

## Fluid standards: The case of mobile content services

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### Abstract

This paper theoretically and empirically discloses transformations in the 'world of standards' and the challenges it creates for current and future standardization in the turbulent and complex environment of m-commerce. This paper discusses the increasing complexity and pervasiveness of standards and standardization processes as the result of an increasing number of standards, links between them and actors involved in their development. While these processes create demand for additional standards, we point out how different kinds of standards and standardization approaches are required - not just more of the same. Developing a case study of a standard (originally Norwegian) for m-commerce, the CPA, we illustrate a range of important qualities and characteristics of standards in a field that reflects these transitions. Drawing upon recent research in Actor-Network Theory (ANT), we discuss the CPA as a *fluid standard*, or a “mutable mobile” composed of a variety of components and with the characteristics as being open, complete, simple, informal, flexible, robust, as well as building on the installed base. In a turbulent and unpredictable environment due to emerging technologies and new organizational relationships, the organization of the standardization work must fulfil basically the same requirements.

### Keywords

Standardization, Actor-network theory, mobile technologies, mobile content services

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## 1. Introduction

Research on ICT standards is in its infancy, but its volume as well as assumed importance is growing (for example illustrated by the Special Issue of MIS Quarterly on the topic published in August 2006). This reflects the growth in number of and importance attributed to ICT standards. But it also reflects a change in requirements of standards due to a more complex and rapidly changing world due to, for instance, globalization processes. This again causes changes in the nature of standards and new requirements regarding standardization processes and their organization. Globalization and internationalization processes more broadly, also leads to a rapid growth in standards outside the ICT domain. Andrew Barry (2001), for instance, argues that the European Union should primarily be seen as a standardization effort aiming at developing the standards need for European integration. This includes standards like the Euro as well as standards for chocolate and the form of cucumbers. Such standards will, however, be closely related to and embedded into ICT standards implemented by the vast range of ICT solutions required to make the envisioned European integration real.

Telecommunication has traditionally been a domain where standards have played a central role. However, during the last decades, this sector has changed dramatically through digitization, liberalization, the development and diffusion of mobile communication technologies, processes of convergence between IT, telecom and media technologies and sectors, globalization processes, etc. The aim of this paper, then, is to explore the changing nature of (ICT) standards in general and within valued mobile services in particular. We do this by highlighting their “fluid” (in Actor-Network Theory terms) character based on a case study of the CPA standard for distribution of content across mobile phone infrastructures. We outline the initial establishment of this standard in Norway and its later internationalization (by being transferred to some other countries) by seeing development and diffusion

1 of the standard as an integrated process in the way pointed out by Lyytinen, Keil and Fomin (2008).

2

3 The paper is organised as follows. Section 2 presents related research on standards. In section 3 we  
4 will present our theoretical approach – Actor-Network Theory. In section 4 our research approach and  
5 methodology is outlined. In section 5, our case study is presented. We first describe the initial  
6 development of the standard in Norway, followed by a description of its transfer by one of the network  
7 operators to Malaysia, Hungary and Ukraine. Section 6 provides an in-depth discussion followed by  
8 section 7 that summarises our key points.

## 9 **2. Related research – a changing ‘World of Standards’**

10 Because of the growing significance of mobile communication technology, some research has been  
11 done on the definition and establishment of mobile communication standards like NMT, GSM, UMTS,  
12 etc. (for example Fomin 2001; Keil 2002; Manninen 2002). The major focus of these studies has been  
13 on historical accounts, as written in committee minutes, technical documentation and specifications, and  
14 as recollected by committee members. Standardisation has been conceptualised as the manner in  
15 which different standards are selected, how formal standardisation organisations supports this process  
16 and how economically and socially optimal standards can (or cannot) be stimulated by ways of  
17 organising and regulation. Thus, the focus has primarily been on formal standardisation processes and  
18 the resulting output of standards as technical specifications. The research presented in this paper is part  
19 of a growing interest in research on standardisation in general and standardisation within ICT in  
20 particular. This increasing interest is a result of the growth in the number and importance of standards  
21 as well as the transformation of the ‘world of standards’ that is a part of the so-called convergence of  
22 telecommunications and information technologies (Brunsson and Jacobsson 2002). Standardisation of  
23 m-commerce and mobile content services is among the newcomers in this ‘world’. Our research aims at  
24 disclosing the transformations and the challenges they raise for future standardisation, and suggesting  
25 proposals for how to deal with these challenges.

1  
2 The number of standards has increased substantially, and so have the links between them (Brunsson  
3 and Jacobsson 2002; Romer 1990; Schmidt and Werle 1998). Technological changes within  
4 telecommunications and ICT have brought many new actors into this field. Telecommunication  
5 standardisation used to be taken care of by (a limited number of) service providers and equipment  
6 manufacturers. With the digitalisation of telecom, computer manufacturers and software companies also  
7 got involved. This technological change opened up possibilities for a broad range of new services. The  
8 development of such services involved even more actors – even users (big and small companies,  
9 professionals like medical doctors, etc.) (Jakobs 2000, Tilson and Lyytinen 2006). Such services also  
10 implied a need for new kinds of standards which raised new challenges. Some new and hard challenges  
11 were related to the fact that the standards for high level services needed to satisfy much more complex  
12 user practices (in particular compared to the simple ones supported by traditional telecommunications  
13 which just enabled users to dial a number, talk, and hang up.) (Bowker and Star 1999; Foray 1994;  
14 Hanseth and Monteiro 1997; Jakobs 2000). The ongoing ‘convergence’ of the ICT and the media  
15 sectors further increases the current technological and institutional complexity and variety as well as  
16 increases the speed of change.

17  
18 These changes partly triggered, and were partly taking place in parallel, with the deregulation of the  
19 telecommunication sector. The deregulation increased competition, which again brought more actors  
20 into the picture at the same time as it changed the relations between the actors involved and  
21 accordingly the rules of the standardisation process. The rules of the game were also changed as a  
22 consequence of the convergence of the ICT and the media sectors which implied that the borderlines  
23 between the regulatory regimens within these sectors (telecommunication, TV broadcasting, printed  
24 press, etc.) became blurred (see for instance, Antonelli 1994; Brunsson and Jacobsson 2002; Bunduchi  
25 et al. 2005a; Bunduchi et al. 2005b; Bunduchi et al. 2004; David and Shurmer 1996; David and

1 Steinmueller 1994; Mattli 2001; Werle 2001; Williams et al. 2004). This new “world of standards” creates  
2 new requirements for standards and standardization processes. In particular, the increased dynamics,  
3 complexity, and unpredictability, require more flexible standards and standardization processes.

#### 4 **2.1 Standardisation processes and flexibility**

5 Since early industrialisation, ad hoc approaches to standardisation have been replaced with formal and  
6 dedicated standards development organisations (SDO) (Lehr 1992). The aim of a SDO is to provide an  
7 institutional arena to support consensus building, ruling out heterogeneous interests and thereby  
8 avoiding the development of suboptimal standards (Tassej 1995). To a varying degree, standardisation  
9 processes need the support of SDOs. The emerging context of standardisation in telecom requires  
10 flexible standardisation processes. All changes mentioned above makes the tasks of standardisation  
11 bodies different. Commonly, the traditional SDOs are too slow, bureaucratic, and inflexible – the number  
12 and varieties of the technology and actors involved constitutes a too complex and rapidly changing  
13 environment for traditional SDOs. SDOs have historically limited their participants to engineers and non-  
14 technical issues have not been on the agenda, as described in depth by Haug (2002) and Manninen  
15 (2002) in the case of the standardisation of GSM. As an implication, SDOs are not suited for  
16 standardising complete technological systems. One initiative to meet this limitation is made by several  
17 consortiums or forums, such as the UMTS Forum, by coordinating the implementation of standards in  
18 the marketplace by rapidly exploiting commercial possibilities (Hawkins 1999; Vercoulen and Weberg  
19 1998). The interest of the participants in a consortium is thus primarily strategic positioning in the  
20 market.

21  
22 Standardisation within telecommunications differs substantially from standardisation within the computer  
23 industry related to, for example, vertical or horizontal integration and formal documentation or  
24 experimental driven processes (Branscomb and Kahin 1996). While dissimilarities in organisational  
25 styles and standardisation experiences are challenging (David and Shurmer 1996), the dynamics in the

1 community will also require equally dynamic standardisation architecture (Forster and King 1995). With  
2 the ICT of today, a range of decisions have to be made amongst a range of different actors (David and  
3 Shurmer 1996) who expect to be involved in standardisation (Lundvall 1995). They come from different  
4 industries with different understanding and approaches to standardisation as well as developing  
5 technology in general. To support standardisation within this context, the combination of SDOs and  
6 consortiums as a hybrid approach has been suggested (Shapiro et al. 2001).

## 7 **2.2 Standards and flexibility**

8 Standardised systems such as ICTs tend to become accumulatively change resistant as they grow and  
9 diffuse (Egyedi 2002; Hanseth et al. 1996). Thus, to endure, these systems have to be prepared for  
10 change to avoid becoming obsolete (Tassey 2000). Standards must allow for growth and change  
11 through various means of flexibility to avoid this. Flexibility can be obtained by standardised interfaces,  
12 decomposition, modularisation and black-boxing, allowing some components to be kept stable while  
13 others are changed without implications for the rest of the system. Allowing for peripheral change and  
14 innovation can release a significant potential for increasing the size of the system, its market (Tassey  
15 1995) as well as the diversity of services (David 2001; Lessig 2001).

16  
17 The location of functions close to the application that uses the function, the so-called end-to-end  
18 argument, is one example of providing flexibility by systems design (Saltzer et al. 1984). The point this  
19 argument is making is that functionality in communication networks only can be appropriately  
20 implemented if based on knowledge that only exists close to the applications standing at the endpoints  
21 of a communication system. Thus, the network should not control how it grows, the applications should.  
22 Both Lessig (2001) and David (David 2005) exemplifies this argument by illustrating the Internet as a  
23 network where intelligence is in the fringes. Since the network is not optimised for any application but  
24 open for and inviting the unexpected and surprising, innovations can flourish without changes in  
25 standards. While standards nurture and sometimes are the very preconditions for innovation, the

1 interrelationship between innovation and standards is intricate. Standards may for instance result in  
2 future innovations being hampered by previous innovations which now are de facto standards in a  
3 market (Dunphy et al. 1996). Because of an increasing installed base, not only does the cost of  
4 switching and changing standards become higher but innovations are required to conform to existing  
5 standards.

### 6 **3. A theory of fluid standards – from “immutable” to “mutable mobiles”**

7 Our chosen theoretical approach is Actor-Network Theory (ANT). The primary motivation behind the  
8 development and use of ANT has been to enhance our understanding of the relationships between  
9 scientific and technological issues on the one hand and social, organizational, political issues on the  
10 other. ANT has been used to describe the establishment of scientific theories and facts and working  
11 technologies as the building of dense socio-technical networks, where elements of various kinds  
12 (technologies, humans, institutions, etc. – called actants) are translated (i.e. modified or re-interpreted)  
13 and enrolled into aligned actor-networks. Individual actors, whether these are humans, technologies or  
14 organizations, are also seen as heterogeneous networks (e.g. Callon 1991). Central to ANT studies has  
15 been the process by which a scientific theory or technology are made universal, i.e. made to work  
16 across ‘all’ contexts, becoming a universal and purified as pure technology or science free of any social  
17 or political attributes. Bruno Latour (1987) has called such objects “immutable mobiles” – they are  
18 ‘objects’ that move around in time and space, but they stay the same. A standard, as traditionally  
19 understood, is a paradigmatic example of an “immutable mobile.” According to Latour, the making of  
20 such an immutable mobile is quite an achievement. And it is not only the object in itself that needs to be  
21 created. Its context also needs to be constructed in specific ways. This corresponds to a situation we all  
22 know within Information Systems and Software Engineering: To make a piece of software run on all  
23 computers, those computers need to be standardized (hardware, OS, etc.). And to make a computer  
24 system work, we need electricity, buildings and furniture, and an organization of people with various  
25 competences and roles, etc. And a working measurement system, like the measurement of hemoglobin

1 in blood, requires a lab with certain instruments and staff with certain skills, electricity, etc. The  
2 "immutable mobile" in itself is then portrayed as a heterogeneous network, but in addition to be both  
3 immutable and mobile another heterogeneous network need to be in place.

4

5 As a part of the recent development within Actor-Network Theory, the so-called "after ANT movement"  
6 (Hassard and Law 1999), it is argued that now the world has become more complex, and that most  
7 'objects' (knowledge, technology, practices, etc.) need to be *mutable* to be mobile. As "*mutable*  
8 *mobiles*," they transform as they flow from one region to another, but possible without the transformation  
9 leading to abrupt changes. Mutable mobiles are *fluid*, they may go through invariant transformation (Mol  
10 and Law 1994).

11

12 The concept of fluidity was introduced by Mol and Law (1994) in their study of anaemia in Africa and the  
13 Netherlands as a social phenomenon in a fluid space. The fluid concept is seen from a topological point  
14 of view, as a space, and in particular in contrast to a region and a network. The authors describe an  
15 entity by the space it occupies which in this case (of anaemia) is argued to best described as fluid. A  
16 fluid shares all the basic characteristics of an actor-network - plus some more specific ones, so specific  
17 that they prefer to go beyond the concept of a network. A network is normally described as a set of  
18 discrete entities with links in between. Elements of a fluid are not necessarily discrete. They are so  
19 closely related that they cannot be clearly separated.

20

21 de Laet and Mol (2000) define a fluid more precisely as having six characteristics, some of which are  
22 closely related. A fluid has: no clear boundaries; multiple identities; mixtures; robustness; continuity; and  
23 dissolving ownership. We will consider each of these characteristics. Possibly the most important and  
24 defining characteristic is that the boundaries of a fluid technology are not clear. Boundaries are defined  
25 by all that is needed to make the technology work. This leads to the second and closely related

1 characteristic of multiple identities. There are many answers to asking the question “What is the  
2 Zimbabwe Bush Pump”. It is a water pumping device, a hydraulic system, a sanitation device, a health  
3 provider, a community builder and a nation builder among others. Each identity has its own boundaries  
4 that are defined by what is needed for the technology to work as that identity. The boundaries are  
5 different for each identity and change over time. The identities themselves are not stable and change  
6 over time and in different contexts. Some identities may be emergent resulting from collective use of the  
7 technology reaching a certain level, e.g. nation building and water infrastructure. Some identities of the  
8 technology are defined by elements in its environment and not by its own elements. As a consequence  
9 of the multiple identities, the fluid can be said to be robust as it is successful or unsuccessful based on  
10 which of its identities is working and not working. It is not clear when it stops acting, achieves its aims  
11 and when it fails and falters. Although in the case of the Bush Pump, some components could be  
12 substituted or done without, it is not that kind of robustness which is conveyed. Lots of things can make  
13 the pump stop working but because of the multiple identities the robustness comes from its multiple  
14 purposes and there being no single weak link that can make all the identities come apart. The strongest  
15 link may also dissolve and not be obvious. The fluid is also continuous. It may have existed before but  
16 not in the same way. When new models come in old models do not disappear. The fluid technology may  
17 be specific and unique but share characteristics with others, a family resemblance, which form  
18 continuity. The fluid technology is also a mixture. It is part of other elements which could be fluids  
19 themselves. The mixtures however have a need to collaborate with each other if the technology is to  
20 work. The collaboration does not have to be rigid and can be flexible and adaptive. Finally the fluid  
21 technology has a dissolving ownership. The ownership is fluid in itself allowing the technology the  
22 flexibility to have unclear boundaries and multiple identities.

23

24 So, what can a perspective on *standards as fluids* bring to our discussion on standards? In particular,  
25 we will argue that a standard like the CPA has to be mutable to be mobile within the complex and

1 rapidly and unpredictably changing world it is a part of. This is contrary to a more 'conventional'  
2 perspective on standards as the formal, precise, unequivocal output of a formal standardization  
3 process, i.e. seeing standards as immutable mobiles. By highlighting the fluid character of CPA we aim  
4 at making a contribution to the research on the heterogeneous nature of standards and how to develop  
5 standards offering the required flexibility for rapid innovation and technological change.

#### 6 **4 Research methodology**

7 Standards are widely accepted as being of strategic value, thus standards develop through a process  
8 where multiple actors pursue their strategies and agendas. Our research approach is based on an  
9 understanding of the processes of standard making as being open and situated as well as being  
10 understood differently by the various actors involved. Inspired by Star (Star 1999), our 'reading' of how  
11 CPA emerged was focused on identifying and analysing different perspectives as well as the more  
12 unstructured and invisible work involved. While CPA is usually presented by network operators as their  
13 'success story', our approach revealed a highly complex process that was not primarily network operator  
14 driven. Further insights were gained into local contingencies, the properties of the standard and the  
15 achievements of those engaged in developing the standard.

16  
17 The research presented here started in 2002 and continued until late 2005. As we were involved in a  
18 larger project studying various attempts of internationalising platforms within one of the Norwegian  
19 network operators, the case of CPA seemed to be of particular interest. Early discussions with people  
20 working with CPA directed our attention to various properties of CPA and challenges related to its  
21 standardisation, implementation and operation. To understand these issues better, one of the authors  
22 initiated an in-depth study of the standard. Another author studied how the CPA standard had been  
23 internationalized in 4 other countries. Since CPA appeared as inseparable with its context, a case study  
24 approach was adopted (Yin 1994), following an interpretative perspective (Klein and Myers 1999;  
25 Orlikowski and Baroudi 1991; Walsham 1993; Walsham 1995). We found our role as researchers to

1 involve describing, interpreting, analysing and understanding the social world of these actors (Klein and  
2 Myers 1999; Orlikowski and Baroudi 1991).

3  
4 Starting out by interviewing the manager of CPA within the network operator where we were involved  
5 directed our attention to how close the standard was interrelated with other (internal) technical platforms  
6 as well as actors within the business sector. We also found the appearance of the relationship between  
7 the various actors and their coordination interesting which guided us also to study how CPA was initially  
8 conceived and implemented. Thus, to understand the standard, the study reached both back in time  
9 towards the predecessors of CPA, out into the business sector as well as out into the more 'global'  
10 setting by studying the internationalisation attempts.

11  
12 A total of 62 formal interviews were conducted with managers, heads of sales and system developers in  
13 a total of 34 different organisations, official of government agencies and forums (listed in Table 1),  
14 including the two Norwegian network operators. Interviews were all done face-to-face and that involved  
15 travel to Malaysia, Hungary and Ukraine. The hierarchical and professional positions of the interviewees  
16 are not listed here. The interviews lasted typically 45 minutes to an hour. 39 of the interviews were  
17 recorded and transcribed. Notes were always taken and in the cases where recording was not done,  
18 notes and summaries were discussed or sent to the interviewee to obtain his/her feedback for a  
19 common understanding and completeness. The interviews did not follow a strict, but rather an open  
20 interview guide. They were focused on discussing the very nature of CPA, its development and  
21 operation. As the interviews progressed, certain issues were also identified and focused on. In addition  
22 to the interviews, data was also collected from studying standard documents and specifications,  
23 websites and the trade press. In following the internalization attempts, presentations made and in some  
24 cases email exchanges were also obtained and studied.

25

Table 1 Interviews

<u>Type organisation</u>	<u>No. interviews</u>
--------------------------	-----------------------

Network operator	37
Aggregator	8
Small content provider	7
Integrator	2
Forum/consortia	2
Government	4
Content producers	2
<b>Total</b>	<b>62</b>

1

2 While giving a broad understanding of the standard as well as its context, this approach came with  
3 certain challenges. Since we did not operate within the borders of one or a few organisations, we had to  
4 negotiate access and justify the participation of the interviewees in a variety of different organisations,  
5 ranging from 5-men businesses to network operators with 20,000 employees. While this required  
6 different approaches to gain access, maintaining access to all these organisations was not feasible.  
7 Another challenge was to identify the important actors related to CPA, both historically and related to  
8 the business sector. To access these 'hard-to-reach' populations, a snowball strategy (Vogt 1999) was  
9 used.

10

11 The data analysis was interpretive and based on our capacity to conceptualise the essential topics in  
12 our data. In our analysis, we broadly focused on the industry's market structure, the nature of the  
13 services and the standard to include a broad context of influential factors as the actors' aims, institutions  
14 and organisations and their strategies. During the transcription of the interviews and detailed study of  
15 the notes and other documents, the key themes were identified. The themes subsequently acted as  
16 input to discussions and guided the further analysis of the transcripts and notes as well as the topic for  
17 new interviews. In parallel with this, the research has been guided by presentations and discussions of  
18 our findings at several seminars, workshops and conferences.

## 19 **5 The CPA case**

20 In this section we outline the Norwegian CPA infrastructure, then what we see as the CPA standard, its  
21 process of establishment and the actors involved. We put a particular emphasis on what we see as

1 distinct with CPA compared to traditional and common standards and standardisation approaches within  
2 telecommunications.

### 3 **5.1 The CPA infrastructure**

4 The CPA infrastructure basically supports three tasks:

- 5 • production, preparation and marketing of content services;
- 6 • transportation (requests and deliveries) of services between producers and consumers; and
- 7 • handling the involved billing transactions.

8 This service sector of content services to mobile phones was up until 1999 based on the network  
9 operators providing separate and different infrastructures and where they were taking care of all these  
10 tasks. The introduction of CPA broke up this vertical integration into functional domains, enabling and  
11 requiring a range of new roles and actors. The provision of rather simple services, such as ringtones for  
12 mobile phones will in the case of CPA usually involve:

- 13 • content producers (composers represented by IPR-brokers<sup>1</sup>);
- 14 • content providers (preparing compositions for mobile phones);
- 15 • aggregators collecting a rich variety of content and possibly integrating these in larger service  
16 concepts;
- 17 • media windows (i.e. newspapers, magazines, TV-broadcasters, etc.) providing space for  
18 marketing; and
- 19 • network operators providing transportation and billing services.

20 Linked to the core of its business idea, CPA is a joint undertaking by the Norwegian mobile network  
21 operators. On the one hand, they provide the same set of functions and a common service level (i.e.  
22 secure delivery and level of capacity), but not a single technical interface towards content  
23 providers/aggregators. On the other, they provide a common user interface for content service  
24 consumers. CPA enables the consumers to acquire content services through some simple steps. For  
25 example, if a consumer would like to travel with public transport from address A to B in Oslo, he first  
26 locates the required information for ordering the service. Typically, this information is available on the  
27 web, in a magazine, but most importantly close to where it is supposed to be consumed, such as on a  
28 poster at a subway station. The information required is basically a short number (four digit phone

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<sup>1</sup> IPR-brokers are actors mediating between content producers and those who hold Intellectual Property Rights to the content

1 number) from where to order the service from and the syntax for the service request. The subscriber  
 2 requests the content by sending a simple SMS (Short Message Services) from his mobile phone -  
 3 containing in this case for example "from A to B" to the number 2003 (see step 1 in Figure 1).

4

5 A key element of CPA is that service usage is billed over the regular mobile phone bill. Since the

6 consumer is already registered with one of the network operators, there is thus no need for

7 cumbersome registration and confirmation of personal data, credit card number etc. When the network

8 operator to which the consumer subscribe receives the SMS at its SMSC (message centre), the number

9 2003 is recognised and the request as well as the subscriber' phone number is sent to the CPA platform

10 (step 2). The CPA platform forwards the request to the appropriate content provider over a TCP/IP

11 connection (step 3).

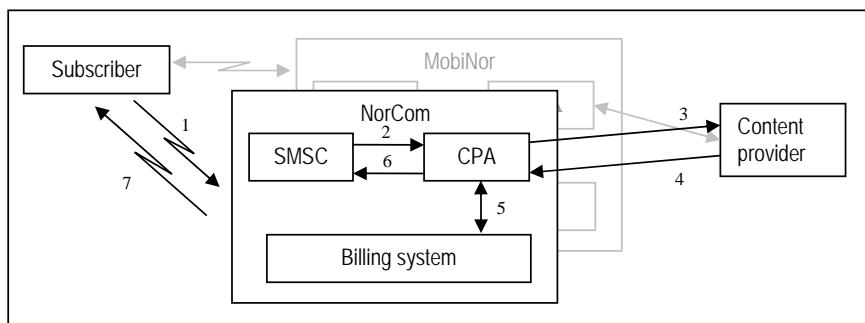


Figure 1 Content services transactions on the CPA

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15 When the content provider receives the request, they recognise "from A to B", and produce and return

16 the requested content back to the network operator together with the phone number of the requester. In

17 addition, the content provider also specifies the rating class of the service, i.e. the cost which the

18 consumer is to be charged. It is thus the content provider and not the network operators who specify the

19 cost, according to standardised rating classes ranging from 1 to 60 Norwegian Kroner (NOK) (step 4).

20 The network operator requests their billing system with a CDR (Call Data Record) to handle billing of the

21 request according to the rating class (step 5), and if successful, the content is delivered to the customer

22 by SMS over the SMSC (step 6 and 7). Finally, when the subscriber pays his mobile phone bill, the

23 revenue is split based on a standardised sharing model between the network operator and the content

1 provider. The actual content of these transactions are not approved, monitored or controlled in any way  
2 by the network operators. However, it is to their discretion to react to complaints and exclude services  
3 they find inappropriate (e.g. involving racism or child pornography) or not following their guidelines.

4

5 One prominent aspect with the CPA standard is that it is based on so-called "premium Mobile  
6 Terminated (MT) billing."<sup>2</sup> This means that incoming messages, that is the request for services, are  
7 charged as basic SMS messages according to the calling plan of the consumer, while the return  
8 message originating from the content provider (step 4 in figure 1) is premium rated, i.e. charges the  
9 receiver for more than the cost of a regular SMS. This gives the content providers the possibility and  
10 responsibility to charge several times for one request, and thus enables subscription or push services  
11 as well as services that are requested from other sources than an SMS, in particular the Internet. For  
12 example, based on choosing a certain geographical area or destination, ski-enthusiasts can subscribe  
13 to alarm services which are triggered with an SMS whenever there is more than 20 cm fresh snow  
14 (powder-alarm). Usually, subscribing to such services is for free, but each alert triggered SMS is  
15 charged according to a certain rate. Initiating such a service subscription may be based on preferences  
16 registered via the web, rather than using a simple, but cumbersome WAP interface or SMS.

17

18 As owners of the underlying mobile telecommunication infrastructures, including the billing systems, the  
19 network operators were central actors in the establishment of the CPA standard. But their recent efforts  
20 have been modest and catered primarily to increasing traffic. At the same time, several application  
21 houses are active in building add-ons to the underlying infrastructure to enable new services and  
22 service concepts. Examples include software to collect votes, produce and visually present numbers

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<sup>2</sup> Billing occurs either when a subscriber sends (originates) a text message to request a service, Mobile Originated or MO billing, or when a subscriber receives a service on their phone, Mobile Terminated or MT billing. The kind of subscription based services described here requires MT billing. Billing strategy is normally an important strategic decision for mobile phone operators. Most billing systems are based on just one of these strategies and changing from one to the other is a task of enormous costs which implies that these services will normally only be provided over infrastructures which are based on MT billing. The crucial role played by billing systems was expressed in the very first statement of our first interviewee. "What kind of services you can provide is totally determined by the billing system." (For more on the complexity of billing systems see Blechar and Hanseth, in press).

1 and statistics on ballots in relation to TV-shows, as well as software which presents on-screen  
 2 comments and questions posted by SMS to discussions/talk-shows.

### 3 **5.2 The standard**

4 The conventional view on standards is to see them as a set of detailed technical specifications –  
 5 approved by a formal standardization body or an industry consortium. Compatibility standards like tele-  
 6 and computer communication standards are primarily seen as interface specifications. Communication  
 7 standards typically define communication protocols and the formats of data to be transferred. Such  
 8 standards also define, implicitly or explicitly, the overall functionality and architecture of the  
 9 communication system or infrastructure the standards relate to. Our description of the CPA standard  
 10 deviates from this description, illustrating that the CPA is a standard of a different kind. While being  
 11 interrelated with a range of technical standards such as GSM, SMS, WAP and MMS, the CPA standard  
 12 is primarily based on more flexible, loose and informal agreements which are necessary to coordinate  
 13 the various actors' efforts. Its technical details are not specified in a coherent set of documents.  
 14 However, it does play the role of traditional compatibility standards and it fits perfectly with de Vries'  
 15 (1999) definition - which he arrives at after reviewing and discussing a huge number of such definitions -  
 16 of standardisation as:

17                    "... the activity of establishing and recording a limited set of solutions to actual or potential matching  
 18                    problems directed at benefits for the party or parties involved balancing their needs and intending and  
 19                    expecting that these solutions will be repeatedly or continuously used during a certain period by a  
 20                    substantial number of the parties for whom they are meant" (p.155)  
 21

22 And what we here consider the CPA standard to be is more than just technical specifications – it is  
 23 rather a "standardised package" (Fujimura 1992) that includes components of very different kinds. The  
 24 package the 'parties involved' arrived at in the case of the CPA includes the following five core  
 25 components:

- 26            • *Business model and revenue sharing model.*

27            CPA is based on the network operators providing a standardised business *model* for premium

1 rated content services to the content providers. This business model is further of an 'open  
2 garden' kind, implying that the network operators allow any content provider to distribute their  
3 content to all subscribers, a model that offer content providers public market access as well as  
4 economies of scale in billing. A revenue sharing model is also standardized (i.e. it is non-  
5 negotiable). The maximum charge is 60 NOK (approx 7.50€) and the predefined revenue split  
6 favours the network operator from 54 to 29 percent.

- 7 • *Equivalent functionality, architecture and service level for content providers*

8 The content providers are offered basically the same functionality and service level, even if the  
9 interfaces to the network operators' implementation of CPA platforms differs. The service level  
10 provided by the network operators are standardised in the sense that the infrastructure of each  
11 of the network operators can take care of general services as well as the typical traffic peaks.

12 The services are provided by means of an infrastructure based on a common architecture. This  
13 infrastructure is, however, implemented differently by the different network operators. While one  
14 uses the CIMD protocol, which is a subset of Nokia's CIMD2 with additional operator specific  
15 parameters, the other has implemented a SonicMQ client API for the content providers. The  
16 content providers are thus required to implement a TCP/IP interface, as well as a Java-client,  
17 alternatively a C-client. Both interfaces are based on content providers initiating a TCP/IP  
18 connection to the respective CPA platforms. The basic transactions are service requests  
19 originating from the subscriber, messages containing the services originating from the content  
20 provider, as well as acknowledge/error messages from the CPA platform to the content  
21 providers. However, aggregators provide interfaces which hide the differences between the  
22 operators' implementations of CPA for the majority of the content providers. This reduces time-  
23 to-market and the necessity of substantial up-front investments to connect to CPA. Further, it  
24 also lessens the administrative burden of network operators as smaller content providers find it  
25 appropriate to connect through the aggregators.

- *Administration and use of rating classes and short numbers*

Based on their public market approach, network operators have also standardised their administration and use of short numbers and rating classes. This adds to the transparency of the market by being the basis for a standardised way of marketing the services.

- *Guidelines for consumer protection*

Further, in order to reduce the risk of 'offensive' services being provided and marketed or marketed fallaciously, the network operators have standardised guidelines describing which services cannot be provided over CPA as well as how to market the services in a consumer friendly manner.

- *Interface for service acquisition*

By providing a standardised interface for service acquisition – the user interface, every mobile phone user in Norway has easy and transparent access to content services. Independent of which operator they subscribe to as well as the type of subscription and calling plan, subscribers can access the same services, from the same short number and for the same price.

This also makes the marketing of services simpler and thus easier for consumers to read and understand.

### 5.3 The standardization process

We will now describe the standardization process, i.e. the design, implementation and adoption of the CPA standard. While focusing on the efforts of the two Norwegian mobile network operators, we will also show the crucial importance of other actors in this process. The standardization can be split into two major steps: the first was through experimentation reaching "consensus" about an open approach; the second defining and implementing the open standard.

In 1997, both of the Norwegian mobile network operators launched independent platforms for provision of content services. These services were not considered by the operators as being of strategic

1 importance, and they thus refrained from any substantial investments. The platforms were instead  
2 based on the efforts of a few enthusiast strongly inspired by the current development of the World Wide  
3 Web – they wanted to create the mobile Internet and a marketplace in everyone’s pocket based on the  
4 mobile phone. This resource-situation combined with an ad hoc approach of a few enthusiast rapidly  
5 generating new services, led to the underlying platforms being developed in a unstructured fashion and  
6 outside the strict systematization regime of the network operators. Over these platforms, the operators  
7 offered exclusive content and utility-based SMS services to their respective subscribers – like more or  
8 less all operators around the world currently are doing. With these exclusive offers, operators could  
9 differentiate and by that (at least assumingly) strengthen brand value and increase customer  
10 attractiveness and loyalty. So, the most crucial precondition for establishing an open standard was that  
11 the operators changed this approach.

12  
13 The services offered by these closed platforms were typically news, stock quotes, weather forecasts  
14 and yellow pages. All in all, it was only simple information services. The service pricing was set  
15 regardless of the content and charged simply on a per transaction basis and as regular SMS – there  
16 were no possibilities for premium rating. Thus, at this time the stake of the content providers involved  
17 was primarily to extend the reach of their services as well as to experiment with and perhaps relate their  
18 brand to new and innovative technology. While this made the services cheap for consumers (NOK 3) it  
19 offered no, if any, possibilities for generating direct profits for the involved actors. The network  
20 operators’ pursuit of exclusive services further inhibited and limited the richness of the services offer  
21 (only utility services) as they were related to the operators’ brand. The market did not respond positively  
22 to this approach, not much traffic was generated and no further service development and innovation  
23 was spurred.

24  
25 In spite of the limited success of the services, some enthusiasts persistently believed and argued that

1 mobile content services had a potential. Fortunately, we may say, they were allowed, or at least not  
2 hindered, to work with such ideas. But the circumstances only allowed for initiatives where resources  
3 spent were insignificant and services not doing harm to the Operators' brand. During fall 1999, one of  
4 these 'entrepreneurs', a former employee of one of the network operators, returned after working for a  
5 TV broadcaster for a few years. Based on his experience with the existing SMS services from his work  
6 at the TV broadcaster, combined with his contacts with other content providers and knowledge about  
7 what they needed, he had a vision about how to approach mobile content services. Upon his return, he  
8 started pursuing a more open and dynamic approach where content providers were enabled by the  
9 operators to freely create and sell content services. Along with the other content providers, he argued  
10 that what was needed was a platform where the content providers freely and rapidly could introduce  
11 new and change existing services. Only content providers had the sufficient knowledge of the market  
12 and the will and guts to invest and innovate. As he started to pursue the operator to open up their  
13 interface, other content providers also approached both network operators with similar ideas. However,  
14 the network operators (at managerial levels) were difficult to deal with, and did for example not take  
15 suggestions such as to charge 5 and 10 NOK for content services seriously, but were rather laughing,  
16 as commented by a product developer from one of the TV broadcasters:

17                    "So, we felt for a long time like banging our heads to the door there, and this was not because of  
18                    technical issues, because that was the next thing, then one had to build that in addition. The problem was  
19                    that they simply did not believe that it was possible to create revenues from it [content services]"

20 On the basis of these initiatives from the content providers, the lack of success with the previous  
21 platforms, high cost for marketing, fundamental concerns related to linking their brand to non-utility  
22 services as well as the pricing possibilities (no premium rating), the network operators, represented by  
23 the few enthusiastic and persistent individuals, took new initiatives. The management efforts and the  
24 investment in the further implementation of what was becoming the CPA were, again, limited. However,  
25 these individuals managed to find some space for action even if this was more in conflict with than  
26 supported by existing strategies - as noted by the 'lead enthusiast' in the CPA 'project' within one of the  
27 network operators:

1 "It was a bit of entrepreneurship spirited, the project, because we had no resources assigned like you are  
2 used to in a big company. So we had to make everything ourselves, and find the resources ourselves, in  
3 a form of a project. And this resulted in, that the atmosphere, both market wise and business wise and  
4 the technical development, was entrepreneur directed."

5 After trying for months to get the access based on rumours regarding the 'new platform', and initially  
6 being rejected, the first content provider finally got the access to the CPA platform of one of the network  
7 operators in the fall 2000. The CPA platform was at this point only based on minor technical changes in  
8 the existing SMS service platform, and it was clear that the platform was premature and still  
9 controversial for network operators, as noted by the manager of the content provider:

10 "And then they had something running ... and suddenly I showed up, but they had not planned to launch  
11 at this early stage. And they had to sort out, what do we do now? And that is difficult in this kind of an  
12 organisation. So, finally by being persistent, I could plug into the platform, but it was made clear that the  
13 billing could fail to function at any time and without any rights for me to claim compensation ... John<sup>3</sup> [an  
14 employee a network operator] meant a lot for this, he did a lot that he was not allowed to by his manager.  
15 He pushed this trough internally, in a way that he possible would not if he were a devoted and nervous  
16 guy. So he was scolded a lot in the beginning."

17 Despite the legacy of the flaws and 'hacked' nature of the previous SMS platform, the platform served  
18 its new purpose. Soon, the other operator had its platform running and other content providers followed,  
19 and the traffic and revenues surpassed the previous platforms in only a few months.

20 To develop the CPA standard, negotiation and coordination were also initiated among the network  
21 operators. Already back in 1997 the operators had seen the costs, the other downsides and the ultimate  
22 failure of providing exclusive content services. In the case of the CPA, the coordination was based on  
23 sorting out issues such as the usage of common short numbers to attract large media actors. In  
24 addition, common price intervals (rating classes) were introduced to enable marketing and one number  
25 and one price for services across the market. In this coordination process, the need for a standard, at  
26 least related to the service level, was identified. The network operators were focused on avoiding the  
27 development of interfaces that were too different towards the content providers. While a certain  
28 difference in the interfaces could be positive since it would make it less attractive for small content  
29 providers to connect directly to CPA (with increasing administrative costs), too much difference could  
30 lead to only one, strong aggregator controlling the content market, which should be avoided.

---

<sup>3</sup> Not the actual name

1

2 We will now describe the process leading to agreement about each of the components of the CPA

3 standard "package". First, the common *Interface for service acquisition* came as a result of the high cost

4 of advertising and approaching only one fragment of the market. A common approach towards the

5 consumers would increase the ease and reduced the cost of advertising and make it more straight

6 forward for the users to acquire services. Already before the CPA, the network operators took the

7 advantage of this approach by using the same acquisition procedures and basically providing the same

8 services. Second, a common *business model and revenue sharing model* rendered possible the content

9 service business, as well as strengthened the operators' power towards the content providers. For

10 example, whenever content providers have tried to negotiate revenue shares with the operators, the

11 operators have acted as being tightly coordinated. The operators offer standardized and open contracts,

12 and the contracts are open and available on the web for content providers. At the same time, this

13 common approach has reduced the administrative burdens. Third, *equivalent functionality, architecture*14 *and service level for content providers* have lowered the threshold for content providers to connect to

15 the CPA platforms and further enabled new service concepts. In particular, as new service concepts

16 have emerged, the CPA platforms have changed from being mere extensions of the previous platforms

17 that was put together rapidly and ad hoc, to well integrated, tested and documented platforms with

18 proper queuing and fault handling mechanisms. Forth, and partly covered above, *administration and*19 *use of rating classes and short numbers*, has been important to enable a common interface for

20 acquisition. Coordinating short numbers implies that whenever a content provider approaches one of

21 the network operators to acquire a new short number, the network operator make a phone call to

22 reserve this number also with his peers in the other operator. Fifth, *guidelines for consumer protection*

23 have from day one been important to avoid negative attention. In general, the industry has managed to

24 have a low profile. Such guidelines have only recently been formally agreed upon by the operators,

25 primarily due to the industry growing larger and the attention from media as well as the national

1 consumer council increasing.

2

3 Bearing in mind the limitations of the earlier attempts of the operators to offer content exclusively to own  
4 customers (or 'walled garden' approaches), there is consent in the Norwegian market that the CPA  
5 standard was crucial for this industry. While the initiatives behind introducing the standard to a large  
6 extent originated from outside the operators, the very shape of the standard was at the same time  
7 defined by the network operators on their own. For example, the revenue model has been a contagious  
8 matter between network operators and the rest of the industry. This tension is intensified by the lack of  
9 initiative and resources put into developing CPA further by the network operators. While the division of  
10 roles and responsibilities is seen as appropriate, this is not reflected in the distribution of burdens and  
11 benefits. Defining the shape of the CPA standard, the constellation of network operators have also  
12 created a monopoly situation in the sense that the revenue share models are non-negotiable and there  
13 are no alternative equivalent channels for content services. Attempts by external actors to implement  
14 competing 'CPA platforms' in the mobile networks have been turned down by the network operators.

15

16 To summarise, the developers and the promoters of CPA were operating with scarce resources but  
17 were equipped with the ability to pursue what they called a 'non-telecommunication' like approach. More  
18 particularly, they avoided the need for a strong and convincing 'business case', the costs of the usual  
19 grand marketing campaigns of the network operators, the need to cumbersonely change the billing  
20 system and they managed to postpone technical systematisation and documentation. The  
21 standardization as well as its implementation was carried out in a bottom-up fashion where a few  
22 enthusiasts, working for the operators, and a couple content providers, set up a pilot version of the  
23 infrastructure and a few pilot services using it. The successful demonstration of these attracted more  
24 content providers and other actors. As the use of the infrastructure expanded, it was polished and  
25 extended and the standard defining it worked out as described in the previous section (and more on this

1 in the next section). Rather than a traditional telecommunication standardization model, i.e. a formal  
2 top-down process focusing on formal and detailed technical specifications, the standardization model  
3 was more driven by “rough consensus and running code” – i.e. in line with the slogan describing the  
4 Internet standardization approach. While the network operators implemented technical CPA platforms,  
5 content providers were similarly important in their persistent belief and pursuit for its realisation. In this  
6 process, aggregators found their role in providing support for smaller content providers where the  
7 standard did not suffice. In addition, and perhaps more important, they developed and introduced add-  
8 ons and extensions to the platform, enabling new services and service concepts. At least partially  
9 resulting from these circumstances, the cost of implementing and operating CPA platforms became  
10 marginal for the network operators compared to earlier and alternative approaches. The costs and  
11 further the risks involved are now primarily resting with the content providers.

#### 12 **5.4 The standardisation bodies**

13 We will now turn to the organisation of the standardisation process: which actors were involved and  
14 what kind of ‘standardisation bodies’ they established to help coordinate the work. We use here the term  
15 ‘standardisation body’, but it is worth noting that none of those we will mention were of the traditional  
16 kind with formal rules and formally established working groups, etc.

17

18 The Norwegian mobile telecommunication market is relatively tidy and basically composed of two  
19 network operators and approx 20 mobile virtual network operators (MVNOs). In turnover, the operators  
20 have respectively 55 and 29 percent of the market. Related to CPA, the industry is much more complex  
21 and involves a range of different roles and actors as illustrated in Table 2 below. The main activities  
22 related to CPA involve approximately 50 different companies and 250 employees<sup>4</sup>.

23

24 The role of aggregators is to collect content from a variety of content providers and provide it in the

---

<sup>4</sup> This picture is a bit different today with eg.g three network operators in Norway. But, this has not significantly changed the picture described here

1 market. Managing the relationships and interfaces with the network operators, aggregators decrease  
 2 the time to market and leverage the up-front costs for small content providers (100.000 NOK per  
 3 operator). Media windows are departments of media houses and TV-broadcasters which offer marketing  
 4 space for content providers and aggregators. Application houses and integrators specialise in  
 5 developing gateways to the network operators as well as new service concepts. Finally, the content  
 6 providers are producing (from scratch or based on others' content) and providing the content services.

7

Table 2 Actors involved in the Norwegian CPA market

Type of actors	Number of
Network operators	2
Aggregators (large)	5
Media windows	6
Application houses and integrators	14
Content providers	153

8

9 To coordinate between the different actors in the case of CPA, several bodies have developed over  
 10 time. Coordination is primarily ongoing between the network operators and the content providers as well  
 11 as between these groups.

12

13 The development and establishment of CPA did not involve any traditional standardization  
 14 organisations. In one way, several activities were coordinated by the market. But institutional structures  
 15 beyond the market did play important roles as most of the discussions were taking place through  
 16 informal networks. This was possible because the number of people involved was low and people knew  
 17 each other rather well. Relationships had developed through collaboration and because people moved  
 18 around among the organisations. For example, several of those who initially developed CPA are now  
 19 working for application houses and integrators as well as being managers of the aggregators. Another  
 20 example is the one who initiated the development of CPA within one of the network operators, who did  
 21 that explicitly based on experiences from working with a content provider and media window. This  
 22 person did later become head of one of the application houses. The first version of the CPA was  
 23 developed by a few people within the network operators after a few key people had agreed upon the

1 approach. On the one hand, they agreed to follow this approach because of extensive knowledge about  
2 the needs of the content providers due to own experiences in the content industry as well as inputs from  
3 pro-active and persistent content providers. On the other hand, they also knew that management would  
4 not allocate resources to do anything more technically sophisticated.

5

6 After the development of the first version of the platform, most standardisation work has been organised  
7 as ad hoc projects going across various organisations and types of actors. Most projects have been  
8 initiated by content providers that need new functionality. They have approached aggregators and  
9 discussed the detailed specifications of the new functions and how to implement them. And in most  
10 cases the aggregators have implemented and added to the 'ends' of the platform, i.e. the parts operated  
11 by the content providers themselves. But in some cases, the new functions have required extensions to  
12 the platforms operated by the network operators. This happened, for instance, when the service levels  
13 had to be improved to handle traffic peaks related to TV-shows such as "Big Brother" and "Idol" as well  
14 as the introduction of MMS services.

15  
16 Most actors are represented in the organisation 'Teleforum'. Within the framework of this organisation  
17 the actors have agreed upon a set of rules for consumer protection related to CPA, for instance what  
18 kind of content they should not allow, treatment of customers including dealing with customers  
19 complaints. A main motivation behind the way this forum works is the fact that all actors agreed early to  
20 act cautiously so that the public authorities did not see any need for more formal regulation of this  
21 sector. They believed that such formal regulation would make things more difficult and slow down its  
22 growth and development. The content providers have also established an organisation called  
23 'Innholdsnett'<sup>5</sup>. Within this organisation they discuss various issues of shared interest. This includes  
24 discussions to help understand the market, the architecture of CPA and the possibilities within. Both  
25 'Teleforum' and 'Innholdsnett' have thus played a role in informing the market about the CPA standard

---

<sup>5</sup> A Norwegian word for 'Content network'

1 besides the operators.

2

### 3 **5.5 The transfer of CPA to other countries**

4 One of the Norwegian operators, Telenor, eventually found the CPA as a “best practice” towards  
5 addressing the mobile content market. And, from 2001 it launched attempts to establish the CPA  
6 standard in countries where the company had an affiliate. We will here describe this ‘transfer’ to  
7 Malaysia, Hungary and Ukraine.

#### 8 **5.5.1 DiGi in Malaysia**

9 In 2001, Malaysia had 5 mobile operators, out of which the Telenor affiliate DiGi was the 3<sup>rd</sup> largest (in  
10 terms of subscribers). At the time, all operators were selling mobile content under their own brand.

11 In mid 2001, Telenor brought in one of their senior managers to be the new Marketing Director (MD) in  
12 DiGi. He had previously worked with CPA in Norway and knew it to be a good concept. In Sep 2001,  
13 with the support of the MD, two members of the Norwegian Telenor CPA team travelled to DiGi to  
14 describe the CPA system - including its success in terms of revenue generation. As a result, in Oct  
15 2001, the DiGi MD initiated a small team made up of the managers from Product Development and  
16 Mobile VAS (Value Added Services). They were given the task of revamping DiGi’s mobile content  
17 business. Although they were aware of details of the CPA and they did incorporate ideas from it, they  
18 developed what they felt was relevant for DiGi in their local context. As work progressed and more  
19 people got involved, there was some debate on the basic idea of opening up the value chain to external  
20 parties by offering a revenue sharing model. The conventional idea of DiGi doing its mobile content  
21 business largely by itself still remained strong. But the MD championing the new ideas inspired by CPA,  
22 and had the support of the CEO (also a Telenor expatriate). The two DiGi managers could also show  
23 that some of the shortcomings and risks related to the current approach could be solved with a CPA  
24 standard. Those shortcomings included DiGi’s limited advertising and promotions budget for mobile  
25 content. In addition, DiGi were unable to work with content providers with content they knew could

1 generate revenue but weren't sure if they wished to associate with the DiGi brand.

2

3 In the mean time, a Telenor Project Manager who had worked on the CPA in Norway arrived in Jan  
4 2002 to assist with the CPA project. He knew the MD and that DiGi was on the move towards the CPA  
5 system. As his girlfriend was being sent to DiGi for a period, he contacted the MD to ask if there was an  
6 opportunity for him to work on the CPA project in DiGi. The MD decided to give him a six month  
7 contract. Although there was no specific requests from the DiGi's CPA project to have this Project  
8 Manager work at DiGi, they supported the Marketing Director's decision to do so. As one manager said:

9

10 'We were actually quite happy to have somebody who had the right experience to come and assist us  
11 because at that time most of the stuff that we were talking about we were actually just basing on what  
12 they (the Telenor managers doing the first presentation) sent us, basically the presentations on how the  
13 market grew for CPA from present to Telenor's value added services revenue and what not. We were  
14 pretty much working from that viewpoint but to have somebody who had been there and done that would  
15 make it a lot easier especially when talking to the other operators because this was a person who could  
16 give immediate feedback.'

17

18 The Telenor Project Manager worked closely with a team of local managers. The team worked out the  
19 functional specifications for the CPA platform and invited proposals/quotations from a number of  
20 software solution providers. The Project Manager provided knowledge of Telenor's CPA platform in  
21 developing the functional specifications. He also got statistics on usage and queue handling from  
22 Norway. On the commercial side, the agreement for Content Providers was taken from Telenor. DiGi's  
23 legal personnel adapted it for local laws and practices. At the same time, DiGi's CEO brought up the  
24 CPA system and cooperation on short numbers at the monthly CEO meeting among mobile operators at  
25 the MCMC (Malaysian Communications and Multimedia Commission). This made it easier for DiGi to  
26 call for the first 'CPA meeting' with all the operators later that same month. Before the meeting took  
27 place, however, all the operators were invited for a meeting by one of the local television stations, TV3.  
28 The meeting consisted largely of a presentation by a Malaysian wireless technology company called  
29 Howtraffic. The previous year, at a conference in US the CEO of Howtraffic met John Strand from  
30 Strand Consulting who described the trends of the Scandinavian markets in general and the role of

1 SMS as a tool for interactive TV in particular. Howtraffic worked with TV3 to provide technical solutions  
2 for programs that required interaction with the viewers (e.g. voting). In particular, they were challenged  
3 by the lack of coordination among the operators. Presenting 5 different short numbers, and sometimes  
4 different prices, made TV-interactivity unnecessarily cumbersome. TV3 wanted to help and called for the  
5 meeting with the operators on behalf of Howtraffic.

6

7 The TV3/Howtraffic meeting added momentum to the meeting called by DiGi. DiGi presented the CPA  
8 system and its success in Norway, the advantage of this system to the mobile operators and content  
9 providers. TV3 and Howtraffic were presented as 'a real life example' showing how common short  
10 codes and standard charges would make advertisements clearer and easier for the TV station, content  
11 provider and users. The meeting ended with a plan to meet again where the other mobile operators  
12 would give their feedback or other proposals on what was discussed.

13

14 A second meeting was held in Feb 2002. Another operator, Maxis, presented their thoughts in the form  
15 of three possible systems. All three systems required cooperation on short numbers and prices. Two of  
16 the options placed one Operator or a 3<sup>rd</sup> part company in a controlling and coordinating role. The 3<sup>rd</sup>  
17 option which was the same as DiGi's proposal placed all the Operators in the same non-controlling  
18 position. In this way there would be little or no overall control. Since none of the Operators really wanted  
19 to see any other Operator in a controlling position; they left that no or little control was the better option.

20

21 Despite opinions to the contrary, DiGi pushed for keeping the maximum value at RM 10<sup>6</sup> and for the  
22 short numbers to be 4 digits (as it was in Norway). A discussion on email followed on the number of  
23 digits. One of the other Operators felt that 4 digits was too small as the first two digits was to indicate  
24 the Operator whereas DiGi felt that 4 digits would be much easier to remember. The other Operators  
25 supported 5 digits so DiGi gave up on the 4 digit position. Each operator would manage a number

---

<sup>6</sup> The Malaysian currency RM (Ringgit Malaysia) equals to 0.21€

1 series according to its prefix (Celcom (019) – 39xxx, DiGi (016) – 36xxx, Maxis (012) – 32xxx, Time  
2 (017) – 37xxx and TMTouch (013) – 33xxx). The operators would let each other know which number  
3 they had assigned to a Content Provider so that the CP could have that same number with all the  
4 operators.

5  
6 A 3rd meeting was held in April 2002, where the short code system was confirmed. Each operator would  
7 decide independently on setup, access and maintenance fees and disclose these amounts among the  
8 operators so that there would not be too large differences. Twenty-one tariff categories from RM 0.30 to  
9 RM 10.00 were also finalized. The proposal to MCMC was sent in July 2002. The operator TMTouch  
10 pulled out of the discussion at this stage, and was not one of the signatories in the MCMC proposal.  
11 TMTouch however subsequently cooperated with the other operators on what was agreed.

12  
13 Within two years the mobile content business was flourishing in Malaysia. And the transfer of the CPA to  
14 Malaysia was found to be the most successful best practice transfer ever accomplished by Telenor  
15 (Alphonse, 2007).

#### 16 ***5.5.2 Pannon in Hungary***

17 In 2002, the Hungarian Telenor subsidiary Pannon was the 2<sup>nd</sup> biggest out of three mobile operators.  
18 During the 90ies, Pannon offered through some Content Providers various premium rate services using  
19 IVR (Interactive Voice Response) – mostly services related to the sex industry. In the late 90ies Pannon  
20 started selling logos and later ringtones through SMS. Pannon bought this content from external content  
21 providers and re-sold them under the Pannon brand. Pannon did not consider this a business to be one  
22 that could generate revenue - just useful for fairs and promotions. By 2000, the growth in person-to-  
23 person SMS triggered a focus on SMS also as a delivery channel for premium rated services. Pannon's  
24 Telenor expatriate CEO was knowledgeable of the success of CPA in Norway and saw its potential.

25

1 For Pannon, a big problem with premium rated IVR was fraud. With IVR, Pannon's subscribers would be  
2 directed through inter-connect to fixed lines and then to the Content Providers. This involved a range of  
3 parties, limited control and higher costs. With SMS, however, the Content Provider would have a direct  
4 connection with Pannon's message handling and billing platform, and accordingly come under a direct  
5 and more controllable relationship with Pannon.

6

7 Most of Pannon's management – in the same manner as DiGi's - was sceptical about allowing 3<sup>rd</sup>  
8 parties to run the content business. But, Pannon's Telenor expatriate CEO saw the virtue of creating a  
9 cooperative environment among the mobile operators in order for the external Content Providers to  
10 thrive and drive this market. He convinced the other managers to support a decision to go for an "open  
11 garden" approach. At levels further down in the organization, the Telenor managers in-charge of CPA  
12 made presentations to the Pannon managers in-charge of mobile content to show the success of the  
13 CPA in markets like Norway and Malaysia.

Comment [PN1]: How and Why?

14

15 At that time, the CEO's of the Hungarian mobile operators met 2-3 times a year to discuss common  
16 issues. Pannon's CEO used this forum to try to convince the largest operator Westel (a subsidiary of T-  
17 mobile) CEO to cooperate on opening the market. This involved following key aspects of the Norwegian  
18 CPA model. The Westel CEO was initially sceptical to the ideas, but started to move in this direction  
19 after some months.

Comment [PN2]: How and Why?

20

21 In 2001, Telenor's country office in Hungary started a company called Digitania to help Pannon develop  
22 the market for premium rate SMS. They used the technical platform and resources of another Telenor  
23 company (Telenor Link, Norway) that had provided the CPA platform for Telenor in Norway. And in  
24 2001, Pannon was the first mobile operator to introduce premium rated SMS by third parties in Hungary.  
25 The third party Content Providers were made up by companies selling premium rate voice. Big Brother

1 was later screened by TV2 in Hungary and offered SMS voting, giving the Hungarian premium rate SMS  
2 market a boost.

3

4 Pannon's premium rate SMS business model in 2001 was as follows. The Content Provider signed an  
5 agreement with Pannon. The CP has to buy the right to use an access number or a range of access  
6 numbers for a fee and pay a monthly maintenance fee. There was then a revenue share between the  
7 CP and Pannon on the selling price of the content. The revenue share percentage was negotiated  
8 individually and ranged between 50-60% for the CP. The CP could decide the price of the content from  
9 a range of pre-determined price classes, but one access number could only be used for a specific price.  
10 As a result of the concern for fraud, Pannon initially decided that Premium rate SMS services could only  
11 be used based on a pre-paid scheme. Therefore, post-paid subscribers would first have to purchase  
12 pre-paid units before being able to use the services.

13

14 The access numbers for premium rate SMS services consists of 10 digits – primarily due to the  
15 requirements set by the regulatory authorities. The system originated from the access code number  
16 system for premium rate voice calls. The format and what they denote is given in the table below.

17

Long distance	Premium rate	Operator code	Price code	Content provider code
06	90	xx	X	xxx

18

19 The Long distance and Premium rate codes are fixed. The Operator codes are 62 for Pannon, 63 for the  
20 two other operators T-mobile and 67 for Vodafone. A combination of Operator code and the Price code  
21 identify a particular price. Therefore, Content Providers need different access number for different  
22 prices. The final three digits are the Content Provide Code.

23

1 There was no cooperation among the operators on access codes, and Westel argued that they wanted  
2 their subscribers to know that a particular service was coming from them by seeing the '3' in the access  
3 number. Even when the operators were using premium rate SMS to collect donations for people  
4 affected by a big flood in Hungary, the operators could not agree on a common access number. Later,  
5 as a result of strong pressure from the Content Providers, the regulatory authorities allowed some 4 digit  
6 number series to be used as access codes for premium rate SMS services and the introduction of  
7 number portability, the operators started to coordinate short numbers.

8

9 Pannon attended the CPA workshop organised by Telenor in 2002 and met Telenor affiliates from Asia  
10 and Europe. Pannon's practice of not allowing post-paid subscribers' credit for premium rate SMS  
11 services was strongly questioned. This resulted in Pannon re-examining this policy and later in 2002  
12 allowing post-paid customers a credit of 2000 HUF<sup>7</sup> for premium rate SMS. This had a 'good effect' and  
13 in 2004 this was increased to 6000 HUF. In early 2003, Pannon also developed a more standard and  
14 transparent revenue share agreement with the Content Providers, based on the revenue share  
15 depending on volume generated.

### 16 *5.5.3 Kyivstar in Ukraine*

17 In 2002, Ukraine Telenor's affiliate Kyivstar was the 2<sup>nd</sup> largest operator in a market with three main  
18 operators. UMC, the largest operator, was the first mobile operator in Ukraine to offer mobile premium  
19 rated content in 2002. The content comprised of logos, ring tones and news services which were either  
20 developed in-house or purchased from 2-3 content providers. The content was sold directly to the end-  
21 users and under the UMC brand. UMC used SMS as the means for billing the content. Kyivstar, also in  
22 2002, started selling a limited number of logos and ringtones which they promoted on their website. The  
23 content was also either developed in-house or purchased from a content provider and sold by Kyivstar  
24 under their brand. The price was kept low and it was done for promotions. Kyivstar used IVR as the

---

<sup>7</sup> The Hungarian currency HUF (Hungarian Forint) equals to 0.004€

1 means for ordering and billing the content. The price rating was based on a premium rate for dedicated  
2 phone nos.

3

4 As one of the first few Content Providers in Ukraine put it: "Before 2003, no open content market. All  
5 operators did 'something' content based on their own. Kyivstar started the CPA politics in Feb 2003".  
6 This process started in 2002 when Telenor's CPA manager made a presentation about the Norwegian  
7 CPA System to managers in Kyivstar's Product Development department. . The Head of the PD  
8 department, who was present in that meeting had heard about the success of the (mobile) content  
9 business in Western Europe and was very interested:

10

11 "I was focused on content as a business. I had heard about the success of the content business (in  
12 Western Europe) and believed in it. Telenor introduced the proper way to implement it." and "The benefits  
13 of the CPA system was that it was a success in Norway; would provide additional revenue from additional  
14 services to the customers; and cost efficient way for Kyivstar to just provide the infrastructure and the  
15 content providers do everything else."

16

17 The Telenor CPA manager said of the meeting:

18

19 "There were doubts how it (the cooperation) was going to work with UMC but they liked the idea anyway  
20 as it was a good way to manage the content business."

21

22 The IT Department got involved as well. As the IT Manager said: "There was a huge presentation from  
23 Telenor. We created a working group. What we can do? Didn't have the feeling of pressure from  
24 Telenor. A lot of presentations." The Kyivstar IT Manager asked Telenor for technical specifications of  
25 their CPA platform but Telenor did not have much technical documentation to send. The decision  
26 however was always leaning towards the IT department doing it themselves. As the IT Manager said:

27

28 "It was considered a pilot project – new services and a new platform. The plan was to try and spend as  
29 little as possible. "It was an unknown business at that time. Thought it would be a small business".

30

1 The CPA platform was developed just for SMS and later they tried to connect (premium rate) voice  
2 services but it was hard to unify the two services as the process around IVR was too different. On the  
3 technical side there had never been any exchange of information with UMC. As the IT manager said:

4

5 "From technical level no relations to UMC or even other Telenor companies. Tried to discuss with  
6 Vimpelcom and Pannon but all had different solutions. Discussion was on content providers and  
7 services."  
8

9 A new manager was hired by Kyivstar's PD Head in Apr 2002 to develop and manage the CPA  
10 business in Kyivstar. He came from a smaller mobile operator in Ukraine and had worked with premium  
11 content using voice. On his 3<sup>rd</sup> day on the job he met with Telenor's CPA manager who made another  
12 visit. The CPA concept and its success were once again presented. The PD Head had earlier described  
13 revenue sharing as "*a questionable issue*" as at that time in Kyivstar "*there was no revenue sharing*  
14 *business with anyone*". He however said "*I was in-charge of the roaming department as well and*  
15 *understood revenue share was a normal international way of doing business*".

16

17 A major concern was whether they would find companies that wanted to play the role of content  
18 providers. Kyivstar asked Telenor if they could pursue Norwegian content providers to start operations  
19 in Ukraine. The Norwegian Content Providers were however either not interested in the Ukrainian  
20 market or wanted very special terms. As the Telenor CPA manager said "*When you invite content*  
21 *providers, they want a special deal*". The market was considered undeveloped and less attractive  
22 compared to other European markets.

23

24 The Head of the Product development department believed in the "*synergy effects*" of all the operators  
25 using the same access number and went several times to UMC to meet with people from their Product  
26 Development department. The negotiations with UMC went on for six months. The agreement with UMC  
27 had been to provide the content providers with a pool of numbers in the 7000 to 7500 range. However,

1 UMC gave out access codes, some with 4, 5 and 6 digits.

2

3 Kyivstar started the CPA system with 2 Content Providers and UMC with just 1. Kyivstar had clear  
4 standard agreements and did not discuss revenue terms with the CPs. The price model was adapted  
5 from Telenor. Kyivstar also sold the access numbers to the CPs, something Telenor didn't do. Kyivstar  
6 was being approached by more companies wanting to be Content Providers. As Kyivstar's CPA

7 Manager said:

8 "There were some good companies but some just asked a lot of questions and some came with strange  
9 ideas (for content and business arrangements)"

10

11 In Sep 2003, the revenue from IVR premium rate content increased dramatically by more than 20 times  
12 and by 40 times two months later (both compared to the figures in Mar 2003). This was attributed to new  
13 services like song dedication which worked only on IVR.

Comment [PN3]: How and Why?

14

15 Final coordination with UMC on price and numbers only happened about towards the end of 2004, more  
16 than a year after CPA started. No coordination prior to that however had never created a serious  
17 problem. The Content Provider would approach either UMC or Kyivstar first and then ask for the same  
18 number from the other Operators.

Comment [PN4]: How and Why?

19

20 By 2005 the Ukrainian mobile content industry had about 92 Content Providers with 5-6 new CPs and  
21 15-16 new services every month.

#### 22 ***5.5.4 From diffusion to development***

23 This transfer process was not just about moving and modifying the Norwegian CPA to fit the context of  
24 the other countries. It was just as much about modifying the whole standard. This happened, first, by  
25 Telenor's decision to make it a corporate standard that should be implemented and shared by all  
26 subsidiaries. When it was implemented in the other countries, it was also becoming (in varying degrees)  
27 a national standard in these countries which further implied that the CPA was becoming an international

1 standard although not a dominant one). And through this process the standard was not just diffusing, it  
2 was also modified.

## 3 **6 Discussion**

### 4 **6.1 The CPA standard's success in Norway**

5 We will now discuss the success of the CPA as a standard. We will first discuss what made the  
6 standardization process successful in the sense that a standard was defined and implemented in a  
7 timely manner. Then, we will discuss specific features of the standard in itself that we see as important  
8 for its success.

9

10 The first factor contributing the success of CPA we will highlight is the relatively small community of  
11 individuals involved in the mobile content service business segment at the time the CPA emerged. It  
12 was a community of mobile operators, content providers and supporting businesses that were known to  
13 each other in the market. In Norway, individuals in these organizations knew each other very well, they  
14 had been working for different companies and kinds of companies, and many of them had worked for  
15 the operators. The members of this community had a shared understanding of how the different kinds of  
16 actors were thinking and what needs they had. Shared ideas related to mobile services had been  
17 developed, and in particular the idea that they should be implemented on top of an open platform.

18

19 A second important factor is the fact that the largest operator Telenor decided *not* to invest into this  
20 area. If they had done so, we believe that would have preferred a closed proprietary platform like i-Mode  
21 and in line with what most operators making investments in this area have done. This also implies that  
22 Telenor participated in this domain and in the community as a small unit including, by and large, just a  
23 few individuals and not as the big corporation it really is. This means that Telenor was just an ordinary  
24 member of the community of small companies.

25

1 The successful development and implementation of the CPA standard also depended on the approach  
2 followed which can be characterized as bottom-up and experimental or as evolutionary and learning  
3 oriented. First, the simplest possible pilot version was developed and tried out. The platform was then  
4 extended and improved as new needs emerged. This simple platform made it easy to try out new  
5 services which is exactly what is required in an environment, or emerging market, like the one of mobile  
6 content services. This kind of bottom-up and experimental standardization also requires specific  
7 organizational structures. The organizational structures need to be simple, flexible and dynamic. And  
8 the informal and project oriented – or ad hoc – organization of the activities fit those requirements well.

9

10 The success of the CPA standard in Norway was also dependent on what we see as its key (partly  
11 overlapping) characteristics: openness, completeness, simplicity, informality, flexibility, and robustness.  
12 We will here briefly discuss each of these points and how they are related to the standard's fluid  
13 character.

14

15 The standard was based on an *open* platform. Not only can anybody connect to the platform, but they  
16 can also extend it by adding new functions at the ends and thus extend the existing architecture without  
17 changing what exists. Thus the architecture is also open. At the same time, the standardization process  
18 has been open for those with the initiative to participate.

19

20 The standard was *complete*<sup>8</sup> in the sense that it covered all aspects that the actors needed to agree on.  
21 It included the mere technical issues such as the overall functionality and the service level of the  
22 network operators' platforms. But just as important, it was a mixture that also included the business  
23 model, aspects related to marketing, use of short numbers, rating classes, etc. And implicitly, the  
24 standard also defined roles for the various actors, such as the aggregators and integrators.

---

<sup>8</sup> Completeness is commonly identified as a key requirement of a standard. Completeness then refers to the technical specifications of the standard. Please note that the CPA was complete in a different sense, and that, as will be discussed in the next paragraph, the in-completeness of its specification is seen as a success criterion.

1

2 The standard was also very *simple*. Only the minimum of functionality was included. This means that it  
3 was easy to understand and to use or implement, and it was cheap and easy to provide new services  
4 based on it. Further, the standards simplicity made it easy to change when new requirements were  
5 revealed.

6

7 Another crucial aspect of the standard is the fact that it is *informal*, which means that almost none of its  
8 features are specified formally or in detail. What was specified was the platforms overall functionality.

9 This characteristic is the opposite of what is commonly seen as a crucial requirement of a standard

10 which says that its technical specifications should be complete so that if two independent

11 implementations of a standard are both correct, they should interoperate perfectly. The reality, however,

12 is different. No matter how detailed a standard is specified, there are always holes in it that those

13 implementing the standard need to agree upon. In the CPA case, this informal character was not seen

14 as an anomaly, but as an important feature that was taken advantage of. The problems a technically

15 complete standard is supposed to solve are in the CPA case solved by organisational means rather

16 than technological ones in the sense that unified interfaces to the operators are provided by the

17 integrators. This has been an advantage because:

- 18 • Specifying a technically complete standard would require lots of hard work which again would  
19 demand resources which were not present.
- 20 • This work would be organisationally complex because of the heterogeneity of the actors'  
21 involved (small and big ones, new and old, rich and poor, coming for various business sectors,  
22 etc.), and in particular the competition and rivalry between the network operators, would make it  
23 hard for them to agree upon a detailed specification.
- 24 • A more formally specified standard would normally be expected to solve future needs. What the  
25 future needs are in this area is incredibly hard to predict. Different actors would have very  
26 different ideas about that, and accordingly they would have very different ideas about what the  
27 requirements for a standard should be, and accordingly how to meet them.
- 28 • A more detailed standard would be more complex and expensive to implement not even  
29 considering about changing it. Accordingly it would not enable innovation in the same way as a  
30 more informal one.

31 The open, simple and informal character of the CPA standard made the standard *flexible*. Flexibility is of

1 utmost importance in an unpredictable and rapidly changing environment like that of mobile services.  
2 This flexibility also made the standard *robust*. It is robust in the sense that when new requirements  
3 emerge, the overall infrastructure can be accommodated to them in several ways. New functionality can  
4 be provided by enhancing the basic platform by the network operators or be added to the 'middleware'  
5 provided by the integrators and aggregators or it may be implemented by the content providers. It is  
6 thus also robust in the sense that modifications can be done by different actors. This means that the  
7 modifications and the work can be done where and by those best suited and most committed. The  
8 network operators are hesitant to reveal details about, discuss and indeed coordinate their internal  
9 systems such as the billing systems. By choosing a standardised service level as well as normalising  
10 the standards as far as possible, the network operators (with help from integrators and aggregators)  
11 have avoided engaging in such discussions and the potential problems associated with them. But,  
12 perhaps most important, this makes the standard robust in the sense that no single actor can block  
13 changes that do not fit their (monopoly) interests or if they do not have the resources. Thus, the  
14 standard is robust in the sense that every actor becomes to a certain degree superfluous, or at least  
15 replaceable.

## 16 **6.2 The transfer and internationalization processes**

17 The CPA standard was successfully implemented in all three cases presented above. And the CPA also  
18 turned out to be a success (to varying degree though) in these countries. However, the speed of the  
19 transfer process varied. Seeing the Malaysian case as a case in point, we can also conclude that the  
20 CPA was more successful the more fully it was implemented as a common national standard.

21  
22 During the process through which CPA was established as a national standard its characteristics  
23 discussed above were all crucial. In all cases the CPA standard emerged through an evolutionary  
24 process where it was growing in terms of elements included in the standard as the scopes of  
25 agreements expanded. Through these processes the CPA also turned out to be flexible and robust in

1 allowing for adaptation to various local specificities (like regulatory frameworks, installed bases of  
2 services based on IVR technology, fraud problems, etc.). The standard also stayed fluid in the sense of  
3 being informal. The only more formal specification was produced in Malaysia.

4

5 The standardization process consisted in all cases of two major steps: first convincing the affiliate to go  
6 for an "open garden" approach, then the other operators that they should do the same and that they  
7 should collaborate about access numbers, price structure, etc. Telenor expatriates played important  
8 roles in all cases. And the project members involved in Malaysia did actively contribute to making that  
9 transfer the most successful case. Content providers – or lack of - were also important. Content  
10 providers have a clear interest in open standards and platforms. Howtraffic, for example, did indeed play  
11 a crucial role in the processes leading to consensus about CPA in Malaysia. And in the other countries  
12 content providers put increasingly more pressure on the operators as they were growing in numbers and  
13 the positive experience with the CPA increased. An important aspect of the standardization processes  
14 was also the fact that the CPA contributed to its own success by proving itself superior to other  
15 standards for selling mobile content. It gained acceptance and was established not all at once, but in  
16 stages where one was building on what already existed in a modest fashion. Nurturing the installed  
17 base of technical components, social relationships as well as external actors was a vital process.

### 18 **6.3 CPA as fluid standard**

19 de Laet and Mol (2000) defined a fluid as having six characteristics: no clear boundaries; multiple  
20 identities; mixtures; robustness; continuity; and dissolving ownership. We will discuss each of them  
21 briefly in the relation to the CPA standard. This definition of a fluid matches well the characteristics of  
22 the CPA highlighted in the previous section, and accordingly the success of the CPA standard can  
23 largely be explained by its fluid character. But the success of the standard also depends on the fluid  
24 character of the "CPA standardization body."

25

1 Seeing a standard as a fluid is almost the exact opposite of the traditional and still dominant view on  
2 standards in general and within telecommunication in particular (and the one shared by all  
3 standardization bodies) where a standard is seen as an "immutable mobile" consisting of a set of  
4 documents giving an exact and consistent definition of a context free piece of (more or less) pure  
5 technology.

6

7 We will start with the last of the six characteristics of fluids: dissolving ownership. Dissolving ownership  
8 allows for different actors to take ownership, make a contribution and then release the ownership. It is in  
9 fact how open standards have been created, developed and maintained. Open standards are owned  
10 collectively by all its developers and users with no one singular owner. Yet there have been individuals  
11 or organizations that took ownership, made it their own, developed the standard further and then  
12 released it back so that others in the collective could also make further developments. It is in fact that  
13 taking and releasing of ownership which created the movement that brought the CPA standard from one  
14 country to another. Telenor took the initial ownership in taking it to the other markets but was also ready  
15 to release ownership allowing first their subsidiary and then the other mobile operators to adapt it to the  
16 local context and make it their own. Numerous content providers took ownership individually in terms of  
17 selecting, developing and marketing content and in so doing they collectively drove the business and  
18 contributed to the CPA's success.

19

20 Lack of clear boundaries between what has been inside and what has been outside the standard is  
21 closely related to the standard's open character. What content should be sold was undecided in the  
22 beginning and is continuously being decided even today. In Ukraine, the SMS delivery channel turned  
23 out to be only one option as IVR turned out to be more popular. Allowing the CPA standard to re-form  
24 so to speak in different contexts aided the transfer processes. It was in a way up to the context dictated  
25 by what had existed before, the business environment, operators and content providers that decided

1 which parts of the original Norwegian model should be adopted or omitted. The ability to do that and the  
2 fact that the standard could still exist as a standard and also accommodate to constraints in the context  
3 contributed to its transferability. The lack of boundaries has also made it easy to extend the standard  
4 when new requirements have emerged throughout innovation processes.

5  
6 The openness means that there were no clear boundaries between the inside and the outside of the  
7 standard and the group of participants in the standardization process. Further, there were no clear  
8 distinction between central and peripheral actors related to initiatives, innovativeness, risk-willingness  
9 and investments. This characteristic is a crucial precondition for enabling innovative activities related to  
10 content services.

11  
12 The CPA has also multiple identities as different aspects have been of prime importance for various  
13 groups of actors. For instance, for some it has been a business model and a technical architecture for  
14 others. What aided in terms of its internationalization was that it carried the identity of being a success  
15 story from Norway that some of the other markets wanted to emulate. In Hungary, the identity that the  
16 CPA could be a source of fraudulent misuse subjected it to additional requirements from the operators.  
17 It is thus important to be aware of the more important identities that develop and to address them either  
18 by accommodating them or trying to overcome them which was also done later in Hungary. The fact  
19 however that a standard can accommodate different identities adds to its robustness in terms of  
20 satisfying more owners and encompassing different boundaries. The fact that the CPA standard can  
21 mean different things to different actors secures its usability across multiple actors and situations.

22  
23 The mixture that composes the CPA consists of technical platforms, revenue models, mobile operators,  
24 the GSM network, content providers, mobile content, SMS, etc. Along with the boundaries, it is a  
25 mixture that is continuously composed and re-composed with different parts having different significance

1 to different groups and over time. This also contributes to its robustness.

2

3 Continuity has also an important aspect allowing the standard to be moved over and still be a part of  
4 what existed previously. There were no sounds of loud revolutions as the CPA standard was  
5 implemented in the different markets. Instead there was the flow of continuity and connectedness with  
6 related objects, time and space. That continuity also implied a connection with and a building upon  
7 existing installed bases.

8

9 Two of the characteristics of the CPA standard we identified as important for its success do not relate  
10 equally directly to the definition of fluid: CPA's simplicity and the fact that it builds on installed base. But  
11 indirectly they do because they both contribute importantly to the CPA's flexibility, and accordingly to its  
12 robustness and continuity.

13

14 We also believe that the fluid character of the organizing of the standardization effort contributed to its  
15 success. In one way, the organizing of an effort aiming at the development of an open standard has to  
16 be fluid by definition in the sense that anybody is free to participate, i.e. there are no clear boundaries  
17 between those that can participate and those that cannot. But in this case, the organizing was also fluid  
18 in the sense that there was no clear structure. Informal projects and meetings were organized as needs  
19 emerged. This contributed to the flexibility and robustness of the effort.

20

21 Should all standards be fluid? No, we do not think so. The fluid character of standards are of particular  
22 importance in domains when, for instance, a larger numbers of actors of different kinds are involved;  
23 things are rapidly changing; and technology is closely linked to user practices or needs. In such  
24 domains there is a large uncertainty about user needs and preferences and spaces for experimentation  
25 and innovation. Mobile content services is one such domain. Information infrastructures, including their

1 standards, for health care is another (Hanseth et al. 2006, Braa et al. 2007). Of the factors mentioned,  
 2 uncertainty about user needs and preferences is, may be, the most significant. Other parts of  
 3 telecommunications standardization, for instance the development of standards for interoperability  
 4 across different messaging services (e-mail, SMS, chat- systems, etc.) of the kind under development  
 5 by the Open Mobile Alliance (OMA) is an example where seeing standards as “immutable mobiles” still  
 6 make sense.

#### 7 **6.4 A “common core”?**

8 Having emphasized the fluid and dynamic character of the CPA standard one may ask: what is the CPA  
 9 standard really? Does it contain a core which is shared by all its implementations and which is the “real”  
 10 CPA standard? There is something which seems to be common for all – but not that much: the business  
 11 model and at a rather abstract level we can see that the overall idea of the CPA, its architecture and  
 12 functionality seem to be common. On the other hand, none of these are specified in official documents.  
 13 So they are all subject to how individuals’ see them – which of course will be different. But we will still  
 14 insist that it makes sense to say that the different implementations of the CPA are the same in spite of  
 15 the fact that they are different as they are distributed across time and space and accordingly that they  
 16 all are implementations of the same CPA standard. Sameness is here defined according to Ludwig  
 17 Wittgenstein’s (1958) concept of “family resemblance.” Wittgenstein arrives at this concept after  
 18 discussing what instances of the same concept have in common which makes them “the same:”

19 “Consider for example the proceedings that we call “games.” I mean board-games, card-games, ball-  
 20 games, Olympic games, and so on. What is common to them all? – Don’t say: “There *must* be something  
 21 common, or they would not be called ‘games’” – but look and see whether there is something common to  
 22 all. For if you look at them you will not see something that is common to all, but similarities, relationships,  
 23 and a whole series of them at that. .. we see a complicate network of similarities overlapping and criss-  
 24 crossing: sometimes overall similarities sometimes similarities in detail. .. I can think of no better  
 25 expression to characterize these similarities than “family resemblances.”” (ibid., para. 66-67.)  
 26

27 This kind of similarities is exactly what the different CPA implementations have in common and which  
 28 makes them” the same.”

## 1 6.5 Beyond fluids?

2 The discussion of “immutable” and “mutable mobiles” is a part of “the Rise of Objects in the Study of  
3 Organizations” (Blackler and Engeström, 2005) and the research on the role of objects in “socio-material  
4 practices” (Suchman 2007). We see standards as important objects in modern life and think that more  
5 research on their “nature” should produce significant contributions to this stream of research. The aim of  
6 this research reported in this paper, however, has been to make a contribution to the more narrow and  
7 specific discussions on standards within IS and related communities. But we will, however, offer a few  
8 reflections on the first theme.

9

10 We have pointed to the fact that standardization communities see standards as “immutable objects.” At  
11 the same time, a key feature of standards is their rigidity and lack of flexibility as they diffuse, i.e.  
12 implemented into technologies which are widely adopted. Their rigidity originates partly from the  
13 embedded-ness into technologies and material objects, but also from their institutionalization and taken-  
14 for-grantedness. What is needed in the domain of standardization, then, is to move beyond pointing out  
15 that some objects are immutable while others are mutable. If the argument of this paper is valid, i.e. that  
16 we need fluid standards in certain domains, we need a richer concept of fluids which helps us  
17 comparing objects and discuss whether one (standard) is more or less fluid than another, what makes  
18 an object fluid or not, etc. And of particular relevance to the technology analysed in this paper, we need  
19 to know how a standard gets transformed from mutable to immutable as it diffuses and how to avoid  
20 that to happen.

21

22 In the case reported here, the CPA standard has been maintained fluid. One simple reason for this is the  
23 fact that the attitudes of those initiated the initial establishment have diffused along with the standard.  
24 I.e. all new actors being involved has had a pragmatic approach where keeping things simple has been  
25 at the centre. To our knowledge, nobody has suggested that a traditional standardization approach

1 should be adopted. The traditional arguments for defining compatibility standards are as valid in this  
2 case as in any other. If one started drifting towards such an approach, the complexity of the technology  
3 as well as the organizational structure would most likely start growing, and such increased complexity  
4 would produce a more rigid standard.

## 5 **7 Conclusion**

6 Based on describing the condition in which the Norwegian CPA standard emerged, this paper has  
7 attempted to bring new insights into the requirements for standards and the process in which standards  
8 emerge in the area of mobile content services. While we cannot give complete answers to all questions  
9 posed, we argue that our case gives solid evidence in support of the assumption that standards are  
10 important in this area in the same way as in other areas of telecommunications. However, this study  
11 shows that in order to be successful, such a standard ought to contain more than specifications of  
12 technical interfaces. We need a fluid standard, or a "mutable mobile" containing a variety of components  
13 like business models, the structure of the business sector, short numbers, rating classes and service  
14 levels, etc. In addition, such a fluid standard needs to have certain characteristics: It needs to be based  
15 on an open or end-to-end like (i.e. extensible, scalable) architecture; complete in the sense that it  
16 covers all aspects that the actors need agreement about; simple so that it easy to understand and to  
17 use or implement, such that it is cheap and easy to provide new services based on it, and that it is easy  
18 to change when new requirements are uncovered; informal in the sense that almost none of its features  
19 are specified formally or in detail; flexible and robust in the sense that when new requirements emerge,  
20 the overall infrastructure can be accommodated to them in several ways.

21  
22 In a turbulent and unpredictable environment due to emerging technologies and new organisational  
23 relationships, the organisation of the standardisation work must fulfil basically the same requirements. It  
24 needs to be flexible, lean and simple, i.e. informal and based on ad hoc projects rather than formal rules,  
25 structures and projects.

1  
2 What we have argued here is that while standards are increasing in number and importance related to  
3 ICT, what we need is not necessarily more of the same. While standards as formal technical  
4 specifications will continue to play important roles, the current pace of innovation and the nature of  
5 actors involved in standardisation require something else. In this paper, we have showed how the CPA  
6 standard successfully adapted to this novel situation, and argued how the fluid character of the standard  
7 led to its success.

8  
9 The fluid discussion contributes to our understanding of successful standard in a number of ways. First,  
10 in seeing it through dissolving ownership, we see how in the case of Malaysia, the standard was  
11 accepted more widely through the taking and releasing of ownership by the different operators and  
12 content providers. Second and related to this is the concept of identity. Even if ownership as in the case  
13 of the CPA standard is more in terms of making a contribution and then allowing other to make  
14 contributions; the identity the standard carries can have a significant impact on its fluidity and success.  
15 In Hungary, it was the identity of something that could be put to fraudulent use. Third, fluidity as unclear  
16 boundaries requires it to incorporate things that were not in the original model. The turning point in  
17 Ukraine came when the IVR channel was also included in the CPA standard, something which was not  
18 relevant in the other countries.

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