Mobile Service Business Models for Cities:

A Framework Bridging Public and Business Model Design Parameters

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Abstract— **This paper proposes a business model framework that allows the design and analysis of value networks for mobile services in a public context. It starts from a validated business model framework and expands it to include parameters that come into play when a public entity (i.e., a city administration) becomes involved in the value network. In the quickly changing mobile telecommunications industry, this framework offers both an academic and practical tool, enabling the comparison and analysis of complex mobile city service business models that include public actors. After its theoretical development, the framework can be further validated by applying it to specific (inter)national and real-life cases.**

Keywords-Mobile services; business models; public value; public governance

I. INTRODUCTION

The telecommunications industry - and specifically the mobile communications sector - has undergone profound change in recent years, as commercial and public entities aim to find strategic fits while adapting their business models. This also applies to the subsector of mobile service provision (e.g., mobile applications and websites) on a regional, municipal or more local level. New players enter the sector (e.g., Apple and Google), actors shift their business strategies (e.g., Nokia and Microsoft), roles change, different types of platforms emerge and vie for market dominance while technological developments create new threats and opportunities (e.g., NFC and LTE) [10][11][25].

These developments have not been without importance in the context of major metropolitan areas. Both private parties as well as city governments have seen the potential of mobile services, and several, divergent initiatives have been set up and applications or services developed. Mobile services can be particularly attractive in fields such as mobility, cultural activity (discovery), tourism, hotel and catering industry, interactions with government and so on.

However, as these services grow in popularity and importance in the market, questions arise for city governments interested in harnessing the potential of mobile service provision in order to increase the quality of life for citizens in a meaningful way [24]. These questions relate to which roles cities can take up in the value network, how they should interact with emergent players, which data they may leverage in providing services, how they may take up platform roles or how they can create additional public value.

This paper will provide an initial step towards answering these questions by building on the business model matrix, developed and validated in [2]. We will expand it to include business model design parameters that become relevant as soon as a public entity or government actor become involved in the value network. Section II offers a quick reminder of the parameters in the original framework –as they remain important in the newly developed matrix– followed by the development of the additional parameters in Sections III, IV and V. Finally, we propose an expanded framework that can be used both as a design and validation tool in discussing business models for mobile applications, which include public actors. This paper decidedly starts from the perspective of the city and takes mobile services as a case to explore new ways of thinking about business models in a public context and proposes a new theoretical framework to tackle pressing questions in this sector.

II. BUSINESS MODEL MATRIX

In this section, we briefly reiterate the basic concept of the business model framework we will be building on. Ballon [1][2] proposes a matrix that is centered around two types of parameters: control parameters on the one hand and value parameters on the other. It examines four different aspects of business models: (1) the way in which the value network is constructed or how roles and actors are distributed in the value network, (2) the technical architecture, or how technical elements play a role in the value creation process, (3) the financial architecture, or how revenue streams run between actors and the existence of revenue sharing deals, and (4) the value proposition parameters that describe the product or service that is being offered to end users.

For each of these four business model design parameters, three underlying factors are at play, which can be summarized in a dichotomous way, but in reality operate on a scale between the proposed extremes. The use of the matrix as a tool for qualitative analysis has been validated through case studies in several sectors and extensively in relation to mobile services (e.g., in [3]). However, the

 ISBN: 978-1-61208-229-5

specific nature of mobile city services, and more particularly the addition of a public component into the value network, adds increased complexity to the business model. In order to capture the intricacies of combining commercial and public control and value creation, we propose a reorientation and expansion of the business model matrix. This expanded matrix is represented in the figure below and the added parameters will be explained in the following sections.

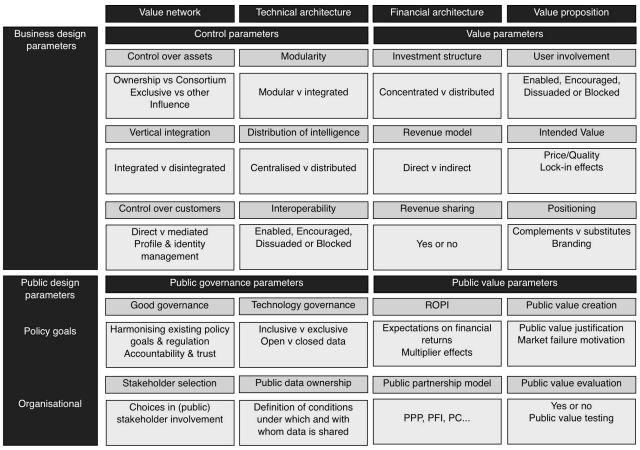

Figure 1. Expanded Business Model Framework.

We note here that all the design parameters important for the business model certainly remain so when a public entity is involved or when certain policy goals are to be achieved. These criteria stay applicable and are not in need of retooling since they were designed with mobile service provision in mind. However, when we take the perspective of a city government or various public bodies, additional business model design parameters become important. We simply refer to these extra parameters as *public design parameters*. In the original business model matrix, a distinction is made between parameters related to control on the one hand and value on the other. This is not different for the public design parameters, however in a public setting we refer to these factors as *public governance parameters* on the one hand and *public value parameters* on the other.

III. PUBLIC GOVERNANCE PARAMETERS

The concept of governance is used in a variety of fields and can be defined in divergent ways (e.g., in strategic management literature [17][29]). This view is however less suited for our approach: the business model matrix assumes a complex value network of several companies, rather than focusing on the internal operations of a single firm. For our purposes, we will use the concept of governance starting from the perspective of the institutions organizing it, i.e., local governments. Our approach is thus based in the idea of *public governance* as described in, e.g., [8]. The United Nations define governance as: *"... the process of decision-making and the process by which decisions are implemented (or not implemented)"* [27] and identifies government as a main actor in governance. It also highlights the added complexity to governance in an urban context, given the large number of actors involved [28]. A policy brief by the Institute on Governance focuses more on the public characteristics of the concept and defines it as being: *"... about how governments and social organizations interact, how they relate to citizens, and how decisions are taken in a complex world. Thus governance is a process whereby societies or organizations make their important decisions, determine whom they involve in the process and how they render account."* [15]. The World Bank [30] offers another take on the process and says governance highlights efficient management of government resources and a mutual respect between citizens and the state.

Depending on the viewpoint, the operationalization of governance can thus be quite variable. For the purposes of defining the governance parameters in relation to the business model matrix, we take note of the UN's definition and can already identify two different layers on which governance can operate, namely in reaching certain policy goals (the implementation process) and organizationally (decision-making). This idea will be expanded upon later on. Elements that are related to the relationships between public and private entities, which stakeholders are involved in the decision-making process, how power and competences are distributed in the value network, the impact of different levels of regulation (transnational, international, national, regional, local), how decisions for or against certain technologies can have effects on the value network and value proposition and so on, are important parameters related to governance, which can be added to the business model through the participation of a public actor. The following section will detail the second set of public design parameters as an addition to the value parameters in the original matrix, namely those related to public value.

IV. PUBLIC VALUE PARAMETERS

The extension of value parameters to public value parameters is a logical one as it is clear that the involvement of a public entity in the value creation and value proposition can have consequences in the public sphere. For example, when public funds are used to develop and deploy a certain service, one might expect a government to justify to tax payers why such an investment is important and whether it fulfills a certain public value.

Mark Moore, author of the seminal work *Creating Public Value* [20], together with John Benington, starts by exposing two ways in which public value can be regarded: firstly, "*what the public values* and secondly, *what adds value to the public sphere"*[5]. He argues that the first question 'what the public values' is a more recent one and can serve as a counterbalance to the top-down determination of what public value *should* be. It empowers citizens to become more active participants in government. However, tensions can form between these two, for example when public service is regulatory in nature (e.g., police) and may impose things on an "*unwilling user*" [20]. With relation to the second question of what adds value to the public sector,

Benington [5] answers with more questions in trying to define what the public sphere or the public itself is, as well as the interesting point on *"what value constitutes in the public sphere, and who decides?"*, exposing questions on power relations, the process of democratic dialogue and absolute and relative values, which are relevant to our analysis. He goes on to detail potential actors that can create value, situate where and how value is created and how it may be measured, and we will come back to this later.

Talbot takes a related approach and identifies different areas in which public values may conflict and proposes that understanding these competing values better, offers a way for public agencies to deal with them [26]. He selects five dimensions on which a public entity should satisfy the public: trust and legitimacy, collectivity, security, personal utility and autonomy. Already, we begin to see similar concepts emerging to the ones appearing in the section on governance and issues such as transparency, responsibility, participation, trust and accountability will be an important part in the further development of the business model matrix.

We take away that the concept of public value is clearly a multi-layered and complex one. For our purposes, we will need to limit the scope in analyzing public value to a more narrow set of parameters. We will define these new parameters in line with the existing business model framework, i.e., per domain (value network, technical architecture, financial architecture and value proposition), but add criteria to reflect the increased complexity when public actors are introduced to the value network.

V. INTRODUCING PUBLIC DESIGN PARAMETERS

The combination of governance parameters and public value parameters to the control and value parameters of the business model matrix, means expanding the framework downward to include additional parameters. The new parameters related to the public domain are explained below. Each time, the first parameter reflects a policy goal, the second an organizational challenge.

A. Governance Parameters Related to the Value Network

1) Good Governance

Similarly to governance, several definitions of what constitutes good governance can be found. The United Nations Development Program states good governance is "*participatory, transparent and accountable*", as well as "*effective and equitable*" and "*promotes the rule of law*" [27]. Hirst [16] proposes a definition, which focuses on the stabilizing elements good governance should entail, and Munshi [21] emphasizes the importance of participation in governing. Graham et al. [15] list five principles for good governance, based on a similar list of eight characteristics of good governance defined by UNESCAP [28], namely *participation, rule of law, transparency, responsiveness, consensus oriented, equity and inclusiveness, effectiveness and efficiency, and accountability*.

Given the relatively vague nature of these concepts and the difficulties in operationalizing them, we will focus on what binds them together: a striving towards equilibrium in governing. This often means finding a balance amongst existing policy goals on the one hand and between those policy goals and existing regulation on the other. As existing policies and regulations can in many cases be contradictory, a striving towards consensus and harmonization of interests is deemed essential in good governance [16]. Since good governance can hardly be regarded as a confined concept [18] and several sources state it should be seen as a process, we propose selecting the trade-offs between often contradictory, existing policy objectives and regulation as an important parameter. In practice, this parameter is dependent on the context in which a certain initiative is taken, but could for example entail an analysis of the goals a service tries to reach and to what extent it contradicts other policies within a government (or e.g., a political coalition) or existing regulation. For example, as more ICT-related regulation comes into play on different decision-making levels (e.g., the Digital Agenda framework laid out by the European Commission [10]), local authorities need to take their compliance with this regulation into account when developing an initiative.

Additionally, we emphasize the concepts of accountability and trust, as it is important to consider which public entity can be held accountable if something should go wrong and how the citizen's rights are protected or can be enforced (see for example [9]).

2) Stakeholder Selection and Management

This organizational parameter refers to the choices that are made related to which stakeholders (be they public, semi-public, non-governmental, private or so on) are involved or invited to participate in the process of bringing a service to end-users (see also the section on governance). In light of the good governance parameter and the striving for balance and consensus described above, including or excluding a particular stakeholder can have consequences for the viability of the final value network and is related to achieving a strategic fit [2] within the business model (cf. supra). Several (sometimes even pragmatic) elements can be important to take into account when deciding on which stakeholders to involve. For example, one aspect could be how competences are distributed among the government actor(s) involved in the value network. When discussing the city, it quickly becomes clear many different levels of government could come into play when offering a certain service, e.g., international, transnational, national, regional, provincial and local. Particularly in the case of large cities or municipalities with large or complex structures, it will be necessary to consider which public organization is responsible for a certain competence or application domain when developing a service, and how these different levels are organized and interact with each other. With the goal of achieving a strategic fit among the actors involved, the

 ISBN: 978-1-61208-229-5

selection process of which stakeholders to involve or not, and how this is decided, is thus important to consider in the analysis.

B. Governance Parameters Related to the Technical Architecture

1) Technology Governance

We borrow this term (more precisely *technological* governance) from [32] who builds upon the concept of *technological citizenship* and links it to how technology is shaped by powerful actors within society. He makes an argument for a more participatory process in which the citizen is the deciding entity in technological choices, which should lead to those technologies "*being more compatible with democratic principles*" than some current "*authoritarian technologies"*. We are not inclined to go as far in this argument, but do recognize the importance of transparency, participation and emancipation in making technological choices, especially by public entities. Choices for a particular technology or platform (e.g., by only offering an iPhone application) may exclude certain parts of the population, something a government should be wary of. This is captured in this parameter through the area of tension "inclusive versus exclusive".

A second element we link to technology governance is the use of open data and whether government information is made available to citizens through the use of ICTs. Many cities and governments are sitting on a wealth of information, which does not find its way to citizens. Okot-Uma [23] lists five important principles related to open government and citizen access to information through digital technologies and ICTs, namely *access, process, awareness, communication and involvement*. Opening up certain data sets and letting developers and the public experiment with them can be an important addition made by a public entity in the mobile services value chain. The choice of a public entity whether or not to open up its data is captured by this parameter.

2) Public Data Ownership

If the decision to open government data to the public is made, the responsible government body should carefully consider the terms under which this data is opened up and to which actors. This is a technological decision in the sense that selecting or limiting the type and amount of formats the data is available in, has consequences to which parties can start working with it (e.g., if the data is machine-readable or not, presented in natural language as well, only available in proprietary formats and so on). Related to this we also consider whether the data is made available to exclusive partners or not and what type of licensing schemes might be in place, as well as their terms. This could be the case when for example a public transportation company decides to provide its real-time travel information to Google, but blocks small developers from accessing the data. These are technical and organizational decisions that can have an important impact on the way the business model is constructed and the final value proposition to the end user.

C. Public Value Parameters Related to the Financial Architecture

1) Return on Public Investment

The phrasing of this parameter is far from new; the notion of expecting a return on public investment in the economic sense is for example mentioned by Margolis [19]. In the context of the business model matrix, we mainly refer to the question whether the expected value generated by a public investment is purely financial, public, direct, indirect or combinations of these, and - with relation to the earlier governance parameters – how a choice is justified. A method, which is often used in this respect, is the calculation of so-called *multiplier effects*, i.e., the secondary effects a government investment or certain policy might have, which are not directly related to the original policy goal. In practice, these effects could be measured by looking at increases in GDP, economic activity, job creation and so on. Calculation of these factors would lead us too far, but we will consider if such indirect return effects are expected or formulated by governments investing in a particular initiative. Also important to consider here is whether these reflections are made *ex-ante* or *ex-post*, i.e., before or after a value proposition is offered to end-users.

2) Public Partnership Model

The organizational parameter to consider in this case is how the financial relationships between the private and public participants in the value network are constructed and under which legal entities they set up cooperation. One example of such a model is the public-private partnership (PPP). Flinders [13] highlights the importance of politics and political tensions behind PPP-constructions as an addition to the traditional analyses from an administrative, managerial, financial or technical viewpoint. While we acknowledge the importance of the political aspect behind PPPs and take into account that political issues may delay or advance particular initiatives, a complete analysis of political tensions underlying certain PPPs is out of scope here. PPPs can also operate in very different areas such as public transport, public utilities, infrastructure and so on. Zhang [31] lists critical success factors for PPPs in infrastructure development such as a favorable investment environment, economic viability, a strong technical consortium, a sound financial package and an appropriate allocation of risk via contractual agreements. Bovaird [6][7] provides an overview of PPP development in the UK and details several potential purposes for and types of PPPs. We also take note of his remarks related to responsibility and risk distribution in this context, namely that the focus should be on the success of the partnership, rather than on that of individual agencies [6].

In the context of the business model matrix, and given the location of the parameter in the financial architecture column, it is clear we choose to emphasize the financial

implications and risk distribution effects of a PPP-model. While other considerations related to the structuring of a PPP are clearly important to the business model design, these are already captured in other public design parameters, e.g., those on *good governance* or *technology governance*. In this perspective, it is also interesting to consider other models, such as a Private Finance Initiative (PFI), a "*more financially-driven PPP, in which the motive for the partnership is fundamentally the readier access to capital finance enjoyed by private sector partners*" [7] or forms of purchasing consortia (PC) which are aimed at seeking economies of scale and bulk purchasing. These and other financial constructions between public and private entities are the subject of this parameter.

D. Public Parameters Related to the Value Proposition

1) Public Value Creation

This parameter examines public value from the perspective of the end user and refers to the justification a government provides in taking the initiative to deliver a specific service, rather than leaving its deployment to the market. A first element that can be of interest is – again borrowed from the broadcasting sector – whether a form of *market failure* is present in a certain domain, i.e., when there is a lacuna in service provision that cannot be met by commercial entities. Of course, depending on the domain, this can be a sensitive discussion (as it is in broadcasting), so together with establishing whether market failure can be identified, we should consider if the fact that there is a specific need in society that is not being met (so that government needs to intervene) is contested by other actors in the value network, or not. And, in the spirit of transparency and good governance, such a justification should also be provided to the public.

We also refer to Moore again here, who, in his Public Value Framework for public organizations [20], proposes some attention points in creating public value (see also [24]): organizational vision (captured in the next parameter by us); strategic goals; links among goals, activities, outputs and outcomes; the range of outcomes; and activities and outputs that create outcomes. We take away here that the goals, outputs and outcomes that public entities wish to achieve need to be clearly outlined and detailed ex ante, so that they can be verified once a service is launched (see the next parameter) and be held accountable (under the good governance principles) should questions on improper behavior arise. The definition of these goals and the promise of their evaluation may also alleviate concerns that can be present with the public.

2) Public Value Evaluation

The organizational parameter we identify as important with regards to how the value proposition is constructed, is whether and how the public value that is (supposedly) created by a public service is evaluated. One way of evaluating the potential success and impact of a public service, can be found in public service broadcasting, with the public value test (PVT) organized by the BBC Trust (the body governing the BBC) and Ofcom (the UK media regulator) as probably one of the most famous examples of such a test. The PVT consists of two parts: the Public Value Assessment (PVA), which is performed by the BBC Trust, and a Market Impact Assessment (MIA), performed by Ofcom. The Trust has a general framework it applies to identify the public value of a service (in some cases ex ante, in others ex post as the debate on which is favorable in which case has not been settled), which is an extension of the public purposes the BBC should fulfill in its role as broadcaster. The parameters of this framework are: reach, quality, impact and cost (and value for money) [4]. These parameters are quite broad and will receive a particular interpretation depending on the service under investigation according to the Trust. The MIA looks at the potential direct and indirect impacts a proposed service may have on consumers and producers of other services in the market [22].

Given the specific nature of broadcasting and the still broad terms describing the PVT, the main take-away towards the business model matrix is whether or not an evaluation is performed in the first place, as well as a description of the form of that evaluation (e.g., a PVT). Clearly, such a test requires clear policy goals that have to be laid out by policy makers and a set of predefined targets such an evaluation should verify.

VI. Business Model Matrix Incorporating Public Design Parameters

These new parameters are important in a context where a public entity becomes part of the value network and have been added to the business model matrix. While this matrix may also be a useful tool in other sectors, we started from its origins in mobile services.

This updated business model matrix, incorporating public parameters, can be used in two ways. In the first place it can guide a qualitative analysis, facilitating the detailed description and comparison of business models in the mobile (public) services industry. By using the parameters to describe different aspects of the business model, a structural comparison between different models becomes possible. Secondly, the matrix can be a useful guide when designing potential business models during the conceptual phase of a service.

VII. Conclusion

This paper set out to build a framework that could facilitate a better insight into mobile service business models when public entities play a role in the value network. We started from the business model matrix, proposed by [1], and expanded it to include public design parameters. Similarly to the distinction [1] makes between control and value parameters, we propose a division between parameters related to governance on the one hand

 ISBN: 978-1-61208-229-5

and public value on the other. Within this division, we delineated eight new parameters to take into account. These operate on two levels: an organizational one, which focuses on how the government organizes itself in realizing the first level, namely the policy goals it sets out to reach. These two levels of analysis are included in the updated matrix.

After making this distinction, we detailed the new parameters and explained their origins. Each of them can be linked up to the original business model matrix, of which the parameters remain applicable. The newly defined governance parameters are good governance, stakeholder management, technology governance and public data ownership. The parameters related to public value are return on public investment, public partnership model, public value creation and public value evaluation. We consider these parameters to be of importance when analyzing a business model in which a public entity (i.e., a city government) is part of the value network.

This expanded framework can be both used as a tool for qualitative analysis (a posteriori) and to design (a priori) the business model of new service initiatives. The parameters allow us to perform a structural analysis of the complex value network of public services and help to identify important aspects that would have been less likely to come to light when only using the business parameters. The addition of the public parameters to the business model matrix adds and interesting and useful layer that allows a more detailed analysis of complex mobile service business models that include public actors.

ACKNOWLEDGMENT

This work was performed in the framework of a Prospective Research for Brussels grant, funded by Innoviris and the Brussels Capital Region.

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 ISBN: 978-1-61208-229-5