

White Paper



Optimizing Service Delivery through the Mobile Channel

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Potential of the mobile phone as a ubiquitous mode of service delivery has caught the imagination of many industries. Increasingly, businesses ranging from financial services to retail to healthcare are wondering how best they can launch various services on this channel.

While conceptually, the mobile channel could be regarded as an extension of the Internet, it is not practically feasible to deliver an application built for the Web, over the cellular phone. Vendors of mobile applications must overcome several challenges before they can go-to-market with an offering suitable for their customers.

Device diversity is one such challenge. Application vendors are confronted with a mind-boggling array of devices, ranging from the simplest text and voice handsets to those that are 3G or even 4G compatible. Each one is characterised by keyboard type, screen size, memory and other features. Clearly, all devices cannot support a mobile application to the same extent. Moreover, while mobile phones may be easy to use, the underlying technology presents certain inherent constraints, which must be factored in by application developers.

Faced with the improbability of creating a single application that can work well on all handsets, technology vendors have resorted to basing their offering on the *Lowest Common Denominator* - so that it can be run on devices with the least capability. However, this is not an ideal solution, since it compromises the interests of users of sophisticated gadgets and forces them to settle for a sub-optimal experience.

The Best Fit approach is an improvement over the *Lowest Common Denominator* principle, as it groups device platforms on the basis of capability and creates individual solutions for each category. However, it suffers from the obvious drawbacks of longer development time and high cost.

Clearly, device constraints must not limit the mobile experience of users across the board. Rather, the mobile application should be able to identify each transaction, and enable it to be processed as best possible within the boundaries of that specific usage. Adherence to the following principles can enable application vendors to address the challenge of device diversity:



Maximize context-based user experience



Every instance of service delivery happens within a specific context - defined by the handset, network speed, browser, location, transaction and so on - which has a significant bearing on user experience. The middleware must be able to define the context associated with each usage, and modify its response in such a way that it delivers the highest level of user experience that is possible within that context. In this way, every single user is able to enjoy the best mobile experience afforded by his particular device.

Device diversity also manifests itself in the form of different interaction mechanisms, such as the keyboard, touch screen and stylus. Once again, different methods of interaction create different contexts that must be responded to accordingly. Hence, the application must incorporate the principle of dynamic design, so that it can adapt to the context at hand.

New age handsets are compatible with several advanced rich media technologies, similar to those supported on PC browsers. In order to maximise user experience, it is vital that a selection of the best Web 2.0 features be enabled on the mobile device.

Interestingly, context can also change with user profile. Younger users, accustomed to dealing with new technology are more likely to be able to deal with complexity, as compared to older people. If the application can identify this type of behavioural dimension, and accordingly present an “interface of choice”, user experience can be further enhanced.

Usage-based context



Context can also be defined by usage pattern. The usage experience of someone who frequently books movie tickets over the mobile phone can be greatly improved if the application can allow him to take a short-cut to this transaction, based on previously made choices of theatre location, show timing and so on.

Taking a different example of product purchase, prior usage pattern can determine the order in which the products are showcased on the mobile browser and shipping information can be recalled from previous buys. At the same time, the user can be navigated through the entire transaction.

When the transaction is completed much faster and with lower data flow, as in the above examples, the cost of usage is also brought down.

Allow evolutionary design and development



The mobile channel is alive with possibilities, the extent of which is yet to be fully grasped by the industry. Application vendors are still in the early stages of the learning curve, and can only progress through experience.

Vendors need to receive substantive feedback based on regular usage, before they are able to determine the optimal mobile middleware solution. Till then, application design and development must follow an evolutionary process. Therefore, they must create applications that enable the monitoring of user experience and easy assimilation of new learning. It follows that the application architecture must be flexible, yet robust enough to monitor intensive levels of usage in real time.

One of the obvious advantages of this approach is the ability to go-to-market quickly with a “base-level” offering which can be improved upon in stages.



Combine transaction orientation and Service Oriented Architecture (SOA) - based integration

Although there are linkages between the two channels, the mobile user interface cannot be treated as a miniaturised Internet website. For one, the usage patterns on both are very different. In general, mobile users come with a clear purpose, knowing what they wish to achieve, and rarely browse around, unlike Internet users. Therefore, the mobile interface has to have a clear transaction orientation, which facilitates the consummation of most regular transactions with minimal effort. The ATM is a good illustration - although ATMs have PC-like capability, the applications are designed to take users directly to a transaction interface from where they can withdraw funds or check account balance.

The implication for developers is that the mobile interface has to be delinked from the Web interface which is delivered on the desktop. While web interfaces seek to deliver content more efficiently, mobile interfaces must raise their transaction capability.

Therefore, it is clear that mobile and internet applications cannot be integrated at the front-end layer. However, they must be integrated at the service level, one layer below. At the service-orientation level, the focus is on unifying transactions conducted via either channel, although they may be visually presented in different ways. SOA-based integration makes it possible to create seamless back-end linkages between the two applications, and does away with the need to build two sets of functionalities. This is a non-intrusive approach wherein there is no need for modification of the intrinsic Web-enabled application. Simply put, two different user interfaces can be made to ride on the same back-end.

Mobile phone usage is expected to maintain its growth momentum for some years to come. In order to leverage this enormous potential, middleware development must be forward looking, and capable of addressing the following imperatives:

Handle multi-mode usage. End users can access a mobile interface via multiple modes. Some may opt for a “thick-client” mode that requires them to download a separate application which helps them connect with the mobile interface; others may use a browser-based “thin-client” model. Alternatively, users may choose to interact only through SMS or go with USSD.

Once again, organisations find themselves in a dilemma regarding the choices that they can provide to users of their application. In the process, they may be forced to accord preference to one mode over the others. This is obviously a sub-optimal solution, since they have no way of knowing how their users will react, and worse, how the other modes will evolve compared to the one that is selected.

Clearly, the ideal middleware solution is one that is multi-mode in character. Fortunately, there are intelligent technology platforms available that can extract information about the mode of usage, along with the rest of the context. By integrating their mobile application with such a platform, organisations can ensure that their mobile offerings are accessible via any mode.

Provide total security. Mobile access is associated with a number of security concerns that have to be addressed before any service can be deployed on this channel. Moreover, technology vendors have to deal with security issues at user, device and network level. Their challenge is to build an intelligent application that ensures end-to-end encryption of data, from the time it leaves the mobile, till it reaches the server. The application must also be capable of

detecting vulnerability, and respond by introducing appropriate safety measures. For example, if it detects an incidence of access over an insecure device or network, it must automatically prohibit transactions of a sensitive nature being carried out.

Deliver performance and scalability. Mobile usage has already reached unimaginable proportions, yet shows no sign of slowing down. Significantly, the quantitative growth in mobile telephony is being matched by an enhancement in its baseline capability. Going forward, mobile access is likely to become increasingly inclusive - therefore, the industry must gear itself to create applications that can deliver high performance at staggering volumes. Hence, scalability and robustness are two key expectations from any middleware platform.

Extend to other channels. The importance of the mobile channel is beyond doubt, yet, technology vendors are aware that this is but one element of any multi-channel strategy. Other promising channels like interactive television and self service kiosks are also emerging concurrently. Clearly, businesses will look to extend their service delivery to these channels in future, if they haven't done so already. Forward thinking vendors are already exploring ways of building intelligent applications that can support user interaction across multiple touch points. The end goal must be to create a solution, underlying which is a multi-channel architecture, so that the mobile application can be adapted to other channels with minimal effort and complexity.

The mobile channel enables virtually every industry to reach out their services to a wide universe of customers. The key to successful realisation of this potential lies in developing mobile middleware that can facilitate transactions as well as maximise the associated user experience, within their specific contexts. Mobile applications adoption is still in the early stages and therefore, it must be designed in a way that supports evolutionary development. Finally, the applications must also be geared to address other important issues such as security, scalability and compatibility with emerging channels.

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The author heads the Infosys mobility platforms and solutions initiative. He and his team focus on building next generation middleware that allow organizations to focus on leveraging the mobile channel without being bogged down with the technology and infrastructural complexities.



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