The Convergence in Fixed-Wireless Applications: Requirements for Successful New Business Models

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Abstract

The slower than anticipated adoption of advanced mobile services across most of the world, puts into question the actual value of mobile data services to the end-user. The technological outcome of “convergence” has made it possible to access applications, both traditional as well as new applications, such as IPTV, across different fixed and wireless technologies, and from multiple devices. The demand side of the market, however is less understood. The “VISOR” framework suggests that financial success for service providers in deploying “converged fixed-wireless applications,” will be predicated on their ability to provide an “ease of use experience” and “seamless interoperability” across devices for end-users. These applications should also provide value creation as opposed to value substitution if service providers want to capitalize on premium pricing rather than discount pricing.

Introduction

Traditionally, end-users have received services and applications through single access points. For example, video-programming was received in the home through satellite, digital or co-ax cable, and voice services were received through twisted copper. However, the development of new access technologies and standards, coupled with the continued liberalization of the telecom sector, have provided end-users with different means of accessing voice, video and other data applications, across multiple devices and from various locations.

Although the adoption of mobile phones in many parts of the world has been rapid, this has been primarily for voice communications. Adoption of advanced mobile services and e-services, have been generally slow, thus raising the question of the value of these services. This situation highlights whether end-users will see additional “value” from accessing new applications such as IPTV, across different fixed and wireless technologies, and from multiple devices. It further raises the question of whether managing and accessing content, seamlessly across these different devices will be issues retarding the adoption of services by end-users. We thus define convergence in fixed-wireless applications as “multi-media applications that are accessed anytime, anywhere and through multiple access devices or a single multi-function device.”

This paper uses the “VISOR” Framework to identify the end-user requirements, the service platforms and organizing model, as well as the concomitant pricing models necessary for successful deployment of new services. Additionally, the paper will draw on the findings from a standardized annual multi-country survey of mobile data end-users, collected in 2005 and 2006 from the Worldwide Mobile Internet Study\(^2\) to identify the value proposition that end-users’ may derive from their ability to access content across multiple locations and devices. Past survey data suggests, that applications and services that increase productivity, efficiency, and convenience

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1 VISOR represents Value Proposition, Interface, Service Platform Organizing Model and Revenue Source and are the inter-related components necessary for a successful business model.
2 The World Mobile Internet Study executes an annual collaborative survey of over 15,000 mobile users in Asia, Europe and the U.S. and represents an international research consortium of university partners in Japan, Korea, Finland, Taiwan, China, Greece, the U.S. and Australia to identify commonalities in user preferences and adoption variables across national markets.
were qualities that motivated adoption, regardless of cultural context, income level or other demographic factors.

**Business Models: A Review**

In general, there is no accepted definition of the term “business model”. In fact, some have argued that the concept of a business model, is relatively new, dating back to only the early 1980s. The plethora of definitions poses significant challenges for understanding the essential components of a business model. This also leads to confusion in terminology as “business model, strategy, business concept, revenue model and economic model are often used interchangeably... (and moreover)... the business model has been referred to as architecture, design, pattern, plan, method, assumption and statement.”

Three general categories of definitions based on their emphasis, namely economic, operational and strategic, each with their unique set of decision variables have been identified. The economic approach focuses on how a firm can make a profit. Key variables from this approach include revenue sources, pricing methodologies, cost structures, margins and expected volumes. Fundamentally stated, this approach deals with how a firm can make money and sustain its revenue stream into the future. Alternatively, the operational approach focuses on the firm’s internal processes and design of infrastructure that enables firms to create value, with key components such as production or service delivery methods, administrative processes, resource flow and knowledge management, with the key objective of designing interdependent systems that create and sustain a competitive business. In the strategic approach, emphasis in on the overall direction of the firm’s marketing position, interactions across organizational boundaries, and growth opportunities. This approach espouses the totality of how a firm selects its customers, defines and differentiates its offerings, creates utility for its customers, defines the tasks it will perform or outsource, configures its resources and ultimately captures profits. Decision variables focus on stakeholder identification, value creation, visions, values and networks and alliances.

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5 Morris et al, op. cit.
### Table 1
Comparison of Business Model Approaches

<table>
<thead>
<tr>
<th>Source</th>
<th>Components</th>
<th>Number of Components</th>
<th>Customer Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horowitza (1996)</td>
<td>Price, Product, Distribution, Organizational Characteristics and Technology</td>
<td>5</td>
<td>N</td>
</tr>
<tr>
<td>Viscio and Pasternak (1996)</td>
<td>Global core, Governance, Business Units, Services and Linkages</td>
<td>5</td>
<td>N</td>
</tr>
<tr>
<td>Donath (1999)</td>
<td>Customer understanding, Marketing Tactics, Corporate Governance and Intranet/Extranet capabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gordijn et. al. (2001)</td>
<td>Actors, Market segments, Value Offering, Value Activity, Stakeholder network, Value interfaces, Value ports and Value Exchanges</td>
<td>8</td>
<td>N</td>
</tr>
<tr>
<td>Linder and Cantrell (2001)</td>
<td>Pricing model, Revenue model, Channel model, Commerce process model, Internet-enabled commerce relationship, Organizational form and Value proposition</td>
<td>8</td>
<td>N</td>
</tr>
<tr>
<td>Chesbrough and Rosenbaum (2000)</td>
<td>Value proposition, target markets, Internal value chain structure, Cost structure and profit model, Value network and Competitive strategy</td>
<td>6</td>
<td>N</td>
</tr>
<tr>
<td>Gartner (2003)</td>
<td>Market offerings, Competencies, Core technology investments, and Bottom Line</td>
<td>4</td>
<td>N</td>
</tr>
<tr>
<td>Hamel (2001)</td>
<td>Core strategy, Strategic resources, Value Network and Customer interface</td>
<td>4</td>
<td>N</td>
</tr>
<tr>
<td>Petrovic et. al. (2001)</td>
<td>Value model, Resource model, Production model, Customer relations model, Revenue model, Capital model, and Market model</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>Afuah and Tucci (2001)</td>
<td>Customer value, Scope, Price, Revenue, Connected activities, Implementation, Capabilities and Sustainability</td>
<td>8</td>
<td>N</td>
</tr>
<tr>
<td>Weill ad Vitale (2001)</td>
<td>Strategic objectives, Value proposition, Resource sources, Success factors, Channels, Core competencies, Customer Segments, and IT Infrastructure</td>
<td>8</td>
<td>N</td>
</tr>
<tr>
<td>Applegate (2001)</td>
<td>Concept, Capabilities and Value</td>
<td>3</td>
<td>N</td>
</tr>
<tr>
<td>Amit and Zott (2001)</td>
<td>Transaction content, Transaction structure and Transaction governance</td>
<td>4</td>
<td>N</td>
</tr>
<tr>
<td>Rayport and Jaworski (2001)</td>
<td>Value cluster, Market space offering, Resource system, and Financial model</td>
<td>4</td>
<td>N</td>
</tr>
<tr>
<td>Bertz (2002)</td>
<td>Resources, Sales, Profits and Capital</td>
<td>4</td>
<td>N</td>
</tr>
<tr>
<td>Hedman and Kalling (2003)</td>
<td>Value network, Resources, Capabilities, Revenue and pricing, Competitors, Output, Management</td>
<td>7</td>
<td>N</td>
</tr>
<tr>
<td>Chesbrough (2003)</td>
<td>Customer, Value network, Capabilities, Revenue and pricing, Cost, Strategy</td>
<td>6</td>
<td>N</td>
</tr>
</tbody>
</table>

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9 Adapted from Morris et. al. op. cit. and Schafer, et. al., op. cit.
The VISOR Framework

In addition, although properly formed business models are very useful and can be a strategic tool for a firm, many business models suffer from 4 common problems\(^\text{10}\), namely:

i) Flawed or untested assumptions underlying the key premises of a firm’s business plan; these resolve around untested assumptions about future conditions, or implicit or explicit cause-and effect-relationships that are not well founded or logical.

ii) Limitations in the strategic choices considered; addressing and developing the business logic in only one ”component” of the business model, and making untested assumptions about the others.

iii) Misunderstanding about value creation and value capture; the inability of organizations to financially capitalize on the “value” they create, which may thus negatively affect the “revenue generation” aspects of the business model.

iv) Flawed assumptions about the value network; assumptions that the current value created through the network will continue unchanged into the future.

The VISOR\(^\text{11}\) model attempts to integrate the different approaches in business model development, as well as to handle unaddressed key elements such as the user experience and interface factors. While these factors are not explicitly recognized in most of the approaches as summarized in Table 1, they figure prominently in many theories of diffusion of innovations\(^\text{12}\).

At its core, a good business model must answer the age-old questions, as Peter Drucker has often asked: “Who is the customer? And what does the customer value? … How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to the customers at an appropriate cost?\(^\text{13}\)”

In this respect, then the VISOR Model, as illustrated in Figure 1, defines how a firm responds to a customer need, latent or established, thus creating and delivering the greatest value to the customer, in a profitable and sustainable manner, and, as such, optimizes the costs of value creation. Thus, from the VISOR perspective, a successful business model is one that is able to align the respective components of the VISOR model to deliver the greatest value proposition that maximizes the willingness to pay on the part of its target consumers, on the one hand, with the ability to minimize the real cost (tangible and intangible) for the provision of these services. Cost minimization is achieved through the optimal mix of interface experience, service platforms and the organizing model.

\(^{10}\) Shafer et. al, op. cit.

\(^{11}\) The VISOR Model was formulated by Omar El-Sawy, Director of Research at CTM and Professor of Information and Operations Management, Marshall School of Business, University of Southern California.


I. Value Proposition

Value proposition addresses why particular customer segments would value an enterprise’s products and services and be willing to pay a premium price for them. The willingness to pay is a direct function of whether these applications provide “value creation” in that they satisfy an unmet latent end-user demand, or “value substitution” in that they provide only an alternative means for end-users to access an existing application or service.

II. Interface

The success of delivery of a product or service is heavily predicated on the user interface experience in terms of ease of use, simplicity, convenience, and positive energy, and should generate an extraordinary or “wow” experience.

III. Service Platforms

IT platforms that enable, shape, and support the business processes and relationships that are needed to deliver the products and services, as well as improve the value proposition.

IV. Organizing Model

Describes how an enterprise or a set of partners will organize business processes, value chains, and partner relationships to effectively and efficiently deliver products and services.

V. Revenue Model

In a good business model, the combination of the value proposition, the way that offerings are delivered, and the investments in IT platforms are such that revenues exceed costs and so are attractive for all partners.

Figure 1
The VISOR MODEL
As shown in Figure 1, then, from the VISOR approach, a high value proposition to the target consumer segment together with a concomitant Revenue/Cost model, could “offset” proportionally any deficiencies with the Interface, Service Delivery or Organizing Model aspects of the VISOR model.

**Applying the VISOR Framework for Converged Fixed-Wireless Applications**

This paper has defined converged fixed-wireless applications as “multi-media applications that are accessed anytime, anywhere and through multiple access devices or a single multi-function device.” As such, commercial and widespread deployment of such applications, beyond “voice,” has yet to occur. However, applying the VISOR framework shows what specific characteristics and functions these applications need to satisfy the requirements for the profitable provision of service and applications, while minimizing the cost of provision of these applications.

I. Value Proposition

As Figure 2 suggests, the adoption of mobile commerce applications, even in the more developed and advanced countries, such as Korea, Taiwan and Japan is somewhat slow. In this respect, as several recent surveys suggest, most end-user do not see the mobile phone as good substitute for other devices that perhaps provide a better user experience, particularly in terms of screen size. For example, in a recent *Los Angeles Times* poll, only 11% of respondents between 12 and 17 years and 6% of those between 18 and 24 years, were willing to watch movies on cell phones.\(^\text{14}\)

Figure 2\(^\text{15}\)
Frequency of Use of Mobile Commerce Applications

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Figure 3 illustrates the personal computer penetration in select markets, which would suggest that end-users see using wireless phones to access current mobile commerce applications as a

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\(^{15}\) WMIS Data, 2006.
substitute, albeit an inferior one to PCs and other terrestrial based access devices as several surveys\textsuperscript{16} in the U.S. suggest. Specifically, 47\% of respondents between 12 and 17 years and 45\% of respondents between 18 and 24 years would watch a movie on a computer, as opposed to cell-phones, or video iPods (similar devices). However, 38\% of those between 12 and 17 years and 48\% of those between 18 and 24 years would not want to watch a movie on a computer, cell-phone or video iPods\textsuperscript{17}.

Figure 3\textsuperscript{18}
PC Penetration and Cell Phone Penetration Rates in Select Countries.

II. Interface

As the VISOR model argues, the consumer interface experience will have a significant impact on whether consumers will adopt converged fixed-wireless applications. To some extent, this is substantiated in Figure 4 which illustrates American consumer requirements solely for mobile devices. Thus, the challenges of providing the consumer with “ease of use” experience in the more technically sophisticated “converged fixed-wireless” applications may prove to be insurmountable in the short-run, or possible only at high financial costs.

\textsuperscript{17} Matea Gold, op. cit.
\textsuperscript{18} International Telecommunications Union, “Select Data,” 2006.
III. Service Platforms

By definition the concept of “converged fixed-wireless” applications then, would require end-users to be able to shift content seamlessly across devices. To reiterate the findings of several surveys discussed above, “ease of use” is an important criterion for end-users. However, the current state of access technologies within the home, that would be a necessary condition for

Figure 5
Comparison of Current In-Home Technologies to Support Seamless Connectivity in the Home

<table>
<thead>
<tr>
<th>Technology (2005)</th>
<th>Bandwidth (M/Bits (L1/L7))</th>
<th>Coverage</th>
<th>QoS Support</th>
<th>Security Enablement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>100/70</td>
<td>Whole House</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>IEEE 802.11b</td>
<td>11/5</td>
<td>2 rooms</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>IEEE 802.11g</td>
<td>54/25</td>
<td>2 rooms</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>DECT</td>
<td>2/2</td>
<td>Whole House</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Bluetooth 1.2</td>
<td>0.7/0.4</td>
<td>1 room</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>HomePNA 2.0</td>
<td>10/6</td>
<td>2 rooms</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>HomePlug 1.0</td>
<td>14/5</td>
<td>Whole House</td>
<td>Negative</td>
<td></td>
</tr>
</tbody>
</table>

the adoption of these “converged fixed-wireless applications” is not encouraging, as shown in Figure 5. The current state of these technologies would instead encourage end-users to maintain their traditional means of accessing applications and services using stand-alone, none integrated devices. As Figure 6 illustrates, for the video-game market in the U.S., console games are expected to still be primary form of “access” for most end-users in the U.S.

Figure 6\(^{21}\)
U.S. Video Game Market

Figure 7\(^{22}\)
Top 10 Internet Activities

Additionally, Figure 7 highlights that most end-users in the U.S. still see the Internet primarily as a means of accessing e-mail and instant messaging, and not for gaming or other entertainment activities. This suggests that, for the U.S. market, if “seamless connectivity” across devices is not achieved, then it is even more improbable that end-users would adopt converged fixed-wireless applications.

IV. Organizing Model

To achieve the optimal “value proposition” and “interface experience” in the delivery of “converged fixed-wireless” applications, then current service providers will have to orchestrate partnerships with other service providers, and other business organizations to organize business processes, value chains, and partner relationships to effectively and efficiently deliver converged products and services. The recent success of Apple’s iPod substantiates the importance of the organizing model, especially since Apple did not invent the MP3 player. Instead, Apple’s success with the iPod is attributable to its ability to resolve the digital rights management and royalty issue, thus providing end-users with an easy way of purchasing music\(^{23}\). Similarly,

\(^{21}\) OECD, “Information Technology Outlook, 2005.”
\(^{22}\) University of Southern California, “Digital Future Report, 2004.”
Hanspring’s ability to capture 15% of the market from Palm within the first year of the introduction of its Visor in 1999, and the success of Dell Computer’s “Direct to the Customer” business model are attributable, to a significant extent, to their abilities to effectively create and manage partnerships in the supply and value chains\textsuperscript{24}.

V. Revenue Model

The VISOR model asserts that ultimately, the combination of the value proposition, the way that offerings are delivered, and the investments in IT platforms are such that revenues must exceed costs and be attractive for all partners. As it has been argued above, true fixed-wireless applications, beyond voice, have yet to be deployed commercially. However, as Figure 8 illustrates, end-users’ willingness to pay for just mobile data services in the U.S., is extremely low. This suggests, in part, that the value proposition of these services is low, and which may be attributable to the “value substitution” as opposed to “value creation” characteristics of these services: many of these services focus solely on entertainment applications that service providers have replicated from that end-users are able to access via terrestrial (landline) means.

\textbf{Figure 8}\textsuperscript{25}
\textit{U.S. Users Willingness to Pay for Mobile Data Services (monthly)}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Figure8.png}
\end{figure}


\textsuperscript{25} WMIS U.S. Survey, 2006.
Conclusion

The “VISOR” framework suggests that the financial success for service providers in deploying “converged fixed-wireless applications,” will be predicated, on the one hand, on their ability to provide an “ease of use” and “seamless interoperability” experience across devices for end-users. On the other hand, these applications would also need to focus on value creation as opposed to value substitution if service providers would like to capitalize on premium pricing as rather than discount pricing. As a comparison of Figures 9 and 10 suggest, the potential of “value creation” for convergence in fixed-wireless applications, is substantial in areas of health and medical care, education and lifestyle.

Figure 9
Ranking of Internet Activity in the United States, 2005.

![Pie Chart](https://via.placeholder.com/150)

Figure 10
Average Annual U.S. Household Expenditures, 2003

![Pie Chart](https://via.placeholder.com/150)

$40,817

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