured by the records
Reporting software tools	*Removes* the need to know relevant segmentations and groupings prior to the data collection	*Enables* the exploration of unexpected behavioural patterns	*Enables* focusing on minuscule behavioural details
Organizational reporting practices	*Necessitates* the two rudimentary layers in order to turn the data tokens into meaningful information	*Enables* mashing up measures from various sources and framing reports with interpretive tactics	*Necessitates* the two rudimentary layers in order to turn the data tokens into meaningful information
Custom analyses	*Removes* the cost of reaching out to consumers for new data needed for the analysis	*Requires* imagining hypotheses driving the custom analyses	*Enables* focusing on minuscule behavioural details

Table 8. The implications of technological discontinuity at the different levels of analytical infrastructure

Table 8 includes nine different ways in which computational data shaped the constitutive rules underpinning the audiencemaking practices. The analytical operations stretching from the hard-coded procedures to the social practices were both enabled and constrained in qualitatively distinct ways by technological information. The transition from using dedicated metering devices to the common information infrastructure *removed* some previous restrictions and *enabled* new kinds of operations on the data. It also *required*, however, certain new conditions to be met and *necessitated* building sophisticated analytical tools to harness the informative potential of computational data in the context of everyday work practices. If nothing else, the table shows that it is possible to put forward reasoned arguments concerning how a specific technology might enable and constrain organizational practices. The four different predicates (removes, requires, enables, necessitates) and the short summaries in the table cells summarize the ways this happened in the current case.

Reading the table by columns reveals that the implications of the three computational characteristics vary from one level to another and are understood best vis-à-vis the particular type of analytical operation. *Comprehensiveness* removed the

need to know the relevant consumer segments and classificatory variables in advance and did away with the need to reach out to consumers in order to gather data for custom analytical purposes. However, together with granularity, it also necessitated operating the two first layers (automatic data aggregation procedures, reporting software tools) in order to make the behavioural observations useful in the context of everyday work practices. *Openness* required locking down rigid formulas to manufacture facts as well as generating hypotheses driving the custom analyses. It also enabled exploring hidden patterns in the data and mashing up measurements from various sources. *Granularity* enabled focusing upon minuscule behavioural details but required also dealing with microscopic behavioural idiosyncrasies.

Reading the table by rows suggests how the three attributes interacted at each level of the analytical infrastructure. *Automatic data aggregation procedures* were not held back by preconceived segmentation criteria but had to also deal with the openness and irrelevant behavioural details captured by the data. The use of *reporting software tools* would seem to benefit considerably from the decoupling of data from preconceived sampling criteria and the possibility of exploring unexpected behavioural patterns in detail. *Organizational reporting practices* were largely predicated on the smooth functioning of the two previous layers while enabling mashing up and interpreting data from various sources. Finally, *custom analyses* became much more economic due to readily available computational data but required also envisioning questions that could be posed to the data.

Taken together, the three attributes of comprehensiveness, openness and granularity underpin the technologically induced change that is shifting the problem of audience measurement from obtaining observations of consumer behaviour to summoning the members out of data. Contrary to crafting surveys, metering devices or other sampling based instruments for gathering data about the audience, the organizational problem was to craft the audience using extant behavioural records. The monitoring function embedded in the network infrastructure did not, however, impose any meaningful order or classification on the records. The data tokens had to go through cascades of operations on their way from the database toward practical applicability. Since there was no inherent order or meaning in the data, it had to be created at the

time of use. Weinberger (2007) calls this the third order ordering. The next chapter will analyse how the vertically stratified member construct entered into different audiencemaking practices.

8 Three cuts into the audiencemaking practices

The previous chapter analysed the arrangements sustaining the attributes of the member entity, a construct that was found to be crucial in coupling the people using their mobile phones with the advertising audience. It would seem that the computational environment generated a novel business opportunity by its capacity to reveal behavioural patterns with new potential for meaning making and interpretation. The organizational capability to observe, measure and analyse network subscribers did not, however, yet result in a sellable asset, a product that advertisers would recognize. This chapter builds on the findings of the previous one and revolves around the question posed in the beginning of thesis: How does a new commercial medium create its audience?

I will analyse three processes that contributed centrally to making up the advertising audience and were mediated through the analytical infrastructure explored in the previous chapter, although in different ways. It is important to keep in mind that the way I cut the processes out from the empirical evidence is motivated by the theoretical interests underpinning the study. The cuts neither strictly follow the organizational units or functions nor attempt to grasp all the activities involved in turning mobile phone users into target groups for advertising. Sticking with my *focus on necessary (but not sufficient) organizational practices* guideline (see Table 4 in section 6.4.3), I have identified the processes both as central to the business of audiencemaking as well as richly present in the empirical evidence, and therefore amenable for analysing how organizing revolved around the matters shaped by the four types of analytical operations.

Despite being largely an informational construct, the member nevertheless also represented a human being. Together with the idea of institutional looping effects this suggests that the audiencemaking practices might not just translate consumer behaviour into the advertising audience but engage in shaping that behaviour and thus becoming, quite possibly, a recursive endeavour feeding back on itself. The idea is represented in Figure 2 (see section 2.5) by the dashed line from the measured audience to the actual audience. This leads to my third methodological

guideline to *look for possible looping effects between classifications and people*. The members were not just arranged into target groups for advertising, but, in order to deal efficiently with the hundreds of thousands of individual consumers, they were constantly segmented, classified and ordered for various purposes. Since observing and acting upon the members took place often using the very same tool, the construct expressed a degree of interactivity difficult to achieve using different arrangements for observing and managing the audience.

Building on the findings of the previous chapter this final part of the analysis reconstructs three processes that contributed in different, yet crucial, ways to the emerging audience product. I have labelled these as *principal operations*, *industrial outreach*, and *organizational development*. In the following sections I will first describe the set of practices in respect to the company business model and then analyse how the facts produced by the automatic data aggregation procedures, explorations into behavioural patterns using the reporting software tools, interpretive reporting practices, and custom analyses meshed with these practices. That is, how did the data-based operations format organizational functions. Each section starts thus with an overview of focal organizational practices, moves on to analyse the role of the member entity in these practices, and, finally, discusses the implications of data-based practices for the attempt to create a new kind of advertising audience.

8.1 Principal operations

The company business model was predicated on maintaining a mobile telecommunications service for consumers and running advertising operations for advertisers. These two activities were the basic building blocks underpinning the attempt to establish a mobile messaging based advertising medium. The former provided the means for catching consumers' attention while the latter was supposed to turn the resulting inventory of attention into a stream of advertising revenues. In its most rudimentary form, the multi-sided business platform was realized as the combination of these two groups of activities constructing the young consumers as an advertising audience. I have therefore labelled this combination as the principal operations. The activities were directed at members and their behaviour as possible

objects of action and, consequently, reflected back to the organization through the myriad of analytical operations described in the previous chapter.

8.1.1 Maintaining the telecommunications service and advertising operations

The principal operations observed and acted upon people both as target groups for advertising and as subscribers to the telecommunications service. Operations, Members and Commercial teams were mainly responsible for the functions sustaining the principal operations together with the local sales office, a call centre company and numerous other technology providers. The three teams comprised of 11 employees who managed an around the clock mobile network service with appropriate subscriber support for a large consumer population as well as directed the sales efforts undertaken by the local office. Although the subcontractors carried most of the routine work, the head office had to deal with various contingencies emerging and the complexity of operations. The former issue had become gradually less prominent once the operations had settled after the initial launch period, but the complexity of business operations was laid bare during the transition from the MVNO arrangement to partnering with established telecommunications operators.

Within the three teams, a whole range of practices depended and acted upon information based on automatic data aggregation procedures and the use of software reporting tools. It would have not been possible to target operations to groups of subscribers, report the success of advertising campaigns to the advertisers, optimize the level of service offered to the consumers, and to identify and sort out problems in the network without the elaborate apparatus that has constantly been churning out sophisticated reports. Lacking the information generated by recourse to computational data, the teams would have simply had no substance to work on. The information cascading through the layers of analytical infrastructure provided the crucial handles to get hold of facts, patterns and observations relevant to the matters at hand. In order to analyse how the member was constructed in the context of principal operations it is necessary to first outline the kind of advertising audience the company was building, that is, what kind of entity the members were supposed to add up to. I will then analyse how some of the key practices observed and acted

upon the members and, finally, discuss the member entity in contrast to flesh and blood human beings. The following excerpt from a company press release illustrates both the kind of intended advertising audience and the data-based nature of business.

> The ad campaigns that fund the service have generated industry leading average response rates of 29%, at a time when trust in other forms of mass advertising is falling and brands [advertisers] are finding it increasingly difficult to engage with young people. […] When new members join Company they are profiled based on their lifestyle and personal interests. This profiling is 100% opt-in and it helps Company to build up a deep knowledge of its customer base and deliver relevant communications to them. The profile enriches over time which means that the consumer experience just gets better and better.
>
> (Press release, April 2008)

An important selling point for messaging-based advertising was that, in contrast to other types of mass media, it would be able to cultivate a different kind of relationship with the consumers. Instead of mere exposure or opportunity to see the advertisements, the company promised advertisers an active audience that would engage with the marketing messages relayed to their mobile phones. Importantly, the company committed to its claims by putting forward the response rate as a key metric for describing the success of advertising. The metric was produced by the automatic data aggregation procedures as an integer representing the proportion of members who responded to the advertisement (see the previous excerpt). In this respect the seemingly embellished adjectives "active" or "engaged" used regularly in corporate communications were not just marketing parlance. Therefore, the member could not be captured merely as an ostensible profile, but had to be understood as an interactive entity. The consumers provided a simple profile upon joining the service to facilitate targeting of marketing messages, but the static demographic attributes (sex, age etc.) needed to be complemented by the understanding of members' reactions to advertising and other operations.

The sheer size of the audience, that is, the number of available members to be targeted by advertising campaigns, would be important for the commercial success

of the business, but it was not considered the defining attribute of audience product. Instead, having publicized the metric for audience responsiveness, the company had to make sure the members expressed appropriate behaviour in respect to the advertising messages appearing in between their personal communications. In contrast to mass media such as television or radio based on broadcasting technology, the Operations, Members and Commercial teams could not only observe but also directly act upon the media consumption behaviour of the members. The analytical infrastructure discussed in the previous chapter did not dictate how the company would harness the opportunities arising from the comprehensive, open and granular data, but it certainly shaped the possibility to conceive members as behavioural entities and to cultivate the member base accordingly. The audience measurement arrangements were not only borne out of computational network infrastructure, but they also made conceivable and shaped the interpretive framework in which the members were managed.

Next I will analyse how the link between the measured and the actual audience was performed in a few key practices within the principal operations. In particular, I will look at the basic unit of company product, the individual member, which did not emerge from one-way observation but existed in a relationship of two-way influence between organizational practices and the computational data used to observe the member behaviour. The members were *en masse* raw material, substance that figured in numerous practices within principal operations; for instance, the individual members were the atoms from which target groups for advertising campaigns as well as for other operations were selected using a variety of software tools.

8.1.2 Interacting with the members

At the office I sat among the Members and Brand Office teams whom I was assigned to assist during the fieldwork. I participated in the discussions and meetings as well as contributed to the daily workflow in the teams. It sounds almost too trivial to reiterate that the work was thoroughly mediated by information systems. In addition to the basic office software package and email, I observed over

20 distinct applications and systems supporting specific organizational processes, document sharing, reporting, collaboration, and interpersonal communication within the organization. Overall, these systems made the distributed mode of organizing possible and, following Mathiassen and Sørensen (2008), provided a portfolio of tools to cope with the uncertainty and equivocality of business operations. Indeed, various reporting systems played a crucial role in representing the environment within which many organizational practices took place. The participatory observation also raised, however, more fundamental questions: Where was that environment? What kind of operations accounted for its existence? The member entity offers an illuminating example of this ambiguity.

The overall behaviour of members was observed on a daily basis for no other reason than to see if the aggregate behaviour followed the usual patterns. These confirmatory peeks using the Member experience reporting tool were part of the daily routine in the Members team and often elicited a short conversation among the employees. No news was usually good news, since any deviation from the received pattern indicated a potential disturbance in the member base. A few desks away, the Operations team kept an eye on the network in a similar manner for any technical glitches and the Commercial team saw the members through the advertising targeting and reporting systems. However, contrary to the example of people processing organizations discussed by Mathiassen and Sørensen (2008) the cases of advertising audience were encountered and dealt with almost exclusively through information systems. The members were central to the business, but bringing some of the network subscribers into the office would hardly have provided much information about the relevant member behaviour. Indeed, marketing and design professionals whose working practices would often benefit from interacting face-to-face with consumers expressed occasional puzzlement, since no such opportunithy was readily available. Instead, the members were brought into the discussion by recourse to the analytical operations. The point is that the analytical infrastructure seemed to be involved in not only representing but also generating important aspects of the environment where the organizational practices and functions were exercised.

On the one hand, the behavioural observations did not answer *en masse* any explicit question apart from demonstrating that the members were there. The open and comprehensive character of data invited, however, exploratory analysis to uncover potentially interesting patterns. The Member experience reporting tool used by the Members team provided an abundance of possibilities to filter, order, combine, cross-tabulate and visualize data as well as to export the outputs for further processing and mixing with other materials using, for instance, spreadsheet and presentation applications. On the other hand, the individual data tokens were seldom interesting. It was usually the identification of informative patterns that would provide valuable input for planning the operations and making decisions. The timing of many operations could, for instance, be planned on the basis of weekly, monthly and cumulative trends, which also helped to forecast the evolution of the business and to understand how the behaviour of individual members changed in respect to the length of their membership. In short, many of the principal operations were conceived as interactions with the digital member behaviour and its aggregates. In the following I will discuss two important types of interactions with the members.

First, the most common act upon members was targeting them with advertisements as well as communications from the company itself. The latter were known as house messages used to introduce new members to the service, train correct behaviour, provide service updates etc. The messages were usually either one-way communications transmitted by the company to the members or so called three-step dialogues starting with a message requesting the member to reply and providing a tailored feedback message on the basis of member's answer. The messaging operations were generally executed by the local sales office using a purpose-built system connected to the member base. Once an advertising campaign consisting of one or more messages was completed, the sales office created a report on the delivery of advertising to the client using the Advertising reporting system (see Table 6 in section 7.3.2).

The actual targeting of messages varied from none, effectively targeting the whole member base, to very specific criteria including both profiling data and information

on the previous responses of individual members. The latter would obviously have not been possible had the monitoring been limited to the sample-based estimates of members' media consumption. Therefore, this would seem to demonstrate one way, in which the technological discontinuity in measurement arrangements formatted the boundaries of conceivable action. It is important to stress that the opportunity to target further messages on the basis of individual members' previous reactions did not dictate how such affordance was actually used, but at the same time a number of observed operations and discussion made sense precisely against such an opportunity. The practices in the Operations, Members and Commercial teams targeted members directly and received feedback often from the very same system where the targeting was done. The following excerpt from a marketing case study on an anti-bullying campaign illustrates the kind of interactive advertising audience that was possible to build using the medium. The response rate metric on the first line is complemented with other interactive and behavioural measures.

> 36% of members responded to the initial SMS
>
> - 7 times industry average for SMS - 29% had encountered bullying in school or the workplace
>
> All respondents received a relevant follow-up SMS
>
> - Raising awareness of the [Customer] website
>
> 1 in 8 respondents visited the website that day
>
> - The [Customer] website saw a 33% uplift in visits vs the previous eight Sundays
>
> (Advertising case study published on the company website)

Marketing cases are obviously chosen from the most successful campaigns and not even the prospective advertisers expect the actual numbers to represent the average case. The excerpt illustrates nevertheless how the company endeavoured to sell its audience as an interactive entity. The members were not only responsive (the first point), but it was possible to build dialogue by tailoring follow-up messaging to the individual members' reactions to previous messages (the second point) leading potentially to further actions (the third point). I will return more generally to the

issue of setting the expectations regarding the kind of audience the emerging mobile medium offered in the next section.

The second group of operations emerged from an occasional need to target a set of members with other types of interventions beyond using the messaging channel. Some of these took place from the head office where I was located. In order to make sure the members served their commercial purpose, that is, to provide target groups for advertising messages, the member base required maintenance and adjustments. An individual member was a viable constituent of an advertising audience, sometimes called a "good member", only if its behaviour fell within certain boundaries. As I have already pointed, the consumers accepted a terms and conditions document that set the expectations how they were supposed to use the service. For instance, the members were supposed to not just use their monthly communications allowance but also stay tuned in the network for the advertisements. The following excerpt suggests a number of sanctions that could be imposed if the member deviated from the terms and conditions of service.

> To remain a Company member you need to keep the SIM Card in a Capable Phone with the correct settings activated. You should also have your phone switched on to be able to receive the brand and other messages that Company sends to you.
>
> Company will keep track of how many messages you have received. Company understands you can't have your phone on all the time, so doesn't require you to receive all the messages it has sent to you. However, if you have not received more than half of the messages sent to you during a 30-day period Company may advise you via text or email to help you get back on track. If after being sent notice by Company you continue to receive less than half of the messages sent to you, your Refill may be suspended and your membership may be terminated as specified below.
>
> (Terms and conditions document)

The rules were not always strictly enforced, but they provided a zone within which the Members team could reasonably try to steer the behaviour of members. Selecting the members for such operations was often a careful analytical exercise involving trying out and discussing various criteria for targeting the actions, and

envisioning the implications of the actions for the member base. A good example of major operation was, for instance, the changes the company made to its offer to consumers around the time when I started the fieldwork. Instead of giving a certain number of free minutes and text messages every month, the company now provided a monthly top-up of credits the members were allowed to use flexibly. Judging from blogs, customer service feedback and writings in online forums, the members seemed in principle to accept the change, but its implications for member behaviour were nevertheless keenly followed from the reporting software tools. The changes shaped the usual baseline member behaviour and there were also some surprising patterns whose meaning was not immediately understood. The situation triggered reflective explorations into the mechanisms behind the metrics and information from the reporting tools occasionally revealing new aspects of the data-based reality.

In this section I have looked into the two key ways in which the company interacted with the members. First, the company sent advertising and other messages to the network subscribers' mobile phones and, second, adjusted the boundaries of possible member behaviour set by the information systems infrastructure. These two mechanisms did not exhaust the variety of interactions between the company and the members but are arguably among the most important and regular exchanges between the measured and the actual audience. The members could also update their member profile and join discussion forums on the company website, call the contact centre, participate in the special promotions organized by the local sales office etc.

8.1.3 Member versus a flesh-and-blood mobile phone user

The member constituted a central object for many organizational practices beyond the principal operations often substituting for a network subscriber, consumer or an individual mobile phone user. For instance, the members figured prominently in software development, public relations and business development activities, some of which will be discussed in more detail in the following sections. Nevertheless, the principal operations were largely responsible for bringing the object alive by constantly observing and acting upon it. The use of reporting software tools, automatic data aggregation procedures and custom analyses occasioned tight

feedback loops from the members' reactions to principal operations back to the organizational practices. Such feedback gradually come to be anticipated in the planning of operations, effectively meaning that the members were constituted as interactive entities.

I have so far analysed how the member construct was realized as an interactive entity by observing its reactions to various interventions through cascades of analytical operations. On the one hand, the member entity represented human beings using the mobile phones and yet, on the other hand, it was a distinct construct from a network subscriber, mobile phone user or, indeed, a human being. In the following I will further elaborate this distinction by discussing two instances when the member became juxtaposed with the idea of mobile phone user as a flesh-and-blood human being.

Two different ways of incorporating the consumers into organizational matters become apparent as I asked about the different ways the organization strived to understand the network subscribers (see excerpts in sections 7.3.2 and 7.3.3). The informants reported two different approaches. First, the local sales office was staffed with market-specific expertise and possessed youth marketing experience as well as cultural familiarity with the consumers using the service. Surveys, focus groups and other market research instruments had been employed during the prelaunch stage to get the overall understanding of the type of consumers who might subscribe to the service. Despite these advantages, the informants were ambivalent with respect to who, after all, was the closest to the members. It was not uncommon to perceive that, in fact, the data provided the best visibility of the members who, in turn, seemed to be conceived as a sort of data doubles of human beings (Haggerty and Ericson, 2000). In terms of decision-making, it was the member that mattered, not the human being. This was the overarching impression at the head office although, as I have pointed out, some employees found the situation uneasy in terms of their professional practices.

The difference between a member and a mobile phone user was reflected in decision-making. As long as an operation was perceived to target the member

construct, it could be planned as a kind of analytical problem solving. The members could be treated as behavioural objects, even if complex and somewhat unpredictable, but nevertheless essentially informational entities. As soon as the operation was perceived to target flesh-and-blood mobile phone users, the decision-making had to account for possibly much more complex reactions. In the latter case it was, for instance, necessary to take into consideration the variety of idiosyncratic ways the actions could be interpreted, potential repercussions in the blogs etc. whereas the member as an informational construct had no idiosyncratic features. In short, it was simply easier to take action on numerical constructs than human beings.

This suggests that the member entity that entered organizational practices referred first and foremost to data-based patterns. It constituted clearly a central object for many work tasks and needed to be maintained and properly managed. However, even if the members existed by virtue of the digital environment the company had made visible, their behaviour could not always be anticipated. The occasions when there was a reason to suspect the validity of computational data often resulted in the experience of losing hold of members.

Despite the increasingly sophisticated understanding of member behaviour in the context of principal operations, the advertising industry and thus potential customers lacked the awareness of messaging-based advertising. The ability to capture the potential value of the new infrastructure was thus limited by the prevailing thinking, for instance, in terms of browsing-based online media. Mobile advertising was by and large treated as online advertising, based on the idea of exposure and clicks; the member as a constituent atom of audience was rather new to the advertising industry. The next section analyses the kind of audience the company promised to manufacture from its members to serve the prospective advertisers.

8.2 Industrial outreach

In order to make the company business model work it was not enough to focus on running the principal operations. As a newly founded venture the company had to establish its approach as a legitimate way of building an advertising audience against the general perception of mobile marketing as a prohibitively complex undertaking (e.g. Laszlo, 2009). In other words, for large-scale advertising sales to take place the potential customers and various industrial intermediaries such as advertising and media agencies had to be convinced about the feasibility of the new medium, and consequently, the results of actual advertising operations had to be reported back to show that there indeed existed the kind of audience that had been sold to the pioneering buyers. The industry had a keen interest in the company whose high-profile founders had succeeded in stirring a considerable interest in their multi-million euros endeavour promising the intimate delivery of advertising and exceptional targeting opportunities based on the previous behaviour of individual members. I have therefore labelled these activities as industrial outreach.

8.2.1 Building the public relations story

At the core of industrial outreach was a professionally executed public relations function mainly targeting telecommunications operators, media conglomerates, advertising agencies, journalists and industrial analysts interested in if and how mobile messaging-based advertising would succeed. For the company their attention was both an opportunity, but also a challenge to build a coherent public relations story and, if needed, to defend it. The public relations activities were coordinated and mainly operated by the Brand Office team that also maintained the company websites for consumers, advertisers, press, analysts and the media industry in general.

Only a minority of public relations activities directly targeted consumers. The function was, nevertheless, instrumental in defining the new kind of advertising audience by building awareness of its selected attributes. The company could be held accountable for the claims it made about the audience in public. The public

relations practices put, as expected, a positive spin on the company issues, yet the operations were grounded on what was happening in the organization. Not everything was reported and there were usually some leeway in the timing of external communications, but the public relations function did not invent the things it reported. Indeed, public relations practices depended on other organizational functions to provide the pieces around which the company story was being built. The members and their behaviour played a key role in this respect and provided substantial input for the external communications. Facts about the audience and its members were repeated over and over again forming the cornerstone of corporate communications.

One way to understand this public relations activity is to view it as storytelling. Each act is, or may become, assessed against the stock of previous episodes in the evolving storyline. A plot that is either incomprehensible or unconvincing tends to draw criticism, or, if nothing happens, the plot becomes uninteresting and fails to make headlines. There was also the risk that journalists could question the company for any discrepancies or simply publish their own interpretations not necessarily benevolent for the organization. Each press release, interview and public presentation should therefore add up to a coherent story but also make sense in terms of the future evolution of business. In the context of a venture organization things could, however, always take unexpected twists and turns. The instances of external communications had to therefore avoid locking the plot onto a trajectory that might become impossible to sustain in the light of future events. The company reached out to the industry using a range of common public relations methods such as writing press releases, blog posts and columns, giving interviews and presentations, producing marketing case studies, and organizing invitation-only gatherings for analysts and journalists. The public relations function also coordinated people making public statements about the company, developed sound bites and tag lines the organization used to describe itself, and organized meetings to discuss public relations issues across the teams.

Observing the industrial reactions to corporate communications was a vital part of the outreach. Using an online news tracking service (see Table 6 in section 7.3.2)

and constantly checking key websites and blogs as well as keeping an eye on the discussion forums on the company website the employees maintained a sense of what was said about the company on the web. These mechanisms did not provide quite as tight feedback as the behavioural data from the network infrastructure did into the principal operations, but they nevertheless constituted a looping mechanism in which the organization reacted to the reactions to its own actions. For instance, toward the end of fieldwork period a journalist working for an important industry publication put remarks made by a company executive on closing the mobile virtual network operations in an unfavourable light. This caused the employees working on public relations to try to counter the situation by a variety of means. Overall, in terms of amount of attention and corporate image, the public relations operations were perceived to have been rather successful. The company had won prizes for its pioneering approach and was commonly requested for speakers in industry gatherings. There had been only few instances when the organization had had to resort to defensive tactics in order to counter negative publicity.

The evolving story reflected back on the organization in a number of ways. To begin with, it indeed seemed to gradually establish a track record for messaging-based advertising. The industrial intermediaries started to recycle parts of the company story adding considerably to its credibility. The perception of a good public image contributed internally to the employee motivation and confidence in the project during the difficult transition period when the company was ceasing its own MVNO and moving to partnering with traditional telecommunications operators. In a sense, the public image could become almost a matter of survival for an organization depending on its ability to attracting venture funding. One of the company executives put it succinctly in a workshop discussing the approach to partnering with traditional telecommunications operators when he pointed out that it was always possible to explain corporate matters for external parties, but without a help of positive corporate image there would be simply too much to explain to too many parties.

8.2.2 Establishing the attributes of audience product

The public relations practices did not generally target consumers, since the local sales office mainly handled member-oriented communications. The member entity had, nevertheless, an important role in the corporate story that incorporated selected attributes of the new kind of audience to objectify what kind of behaviour was expected from the members. The data-based observations made it possible to produce evidence to back up distinct claims about audience behaviour in contrast to traditional media. This, in turn, contributed to reifying the kind of member behaviour that had to be observed to support the storyline. In order to open up these mechanisms I will discuss the use of three genres of external communications and show how they defined the audience product. These are press releases, case studies and conference presentations.

The press release is the most official and nearly universal genre of external communications for major companies[34]. They are usually published in relation to events the organization wishes to gain public attention or feels otherwise compelled to react officially to. The releases are written so that time-pressed journalists can publish them with as little editing as possible effectively recycling corporate material as journalistic content. The topics of the company press releases from the very first one in late 2006 until May 2010 covered events such as the appointments of senior executives, advertising campaign case studies, awards, new funding, corporate partnerships and business expansion. Apart from their varying topics, the press releases consistently repeated a set of core messages about the organization and its business. The following excerpt illustrates these.

[34] A related genre of stock exchange releases is statutory for publicly traded companies.

> Company, the new mobile network for 16-24 year olds funded by advertising, has signed up over 100,000 members since its launch in [country] at the end of September, 2007. Members have embraced the concept so rapidly that annual member targets have been reached six months ahead of schedule, establishing it as a powerful new media for connecting advertisers with young people. […] The ad campaigns that fund the service have generated industry leading average response rates of 29%, at a time when trust in other forms of mass advertising is falling and brands are finding it increasingly difficult to engage with young people.
>
> (Press release, April 2008)

The most common way to refer to the user of the telecommunications service was "member" emphasising the relationship the consumers were assumed to have with the medium. Out of 26 press releases 18 mentioned the members while more generic terms "subscriber", "consumer" or "customer" were much less popular. The attributes used to describe the members was their age, which was mentioned in 16 press releases, and the high level of engagement with the advertisements backed up by the average response rate which was found in 10 press releases. The fact that the members had explicitly opted in to receive advertisements and provided profiling information for targeting was also highlighted several times. Indeed, the press releases implied that the ability to pick the target audience on the basis of members' profiles and behavioural patterns could turn advertising from a nuisance to a mostly entertaining and even useful experience.

If the press releases drew more often than not on certain behavioural metrics to describe the audience, this was even more clear with the case studies on successful advertising campaigns the company published on its website. A marketing case study is another common public relations and marketing method used to explain and promote a service or product by describing its use by an actual customer, who may receive, for instance, a discount for the service in exchange for participating in the case study. All of the 22 case studies published on the company website highlighted the response rate or some other behavioural measures as an evidence for the success of advertising at the level of individual campaigns. The excerpt in section 8.1.2 illustrates how the metrics produced by the automatic data aggregation procedures were expressed as straightforward factual statements about the audience. Using the

reporting software tools and manually juxtaposing numbers from various sources, it was possible to show how the members interacted with specific advertisements and, indeed, took actions on the basis of advertisements. Furthermore, the case studies emphasised how the individual members' responses to a specific advertisement could be used as criteria for targeting subsequent ads.

Finally, company executives and occasionally also employees gave presentations in various industry gatherings. The events and topics to be highlighted were usually coordinated by the public relations function. One of the events that took place during the fieldwork period focused interestingly on the organizational capability to analyse members' behaviour. The presentation prepared by the Member Care Manager identified a number of activities that depended on the Member experience reporting tool (see Table 6 in section 7.3.2). In the presentation he discussed how the tool supports the company in acquiring new members, making sure the existing members are available for the delivery of advertisements and likely to respond to them as well as monitoring and enforcing expectations set for member behaviour in the terms and conditions document. The importance of activities labelled as "customer experience analytics" was later on confirmed in a press release highlighting the continuing corporate partnership with the contractor providing the Member experience reporting tool for the company. Taken together, the press releases, marketing case studies and the conference presentations illustrate key means by which the company became committed to a certain kind of audience product revolving around member behaviour.

8.2.3 From audience measurement to the facts of audience

Public relations activities attempted to externalize to the industry a consistent idea about the audience that the mobile messaging-based advertising medium could deliver to the advertisers. The audience was not supposed to be made of passive recipients but members who are inclined to interact with the advertisements. It was argued, and indeed to some degree quantitatively demonstrated, that, in contrast to other media, many consumers experienced the advertisements as comparatively more relevant and entertaining. The company promised the advertisers an audience

that was not only exposed to their messages, but also show measured behaviour in respect to the advertisements. The organization became thus committed to a public relations story that depended heavily on the metrics and analytical operations based on the behavioural observations. An important achievement took place in August 2009 when a major industrial research firm affirmed in its report some of the claims made by the company.

> Advertisers were satisfied. Brands have been impressed with average campaign response rates of 25 percent. The richness of the interaction between Company's members and advertisers has also frequently been impressive. One example was a campaign organized by [Customer], which is a leading contact point for advice and guidance on bullying. The campaign was created to engage with 16- to 19-year-olds on this sensitive issue. Thirty-six percent of targeted members responded to the initial SMS, and several of the responses revealed sensitive personal experiences and emotions. This type of engagement has convinced advertisers that mobile is a viable engagement medium for their target audiences. They can also see an acceptable return on investment (ROI).
>
> (Industrial analyst report, August 2009)

The excerpt shows how another industrial actor took up the behavioural metrics as factual statements about the audience. At this point, the response rate measurements that originated in the automatic data aggregation procedures had consistently cascaded through reporting software tools and organizational reporting practices into public relations and company marketing materials. Finally, when an industrial analyst picked up the measurements, perhaps averaged them once more, and recycled the response rate into its own reports, the metric become largely detached from the arrangements in which it was fabricated. Supported by the legitimacy of a major research firm, the response rate started to look at this point very much like a fact about the audience.

In this section I have analysed how the measurements from the analytical infrastructure were gradually turned into facts about the audience. There are numerous stages in the fabrication process and it took two years of sustained public relations operations before the behavioural observations cascaded into a fact about

the responsive audience. Nevertheless, I have shown how the average response rate in the previous excerpt can be traced back to the digital data. The analytical opportunities provided by the comprehensive, open and granular data can therefore be argued to account, at least in part, for the conditions of possibility for fabricating specific behavioural facts about the audience. This chapter has so far attempted to demonstrate how knowing and managing the members as an advertising audience were sustained by the analytical capability to generate information out of member behaviour. This capability had, however, also other uses beyond producing the crucial facts about the audience.

Insightful cuts into the comprehensive, open and granular records could potentially suggest answers to novel questions arising in the course of developing business operations, and the analytic capability could be offered in a limited fashion to advertisers interested in learning about the consumers. Finally, the outcomes from the analytical operations could be short-circuited back to the advertising campaigns from which they originated to enrich the interactive member experience. These observations are the topic of next section.

8.3 Organizational development

Given the short corporate history, many of the employees had been personally involved in setting up the functions they were currently operating. The employees were thus often aware of past reasoning, struggles and coincidences that had gone into the existing state of organizational practices, processes and arrangements. Past decisions that had shaped current circumstances were often reflected upon when discussing possible ways to tackle emerging issues. As I discussed in Chapter 5, the organization was sometimes perceived as a project inventing and, consequently, reinventing itself in its search for profitability. From this perspective the organizational structures were not simply a taken-for-granted background against which the work practices took place, but the employees were engaged in reflecting upon the organizational arrangements with a view to transforming them. The fieldwork coincided with a particularly intensive period of organizational development activities. The company had decided to move from the MVNO

structure to offering its service to consumers in partnership with traditional telecommunications operators.

The transition period provided an opportunity to observe how the informants themselves scrutinized the workings of their own organization. Indeed, it was a source of frustration and anxiety that employees found it occasionally laborious to change the things they had been building only few months before. The overall idea was to retain the "soul of media" but to reorganize organizational functions as so-called managed services provider able to tap into the millions or even tens of millions of subscribers in the partner operators' networks. Instead of competing with the established telecommunications operators by managing its own mobile telephone subscription service, the company would let the partnering operators offer an advertising-funded mobile service for consumers on a revenue-sharing basis. I call these activities the organizational development loop. They are interesting for two reasons. First, while the activities did not target the members or the audience directly, they were intended to shape the audiencemaking arrangement itself. Second, the business development practices relied in a number of ways on the insights emerging from the analytical infrastructure.

8.3.1 Reorganizing the principal operations

One might also call these activities as the business development function even if the efforts were not explicitly labelled as such. Contrary to the practices sustaining the principal operations and the industrial outreach, the business development function did not map on any of the teams but was distributed across the organization. The activities incorporated employees across the teams to jointly envision the new way of running the business, which would eventually alter the principal operations and the public relations story discussed in the previous sections. The associated practices represented, therefore, a sort of second-order activity; conduct aiming at changing the organizational conduct. The scale and scope of the business development activity could be readily observed in the company intranet system. The development of the partnership approach was initially confined to a separate intranet space that

nevertheless grew faster than any other section during the fieldwork period and eventually took over the whole company intranet[35].

The company executives were away from the office most of the time, travelling to meet telecommunications operators around the world in order to identify potential partners and to discuss the conditions of partnership contracts. These discussions provided the moving and elusive target toward which the company and organizational arrangements were supposed to move. During the fieldwork period it was a paramount task for many employees at the head office to incorporate input from the evolving negotiations into plans supposed to take the organization, its systems and processes into the new approach for executing the media business model. The work took place under considerable uncertainties, shifting deadlines and strict financial constraints. When new information emerged from the negotiations the employees often had to rearrange their schedules and previously planned tasks in order to make sure the plans remained aligned with the recent developments. This happened both by adjusting the plans and by suggesting feasible directions for further negotiations. The principal operations and industrial outreach remained important among many other activities, although maintaining them had become largely routine by the time of fieldwork. To summarize, it was the business development operations that set the agenda at the office.

The organizational challenge was to rearrange the existing assets, processes and practices so that the successful consumer experience would be maintained, but at the same time integration with the systems of different operators would be enabled. As it was discussed in the previous section, the company had established during its MVNO period an approach to mobile advertising that was generally not only acceptable to consumers but also, in the light of average response rate, comparatively more engaging than other commercial media. In other words, the company could demonstrate from the data that it was capable of turning mobile network subscribers into members who behaved like an advertising audience. This capability was largely based on the principal operations managing and selling the audience members to the advertisers, and turning the measured interactions between

[35] This finding is based both on the daily observations at the office and the statistics collected from the intranet system.

the two parties into fact-like statements about the mobile advertising audience. It was crucial to disentangle the essential aspects of organizational arrangement from the incidental ones so that the former could be protected and re-embedded into a new setup.

8.3.2 Analytical infrastructure and the transition toward new organizational arrangement

The ongoing negotiations with the potential partner operators influenced the transformation to the new structure in a number of ways. The employees had to constantly reflect upon and try to capture the core assets and mechanisms of commercial media based on mobile messaging, while the commercial terms, co-branding arrangements, and the necessary systems integration with the partner operators had to be also taken into consideration. A lot of roles and responsibilities that were currently embedded in the organization would be shared with the partners. The data flows across tens of integration points between the different systems making up the company infrastructure had to be assessed and reconfigured. Relinquishing control over some parts of the service was generally not seen as a problem, but forced the organization to identify those aspects that were vital for successfully turning mobile network subscribers into "members" and selling them as audiences to the advertisers. Among many other things, this work came to reaffirm the central role of analytical infrastructure in many organizational practices.

> Researcher: Does it [Member experience reporting tool] have any role in this new partnership based model?
>
> MCM: That is a good question. If you ask my opinion, my opinion is that you cannot run this business in any setup without visibility, insight and reporting.
>
> (Interview with Member Care Manager (MCM) on 14 May 2009)

The members would take an increasingly central role in organizing as the result of transition to the new model. The telecommunications operator partners would take care of the subscriber relationship with the consumers, that is, provide the range of services and support consumers were used to receiving from their mobile phone

operator, while the company operations would revolve around members; the subscribers-as-an-audience. All in all, the company relationship with the consumers would become defined almost exclusively in terms of members. At the same time there was an increasing tendency to talk about members in aggregate as the audience. These shifts in organizational perceptions were reflected in the formal organization when the actual reorganization was launched toward the end of the fieldwork period. During the transition the former Members team was disbanded and its employees were assigned to roles closely related to new function known as audience management. The analytical infrastructure figured in the business development activity in three distinct ways.

8.3.3 Harnessing the computational data for business development

First, the analytical infrastructure provided a kind of laboratory environment in which emerging ideas could be assessed and tested against the actual member behaviour. Instead of having to enter into tedious debates about the assumed member behaviour and possible reactions to the new kind of service, it was occasionally possible to test the assumptions against the data either by using one of the reporting software tools or by crafting a custom analysis. For instance, at one point it was necessary to dig deeper into the nature of member engagement with the advertisements. The Member Care Manager who was responsible for the member analytics suggested studying the matter from the data and put together a graph depicting the speed of responses across various demographic groups revealing interesting patterns beyond the aggregate response rate. The availability of comprehensive and granular data not only enabled such operations but also made it into a routine-like course of action. Even if the raw data was almost never seen directly as it was buried deep in the system it underpinned an environment in which data-based operations and courses of action were always at hand.

Second, the fact that the monitoring function was embedded into the medium itself made it possible to envision new features that could make the advertising format more appealing to consumers. For instance, some employees pondered how the data could be short-circuited back to the content of advertisements. How much could “we

get out of 'yes' answers to a single advertisement" as one of the employees put it in a workshop session discussing the ways to position the company among other commercial media. Reflecting real-time data back to consumers is an increasingly common mechanism on various websites but less so in the context of advertisements. Although it was quickly pointed out that the commercial companies might not be willing to let the aggregate data from their campaigns be fed back to the members, the public sector and other non-commercial advertisers could see this as an opportunity to enhance the exposure of their messages. Discussing the idea afterwards in an interview, the informant referred also to the struggle to prove that the new medium and its audience exist.

> HBD: If the campaign is not bought by a single company or let's say it is a campaign for the public sector, they want that the results become public. These could be published on the internet almost in real time. This would generate much more attention, buzz and search engine optimisation. We could show the pulse of young people's answers. […] that kind of real-time publishing about what is happening in the network would show that this media exists because otherwise it is almost invisible...
>
> (Interview with Head of Brand and Design (HBD) team on 16 September 2009)

It also emerged in the discussion that company could use polls to ask members' opinions on specific business development issues such as the branding of the service offered in partnership with traditional telecommunications operators. This leads to the third aspect of how the capabilities built on the computational data shaped the business development opportunity. The analytical capabilities that have so far been shown to sustain the facts about the audience could be, in principle, passed on in a limited fashion to the advertisers interested in using the interactive audience to acquire consumer insight for their own purposes. This could happen simply by using the interactive advertising format for posing questions to the audience about itself, but also by deepening the insights by looking at the answers against behavioural data to understand, for instance, what kind of consumers did not answer or provided utterly negative feedback.

The analytical capability supporting the audience product was indeed to some degree also part of the product, as highlighted in the press releases discussed in the previous section. Finally, the audience was not only a measured entity, but also an analyzable entity amenable to exploration. In this respect the opportunities arising from the granularity and openness of computational data were, to a degree, passed on to the advertisers. Indeed, some of the messaging products offered for advertisers were not about delivering corporate messages to the audience, but surveying the audience for corporate purposes.

The business development ideas put forward along these three dimensions were not always carried out in practice, but even so they would have often been relatively straightforward operations to implement by virtue of the monitoring function embedded in the network infrastructure and the kind of data it produced. The final point that emerges from the discussion is thus that whether actualized or merely envisioned, the perceptions of possible courses of action were shaped by the configuration of automatic monitoring; comprehensive, open and granular data; and the analytical infrastructure.

8.4 Findings from key organizational functions

The first part of the analysis in the previous chapter unpacked the analytical infrastructure layered on top of the raw data coming from various sources. In particular, it was shown that the digital data tokens emanating from the network infrastructure did not speak for themselves but through the four kinds of operations that were needed to turn the behavioural traces into useful information. The analytical operations were shaped by the comprehensive, open and granular nature of computational data. In a historical purview these characteristics seem to derive at least to a degree from the computational network infrastructure itself as they were not present in the traditional measurement technologies. It is also worth reiterating that the analytical operations were not confined to a specific team or function as the technological information cascading through the layers of analytical infrastructure supported in one way or the other most organizational functions.

The purpose of this chapter was to analyse how the nature of technological information shaped the conceivable opportunity for practical action at the office and to identify any implications for the kind of audience that was being crafted out of mobile network subscribers. In this respect I have taken a realist rather than a social constructivist stance. If it makes sense to study the social shaping of technology, why should not we also study the technological shaping of social? However, instead of adopting a mutual shaping perspective following e.g. structuration theory or denying *a priori* separation of technology and social practices in the spirit of the ANT, I have tried to keep the two analytically separate while placing the emphasis on the former. To me this does not mean necessarily rejecting the mutual shaping thesis or the monistic/relational ontology, but choosing an approach that can carve the role of technological information out from social settings that are always too complex to be analysed exhaustively. Following the methodological guideline to focus on necessary (but not sufficient) organizational practices, the analysis in this chapter focused on three central functions in respect to the media business model. In other words, assuming that the organization was serious about sustaining itself as a commercial media[36] these practices were essential for its survival. I will return to the methodological choices and their implications in the next chapter.

8.4.1 Data-based audiencemaking

Each of the three sections outlined the kind of practices subsumed under the category, described their relevance to the emerging platform business and, most importantly, identified how operations were shaped by technological information. I have neither tried to analyse all of the organizational practices present in the empirical evidence nor to explain entirely the ones selected for the analysis, but rather discussed examples where the technological information apparently made a difference to the business. I will first summarize the main findings from each category and then discuss the more detailed observations. Table 9 in the next section

[36] One might argue that many startup companies claiming to build an advertising-funded business are, in fact, betting on being acquired by an established corporation for their talent and technology instead of actually sustaining the organization by advertising revenues.

summarizes the empirical observations on practices that can be understood to express the underlying data-based generative mechanisms.

First, the principal operations accounted for turning the network subscribers into audience members. These operations conceived the member primarily as a behavioural entity by virtue of measurement based on comprehensive observations on network subscribers' reactions to the advertisements. The members had a basic demographic profile, yet it was first and foremost their behaviour that was supposed to distinguish the audience product from other media. Importantly, the embedded monitoring function reflected the member behaviour back to the organization almost in real-time suggesting it was neither the organizational measurement practices nor the subscriber behaviour alone but their interactive relationship in computational data that produced the member.

Second, industrial outreach committed the company to a certain kind of interactive audience by recycling selected behavioural metrics into public facts about the product. Public relations operations externalized the idea of an audience whose members actively engaged with advertising. This was necessary to legitimate the novel medium in the industrial context and, in particular, in the eyes of advertisers. The company tracked what was said about it in the trade press, but in general the feedback from public relations operations was more indirect and delayed than in the context of principal operations. However, once the company had become publicly committed to an essentially interactive audience, the member behaviour had to be managed accordingly so that it lived up to the expectations external parties started to put on the audience product they bought. Measurements of individual advertisement campaigns would need to consistently convince advertisers that they actually received the kind of audience that the company claimed to have.

Third, in the context of organizational development the computational data could be seen to shape the space of conceivable actions both in terms of actual operations and perceptions. Business development operations made recourse to the analytical cascades and digital data as a laboratory to try out and explore various options. Just as Varian (2010, p. 6) points out, businesses have perhaps always engaged in

experimentation "but the availability of computer mediated transactions makes these experiments much more inexpensive and flexible than they have been in the past". Organizational development operations were intended to change the audiencemaking arrangement itself, which indeed started to happen towards the end of the fieldwork period. The empirical evidence does not unfortunately allow the resulting changes to be assessed in detail.

8.4.2 The summary of data-based practices

Overall, Table 9 below lends support to the argument that the digital data feeding the sophisticated analytical infrastructure assumed a central role across a number of organizational functions. None of the observed practices are seen as being determined by the computational data and, indeed, it may well be that at least some of them would be more effectively explained by other kinds of mechanisms. However, individual misattributions notwithstanding, looking across the examples in the second column it would seem possible to assign a number of observable implications to the generative mechanisms in the data.

Practice	Data-driven implications	Main feedback mechanism
Principal operations		
Advertising and house messaging	The comprehensive data makes it possible to interact with individual members on the basis of their individual responses	*Direct, immediate:* Analysing the behavioural records
Changing the consumer offering	The members enter into decision making not as human beings but as informational constructs; explorations into unexplained patterns seen through other mechanisms	*Semi-direct, slightly delayed:* Observing discussion on the company website and elsewhere in the web, customer service feedback etc.
Industrial outreach		
Publishing press releases	The company publishes behavioural metrics that become eventually recycled as factual statements by third parties committing the company to managing the member as an interactive entity	*Semi-direct, slightly delayed:* Using external content aggregation systems to observe the company media coverage
Publishing marketing case studies	The marketing case studies illustrate the variety of measurable interactions and behavioural reactions beyond what is captured by the simple response rate metric	*Indirect, delayed:* Diffuse, behavioural and perceptual change on the industry (difficult to attribute to a particular operation)
Presenting in industry gatherings	A joint presentation and a press release with a software vendor emphasises the key role of analytical infrastructure in the business	
Organizational development		
Planning the transition to the new organizational arrangement	The analytical infrastructure together with raw computational data appear as a laboratory that is used to look for answers to emerging questions and concerns	*Indirect, delayed:* The implications of organizational development activities are diffuse and generally difficult to attribute to an instance of specific operation
Envisioning the consumer experience	Discussions about enriching the interactive advertising format by short-circuiting the measurement data back into the communicative content of advertisements	
Developing the audience product	The analytical capacity underpinning the product can, and to some degree is, incorporated into the product itself letting the advertisers study the audience to understand the consumers better	

Table 9. Empirically observed implications of computational data across a variety of organizational practices

Continuing reading the table by columns, the rightmost column summarizes the ways in which practices in three categories were able to observe their own implications. The table attempts to capture, in particular, how direct and immediate feedback mechanisms were available. Direct feedback refers to a situation in which

the implications of an operation could be observed in the very same medium in which the operation took place. Acting upon the members by virtue of observing and planning actions on the basis of analytical operations on digital data is the paramount example of direct feedback. Semi-direct feedback is still largely associated with the specific operation, but may require recourse to a second-order system to capture the reactions. The use of the Online news tracking system to observe the company coverage in the trade press serves as an example of semi-direct feedback (see Table 6 in section 7.3.2). Indirect feedback takes places when the organization becomes aware of some diffuse behavioural or perceptual changes resulting from its actions. Finally, the immediacy of feedback refers to the general time lag between the operation and the observation of reaction it triggered.

The more direct and immediate feedback is available, the more unambiguously the outcomes of operations could be attributed to the specific operation. In the extreme case of the member entity, the direct and nearly real-time feedback resulted in an interactive entity constructed in the looping effects between the members and the principal operations. In other words, the member base was not made of static entities that could be simply stored and lined up as target groups according to a stable profile, but behavioural objects that interacted with whatever treatment they were subjected to. It was the nature of these interactions, resulting from simultaneous observation and acting upon the member in the computational infrastructure, that were the core of the digital audience.

9 Discussion and conclusions

This study set out to explore the process of turning mobile network subscribers into an advertising audience. The main research question stated in the very beginning was: How does a new medium create its audience? Starting from the excursion into the history of audiencemaking in Chapter 2, the study first revealed that a technical capability to relay advertising messages to individual consumers is hardly a necessary precondition for the existence of a viable advertising medium, and then, to use the well-known metaphor, proceeded to open the black box of the digital advertising audience analysing its complex computational character. The study has both practical value and academic relevance. Beyond the obvious managerial concerns related to building a new business, the analysis offers a perspective into the evolution of commercial media and the role of contemporary information and communication technology in digital service innovation. Whether we like it or not the content of advertisements, revenues from advertising maintain a great deal of the services people take for granted in their everyday life.

In this study I have analysed the digital advertising audience in order to understand how it is being produced, but at the same time I have ended up making it perhaps even more difficult to say what is the audience. Indeed, the idea of audience has remained throughout the study somewhat elusive, which reflects much of the contemporary thinking in the field of media studies. Neither did the informants give a specific definition of the audience nor did they seem particularly concerned about such a definition. Borrowing a concept from the cultural-historical activity theory, the audience could be understood as the object of an activity motivating and drawing together the actions and operations of a novel business organization while being difficult to pin down exactly (Aaltonen, 2005; Engeström, 1999; Engeström and Miettinen, 1999). Engeström (1990, p. 181) describes the object of activity as "both something given and something anticipated, projected, transformed, and achieved" in its capacity to orient collective actions. The notion captures much of the productive ambiguity associated with the idea of the audience at the research site, which revealed on top of everything that manufacturing a novel audience product is far from a straightforward or easy task.

It remains to be seen if the technological changes brought about by the computational network environment turns out to be a radical, competence-destroying shift favouring new businesses or alternatively a competence-enhancing development playing into the hands of incumbent actors (Tushman and Anderson, 1986). The reorientation of the studied company from running its own MVNO to partnering with the traditional telecommunications operators falls somewhere in-between these two extremes. The discontinuities in the technological underpinnings of audiencemaking business would, nevertheless, seem to amount to a disruptive architectural innovation, creating a latent technological potential that the company tried to harness for service innovation (Lyytinen and Rose, 2003). The study captures a transitional period in technological innovation, adoption and adaptation, which provides an intimate view into the matters that are difficult disentangle once the new arrangement becomes firmly institutionalized (Tyre and Orlikowski, 1994). Audience measurement and the organizational practices it supported were found not only to represent but also to be involved in creating the kind of advertising audience.

Three perspectives on the main research question took shape in the course of study: How does the company manufacture the audience product? How do computational data influence the audiencemaking practices? How does the digital audience differ from traditional media audiences? I did not originally set out to answer exactly these questions, which emerged during the research process as the result of interaction between theoretical ideas and empirical evidence. Indeed, my research experience suggests that the role of research questions was somewhat different from the studies testing hypotheses deduced from mature theories with precise empirical implications. The questions and the way I have sought to answer them represent the avenues along which I wish to connect the exploratory case with the matters of broader relevance, that is, the ways I suggest the findings have general value beyond the boundaries of the research site. In this chapter I will summarize these contributions vis-à-vis managerial concerns, IS theory and media studies mapping roughly the aforementioned three perspectives. Finally, I will discuss the limitations of the study and draw some conclusions in respect to pursuing the topic further.

9.1 Contributions toward practice, IS theory and media studies

Chapter 5 identified three perspectives on technology at the research site, of which I chose to focus on the use of computational data for manufacturing the audience product. The motivation behind the decision was to connect the analysis with the company business model and the conditions it imposed on the organization and its ability to survive in a competitive environment. Since my intention has been to look at the technological organization of a specific type of business operations, I have decided to foreground the industrial setting and certain key organizational practices with respect to it – instead of taking them a mere context for studying IS phenomena. Certain technologically mediated practices and analytical operations were then identified as essential for the survival of the company.

The Chief Economist at Google, Hal Varian (2010) pointed out recently that new kinds of computational records make it possible to pin down previously unobservable behavioural conditions, which can then be brought to bear on organizational matters and to condition contractual relationships. Indeed, the analysis demonstrates in a number of ways how technological information generated by a variety of data-based operations should not be understood as a simple input for decision-making. In the case, specific behavioural and cognitive patterns emerged along with novel technological information. Technology was clearly more than a tool; understanding the computational data merely "as a symbolic representation of something else real" (Yoo, 2010, p. 218) would fail to capture its potential in the audiencemaking business. The key organizational issue was not how accurately the data represented the actual mobile phone user, but what kind of operations and practices would be needed to know the audience.

The operations on the new kind of data generated a new kind of audience information and, consequently, different conditions for audiencemaking practices. Take for instance the member discourse at the research site that was shown to take the analytical member entity as its primary referent instead of actual human beings. As I have discussed in Chapter 2, some kind of reductive treatment of human beings is perhaps needed in all people processing organizations, which nevertheless calls

precisely for understanding the specific means by which the data doubles representing the individuals are constructed. In the case, these means were furnished to a considerable degree by analytical operations, whose computational underpinnings were reflected on the audience member that stood for an actual mobile phone user in the organizational setting.

By placing the analysis against the historical trajectory of industrial audience measurement and the theoretical ideas about technological information, I have shown that some of the observed patterns may not be specific to the research site but to the computational mediation of activity. For instance, various implications of granularity and open-ended nature of computational data have been observed in previous studies and different settings, as I will will discuss below. Taken together, Table 5 (section 7.2), Table 8 (section 7.4.2), and Table 9 (section 8.4.2) summarize the main empirical findings of the study. The tables describe the new kind of technological information, its implications on four types of analytical operations and their involvement in three sets of organizational practices contributing centrally to the audience product. Next, I will discuss contributions from the findings with respect to digital service innovation, IS theory and media audiences.

9.1.1 Digital service innovation

The company success was predicated on launching not just another media outlet but a new genre of advertising and a type of multi-sided business platform. The research site thus represents an attempt to build a new kind of organizational capability to cope with an ambiguous and difficult to maintain audience product, and, in this respect, the organization had no immediate antecedent or exemplar to follow. The following summarizes three practical contributions that I suggest carry implications for managing digital service innovation.

At the outset, the case provides a sobering example of what it actually means to establish a new commercial medium and to provide services seemingly for free to the consumers. It is not easy. The findings of the study put the fashionable talk about "free" (Anderson, 2009) into perspective, suggesting caution toward grand

arguments about a major shift to advertising-funded service provisioning. In general, setting up a multi-sided platform or "ecosystem" business may seem an appealing proposition, but it can also be tremendously difficult (Evans, 2009). While this is perhaps not surprising as such, the case sheds light on the kinds of difficulties that building a commercial medium entails in the new environment. Such a venture must succeed in at least two different markets such as the consumer market for telecommunication services and the market for advertising audiences (Cusumano, 2011). Getting consumers on board is a prerequisite for attracting advertisers, but, importantly, not enough to make up an attractive audience product. The product was created in a process involving practices such as analysing and managing the audience members' behaviour, making industrial actors aware of the evolving audience, and learning from the members' and advertisers' reactions to the interventions made by the company. Such a reflexive process took much more time than just getting the consumers to sign up for the service. At the time of writing, the studied company had spent five years and tens of millions of euros in venture capital to build a new commercial medium, but the work was far from over. The business platform had still not reached the level of revenues needed to sustain itself.

Any new advertising medium has to build the capability to produce sophisticated analytical statements on its audience and to legitimize these statements as facts to the industry before it can even start to compete with other media for a regular share of advertising budgets. Despite the attractive promise to target and engage the right consumers, the reallocation of advertising budgets may not be in the interests of all the parties who have their say over how advertising money is spent. Furthermore, given the increasing fragmentation of the media landscape, Napoli (2003) predicts a declining overall quality of advertising audiences and therefore viability as a source of revenues. Other commentators point out that the wave of free online services could be merely a sign of the immaturity of the new environment (e.g. Orlowski, 2011). For these reasons, tapping the assumed digital surplus by advertising may, after all, look more appealing than it actually is for most companies[37]. Advertising is not the only option for sustaining free digital service provisioning to the consumers, but it is the usual, if not always explicit, assumption behind the idea of free service

[37] See Bughin (2011)

provisioning. These observations do not invalidate the approach, but anybody planning to launch an advertising-funded platform business had better be aware that sending out advertisements can be easy compared to demonstrating that somebody is actually receiving them. The potential for service innovation that is brought about by disruptive infrastructural changes is thus rendered under specific industrial conditions and their historical evolution.

Second, the case contrasts with the popular ideas on user-led innovation (Herstatt and von Hippel, 1992; von Hippel, 1986; 2007) and the generativity of the online environment (Zittrain, 2006; 2008). The business concept came firmly from the company founders, and it was the head office employees who masterminded the crucial analytical infrastructure that made the novel audience product possible. The analysis shows how the flesh-and-blood mobile phone users usually entered into organizational practices only indirectly through the digital member category that reduced the richness of human being into a few organizationally relevant dimensions. In a similar vein, there is little generativity driven by the consumers. This suggests that the generative opportunities for service innovation in the computational network environment go beyond the creations of users at the peripheries of end-to-end architecture. This was perhaps most obvious in the case of business development that used the data and analytical infrastructure to intervene in the organization itself and advertising formats themselves. The data that mediated the relationships between the company, its audience and advertisers were thus also harnessed to act on the organization itself.

Varian (2010) suggests that the computational network environment has unleashed a wave of combinatiorial innovation, and Yoo, Henfridsson and Lyytinen (2010) argue that generativity may take place at any level of the layered modular online environment, not just on the topmost level of consumer interaction. In particular, there may be different kinds of online generativity that support each other. For instance, the economic viability of popular platforms for user-generated content (e.g. YouTube and Facebook) is more often than not based on the capacity to capture the resulting consumer activity and attention as an advertising audience. In the current case, such a capacity has little to do with the intentions and content

driving the service usage or the meanings the consumers attach to the service and more with the data-based analytical operations. The generativity springs from the wealth of new behavioural data that is only loosely coupled with the infrastructural layer and the specific purposes for which it was originally developed (Yoo, Henfridsson and Lyytinen, 2010). The mobile phone users were mostly relevant in the context of organizational practices by virtue of their digital shadow, that is, the member entity that was fabricated from the behavioural data and became the prime object in innovating and intervening in the new kind of advertising audience.

Third, the analysis traces much of the novel business opportunity to the emerging organizational capability to harness the computational data, which could be perhaps understood as a kind of data-based generativity in contrast to user-driven generativity. Data mining and business analytics are increasingly common activities across various industries (Ayres, 2007; Davenport, Cohen and Jakobson, 2005; Lavalle, et al., 2010; Nedelcu, 2009; Redman, 2008). However, in the current case the analytical operations were not just used to support operations and decision-making, but they also formed the core of the production process itself. The new kind of advertising audience was manufactured from the behavioural observations made possible by the computational data. Practices based on the data accounted for a significant part of business and everyday work not unlike earlier cases on the computerization of industrial settings by Zuboff (1988) and Kallinikos (1999). Contrasting the current study against the two cases helps to further clarify its distinctiveness and relevance.

The research site was built from the ground up in the contemporary computational environment, whereas the two former cases observed the process of imposing a computational layer on top of existing industrial processes. To borrow a metaphor from the librarians, the objects of work are born digital in the case of audiencemaking (Friedlander, 2002). The member entity had never existed nor could it have existed outside the system, since the material for manufacturing the audience, that is, digital behavioural traces, was generated by the computational network environment. In the case of pulp (Zuboff, 1988) and dairy products (Kallinikos, 1999), the raw material for the industrial process comes from forests

and cows. The computationally rendered entities could be still understood to *represent* industrial processes and materials outside the system, whereas in the current case the computational data tokens and the members constructed out of them are constitutive elements of the value creation process. More generally, the study departs from a body of IS literature in which computing is "conceptualized as a discrete symbolic representations of something in the *real* world" (Yoo, 2010, p. 218). The digital data was real (if not physical) material possessing distinct attributes in the sense that the relevant human behaviour was only accessible as the data – looking at people using their mobile phones on the streets would be of no use in terms of manufacturing the audience. In contrast, the industrial machine operators could still leave their screens and go out to physically sense the manufacturing process and its materials, whereas in the case of digital advertising audience there was no other access to the audience member than through the screen and analytical operations.

The professional implications of this were perhaps most clearly expressed by the marketing staff and designers whose practices tended to emphasise rich interaction with flesh and blood consumers. In the feedback session I organized for the key informants, one of the marketing employees bemoaned "the strange nature of business being managed far away from the consumer by virtue of reports". Indeed, going from informating physical industrial processes (Zuboff, 1988) to constructing the value creation process around technological information incorporates a shift from technological representations to an increasingly self-referential computing (Kallinikos, 2006; Yoo, 2010). In the latter, the value of computational technology is not derived primarily from how well it represents the production process but from how technological information makes the value creation possible in the first place[38].

Against this background, the enthusiasm around user-led innovation, user-generated content and user-driven generativity can be understood partly as a reaction to the progressive distancing of consumer business from consumers. The more comprehensively consumers can be dealt with in the behavioural matrix set up by the company, the more efficient the business. As I discussed in Chapter 2, formal

[38] For instance, various content aggregation and search services can be understood to exemplify this trend.

organizations are rule-based entities often driven by efficiency concerns that make it difficult to cope with the idiosyncratic existence of human beings. The comprehensive, open-ended and granular data opens up whole new opportunities to innovate such matrixes.

9.1.2 The computational rules of audiencemaking

The research design and theoretical perspective in this study should not be understood to indicate a search for deterministic implications of computational technology. Nevertheless, in contrast to the social constructivist position limiting itself to studying how the enabling and constraining material aspects of technology are enacted in social settings, the empirical investigation has assumed that the inherent aspects of contemporary technological environment can and should be studied. This means leaning toward a realist position in the debate between social construction and technological determinism (e.g. Bijker, 2001; 2010; Hutchby, 2001; Kallinikos, 2004; Kling, 1992; Pinch and Bijker, 1984; Suchman, Blomberg, Orr and Trigg, 1999; Woolgar, 1991). More relevant than taking a side in the old debate is, however, that I did not adopt a nowadays popular position to deny the separation of technology and social action as a starting point for empirical research (Khong, 2003; Latour, 1999; 2005; Orlikowski, 2010). Chapters 4 and 6 aligned the investigation with the critical realist metatheory arguing for the understanding of mechanisms and entities underlying the empirically observable reality. In the following, I will first contrast this position against the aforementioned ontological tradition by staging a brief immanent critique the ANT. Second, I will elaborate what kind of rules can be understood to be embedded in the computational network environment.

ANT argues that an activity is always performed by a variety of different kinds of entities that incorporate and convey each other's actions thus having a sort of collective agency. Following from the original idea of ontological symmetry (Callon, 1986; Miettinen, 1999), the activities are assumed to be performed by heterogeneous assemblies of actants that cut across conventional ontological categories – most importantly that of humans and non-humans. No thing, a human

or non-human, acts on its own since to "act is to mediate another's action" (Latour, 1996, p. 237). Who or what counts as a relevant actor is assumed to be a matter of intensive empirical observation leading to endogenously defined case studies as I have discussed in Chapter 6.

What were then radical statements sound today less controversial given that most contemporary organizational settings are mediated by various technologies[39]. The original insights from science and technology studies have been adopted to various degrees by different schools of thought (e.g. Engeström and Escalante, 1996; Schatzki, 2006). In the context of the research site, the mutual shaping or sociomaterial entanglement could for instance be observed as the coming together of mobile phone use, computational data, various analytical operations and social practices into the member entity. The member object, as it entered organizational practices, was neither exclusively human nor technological entity but a mixture of different ingredients and operations. However, I adopted the position that the interesting question is not *if* technology matters, i.e. is involved in making up organizational entities, but *how* to capture the influence of a specific technology on organizational doings with respect to a specific kind of business (Williams and Edge, 1996).

To begin with, the relative malleability of different entities and the influence they exert on the joint activity varies over time (Archer, 1982; Gieryn, 2002; Runde, Jones, Munir and Nikolychuk, 2009). In order to understand a certain activity, it is often necessary to unpack or account for these temporal patterns, but neither ANT nor sociomateriality seem to provide robust analytical tools for this particular task. From this perspective, the problem with the approaches is not that they reject strong assumptions about the individual intentionality of action (cf. McMillan, 2003), but that they tend to promote descriptive research designs that have difficulties in grasping generic patterns that may emerge from non-material characteristics of computation beyond local idiosyncrasies in technology adoption and use (Kallinikos, 2004; Pollock and Williams, 2008). More specifically, I argue that the inconspicuous data tokens at the heart of audiencemaking business would have

[39] According to ANT, the mediated nature of action is of course not limited to contemporary organizations but a generic characteristic of all action.

probably never come up if I had started directly from the level of organizational practices without first placing the research site in its historical and theoretical context. This would have made it difficult to assess technologically induced changes in audiencemaking business.

The key empirical findings show that the computational data assumed a crucial role in the audiencemaking practices at the research site. This was observed, for instance, when the lack of data or a problem in the analytical infrastructure withheld a piece of information that had been incorporated into practices assuming the existence of such a condition. Furthermore, the direct and immediate feedback from the members' reactions to organizational interventions meant that the member could be understood as interactive entities (see section 8.4.2). They could always behave in an unexpected manner, and this expectation of unexpected behaviour shaped the practices dealing with the members. The basic format of server log entries is probably a result of heterogeneous assemblage of actors, but its design and implementation had taken place long before the company even existed, and the involved actors had never been present at the research site. In other words, there was very little room in the context of ongoing audiencemaking practices for negotiating or reshaping the kind of data that was available. The nature of data tokens was in itself a firmly closed black box from the perspective of audiencemaking practices, and thus it did not seem a fruitful starting point to assume that computational data tokens "have no inherent qualities, but acquire their form and attributes only through their relations with others in practice" as Orlikowski (2010, p. 135) describes the position adopted from ANT in the sociomaterial approach. Instead, the computational data appeared from the perspective of local actors as a structuring force shaping the space of conceivable actions. The conflation of epistemology and ontology in ANT leaves little room for capturing such forces theoretically. In some respects, the critical realist approach adopted in this study does not necessarily contradict the idea of relational ontology, but allows some things to be theoretically assigned to the background while foregrounding others.

In order to analyse the implications of computational technology for the audiencemaking business, I have assumed following Lanzara (2009) that

organizational practices revolve around objects that are specific to the medium on which they exist (see also Faulkner and Runde, 2009; 2010). In particular, I asked what is the specificity of the computational medium, that is, the agency exhibited by the common computational infrastructure in contrast to the second-order measurement devices. The analysis traced the computational mediation to three historically distinct characteristics (see Table 5 in section 7.2): comprehensiveness (not a sample but a census), openness (not tied to a particular purpose) and granularity (breaks the observed reality down at the level of minuscule details). The first two characteristics (comprehensiveness, openness) identified by empirical analysis extend the understanding of digital objects in Kallinikos, Aaltonen and Marton (2010) and Faulkner and Runde (2010), while the third (granularity) maps closely to an attribute found in the aforementioned studies[40].

The computational data generated by the monitoring function embedded in the transmission infrastructure is not a panacea for audience measurement, but shifts the nexus of value creation from obtaining valid and reliable samples of people's media consumption to analysing the audience out of extant data. This may have implications for the relevant capabilities and organizational structures on the media industry. Indicative of this, analytical operations and skills retained, and even increased, their relative importance throughout the difficult transition period from the MVNO structure to the partnership-driven organization arrangement. More generally, the possible configurations of content and service provisioning, measurement, analytical operations, and delivery mechanisms are being redrawn on the computational network infrastructure, with examples such as search engine marketing and advertising based on mobile messaging discussed in this study.

Chapter 7 analysed how the three aforementioned attributes shape the cognitive rules on creating and managing the audience (see Table 8 in section 7.4.2). In this respect, the rules should neither be understood as simple contraints on activity nor did they determine how the audiencemaking operations were played out in the context of everyday work. The rules stand for the shifting boundaries of what is

[40] I am aware of the unfortunate discrepancy between the concept of openness in this study and in Kallinikos, Aaltonen and Marton (2010). Despite the use of similar label, openness refers to different phenomena in the two texts.

conceivable and efficient in the historically new setting; they were both involved in constituting the business opportunity and in regulating everyday work at the office (Hildebrandt, 2008). Furthermore, the idea of constitutive rules resembles the typology of maps and scripts in Schmidt (1999). A map is understood by its capacity to depict the boundaries and selected features of a territory that can be explored, while a script is taken to settle the interdependencies between the operations in advance. Schmidt argues in a realist fashion that for instance a flight-deck checklist constitutes a script that imposes an arguably stronger template for action than the idea of plan allows. It is essential to the checklist that it centralizes procedural control and instigates a relatively standardized behaviour, that is, removes local discretion.

The notion of abstract computational rules differs from maps, plans and scripts. In contrast to a map covering a known territory or a plan suggesting actions that a project may come to incorporate, the computational data constituted an exploratory space whose boundaries were essentially unknown. It would neither be possible to map explicitly all the combinatorial possibilities nor to plan the use of available data in detail before actually using it. Unlike a script, the data-based rules did not fix interdependencies between the operations that took place on the medium. Table 8 (section 7.4.2) lists the ways in which the computational medium shaped the kinds of operations that were possible to employ in order to extract meaningful information out the behavioural traces. The idea of computational rules is thus suggested to extend the typology of maps and scripts as empirically oriented conceptualizations on how technological forms (Kallinikos, 2005; Smith, 2006) may come to govern human conduct in local settings.

9.1.3 The new kind of audience

The audience constitutes a problem both for the commercial media business and for media scholars. Academic audience studies have come to deconstruct the audience up to a point where some scholars argue that no such thing probably exists beyond discursive constructions. For instance, Bratich (2005) suggests replacing the constituted power of the audience in communication studies with the idea of

mediated multitudes, presumably better able to capture peoples' media usage. Such views are generally consistent with the problem recognized by commercial audience research and business practitioners, who need to contain the complexity for their own purposes. As I have already pointed out several times, consumers' media consumption habits have become progressively more heterogeneous and idiosyncratic in response to the fragmentation of media landscape.

No advertising-funded media can survive without a coherent audience product proven to exist beyond the corporate marketing materials and rhetoric. Consequently, the industry has deployed increasingly sophisticated measurement arrangements to counter the misalignment between the measured and the actual audience. While the approach is probably the only viable solution in the short-term, it also contributes to the further fragmentation of media perpetuating the very problem the measurement is supposed to solve. If the academic discourse counters the increasing complexity in audiencehood by more complex and nuanced conceptual approaches, the commercial media have historically developed progressively more complex measurement arrangements to reduce the variability of media consumption so that consumers can be treated as homogenous material for audiencemaking purposes. This section summarizes three contributions with respect to the emerging mobile advertising audience.

First, the constitutive relationship between the measured and the actual audience was essentially interactive as a result of the direct and immediate feedback received from the member behaviour. The operations targeting the audience members immediately fed back into the same system that was used to plan and execute the messaging (see Table 9 in section 8.4.2). The expectation of feedback could thus become factored into the planning of operations effectively treating the member as an interactive entity, resulting in the expectation of unexpected reactions. This had the implication that knowing the new kind of audience meant not only pinning its members down in terms of static profiles but also learning and managing its behavioural reactions to different interventions. Indeed, during the company reorganization many of the activities from the former Members and Commercial teams were combined into a new audience management function. This brings the

discussion back to Figure 2 (see section 2.5) depicting the loop from the measurement arrangements to the measured audience, and through the actual audience back to the measurement arrangements.

The managed interactivity of the member entity suggests that the audience not only derives from the natural groupings of people, but the audiencemaking practices can bring into existence a new common denominator between people. The interactivity of the member entity allowed for observing, encouraging and, if needed, expelling certain kinds of behaviour and, thus, members. In Figure 2 this is reflected by the enumeration of phases starting from the measurement arrangements instead of the actual audience. Let me elaborate. Without the measurement arrangements there can be no measured audience, and hence any actual audience would be irrelevant from the perspective of the media business model, whereas the measurement arrangements are, in principle, able to shape the actual audience. Given the interactive character of the audience members, the actual audience was conceived against the measured audience, not the other way around. The measurement arrangements can be thus argued to be literally involved in constructing the audience. In order to function properly, the audiencemaking loop needs all three elements, but the measurement arrangements would seem a more appropriate starting point than the actual audience in Figure 2.

Second, shifts in the audience measurement arrangements often have repercussions for the media industry and content. The case would seem to support two industrial trajectories. The more obvious one is the unbundling of the composite nature of media content (Carr, 2008), which relates closely to the dual role of media companies. The delivery and measurement of content has historically taken place at the level of radio stations, television programs or newspaper issues leaving considerable ambiguity over which parts of the composite product are actually used or ignored by the citizen-consumers. As long as the overall content bundle attracted enough attention, the journalists could justify the time spent on serious investigative journalism by reference to the public interest. At the same time, lacking more granular measurement, the advertisers could place their advertisements next to the

celebrity gossip mostly ignoring the question if the so-called opportunity to see (OTS) translates into any actual attention to the advertisement.

The necessarily bundled nature of content has largely made possible the working consensus between the journalistic and capitalistic functions of media companies. However, once the snippets of media content and the advertisements can be delivered and measured individually, the economic rationality of the composite product becomes more difficult to sustain. This can be seen as an expression of the granularity attribute of computational entities and the decoupling of the *en bloc* nature of organizational entities and processes it affords. Carr (2008) warns that such developments are already severing the historical relationship between advertising and journalism, yet the current case can be understood to go even further. It shows how the evolution of measurement arrangements helps to convert new spaces (such as the messaging inbox in the mobile phone) to which people pay regular attention into advertising mediums without recourse to costly content production. Indeed, from the perspective of the commercial media business, user-generated content means outsourcing the content production to the advertising audience itself – in the case of search engines to society in general.

Third, the less obvious trajectory relates to an old political economy perspective on the relationship between the audience members and the media. Bermejo (2009, p. 136; referring to Smythe, 1977) summarizes the idea by pointing out "when workers try to relax in front of the television set in order to generate the energy required to go back to work, they are actually working as audiences". Although he readily admits that this is just "one of many possible ways of conceptualizing what the audience does with the media; a way that does not account for the whole complexity of audiencehood" (Bermejo, 2009, p. 136 footnote 1), the empirical findings suggest some interesting comparisons in respect to the idea of watching advertisements as labour. It was pointed out in Chapter 2 that the case is an example of permission-based marketing approach in which the consumers grant a trusted party the right to send them advertisements in exchange for tangible benefits.

The company approach went further, however, than the mere permission to send advertisements, as the terms and conditions of the service explicitly required the consumers to make themselves available for advertising. The permission to send is coupled with an obligation to receive, as it is the interactive behaviour that matters in terms of fabricating the new kind of audience. Accepting the terms and condition document does not amount to signing an employment contract, but it nevertheless sanctions the reception of advertisements. Such sanctioning can make a difference because the computational data provides a cost-efficient way to monitor and act upon the member behaviour. Just as Varian (2010) points out, computer-mediated transactions make it possible for the company to condition contractual relationships on previously unobservable terms thus giving rise to possible new contractual forms. The contractual relationship disciplining a relevant domain of individual existence during office hours and the capability to monitor pertinent behaviour are the cornerstones of modern bureaucratic organizing and management (Kallinikos, 2011a). The terms and conditions accepted by the members shift the reception of advertisements from purely voluntary consumption toward a contractual obligation.

This chapter has discussed the relevance of understanding digital audiencemaking from a number of perspectives such as the role of advertising revenues in maintaining digital services, complexities involved in building a multi-sided platform business, generative opportunities for digital value creation, and the precarious link between advertising and journalism in the new media environment. In this section I have opened yet another perspective on the audiencemaking business. The advertising audience can be understood as a sort of labour force for media companies. Given the possible new contractual forms supported by the computational network environment, the idea is not as far-fetched as it may sound. One needs to look no further than Wikipedia for an example of unconventional involvement in the productive activity made possible by the computational environment (Aaltonen and Lanzara, 2010; Benkler, 2006; Shirky, 2008).

9.2 Some limitations of the study

The critical realist position assumes that knowledge is always incomplete and provisional; it is always possible to pursue matters further, quite possibly resulting in a revision of the current understanding. The approach concurs with the thinking of Karl Popper in that theories can never be ultimately proven to be true but should be made precise enough to be refuted by empirical evidence (Lazar, 1998). Ideas that survive rigorous testing can then be deemed as provisionally true or the best approximations so far. The purpose of this section is to clarify the limitations to the knowledge based on the empirical findings and to identify ways to put the suggested contributions to test in future studies. The criteria for assessing the credibility of case study findings are generally less rigidly formalized than for some other research strategies, and yet a substantial part of knowledge in social sciences is based on case studies (Benbasat, Goldstein and Mead,1987; Flyvbjerg, 2006; Lee and Hubona, 2009; Walsham, 2006; Yin, 2003). I will first reflect upon the presentation of empirical evidence and the kind of contributions offered in terms of selected criteria, and then discuss the manner in which I have distinguished the study from social constructivism and traditional commercial media.

9.2.1 The presentation of empirical evidence

In the context of the current research design, the role of the analytical narrative is not to logically prove the findings but to work through the empirical material in order to construct a credible argument. I have thus made a selective use of excerpts from the empirical evidence to illustrate the retroductive reasoning process. However, the research site is a private commercial setting, which puts certain limitations on how the collected material can be presented for the reader. Finding a balance between an analytically rigorous presentation and not risking the relationship with the informants caused a quite bit of anxiety during the analytical writing process. In the research contract the informants were granted the right to check the use of empirical material in the analysis to ensure that no confidential material ends up in published work. I have therefore circulated Chapters 5, 7 and 8 among my contact persons at the research site, who came up with very few changes

to the text. A bigger problem may thus have been a sort of self-censorship in the form of leaving out details that I thought might not have passed the check. Even if I may have occasionally erred on the side of unnecessarily leaving out material from the presentation, the study has nevertheless benefited considerably from the relatively unhindered access to a private commercial setting.

9.2.2 The quality of theoretical constructs

The most common approach to assessing the quality of empirical research revolves undoubtedly on the reliability and validity of results. The two criteria that derive largely from the context of quantitative testing of empirical hypotheses have also been appropriated for case studies. Reliability is concerned with the implementation of research procedures in a manner that is free from random errors and systematic biases. The problem of reliability is often stated in the form of question: If another researcher followed the same procedures, would he arrive at the same results? The criterion makes sense in a theory-testing type research, while in the context of theory building the debate is often fundamentally about the right procedures and approaches, not just how they are applied.

Validity can be understood to include a number of aspects. Yin (2003) discusses construct validity, internal validity, external validity and reliability as the criteria for judging research designs and findings. Construct validity is about demonstrating "that the selected measures […] do indeed reflect the specific types of change that have been selected" for analysis (Yin, 2003, p. 35). Internal validity is concerned with the risk of misattributed or spurious causal relationship, and dealing with possible rival explanations. External validity refers to the problem of what kind of generalizations can be made on the basis of findings. Lee and Hubona (2009) suggest formative and summative validity as the criteria for assessing the quality of research aiming at the development of theoretical knowledge. Formative validity concerns the quality of the theory building process, while the theory accumulates summative validity by surviving repeated empirical testing. The latter idea thus comes close to the replication logic underpinning external validity according to Yin (2003). Given the theory-driven nature of this study, I find the pair suggested by Lee

and Hubona (2009) more useful in assessing the validity of results. Also, the authors subscribe to the idea of falsifiability of scientific knowledge and view the evolution of theoretical knowledge as a process that necessarily transcends individual studies. No individual study can ultimately prove a theoretical construct, but they can repeatedly fail to refute it. How does the study live up to the criteria of formative and summative validity?

In terms of formative validity, I have tried to make the research process and assumptions behind the analytical narrative explicit. Although it is not possible to provide a complete account of the process, the reader should have a reasonable opportunity to follow my reasoning and the use of evidence toward the results. In terms of summative validity, I have identified the comprehensiveness, openness and granularity as distinct qualities of computational data in manufacturing the mobile advertising audience. First, the study demonstrated empirically the effects of granularity theorized by Kallinikos (2006), Kallinikos, Aaltonen and Marton (2010) and Faulkner and Runde (2010). Aaltonen and Lanzara (2010; 2011) identify the granularity of digital objects in another empirical setting. Taken together, these studies suggest a degree of summative validity to the concept of granularity.

Second, the implications of the open-ended nature of computational data were already observed by Zuboff (1988) in her remarks that new organizational purposes could be imposed on the data that was originally collected for another purpose. Weinberger (2007) discusses the shift from recording things into a fixed order to dynamically creating variable orderings at the time when digital records are used. Perhaps no straightforward replication can be claimed here, but the digital data generated by computational systems would seem to lend itself to unexpected purposes and operations beyond those envisioned at the time of recording. Third, the implications of the shift from sample-based measurement to the comprehensive computational data remain an intriguing proposition at this point. It would be useful to study a similar transition in another setting.

Finally, the critical realist underpinnings of the study call for empirical falsifiability and putting forward alternative hypotheses to test the validity of theoretical

constructs. It is thus worth asking if the association between the theoretical constructs and the empirical findings is in principle falsifiable, and if one could put forward an alternative hypothesis that would account for the empirical findings.

In terms of falsifiability, Table 8 (section 7.4.2) and Table 9 (section 8.4.2) summarize the empirical findings of the study, and attacking comprehensively the associations with the computational data suggested in these tables would make it possible to refute the claims I have made. I have specifically argued that, against a relevant industrial context, certain computational characteristics of measurement data account for the conditions of possibility with respect to how the audiencemaking practices were enacted. If one could show that a reasonably similar audiencemaking business exists without the presence of computational data, this would cast doubt on the findings of my study. An appropriate research design for this purpose would be for instance a multiple case study comparing another case of digital audiencemaking with a more traditional media organization along the dimensions identified in this study. This would increase the summative validity of my findings assuming they would survive the test, that is, not end up falsified despite repeated efforts.

A possible alternative hypothesis inspired by a social constructivist position would be that the computational data has no serious influence on the audiencemaking practices and, thus, on the kind of audience that is fabricated by the company. One could try to understand audience construction at the research site exclusively in terms of human interpretation and meaning making, driven by the interest to sell advertising space or, more generally, to expand the domain of capitalistic exploitation. The response rate and other behavioural characteristics of the audience product would then be primarily understood as choices made by the actors, not as something that are made possible and conditioned by the computational environment. Indeed, the study identified a number of interpretive practices such team reporting and public relations that are involved in constructing the new advertising audience. However, if we take a closer look at some of those practices, we also see how such an explanation would leave a number of things unexplained. To begin with, Chapter 2 discussed the historical co-evolution of measurement

arrangements and forms of commercial media. While such covariation does not necessarily imply a causal relationship, the historical setting certainly suggests some sort of association between the two. But could it be that the key metrics and measurements along them were simply socially constructed to come up with a new kind of business?

At the research site, the public relations function did not invent the stories about the company and its audience, but was found to rely on events taking place in the organization in order to have something to say for the industry. I have argued that some of these events and their attributes can be best understood by reference to the underlying computational infrastructure. Importantly, the temporal sequence from computational conditioning to interpretive practices was often clear. The generic format of data tokens and their comprehensive, open and granular characteristics were attributes of the environment in which the company was born rather than explicit decisions by the company. One might perhaps try to argue that it was the company and its employees who essentially enacted those attributes such as the comprehensiveness of the data by choosing not to base audiencemaking practices on samples. The latter option would have indeed been possible, yet the choice itself between the two options was practically conceivable only in the computational network environment. The default option can also be understood to change from having no other option than using the best available sample in traditional audience measurement to the new environment in which limiting measurement to samples would have required an explicit decision to discard some of the extant data.

The influence of computational data on audiencemaking practices was also manifested by its occasional absence. The resulting lack of technological information against a routine expectation of being informed by the computational data would have not caused feelings of deprivation and anxiety if it had not made any difference in audiencemaking practices. Direct and immediate feedback from organizational interventions to the member base was found to result in employees expecting unexpected reactions and thus treating the audience member as an interactive entity in audiencemaking practices. The interactive audience had to be managed so that it maintained pertinent behaviour seen through quantitative

measures based on computational data. None of these remarks deny the interpretive dimension of organizational practices, but with respect to the aims of this study, the alternative hypothesis falls short on explaining a number of important issues.

9.2.3 The idea of traditional media

This study has used the epithet *traditional* somewhat loosely to lump together commercial media underpinned by second-order measurement arrangements to sample people's media consumption. The purpose of this approach has been to make the specific morphogenetic changes in the case stand out against morphostatic continuities (Runde, Jones, Munir and Nikolychuk, 2009), that is, for the sake of argumentative clarity. The unfortunate downside is that it does not obviously do justice to the diversity subsumed under the label and can be perceived to suggest a categorical difference between the computational commercial media and other forms of advertising. In other words, the traditional media is not assumed to be a homogenous entity, but a category constructed along the dimensions defined by and for the current case analysis. As I already pointed out, these dimensions relate to the kind of measurement available for the audiencemaking practices.

Traditional audience measurement has evolved over the years into a highly sophisticated system based on technologically advanced metering devices and elaborate methodological arrangements. Using contemporary information and communication technologies, the measurement companies can for instance deliver the ratings results to their subscribers on the next day and harness cheap software applications to conduct huge panel studies on internet usage. In this respect, the new technology also supports the morphostatic aspects of commercial media business – novel technological artefacts can often be conservative in their effects (Aaltonen, 2005, p. 138). However, at the same time it is clear that the case represents a distinct approach to audience measurement. While the traditional measurement approach sets up feedback loops through reactive changes to the content programming, the computational measurement takes place in the same system where the advertising operations are planned constructing the individual audience members as interactive entities. However large the samples acquired by panel studies, they do not provide

the comprehensive data underpinning the interactive character of digital advertising audience reported in this study.

9.2.4 Critical realism versus the varieties of constructivism

Throughout the study I have been somewhat critical of the social constructivist position as well as the ANT/sociomaterial approach. This is mainly for three reasons. First, the critical realist position adopted in this study can be understood to share a number of epistemological assumptions with the aforementioned broadly constructivist approaches (Outhwaite, 1998; Walsham. 2006). The approaches are not strictly compatible with critical realism (Archer, 1998) but share enough common ground to make fruitful comparisons and disagreements possible. Second, by choosing a well-known and highly developed tradition in the IS field as the target I have been able to clarify my own position and to hopefully communicate it to the reader. In this task I have been inspired by the constructive confrontations between the positions found for instance in Kling (1992), Schmidt (1999), and Faulkner and Runde (2010). After all, there may be little point in trying to resolve the differences between the approaches as they support each other by offering useful counter-positions to each other. Third, I have been inspired by ANT in my earlier work (Aaltonen, 2005; 2006).

I put the critical realist approach forward as an alternative to the increasingly popular sociomaterial perspective that is inspired in certain key respects by ANT. Both sociomateriality and ANT put the idea of relational ontology at the centre of empirical analysis and suggest establishing the boundaries of a case endogenuously by following the distinctions made by the actors. I have been at pains to show that despite the insightfulness of such a position, it would have not served the aims of the current study. One benefit of choosing between more than one seemingly viable alternative is that it can increase methodological awareness in the research process[41]. For instance, it became clear how the approaches incorporate different ideas on how the unit of analysis takes shape (see Table 2 in section 6.2.1). In the tradition deriving from the ANT the researcher is supposed to follow how the various kinds

[41] To resort to an old cliché, if all you have is a hammer, everything looks like a nail.

of actors define their relevant others, while the critical realist perspective allows the researcher to carve the case out of empirical evidence with a theoretical purpose in mind. All in all, my primary purpose has not been to criticize the ANT/sociomaterial approach but to clarify the position adopted for this study.

9.3 Conclusions

In this study I have explored the making of a new kind of advertising audience out of digital behavioural traces left behind by the mobile phone users in the computational network environment. Taking the business model of commercial media as the starting point, I have sought to answer this question from three different angles that emerged during the research process. The study identified measurement as a constitutive operation in audiencemaking and analysed the implications of digital data emanating from the network infrastructure on key organizational practices. More specifically, I have discussed three historically novel attributes of computational data and juxtaposed these with four kinds of analytical operations to uncover rules of computational mediation at the research site. The implications of this analytical infrastructure were then reflected upon three sets of key organizational practices. The analysis revealed an inherently interactive nature of audience resulting from the direct and immediate behavioural feedback in the audiencemaking cycle. Finally, in this chapter I have elaborated the empirical findings into contributions toward innovating new digital services, IS theory and the study of media audiences.

One could ask whether the developments in the computational media environment are desirable and if they are associated with new kinds of risks. These are important but at the same time broad questions that cannot be tackled here. However, I will provide few pointers to discussions that may find this study relevant. First, from purely economic perspective, the possibility to monitor and thus to condition increasingly microscopic behaviour by contractual means should, in principle, promote efficiency and optimal allocation of resources. Any such gain may, however, in practice be offset by a number of social repercussions from the increasing intensity of advertising and by factors such as the double bind of

audience information. More interestingly, the case could also be understood in terms of expanding the scope for the econometric modelling of human behaviour. Since data-based information is all that exists from the perspective of statistical models, the evolution of audience measurement arrangements effectively brings new things and events into the domain of modelling.

Second, as I have already briefly noted, there are obvious risks related to the privacy and use of personal information. To me it seems that the discussion on normative and moral issues needs to be informed by practical considerations, that is, broad understanding of the computational network environment. On the one hand, it would be difficult to prohibit the automatic recording of behavioural traces, since this could easily cripple the network infrastructure itself. Furthermore, the data tokens emanating from the infrastructure are only potentially informative. Extracting any useful information out of them may require considerable up front investments, skills and effort effectively moderate potential risks to a degree. On the other hand, for Foucault the relationship with the audience members in the case would undoubtedly resemble a disciplinary institution that "secreted a machinery of control that functioned like a microscope of conduct; the fine, analytical divisions that they created formed around men an apparatus of observation, recording and training" (Foucault, 1984, p. 191). It is not necessarily any intentional harm or a particular malicious activity that represents the biggest risk from the increasingly pervasive tracking of human behaviour, but the all-embracing embedding of human relations and activity into matrixes driven by efficiency considerations.

Third, people processing organizations depend usually on classificatory arrangements that may become in the new environment more interactive in respect to the people they are supposed to describe, while at the same time companies serving huge online populations can have remarkably few employees. Traditional brick and mortar companies often need tens or even hundreds of thousands of employees to serve large consumer populations, whereas companies such as Facebook and Skype deal with hundreds of millions of users by employing only a few thousand people. The computational network environment would therefore seem to enable the simultaneous distancing of a consumer business from consumers

and capturing the consumer as an interactive entity. Phenomena such as user-led innovation, user-generated content and user-driven generativity are often understood to mean companies becoming more open and getting closer to the consumers, but indeed from this perspective they can also be seen as reactions to the progressive distancing of organizational practices from the consumers. Indeed, the organizational implications of new technologies have often been found to be contradictory (Robey and Boudreau, 1999).

Finally, organizations are today bracing themselves for the post-PC era when computing is not tied in any essential sense to discrete software/hardware artefacts anymore, but takes place in the cloud (Armbrust, et al., 2010; Hayes, 2008; Mathiassen and Sørensen, 2008; Ozzie, 2010; Tilson, Lyytinen and Sørensen, 2010; Vouk, 2008; Yoo, 2010). In order to remain relevant for organizations and management theory, the field of IS needs to come up with theories and concepts to understand services, data and content that are agnostic to particular devices, information systems or even infrastructures. In this study I focused on the digital data emanating from the common network infrastructure and constructed an analytical narrative on the audiencemaking business around its prominent computational attributes. The data tokens made it possible to know a new kind of audience by virtue of microscopic behavioural distinctions captured by the tokens. However, these distinctions were too granular to be meaningful by themselves, and the business was being built by extracting valuable information out of the potential embedded in the data. The question was never what does the new kind of data represent but what can be done with it.

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27 February 2009

Research project introduction

Dear recipient, I have agreed with Company to participate in some Company projects at the office for three months approximately three days a week. I will be mainly assisting Members and Brand Office teams in the development of new partnership model while collecting data for my PhD thesis for the Department of Management at the London School of Economics and Political Science (LSE). Company will not pay me a salary or any other compensation.

The data collection focuses on the coordination and organization of work in a fast moving, distributed and mobile work environment. The current phase in the evolution of Company offers an excellent opportunity for the study and I am thrilled to participate in Company projects. The research practice will run on a side of my day-to-day tasks causing as little disruption as possible to you at the office. I have an agreement with Company where confidentiality matters etc. are properly covered.

The data collection is based on multiple methods:

- Interviews: The maximum length and a convenient time of each session will be agreed individually.
- Observations: I am writing down my observations at the office.
- Document analysis: In order to enrich the interview and observational data I will contrast it with relevant documents.
- Photographs and recording: There may be certain occasions I would like document using audiovisual recording equipment.

The research is conducted according to LSE Research Ethics Policy. This means, in short:

- Participation in the interviews is voluntary and you may withdraw at any time. The interview recordings, transcripts, observation notes and other original data will be stored securely and will be accessible only by the researcher.
- Any excerpts used in publications will be anonymized and go through fact-checking procedure. Note, however, that due to the small size of the sample it may not be possible to guarantee unqualified anonymity. We have agreed on a simple clearance process with Company representative in order to ensure that no business secrets end up in research publications.
- For the comprehensive description of the Policy, see LSE website (http://www.lse.ac.uk/collections/researchAndProjectDevelopmentDivision/research_ethics_policy.htm) or a post at my research blog (http://www.alexicon.info/my-research-ethics)

If you have any questions or comments, please do not hesitate to contact me. As a part of the arrangement I will also present my findings at Company.

Yours sincerely,

Aleksi Aaltonen

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Appendix 2

The list of interviews

The interviews covered the whole head office staff except for three employees. Some of the key informants were interviewed twice to follow up and explore emerging research themes further. The informant code is used to refer to the informant in the material excerpts except for the people who were not interviewed (X1, X2, X3 used instead).

Date	Code	Job title
20.2.2009	BMMA	Business Manager, Member Acquisition
24.2.2009	MCM	Member Care Manager
25.2.2009	AA	Architect, Advertising
6.3.2009	AB	Architect, Browsing
9.3.2009	UED	User Experience, Director
9.3.2009	BRM	Brand Manager
10.3.2009	QAM	QA Manager
17.3.2009	SM	Service Manager
17.3.2009	HSA	Head of Security and IP Architect
18.3.2009	COO	Chief Operating Officer
19.3.2009	TSM	Technical Support Manager
19.3.2009	SSE	Senior Software Engineer
23.3.2009	BMA	Business Manager, Advertising
25.3.2009	HCPR	Head of Communications and PR
25.3.2009	BM	Business Manager
25.3.2009	HMO	Head of Member Operations
26.3.2009	HT	Head of Technology
7.4.2009	FD	Finance Director
15.4.2009	AS	Assistant
27.4.2009	HLPC	Head of Legal, People and Culture
27.4.2009	HRM	Human Resource Manager (external consultant)
5.5.2009	HSBD	Head of Strategy and Business Development
6.5.2009	CEO	Chief Executive Officer
8.5.2009	AS	Assistant (second interview)
12.5.2009	CEO	Chief Executive Officer
12.5.2009	QAM	QA Manager (second interview)
12.5.2009	HO	Head of Operations
13.5.2009	BMA	Business Manager, Advertising (second interview)
13.5.2009	AA	Architect, Advertising (second interview)
13.5.2009	CFO	Chief Financial Officer
14.5.2009	MCM	Member Care Manager (second interview)
14.5.2009	BRM	Brand Manager (second interview)
15.5.2009	BMMA	Business Manager, Member Acquisition (second interview)
16.9.2009	HBD	Head of Brand and Design

Appendix 3

Original Finnish excerpts from the empirical evidence

The full list of informant codes can be found from Appendix 2.

Section 5.4

Interview with User Experience Director (UED) on 9 March 2009

UED: …vaikea sanoa onko [yritys] olemassa [sijainti] puolen vuoden päästä.

Researcher: Niin ainakaan kuluttajabrändinä.

UED: Kyllä tämä on sillä tavalla sekä hyvässä että huonossa että ei ole tylsää [nauraa] […] Muutos on ainoa pysyvä ja tässä markkinatilanteessa tietenkin tällä pienellä ja aika riskialttiilla organisaatiolla pitää olla valmis myös muuttumaan tosi nopeesti. Semmonen ihmistyyppi joka ei sitten sopeudu tai pitää sitä ihan mielettömän stressaavana niin ei pystyisi varmaankaan olemaan täällä.

Section 6.3

Observation log entry on 4 March 2009 at 17:00

MCM kysyy tutkimuksesta ja kerron olevani kiinnostunut työn koordinoinnista monimutkaisessa tilanteessa. Samalla kun pitäisi pyörittää liiketoimintaa niin pitäisi kehittää kokonaan uusi liiketoimintamalli. Puhumme siitä miten työ on paljolti ruudulla ja datana. MCM sanoo HBD pohtineen, että itse asiassa toimistolla saatetaan olla lähempänä asiakasta kuin paikallisessa myyntitoimistossa. […] Toimistolla seurataan raportointia ja kirjoittelua blogeissa ja foorumeilla. Se kenellä on näkyvyys näihin on lähimpänä asiakasta. […] MCM sanoo: ”Asiakkaat ovat datassa.”

Section 7.1

Observation log entry on 24 March 2009 at 16:15

MCM puhuu puhelimessa erilaisista member-raportointimalleista. Nyt on kolme tasoa: ad-hoc, raportointityökalu, täysin automatisoitu. Puhuu myös membereiden profiloinnista eri maihin. MCM sanoo, että tavallinen operaattori ei välitä onko asiakas pois pari viikkoa verkosta, onko settingsit kunnossa, onko

oikeanlainen puhelin. Menetetään revenueta, mutta ei aiheuta kuluja. Ei yritetä aktivoida. Meillä taas asiakkaat ovat yleisö, johon pitäisi olla yhteys. MCM pohtii, voisiko tämä olla operaattorille kiinnostava malli myös ilman mainontaa [kasvattaisi verkon ja palveluiden käyttöä].

Section 7.3.1

Interview with Business Manager, Advertising (BMA) on 13 May 2009

BMA: Meidän formaatti on niinkuin todella hyvä. Siis siinä on hiomista paljon mutta se formaatti on hyvä. Ja se response rate ja kaikki se mitä me saadaan aikaiseksi: web-liikenteen lisäykset, kuponkien lunastukset määrät ja se ROI [Return On Investment] oikestaan mihin se kulminoituu.

Section 7.3.2

Interview with Quality Assurance Manager (QAM) on 10 March 2009

Researcher: Kenellä sinun mielestäsi sitten on paras näkyvyys tai käsitys siitä miten tuo memberbase toimii ja käyttäytyy? Missä se syntyy?

QAM: Aika vaikea kysymys. Minä luulisin että todennäköisesti MCM:lla ja BMMA:lla. Pitäisi olla [paikallisessa myyntitoimistossa] mutta minä luulen että tota noin se on kuitenkin valtaosaltaan täällä.

Section 7.3.2

Interview with Business Manager, Advertising (BMA) on 13 May 2009

Researcher: Seuraatko sinä itse jotain raportteja toiminnasta aktiivisesti tai tuotatko sinä niitä?

BMA: Minä tuotan ja seuraan. Katson kyllä noin päivittäin. Katsoin jossain vaiheessa niitä päivittäisraportteja mitä tulee sinne edelleenkin, koska ne ovat hyvää vertailua. Tai sitten katson meidän mainosraportoinnista viimeiset pari päivää. En välttämättä ihan joka päivä mutta monta kertaa viikossa.

Researcher: Että sinulla on tuntuma siitä mitä siellä tapahtuu?

BMA: Joo […] tietenkin siinä on myös se että toimiiko asiat on tärkeä tietää. Ja mitä asioita on ajateltu ja kaikkea muuta. […] Siitä saa hyvän touchin ja sitten se touchi on myös siitä mitä se porukka vastailee siellä.

Section 7.3.3

Observation log entry on 18 February 2009 at 11:29

X1 tulee [pöytäämme] kysymään miten ensi viikolla toimitaan, kun täytyy tilaajakuntaan halutaan kohdistaa laajamittainen toimenpide. MCM ja BMMA toteavat että toimenpide kannattaisi aloittaa nyt, koska ensi viikolla voi olla liian myöhäistä. […] Kaveri kysyy mitkä käyttäjät deletoidaan. […] MCM pohtii mikä on moraalisesti arveluttavaa ja mikä ei. Hän viittaa taas kahvipöytäkeskusteluun, jossa on päätetty, että raportointia ei päivitetä. Nyt ei ole kunnon tietoa toiminnan pohjalle.

Section 7.3.3

Interview with Head of Brand and Design (HBD) team on 16 September 2009

Researcher: Kuka sen raportin [member-hankinnasta] kokosi tai miten se koottiin?

HBD: X2:llä oli yksi kaveri [maatoimistossa] joka veti yhteen ne numerot. Ja tuolla Operationsissa vedettiin yhteen jotkut toiset luvut ja sieltä se kasattiin. […] Minä olin ehkä lähtökohtaisesti välillä skeptinen. Meillä oli sellaisia papereita, joissa oli 20 KPI:tä [key performance indicator]. Kaikkiin niihin sanoin silloin X3:lle ja CEO:lle, että tämä on liian monimutkaista. […] Minä itse asiassa loin siitä monimutkaisesta sen jälkeenkin siihen Exceliin ne luvut itselleni, jotta mä pystyin seuraamaan verrattuna siihen aikaisempaan.

Section 8.3.2

Interview with Member Care Manager (MCM) on 14 May 2009

Researcher: Onko sillä [Member experience reporting -työkalu] mitään roolia tässä uudessa partnerimallissa?

MCM: No se on kysymysmerkki. Jos kysyt minun mielipidettä, niin minun mielipide on se, että tätä bisnestä ei pysty ajamaan millään setupilla ilman näkyvyyttä ja ymmärrystä ja raportointia.

Section 8.3.3

Interview with Head of Brand and Design (HBD) team on 16 September 2009

HBD: Jos se ei ole yhden yrityksen ostama kampanja tai sanotaan että se on jonkun julkishallinnon [organisaation kampanja]. Ne haluaa että se tulos tulee julki. Niin nämähän voisi tulla verkkoon melkein reaaliajassa, mikä aiheuttaisi paljon enemmän näkyvyyttä, pöhinää, hakukoneoptimointia. Näkyisi ikäänkuin että tämä on nuorison vastausten pulssi. […] sellainen reaaliaikainen verkkoon laittaminen siitä mitä verkossa tapahtuu, se näyttäisi että tämä media on olemassa koska muuten se on lähes näkymätön…

Appendix 4

Coding scheme used for the theoretical coding of observations

The table below describes the coding scheme used to map the fieldwork observations to the theoretical framework and to the company business model. Some of the codes such as *Skype* and *employee presence* are reminiscent of the initial, somewhat broader analytical focus that became narrowed down during the fieldwork. *n* is the number of episodes assigned with the code.

Code	n	Description
Advertising	46	Advertising formats and individual campaigns sold to the advertisers
Audience	59	The audience as the sellable asset of the company
Business development	231	Actions and talk about the new way of executing the business model by partnering with traditional telecommunications operators
Consumer behaviour	38	Consumer behaviour reflecting back to the organization
Coordination	164	The management of interdependencies between work tasks performed by different subcontractors, organizational units, teams and individuals
Current subscriber offering	95	The service the company currently offers to the mobile network subscribers in exchange for receiving advertisements in their mobile phones
Decisionmaking	43	The instances of decision making and talk about decisions
Employee presence	122	Incidents related to the employee presence/absence either physically or via computer-mediated communication
Miscellaneous	66	Miscellaneous but potentially relevant observations
Public relations	89	Communication about the company and its products to the various external stakeholder groups
Records	55	Indirect and direct references to Call Detail Records and other logging data about the operational environment
Reflections on methodology	24	Remarks about the ongoing execution of the study
Reorganization	100	The reorganization of the company toward the new way of doing business
Reporting systems and practices	186	The systems and practices for gathering, aggregating, analysing and communicating data about the operations and the environment of the organization
Skype	31	The instances of Skype software usage
Team structure	25	Observations on the organizational structure
Temporal structure of work	148	Observations on temporally structured phenomena

13.5.2009

Company fieldwork spring 2009 interview

Before starting the interview explain the interview procedure and ethical considerations verbally, and give the fact sheet where the matters are stated.

Time and place

13.5.2009 15:00–15:45
[Company address]

Informant background information

Name: [Informant name] ([Code])
Notes: This is a follow-up interview.

Organization

1. Are you now busy?

2. What are we selling to operators and advertisers in the new partnership model? I.e. what is valuable in Company?

    a. Follow-up question: *What is audience? How does it come into existence?*

3. What is the biggest coordination challenge at the moment?

    a. Follow up question: *Why didn't we use Wiki to draft the contract documentation?*

Reports

3. What are the reports you use in your everyday work?

    a. Follow-up question: *Do you create any reports yourself?*

4. What is the role of ad reporting in the new partnership model?