Supporting the Pharmaceutical Sales Force through Mobile Information and Communication technologies: an Exploratory Investigation

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Abstract

Firms are increasingly rushing to invest in a variety of technologies or sales force automation (SFA) to increase the performance of their sales forces. Research has shown, however, that a high proportion of SFA projects fail. The high failure rate of SFA projects can be explained by the lack of appropriate planning, resulting in a gap between management and the sales force in perceptions and usefulness of SFA. This paper explores the barriers to performance that the pharmaceutical sales force face when operating in a mobile working setting, The paper also explored the perception of the sales force with regard to a number of mobile solutions that could provide the sales representatives with the necessary support to deal with the barriers to performance they face in the course of their everyday work. This is achieved through a case study of a midsized multinational pharmaceutical company.

Keywords: Mobile information and communications technologies, sales force, mobility, barriers to performance.

1. Introduction

Firms worldwide are investing significant sums in sales force automation (SFA) with the goal of improving the performance of their sales forces. SFA occurs when a firm applies information technology to enhance the performance of its sales force or to computerise routine tasks in the sales process (Honeycutt, 2005).

SFA appeared to provide firms with a competitive advantage (Dulaney 1996; Keillor et al. 1997). Some researchers even go so far as to claim that SFA is now a survival tool, something a firm adopts so as not to be at a competitive disadvantage (Erffmeyer & Johnson, 2001). However optimistic reports contrast sharply with other research that clearly states that the adoption and use of SFA/CRM technologies have been less successful than originally hoped (Rigby et al. 2002). The failure rates for SFA implementations have been reported to be as high as 55–80 per cent (Honeycutt, 2005; Rigby et al. 2002). According to a leading IT consulting agency, 60 per cent of sales personnel report not using available SFA technology (Dulaney, 1996). The main reason cited by sales representatives is that SFA did not help them in the most important aspects of their job: face-to-face customer meetings. As a result, given that firms invest between US$5000 and US$15,000 per salesperson in SFA projects, failure rates at even one half of this magnitude indicate that firms may not be recouping their technology investment (Honeycutt, 2005).

However, despite the growth of SFA initiatives, the potential efficiency and effectiveness SFA is perceived to bring to the sales force, and the magnitude of SFA failures, it is surprising that relatively few studies have addressed this important topic especially in the information systems discipline. Most researchers state that the level of SFA research is insufficient (Erffmeyer and Johnson, 2001, Jones et al. 2002, Pathasarathy & Sohi, 1997, Rivers & Dart, 1999, Speier& Venkatesh, 2002 and Widmier et al. 2002). For example, according to Honeycutt et al. 2005, the accelerating growth and significant investments made by industrial firms validate the significance of SFA research. Likewise, Erffmeyer observes that major literature reviews suggested sales force automation would be a promising area of research, yet noted that little has been forthcoming.

The literature about SFA adoption (e.g. Gohmann et al. 2005; Buehrer et al.2005; Jones et al., 2002; Robinson et al. 2005; Rangarajan, 2005) suggests that although the sales force may initially adopt the SFA technology, their full usage of the technology is not always guaranteed. Therefore the majority of the studies about adoption of SFA by the sales force point to the importance of convincing the sales force of the usefulness of SFA for their everyday work activities, "Unless the sales force buy into the CRM implementation it will fail" (Patton, 2001). According to Honeycutt et al.(2005) one common mistake individual firms make when promoting automation is focusing on technology features (e.g. wireless Internet access) instead of specific benefits (e.g. ability to check inventory and delivery dates instantly while talking to clients at their locations). However, there remains the unanswered question of how to convince the sales force of the usefulness of the SFA technology so that they can both adopt it and use it to its full potential. For example, although salespeople technology usage has been recently investigated, most of the studies focus on implementation issues either after implementation of the sales force technology or a few months prior to implementation, but after the decision of automation and the selection of technology has already been made by the management. No study has yet looked at what salespeople perceive as barriers to their performance in their everyday work activities prior to shopping for a technology solution and then, based on the results, identify the characteristics of the technological support that would enable them to overcome the barrier to performance they face. Knowledge of the sales force's barriers to performance in the field would not only enable management to select the appropriate SFA technology that would help the sales force to deal with the barriers they face, but would also provide convincing arguments that could show the usefulness of the technology to the sales force and thus ensure their acceptance. As Gilbert 2004 observed, in order to gain the sales force "buy-in", the benefits of SFA must be understood by management and explained to the sales force (Gilbert, 2004). Likewise, Gohmanna et al. (2005) state that when salespeople are excluded from the decision-making process they may view the adoption of SFA technology as an imposition at best or an odious addition to the job at worst. Indeed, when salespersons do not understand the benefits offered by new technology, they only see cost in the time and effort of using it.

Additionally, the majority of the studies of SFA technologies neglect one major dimension of the sales force's work activities, which is mobility. Work mobility is indeed one key dimension that characterises the work of sales representatives. Such mobile workers spend most of their working time out of their office, interacting with customers and attempting to bring new orders to their companies.

The advent of mobile information and communication technologies (M-ICT) has resulted in rapid growth in a number of mobile applications and services. This paper

defines M-ICT as information and communication applications run over a wireless network using a mobile device and in a wireless environment. A mobile device is any lightweight device connected to the Internet or other networks through wireless networking using any standard wireless communication protocol. They may include such devices as PDAs, communicators or smart-phones. How M-ICT can support these frontline ambassadors in their everyday tasks are key questions facing many stakeholders, including sales managers, today.

In order to study those topics (barriers to performance that the sales force faces when operating within a mobile work setting, and on how M-ICT could support them to overcome the barriers they face and enhance their overall performance), we carried out a case study of the sales force of midsized pharmaceutical company (Pharma). The purpose of the case study was to answer the following two research questions:

> 1) What barriers to performance do the pharmaceutical sales representatives face when they are operating in a mobile work environment?
>
> 2)What mobile solutions would allow the pharmaceutical sales representatives overcome the barriers they face in the field and enhance their overall performance?

2. Study Context

The research was undertaken in a subsidiary of a multinational pharmaceutical company (Pharma Co) employing 6000 people worldwide in 2003, about half of them engaged in sales and marketing activities. Pharma is a relatively small company operating as a niche player with particular expertise in the area of psychiatric and neurological disorders.

The company has a national sales team consisting of 14 sales representatives (sales reps) and seven territorial sales managers. These sales representatives report to a sales manager who is ultimately responsible to the marketing manager.

The main role of a Pharma sales rep is to meet physicians, nurses as well as prescribers in hospitals and pharmacists to provide information about the way the company's products operate, trying to emphasise their clinical benefits to patients and health professionals in terms of disease management. The purpose is to encourage the health professionals the sales reps they visit to prescribe Pharma's products rather than those of their competitors.

In addition to their daily encounters with health professionals (mainly physicians), Pharma's reps work duties include managing relationships with their customers. Relationship management with physicians involves providing them with any information they need related to the company's products, entertaining them in order to personalise the relationship with them as well as inviting and accompanying them to scientific conferences and congresses covering the scope of their medical interests. Pharma´s sales reps duties also include administrative work. Their administrative tasks include preparing reports about both their daily sales encounters with health-care professionals and the expenses they incur during their sales visits (i.e. catering provided to health-care professionals during sales meetings).

The management of Pharma's reps is based on an outcome system of compensation as well as autonomy in the field within certain regulatory guidelines. Pharma requires each sales rep to make five sales visits per day. The reward system is

then based on the number of face-to-face meetings held with target customers as well as the level of the company's product sales within the territory where the rep operates.

Pharma provides training for its sales force once per year. Each training course lasts three days and covers both sales and technical training programmes related Pharma products.

The information technology support that Pharma provides for its sales force includes a mobile phone and a laptop computer. The sales reps also have a sales support system that runs on their laptops and that enables them to store sales visits information and to connect their company's corporate database via a dial-up system

2. Study 1: A qualitative investigation

2.1 Method

We conducted five semi-structured interviews lasting on average two hours with Pharma's sales reps and the marketing managers who supervise the sales force. The purpose was to document and validate the existing sales process, discuss their criteria in assessing and rewarding the reps' performance and identify activities that they regard as potential performance inhibitors for their sales reps. Subsequently; data were collected through observation by means of field sales trips. The field sales trips lasted an entire day and represented "an ordinary day" in the life of a Pharma sales rep. Throughout the research process, the field material was categorised into issues, then themes and then "made sense" of (Hayes 2001) by drawing on the theoretical approach that underpinned the research study. Several interesting themes were found about both the barriers to performance that the reps face within the course of their everyday work life and the nature of their information they need when on the move. Such themes helped frame the survey to be used in the second study.

2.2. Results

2.2.1Emerging barriers to performance in the field

Based on the thematic analysis of the qualitative field material, the paper assigns the barriers to performance the sales representatives face during the course of their everyday mobile work, into pre-, in- and post-mobility barriers to performance (see BenMoussa, 2005 for more details).

One barrier that the reps face prior to starting their daily sales trips is associated with preparation for the presentation that they will give during the following day's sales visits. The reps have to visit their targeted physician at least five times a year. Prior to each sales visit, the rep has to find time to review the content of the previous meetings held with the physician and to find out new information not mentioned in previous meetings that the physician may find helpful and interesting. Indeed, the reps' effectiveness in their meetings with physicians depends to a large degree on the extent to which the physician perceives that the meeting with the rep has been intellectually value-adding. In some cases based on such judgement the physician may decide about the future of the relationship with the rep.

A further difficulty that the reps face prior to starting their sales visits is adaptation to the shortcomings associated with the technological support they have (the laptop) in order to make sure that the information they need during the working day is available when and where it is required. For example, given the fact that the reps know that they cannot get access anytime and anywhere to the information stored in their laptop or within the corporate database, they make sure to print out in the

evening all the documents they consider might be useful during the following day's sales trip. However, the strategy of printing files on particular topics (for example, the day's schedule) is not always effective in adapting to the deficiencies associated with the technological support they have access to, as one rep explained:

> Usually I print the timetable for next day at night. Last night I forget to print any paper to remind me where to go and I didn't do it in the morning because I have a little daughter and I don't want to interrupt her sleep in order to get my briefcase. When I don't remember to print my schedule, then I don't want to do it the following morning, either, for fear of waking her up. Fortunately this morning I have only four meetings and I can memorise them when I check them on the laptop.

In-mobility barriers to performance refer to the challenges the rep face during their daily sales visits. The paper assigns such challenges to barriers to efficiency and barriers to effectiveness.

One barrier to efficiency the reps face during their daily sales trips is when a physician cancels an already arranged appointment. In many situations the sales rep fails to get received by the physician because of unpredictable circumstances that might make the doctor not available for the meeting as one rep explained:

> You never really know (with regard to meeting a GP). You should only hope that he will be there and, of course, face the reality that there may be a problem with your schedule. I sometimes call on a neurologist with whom I had a booking, I might be waiting outside her office; then a nurse comes to me and says the physician is too busy at the moment, "I am sorry you cannot see her today".

As a result, if the meeting is cancelled the sales rep moves to the next sales visit scheduled in his/her day and waits in the car or in a cafeteria till the meeting time with the next physician comes, with the frustrating feeling that he or she will not fulfil his/her quota of five sales visits per day.

Another barrier to efficiency identified in the study is the difficulty in turning periods of dead time into productive ones. Dead time refers to the time during the working day that the rep perceives as wasted because it is spent without performing any work-related activity. Examples include time in transit between the day's scheduled meetings, time wasted as a result of a last minute cancellation of an already booked meeting with a physician, or time available because of less time than expected being spent with a physician. In the case of Pharma's sales reps, the occurrence of dead time is frequent and has various causes. One cause is the difficulty in predicting its happening so that the reps can plan ahead for the kind of activities that would enable them to make a good use of it. For example, in the event of a last minute cancellation of a meeting the reps find it difficult to fill that time with a value-generating activity such as visiting another contact. Generally physicians require to be contacted in advance in order to arrange a meeting with the rep. Therefore the time devoted to the cancelled meeting turns to be a dead time, as one rep mentioned

> When you have a long gap between your contacts, what you can do is to wait for the next meeting. You may try to visit another doctor but most of them like you to call them beforehand, sometimes a few weeks in advance.

Another cause of dead time for Pharma reps is the lack of appropriate technological support that would enable the rep to perform a work-related activity during this time. A laptop computer appeared to be awkward to support the reps during dead time because of its size and also the time it takes to get the device mobilised to provide the required support. The reps try to use the laptop generally in the car. However, if the rep faces short dead time (e.g. between two meetings in a hospital), and wants to use the laptop to perform a scheduled task or retrieve information, he/she is discouraged

from doing that. This is because the rep figures out that by the time he/she gets to the car in the parking area and starts the laptop, the time for the next meeting will come. Therefore the rep may choose to use the short dead time just waiting outside the physician's office or in the hospital cafeteria.

A third barrier to efficiency that the reps face during their daily sales trips is the difficulty of accessing contact information when the reps have meetings in large hospitals. A meeting that takes place in a large hospital is a good opportunity for the reps to perform their prospecting activities. This is due to the large number of physicians working in large hospitals. A key enabler to help the reps search for new prospects in such hospitals is to have access, whenever they have time available (i.e. between meetings), to sales information such as the contact names of the physicians they know in the hospital. Then the rep could have those physicians with whom they have already built a relationship introduce him/her to their colleagues, during a coffee break for example. However, the reps store useful sales information in their laptops, which in most cases they do not carry with them. As a result, they rely mainly on the contact name they remember. The time available for performing prospecting activities is therefore spent just waiting for the following meeting.

The barriers to effectiveness the reps face during their sales trips are various and have many sources. One barrier to effectiveness is the difficulty the reps experience in terms of coordinating with field secretaries during sales trips. Such difficulty stems from that fact that the reps as mobile workers cannot be aware of the booking actions made by the secretaries during their sales trips. They need to wait until they are at home and connect to the corporate database. The field secretaries experience the same difficulty. In order to know the reps' opinion about possible meeting dates or the reps' actions with regard to contacting a specific physician, they need to wait until the rep enters the information into the corporate system. Such coordination difficulties result in problems such as booking a meeting with the same physician twice, which can be detrimental to the rep´s relationship with physicians:

> The worst thing that may happen is that when you have just booked a doctor for yourself and then for the same time the secretary makes you a booking with another doctor and they are both very important. Then you have to decide what to do, which one you have to transfer to another time. It is not easy as they are busy and you may not find another time to catch him or her

A second barrier to effectiveness is a long delay in providing physicians with answers to their outstanding questions. Outstanding questions refer to questions that the physician asks and to which the rep does not know the answer.

> Sometimes doctors may need things urgently; the quicker you deliver the information the better.

In order for the rep to provide answers to such a question, he/she needs to look for the information him/herself. In most cases, the information-gathering process takes place at home, which increases the time; it takes for the rep to submit the answer to the physician. Also the reps may forward them to more specialised colleagues within the company. In this case the rep has to wait until the colleague submits the reply to the outstanding question. However, the inability to check e-mail while on the move extends the time it takes the rep to provide an answer to the physicians' outstanding questions. As a result it might be that the colleague from whom the rep seeks support with regard to a physician's outstanding question has already submitted an answer using e-mail to the rep during the working day. However, in the absence of access to e-mail in the field, the rep will not be aware of the colleague's reply until he or she gets home in the evening and accesses his or her corporate database.

A further barrier to effectiveness is physicians expecting reps to adapt to physicians' information requirements. Physicians require that the reps provide them with new information during each sales meeting as one rep explained:

> The physician is pleased if you can provide her with new information she does not know…You should prove to the physician that you are up to the task and that you know more than her.

Also, the fact that physicians appreciate that the rep can provide them with the experiences of other physicians is another barrier to effectiveness the reps face during their sales encounters. Physicians often regard the opinion of their colleagues about the product the rep is promoting as more reliable than the arguments the rep provides them with, as one rep explained:

> Every time you come, they (doctors) expect you to have something new. They also want to hear other doctors' opinions, their experience with the drug, they want you to deliver all the information you heard from other doctors. Even though you know your drug quite well, a doctor believes another doctor more than the rep.

The way the reps take and store useful information that they acquire during sales visits appeared to be a barrier to effectiveness. During the short meeting with physicians, the reps rely mainly on their own memory for recording what they perceive as useful information, such as drug-related issues discussed with the doctors or questions that the physicians have. For information that the reps perceive as highly important (i.e. questions needing a follow-up), the rep writes it down in order not to forget, and then, enters the handwritten information into the laptop when there is sufficient time between meetings. As one rep explained:

> During meetings with doctors I try to memorise. If there is an important thing I write it on a piece of paper to make sure that things that were asked of me could be answered for sure. Then when I have sufficient time during the day, I try to open the laptop and input the information just to make sure it stays there and I don't have to find my piece of paper later on.

In the evening, once at home, the rep accesses the company's database and enters the sales reports for the day. Some reps leave reporting tasks till the weekend and input the sales reports for the whole week.

The time gap separating sales visits and the time when the reps enter information related to such visits to the corporate database affects the quality of the reports. Indeed, if the rep carries out the reporting activity at the weekend, then he/she will have to input on average 25 reports. Therefore quite a lot of useful information might be omitted or locked somewhere on a piece of paper. Such a time gap would also lead to a collaboration gap between reps in terms of sharing knowledge about physician-related experiences with the company's drugs. A rep may gain useful knowledge from his/her interactions with doctors. However, other reps cannot access such knowledge and use it as an argument during their sales visits even though they try to connect up to the office in order to access the corporate database, until the rep enters it into the corporate database at the end of the week.

A final barrier to effectiveness that reps face is the availability gap. When physicians feel an urgent need for information about Pharma's drugs, they try to make a phone call to the reps. However, during his or her sales visits, the reps put their mobile phone in meeting status and thus they cannot answer incoming calls. After the sales visit the rep may try to call back the physician who initiated the phone call, but the physician may be busy and not available to take the rep's call. Such an availability gap may result in the physician lacking context-specific information that he or she may need to deal with a patient being treated.

Post-mobility challenges refer to the work-life balance that the reps attempt to achieve. Indeed, once at home, Pharma's reps have to accomplish work-related activities that they were not able to do during the day. The time that the reps devote to accomplishing work-related tasks at home is used at the expense of their rest and family time:

> I put great value on not being obliged to open my laptop after 4 pm to fully concentrate on my little daughter, my hobbies and my everyday tasks at home. You don't get paid after 4 pm. It is quite embarrassing to keep working on Sunday.

Category	Type of Barriers
Pre-Mobility Barriers	• Preparation of sales visits and planning how to deal with physicians' questions • Printing in advance all the documents that the reps regard as important for the following day's sales visits
In-Mobility Barriers	<u>Barriers to efficiency</u> • Unexpected cancellation of appointments by physicians • Difficulty in working productively in dead time periods including when driving from one location to another • Difficulty in accessing sales information to carry out prospecting activities <u>Barriers to effectiveness</u> • Managing physicians´ outstanding questions • Note-taking during sales visits • Availability gap • Difficulty in coordinating with field secretaries in the field • Difficulty in adapting to physicians' information requirements in terms of providing new information during each sales trip and disseminating the experiences of other physicians with the company's drugs
Post - Mobility Barriers	• Carrying out administrative and information-gathering task at the expense of rest and family time.

Table 1:
Emerging barriers to performance that the reps face based on the data collected in the study1

Based on the themes identified in Study 1, a second study was conducted. For this study a survey was developed. The questionnaire was sent to the company's entire sales force. It was thought that confirmation of the themes identified in Study 1 with a survey would help confirm the validity of the thematic analysis conducted on the qualitative material collected in study1.

3.1 Method

The instrument used was a questionnaire that was e-mailed to each of the salespeople working in Pharma. The managers of Pharma regularly employ e-mail to communicate with their sales force. Once the e-mail survey was completed by the

salesperson, his/her response was sent directly to the researcher to maintain confidentiality. Respondents were assured of the confidentiality of the information they provided and that only averaged and anonymous data would be used in any report. The main themes of the questionnaire were:

- The nature of the work impediments that the sales representatives face when they operate within a mobile work setting,
- How the sales representatives perceive the possible impact of mobile solutions in terms of overcoming the barriers they face and enhancing their performance.

In the first part of the survey salespeople were asked to rank several statements about the barriers to performance they encounter during the course of their everyday work, on a five-point Likert-type scale, ranging from 1 to 5, where 1 equalled always facing the barrier to performance, 2 = often, 3 = sometimes, 4 = seldom and 5 = never.
In the second part of the questionnaire respondents were asked to assign points to several statements that describe solutions that would enable them to overcome the impediments and enhance their performance in the field, on a five-point Likert-type scale, ranging from 1 to 5, where , where 1 equalled "extremely unimportant" and 5 equalled "extremely important". Questions about the reps' frequency of usage of the information technology support (i.e. laptop) available to them were also asked.

3.2 Results

3.2.1Barriers to performance in the field

As shown in table 2, the percentage of Pharma´s reps always or often, facing the barriers to performance ranges from a low 21% to a high 93%. While the percentage of the reps at least sometimes facing the barriers to performance ranges from a low 50% to a high 100%. The mode value of 9 out of the 14 barriers to performance is 2 or 1.These results directly replicate Study 1 results in terms of the barriers to performance the reps face during the course of their everyday work. The reps confirm the existence of the efficiency and effectiveness barriers to their performance identified in the qualitative study. In terms of the usage of laptop computer during sales trips, seventy-nine per cent of the reps report that they seldom or never use their laptop computer to find answers to physicians' questions that are difficult to answer. Ninety-two per cent of the reps also report that they seldom or never carry their laptop with them to each sales meeting with physicians. In order to get access to information whenever needed, the reps print out documents they think they may need before starting their daily sales trips. Indeed 71% of the reps report that prior to starting their sales trips, they always or often print out all documents they may need during sales trips. They also extend their working days to carry out administrative tasks that they are not be able to do in the field even when they have an opportunity in terms of dead time. These are performed at the expense of their rest and family time.

Table 2:
Leading sources of barriers to performance for the sales reps interviewed. N=14

How frequently do you face the following barriers to performance	Always or often* %	Sometimes ** %	Seldom or never *** %	Mode	Mean	SD
Performing administrative work at home	92.9	7.1	0.0	2.0	1.6	0.6
Printing out documents before sales trips that might be useful during sales trips	71.4	7.1	21.4	1.0	2.0	1.4
Making notes on paper about physicians' outstanding questions during sales visits	71.4	7.1	21.4	1.0	2.0	1.2
Physicians requiring to call in advance before arranging a meeting	64.3	0.0	35.7	2.0	2.8	1.6
Physicians requiring new information during each meeting	50.0	42.9	7.1	2.0	2.5	0.8
Difficulty of identifying alternative contacts to visit if an appointment is cancelled	57.1	28.6	14.3	2.0	2.6	0.8
Physicians appreciating hearing the opinion of other physicians about the company's products	50.0	50.0	0.0	2.0	2.5	0.5
Spending time gaps between meetings just waiting for the upcoming meeting to take place	50.0	28.6	21.4	2.0	2.7	1.1
Physicians not informing in advance in case they cancel an appointment	42.8	50.0	7.1	3.0	2.6	0.8
Difficulty in accessing sales contacts in large hospitals	42.9	28.6	28.6	2.0	2.7	1.1
Long delay in providing an answer to physicians ´ outstanding questions harms my relationship with him or her	42.9	14.3	42.9	4.0	2.9	1.2
Coordinating with field secretaries during sales trips	21.4	50.0	28.6	3.0	3.1	0.9
Not checking e-mail during sales trips increases the time taken to provide physicians with answers to their outstanding questions	21.4	35.7	42.9	3.0	3.4	1.0
Physicians do not like me to call them during their work hours	21.4	35.7	42.9	3.0	3.3	0.9

*) Percentage of respondents who answered always = 1 or often = 2
**) Percentage of respondents who answered sometimes = 3
***) Percentage of respondents who answered seldom = 4 or never = 5

3.2.2 Overcoming the barriers

The survey also asked respondents to assign points to several statements that describe solutions that would enable them to overcome the barriers they face and enhance their performance in the field, on a scale of 1 to 5, where 1 equalled "extremely unimportant" and 5 equalled "extremely important". We classify such solutions into two groups: the productivity of working time-boosting solutions and effectiveness-enabling solutions (Tables 3 and 4).

Table 3:
The importance reps assign to the productivity of working time-boosting solutions

Scales 1-5	Unimportant * %	Important** %	Mode	Mean	SD
How important is for you?					
Identifying alternative doctors to visit if a planned meeting is cancelled	0.0	85.7	5.0	4.4	0.7
Recording and reporting sales contact information after meeting	0.0	85.7	5.0	3.9	1.0
Receiving information alerts about new customers to visit during sales trips	0.0	85.7	5.0	4.4	0.9
Receiving information alerts about customers that have the highest potential in your territory during sales trips	7.1	71.4	5.0	3.8	1.1
Receiving information alerts about cancel-lation of appointments with physicians	14.3	64.3	5.0	3.9	1.3
Receiving information alerts about potential traffic jams during sales trips	21.4	35.7	3.0	2.6	1.2
Receiving information alerts about exhibitions and display during sales trips	35.7	21.4	2.0	2.8	1.1

*) Percentage of the respondents who answered 1 = extremely unimportant or 2 = unimportant
**) Percentage of the respondents who answered 4 = important or 5 = extremely important

Table 4:
The importance the reps assign to the effectiveness-enabling-solutions for their performance in the field

Scale 1-5	**Unimportant %**	**Important %**	**Mean**	**Mode**	**SD**
How important is for you?					
Accessing field secretaries' booking actions while in the field	0.0	92.86	4.1	4.0	1.1
Providing physicians with straightforward answers to their questions	7.1	92.9	4.2	4.0	1.4
Accessing the company database for information before meetings with physicians	7.1	78.6	3.4	4.0	0.9
Checking e-mails during sales trips	14.3	71.4	3.9	4.0	1.4
Accessing physicians' sales visit information before meetings	0.0	57.1	3.7	4.0	0.6
Receiving information alerts about important events in the pharmaceutical industry,	21.4	50.0	3.1	3.0	1.1
Receiving information alerts about competition during sales trips	21.4	35.7	2.9	3.0	1.0
Learning about new or competitive products while driving from one location to another	42.8	28.6	3.1	2.0	1.3
Accessing other team members sales visits information	50.0	14.3	2.7	3.0	1.0

*) Percentage of the respondents who answered 1 = extremely unimportant or 2 = unimportant
**) Percentage of the respondents who answered 4 = important or 5 = extremely important

The survey findings reveal an overall positive opinion of the reps with regard most of the mobile solutions suggested to them, in terms of enhancing their performance as seen by them. The high importance the reps assign to almost all the solutions suggested to them in the survey reveal that that reps face a number of barriers that need to be removed. The majority of the reps rate as highly important for their performance a number of time-saving solutions such as the ability to make sales visit reports using available time during their sales trips or receiving alerts from physicians about potential cancellation of appointments.

Furthermore, a high proportion of the interviewed regard as highly important their ability to receive information alerts on various topics during sales trips that would support their actions and also save time that could be devoted to information-gathering activities. In addition, the possibility for the reps to access information just before a sales meeting with a physician is reported by the interviewed reps as highly important for their performance because, armed with fresh and pertinent information, they can be more responsive to the physician's questions and information needs, which in turn strengthen his or her relationship with the physician.

However, there are some solutions that have not been regarded by the reps as highly important for their performance in the field. For example, less than a third of the reps interviewed regard traffic-jam alerts as highly important for their performance in the field. This could be explained by the relatively low density of traffic in cities where the reps operate, which means that traffic jams are not a major source of time-wasting for the reps. Likewise, according to the survey results, only fourteen per cent of the interviewed reps regard accessing other team members' sales reports as highly important for their performance in the field. This would be due to the fact that the current reporting system that the reps use does not emphasise knowledge-sharing, such as storing a useful insight about a physician's experience with company drugs obtained by one rep for potential use by his/her colleagues

4. Discussion

Companies have invested in sales force automation in the hope of achieving the benefits it can provide in terms of enhancing the sales force's performance, increasing organisational knowledge about customers and building profitable long-term customer relationships. However the literature is clear in stating that the adoption of sales force automation has achieved less successful results than originally hoped (Rigby et al. 2002). These failures happened because a large proportion of the sales force either did not accept the technology or underutilised it. The lack of both appropriate planning of the SFA investment and communication of its benefits to the sales force account for the problems associated with SFA failure. Firms fail to clearly identify the business problems that need to be resolved and then match the appropriate technology to that dilemma. Erffmeyer´s et al. 2001 study about firms' expectations from investing in SFA reveal that a limited number of the firms participating in their study were able to offer details with regard to the goals of their sales force automation. For example, the majority of respondents mentioned improving the sales force efficiency as a goal of SFA. However, when asked what specific areas need improvements, a typical response was "our goal is to get as many things automated as possible". Other studies report that mangers can be motivated to adopt a technology by the broad belief that by not acting other firms may gain a competitive advantage (Gilbert, 2004). The inability to articulate specific goals for SFA makes it difficult for firms to plan, communicate and evaluate the benefits of the SFA investment to the sales force. As a result the

sales force may perceive the SFA as just an added responsibility or a burden (Honeycutt et al. 2005).

The fast and ever-changing set of technological tools available to salespeople as in the case of mobile technologies, will continue to pose a challenge to sales managers in terms of selecting the technology the would result in the expected outcomes.

Consequently, it is very important that sales managers fully understand the barriers that hamper their sales force performance. Once the barriers are identified, sales managers can take steps to select and implement the ICT that matches the barriers' support requirements.

Knowledge of users' barriers to performance is particularly important when we are dealing with M-ICT. The physical and computational limitation of mobile devices makes them unfit for some tasks, e.g. providing an overview of large amounts of information. Indeed a number of studies treated mobile devices as a stand-alone technology to support the prospective users in carrying out their job related tasks. They do not relate mobile devices to other technological support available to the users and which can support them better than mobile technologies. However as Gebauer et al. (2004) showed, mobile applications can complement rather than replace existing applications and support in terms of supporting users to deal with specific tasks. Likewise Nielson (2001) argued that mobile technology support should be examined as one component among the "web-of-technologies" available to support the user's tasks and routines. Hence she suggested that mobile devices need to fulfil at least one of the following demands in order to be successful: (i) expand an already existing service or system by giving them mobility and making it possible to solve a set of specific tasks in a specific context; (ii) offer a solution to a well-defined, targeted task, i.e. provide here-and-now related information.

The results of both studies showed that salespeople face a number of barriers that impede their efficiency and effectiveness in the field. The negative impact of these barriers goes beyond their work performance, to affect even their family and rest time.

The ICT support available to the reps in the form of laptop and mobile phone does not appear to provide them with an appropriate support. The lack of relevant information that could support the reps' actions whenever needed appears to be the main source of most of the barriers the reps face during their sales trips. Useful information that could support both the reps' effectiveness and efficiency in the field might be available. However, they are not accessible when the reps experience a need for them to support their actions. The information is either locked in the corporate database, which the reps cannot access in the field or it is stored in a laptop computer that most of the reps use as a "desktop" at home. Additionally, useful insights remain locked in the reps' heads and are not shared with other reps or with the sales management. The inability to work whenever time is available is the main factor underlying the barriers to efficiency facing the reps. During their sales trips the reps have many opportunities, i.e. time, where they can carry out some of their daily work activities (i.e. administrative work). However, the reps' efforts to exploit such opportunities productively are hindered by the characteristics of the laptop, which does not support "any time work". As a result, the reps extend their working day at the expense of their rest time and work at home to carry out tasks that they could do during the sales trips if they had access to an appropriate information technology device.

When asked their opinion with regard to a set of mobile solutions that would enable them to overcome the barriers they face in the field, the sales reps were highly positive about the positive impact of such solutions on their performance as seen by them. Those solutions could be implemented thanks to key characteristics of M-ICT

in terms of timely information support, ubiquitous terminals, adaptive communication and simple and natural input/output.

M-ICT can allow users to have a timely information support in a number of ways. First, with a mobile device and a wireless connection (i.e. GPRS or UMTS), the mobile user can have access to the Internet as well as diverse databases anytime time is available and irrespective of location to get the information he or she needs. Wireless bandwidth is increasing which supports the demands of business applications such as e-mail with attachments, multimedia contents and Web services. The current development of positioning technologies has the potential to enhance the timely information support enabled by mobile technologies.

The ubiquitous features of mobile terminals free the users from the time and space constraints that may impede their access to the information systems capabilities. This is a key characteristic of mobile information systems compared to traditional (wired) information systems, where users have to be in a specific place (the office, home) in order to use the system's capabilities (Keen and Mackintosh, 2001). For instance technologically speaking mobile digital calendars are not very different from their PC based calendar systems, but they naturally incorporate portability benefits, a key desired feature in calendaring (Sell 2006). Similarly as the mobile device is "always on" it enables the user to get access to the mobile system's functionalities anytime and with reduced booting time compared to laptop computers, especially in situations where the user has only little units of time to satisfy his information and communication need.

Another attribute of M-ICT is that it provides flexibility in terms of the communication medium that the rep could select when it comes to collaboration and coordination in the field with co-workers. The communication medium carrying the information support can take such forms as SMS, MMS, e-mail, phone call, pushed alert or real-time access to database. The selection of the communication medium would depend on both the environment where the rep is operating (e.g. face-to-face meeting with a customer, in a train or restaurant) and his or her information support value chain (provider versus receiver of the support).

A hand and eye-free approach using audio based augmentation would enable the user to simultaneously perform other tasks while listening or speaking (Martin, 1989). This is of great interest for the sales reps whose information support need is both time-independent and space-independent. Speech augmentation would provide the reps with a simple and natural mechanism to enhance the productivity of their working time even in situations where their cognitive and physical capabilities are engaged by other activities such as driving the car.

5. Limitations and suggestions for future research

This study has limitations. Perhaps the most important limitation of the current study is the single company frame. However, the choice of the single-case study focus has been inspired by the wish to control contextual factors (e.g. market and organisational factors). Within the sales force research context, many researchers have warned of the danger of pooling data from a number of unrelated industries and product types in an attempt to generalise. Furthermore, lumping together data from different firms has been mentioned as a potential explanation for the mixed findings in research investigating information technologies and performance (Schillewaert and Ahearne, 2001). Also, it is possible that the results of the study may not represent the population of interest, salespersons in general.

As always in science limitations open avenues for future research. One avenue would be to replicate the current study and confirm the validity of our exploratory finding using another pharmaceutical firm and a larger sample. Another avenue would be to carry out a similar study in a different industry than the pharmaceutical context. This would make it possible to study similarities and differences among industries when it comes to M-ICT support to the sales force.

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