

Mobile Enterprise Readiness and Transformation

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INTRODUCTION

Recent studies claim that mobile information and communication technologies (ICT) offer a plethora of new value propositions and promise to have a significant transformational impact on business processes, organizations, and supply chains (Kornak et al., 2004). However, despite its potential contributions, enterprise adoption of mobile ICT has not been as widespread as initially anticipated. Previous research has argued that successful adoption and implementation of any emerging ICT, such as mobile ICT, often requires fundamental changes across an enterprise and its current business practices, organizational culture, and workflows (Taylor & McAdam, 2004; Rouse, 2006). Hence, in order to minimize organizational risks and maximize the potential benefits of mobile ICT, enterprises must be cognizant of the value of enterprise mobility to their organization and accurately evaluate their level of “readiness” for mobile ICT adoption (Hartman & Sifonis, 2000; Ward & Peppard, 2002). This paper reviews the transformational value and impact of enterprise mobility and explores the critical dimensions for determining an enterprise’s readiness for mobile ICT. Both theoretical and managerial implications are discussed.

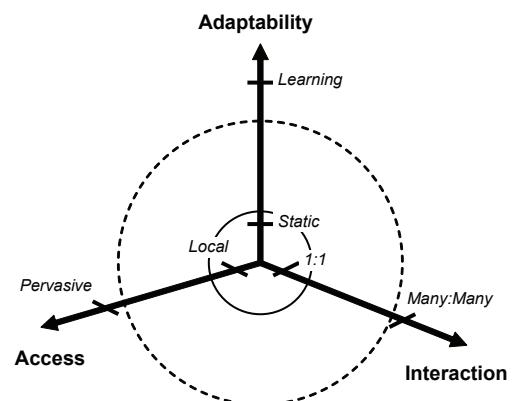
BACKGROUND

Over the past few years mobile ICT have advanced at a tremendous pace making an always-on connection, anywhere and anytime, a growing reality. The rapid proliferation of mobile devices has led to an increasingly mobile society in which users now expect to have instant communication means, data access, and commerce capabilities. A similar trend has also seeped into the enterprise domain. The use of mobile ICT in enterprises has evolved from being simplistic point solutions and small projects focused on productivity improvements and costs savings to strategic and large-scale enterprise-wide implementations that enable organizations to create new core competencies, gain and sustain competitive advantages, and define new markets (Davidson, 1999; Kornak et al., 2004).

The Mobile Enterprise

So what is a mobile enterprise? Simply deploying laptops so employees can take work home does not constitute a mobile enterprise. Pundits have argued that a slight increase in mobility that a laptop affords amounts to little more than a very small geographic extension of the existing static enterprise. Similarly, a mobile enterprise is not merely a collection of people with handheld devices, smart phones, tablet PCs, and pagers. Many enterprises already have such a workforce, however, it often does not change how those people work with each other and the rest of the organization. Therefore, bolting a group of mobile workers onto an organizational chart does not create a new organization and often does very little to enhance the existing one. However, the more mobile workers an organization has, the greater will be the need to transform at least part of that company into a mobile enterprise. More specifically, it will require a rethinking of how business is organized, how people interact and collaborate, how corporate resources are accessed, and how adaptable an enterprise is (Barnes, 2003; Rouse, 2005). Building on this notion, we propose that mobile enterprises exhibit higher levels of access, interaction, and adaptability than their static counterparts do. In visual terms, static enterprises tend to exist in spheres closer to the origin (see Figure 1). The further the sphere is from the origin, the higher the

Figure 1. The dimensions of the mobile enterprise



level of enterprise mobility. Thus, independent of location, the mobile enterprise is built on a foundation of processes and technologies allowing full access to organizational resources, which results in improved adaptability, access, and interaction among employees, customers, partners, and suppliers (Basole, 2005).

Benefits of Enterprise Mobility

With this understanding of the mobile enterprise, it therefore becomes more transparent what benefits mobile ICT can offer. The ability to access the corporate network and resources anywhere and anytime is one of the primary benefits and key drivers to adopting mobile enterprise solutions. Field workers are no longer tied to desktop computers to check mission- and task-critical data. The use of mobile ICT enables workers to receive timely answers, which in turn can lead to timely decisions. Enterprise mobility solutions also offer the potential of achieving significant cost savings. Expensive computing equipment can be replaced with smaller, more portable, and less expensive handheld devices. Field workers can use these devices to be immediately connected to all the sources they need. Furthermore, replacing paper-based processes with mobilized applications reduces the potential for errors in transferring information to a call report or clinical chart, leading to a higher level of data accuracy and integrity, which in turn can be harvested for overall business intelligence use. Better access to corporate resources—both data and people—naturally leads to a higher level of productivity, as mobile workers are able to view data

that allows them to respond and execute faster to changing market conditions.

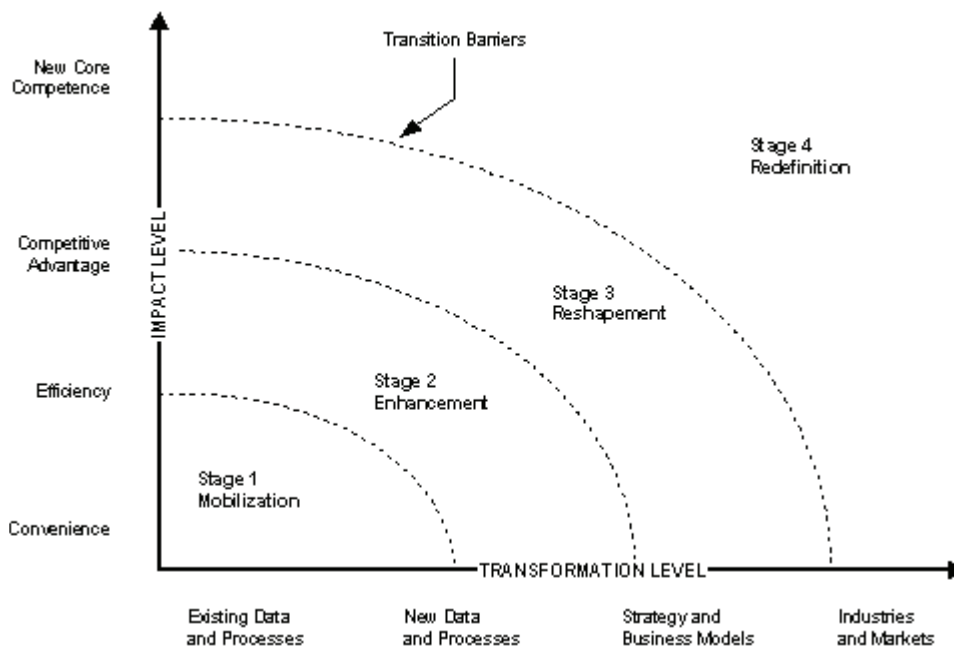
ENTERPRISE TRANSFORMATION THROUGH MOBILE ICT

Mobilizing enterprise applications and providing business professionals access to information anywhere and anytime is clearly an important first step in gaining business value (Barnes, 2003; Kornak et al., 2004); however these gains are only the beginning. We argue that enterprises can realize a much broader range of benefits over time by pursuing a multi-stage mobile transformation process. Research has shown that ICT have the ability to change and fundamentally transform enterprises in a number of ways (Basole & DeMillo, 2006; Rouse, 2006). This transformational impact can be primarily experienced and realized at the strategic, operational and organizational culture level (Taylor & McAdam, 2004). Indeed, the impact of mobile ICT is far beyond mere business process improvements and enhancements (Davidson, 1999; Kornak et al., 2004; Basole, 2005). Extending this previous work, four distinct stages of mobile enterprise transformations are proposed (see Figure 2).

Mobilization (Stage 1)

The first stage of the transformation process begins with the mobilization of existing data and applications. Mobilization refers to the process of making current business data, pro-

Figure 2. Stages of enterprise transformation through mobile ICT



cesses, and applications available for use on mobile/wireless devices. The first stage aims to provide end-users with a new level of convenience by enabling access to resources anywhere and anytime. Examples include access to corporate e-mail, the Intranet, and other data and human resources. Generally, Stage 1 solutions will lead to higher levels of convenience and generate significant performance gains in productivity, speed, efficiency, quality, and customer service (Kornak et al., 2004).

Enhancement (Stage 2)

The second stage shifts its focus from mobilizing existing data and applications to enhancing existing and creating new business processes that leverage the unique functionalities and capabilities of mobile ICT (Barnes, 2003). Characteristics of these business processes generally include two elements, namely (1) mobility (do it anywhere) and (2) immediacy (do it now), all with the user's context in mind. While solutions in the enhancement stage may affect working practices and modify business processes, they seldom change the business in a fundamental manner. This level of transformation occurs in Stage 3 of the mobile transformation process.

Reshaping (Stage 3)

As enterprises transition to Stage 3, mobile ICT begin to reshape business models and strategies. The creation of innovative new mobile processes and services provide enterprises with a source of competitive advantage. In this stage, mobile ICT often enable a business capability and become a critical element in the overall business model. For example, wireless sensors could enable a pharmaceutical company to shift from selling only medication to a business model in which the company provides both medication and sensors, and enters into a contract with a medical practitioner to perform continuous monitoring and keep a patient's blood pressure within an agreed range.

Redefinition (Stage 4)

In the fourth and final stage of the transformation process, mobile ICT create entirely new core enterprise competencies. Business models and strategies are based and revolve around enterprise mobility and in turn lead to a redefinition of entire markets and industries. Concrete examples for this stage of the mobile transformation process have not emerged yet; however, as enterprises continue to embrace mobility and mobile ICT mature, mobile redefinition is expected to become an increasingly common business phenomenon.

The four stages of mobile enterprise transformation are not purely sequential. Activities performed during Stage 1 continue during Stages 2-4. Some companies may elect tran-

sitioning directly from Stage 1 to Stage 3. New ventures may begin their business models based on Stage 2 philosophies. Stage 4 examples are still scarce, but are poised to emerge as mobile ICT continue to mature and new business models take shape. Yet, all four stages are inextricably linked in significant ways. Diligent pursuit of Stage 1 initiatives will lead to many Stage 2 and 3 opportunities. Similarly, Stage 4 opportunities will emerge as enterprises realize the full transformational potential of mobile ICT solutions.

Adoption and Transition Barriers

Enterprises that undergo significant organizational changes generally encounter a number of transition barriers. Empirical evidence suggests that these barriers can be broadly categorized as economic/strategic, technological, organizational, and environmental-related issues (Taylor & McAdam, 2004).

Despite tremendous advances, mobile ICT are still in their infancy stage. Evolving standards, lack of technology maturity, and issues of compatibility with existing systems and infrastructure are causing organizations to delay mobile ICT implementation (Basole, 2005). Another prevalent barrier is related to the ongoing debate of business value and cost. Investments in emerging technologies such as mobile ICT often require significant financial commitments by the enterprise. With shrinking IT budgets, it becomes critical to understand what value enterprise mobility can deliver now, and in the future. Mobile ICT implementations must thus be aligned with the overall business strategy and support enterprises' current and future business objectives. Similarly, the availability of other organizational resources—such as human and technical support—must be in place in order to successfully adopt mobile ICT and transition across the stages. From an organizational perspective, enterprise culture, size and structure also play a critical role in the adoption and transition process. As with most new ICT implementations, end-users often show resistance to new processes and change. Mobile ICT will have a radical, and potentially transformational, impact on the way work is done; hence, particular attention to end-user needs, education, motivation and incentives must be provided to ensure a successful adoption, implementation, and transition. Lastly, unfavorable market conditions, strong regulatory influences, lack of customer and supplier pressure, and inadequate vendor support may also inhibit organizational adoption of mobile ICT.

In summary, in order to avoid a "fragmented" mobile ICT adoption and transformation, enterprises should determine the fit between the value of mobile ICT and the overall business strategy, and ensure that a common vision, leadership support, and strategic path for implementing enterprise mobility solutions is in place (Ward & Peppard, 2002).

ENTERPRISE READINESS FOR MOBILE ICT

The previous discussion highlights the complexity of mobile ICT adoption and implementation, as well as the transition across the four transformation stages. It also underlines the fact that successful assimilation will require significant organizational changes, its current business practices, culture, processes, and workflows. While previous studies identified the potential benefits, challenges, and drivers for enterprise adoption of mobile ICT, exact enterprise benefits and ROI of mobile ICT implementations may not be known for the near future. As ICT budgets have decreased and failure rates for new ICT implementations have continued to rise over the past years, a smaller tolerance to ICT failures has emerged. The hype of potential benefits often drives enterprises to jump onto the “fad” bandwagon and rush into ineffective implementations of new ICT. In contrast, however, a range of studies have shown that many potentially successful IT projects fail due to a lack of assessment of potential barriers and organizational risks associated to the implementation of new ICT.

In order to minimize the associated risks and maximize the potential benefits of enterprise mobility solutions, organizations must thus not only understand the value and economics of enterprise mobility solutions, but also carefully evaluate and measure their level of “enterprise readiness” for mobile ICT (Hartman & Sifonis, 2000; Basole, 2005). Readiness assessment enables decision makers to become more knowledgeable about the characteristics of mobile ICT, form attitudes about it, and make a decision regarding the fit between the technology and the organization (Hartman & Sifonis 2000). It also enables decision makers to determine whether enterprises can truly benefit from mobile ICT and take appropriate measures to steer the organization towards a successful adoption and mobile transformation transition.

Defining Enterprise Readiness for Mobile ICT

The concept of enterprise readiness for ICT has received very limited attention in both the academic and business press literature. Preparedness, agility, and maturity are often some terms commonly associated with enterprise readiness. However, anecdotal evidence has shown that higher levels of enterprise readiness generally lead to lower levels of innovation risk and more successful implementation outcomes. A similar argument can be transposed to the context of mobile ICT: higher levels of mobile ICT readiness leads to lower organizational risks and implementations that are more successful.

So what constitutes enterprise readiness for mobile ICT? Extending previous theories of organizational readiness and

technology adoption (Hartman & Sifonis, 2000; Taylor & McAdam, 2004), we postulate the following definition:

Enterprise readiness for mobile ICT is an assessment of an organization’s (1) preparedness, (2) potential, and (3) willingness to adopt and implement mobile ICT.

More specifically, preparedness refers to an organization’s ability to adopt, diffuse, and assimilate mobile ICT; potential refers to an organization’s processes, employee, and strategy that could benefit from mobile ICT; and willingness reflects the attitudinal orientation of leadership and employee towards adopting mobile ICT.

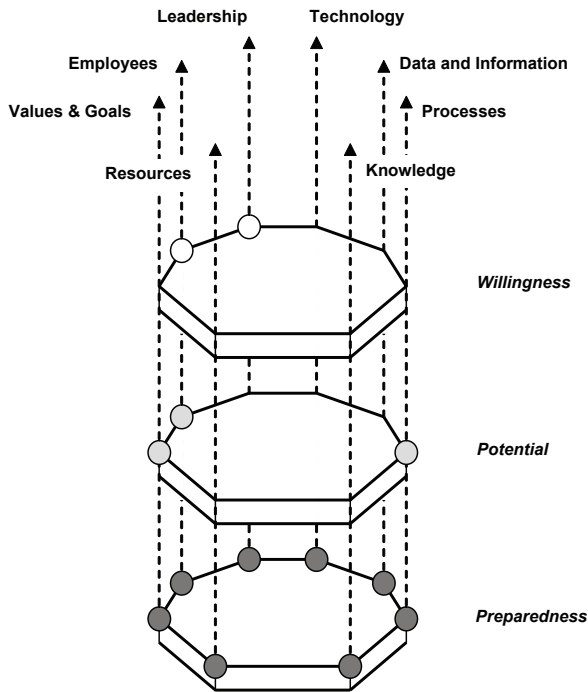
Dimensions of Enterprise Readiness

We further argue that enterprise readiness for mobile ICT is comprised of eight dimensions: (1) technology, (2) data and information, (3) process, (4) resource, (5) knowledge, (6) leadership, (7) employee, and (8) values and goals. A complete enterprise readiness assessment will thus involve an evaluation across the three layers—preparedness, potential, and willingness—and along all eight readiness dimensions (see *Figure 3*). Preparedness is assessed for all eight dimensions; potential is evaluated along the process, employee, and value and goals dimensions; and, willingness is assessed along the employee and leadership dimensions.

Theoretical and practical support for each of the eight dimensions and associated assessment indicators is provided as follows:

- **Technology Readiness:** Technology readiness refers to the ability of the underlying technology infrastructure (network services, hardware, software, and security) to support the adoption and implementation of mobile ICT. A robust, comprehensive, and open-standards oriented technological infrastructure, flexible and scalable to accommodate any change and emerging requirements, leads to a higher level of technology readiness.
- **Data and Information Readiness:** Data and information readiness refers to the ability to federate data from multiple sources, provide a single view of enterprise data, and make it available to any system at the time when it is needed. Higher levels of data and information readiness is achieved through a consistent, reliable, and secure data and information infrastructure that provides both synchronization and data recovery capabilities for highly disconnected and variable environments.
- **Process Readiness:** Process readiness refers to the ability of organizational processes (e.g., human processes, information processes, organizational change processes, etc.) to facilitate the adoption and implementation of mobile ICT. Well-defined, documented,

Figure 3. Dimensions and layers of enterprise readiness for mobile ICT



managed, repeatable and optimized processes indicate a high level of readiness along this dimension.

- **Resource Readiness:** Resource readiness represents an organization’s ability to support mobile ICT adoption and implementation. These resources may include (1) financial, (2) human, and (3) technical assets. The availability of resources for current and future plans is an important aspect in successful assimilations of mobile ICT.
- **Knowledge Readiness:** Knowledge readiness reflects both the general and specific knowledge required by decision makers for mobile ICT adoption and implementation. General knowledge includes awareness and understanding of the state of emerging ICT, ICT-related decision-making processes, and previous experiences with ICT adoptions and implementations. Specific knowledge encompasses an awareness and understanding of the opportunities, challenges, barriers, and opportunities that come with the adoption and implementation of mobile ICT. This will include an understanding of mobile ICT characteristics, its potential impact on strategy, processes, and people, and the changing enterprise mobility market.
- **Leadership Readiness:** Previous studies have shown that one of the most critical factors in technology adoption decisions is the support and vision of top management. Leadership readiness, hence, reflects

an appropriate level of skills, innovativeness, knowledge, and risk orientation of top management. It also indicates the level of support and strategic vision that management offers in association to the adoption and implementation of mobile ICT. Leadership needs to ensure that mobile strategies fit with the way they are doing business rather than changing their ways of doing business to fit the strategy.

- **Employee Readiness:** Employee readiness reflects the end-users attitude towards change, their level of skills, and perceived benefits by the end-users. A high level of employee readiness can lead to a faster adoption and diffusion of mobile ICT.
- **Values & Goals Readiness:** Values and goals readiness reflects the fit between existing structural and nonstructural enterprise characteristics and mobile ICT characteristics. Structural characteristics may include organizational size, centralization, formalization, autonomy, specialization, functional differentiation, strategic objectives and goals. Nonstructural characteristics may include culture, bureaucracy, task environment, and political climate.

It should be noted that all of these dimensions have an influence on each other and must therefore be considered as a whole. A lack in one dimension may influence the overall enterprise readiness for mobile ICT. Similarly, a lack of readiness in one of the three layers will also result in a lower degree of enterprise readiness. As such, a comprehensive assessment of all dimensions on all layers should be conducted.

FUTURE TRENDS AND CONCLUSION

Enterprise mobility is not merely a fad; it has become a reality in a wide-range of organizations and industries. Mobile ICT clearly offers a plethora of lucrative value propositions that will impact and fundamentally transform business processes, organizations, and supply chains. As mobile ICT continues to evolve and mature, enterprises must prepare themselves for a more “mobile” future. In order to minimize organizational risks and maximize the potential benefits of mobile ICT adoption and implementation, is therefore of utmost importance in order to assess the level of enterprise readiness for mobile ICT. We further argue that an understanding of the transformational stages can provide decision makers with a strategic map of the potential impact of mobile ICT. An assessment of an enterprise’s preparedness, potential, and willingness in conjunction with an understanding of the transformative influence will enable decision makers to make more objective judgments on why and when to adopt mobile ICT, aid in the formulation of appropriate mobility strategies, and enable successful transformations.

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KEY TERMS

Enterprise Readiness for Mobile ICT: Enterprise readiness for mobile ICT is an assessment of an organization's (1) preparedness, (2) potential, and (3) willingness to adopt and implement mobile ICT, and is an essential element for successful enterprise transformation through mobile ICT.

Enterprise Transformation: Enterprise transformation concerns fundamental change that substantially alters an organization's relationships with one or more key constituencies, and can involve new value propositions in terms of products and services, how these offerings are delivered and supported, and/or how the enterprise is organized to provide these offerings.

Mobile ICT: Mobile ICT refers to all mobile information and communication technologies, including network infrastructure (e.g., WiFi), devices (e.g., smart phones, laptops, PDAs), and mobile applications.