

2014

PERFORMATIVE IS RESEARCH – SCIENCE PRECISION VERSUS PRACTICE RELEVANCE

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Recommended Citation

Carlsson, Christer and Walden, Pirkko, "PERFORMATIVE IS RESEARCH – SCIENCE PRECISION VERSUS PRACTICE RELEVANCE" (2014). *PACIS 2014 Proceedings*. 246.

<http://aisel.aisnet.org/pacis2014/246>

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PERFORMATIVE IS RESEARCH – SCIENCE PRECISION VERSUS PRACTICE RELEVANCE

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Abstract

In IS research we live with positivistic roots which have recently been criticized as focused on “singular, independently existing reality that is more or less given, and undergoing linear changes within a four-dimensional space”. This is what we according to prevailing norms need to do in order to get valid research results in empirically oriented IS research. In contrast with that, IS research in the 21st century will have to deal with “inherently uncertain, distributed, complex and multiple reality, hyper-connectivity, increasing speed of all processes, nonlinear and global changes”? We will use the arena for mobile value services as the context for working out what is required of performative IS research and to find out if science precision and practice relevance can both be met in the new paradigm.

Keywords: Performative IS research, mobile value services, action design research.

1 INTRODUCTION

The creation of mobile technology started to gain momentum in the early 1990's and the further development of it and implementation as mobile services became one of the revolutionary driving forces of the 2000's and 2010's with a profound impact on our everyday lives, on the information and communication infrastructures of business, industry and society. Many of the phenomena that appear to be driving the development of mobile technology and services are still not well understood as most of the methods we have learned to use in order to carry out valid research on technology acceptance and the development and use of mobile services appear to fall short in providing any sufficient explanations for the driving forces behind the introduction, penetration and acceptance of mobile technology. Attempts have been made at predicting the appearance and acceptance of so-called mobile “killer applications” which were expected to quickly and totally swamp large groups of consumers as “must” services; the proposal was that by identifying the drivers of these applications, we could collect empirical evidence of these drivers and then figure out the penetration rate and demand for the application [and the first-movers on the “killer application” could quickly earn some billion euros in revenue]. This proposal has not worked out as most predictions have been wrong on almost all aspects of mobile applications: what applications will become market winners, how large the penetration ratio is going to be, when the penetration will reach critical mass and what the demand is going to be. In most cases there has not been any idea what a viable business model should be in order to drive and support the market penetration process.

The eBled conferences hosted some of the early studies of applications of mobile technology and the development and implementation of mobile services. A study [*From MCOM Visions to Mobile Value Services*] was carried out as part of the eBled 25th Anniversary review and traced the development of the key proposals and results of the research on mobile technology applications. As the space is limited we will use this study as our context and background and draw upon the results which have been reported; the alternative would have been to carry out a state-of-the-art on mobile technology and mobile value services – this would take too much space to be relevant for the purposes we have with this paper.

The proposal we want to study is twofold: (i) acceptance of mobile technology and the development and implementation of mobile services could in principle be studied with Information Systems [IS] research methodology, but (ii) IS research methodology is becoming obsolete for the context in which mobile technology and services should be studied. If we can find evidence of both (i) and (ii) we have a basis for proposing new and better ways to study and understand the forming of mobile value services and the acceptance and market penetration of them.

We will have a quick look at mobile value services. It was early on recognized that the search for “killer applications” was misdirected, that mobile services that could build sustainable demand could not be identified in this way. Some consensus was formed in 2008 around the insight that the point missed is how to create and implement user value. Some good answers and some indications of the road ahead were formulated by Peter Keen in his keynote at the HICSS-38 conference (in 2005). Keen’s starting points (which are still valid after almost 10 years): (i) experts overrate data services as a natural driver of demand; (ii) for consumers, flexibility – freedom of location and access – is key (hence the wifi explosion); (iii) “knowledge” is a matter of conversation, not information – part of PCCI (Personal Consumer Communications Industry); chat rooms made AOL, SMS was the unplanned killer app, WAP was a disappointment; (iv) the mobile industry has wasted well over \$1 trillion in the search for business models for data services - these amounted (in 2008) to 2-3% of revenues, but messaging represented 10-15%. Keen actually pointed to the fact that the understanding of the business context and the business models had gone wrong; the “mobile commerce” is not a quick fix of e-commerce products and services run on mobile phones, it is a totally new industry with new business logic and new requirements. The IS research methodology we were using was leading us astray and we did not get the answers we needed and expected to get.

In a panel discussion at the eBled 2008 conference it was attempted to find an outline of what should be understood with mobile value services (MVS): (i) MVS will be part of and an implementation of the value web models; (ii) MVS will be generic, modular designs that will support and be part of web community services; (iii) MVS will implement the Braudel Rule [*“freedom becomes value when it expands the limits of the possible in the structure of everyday life routines”* – Peter Keen]; (iv) MVS will be key drivers in the forming of community services. The mobile value services were seen as important in 2008 as they would be a roadmap for both mobile data services (a key focus area for the mobile network operators) and web community services, which both were seen as potentially very large and revenue generating markets.

The conceptual frameworks through which we tried to understand the forming of markets for mobile technology and services are diverse and not very consistent which is explained with the fact that research groups of different backgrounds from many different countries with access to different types of consumer markets have been working out their understanding of the market drivers and mechanisms they have been observing.

On the other hand, the IS research paradigm is not exactly consistent; we have many different methodologies that have been applied and used over the years and it is often surprising to see that studies of [in principle] the same phenomena sometimes give very different results. IS research has been described as progressing in four eras (Hirschheim and Klein (2012)) which roughly coincide with the 1970s, the 1980s, the 1990s and the 2000s and the progress in computational technology. Using quick and sketchy descriptions IS research methodology has progressed to support the design, development and implementation of information systems through,

- Methods to find the real value of information systems for management; design of human-computer interaction for efficient decision support systems; algorithms for effective decision support systems to enhance productivity in planning, problem-solving and decision making [1970s].
- Methodology used to define the IS field [positivism, systems science]; IS as drivers of competitive advantage; the notion of socio-technical systems and participative design to capture the needs of potential users [1980s].
- Methodology to evaluate IT productivity and economic performance and IT/IS value for various user categories; technology acceptance models to find organisational impact of IS; business process reengineering through IT and the process view of IS implementation [1990s].
- Methodology built on design science and the trade-off between rigour and relevance; the mobile technology impact on the socio-technical system and the development of action design research; knowledge management and knowledge mobilisation [2000s].

The development of IS research methodology has progressed without any significant scientific revolutions [in the Kuhn sense] as there was an established tradition of gradual improvement of methods and a gradual and conservative adaptation to the development of information and computational technology. Nevertheless, at ICIS 2013 in a panel discussion [chaired by Doug Vogel] Dubravka Cecez-Kecmanovic proposed that the IS research methods we use are inadequate as they represent a 19th century research philosophy that we try to apply for 21st century challenges. The shocking news is not that she said it but that she probably is right, and that the suspicions we have had about the relevance of the research methodology for mobile technology and services got some confirmation.

There are other signs that show the need for changes – IS research will have to meet the “big data” challenge and find ways to support management in filtering out relevant data, information and knowledge from huge sets of data produced with modern information technology and that threatens to overwhelm planning, problem solving and decision making routines. Analytics is another movement that is making inroads in management and is challenging IS research to provide guidelines on what is valid and verifiable results that could safely be used in and for management. Given both “big data” and “analytics” we get a further challenge: do we really know how to advise and support management in the new context that is formed by these two developments? The answer is that with IS research methodology – as claimed by Cecez-Kecmanovic – we do not.

In the following, in section 2, we will first give a brief summary of some key aspects of IS research methodology to be followed, in section 3, by another summary of mobile value services; the collected material will then be used to introduce the *performative IS research* as a new methodology in section 4, after which we will conclude with some discussion points and an outline of further research.

2 IS RESEARCH METHODOLOGY

If we continue using the quick sketches of the previous section we can see a development from positivism to design science in IS research methodology from 1970-1980 to 2000-2010. The diversity in IS research methodology can be explained with a number of reasons (Eriksson (2013)): (i) the diversity of problems assessed in a variety of organisations; (ii) the diversity of theory foundations and reference disciplines used as a function of (i); and (iii) the diversity in the use of methods to collect, analyse and interpret data.

Most IS researchers have backgrounds in other disciplines and have brought with them successful research methods to IS research; as a consequence we have the diversity Eriksson (2013) brought out. Another consequence is that researchers do not necessarily agree that we have a transition from positivism to design science, or – if that transition is taking place – that it should be supported. A final consequence is that we cannot just assume that we by moving towards design science will find better ways to study the forming of markets for mobile technology and services.

Positivism is traditionally understood to promote science precision by compromising on practical relevance; design science is described as bringing out practical relevance in theory constructs and – if necessary - compromising on science precision to get constructs that are useful for planning, problem

solving and decision making. This is - of course - an oversimplification, but we will find out if we can build a development of IS research methodology for our context on this difference in approach.

One of the problems we have to deal with is that positivism is not a single methodology and that it has changed shape and scope over time; if we state that IS research should follow a positivist methodology we are not exactly precise in that statement. Modern positivism was developed by Auguste Comte in the early 19th century; his key point was that all authentic knowledge allows verification and that all authentic knowledge assumes that the only valid knowledge is scientific. Verification should be carried out through empirical evidence. This rather strict way of carrying out research builds precision but will exclude constructs that do not allow empirical verification; rather quickly this became unacceptable for studies in social sciences as the strict verification required that research problems and objects of study were simplified to a stage where the answers and results became irrelevant for problems that had triggered the research.

Positivism in the social sciences [to which studies of markets for mobile technology and services belong] builds on quantitative methods (cf. section 3), but there have been strong arguments in the studies carried out in cultural anthropology that qualitative methods will give more insight. This trend has been taken up also in research on mobile value services. Contemporary social science has largely abandoned positivism (Gartell and Gartell (1996)) because of problems with observer bias, structural limitations of studies of important problems and the representativeness of data collected for verification. The criticism triggered defence movements among the positivists – which is typical in all paradigmatic struggles (cf. Kuhn) – and one of the results was that we now have at least twelve different epistemologies that are referred to as positivism. Another result was the movement called critical realism that was an attempt to build a common foundation for social sciences (Brooke (2009)) and that we will have a closer look at below.

In summary, for our purposes the main principles are (i) authentic knowledge allows verification, (ii) valid knowledge is scientific and (iii) verification should be carried out through empirical verification.

Action research has been one of the key directions of IS research for a couple of decades; action research is motivated by the need to get into the problems that should be solved with the development and implementation of information systems. The approach that has been worked out and refined over the years has IS researchers actively involved in the process, the researchers build a subjective understanding of what is needed and then help and support stakeholders in finding good solutions. The development work is often described as co-creative, i.e. the researchers and the stakeholders will jointly find IS designs by drawing upon their knowledge and experience. Intuitively this has much appeal for real-world problem solving – “find solutions that work and do not care too much about scientific precision, we can always find some (positivistic) principles to anchor our findings” – but the validation and verification remain subjective, i.e. we cannot be sure that the resulting IS constructs will work in other contexts and for other purposes.

Another approach to deal with practical problem solving and support of IS development and implementation is design science; this is fundamentally a problem solving paradigm with roots in engineering and science and is working out designs in order to find ways to tackle real-world problems. The designs build on an understanding of what is needed to deal with the problems; the design is both a process (a set of activities) and a product (called an artefact) and both can be validated and verified for being logically consistent and technically error-free. The artefact is understood in a broad sense as being products, (engineering, software, process, etc.) constructs, (process, structural, business, etc.) models, methods or even artificial instantiations of a theory, an ontology, etc. Design is to invent and to bring into being something that does not yet exist and that will solve or help solve problems we encounter. In our present context of study - the forming of markets for mobile technology and services – design science has a strong appeal. Mobile services are software constructs (artefacts) that we can (i) design and work out jointly with the coming users in co-creative processes; (ii) the artefacts can be validated and verified for design and construct errors, the usability of the artefacts can be tested and (iii) the functionality of the services can be worked out in the context and with the users for which

they were designed. Most of the results of (i)-(iii) can be generalised in the positivistic sense and the insight can be reused for other contexts and the development and implementation of other artefacts. The key problem with design science appears to be that the context for which mobile services should be designed and implemented is quickly turning much more dynamic and much more complex than we have foreseen; i.e. engineering-inspired methods are not adequate to handle the complexity.

Action design research (ADR) (Sein et al (2011)) found that design science is too technologically oriented and is not paying enough attention to the organisational context of the artefacts. Thus the main effort is on designing and building artefacts and the evaluation of them is carried out as a separate and subsequent process. It is claimed that this will promote technological rigour at the cost of organisational relevance and that it fails to account for the fact that the artefact designs emerges from an interaction with the organisational context. The ADR works with IT artefacts that are ensembles shaped by the organisational context both when designed and developed and also when used. The IS research process when guided by ADR allows the organisation to intervene in and concurrently evaluate the design and building of the artefact. This is, of course, an approach to deal with the dynamics and the complexity of the context that we found to be a problem for engineering-inspired methods. ADR intervenes in problem situations found in specific organizational settings and works out IS artefacts that help solve the problems, even if the setting is dynamic and complex. ADR works towards generic solutions by constructing and evaluating artefacts that address the class of problems than can be typified and generalised from the encountered situation. In this way it appears that ADR is a promising methodological framework for gaining an understanding of the forming of markets for mobile technology and services.

We pointed initially to the criticism that Dubrovka Cecez-Kecmanovic levelled at IS research methodology as being of 19th century vintage but trying to cope with 21st century problems. Cecez-Kecmanovic (cf. 2011) described our positivistic roots (cf. above) as focused on “(a) singular, independently existing reality that is more or less given, undergoing linear changes within a four-dimensional space” – this is what we need to do in order to get valid research results in empirically oriented IS research. In contrast with that, IS research in the 21st century will have to deal with “(an) inherently uncertain, distributed, complex and multiple reality, hyper-connectivity, increasing speed of all processes, nonlinear and global changes” – to which we need to add the growing “big data” challenges. If we rely on 19th century methodology we will develop solutions that either do not work properly or are solutions to problems that have already changed when we find the solutions. The 21st century context requires that we start to develop a performative IS research methodology that adapts to a dynamic, complex and hyper-connected context that keeps evolving as we work with it. This would be a key step as Cecez-Kecmanovic proposes that IS research is partially implicated into and to some degree creates IS practices and the socio-technical world(s) it studies. Cecez-Kecmanovic builds her discussion on a study of critical realism (cf. (2011)) that she applies to IS research; she cites Scherer (2009) in finding that (cf. (2011) p. 442) “the scientific method and positivist social science are, ..., fundamentally deficient as a model for social sciences primarily because they cannot explain the subjective, socially constructed and normative character of social phenomena.” She then finds support for her own constructs in Habermas’ theory of knowledge-constitutive interests. Her following discussion of philosophy goes well beyond any scope of this paper but we will pick up the idea of a performative IS research methodology and explore that further in section 4.

3 MOBILE VALUE SERVICES

Mobile technology has quickly become a global phenomenon on an unprecedented scale; we now have an estimate of 6.7-7.0 billion mobile phone connections in use. This means that the task to understand the forming of markets for mobile technology and services has become much more complex and is becoming more complex every year. In the early years it was possible to identify distinct user groups

and to work out what kind of mobile services would be useful for them – at least we believed that this was the case, and that we could use IS research methodology to find the services.

The eBled conference was the place where much of the early results on the adoption and use of mobile technology and services were reported. We will in the following briefly go through some of the highlights to show what the research results were and how the perceptions changed – with the benefit of historical hindsight it is easy to see that many of the ideas were wrong and the question is of course how our research methodology could lead us astray.

The first papers at eBled on mobile technology were at the 13th and 14th conferences in 2000 and 2001 but then there were 60 papers in the next 8 years, between 5 and 9 accepted each year after strict peer review. There were panels on mobile commerce (and mobile services) at the 15th – 19th and 21st-22nd eBled conferences where most of the new ideas were presented and sometimes hotly debated; a number of proposals for coming research projects were outlined and then pursued in several research groups throughout the EU.

In one of the first panels the quest for killer applications was found to be a quest in vain as no mobile service was evident that could have the impact of the SMS, the first and only killer application. Still there were numbers of consumer surveys in 2002-2003 trying to identify potential killer applications. There was a Wharton School report from the same year 2002: *“Wireless Dreaming: Is 3G Dead?”* (July 2002), which appears to state that 3G is only advertising hype for which there is no real need or demand: *“The idea of chatting, surfing the web, zipping snapshots of loved ones back and forth, and using the same phone in Bangkok, San Francisco and London is appealing. But whether this dream will become reality is largely unclear, say many experts at Wharton and elsewhere”*. The Wharton expertise builds on surveys in the US market, in which the penetration of modern mobile technology was relatively low in 2002. Then it was not surprising that some misconceptions were growing. The same mobile phone could be used in Bangkok and London (but not in San Francisco) as the standard chaos referred to was prevalent in the US market, but not so much elsewhere. Our own studies in Europe showed Carlsson and Walden 2002a, b) that chatting and surfing were not preferred uses of the mobile phones – the Wharton expert report claimed so in order to get something to shoot at. The zipping of snapshots from mobile phones (such as the Nokia 7650), which was being ridiculed, was becoming a hot application in Europe in the summer of 2002. In the work we were doing with mobile markets (Carlsson and Walden 2002a, b) it turned out that the “expert” reports published almost weekly on the Web were way off the mark in most of their “facts” and predictions.

An obvious step to gain understanding of what m-commerce services may be is to collect empirical evidence. Also obvious is to first ask the experts and to make sure that as many views as possible are represented. There were expert surveys in Finland, France, Germany, Hong Kong and Singapore in 2001-2002 in cooperation with our research partners; the experts were providers of i) m-commerce products and services, (ii) m-commerce infrastructures and (iii) consulting and financial services in m-commerce; the number of companies interviewed was 25-30 in each country. The experts were asked to evaluate a number of m-commerce services and the likelihood of achieving a satisfactory level of turnover within the next 18 months

The experts’ opinions from Singapore and Hong Kong showed that mobile shopping will have a high potential of success. The opinions differed quite a bit when compared with the Finnish experts but the reasons were not obvious and explanations were eventually built on cultural aspects. Communication applications like SMS were found to have a high potential of success, but there were differences between the expert opinions; the experts in Finland were more positive than their counterparts in Hong Kong and Singapore. The experts reported on their impressions of what consumers will do in the next 18 months and what mobile services will be in demand; these expert surveys were repeated another 2-3 years in several countries until it was found out that very few (or none) of the predictions were correct. The experts simply did not have any overview of what consumers needed; the positivism-inspired methodology was not useful.

If the experts cannot predict what their customers are going to build into a demand for mobile services then the obvious step is to ask the consumers. This was done with a random sample of 1300 consumers in Finland in 2002, the sample was selected to be representative of the Finnish population and the survey collected an answering rate of more than 50 % (a lottery with the most advanced Nokia phone as the prize activated the consumers). The questionnaire was built on the basis of the TAM (Davis (1998)) and simply tested what mobile services the consumers were using, if they intended to continue using them and what new mobile services they had tested and planned to continue using in the next year; the respondents were asked to report what phone they were using (we checked that they actually had the services available that they reported using). This way to collect empirical evidence is positivist and some of the criticism applies: (i) we have no control of who actually answered the questionnaire, (ii) we cannot be sure how the respondents understand the questions (the questionnaire was pre-tested rigorously to find any obvious problems) or that they are truthful in answering. On the other hand, the sample was proved to be representative and the large number of answers eliminated the influence of individual errors. The same study was repeated annually 2003-2012 and formed a large database that allows testing for longitudinal trends in the adoption and use of mobile services; the questionnaire was adopted for corresponding surveys in Greece, New Zealand and The Netherlands and cross-country comparisons could be carried out (cf. Carlsson and Walden 2012a).

It is obvious that we can claim that large consumer surveys when carried out with random sampling and with a relevant theory as background can give insight on what mobile services are used and what services will continue to be in demand. If we find similarities or differences between countries using the same method and the same instrument we can find explanations and form some (careful) generalisations. This is how we want to proceed in a positivist tradition. Nevertheless, it did not work out – it turned out that consumers truthfully reported what mobile services they were using (verified with the type of phone they were using) but the surprise was that they were using very few services. Another surprise was that after the generation shifts in mobile phones in 2005 and 2008 this did not change significantly – the consumers continued using the same services even if they had bought phones with the potential to use much more advanced services. A final problem was that their intention to use mobile services did not materialise – we checked year after year that there was no correlation between what they intended to use at year y_1 and what they actually used at year y_2 . Thus there is not a good basis for generalising predictions on what mobile services will be in demand – the answers all stakeholders are looking for in the mobile markets (cf. Sell et al 2012b).

In a panel at the 16th eBled Conference in 2003, the concept of “Mobile Life” was introduced as a metaphor for the penetration of mobile technology into our daily life and into our daily routines – much as Peter Keen had outlined in his vision of the *Freedom Economy* in 2001 (Keen-Mackintosh 2001). The global penetration of wireless phones was expected to grow to 1 billion by 2003 which would build a huge market for Internet business products and services, on a much larger scale than envisioned with e-commerce technology. In the 2003 vision mobile technology offered much more than e-commerce: mobile platforms built for personalised decision support at the point of decision, as support for problem-solving as problems appear, as platforms for mobile health care, as support environments for virtual teamwork, as personalised and interactive time management platforms, etc. This amounted to new and innovative ways to improve on and enhance the everyday routines invented to simplify and organize our daily lives. In this way, mobile technology was to impact our world in profound, new ways, which would have consequences for both business and society (cf. Anckar et al 2003).

Research in mobile life applications should (according to the 2003 panel) focus on (i) building and testing new, effective products & services, and (by critically evaluating results), (ii) finding generic products & services, which would both offer significant value added substance to the customers and means for companies to build a growing profitable business (cf. also Carlsson et al 2004, 2005, 2006). It was anticipated that there is not one customer group for mobile life applications but many different customer profiles, having their origins in different social and cultural backgrounds. They were seen to be reflected in particularities in the using behaviour, in the purchasing habits, in the need for support

and in the attitudes towards issues like privacy, security and trust. It was essential that such profiles be identified and acted upon by both the present and future mobile life applications.

These visions, formulated 10 years ago, are still largely valid today as they have remained visions; we are still working our way towards good tools and instruments for turning the visions into mobile value services. The way to work out knowledge we need to build services for “mobile life” was still very positivist oriented – the thinking was that we could find out the needs of the potential users by carefully constructed survey instruments and by studies of cleverly identified consumer segments.

At the 21st eBled conference in 2008, a panel was built to put focus on the many still unresolved problems with building user value as part of mobile service designs. The panel included academics, network operators and mobile technology developers.

The context outlined for the panel was built in the following way: *mobile value services are still an emerging network solution with formative solutions in unformed markets of global, gigantic reach; we still do not fully understand the driving forces, which are going to create commercially viable and user-valued products & services; we still do not have agreed standards for the infrastructure, neither for the support technologies needed to operate the emerging mobile business nor for the potential users to fully benefit from mobile services.*

The panel found the following factors at the core of applications built around mobile, wireless technology: (i) *mobility* - mobile phones are brought along as individual tools and instruments, which has changed the everyday routines of communicating; (ii) *availability* - mobile phones allow their users to be continuously connected, which has changed the communication infrastructure in significant ways; (iii) *ubiquity* - network interconnectivity and roaming agreements allow mobile communication anywhere and at any time; (iv) *value services* - mobile technology is a platform for services that expand the limits of the possible in the structure of everyday life routines. The key proposal was then that any mobile value service should show an evolutionary path of development from these four value-building features. The notion of *mobile value* services was created as the identifying concept for the type of services we had in mind. It was obvious then that finding and tracing an evolutionary path will require some other type of IS research methodology than the positivist, survey-based methods.

The work on finding mobile services that could build a sustainable demand continued in a number of research groups after the eBled conference. Problems that hamper progress were identified: (i) markets for mobile technology applications are described in theory; there is no real understanding of what they are in practice; (ii) common wisdom is often anchored in limited market surveys which find only specialized user groups; (iii) the infrastructure and business models for mobile services are only being formed and major market actors are moving to establish positions; (iv) full-scale introductions of mobile services have been mostly trial and error – it appears that the mobile network operators are to be blamed for this. This amounts to a lack of sufficient data for building a proper understanding of the mobile services; at this stage it became obvious that the annual survey data we collected with random samples was one of the few usable data sets.

After the 2008 generation shift in mobile phones we did not find any significant change in the use of (the few) mobile services. There was a new generation shift in 2011 when the present demand for smart mobile phones started to gain serious momentum in both Europe and Asia (the generation shift did not happen at the same time in all countries). Smart phones are seen to drive the development of mobile applications and a more or less intuitive belief is that once the users have a smart phone they will download applications and start using a wider variety of mobile services and/or more advanced mobile services (Sell et al, 2012b). Application downloads from Apple’s App Store are counted in tens of billions and the estimate is that in Europe 7.2% of the subscribers will use downloaded applications by 2015; worldwide this is estimated at 5.9%, but in North America at 26.9%. (Portio, 2011). In the 2012 survey of Finnish consumers we found that in addition to a small ‘power user’ group (15 %) and a substantial set of ‘interested but inactive users’ (47 %), there is a large group (38 % of smart phone users) that does not use any advanced services and has a low motivation to continue using smart phones in the future (Sell et al, 2012b). Similar results were found in a study for the network operator

DNA (AddValue 2012) where 29% of the respondents were found to be ‘passive smart phone users’ that use only voice and short message services. The market studies give results that are registered at points in time – we do not get the wanted evolutionary paths – but we continuously get reality checks that keep reminding us that the general population is not that keen on getting mobile services and that the value formed through the services still is not well understood.

In order to conclude this discussion about mobile value services we will summarize the results of a recent comparison of three R&D projects in which mobile service prototypes were developed using a design science methodology (cf. Bouwman et al, 2014). It was found – in one sentence – that designing mobile services in R&D projects is one thing; moving from exploring to exploiting such a service is different matter altogether. The paper was written as a contribution to design science, which has been much debated in IS research. Generally speaking, design science bridges the relevance gap by creating new and innovative artefacts and focuses on generating knowledge on the design and creation of artefacts.

The prototypes are: (i) MobiFish, a mobile fishing permit application developed for tourists and vacationing fishermen in Finland; (ii) MARS, a mobile accident report system developed for an insurance company in Germany; and (iii) Wijkwijzer, a mobile knowledge management application for police officers in The Netherlands.

The details are worked out in the paper but here we will quickly summarize some design science relevant issues. It was only in the Finnish case that we can say that the conditions for adoption and use are favourable, actual adoption figures of the mobile applications are limited in the other two cases. Two of the three projects were motivated by technology-driven arguments. Although commercial exploitation (or, in the police case, a clear objective rooted in policy) was a clear objective in all cases, the commercial issues were only taken into account after a prototype was delivered. In all cases, there was a clear focus on making sure the expected users were involved in the design of the applications, as user requirements were made explicit. However, in the process of understanding and implementing user requirements, the focus on commercial exploitation was lost; no clear business case was defined. The relationships with core actors in the projects were hardly managed at all. Although, at an operational level, organizations were involved, the key decision-makers were not. Also, the lack of attention to the individual business models of the actors involved explains why most projects did not make it to the commercial exploitation stage.

The prototype projects focused on user requirements and needs, technical realization of the application and to a lesser extent on the underlying business models, with the exception of the Dutch project. However, even in the Dutch project, the business model analysis served mainly as a validation of the service concept, as it was only conducted after all choices regarding the service had already been made. Business model literature and innovation management models suggest that paying more attention to stakeholders and business models would increase the chances of commercial success. Some lessons that can be learned from the three cases are: (i) the focus in design projects should not be only on technology and applications, but also on business models; business models force designers to think in terms of added value for users and other relevant parties; (ii) the business models of the core actors involved in designing and implementing the system should be worked out at an early stage; (iii) the set-up of design projects should include explicit iterative steps between service design, stakeholder analysis and business model design; stakeholder analysis and business model design should not serve merely as validation of the service concept.

The design science methodology that was used for the prototype projects offered some important lessons learned on how mobile value services could (or even should) be worked out. Next we will work out some consequences of these lesson in our version of performative IS research.

4 PERFORMATIVE IS RESEARCH

The forming of markets for mobile technology and services no doubt fulfils the description of the context for 21st century IS research – “(an) inherently uncertain, distributed, complex and multiple reality, hyper-connectivity, increasing speed of all processes, nonlinear and global changes”. These markets have grown to their present volume in the span of a little more than 15 years, the use of mobile services is a global movement with a huge number of variations of motives, restrictions, value arguments, business models, ecosystems, etc. We have seen Nokia become a dominant actor in mobile technology with a global market share of 40% in less than a decade and then lose this position in less than 24 months because of an ill-timed announcement that support of the dominating Symbian operating system will be discontinued; this opened the way for the Android operating system that now has a market share of more than 80% among the smart phones at the same time as the smart phones (in 2014) gained a market share of more than 50% of the mobile phone market. These upheavals have a dramatic impact on the mobile services that consumers are going to use in the next few years, they will decide the type of business models that are going to determine the winning concepts in the future mobile markets and they will contribute to the impact mobile technology will have in industry, business and society.

IS research methodology should be developed to give us the instruments we need to study acceptance of mobile technology and the development and implementation of mobile services in the 21st century environment, where the research process will be partially implicated into and create the practices and the socio-technical world that is being studied. This is our understanding of *performative* IS research.

At the moment we have identified two elements in a performative IS research methodology, there will probably be 2-3 more elements as we gain experience and understanding with the methodology.

Proposal 1. The foundation should be in action design research (ADR) which builds on four stages and seven principles (Sein et al, 2011):

1. Problem formulation: (i) practice-inspired research and (ii) theory-ingrained artefact
2. Building, intervention and evaluation: (iii) reciprocal shaping, (iv) mutually influential roles, (v) authentic and concurrent evaluation
3. Reflection and learning: (vi) guided emergence
4. Formalization of learning: (vii) generalized outcomes

ADR offers the flexibility and innovation processes of design science combined with the possibility to verify and validate the technical and logical correctness of artefacts through strict testing methods. Lessons learned from the three prototype cases (cf. section 3) indicate that the ADR may be too slow to capture the dynamics of the market formation for mobile technology and services. Another lesson that we keep getting from the market is that business models should be part of any development of mobile services; this has so far not been considered part of IS research methodology as the business models are considered part of the commercialisation on which researchers do not spend much or any time. It may be time to have a different opinion as IS research keeps missing some fundamental part of the process – prototypes are not being turned into actual use.

Proposal 2. Agile Scrum should be worked out as part of stages 1-3 of the ADR. Scrum is part of modern agile software development but is being enhanced to guide project management and team work in projects. The Scrum is worked out in four steps (cf. Bouwman et al 2008):

1. Visualisation of unique project reasons and core processes
2. Analysis of functionality needed to support core processes and system design
3. Realisation of the functionality; maintain communication between developers and stakeholders
4. Control if implementation fits the goal; evaluate the project process for logical consistency

It appears clear that the Scrum needs support for interactive team work on analytics tasks and the use of big data; the support will most probably build on cloud architecture and the team members will work through mobile platforms.

At the moment we will have to gain experience from integrating the Scrum in ADR before we can start working out the benefits and problems of developing and implementing a performative IS methodology.

5 SCIENCE PRECISION AND PRACTICE RELEVANCE

In IS research we have the dual requirements to verify that our results fulfil the requirements for science precision and the usability requirements for practice relevance. We have shown in this paper that – at least at this stage of IS research – there is some conflict between these two objectives. We will have to find some compromise and work out research methodologies that give both sufficient precision and sufficient relevance. Reviewers in our journals and leading conferences do not always agree on or accept this compromise, or the necessity for it.

In this paper we used the context of mobile value services as a background for the discussion of IS research methodology. We could show – because we have been closely involved with the development of this research arena for more than a decade – the question of what constitutes the *value* in mobile value services still remains unsolved. This again points to the challenge to study and understand the forming of mobile value services and the acceptance and market penetration of them. If we can resolve these issues we have a fair chance to start unravelling the ecosystems that guide the global markets for mobile technology and mobile applications.

Future research will first have to find out if Scrum can be worked into the ADR and if this will be a viable IS research methodology.

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