

A TASK-BASED FRAMEWORK FOR MOBILE APPLICATIONS TO ENHANCE SALESPERSONS' PERFORMANCE

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Abstract: The paper suggests a framework for mobile applications aimed at supporting salespersons' tasks for greater performance when they are operating within a highly mobile work environment. To do so the paper starts by providing a review of mobile technologies characteristics in terms of mobile devices, connectivity and mobile applications. After deriving a set of propositions, the paper offers some concluding remarks and suggests areas for future research

Key words: Mobile technologies; Salespersons performance; salespersons tasks; task technology fit.

1. INTRODUCTION

The role of the professional selling has expanded and changed dramatically in recent years. Instead of merely selling products, today's sales persons are expected to serve customers as consultants who offer expert advice on improving customer's life style or making their business operations more profitable. They operate like micro marketing-managers in the field. Buyers are becoming increasingly skilful at obtaining value of their expenditures. Salespersons now usually deal with professional buyers or purchasing agents who base their buying decisions on the representative's delivery of quality and service and how the product will affect their company's profit. Such rapidly growing sophistication of professional

buyers and their increasing access to information will continue to challenge salespersons to find new sources and faster methods of obtaining information despite their constant move. Additionally, the unique nature of selling with its mobility requirements, time demand, psychological strain, work-related role stress and performance orientation continue to put unusual pressure on salespersons.

The advent of access to services through mobile and wireless devices has resulted in a fast growing of a number of mobile applications and service. Mobile (or wireless) applications, despite being different in their nature, they share a common characteristic that distinguishes them from their wire-line counterpart: They put the user at the centre of information and communication through the provision of location specific information, personalization, immediacy, and service availability (Durlacher, 2001). These characteristics would enable the development of innovative mobile applications to support firms' salespersons for greater performance despite their high work mobility. How and which mobile applications can support these frontline ambassadors in their sales efforts are key questions facing a number of stakeholders including sale managers today.

The paper suggests a task-based framework for developing mobile applications to support salespersons' tasks when they are operating within a highly mobile work environment. To do so the paper starts by providing a review of mobile technologies characteristics in terms of mobile devices, connectivity and mobile applications. After deriving a set of propositions, the paper offers some concluding remarks and suggests areas for future research

2. MOBILE TECHNOLOGIES OVERVIEW

A complex, interconnected set of technologies provides the basis on which mobile applications and services can be built. Similar to traditional information systems (IS), mobile technologies can be reviewed according to three dimensions: mobile devices corresponding to the hardware in IS, network connectivity and applications (software).

2.1 Mobile Devices

Mobile technologies bring back to discourse the issues associated with devices that can be used to access and utilize IS functionality. Laptop PCs have extended IS functionality by enabling workers to bring their digital work with them whenever they were going. Gradually smaller devices have been developed. Personal Digital Assistant (PDA) such as Psion, Palm and

Windows CE based palm tops, and operating systems such as WinCE, EPOC and PalmOS have emerged for mobile users. Smartphones, a combination of a mobile phone and a PDA have increasingly become popular and hold a great promise. They include versions of Nokia communicators, Handspring Treo, smartphone devices from vendors such as Orange, Samsung and AT&T Wireless version (www.synchrologic.com).

For the purpose of this paper, a mobile device is any device connected to the Internet or other networks through wireless networking using any standard wireless communication protocol. They include such devices as laptop PCs, Tablet PCs, PDAs, smartphones and WAP enabled phones.

Mobile devices can be assessed according to the three dimensions: usability, capability and cost. Usability includes such characteristics as portability, micro-mobility, display and input characteristics. Portability as determined by the device's weight and size is a significant usage factor for the mobile workforce. Device's micro-mobility as describes by Luff and heath (1998) is inherent in the physical objects in that they may be moved about and be shared between people to support communication (i.e. during a meeting).

Device's capability include such characteristics as processing power, amount of local storage, battery life, available connection options, location-awareness and security factors (see for example, Tarassewich et al. 2002, Ovum 2003, synchrologic 2003 for discussions of open issues).

The device 's cost factor includes procurement cost, support and add-in cost. Add-in cost is the cost resulting from adding other functionality to an existing type of device such as a cell phone. An example is mobile software applications that add processing and other functionality to cell phones (Gebauer et al., 2002)

Mobile devices differ in terms of their usability, capability and cost characteristics. Such differences give raise to tradeoffs particularly between device capability and device usability. For instance a Laptop Pc offers some good features in terms of processing power, memory, display and input /output characteristics, but they are often awkward to use on the move. Indeed, a laptop is able to receive a document anywhere that a network can be established with computers back at the office. However once the document is received, the laptop cannot be spatially reoriented at the micro-level, during a face-to-face meeting in a way that a PDA or a smartphone allows. Additionally, The Laptop's procurement and maintenance cost are far high compared to PDAs or smartphones.

2.2 Connectivity

In addition to mobile devices, networking support is crucial to support a mobile workforce without constant physical access to stationary IS. Mobile and wireless networks are experiencing significant progress in the form of wireless local area network (WLAN), Satellite-based Networks, Wireless Local Loops, Mobile Internet Protocol and Wireless Asynchronous Transfer Mode Network (see for example Varshney 2002 for more details about such technologies). One emerging technology is bluetooth, a short-range, point-to-multipoint data transfer, which provides low cost short-range radio link for wireless connecting.

Distinguishing factors for network connectivity include Network capacity (i.e. bandwidth), geographic network availability and connection fees. Significant efforts are in course to enhance mobile and wireless network' bandwidth. In addition, developments in mobile middleware platforms contribute in optimising for low bandwidth, intermittent connections as well as the amount of processing required at the mobile device.

Network availability, including roaming across multiple networks and the mobile user location's environment (outdoor, indoor, underground); might be a significant functionality factor for mobile applications and services, in particular those supporting an on the move workforce. An example is location based mobile applications and services, which rely on positioning technologies such as GPS and Cellular positioning technologies. The positioning accuracy of such technologies depends on whether the user is in an indoor environment (i.e. a building), a rural or dense urban area. (BenMoussa, 2004).

Current developments in wireless and mobile connectivity in the form of the third generation mobile communication systems (3G) hold a great promise in providing a faster and reliable access time to users and reducing the total cost of access and transfer of data across multiple networks. Some firms started developing 4G technologies and global standards. NTT DoCoMo, Inc. announced in 2003 plans for a field trial of 4G mobile communication systems.

2.3 Applications

Although mobile technologies such as mobile phones and PDAs were first developed as consumer products rather than business solutions, a number of innovative companies have adopted those technologies as enablers for their process innovation` initiatives (Kakihara et al. 2003). Traditionally, the use of mobile technologies in business environment has been concentrated in supporting sales process and logistics (i.e. the cases of

Fritto-lay, UPS). The introduction of wireless digital networks has made it possible to transfer data cost effectively and potentially increase the added value of mobile applications through the provision of location sensitive information.

The paper categorizes mobile application and services into the three functional categories: the connective, the interactive and the proactive mobile application and services. The following outline the three analytical categories of mobile application and services.

2.3.1 Connective mobile applications

Connective mobile applications involve basically a mobile and a wireless client accessing a centralized service. An example of connective mobile applications includes accessing wirelessly Intranet functionality via a mobile device. The user sends information requests to the server, which in turns serves, the relevant information back to the user. Another example is accessing wirelessly a WAP or I-mode site.

2.3.2 Interactive mobile applications

Mobile interactive applications support the generation of information through communication between people. Obviously the best example of interactive mobile applications is the mobile phone itself (Sorrensen et al., 2002). The SMS functionality supports short text messages can also be considered interactive mobile applications. As is the instant messaging services, such as ICQ, AOL, and MSN messenger service for pocket PC 2002. Other examples of interactive mobile applications include e-mail systems and Awareware supporting mutual awareness through synchronous or asynchronous modes of awareness employing visual or verbal media.

2.3.3 Proactive mobile applications

Proactive mobile applications are aimed at supporting mobile users in responding proactively to potential changing environmental trends. Based on the user's situational context and changing environment, the service provider delivers content without receiving a request from him/her. An indicative example of mobile applications could be the use of mobile wireless client in managing the supply chain allowing dispersed actors to interact with the parameters governing the supply chain and respond proactively to potential malfunction (i.e. lost or delayed orders).

3. FRAMEWORK FOR MOBILE APPLICATIONS TO SUPPORT SALESPERSONS TASKS

The paper now suggests three propositions for developing mobile applications aimed at supporting salespersons for greater performance.

✓ Categorising salespersons tasks by the areas that might be affected by mobile technologies,

✓ Fitting mobile technologies characteristics with salespersons' task requirement in order to increases the applications' chance to succeed,

✓ Involving actively the salespersons in the design, development and implementation of mobile applications can increase the success chance of such applications.

3.1 Categorizing Salespersons Tasks by the Areas of Mobile Support

The paper suggests that categorising salespersons tasks based on the areas that mobile technologies can support, would provide a rich resource in terms of delivering a targeted support to salespersons in order to handle the tasks at hand. Salespersons tasks can thus constitute the point of departure in terms of developing salespersons' mobile applications. Using tasks as unit of analysis for supporting knowledge workers in general has been emphasised by many authors (Hackman, 1969; Druckar, 1999; Byström, 1999; Perry et al, 2001, Luff and Heath, 1998). For instance, Druckard points out that understanding knowledge workers' tasks is the first requirement in tackling knowledge workers' productivity. One reason for this, Druckard said, stems from the fact that unlike manual work, knowledge work does not program the worker. (Luff et al, 2000) have shown that the misunderstanding of the nature of tasks that workers perform can be problematic and lead to technologies being used in unexpected ways. For example they describe a situation in which a mobile device was introduced onto a building site to replace a paper allocation sheet used to record the amount of time workers spent on particular aspects of a job. The system was supposed to provide a mobile resource for the workers to help them monitor problems as they occur and to support in situ discussion with other people on the site. What happened in actual use however differed from the intent. Instead of being used as a communication tool to support the mobility of the worker around the site, it was used primarily as a data documentation device. This occurred because the device impeded certain important features of collaborative work practices of the workers and the other workers when on the site.

The paper proposes the following categorisation of salespersons tasks based on the review of the determinants of salespeople performance and the characteristics of mobile technologies.

3.1.1 Information tasks

Mobile technologies can enable salespeople to collect and have access to information irrespective of their locations, which would have an impact on the areas of prospecting and customer relationship management.

In prospecting, salespersons can be supported by having access anywhere and anytime to customize the list of prospects together with additional information about customer's buying history, real time orders, and latest events in the customer's business, which may enable them to qualify prospects and apply target selling.

In the field, mobile technologies can also enable salespersons to obtain up-to date information about the prospect and use it during the sales call to adapt to sales situations and to overcome objections. In addition, Mobile technologies can give the sales force the ability to check the availability and prices of any products, and thus deliver feasible promises. Salespersons can also configure products to reflect customers needs and wants, while with the customer, by having access to communication with the company's technical specialist. Furthermore, awareness of salespersons' location can enable useful information about the customer to be delivered to them so that they can reflect it during their sales call.

3.1.2 Interaction Tasks

Information contained in sales call, expenses and calendar reports from salespersons is vital to sales managers' ability to both adapt their marketing strategies and manage salespeople. Mobile technologies can help sales persons in reporting such information any time and irrespective of their locations. Also, ubiquitous access to e-mails and corporate data by salespersons may enable them to make themselves readily available to interact with their accounts and address their problems and question, which would have a positive impact on their customer orientation. Indeed the customer requires, in today's highly competitive world, timely and accurate information, fast response to questions and the ability to work with salespersons that can provide these things (Engel et al, 2000). In addition mobile technologies would make it possible to salespersons, irrespective of their locations, to seek support from both their colleagues and managers should they face an unexpected challenging sales problem.

3.1.3 Planning Tasks

Mobile technologies can enable salespersons to better manager their time and reorganize their contacts irrespective of their locations so that they can focus on the most profitable accounts and use their dead time more productively. This time generally occurs between tasks and between meetings, in which salespersons usually have little control over the resources available to them. For instance, pharmaceutical sales reps often visit doctors to provide them with information on what is available as order brochures on products in which the doctor is interested. Frequently the doctor is not available and the representative wants to find a nearby alternative contact. If there is no alternative contact to visit, then the time for waiting for the doctor to become available may turn to be dead time for the sales representative. With mobile technologies, the sales rep can turn this dead time into a productive one by performing non-selling tasks such as completing and sending expense reports to her company, preparing invoices or writing and sending thanks letters to customers. These reduce the time that sales reps have to spend in the office to perform routine tasks and thus allow them to spend more time selling. Indeed, despite the problems associated with laptop computer in terms of carrying behaviour, weight and booting time, Hewlett Packard found that salespeople using laptop computers spent 27 percent more time with customers, earned 10 percent more sales and achieved three times the productivity of sales reps who did not use laptops (Taylor, 1987). Using dead time more efficiently may occur in a variety of locations (i.e. trains, airports, airplanes, hotels rooms, office buildings, etc).

3.2 Fitting Salespersons' Task Requirements with Mobile Technologies characteristics

After reviewing mobile technologies characteristics in terms of devices, processing and network connectivity, the paper suggested a categorisation of salespersons tasks based on the areas that can be affected by mobile technologies, the paper derived three categories of salespersons tasks: information tasks, interaction tasks, planning tasks and mobile tasks. The paper now suggests that each of the above mentioned category of tasks has specific requirements in terms of mobile technologies characteristics, and that a fit between mobile technologies characteristics and the requirements of the tasks with respect to content, processing, device portability, device micro-mobility, retrieval and location based alerts can support the success of salespersons 'mobile applications in terms of achieving the expected benefits. Figure one refers to a framework of mobile applications to support

salespersons' tasks when they are operating within a mobile work environment.

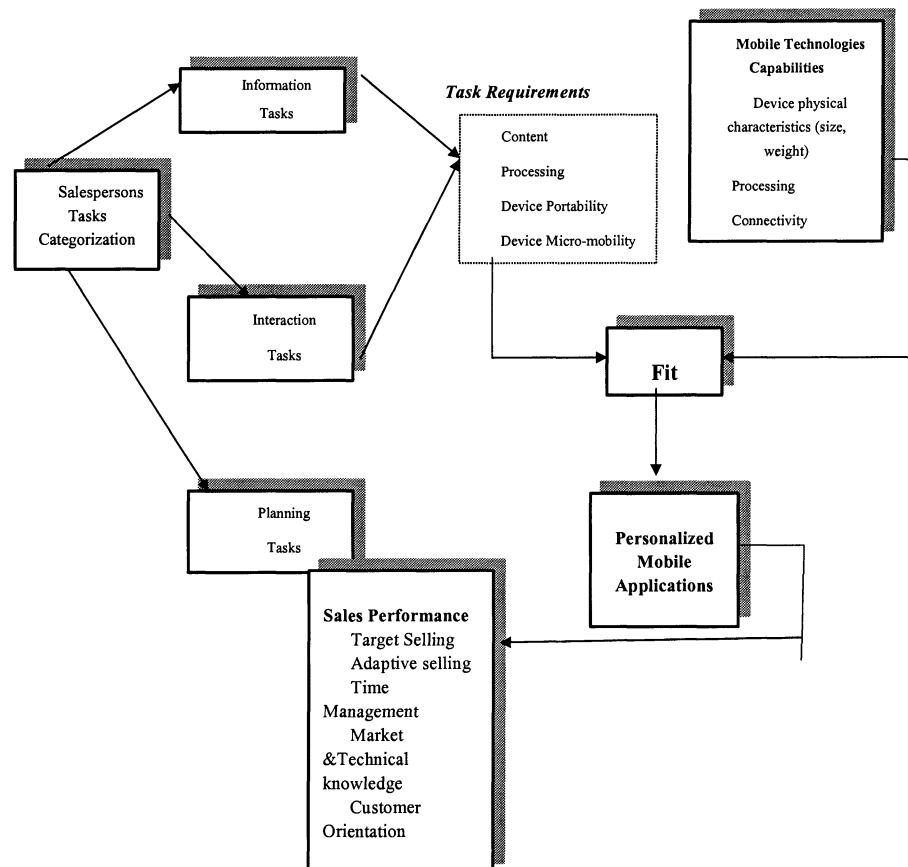


Figure 1: Fit between salespersons task requirements and mobile technologies capabilities as enabler of the success of mobile applications to support salespersons performance

The paper proposes that salespersons perform a variety of tasks with different purposes, which impose requirements that cannot fit the characteristics of a specific mobile device. For instance a laptop is able to receive a document anywhere that a network connection can be established with a computer back at the office. But once the document is received, the laptop cannot be spatially reoriented at the micro-level, for example during a face-to-face interaction in a way that a PDA or a smart phone can allow. Additionally a mobile phone can be appropriate for alerts and notification to

support information tasks as well as simple interaction tasks (i.e. inventory checking, price inquiry or product inquires) but difficult to use it for interaction tasks involving a data processing or complex information analysis such as reports on customers' business or key accounts profitability.

In contrast the laptop, given its size and functionality can support salespersons in performing such tasks. However for alerts and notifications, laptop might not be an adequate medium given their size, weight and booting requirement.

The tasks also impose requirements in terms of the content. For instance information tasks require an adaptation of the content so that it can fit with other requirements such as device portability or micro-mobility and thus make the information relevant to the situation faced by the salesperson. Content about products, market or prospects' business should be adapted so that they can fit with the portability characteristics of mobile phones or PDAs and thus they can be used at the moment of relevance (i.e. during customer interaction).

Travel is a key component of salespersons' work. Studies have shown that before the trip, workers face unpredictability with respect to the nature of information and artefact that they need during a trip. (Perry et al. 2000). As a result, they plan ahead to take things that they just feel they would need. The purpose is to make sure that documents and information are available in the appropriate form when and where needed to support unanticipated information and communication need. In theory laptops can support this type of impromptu document access because they offer the potential flexibility to open unanticipated documents from hard disk or over network connections. However Perry et al. 2000 behaviour study of 17 mobile professionals from a variety of professions (management personnel, sales staff, consultant, medical workers, civil servant and media) revealed that while 70% of the participants they studied have access to a laptop, only about a half took them to the trip and those participants bringing their laptop do not necessarily take them to meeting. Furthermore according to such a study, the use of connected laptops to access information was hindered because laptops themselves were subject to planning (should they be taken or not). This was due to the laptop carrying behaviour (i.e. size, weight, risk of theft) conflicts with potential use in supporting unanticipated documents and communication needs.

3.3 Involving Salespersons in Applications' Design, Developments and Implementation

The paper suggests that the real benefits of developing mobile applications to support salespersons' tasks come from their use in actual

selling and customer interaction. Therefore salespersons should be encouraged to use such application. This raises the need of the acceptance of such applications by salespersons. The paper proposes that involving salespersons in the design, development and implementations of such applications can insure good information of the applications' design, which in turn can have a positive impact on the quality of support the applications provide. DeLone and Mclean (1992) model supports this proposition. DeLone and McLean believe that the information technology system' quality, together with the quality of information will lead to the utilisation of the information technology. This utilization then leads to an individual impact resulting in an organizational impact. They also point out that utilisation also interacts with user satisfaction. Additionally, involving actively salespersons in the different stages of applications development process might lead to new innovative ideas in terms of the use of the new technologies that salespersons can come up with based on their experience.

CONCLUSION

The paper has proposed a framework for mobile applications to support salespersons tasks .The paper suggested a categorisation of salespersons tasks based on the areas that can be affected by mobile technologies. The paper then derived three categories of salespersons tasks: information tasks, interaction tasks and planning tasks. The paper also suggests that each of the above mentioned category of tasks has specific requirements in terms of mobile support and that a fit between mobile technologies characteristics and the requirements of the tasks in terms of content, processing, device portability, device micro-mobility, retrieval and location-based alerts can increase the success of salespersons 'mobile applications in terms of achieving the expected benefits. The paper also proposes that involving actively salespersons in the design, the development and implementation of the applications can increase the chances of developing high quality application; which in turn would affect positively their acceptance by salespersons and thus their use during sales situations.

It is worth mentioning that the use of mobile technologies may result in some consequences that salespersons may not welcome. Perhaps the most immediate drawback of extensive use of mobile technologies by salespersons is the problem of "information and interaction overload". In addition, some salespersons may perceive mobile applications and services as threat of their freedom in the field and thus may be reluctant to adopt them.As the acceptance of mobile applications and services by salespersons goes beyond the scope of this paper, future research is needed to both

address acceptance issues associated with mobile applications and services and translate the rapid development of mobile technologies into innovative and value adding solutions for the sales force.

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