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THEORIZATION AND TRANSLATION IN INFORMATION TECHNOLOGY INSTITUTIONALIZATION: EVIDENCE FROM DANISH HOME CARE

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Appendix

Case Study Design

Our longitudinal investigation of the institutionalization of mobile IT in the Danish home care field followed previous travels of ideas studies (e.g., Morris and Lancaster 2006). It is advocated that illustrative case studies are particularly valuable in longitudinal studies to help readers focus on the proposed conceptual relationships (Siggelkow 2007). In addition to comprehensive data from the broader home care field (Table A1), we therefore compiled detailed data from three home care agencies (Table A2) to illustrate more concretely the recursive dynamics of translating ideas of mobile IT usage into day-to-day practices. To increase the study's internal validity we used mixed methods, including both primary and secondary data based on surveys, interviews, and documents (Jick 1979; Tashakkori and Teddlie 1998). Although our investigation covers a 10 year period of time (1998–2008), our data collection occurred during 2007 and 2008. The data collection was carried out by the first author.

As summarized in Table A1, we collected *field level data* to understand the overall dynamics shaping mobile IT institutionalization, involving articulation of mobile IT usage within the Danish home care field. As a starting point, we undertook a survey of home care managers in the 98 Danish municipalities to map the diffusion pattern of mobile IT and to improve our understanding of the research context. We used a structured interview guide and all 98 managers were interviewed by telephone, ensuring a 100 percent response rate. The questions we asked included: How many home care agencies are using mobile IT? Which groups of healthcare personnel make use of the technology? When did they start using mobile IT? Another purpose was to get a sense of each home care agency's interplay with the broader organizational field, asking about their reasons for adopting (or rejecting) mobile IT, the influence of government funding, and sources of inspiration for adopting mobile IT. Recognizing that IT linguistic practices manifest in a variety of forms or channels (Kaganer et al. 2010), we chose to consider expressions (1) in newspapers and practitioner magazines, (2) on IT providers' web sites, and (3) in government reports and web sites. Although other expressions were also in play (e.g., TV and radio), these were selected to represent the major forms of expression readily available for

Table A1. Field Level Data			
Source	**Respondent**	**Purpose**	**Date**
Survey			
Survey (focal population)	Home care managers in all 98 Danish municipalities	Identifying the diffusion pattern of mobile IT and the major sources of inspiration for adopting mobile IT	September 2007 – October 2007
Documents			
Policy documents	Publishers: • Modernisering.dk • Ramböll Management • The Ministry of Finance • The Ministry of Social Affairs	To get insight into how political stakeholders promote mobile IT usage	1998 – 2008
IT providers` webpages	Three main competitors within Danish home care	To get insight into how providers market and communicate about mobile IT	2007
News articles	298 practitioner magazines and newspaper articles about mobile IT	To get insight into how the media presented and communicated about mobile IT	1990 – 2008
Interviews			
Interviews with key stakeholders in the political environment	Representatives from: • The Ministry of Social Affairs • The Ministry of Finance • Local Government Denmark (LGDK)	To get insight into the entrepreneurial effort to promote mobile IT usage as way to modernize Danish home care	October 2008 – December 2008

Table A2. Selected Cases			
	Large-HCA	*Medium*-HCA	*Small*-HCA
Municipality Population (2008)	503.699	59.040	35.445
Geographical location	Zealand	Funen	Jutland
Number of care workers (2007)	3.300	400	270
Clients recieving home care (2007)	20.018	2.602	1.600
IT-provider	CSC	Ramböll	Zealand Care
Mobile device	PDA	PDA	Smartphone (Communicator)
Mobile devices in use (2008)	2.650	400	270
Implementation	2002-2007	2005	2005

analyses. We identified and analyzed 298 magazines and newspaper articles about mobile IT usage within home care.[1] We also undertook content analysis of the websites of three key IT providers (CSC, Ramböll, and Zealand Care) that promoted and marketed mobile IT in order to examine the rhetoric that surrounded these technologies. We supplemented this with information about the providers and their solutions from newspapers and professional magazines. We read through government reports (e.g., The Ministry of Social Affairs 2005), government websites (e.g., modernisering.dk), and consultant reports (e.g., Ramböll Management 2007) to further our understanding of how mobile IT was articulated in the home care field. Finally, we interviewed key stakeholders in the political environment including representatives from the

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[1]The articles are found in the electronic database infomedia.dk and cover the period from 1990 until 2008. Infomedia.dk monitors approximately 600 Danish print media including all the key media. In our search, we used keywords such as mobile IT, mobile technology, PDA, and CareMobile in combination with home care and elderly care. The search is not a guarantee that all articles about mobile IT is included, but we believe that most articles on the subject were captured as we used different keywords and an extensive database.

Ministry of Social Affairs, Ministry of Finance, and LGDK (a major interest group for municipalities) as they were particularly influential in the discussion on modernizing home care using mobile information technologies. Through semi-structured interviews, we addressed such topics as how they were engaged in the articulation and proliferation of mobile IT. The interviews, lasting one hour on average, were recorded on tape and transcribed.

As summarized in Table A2, we collected *organization level data* to understand how ideas of mobile IT usage transformed into specific usage arrangements in individual home care agencies (HCAs). We selected three illustrative cases—*Large*-HCA, *Medium*-HCA, and *Small*-HCA—for our study. They all had considerable experience using mobile IT (respectively 5, 2, and 2 years), which allowed us to obtain detailed insight into how they engaged ideas of mobile IT usage and how it was translated into day-to-day work arrangements. At the same time, the three organizations differ in number of clients (large, medium, small), geography (three different areas in Denmark), and choice of IT provider. The multiple case design afforded illustration and comparison of various forms of translation processes, thereby ensuring more robust data compared to a single case study (Yin 2009).

To reach an appropriate degree of internal validity, we included multiple sources of empirical evidence: interviews, survey data, and documents (Table A3). Semi-structured interviews in each case represented the major stakeholders: managers and the users of mobile IT (care workers and nurses). Overall, 10 managers or project managers (respectively 4, 4, and 2 in each case) and 24 employees (respectively 7, 8, and 9 in each case) participated in the interviews. We conducted them as either single interviews or group interviews with two or three participants. Interviews included generic questions that allowed the respondents to express how they considered the decision to implement mobile IT, how they experienced the implementation process, their perceptions about mobile IT, and how they used (or did not used) the technology in practice. More specific questions were also asked. For instance, managers were questioned about major sources of inspiration and their collaboration with IT providers and consultants to explore how translation and theorization practices interacted. We ensured that the data from all cases covered similar topics and would allow cross-case comparisons (Miles and Huberman 1994). To supplement the interviews, we conducted a survey of care workers across the three case setting (N = 315, response rate 63%). Although we made use of a quantitative technique, it was not developed for hypothesis testing, but rather as a way to ensure more valid data and more robust conclusions in our qualitative analysis (Silverman 2001). The purpose was to identify the scope of some of the views that emerged in the semi-structured interviews, particularly focusing on care workers' perceptions about the new technology and how they use mobile IT in practice to get a sense of how they engaged in translating mobile IT into daily use. Finally, internal documents (e.g., project descriptions, minutes, from meetings and evaluations) were collected in each case to further our understanding of the institutionalization process, including how mobile IT usage was selected, motivated, objectified and legitimized.

We transcribed each interview and analyzed the data following the well-documented recursive pattern of interpretive research (Miles and Huberman 1994). We reported our results to key participants (e.g., managers in municipalities and representatives from The Ministry of Social Affairs and The Ministry of Finance) for validation of facts and citations. This resulted in a few, minor changes and insured the pragmatic validity of our findings. Overall, they believed our results corresponded to their personal impression of mobile IT adoption and usage in home care.

Table A3. Organization Level Data: Three Case Studies			
Source	**Respondent**	**Purpose**	**Date**
Interviews			
Interviews with key stakeholders in each home care agency	• Home care managers • Project managers • Care workers and nurses	To gain insight into how ideas of mobile IT were translated into practice	December 2007
Survey			
Survey across the 3 home care agencies	• 315 care workers received a survey and 198 responded (63%)	To quantify the health care personnel perceptions of mobile IT and how they use mobile IT in practice	December 2007 – January 2008
Documents			
Internal documents in each home care agency	• Project descriptions • Minutes from meetings • Evaluation reports	To get insight into how ideas of mobile IT usage were motivated, objectified and legitimized	1998 – 2008

To manage the complexity of data, our analysis unfolded in stages. First, we read through the collected empirical material to gain a chronology of major events (Miles and Huberman 1994). We identified antecedent conditions and major events taking place between 1998 and 2008 in mobile IT institutionalization within the Danish home care field and specifically in the three selected home care agencies. The next stage was more directly linked to our research question and our theoretical constructs served as sensitizing devices (Patton 2002). We identified three distinct periods in the process of mobile IT institutionalization, and in each period we searched for key theorization and translation practices. Finally, to outline a storyline (Golden-Biddle and Locke 2007), we focused on how mobile IT institutionalization practices constituted through theorization in the home care field and translation by its member organizations. Below, we present summary tables from the analyses.

Table A4. Adoption of Mobile IT by Care Workers (Absolute Numbers and Percentage)					
	Phase 1: 1998-2001	**Phase 2: 2002-2005**	**Phase 3: 2006-2008****	**Non-Adopters**	**Total**
Number of municipalities	0	18	71	9	98
%	0	18	73	9	100

*Home care managers were asked (in 2007) what year care workers started to use mobile IT.
**Estimate for 2008. Home care managers were asked (in 2007) if they expected care workers to start using mobile IT during 2008. 13 managers answered yes to this question.

Table A5. Publicity of Mobile IT in the Media, Categorized by Year (%)						
	Positive Publicity	**Negative Publicity**	**Mixed Publicity**	**Neutral Publicity**	**SUM**	**Number of Articles**
Phase 1: 1998-2001	64	0	18	18	100	11
Phase 2: 2002-2005	58	10	12	20	100	75
Phase 3: 2006-2007	43	21	15	21	100	212

Table A6. Sources of Inspiration for Mobile IT Adoption	
Source of Inspiration*	**The Number of Municipalities Indicating That this Source Was a Primary Inspiration**
IT-providers	29
Other municipalities	28
CareMobile	25
From "old" municipalities (in merged municipalities)	10
Professional networks and conferences	6
Consulting firms	3
LGDK	3
Media	1
Other	9

*When asked for source of inspiration, there were no predefined options so managers could freely specify multiple sources.

Table A7. Preferences of Care Workers: Current Use of Mobile IT and Previous System, 2008 (%)					
	Current System of Mobile IT	**Previous System Without Mobile IT**	**Undecided**	**SUM**	**N**
All	53	35	12	100	176
Large-HCA	52	40	8	100	82
Medium-HCA	58	31	11	100	59
Small-HCA	49	31	20	100	35

Table A8. Care Workers' Assessment of Mobile Technology Use (%)		Strongly Agree	Agree	Disagree	Strongly Disagree	SUM	N
Easy to use	*Large*-HCA	25	51	16	8	100	81
	Medium-HCA	14	57	26	3	100	58
	Small-HCA	24	64	6	6	100	33
Saves time	*Large*-HCA	7	28	34	31	100	82
	Medium-HCA	9	28	34	29	100	53
	Small-HCA	9	25	38	28	100	32
Better task performance	*Large*-HCA	11	35	32	22	100	78
	Medium-HCA	11	39	37	13	100	46
	Small-HCA	3	40	34	23	100	35
Less stressful working day	*Large*-HCA	4	10	58	28	100	73
	Medium-HCA	8	19	45	28	100	53
	Small-HCA	6	6	49	39	100	33
Increases the control	*Large*-HCA	30	31	34	5	100	80
	Medium-HCA	8	24	44	24	100	51
	Small-HCA	27	46	27	0	100	33
Technical difficulties hinder use	*Large*-HCA	19	53	24	4	100	74
	Medium-HCA	37	52	7	4	100	54
	Small-HCA	20	62	15	3	100	34

Table A9. Key Empirical Findings			
	Phase 1: Emergence (1998– 2001)	**Phase 2: Experimentation (2002–2005)**	**Phase 3: Stabilization (2006–2008)**
Key Stakeholders	Government reforms increased the need for IT support of home care. A few IT providers developed quite simple solutions based on offline connectivity. A few home care agencies tested mobile IT in close collaboration with IT providers.	Government financed an ambitious, large-scale pilot (CareMobile). CareMobile involved key stakeholders (ministries, interest groups, providers, consultants and six pilot municipalities). More IT providers developed advanced mobile IT systems based on online technology. Several home care agencies experimented with mobile IT usage.	Government allocated 45 mill Euros to support mobile IT implementation. Number of IT providers decreased. Nearly all home care agencies used mobile IT.
Theorization	IT providers, some home care agencies, and the media communicated mobile IT as an interesting innovation that could help address the need for improved management and documentation accelerated by government reforms. The legitimacy sought was more moral than pragmatic as the rhetoric presented mobile IT as functionally superior to existing practices rather than stressing a general organizational failing as core motivation.	CareMobile provided evidence of positive effects from the use of mobile IT, especially efficiency of operations. Experiences from CareMobile were articulated in general terms to make mobile IT usage universally applicable across the Danish home care field. The language used appealed to economic reason. Key IT providers developed increasingly different articulations of the benefits from mobile IT usage. The media presented mobile IT in predominantly positive terms. Innovative home care agencies communicated their experiences of translating mobile IT into practice at conferences, websites and in practitioner magazines.	The normative appeal increased as the Prime Minister and other key ministers communicated in favor of mobile IT usage. IT providers and consultants praised the use of mobile IT with examples from new working practices in specific home care agencies. Multiple ideas surrounding mobile IT usage evolved. The media published more articles on mobile IT and articles with negative publicity on mobile IT exceeding the positive.
Translation	An exclusive group of home care agencies started to translate ideas of mobile IT usage into specific usage arrangements. However, early experiments were impeded by technical difficulties and suspended after pilot. ***Large*-HCA:** Decision on mobile IT adoption to improve documentation and management control based on PDAs with offline connectivity; inspiration from IT provider (CSC); managers as key promoters. Mobile IT inscribed in a context in which *Large*-HCA had a tradition for carefully monitoring working hours and services in home care ***Medium*-HCA:** No concrete initiatives on use of mobile IT. ***Small*- HCA:** No concrete initiatives on use of mobile IT.	The scope increased with more experiments with mobile IT usage. ***Large*-HCA:** Pilot, stepwise implementation, critical voices gained ground. ***Medium*-HCA**: Decision on mobile IT adoption to improve image based on PDAs with online connectivity; inspiration from IT provider (Ramböll) and other home care agencies; managers as key promoter. Mobile IT inscribed into a context, where *Medium*-HCA saw itself as being at the forefront of new technology. ***Small*-HCA:** Decision on mobile IT adoption to improve efficiency of operation based on online connectivity; inspiration from IT provider (Zealand Care) and CareMobile; politicians from the City Council demanded administrative time savings and new meeting structures. Considerable resistance among care workers as new work arrangements collided with existing practices.	The majority of home care agencies engaged in translating ideas of mobile IT usage into working practices. ***Large*-HCA:** Mobile IT in daily use predominantly for documentation. The overall management approach dominated, but care workers also circumvented managerial guidelines and sometimes used PDAs differently than planned; different and conflicting perceptions towards mobile IT; reactions to control. ***Medium*-HCA:** Mobile IT in daily use predominantly for communication. Care workers circumvented managerial guidelines, they continued to print schedules rather than access them on PDAs. Different and conflicting perceptions towards mobile IT; technical problems. ***Small*-HCA:** Mobile IT in daily use. Different and conflicting perceptions towards mobile IT usage; lack of knowledge sharing and collegial relationships as face-to-face meeting was replaced by mobile communication.

Table A9. Key Empirical Findings			
	Phase 1: Emergence (1998– 2001)	**Phase 2: Experimentation (2002–2005)**	**Phase 3: Stabilization (2006–2008)**
IT Institutionalization	IT providers and innovative home care agencies took leadership in early theorization and translation practices. Providers developed new technical solutions, they promoted them linguistically, and they took part in early translations within home care agencies as their ideas on mobile IT usage were mixed with established management traditions in each home care agency.	Government stakeholders entered the scene as mobile IT continued to move towards institutionalization. CareMobile illustrates how this process involved recursive intertwining of theorization and translation practices as the project served as an arena in which heterogeneous stakeholders could translate different ideas, discuss challenges, and identify key lessons from practice.	Progress towards stabilization, but also movement toward fragmentation. Increased field level pressure for adoption, at the same time as adoption had different faces. Many experiences from translating mobile IT into new use arrangement continued to shape the ongoing debate over the role of the new technology.

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