Introduction to the Special Issue on Mobile Commerce: Mobile Commerce Research Yesterday, Today, Tomorrow—What Remains to Be Done?

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ABSTRACT: Mobile commerce (m-commerce) in the smartphone age is revolutionizing established value networks and transforming the wider economy. In this introduction we strive to build a bridge from the past of m-commerce research to its future. We examine more than a decade of research and conduct a Delphi study among leading scholars in the field. The review reveals significant changes in m-commerce topics as time goes on, and provides initial insights into what the future may hold for us. The most sobering finding is that the m-commerce field has still to establish a strong theoretical foundation. This has been reflected in less than overwhelming success in publishing on the subject in the most prestigious journals of the Information Systems discipline. At the same time, m-commerce forms one of the epicenters of the ongoing digitalization of our life. Therefore, we look forward to m-commerce research rising to the challenge and making significant contributions to understanding one of the important phenomena of our time.

KEY WORDS AND PHRASES: Delphi study, literature review, m-commerce, mobile commerce research.

Mobile commerce (m-commerce) is concerned with business transactions where transacting partners use mobile communication technologies for service initiation, agreement, or fulfillment [10]. M-commerce assumes mobility of the devices and their users, possible mobility of services between devices, and the use of related location or mobility information to enable, support, or conduct transactions. Overall, m-commerce has been on the rise—especially during the past five years—as smartphones and broadband connections have become everyday realities in most advanced industrial societies and throughout the world. This special issue reports advances in m-commerce research and discusses related challenges. It includes articles selected from the best work presented at the Twelfth International Conference on Mobile Business (ICMB) in Berlin on June 10-13, 2013, along with additional manuscripts submitted to a complementary call for papers.

Overall, the aim of this introductory article is to build a bridge from the past of m-commerce research to its future. We strove to accomplish this by undertaking two studies: (a) an extensive review of the m-commerce literature since the inaugural meeting of the ICMB, and (b) a Delphi study on the most salient academic m-commerce research topics. The literature review examined a total of 1,613 papers from 2002 through 2013 and provides an in-depth analysis of 274 m-commerce–focused articles. The Delphi study followed a classic three-round approach (i.e., without predetermined items) and captured the views of 14 leading mobile commerce

scholars on the most relevant m-commerce topics of yesterday, today, and tomorrow.

In the next section we use the literature review to present a broad landscape of what the m-commerce community has achieved and its influence on the Information System (IS) discipline. This is followed by our report on the perspectives of the respected researchers who participated in the Delphi study. In the closing sections we reconsider Lyytinen and Yoo's foundational research on the challenges of mobility [14], in the light of the findings from the two studies presented here. Doing so provides a platform for discussing the changing role and meaning of m-commerce research, its implications for practice, and its position within the IS research field.

The Literature View: An Analysis of Past M-Commerce Research

M-commerce research is no longer a new topic. Several extensive literature reviews are already available. Ngai and Gunasekaran [17] offered a detailed analysis of mobile commerce research between 2000 and 2003. They categorized 149 papers from 73 journals into m-commerce theory and research, wireless network infrastructure, mobile middleware, wireless user infrastructure, and mobile cases and applications. Kourouthanassis and Giaglis [9] used the same five categories for an extended analysis of 1,031 papers published in 41 journals between 2002 and 2011. Fouskas et al. [4] proposed a roadmap of mobile commerce research based on an analysis of published sources and empirical work. They classified m-commerce research into technology (infrastructure and devices), service (including applications), content, payments, value (including business models), users/workers, along with enablers (including security and privacy), policy, and regulation. Besides these holistic analyses, several papers provide narrower reviews of specific m-commerce research topics, such as Min and Ji [15] for China, [1] for mobile payments, Fischer and Smolnik [3] for mobile computing, Hong, Suh, and Kim [7] for context-aware systems, and Varnali and Toker [29] for mobile marketing. No extensive analysis has been done since 2011 and none of the prior analyses take into account where such work was presented and why.

For our analysis, we included papers published in major IS journals and conference proceedings. We limited the search to the top outlets and the most active ones in m-commerce from 2002 to 2013—thereby encompassing the period from the takeoff of m-commerce research until the ICMB conference held in Berlin. The search was performed using key words ("mobile," "wireless," "ubiquitous," "RFID") as well as title and abstract content analysis. We identified 1,613 papers from 12 journals and 4 conferences (Table 1).

Temporally, mobile commerce research peaked in 2005 with 190 papers published in 6 journals and 4 conference proceedings. Mobile commerce has remained a major topic in conferences (996 papers, with ICMB accounting for 641 papers), but it is still underrepresented in journals. In fact the higher the ranking of the journal, the smaller the percentage of m-commerce articles.

Table 1. Distribution of M-Commerce Publications per Year and Outlet.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Σ
Electronic Commerce Research and Applications	1	-	1	1	6	2	7	1	6	7	3	3	38
European Journal of Information Systems	-	-	-	-	7	-	1	1	-	-	-	-	9
Information Systems Journal	-	-	1	1	1	-	-	1	2	-	-	1	6
Information Systems Research	2	-	-	-	2	-	-	-	2	-	4	2	12
International Journal of Electronic Commerce	-	6	5	-	-	2	-	-	-	-	6	1	20
International Journal of Mobile Communications	-	22	27	27	40	39	43	32	31	32	31	29	353
Journal of Information Technology	-	2	-	-	3	-	1	7	2	-	2	1	18
Journal of Management Information Systems	-	-	1	-	1	1	1	2	1	-	-	2	9
Journal of Strategic Information Systems	-	-	1	4	1	2	1	-	-	1	1	1	12
Journal of the Association for Information Systems	-	-	-	1	-	1	-	1	-	-	1	-	4
MIS Quarterly	-	-	-	-	-	-	-	-	1	1	1	2	5
Mobile Networks and Applications	5	12	15	8	6	6	3	10	11	14	21	20	131
International Conference on Information Systems	3	4	4	2	2	3	3	6	7	9	9	12	64
European Conference on Information Systems	7	2	13	12	10	12	10	16	7	10	10	6	115
Hawaii International Conference on System Sciences	13	25	10	28	13	13	15	7	11	7	17	17	176
International Conference on Mobile Business	62	50	40	108	46	67	38	64	69	43	25	29	641
Σ	92	123	116	190	124	146	115	145	142	117	128	122	1,613

Note: Journals and conferences are listed, respectively, alphabetically.

Geographically, most publications originate from Europe (882 papers), followed by Asia (462 papers), North America (418 papers), Australia/Oceania (165 papers), Africa (11 papers), and South America (9 papers). The most active countries are the United States (351 papers), Germany (155 papers), China (153 papers, including Hong Kong), Finland (137 papers), and Australia (126 papers).[1]

Detailed Publication Analysis

First, we wanted to learn about the type of m-commerce research represented in top outlets: what topics, research strategies, and research tactics did authors pursue? Therefore, we performed a more detailed analysis of m-commerce papers published in the AIS Senior Scholars' Basket of Journals,[2] *International Journal of Electronic Commerce* as the leading e-commerce journal, and the two most recognized conferences *International Conference on Information Systems* and *European Conference on Information Systems*, resulting in 274 papers to analyze.

We categorized the sampled papers using the morphological method [31], which combines the three characteristics, research strategy, research tactic, and main research topic, with a total of thirty-two potential instances. The first characteristic reflects the *research strategy*, which provides the overall direction of the research and the research process [25]. The research strategy can be theoretical, empirical (qualitative or quantitative), and/or design-oriented. The second characteristic reflects the *research tactic*, which determines the approach used for data collection and analysis [25]. Research tactics are adopted from Galliers [5] and complemented by four design science tactics: artifact building, artifact evaluation, framework, and prototyping. Research tactics that did not fit in one of the eighteen instances were summarized in the instance "other." The third characteristic reflects the *main research topic*. Here we adopted the eight topics from the ICMB categorization: *analysis of mobile phone datasets and networks, B2B applications and services, B2C applications and services, development of mobile markets, legal and political aspects, mobile for development, mobile technologies,* and *theory development* (*empirical* or *theoretical*). Figure 1 shows the resulting categorization framework.

Figure 2 shows the followed research strategies for the intervals 2002–2005, 2006–2009, and 2010–2013. As one would expect, the number of papers per period has increased over time. Moreover, quantitative research has gained more attention as the topics have matured. Qualitative research—often used

Characteristic	Instances																	
Research strategy	design science							empirical research				theoretical research						
								qualitative		quantitative								
Research tactic	action research	artifact building	artifact evaluation	case studies	ethnography	field experiment	focus groups	Forecasting	framework	grounded theory	in-depth survey	laboratory experiment	large scale survey	literature review	mathematical simulation	participant-observer approach	prototyping	scenario research	other
Main research topic	analysis of mobile phone data sets and networks			B2B services and applications		B2C services and applications		development of mobile markets		legal and political aspects		mobile for development		mobile technologies		theory development for mobile IS		
																	empirical	theoretical	

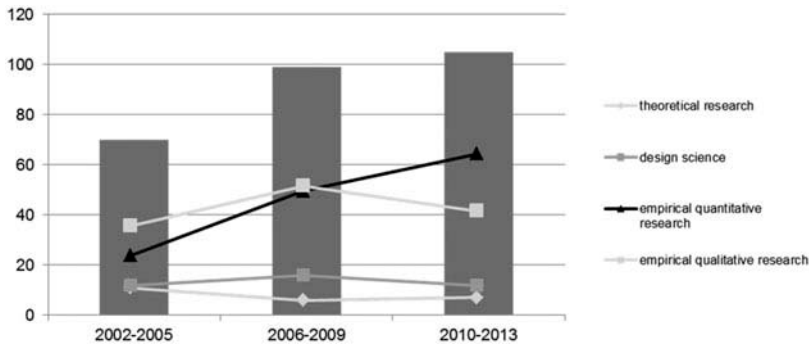**Figure 1. Categorization framework**

Figure 2. Research strategies per period

Note: Multiple assignments are possible.

to study new phenomena—began at a higher level and peaked in 2006–2009. In contrast, design science papers remained at a steady but lower level in the quality outlets. However, theoretical research has never been significant. In fact, it declined over the years: 2002–2005: 13 percent (ten papers); 2006–2009: 4 percent (five papers); 2010–2013: 5 percent (six papers).

Figure 3 shows the main research tactics followed. The most common research tactics were the use of large-scale surveys (increasingly common as the topic matured), case studies (slightly decreasing), and in-depth surveys (with a peak in 2006–2009).

Finally, Figure 4 shows the development of topics and their popularity over the years. Three dominant topics accounted for 69 percent of the
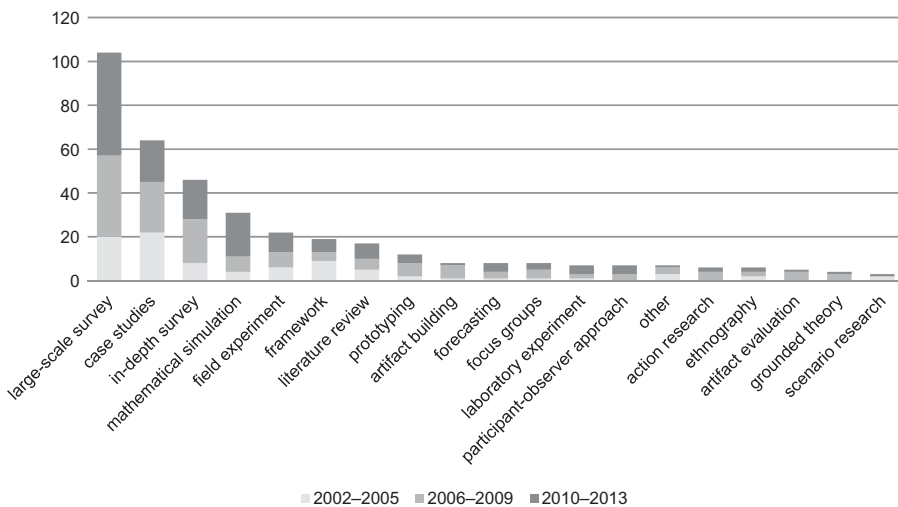

Figure 3. Research tactics per period

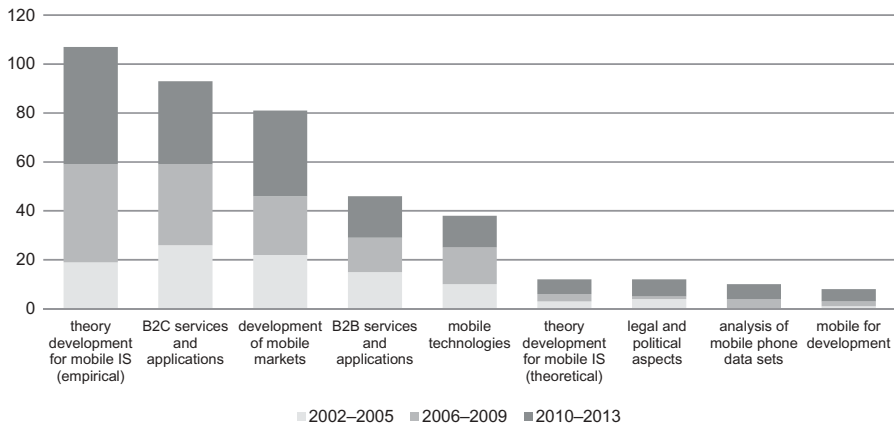*Note:* Multiple assignments are possible.

Figure 4. Main research topics per period

Note: Multiple assignments are possible.

contributions throughout all time periods: Research on *B2C applications and services, empirical theory development* (which, in accordance with Figure 4, steadily increases over time), and *mobile markets* (e.g., business models, value chains, and market power issues). Two topics remain at mid-levels of interest, *B2B services and applications* and *mobile technology*. Together they account for roughly 10 percent of all papers.

The vast majority of empirical theories cover tactical topics, such as—and especially—customer acceptance issues, often for specific B2C applications and services. While theory development remains very limited (3 percent of all papers), theory development for strategic issues is virtually nonexistent. This highlights the focus on empirical customer-level issues in m-commerce research. However, the paucity of theory development also helps to explain why the field has remained underrepresented in the top-level IS journals.

The Scholars' View

We conducted a Delphi study [2] among leading m-commerce scholars about the changes in the field and its future directions. Delphi has been used as a tool to measure and aid forecasting and decision making in a variety of disciplines [26]. A derivative of this method has been used extensively in IS research to identify and rank key issues for management action [27]—a problem similar to ours.

We sent invitations to thirty-two scholars from thirteen countries.[3]

Sixteen of them agreed to participate, resulting in 56 percent of the Delphi panel being scholars from Europe, 38 percent from North America, and 6 percent from Asia. We conducted a conservative three-round Delphi procedure with round 1 as *content-creation phase (R1)*, round 2 as *assessment phase (R2)* and round 3 as *consensus/dissension phase (R3)*. In R1 we received fifteen

questionnaires, which allowed for the extraction of thirty items, each representing a ratable statement made by one or more panel members, without any presetting (or bias risk) from the study authors.[4]

In R2 and R3 we received fourteen questionnaires, rating each R1 item on a five-point Likert scale.[5]

In R2, the panel rated all items without feedback about other participants' ratings. R3 included feedback about the anonymized R2 voting results and comments and then asked for a final evaluation and rating.

To provide inter-item and inter-round comparability, we applied two measures for location (i.e., assessment value) and spread (i.e., consensus level) to assess the level of consensus reached. We also recoded the assessment values to a zero-based interval scale representing the equidistance of ratings [23]:

$$x \in \left[-\frac{a-1}{2}, +\frac{a-1}{2} \right] \tag{1}$$

x : *assessment of a panelist* a : *number of assessment options*

The mean value μ of the assessments for an item was calculated as the *arithmetic mean*, the variation σ was calculated as the *average deviation* from μ:

$$\sigma = \left(\sum\nolimits_{i=1}^{n} |x_i - \mu| \right) * \frac{1}{n} \tag{2}$$

i : *panelist* $(1 \dots n)$ x_i : *assessment of panelist i*

As a result, we could describe and compare the level not only of assessment but also of consensus for each R2/R3 item.

In additional, we enhance overview and comparability of the Delphi results by a graphical representation called a *Delphi diagram*.[6]

Scholars' View of the Past Research

In R1, the expert panel identified fourteen items as relevant research topics from the past ten years. The R2/R3 assessments for these items are shown in Figure 5.

The scholars agreed that six of these topics were of major importance ($\mu \geq 1$; in brackets particular aspects named in R1): *mobile Internet* (the shift to smartphones and the mobile Internet), *user behavior* (e.g., studies on consumers' intention to use mobile services as well as the adoption and acceptance of mobile technologies and services), *development of mobile markets* (e.g., m-business models and frameworks, understanding the emergent paradigm of mobile e-business as well as the value of mobile to preexisting business models and the effects on and relationships with

One of the most relevant m-business research topics within the last 10 years was …

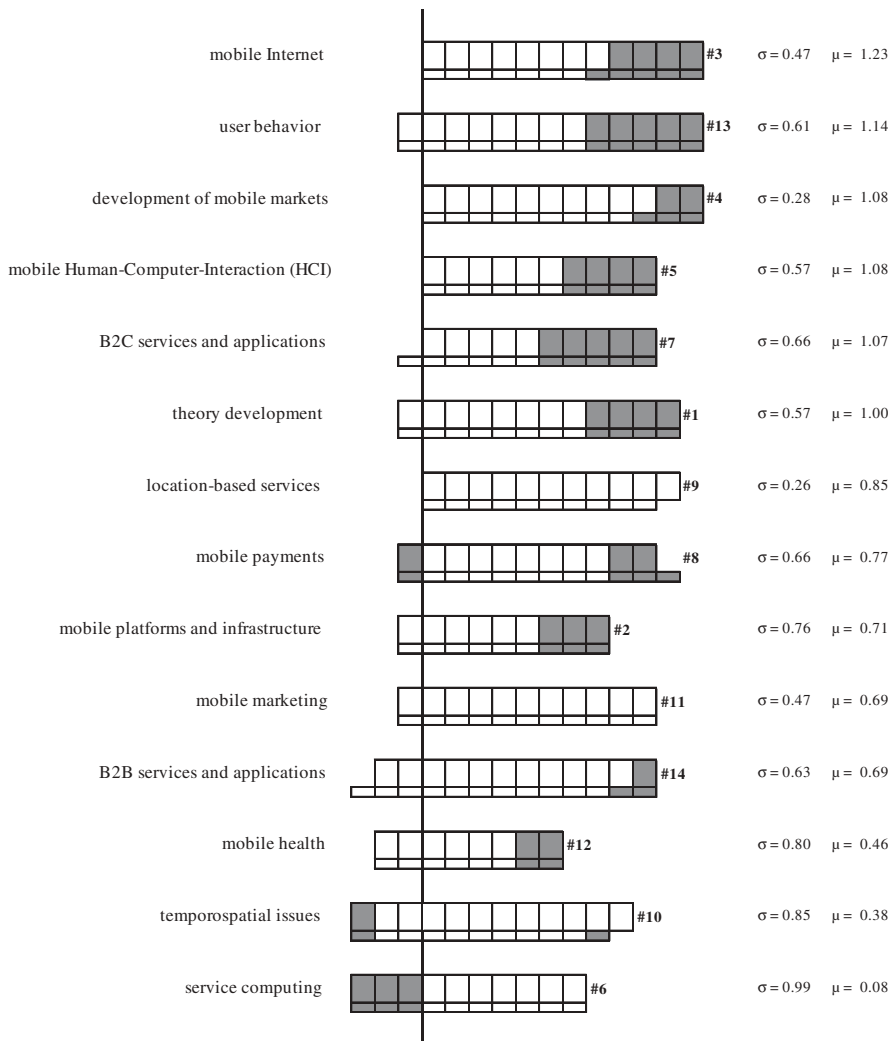|		
mobile Internet	#3	σ = 0.47 μ = 1.23
user behavior	#13	σ = 0.61 μ = 1.14
development of mobile markets	#4	σ = 0.28 μ = 1.08
mobile Human-Computer-Interaction (HCI)	#5	σ = 0.57 μ = 1.08
B2C services and applications	#7	σ = 0.66 μ = 1.07
theory development	#1	σ = 0.57 μ = 1.00
location-based services	#9	σ = 0.26 μ = 0.85
mobile payments	#8	σ = 0.66 μ = 0.77
mobile platforms and infrastructure	#2	σ = 0.76 μ = 0.71
mobile marketing	#11	σ = 0.47 μ = 0.69
B2B services and applications	#14	σ = 0.63 μ = 0.69
mobile health	#12	σ = 0.80 μ = 0.46
temporospatial issues	#10	σ = 0.85 μ = 0.38
service computing	#6	σ = 0.99 μ = 0.08

Figure 5. Most relevant m-commerce topics of the last 10 years

key stakeholders), *mobile HCI* (usability issues, differences between fixed and mobile technology), *B2C services and applications* (e.g., design, usability, development, diffusion, and adoption of services), and *theory development* (e.g., insights into B2B and B2C applications). While the items are not mutually exclusive, the view is broadly in-line with the results of the literature review. It also constitutes an acceptable basis for the assessment of present and future research when objective measures are unavailable.

We also observe some controversial votes (e.g., σ = 0.99 for service computing) or indifferent votes (e.g., five out of fourteenfor mobile infrastructure) by panelists as well as reconsideration of evaluations between R2 and R3 results in seven out of fourteen items.

Scholars' View of the Current Research

In R1, the panel identified seventeen items as relevant current research topics. The R2/R3 assessments for these items are shown in Figure 6.

However, the scholars agreed that only five of these topics were of major importance (μ ≥ 1). Here we observe a paradigm shift: the formerly dominant topics lost relevance or underwent major changes. For instance, the most

One of the most relevant m-business research topics today is …

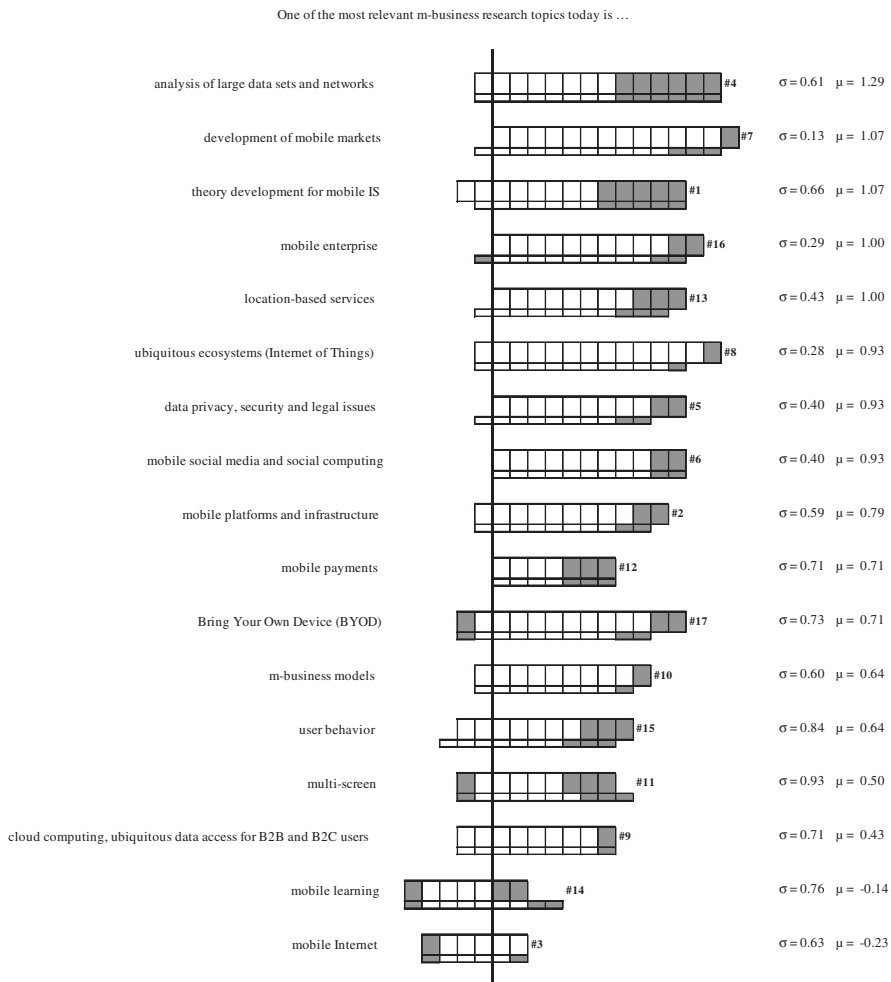|		
analysis of large data sets and networks	#4	σ = 0.61 μ = 1.29
development of mobile markets	#7	σ = 0.13 μ = 1.07
theory development for mobile IS	#1	σ = 0.66 μ = 1.07
mobile enterprise	#16	σ = 0.29 μ = 1.00
location-based services	#13	σ = 0.43 μ = 1.00
ubiquitous ecosystems (Internet of Things)	#8	σ = 0.28 μ = 0.93
data privacy, security and legal issues	#5	σ = 0.40 μ = 0.93
mobile social media and social computing	#6	σ = 0.40 μ = 0.93
mobile platforms and infrastructure	#2	σ = 0.59 μ = 0.79
mobile payments	#12	σ = 0.71 μ = 0.71
Bring Your Own Device (BYOD)	#17	σ = 0.73 μ = 0.71
m-business models	#10	σ = 0.60 μ = 0.64
user behavior	#15	σ = 0.84 μ = 0.64
multi-screen	#11	σ = 0.93 μ = 0.50
cloud computing, ubiquitous data access for B2B and B2C users	#9	σ = 0.71 μ = 0.43
mobile learning	#14	σ = 0.76 μ = -0.14
mobile Internet	#3	σ = 0.63 μ = -0.23

Figure 6. Most relevant topics in today's research

relevant topic of the preceding ten years, *mobile Internet*, was still nominated in R1 but then assessed as irrelevant (μ = –0.23, with only two scholars still supporting it).

The topic *development of mobile markets* still remains in the top ranks, but some subsets (e.g., business models or ecosystems for the Internet of Things) became items in their own right, albeit with somewhat less relevance. During R1 the scholars noted that the two-way relationship between infrastructure, strategies, and changes in the app economy, were new current topics that had not been salient in the past. These topics further include the new competitive landscape, marketplaces, and stakeholders. While *theory development* also remains important. Tellingly, an R1 participant commented that "Mobile IS research still lacks its own theory base."

By far the most relevance was attributed to a newly emerged topic: the *analysis of large data sets and networks*. According to R1, this comprises the analysis of data generated by mobile devices and their usage for new business models as well as the growth of social networks and the data generated by them. *Location-based services,* already considered relevant in the past decade (μ = 0.85), now joins the highest-ranked topics.

Mobile enterprise is an interesting case. It appears as a midlevel topic in the literature review (under the term *B2B*) but represents the only topic not even nominated by scholars for the past decade. It remains unclear why it was not on the scholar's radar, but present research sees it ranked among the top items. Especially prominent topics include value creation for specific industries and their stakeholders, the potential of mobile business processes for organizations (including the effects of constant connectivity on the workforce as well as on behavioral, legal, and ethical boundaries), the effect of mobility on agility and flexibility in customer and supplier responsiveness, construction methods, and reference models for mobile-integrated business models.

Remarkable change can also be seen in *user behaviors,* which was ranked in the top two for the past decade. In contrast, scholars now ranked it among the least relevant items, though it still has strong advocates. *Mobile learning* showed a strong consensus effect: on the negative R2 result, half of its supporters withdrew their support in R3. Finally, the relatively new *Bring Your Own Device (BYOD)* issue aroused particular interest: Whereas μ = 0.71 positions it is a mid-range issue, it mobilized the panel as few other topics did—thirteen out of fourteen respondents were clearly for or against.

Scholars' View of Future Research

In R1, the panel identified sixteen items as relevant future research topics. The R2/R3 assessments for these items are shown in Figure 7. The scholars agreed that half of these topics were of major importance (μ ≥ 1). In-line with our earlier finding that the m-commerce literature lacks a strong theoretical foundation, the scholars ranked *theory development* as the most relevant for future research—with an unprecedented assessment value of μ = 1.50. It comprises the development of new theories specific to mobile as well as the application of existing theories to mobile contexts.

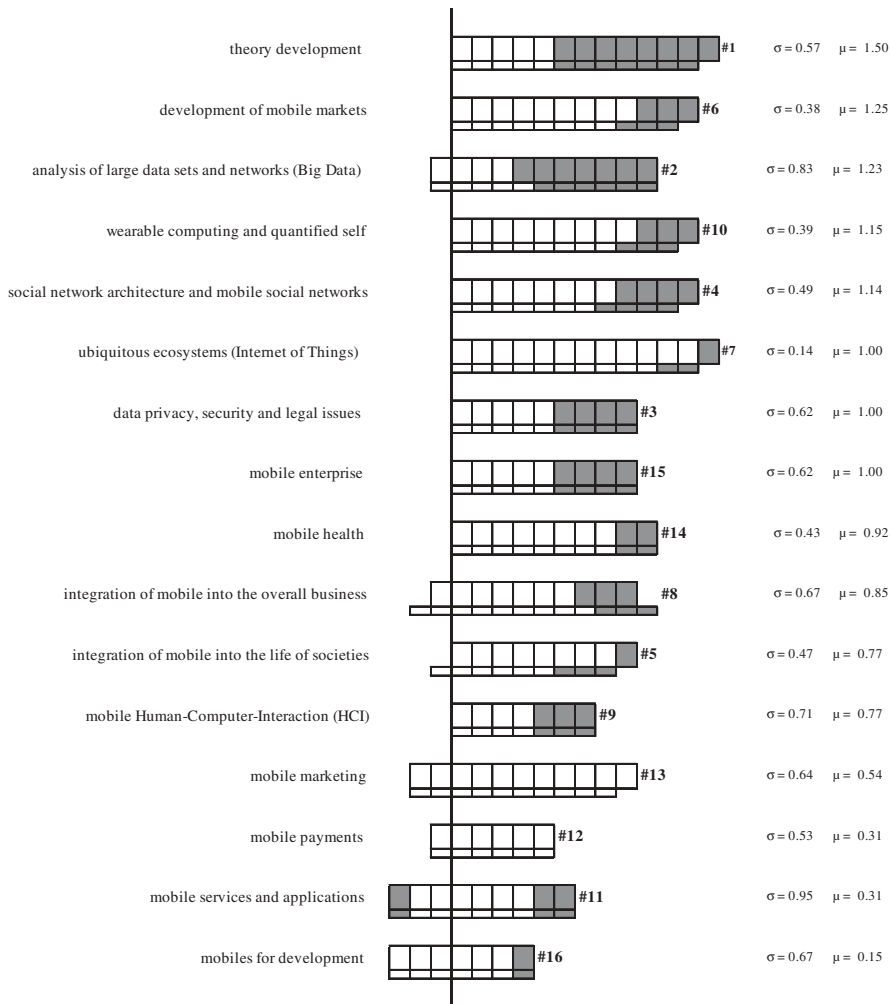One of the most relevant m-business research topics within the next 10 years will be …

	σ	μ
theory development **#1**	0.57	1.50
development of mobile markets **#6**	0.38	1.25
analysis of large data sets and networks (Big Data) **#2**	0.83	1.23
wearable computing and quantified self **#10**	0.39	1.15
social network architecture and mobile social networks **#4**	0.49	1.14
ubiquitous ecosystems (Internet of Things) **#7**	0.14	1.00
data privacy, security and legal issues **#3**	0.62	1.00
mobile enterprise **#15**	0.62	1.00
mobile health **#14**	0.43	0.92
integration of mobile into the overall business **#8**	0.67	0.85
integration of mobile into the life of societies **#5**	0.47	0.77
mobile Human-Computer-Interaction (HCI) **#9**	0.71	0.77
mobile marketing **#13**	0.64	0.54
mobile payments **#12**	0.53	0.31
mobile services and applications **#11**	0.95	0.31
mobiles for development **#16**	0.67	0.15

Figure 7. Most relevant topics in tomorrow's research

Other major topics for future research are again the *development of mobile markets* (now comprising, for example, new business models and revenue streams such as integrating the user into the value chain as a content provider, the effect of mobile services on the way business is conducted in general, along with the "app economy" and multisided platforms for mobile services, economics of ubiquitous IS ecosystems, and revenue streams for Web 3.0/4.0), *analysis of large data sets and networks, wearable computing and quantified-self, social network architecture and mobile social networks* (e.g., including the analysis of user profiles and behavior such as sentiment analysis, opinion mining, influence analysis, herding phenomena, behavior manipulation, convergence and consensus

analysis), *ubiquitous ecosystems, data privacy, security and legal issues*, and *mobile enterprise* (e.g., intelligent supply chains, managing enterprise mobile apps, use of mobile-augmented reality, mobile-oriented gamification apps to motivate and control employees). It is remarkable that for all of these topics, only one negative vote was counted—judging big data a relevant topic but not mobile-specific.

While consensus was relatively high for these topics, the lower-ranked ones showed more variance. As can be seen in a couple of R3 redecisions scholars switched more than one rank in their redecisions. This indicates that some scholars could not easily make sense of the topics *integration of mobile into the overall business* as well as *into the life of societies*. Both are only ranked mid-level and the panel submitted virtually no comments addressing these topics.

Results and Discussion

We next make sense of these findings by mapping them onto the framework proposed by Lyytinen and Yoo [14] in their examination of the key research issues surrounding what was referred to as "nomadic information environments." Indeed, we find that the framework provides a convenient way of structuring the empirically derived m-commerce research landscape some thirteen years later (see Table 2).

The yesterday/today/tomorrow categorization in the landscape boils down to three categories: (a) topics in parentheses and square brackets represent those that will not remain relevant in the future; (b) topics without parentheses or brackets are currently relevant and will remain so going forward; and (c) topics in angle brackets are expected to emerge as important ones. The most obvious deviation from Lyytinen and Yoo's expectations is the relative lack of research topics addressing the team level of analysis. Computer-supported cooperative work (CSCW) did not emerge as a major theme in m-commerce research, but stayed within its own research community. Theory development, which cuts across all categories, and is thus not reflected in Table 2, will be addressed shortly.

Comparing the scholar's view of the past with the findings from the literature review reveals some interesting details. All the topics proposed by the scholars are reflected in the literature, albeit with different emphasis. *User behavior* and *development of mobile markets,* for instance, maintained their Delphi ranking in the literature. However, *temporospatial issues* related to the specific nature of mobile IS made it to the scholars' list of the most relevant research topics—but gained almost no traction in the literature. The same is true for *mobile HCI*. On the other side, *B2C services and applications* was rated only in the middle of the field, but showed the highest number of publications. Thus topics that the scholars viewed as offering potential for the largest theoretical and practical insights proved the most difficult to come to grips with and remain largely untapped.

Table 2. Mobile Commerce Research Landscape.

Services	Individual level *Theme 1: Individual-level services*	Team level *Theme 3: Team-level services*	Organizational level *Theme 5: Organizational-level services*	Interorganizational level *Theme 7: Interorganizational-level services*
Design	• [Location-based services] • [Mobile platforms] • B2C services and applications • Mobile payments • Mobile marketing • Analysis of large data sets and networks/big data • Mobile health • Mobile HCI • <Wearable computing and quantified self>		• B2B services and applications • Mobile payments • Mobile enterprise • Analysis of large data sets and networks/big data • <Integration of mobile into the overall business>	• (BYOD) • Mobile payments • Development of mobile markets • Analysis of large data sets and networks/big data • <Integration of mobile into the overall business>
Use and adoption	• [Location-based services] • [User behavior] • (Mobile social media and social computing) • (Multi-screen) • Mobile payments • Mobile marketing • B2C services and applications • Theory development • Mobile HCI • <Wearable computing and quantified self> • <Social network architecture and mobile social networks>		• (Mobile social media and social computing) • (Multi-screen) • B2B services and applications • Mobile payments • Mobile enterprise • Analysis of large data sets and networks/big data • <Wearable computing and quantified self> • <Integration of mobile into the overall business>	• (BYOD) • Development of mobile markets • <Integration of mobile into the overall business>
Impact	• [Location-based services] • [User behavior] • Mobile health • <Social network architecture and mobile social networks>		• (M-business models) • B2B services and applications • Mobile enterprise • Analysis of large data sets and networks/big data • <Integration of mobile into the overall business>	• Development of mobile markets • Mobile health • <Integration of mobile into the overall business>

(continues)

Table 2. Continued

Infrastructure	Individual level — *Theme 1: Infrastructure for individual level*	Team level — *Theme 3: Infrastructure for team level*	Organizational level — *Theme 5: Infrastructure for organizational level*	Interorganizational level — *Theme 7: Infrastructure for interorganizational level*
Enabling capabilities	• ((Mobile Internet)) • ((Temporospatial issues related to the specific and intrinsic nature of mobile IS)) • [Location-based services] • (Cloud computing, ubiquitous data access for B2B and B2C users) • Mobile HCI • <Social network architecture and mobile social networks>	• (Cloud computing, ubiquitous data access for B2B and B2C users)	• [Mobile platforms] • (Cloud computing, ubiquitous data access for B2B and B2C users) • Mobile services and applications • Mobile payments • Analysis of large data sets and networks/big data	• Development of mobile markets • Mobile payments • Analysis of large data sets and networks/big data
Governance and control	• Data privacy, security and legal issues		• Data privacy, security and legal issues	• [Mobile platforms] • Development of mobile markets

Fundamental drivers

- Mobility
- Convergence
- Mass scale

Notes: Requirement for a topic to be included in the research landscape: R1 nomination and R3 consensual evaluation positive (µ > 0). Yesterday/today/tomorrow categorization is shown with the use of parentheses and brackets: ((yesterday's research topics)), [yesterday's + today's research topics], yesterday's/today's + tomorrow's research topics, <tomorrow's research topics>.

Conclusion

M-commerce as a distinct field of research, and the existence of an m-commerce research community is based on the particularities of mobility and mobile information systems (see, e.g., [11, 13, 20]) as well as on their ecosystems and their rewriting of the rules for traditional industries (see, e.g., [18, 19, 21, 22]). We believe that a lot of the work on mobile topics presented at conferences reapplied theory and methodologies developed by IS scholars who studied previous waves of technology (e.g., technology acceptance model, diffusion models, motivations for use). In many cases, the work did not address the unique aspects of mobile systems (such as local mobility, scale, or real-time interactions). Thus, it is not so surprising that little of this work found its way into the IS journals that demand original theoretical contributions.

Lyytinen and Yoo's [14] commentary highlighted the importance of considering context and awareness in the study of nomadic computing. They put forward the dimensions of convergence, mass scale, and mobility as distinguishing features of such use. Smartphones and other devices have led the way in the convergence of numerous types of media and formerly separate devices (PDA, music player, camera, e-mail access, etc.). Apple, Google, Facebook, and others have brought about mass scale in the services offered via smartphones and other channels. Location-based services, sometimes built into mobile operation systems, have also brought us forward in terms of context awareness. However, such issues have not been examined extensively by the IS community due to challenges of theorizing and gaining access to the proprietary data sets central to understanding many of the new phenomena.

In recent years, device and service convergence has transformed the content industries. However, the IS literature has not been at the forefront of building the theoretical perspectives about industry-level, or macro changes [28]. We could also lament that we have not been able to persuade at least some practitioners to heed what we do know. For example, we have observed many actors roll out e-payment systems or applications that fail to take off because they fail to conceptualize the effort as one of building an infrastructure and focusing on, for example, reaching critical mass or identifying the value for the relevant set of stakeholders [24].

Despite the long tradition of design science in IS, the field as a whole is a follower—it has contented itself with trying to describe and explain the deployment of new technologies often after they have succeeded in the marketplace (e.g., enterprise resource planning [ERP] in the 1990s). A key challenge for building a relevant research agenda continues to be that building theoretical perspectives is considerably more difficult at these macro levels or when dealing with recombinant innovation and new types of use patterns. In addition, we can argue that the data necessary for insightful investigation of these macro-scale issues is difficult to access because it is often locked up in the proprietary dominant infrastructures central to the phenomena of interest. The mass scale of these platforms that developed out

of consumer-focused products now dominates the corporate market, and has displaced the services that offered specialized services such as BlackBerry. Another example of convergence is the combination of both hedonic and corporate computing.

However, the good news is that mobile information systems and m-commerce now constitute the core of digitalization, and will remain a challenge to researchers to bring novel theoretical frames to the research landscape and to help define the most important transformative phenomena of our age.

Papers in the Special Issue

For this special issue, three articles [8, 13, 30] were selected from an initial set of twenty-eight submissions. The articles have undergone several cycles of revision and selection.

The first study in this special issue, by Pin Luarn, Jen-Chieh Yang, and Yu-Ping Chiu [13], examines the motivations for mobile users' check-in behavior. Whereas check-in is a typical issue of using m-commerce in the real world, it includes the concepts of information disclosure, word of mouth, and social interaction. The authors identify twenty constructs that influence engagement in check-in behavior and demonstrate that social condition plays the most critical role in motivating people. The second study, by Youwei Wang, Yufei Yuan, Ofir Turel, and Zhiling Tu [30], investigates the "biography" of a common service: mobile text messaging, in China. The authors base their analysis on 1,403 news items that were screened from more than 40,000 news items over sixteen years. They deduce a pattern that includes four alternative actor-network configurations for mobile text messaging services and show how this typical mobile service evolves from a small and dense network of actors to a complex and heterogeneous actor network. Finally, the study by Guei-hua Huang and Nikolaos Korfiatis [8] investigates the moderating role of online reviews in attitude formation toward mobile apps. They carefully distinguish the cognitive and emotional aspects of users' online experience and link them to the trial attitude toward using apps.

Finally, we would like to express our gratitude to all the authors who submitted studies to the special issue and a cadre of excellent reviewers who made the issue possible.

NOTES

1. Each country was counted only once per paper. Less than one-fifth of the analyzed papers had authors from various countries (19 percent).

2. The AIS Senior Scholars' Basket of Journals (http://aisnet.org/?Senior ScholarBasket) provides a short list of the eight most recognized information systems journals based on the opinion of the Senior Scholars Consortium; it includes *European Journal of Information Systems, Information Systems Journal, Information Systems*

Research, Journal of the AIS, Journal of Information Technology, Journal of Management Information Systems, Journal of Strategic Information Systems, and *MIS Quarterly*.

3. Experts were chosen according to the requirements described by Hill and Fowles [6]. We put great emphasis on the internationality of the panel. Major selection criteria are: We invited all former general chairs of the ICMB (12 experts) and then added according to research experience in mobile commerce, number of publications, and influence in the research community (20 experts).

4. With regard to our research aim and as suggested by Murry and Hammons [16], we choose a three-round procedure using three different questionnaires. According to Linstone and Turoff [12], we start round 1 with an open-ended format, using three very general questions (Q1: What are the most relevant two or three research topics today and why? Q2: What were the most relevant two or three research topics within the past ten years and why? Q3: What will be the most relevant two or three research topics within the next ten years and why?).

5. The Likert scale offers the equidistant response options "I strongly disagree (1)"; "I disagree (2)"; "neither" (3); "I agree (4)"; and "I strongly agree (5)."

6. This concept, developed by Pousttchi, Moormann, and Felten [23] enables an apt access to the complete information for each item, comprising the assessments down to the level of single expert (re-)decisions in both rounds. As the basic concept of Delphi diagrams, we represent each expert who has rated the specific item by a square. Squares above the horizontal axis reflect positive assessments, conversely squares below, negative ones. Depending on the strength of the assessment, squares are either white (2, 4) or gray (1, 5). These major columns of squares represent the final result (R3). A smaller column attached to the right reflects the preceding R2 result. Panelists abstaining from voting or voting with "neither (3)" do not show up [23].

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