A Relevancy-Based Services View for Driving Adoption of Wireless Web Services in the U.S.

Radio, television, PCs, and the Internet are all part of our everyday lives. It would be quite difficult to carry on our normal daily functions without them today. Cell phones and wireless web services offer the promise of becoming another technology that consumers are unable to live without. To capitalize on this opportunity, wireless service providers have invested heavily in upgrading their networks to the next generation standard (3G). However, consumer interest in data services does not paint a rosy picture for the providers. A recent BusinessWeek survey shows extremely low penetration of wireless Web (data) services.¹

In this study, we explore the issues that drive (or inhibit) the adoption of wireless web services. The underlying question that we want to explore is: how can service providers explain the value proposition of wireless web services to consumers in the U.S.? In trying to answer this question, we conduct an initial exploration of the services desired by potential adopters of wireless Web services in the U.S. On a more fundamental level, we propose a framework for service providers to design and deliver wireless data services in the U.S. market. Our framework points to the need to think beyond location-based services and have a relevancy-based orientation. After gaining a better understanding of the value proposition of wireless web services to U.S. consumers, we explore pricing as a way for service providers to capitalize on relevancy-based value proposition.

Drivers of Wireless Web Services Adoption

While wireless service providers tout the benefits of wireless Web services, customers remain skeptical. Venkatesh et al.¹⁰ suggest this may be the case because of two key issues: consumers think that wireless web services are too complicated to use and; consumers think that they do not need wireless web services (for example, an unclear value proposition of wireless web services). The technology acceptance model (TAM) also alludes to these two factors as drivers of adoption of new technology in general.¹ More recently, Venkatesh et al.¹¹ have suggested the use of Microsoft Usability Guidelines (MUG) to focus on the usability of mobile commerce services and applications as driver of adoption. Usability of wireless web services is determined by the context of mobile user experiences: the use context (Time, Location and Convenience) and device context (the limitations of the mobile device used to access the mobile services). Therefore, based on earlier research, our research focuses on the two main potential drivers of wireless web services adoption:
Perceived usefulness of wireless web services; and perceived ease of use of wireless Web devices.

**Perceived usefulness of wireless web services:** The usefulness of wireless Web services is in some part derived from the relative advantage of using mobile web access over traditional landline access for some activities. However, there is also a large component that is derived from the absolute utility of performing some activities on wireless web devices (these activities might not be useful to conduct through landline web access, but might be very useful to conduct on the go). For example, knowing the trendiest bars in a new area that you are driving or walking in has a distinct value for a mobile consumer.

**Ease of use of mobile devices for wireless Web services:** The input form factor, display and the output form factor are all key to adoption and use of mobile devices and consequently the wireless Web services. Mobile device manufacturers continue to build more and more functionality into the cell phones. However, consumers feel that the increased functionality makes the devices harder to use. As a consequence, consumers are starting to prefer devices that are relatively simple to use. Researchers have hinted that to a large extent the poor form factor of mobile devices may impede the adoption of wireless web services.

**Focus on Perceived Usefulness and Willingness to Pay**

Our results show that both perceived usefulness and ease of use are correlated with consumers’ propensity to adopt wireless web services. It is interesting to note that perceived usefulness of wireless web services is more strongly correlated with adoption propensity as compared to ease of use of mobile devices. In other words, consumers will overcome issues with the device in order to gain the benefits from the services delivered through the device. This result is consistent with existing research on new products, which has found that in situations where both the interface and functionality are relatively new, the consumer will focus more on the functionality than the complexity of the interface. Given our results as well as those of prior researchers, we believe that if service providers can provide a convincing argument for the value proposition of wireless Web services, then consumers will be willing to adopt new devices for the functionalities they offer even if the devices themselves may not yet up to par in their eyes.

In past research, location-based services (LBS) have been found to be a critical factor driving the strategy of wireless service providers. Further, Tarasewich suggests that the value of wireless services is also derived from the time at which these services are consumed. In other words, the wireless web services should be tailored to where the consumer is and also be delivered in real-time. Both time and location are important to the value of information, but we feel an additional dimension is important: the need for the information.

To that end, we present a framework (Figure 1) that integrates these three critical dimensions integral to the effective communication of the value proposition of wireless web services. We arrived at this framework by considering previously published research, insights gained from our focus group work, and the primary author’s consulting work with a U.K. based wireless service provider which resulted in a marketing strategy and implementation that was fairly well-received by potential adopters of wireless web services. Each of the three dimensions, namely time, location and need, is an important dimension on its own; however, a more complete picture of the value proposition emerges when all three are considered together.

**Carving Out a Marketing Message for Wireless Web Services:**

While location-based services take into account the expressed “current” need of the consumer (the consumer is lost so she needs a map), these services do not capitalize on anticipated needs. Specifically, consumers can have recurring needs they have already revealed to a service provider (Expressed Need) or they may have a new need not actively revealed by the consumer, but one a service provider could infer based on past activity, current time, and present location (Anticipated Need). Such anticipated needs can be assessed by having more detailed knowledge of customer preferences and history of information access patterns.

Wireless service providers that leverage complexities of consumers’ context are likely to achieve long-term

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**Figure 1. A Framework for Relevancy-Based Wireless Web Services**

![Diagram](http://www.usabilitynews.com/news/article1545.asp)
How Data Was Collected and Analyzed

We collected the data in three phases. In the first phase, we conducted in-field interviews with users of wireless Web services in three countries—Finland, Sweden, and Poland. The second phase involved a survey of three pools of respondents. First, we surveyed executives attending a large university sponsored seminar. Second, we surveyed a pool of first year MBA students at the same university. Together, this gave us responses for the 25+ age group. Finally, through a kiosk located at another major U.S. university, we invited undergraduate students and graduate students to fill out the survey. This sample helped us cover the 18-24 age group. In total, we had 321 respondents. In the final phase, equipped with the results of our survey, we conducted a focus group interview with potential users of wireless Web services to understand their needs and pricing issues in more detail.

To collect and analyze the data, we created an Adoption Propensity index by aggregating their response to three survey items: likelihood of subscription to wireless web services, recent consideration of subscription to wireless web services, and how intrigued are they by advertisements and promotions related to the wireless Web in the media.

The perceived usefulness of wireless web data services was determined by asking the respondents to rate on a scale of 1 to 10 the importance of mobile access to conduct the following activities: accessing news, sending and receiving email, getting maps and driving directions, sending short messages to friends and family, accessing latest financial information, playing multi-player games banking, downloading and playing music, receiving coupons and promotion deals, shopping for products and services, making emergency contacts, finding contact information, using digital wallet (such as paying bills, electronic payment at grocery store and movies), and receiving entertaining material (cartoons, jokes, or movie trailers).

This list was generated through field interviews (advanced users in countries that were on leading edge of wireless services adoption). Through search of news stories, we also took into account the services that the wireless services providers were planning to introduce in the U.S. The list also included services that were used by researchers to study adoption of Internet. We acknowledge that this is not a comprehensive list of services, but it is a list of the most commonly used/paid services at the time of survey. Measuring perceived usefulness by aggregating the importance of a list of wireless Web services takes into account: the usefulness of wireless Web services as a relative advantage over use of traditional land-line web access for some activities; and also, the absolute advantage of services that are pertinent only to the mobile context. Finally, by asking for importance of mobile access to conduct services, we take into account the fact that at the time of survey many of the respondents had not yet actually subscribed to the services. Therefore, the importance measure is a proxy for perceived usefulness.

Ease of use was measured in terms of how easy it is to enter information into wireless Web devices and how easy it is to find the information deployed on the wireless Web devices, and how easy it is to access the wireless Web sites on the mobile devices. Finally, the pricing related issue that we also explored was whether flat fee pricing was the preferred form of billing for the consumers in the U.S. (as opposed to pay-per-service or pay-for-usage).

These measures were used to conduct a hierarchical regression (see accompanying table) to supplement other data analysis methodologies.

Table 1: Investigating the antecedents of wireless Web services adoption

<table>
<thead>
<tr>
<th>Dependent Variable: The Adoption Propensity of Wireless Web Services</th>
<th>Model 1a</th>
<th>Model 1b</th>
<th>Model 1c</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Variables</strong></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
<td><strong>β</strong></td>
</tr>
<tr>
<td>Gender</td>
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<td>.055</td>
<td>-.009</td>
</tr>
<tr>
<td>Age Group</td>
<td>.029</td>
<td>.017</td>
<td>.028</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Utility of Wireless Web Services</td>
<td>.400***</td>
<td>.315***</td>
<td></td>
</tr>
<tr>
<td>Perceived Ease of Use of Mobile Device to access Wireless Web</td>
<td>.152**</td>
<td>.115*</td>
<td></td>
</tr>
<tr>
<td>Flat Fee Pricing for Mobile Services</td>
<td></td>
<td>.274***</td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.004</td>
<td>.187</td>
<td>.247</td>
</tr>
<tr>
<td>F</td>
<td>1.633</td>
<td>19.682***</td>
<td>22.267***</td>
</tr>
<tr>
<td>Dof</td>
<td>(2,323)</td>
<td>(4,321)</td>
<td>(5,320)</td>
</tr>
<tr>
<td>Change in R²</td>
<td></td>
<td>.187</td>
<td>.061</td>
</tr>
<tr>
<td>F Change</td>
<td>37.364***</td>
<td>26.379***</td>
<td></td>
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<tr>
<td>Dof</td>
<td>(2,321)</td>
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</tr>
</tbody>
</table>

* **p < .001, ** p < .01, * p < .05

success. In other words, when service providers offer services in real-time at a specific location based on a history of consumer information/service consumption, the perceived usefulness of wireless web services will be much higher for consumers. We label these kinds of services as relevancy-based services (RBS). Next, we try to provide some guidelines as to how to develop, market and deliver RBS.

The delivery of RBS will require a “pull based push” approach. Consumers should be educated and encouraged to express their tastes/preferences/needs to service providers in order to create the “pull” (needs based demand) for wireless services. Given this pull, service providers can deliver information to consumers at the right time (need-time versus real-time) and right location – the “push” (needs based supply) of services. For instance, a customer who has to engage in extensive work-related travel may express the desire to be informed about hotels and restaurants in the location to which he is traveling. Based on the consumer’s location and previous preferences, service providers may suggest hotels and restaurants. If the consumer approves of the suggestion, a room reservation at the hotel and dinner reservation at the restaurant will be made and the money will be deducted automatically from the digital wallet. This would enhance the perceived usefulness of digital wallet in the consumers’ eyes.

Another example is delivering deals and coupons through wireless devices. While many service providers think that this is a LBS, such as, if the consumer is walking by Starbucks, pushing a coupon for a cup of coffee is of value to consumer. Many consumers
actually do not think of this as a value-added service, and in fact may see this as an invasion of privacy or mobile spam. On the hand, if the consumer expresses that she is a Starbucks coffee lover and would love to hear about any offers, pushing a coupon to try a new flavor of coffee to such a consumer may enhance the relevance (usefulness) of such a service in her eyes. And perhaps, she would also find paying for the cup of coffee using her digital mobile wallet to be a great convenience.

As another example of RBS, drivers can be warned about road closures, accidents or other relevant information such as alternative routes (and times that it would take to traverse those routes) based on the history of their driving routes and times. Additionally, if the driver is going to be late for a meeting, an automatic text message can be sent to others attending the meeting (service provider can look into the calendar stored on the driver’s mobile device or central server). This is a clear example of providing a relevant wireless web service based on the anticipated need of the consumer.

With a growing population of pre-teen and teen wireless subscribers, RBS can be offered to parents. For example, parents want their younger children to have cell phones in case of emergencies, but are not comfortable with letting their children use it without restrictions. Disney has created a phone where parents can monitor minutes used, which numbers were dialed, and can track the location of the child through the GPS. Verizon has a service called “Chaperone” where the parent would receive a text message if their child left a certain location (school, work) during the time programmed by the parent. These services can potentially make the wireless carriers significant profits. Verizon’s “Chaperone” service is expected to cost parents about $20/month.

Fundamentally, the delivery of RBS requires gaining the consumers’ trust. But once such a trust is built, the same services that do not appear as high utility services can be positioned as highly useful wireless web services. Of course, service providers need a lot of their consumer preference information in order to deliver RBS. They have to be the trusted party holder of consumer information. In fact, as wireless voice services are becoming commodity, it is the RBS that will provide the lock-in for customers.

Examples of RBS are not limited to end consumer segments; Smartphone users will be able to deliver critical real-time patient information to physicians specializing in the care of intensive care patients - both inside and outside the hospital. Thereby, a physician attending a personal/social event will be able to respond instantly to emergency and the complete patient data can be delivered to their mobile device as she is on the way to the hospital.

However, as important as the RBS are, another key component of the value proposition for the consumer is pricing. Not surprisingly, pricing of telecommunication services has been found to influence the adoption pattern of the services. Researchers have also proposed a value-based adoption model that takes into account the cost of services borne by subscribers to explain the adoption of mobile services. Preliminary research on the adoption of wireless web services has shown that pricing continues to be an important issue for potential adopters. Therefore, we further explored the influence of pricing on adoption of wireless web services and comment on how wireless service providers should think about pricing their services so as to spur the adoption of wireless web services.

Specifically, the pricing issue that we explored in this research was whether flat-fee pricing was the preferred form of billing for consumers in the U.S. (as opposed to pay-per-service or pay-for-usage). We found that consumers in the U.S. have a distinct preference for flat-fee over pay-per-use pricing for wireless web services. In fact, flat-free pricing was considered more critical to the adoption of wireless web services than form factor of mobile devices (for example, ease of use).

To explore which categories of wireless Web services/activities are the most useful in terms of being the most conducive for the mobile environment, we also asked about specific activities that consumers would conduct on a mobile device. Our goal was not only to determine which activities were particularly important, but also to then begin to think about these activities in conjunction with pricing. Figure 2 shows the various activities/services and the perceived usefulness of conducting those activities through mobile devices.

As can be seen from Figure 2, there

![Figure 2. Perceived Usefulness of Wireless Web Services](http://press-releases.techwhack.com/1945/sprint-and-verizon-global-care/)
is promising news for the service providers because consumers indicated that several of the services were important in terms of conducting these services over the wireless web. The highest rated wireless services (in terms of the consumers’ utility that results from performing those services through wireless devices) are directory and map/driving directions services. Interestingly, these are not high volume activities. Thus, the question arises whether service providers can charge a premium flat rate for these services.

Other services that have high mobile usefulness are email, mobile shopping, and receiving deals and coupons. While a service like email is a high volume service, it tends to be commodity type service (as evidenced from the Internet trends). Therefore, once again one has to wonder if a premium flat rate can be charged for such services. Finally, although services like mobile shopping and receiving deals and coupons are perceived to be useful, consumers may not be willing to pay for such services. This led us to conduct a follow-up focus group to explore what are the services for which potential consumers in the U.S. are willing to pay are premium fee for.

In our preliminary exploration, we discovered that one possible pricing strategy for service providers would be to bundle several services together. More specifically, services can be bundled based on the perceived usefulness of the services. The basic services (ones considered having low perceived usefulness) could be offered as a bundle for a lower flat-fee. Simultaneously, the services that are perceived as most useful (and this is where marketing campaigns will play a large role) can be offered as a higher flat-fee bundle.

Furthermore, an advertising-based approach may also be integrated into the pricing strategy. AT&T has recently started a test in which mobile subscribers get free directory services in exchange for watching two 15-second ads at the beginning and end of call. Similarly, some highly useful services like mobile shopping and receiving deals and coupons lend themselves better for advertising-based models rather than subscription-based pricing models. In fact, such mobile marketing messages can be delivered as relevancy-based advertisements - advertisements that are based on consumers’ locations and preferences. For example, Adidas has a marketing campaign in which a consumer can grant the company permission to use the knowledge of their location (based on their phone numbers) and affinity for an all-star sporting event. Based on this location and preference information, Adidas sends the consumer a text-message regarding sale of limited edition shoes associated with the sporting event. In order to provide such advertisements in the form of services, wireless service providers as well as advertisers have to absolutely ensure that these services are not seen as spam, but rather as RBS (including deals and coupons) that are not just delivered based on the location of the consumer, but also congruent with their specific needs.

While wireless web services hold a great potential for services providers, we contend that the potential can only be realized by thinking beyond LBS. Wireless service providers may be better served by adopting a relevancy-based approach to services. Providers must also undertake extensive communication and consumer education effort to convince consumers of the usefulness of their relevancy-based services. Simultaneously, providers should build consumer trust to capture the preference information from customers in order to effectively provide relevancy-based services. Furthermore, service providers may need to invest in analytics systems to process the preference information. Such an information systems based capability will help providers anticipate customers’ needs and drive the design and delivery of services that are relevant to customers based on their consumption context (location and time) as well as consumption preference (expressed and anticipated needs). Moreover, the full potential of wireless service adoption will not be realized without effective pricing strategies. Given consumers’ preference for flat-fee pricing in the U.S., a flat-rate pricing model in which services are bundled according to different perceived usefulness may be effective. Additionally, the pricing of RBS may be subsidized through relevancy-based advertising, which itself is based on the consumers’ context and preference. Such advertising will ensure that marketing messages are not seen as rude interruptions, but rather as relevant information. In other words, advertising itself can be a RBS rather than spam.

References

We would like to express our gratitude to Dell Corporation for their Dell Star Research grant. The grant enabled us to conduct this exploratory research.

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