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The MobiCom Project

Emerging Market Dynamics
in the Mobile Services Industry

White Paper

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Executive Summary

This paper provides essential insight for all those who deal with the uncertainties of the mobile business environment and whose survival depends on wise decisions that are likely to capitalise on the opportunities lying ahead while mitigating against the imminent risks.

Our task here is to map the implications of the four MobiCom scenarios for market competition and business strategy. Towards this aim, we have investigated market dynamics in the mobile market. Our analysis is based on the scenario value chain models. The scenario value chain models consider the broader market dynamics by taking into consideration all the actors in the mobile services value chain.

We have made an analysis of four scenarios for the future mobile market. The analysis is made with the purpose of identifying the dynamics of the four alternative mobile futures. Our purpose here is not to draw potential business models or specific business plans, although the reader can draw various useful conclusions in this direction as well. The viewpoints addressed for each scenario are regulation, Technology and Market structure. The last part of this white paper includes opportunities, risks and strategic recommendations for the key mobile stakeholders: Mobile Network Operators, Service and Content Providers, Service Integrators, Application Developers, and Customers.

Finally, the paper provides an illustration of how this scenario analysis can be used for strategic decision-making in this industry, under different assumptions about the future.

1. Introduction

According to the industrial [3] and academic world [1, 2, 7], a number of new business models, basically in terms of new players and roles, are gaining ground in the mobile communications industry, namely the Virtual Operator (VO), the Wireless Application Service Provider (WASP) and the Multi-Access Mobile Portal. While these business models introduce crucial business evolution that has to be seriously considered, they are not providing themselves a feasible investment opportunity for start-up companies. An exception may stand for the WASP model, which provides tremendous opportunities for start-up Application Developers to become either a consumer or a business orientated WASP. Depending on the way in which the above actors are related to each other, we can have a number of different business models. A combination of the above business models/roles with some existing roles (Mobile Operators, Content Providers, Service Providers and Integrators, Application Developers) and Internet business models (e.g. Internet portals, payment service provider) results in more complex business models for m-commerce. In order to define the most profitable business models, one has to take into account the special features/ implications of the mobile environment, as well as a number of trends/ changes in both the supply and the demand sides of the mobile service provision.

The special features that differentiate mobile transactions and services from their e commerce equivalents concern the ability to locate people through their handheld device, the availability of services regardless of time and space, the immediacy of receiving information and service at hand, etc. The wireless environment has not only special features but also special peculiarities, including peculiarities of wireless network, constraints of mobile terminals, and usability implications. M-Commerce brings challenging opportunities for all actors involved in m-Commerce, the role of which can vary from very simple and passive to very active and dynamic by being strategically positioned in the value network that is developed.

Figure 1 depicts the various roles market players can assume in the mobile market. These should not be seen in the narrow sense of a business model. Further, this is not a comprehensive list of all current and potential future players in the market. Instead, this diagram, presents distinct abstract roles. Any one actual player today or in the future may choose to assume one or more of these roles. Moreover, as we shall show in subsequent sections, over time and under different market conditions, key players may shift their core activities from one role to another.
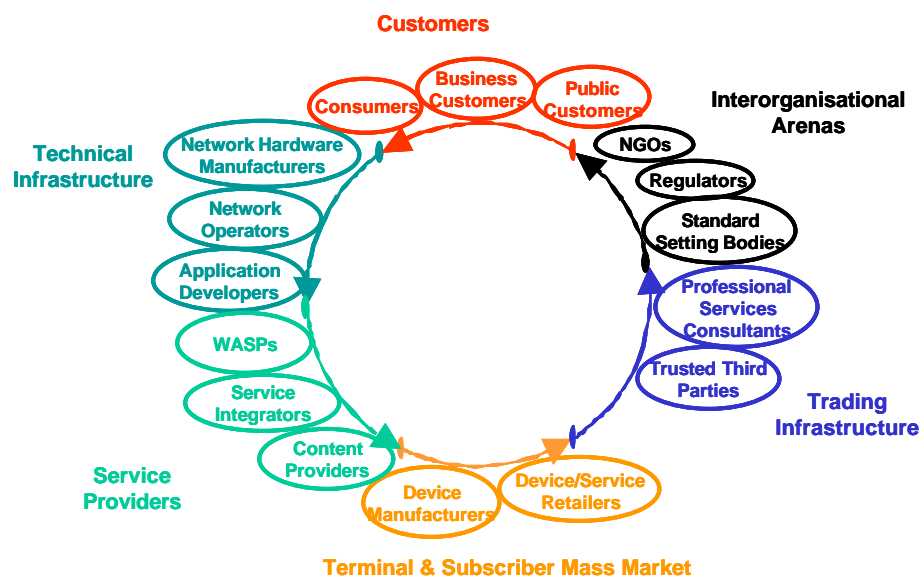

Figure 1: M-Commerce Roles

Trends that will be driven by strong market conditions rather than regulatory forces will require Mobile Network Operators (MNOs) to shift their business focus away from providing only the network infrastructure to their mobile customers. Instead, they will be obliged to increase their value proposition by offering either directly or though their established partners (Content and Service Providers) an entire service package to their individual and business customers. MNOs that fail to implement such strategies will not survive in the long-term, since network provision is expected to become a commodity. MNOs and Virtual Mobile Network Operators (VMNOs) are expected each to occupy their own space in the market. They will differentiate themselves towards customers through their range of services and brand rather than through deployment of their own infrastructure. The final allocation of roles as well as the distribution of revenues will be the crucial business model determinants for the future mobile market.

A number of considerable trends, basically in terms of evolving needs and requirements of the mobile users, will also have an impact on defining and assessing m-business models. The customers' demand for doing business from anywhere and at any time in a consistent manner with the best available device is expected to vastly affect the way that businesses operate and the way people live. Moreover, the customers' need for getting a package of services rather than isolated content and services will force the development of new partnerships along with revenue sharing agreements.

Based on four future scenarios, we discuss trends, relationships and dominant roles for the future.

2. Working with Scenarios to Assess Business Models

2.1 Introduction

The MobiCom Project has already developed scenarios for the Mobile Commerce in 2006 [4].

In order to simplify the presentation of the four scenarios, we have selected two aggregate dimensions on which to define them: *Public Initiatives* and *Operator Power*. Next, we have identified the extreme values that each dimension may take and sketched the four scenarios (see Figure 2).

We analyse these scenarios in this chapter and we try to give a valuable overview of the future environment. According to our framework, we give an insight to the regulatory and technical background as well as to the market structure.

Although a key characteristic of Mobile Commerce is that it involves a very broad and diverse range of stakeholders and various formal or informal stakeholder organisations, we have tried to reduce this complexity by analysing the main roles, which are the application developer, the network, service and content providers, as well as the service integrator. The strategic plan followed by these actors-roles is anticipated to have an impact on the structure of the future mobile market.
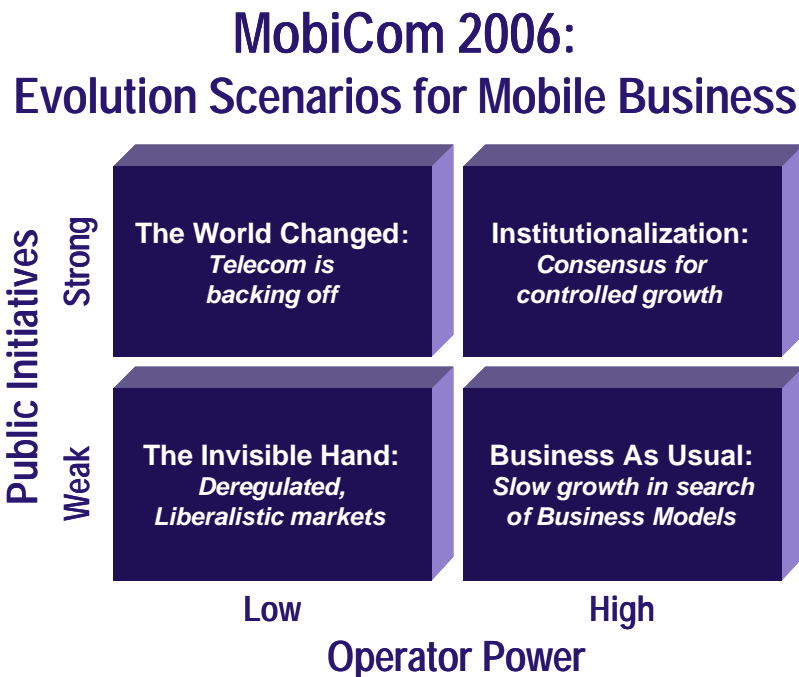
MobiCom 2006:
Evolution Scenarios for Mobile Business

Figure 2: Four Evolution Scenarios for Mobile Business

2.2 Scenario 1. Business as usual: slow growth in search of business models

According to the present scenario, by 2006 there has been a sloppy growth of mobile commerce, and the market constellation resembles the situation of today. The economic downturn and aftermath of the UMTS-licensing rounds have stagnated the anticipated growth.

2.2.1 Regulation

Government does not provide the stimulus for the diffusion of mobile services. Control over copyright does not exist due to unclear principles for content licensing. Effective regulation does not exist regarding privacy issues. It is not possible for consumers to control the type and quantity of information they give away in any transaction.

2.2.2 Technology

Although technological pluralism exists and UMTS is not the only platform, seamless roaming between services, devices and networks does not exist. Standardisation of mobile technologies has not been assured and therefore dominant industry players define their own standards for m-services delivery, access and development.

2.2.3 Market Structure

Actors

Network Provider / Service Integrator

As a part of the European Union regulatory framework, mobile operators are forced to separate their roles as network providers and service integrators. Customers are only able to use services, which are supported by their operator. Nevertheless, because of the lack of roaming, they can have many subscriptions to various network operators. The lack of proper roaming combined with the intense fight for subscribers has led to a situation, where different network providers' services are not compatible. Efforts to standardise services and interfaces are met with resistance by operators, as service differentiation are seen as the primary means of competition. However, each operator offers a broad menu of services, in collaboration with an increasing number of third parties supplying content, applications or just the business idea. In that sense, the operator acts as integrator of the services offered through its own network (but does not offer services exclusively distributed through competing networks).

Application Developer

The application development market remains small, due to technological and financing reasons, and operators are forced to carry out a lot of application development themselves on behalf of third parties. This creates a bottleneck in new service development. The key competitive advantage of operators from an application development point of view is their investment and know how in billing systems. It is highly unlikely for any third party application providers to develop their own billing system, which is essential for any business model. Therefore, mobile operators effectively control the market for applications.

Content Provider

The operators have been able to dominate content providers. The primary reason for this is that the content providers have not considered mobile as a competitive channel for their services. As roaming does not work seamlessly, the market size is limited compared to the one provided on the Internet. The content providers' efforts to limit illicit copying have required substantial investments, but meagre results. Copyright infringements are common, and content providers are compelled to rely on operators in fulfilling their obligations to copyright holders. As a result, operators effectively acquire exclusive rights to content and are responsible to enforce intellectual property rights through their delivery channel.

Service Provider

Service providers also depend on the operators, as the operators own the customer data and are the sole partners to provide mobile payment systems. The balance of power is on the operators' side.

Actors Relationships
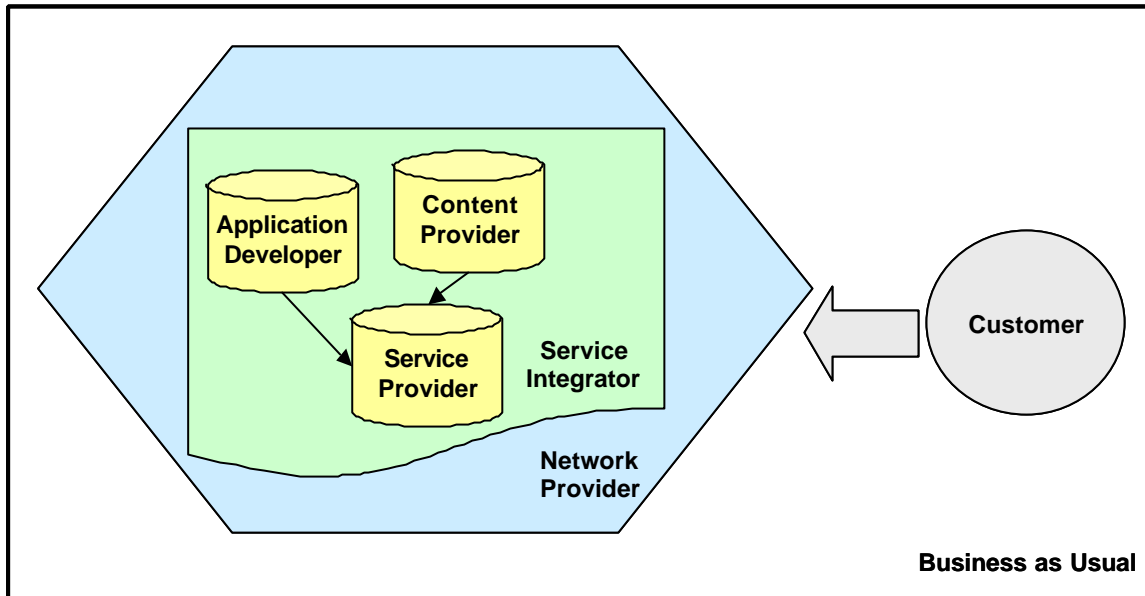
Operators in effect take ownership of content. In this scenario, the mobile operator dominates the value chain by developing applications, acquiring exclusive rights to content and providing the services. lack of technological standards, copyright protection and effective regulation impede the development of a differentiated large market for mobile services. Operators may enjoy the benefits from controlling the value chain but, at the same time, are a bottleneck, slowing down industry growth.

There is intense competition between network providers for consumer market share and for higher average return per user (ARPU), in other words, 'wallet share'. Competition for ARPU turns to competition for more innovative value added services. However, operators can devote only a limited amount of resources to new service development. Market entry in the application development and service provision segments (currently controlled by the network providers) is difficult for the following reasons.

Lack of technological standards. Potential application developers have to tie their systems to those of the operator.

Network providers own billing systems and know how. This is related to the lack of technological standardisation. Every new application requires the appropriate billing front-end, which is non-standardised.

The end-user interface is not conducive for third party service providers. The SMS interface is inherently controlled by the operator, while the WAP interface, which is suitable for third party service provision, has failed to attract large numbers of end users.

2.3 Scenario 2. Institutionalization: Consensus of institutions for controlled growth

This scenario envisages an extended and well-developed value chain where service providers, content providers and application developers have distinct roles as suppliers. However, the network provider, who controls the customer base, dominates the market. This is an ideal scenario from the operators' point of view.

2.3.1 Regulation

Government actions will provide the stimulus for the diffusion of mobile services. Control over copyright and use of copyrighted material is straightforward due to standardised handling of digital copyrights and clear principles for content licensing. Moreover, effective regulation exists regarding privacy issues.

2.3.2 Technology

The technological environment is favourable for mobile service development: Seamless roaming exists between services, devices and networks. Revenue sharing problems associated with roaming agreements and interconnection fees are resolved. Open standards are the norm in m-commerce and technological pluralism prevails.

2.3.3 Market Structure

Actors

Network Provider / Service Integrator

Network providers are providing access to mobile commerce services on multiple platforms: UMTS, WLAN, GPRS etc. They are competing between themselves over customers. This seems to be a universal strategy as they are providing access to different types of networks. Network providers act also as service integrators, as they control the customer base. They bundle services and offer them via their channels, but they act also as multi-access portals to provide access to the different content and services available. In order to meet the technical challenges, small network providers are creating alliances with dominant ones. Their strong gatekeeper role is partly due to their ownership and good care of the customer base, and that they are the only ones who provide billing systems.

Service Providers

The segment of the value chain for service provision is very competitive and growing fast. Market conditions are conducive for competitiveness and growth, mainly due to the following factors.

Standardisation of technologies

Effective control of intellectual property rights

Desirable public intervention in terms of regulation

In this environment, a service provider may develop a service concept, acquire application technologies from an application provider and content from a content provider to offer an integrated service to end users.
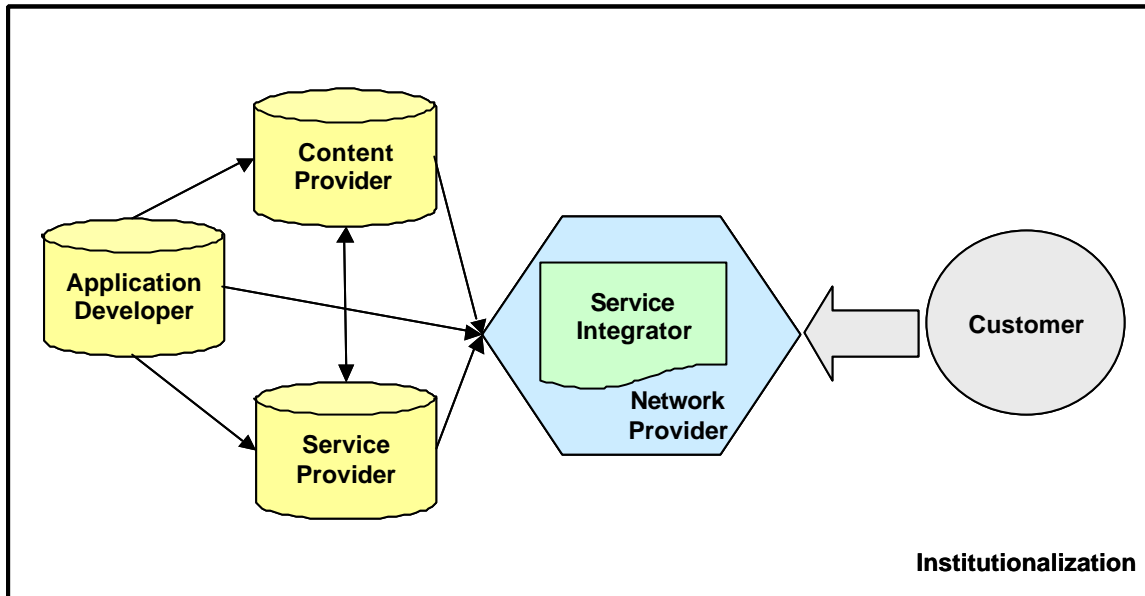
Application Developer

Application developers specialise in handling the various network and device technologies available in the market. They deliver the platforms through which service and content providers reach their buyers. Technological standardisation is the key enabler of growth in this segment of the value chain.

Content Provider

Effective IPR enforcement means that content providers can sell and resell their content and still be able to appropriate all its value. This segment of the value chain is also characterised by competition and growth.

Actors Relationships

Network operators limit their activity to providing access to third party service providers and to billing end customers. They do not develop original content, services or applications. This pivotal role is what gives them market power. Public regulation has played a critical role in introducing the right market incentives, in limiting the breadth of operator activity and in inducing competitive behaviour from all players. On the supply side, the roles of application developer, content provider and service provider may not be as distinct in practice. For example, service providers may also develop the applications they need and owners of valuable content may also turn into service providers. Depending on the total size of the market there may be a tendency for consolidation of the three roles into integrated business entities. The larger the size of the market, the more specialised (thus fragmented) and distinct the roles of application, content and service provision.

Operators can take the role of a mobile portal (i.e. service integrator) to provide information about the different available content and the services that they provide. In such an environment, it is more difficult for operators to make exclusive partnerships with service and content providers. The reason is that content and service providers, especially those of a great brand name, have no interest in restricting their content or service to specific target groups. Instead, they are eager to make their services and content available to as many operators as possible, so that access to all is guaranteed.

The existence of open standards and technology pluralism encourages application developers and service providers to enter their market and obtain their own market share, while it decreases the possibilities for having a positive feedback. The entry of new players is also favoured by the encouraging role of the government as well as the protection of suppliers' and customers' rights by the regulatory framework. Therefore, the environment of this scenario leaves a lot of space for market growth and encourages the development of intense competition.

2.4 Scenario 3. The world changed: Telecom is backing off

Telecom operators have agreed upon seamless roaming of mobile services all over Europe, as they see it in their interests to boost traffic on mobile networks. Competitively priced services are pushing operators back to the traditional telecom positions specialising in data transmission and maintaining the infrastructure. Importantly, customer billing may be carried out by any third party. Public investment in mobile services and effective regulation also foster a conducive environment. This has opened up possibilities for new entrants on the service market, notably third party service integrators.

2.4.1 Regulation

Although similarly to the previous scenario, government actions will provide the stimulus for the diffusion of mobile services and effective regulation exists regarding privacy issues, control over copyright material has not been safeguarded.

2.4.2 Technology

Similarly to the previous scenario, technology environment is favourable for the mobile service development: Seamless roaming exists between services, devices and networks, revenue sharing problems associated with roaming agreements and interconnection fees are resolved, open standards are the norm in m-commerce and technological pluralism exists.

2.4.3 Market Structure

Actors

Network Provider

In 2006 there are multiple technological platforms for mobile commerce: UMTS has had some progress especially on the business market, but cheaper WLAN and 2.5G+ networks are dominating private customer segment. Telecom operators have moved back to the traditional network provider role, so it is in their interest to grant roaming between the services, platforms and networks, thus increasing network traffic. In relation to Scenario 2, the network provider has withdrawn from service integration and is not the sole expert and provider of billing infrastructures. As a result, operators do not dominate the market and are confined to a subcontractor position.

Service Integrator / Service Provider

The operators backing off from service provision opens up possibilities for many of the other stakeholders. There is a free, open and fast growing market for service integration and provision, which results in a vast number of services, which are available and accessible for all consumers. Consensus on the importance and implementation of open standards is helping to accelerate this.

Application Developer

Because of the open and fast growing market for service provision, application developers envisage an attractive market for their expertise.

Content Provider

The traditional content providers are most worried because of the fast changing industry with little effective control. There are many new opportunities but potential new entrants are hesitant to expose their intellectual property. There is an ongoing struggle on formats, packaging, and presentation of content. Weak IPR enforcement, means that powerful content providers are likely to become service providers and reach the end customer directly. Alternatively, they may enter into alliances with service providers or integrators who, in turn, acquire exclusive rights to the content and are then able to resell it.

Actors Relationships
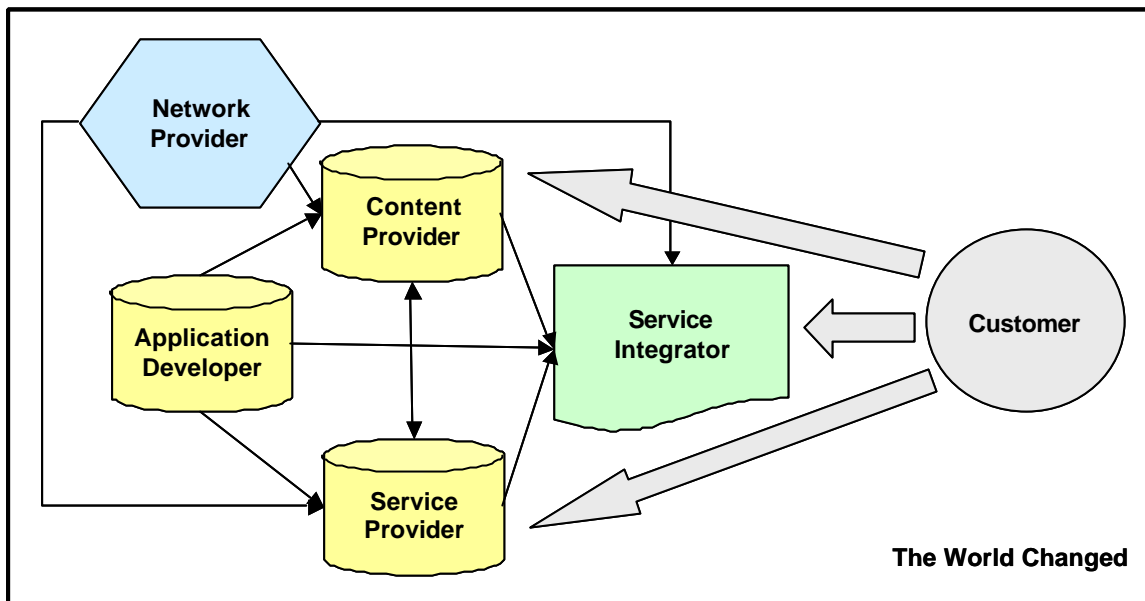
Network providers have lost their power. Because of the lack of copyright protection, content providers also have a problematic role. They cannot safeguard their revenue. Therefore, they have to make alliances with dominant players (either service integrators or service providers) or attempt to reach end customers directly. For example, a company like Bloomberg may be a service provider direct to end-user and/or may resell its content to a specialised m-finance service provider. However, due to weak IPR enforcement, content reselling is exclusive. Service integrators have a strong role, since the operator has lost its power to provide exclusive services. Moreover, they may take the role of Virtual Operator (VO) cooperating with multiple network and service providers for offering a mobile service package to the mobile users. The technology is favourable for new entrants, since there is no risk of creating an incompatible service or technology solution. An important assumption, technology standardisation and roaming aside, is that billing platforms are available to any service provider (in-house or ASP-type).

Service integrators compete with each other to offer better quality access and value-added services to their customer base. They may also compete with dominant content/service providers, which own a customer base. Their strategic action should be focused on providing a package of services and content that will differentiate from its competitors either on price or on the value created for the customer. In order to offer their service packages, they use network infrastructure, which has become commodity, from operators and resources from application developers.

In such a market, where technology poses no barriers of incompatibility, switching costs are low, and thus competition is intense between existing and newly incoming Service Integrators. The competition is moved from providing technology innovation to acquire and retain a critical customer base.

2.5 Scenario 4. The invisible hand: Deregulated, liberalistic markets

Regulators were very active in creating and implementing a liberal mobile commerce policy, in order to boost competition on the common market. IPR-regulation is effective, and seamless services are provided over various networks. Last mile competition, portable subscriber addressing, transparent pricing of services has been introduced. The severe competition has boosted the innovation of services, however, few of them survive.

2.5.1 Regulation

Regulators have adopted a hands-off stance as to the structure of the industry and the conduct of competition. After enforcing technological standards, seamless roaming and IPR enforcement, regulators have not resolved issues of privacy protection and the public sector is not driving growth through investment in public m-services. As a result, the market structure is highly liberal.

2.5.2 Technology

Again, technology environment is favourable for the mobile service development: Seamless roaming exists between services, devices and networks, revenue sharing problems associated with roaming agreements and interconnection fees are resolved, open standards are the norm in m-commerce and technological pluralism prevails.

2.5.3 Market Structure

Actors

Network Provider

Technological pluralism is a key feature of the scenario; there are multiple technologies available on the markets and mobile commerce is taking place on a number of technical platforms, such as UMTS, GSM, WLAN, GPRS etc. Roaming between the various networks is in place and highly valued by users and the industry. The large number of services is accessible transparently via the extensive roaming system. Despite all that, the network provider is confined to a subcontractor role, offering voice and data transport and having nothing to do with value added services.

Service Integrator

There are few big players on the market, competing with each other on the customer base. They bundle services and content and they offer them through various networks. In the absence of effective regulation regarding privacy issues, service integrators gain significant market power from controlling large shares of end customers. Service integrators develop strong brand names and are able to gain consumer confidence. For this reason, third party service and content providers do not reach end-customers directly but typically through service integrators. As a result, this segment of the value chain is highly concentrated with a small number of large integrators.

Service Provider

The market of service providers is also very competitive. There are many players on the market, the number of which has been boosted by the active capital market. They are working together with content providers and they sell their services to the few service integrators.

Application Developer

Application developers are working together with content and service providers on developing services for which the network providers offer connectivity. Special attention has been paid to the implementation of IPR-control due to recognition of mutual interest of all interested parties.

Content Provider

There are multiple mechanisms for funding the development and introduction of services, owing to the active capital market, and revenue sharing is one of these mechanisms. Therefore, many small content providers have high-powered incentives to enter the market, and are able to be very aggressive on the market. They are in a good position to choose their preferred partners.

Actors Relationships
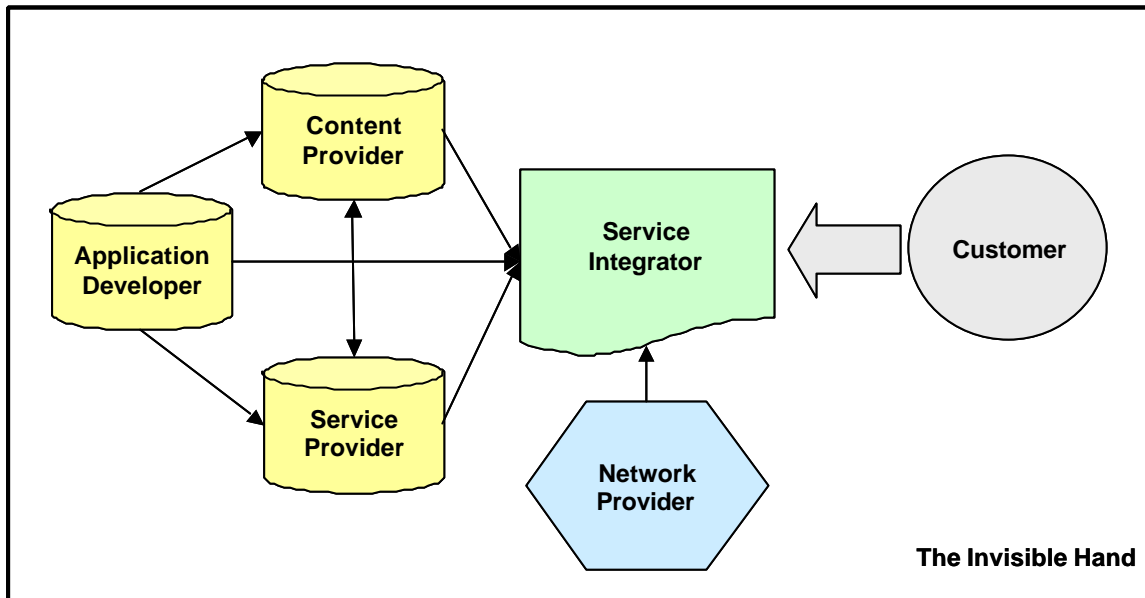
As investment by government on mobile services is low and privacy issues remain unsolved, the market of service integrator is monopoly or consolidated. Service Integrators control the customer base and they try to offer differentiated services. Since the market is consolidated, Service Integrators have an installed relationship with a customer base that favours the development of positive feedback. That means that strong Service Integrators may become stronger, while weak Service Integrators may become weaker.

Network providers have lost their power, since they do not control the customer base. Because of that, there are few service integrators, which control the customer base and offer information and services through several channels.

3. Discussion

Mobile Business is one of the key sectors of today's mobile information economy, due to the large number of opportunities it opens to various stakeholders: Mobile Network Operators, Service and Content Providers, Finance Institutions, Consumers, etc. In this White Paper, we have identified the major actor roles in each of the four MobiCom scenarios [4] and we have proposed a different strategy for each, depending on the characteristics of the respective scenario. Table 1 summarises this insight.

Scenarios: Role:	Scenario 1 *Slow growth in search of business models*	Scenario 2 *Consensus of institutions for controlled growth*	Scenario 3 *Telecom is backing off*	Scenario 4 *Deregulated, liberalistic markets*
Network Provider	Mobile operators are forced to separate their roles as network providers and service integrators.	Network providers are mediating access to mobile commerce service providers but control the customer interface.	Telecom operators have moved back to the traditional network provider role.	Network provider is confined to a subcontractor role, offering voice and data transport.
Service Integrator	Operators act as integrator of the services offered through its own network.	Network providers act also as service integrators, as they control the customer base.	There is a free, open and fast growing market for service integration. Service integrators compete with service providers	Service integrators bundle services and content and they offer them through various networks.
Service Provider	Service providers depend on operators, as they own the customer data and are the sole partners to provide mobile payment systems.	A service provider may develop a service concept, acquire application technologies and content to offer an integrated service to end-users.	There is an open and fast growing market for service provision, which results in a vast number of services, which are available and accessible for all consumers.	The market of service providers is very competitive. They are working together with content providers and they sell their services to the few service integrators.
Content Provider	The operators have been able to dominate content providers.	Effective IPR enforcement means that content providers can sell and resell their content and still be able to appropriate all its value.	There are many new opportunities but potential new entrants are hesitant to expose their intellectual property.	Many small content providers have high-powered incentives to enter the market.
Application Provider	The application development market remains small, due to technological and financing reasons. Operators take the lead in ASP.	They specialise in handling the various network and device technologies available in the market.	Because of the open and fast growing market for service provision, application developers envisage an attractive market for their expertise.	They are working together with content and service providers on developing services for which the network providers offer connectivity.

Table 1: Actors' roles per scenario

Although we have proposed four different views of the future, these future worlds can be seen in a sequential order (Figure 3). The first scenario, "Business as usual", can be seen as the linear projection of the present into the future. Network Operators are the dominant players, they control the customer base and they offer the services. In the second scenario, there is a consensus for controlled growth. Network operators limit their activity to providing access to third party service providers and to billing end customers. They do not develop original content, services or applications. On the other side, application developers, content and service providers have strengthened their roles. In the third scenario, network providers have lost their power. Network provision has become a commodity service and there are other players (content and service providers), which dominate the market. The last scenario describes a situation, where the dominant player is the service integrator. The market is consolidated but this time it is not the operators with the market power, but the service integrators instead.

MobiCom 2006:
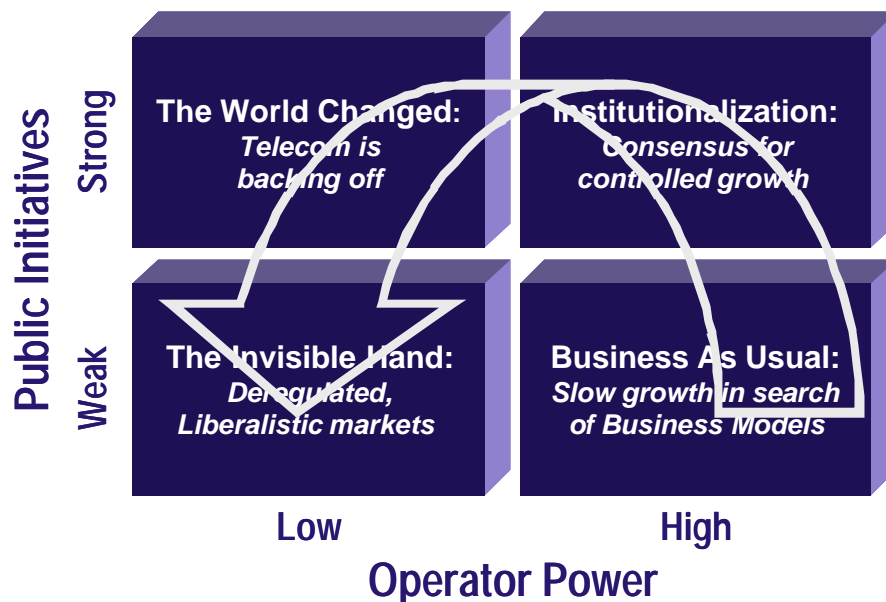## Evolution Scenarios for Mobile Business

Figure 3: Scenario Evolution

4. Conclusions

Throughout this paper, we tried to throw light in the future of mobile business from a strategic perspective. By following this reasoning, a key player today is able to find an opportunity to enter the market, or to sustain competitive advantage by adjusting its role or its core competence. Figure 4 summarises the recommended strategies for content or service providers, under the conditions of each of the four MobiCom scenarios. In scenario 1, a content/service provider needs to get into a strategic alliance with a strong mobile operator in order to get access to a large customer base. This ought to be a win-win situation for both the operator and the service provider. In scenario 2, content/service providers need to innovate in terms of their core offerings and to reach the broadest customer base possible through any and every mobile channel available, with the right Service Level Agreements. Here competition between content/service providers is heightened and content/service innovation and differentiation are key to competitive advantage. In scenario 3 content/service providers have a chance to build a direct channel to their end customers, cultivate customer relationships and build their brand name. This is a window of opportunity for forward looking service integrators, positioning themselves for future consolidation. In scenario 4, a small number of service integrators win the market by establishing their presence and brand rapidly, gaining economies of scale and driving large numbers of end customers through their portals and service bundles. The rest, focus on third party content, service or application provision, primarily through one or more integrators. Their key competitive advantage derives from the capability to excel in specific types of services and to be the providers of choice for select market segments.

This final analysis is a brief illustration of the powerful practical insight that can be generated by following the scenario approach analysed in this paper. More specific lessons and recommendations can be drawn, depending on the perspective one wishes to adopt: that of the operator, the regulator, a new entrant, a virtual operator, or a traditional content owner.
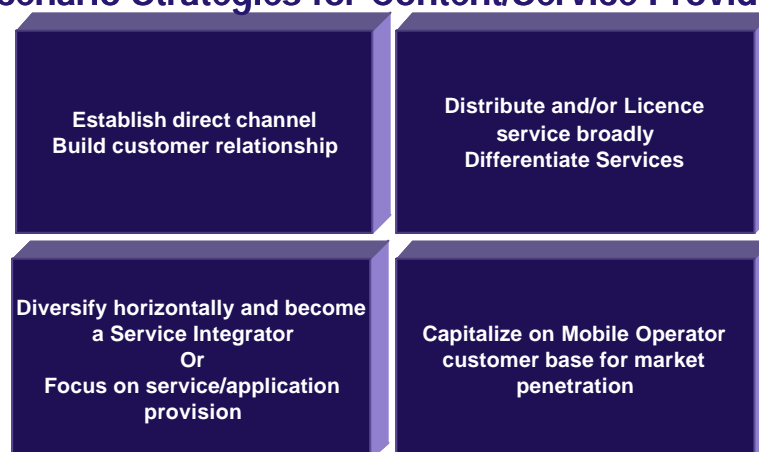

Figure 4: Scenario Strategies

Bibliography

Afuah and Tucci (2000) *Internet Business Models and Strategies*, McGraw-Hill International Editions, New York, Chapter 4, pp. 45-67.

Alt, R. and Zimmerman H.D. (2001) Preface: Introduction to Special Section – Business Models, *Electronic Markets*, *11, 1*, pp. 3-9.

Durlacher Research (2001) *UMTS Report*, available online from www.durlacher.com.

The MobiCom Project (2001). Scenarios for Mobile Commerce in 2006, Deliverable 5.1

The MobiCom Project (2002). Definition of Diffusion and Adoption Patterns, Deliverable 5.2

The MobiCom Project (2002). Feasibility Studies on M-Commerce Services, Deliverable 5.3

Tsalgatidou, A. and Pitoura E. (2001) Business Model and Transactions in Mobile Electronic Commerce: Requirements and Properties, *Computer Networks, 37*, pp. 221-236.