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Smart Mobile Devices and Competitive Strategy: A Resource-Based Perspective

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Abstract: This research examines the implications of smart mobile devices (SMDs), or smartphones, for organizational competitiveness. It employs a resource-based framework to analyze the relationship among smart mobile devices, strategy, and firm performance. Building on existing strategic management research which suggests that leveraging IT to build business strategies can be a source of sustainable competitive advantage, six propositions relating smart mobile devices to sustainable competitive advantage are presented. Drawing also from scholarly work in the information technology and information systems domains, strategic implications of mobile-device technology for firms are provided. It is suggested that SMDs impact firm communications, decision-making, innovation, and performance.

INTRODUCTION

Management scholars interested in competitive strategy have long been fascinated by the implications of innovation and technology for firm and national competitiveness (e.g. Schumpeter, 1942; Powell and Dent-Micallef, 1997; Röller and Waverman, 2001). Though technologies may be widely available, and in some cases are approaching commoditization, existing research suggests that leveraging IT to build business strategies is not only feasible, but can be a source of sustainable competitive advantage (Clemons and Row, 1991; Mata, Fuerst, and Barney, 1995; Wade and Hulland, 2004). Much of the research that has addressed the relationship between technology and competitiveness has focused on computer systems and information and communications technology (ICT) infrastructure, technologies that have historically been fixed geographically. However, today mobile telephones have surpassed both computers and fixed-line phones in terms of the number of users globally, and the business, cultural, organizational, and economic impacts of mobile technologies are dramatic. In terms of market penetration, the International Telecommunication Union (ITU, 2009) reported that globally there were 4.6 billion subscriptions for mobile phones in 2009 compared to 1.9 billion people with access to a computer and 500 million with fixed broadband. In terms of impact, The Economist (2009) recently reported that remarkable social and economic transformations are being anticipated and realized in emerging economies as a consequence of the increasing availability of mobile telephony. In developed countries, the mobile phone market is now larger than the fixed-line market, and is increasingly being driven by growth in the deployment of advanced or "smart" mobile devices (e.g. Android, Blackberry, iPhone, Palm, etc.), which are capable of providing high-speed mobile access to electronic mail and the Internet. The adoption rate of these devices in developed markets has been growing very rapidly, more than doubling every two years from 2005-2009 (ITU, 2009). Due to their small size, extended battery life, and unique capabilities, these mobile devices are reshaping the business strategies and competitive environment for a multitude of organizations. For example, based on a survey of top-500 enterprises located in the United States and Europe conducted by independent research firm Coleman Parks and sponsored by Mformation Technologies, Inc., more than half of managers and one-third of staff now use smart mobile devices, and their use is continuing to increase. Clearly, smart mobile devices and their accompanying mobile applications are becoming influential strategic corporate assets (Mformation, 2007).

In light of the important link between firm strategy and technology identified by management scholars, and the relatively limited assessment of the unique characteristics of mobile technologies as well as their implications for business strategy, we address the relationship between smart mobile technologies and business strategy in the pages that follow. Specifically, using a Resource-Based View (Rumelt, 1984; Wernerfelt, 1984; Barney, 1986, 1991) this paper focuses on the strategic implications of smart mobile devices, a specific and unique form of ICT that has grown rapidly in the last five years. Mobile devices fall under an umbrella of several different technologies: smartphones, PDAs (personal digital assistants), cell phones, mp3 music players, voice recorders, cameras, and other portable devices. While all of these different handheld devices offer unique possibilities for strategic application, the focus of this research is specifically on "smart mobile devices" (SMDs), also called smartphones, defined as handheld devices that offer a combination of the following services: email, voice communication, document manipulation, Internet browsing, calendar updating, GPS locating, and the ability to add new software applications; most also include the capability to take pictures or videos. This definition is developed inductively, based on the observations that "smart phones are fast becoming as important to the business user as laptops" (Mformation, 2007). Enterprise users are increasingly using smart devices with all of these capabilities; mobile email, internet and calendar applications are already pervasive, with more than 90 percent of companies using them, and businesses are set to significantly increase the use of new mobile applications such as sales force applications and company file sharing systems (Mformation, 2007).

In the pages that follow we present a brief review of the Resource-Based View, followed by a discussion of scholarly literature that has used the Resource-Based View to examine firm applications of technology resources to achieve strategic aims. Afterwards, we discuss the unique characteristics of smart mobile devices (SMDs) and some basic assumptions from which we operate in developing propositions. We then present and discuss our propositions relating SMDs to organizational performance and sustainable competitive advantage, and finish by discussing implications of our ideas and suggestions for additional examination of SMD influences on firm strategies.

THE RESOURCE-BASED VIEW

The Resource-Based View (RBV) focuses on how firms rely on their core competencies to compete and why some firms outperform others (Freeman and Harrison, 2001). "The notion that firms are fundamentally heterogeneous, in terms of their resources and internal capabilities, has long been at the heart of the field of strategic management" (Peteraf, 1993, p. 179). This theoretical framework has been used by researchers and practitioners alike to identify, explain, and exploit the unique set of resources that firms possess to obtain a sustainable competitive advantage (SCA). Specifically, several empirical studies have been completed using the RBV to identify those resources, which has undoubtedly strengthened the framework's face validity (Armstrong and Shimizu, 2007). There is still some debate, however, which Armstrong and Shimizu (2007) bring to light, regarding how researchers operationalize the variables being studied in the Resource-Based View. In summary, they suggest that the RBV can be successfully used to empirically study issues in strategic management, offering recommendations for selecting dependent variables that reflect sustainability as well as how to identify firm resources. Often, it is not a single resource that a firm identifies, but instead a bundle of resources that leads to a SCA (Powell and Dent-Micallef, 1997). This is an important consideration when analyzing resources that are individually homogenous in nature, and where substitutability and imitability are viable options for competitors. Mata et al. (1995, p. 491) state that "the resource-based view of the firm is based on two underlying assertions, (1) that the resources and capabilities possessed by competing firms may differ (resource heterogeneity); and (2) that these differences may be long lasting (resource immobility)." Peteraf (1993) adds that ex ante and ex post limits to competition are cornerstones of resource-based competitive advantage. These assumptions can be used to take a particular resource or bundle of resources available to a firm and examine its potential for producing competitive advantage. These advantages then become the basis for creating corporate strategies, including "cost leadership, product differentiation,

strategic alliance strategies, diversification strategies, and vertical integration strategies" (Mata et al., 1995, p. 492). Barney (1991) describes the competitive advantages as "sustaining" only when competitors are unable to duplicate those strategies, regardless of the amount of calendar time for which that advantage is held.

Identifying the resources available to firms and their potential for a sustainable competitive advantage can be a particularly arduous process. According to Dierickx and Cool (1989, p. 1504), "managers often fail to recognize that a bundle of assets, rather than the particular product market combination chosen for its deployment, lies at the heart of their firm's competitive position." In relation to understanding the strategic implications of SMDs, Barney's (2001) guidelines are instructive. Barney (2001, p. 43) states that, "in all high-quality resource-based work, researchers must begin by addressing the value of resources with theoretical tools that specify the market conditions under which different resources will and will not be valuable." Barney clarifies why the definition of firm resources is left for the specific context being studied by saying, "rather than limit its [RBV] prescriptions to specific resources that can be identified, a priori, managers can apply resource-based logic to any resource whose value can be determined from the market context within which the resource is to be applied" (Barney, 2001, p. 51). Firm resources do not need to be in the form of tangible assets, such as machinery, buildings, or employees. Intangible assets, although possibly more difficult to identify, also constitute a part of the firm's overall resources at any given point in time (Wernerfelt, 1984). The criteria set forth by Barney (1991) establish that, whether or not resources are tangible or intangible, they should be valuable, inimitable, non-substitutable, and rare to contribute positively to SCA. Resources are classified as valuable when, according to Barney (1991, p. 106), they "enable a firm to conceive of or implement strategies that improve its efficiency and effectiveness." A resource that does not add value contradicts the definition of a competitive advantage. The next two criteria identified by Barney, inimitability and non-substitutability, are closely related. There is an inverse relationship that exists between a resource's degree of imitability and substitutability and its potential for being a sustainable competitive advantage (Wernerfelt 1984; Dierickx and Cool 1989). Finally, a resource is classified as rare when competing firms do not possess the same or similar resource, regardless of it being valuable (Barney 1991).

Our research, similar to that of others using the Resource-Based View, points to the combination of tangible and intangible assets that provide the opportunity to create a sustainable competitive advantage. Because the use of smart mobile devices spans across such diverse industries (e.g. financial services, health care, education, etc.) and use of the devices is increasing rapidly, it has become evident that there is a need to examine how these unique technological assets influence competitive outcomes directly and indirectly, through interactions of these devices with other tangible or intangible assets to produce sustainable competitive advantages. According to Bharadwaj (2000, p. 171), "resources tend to survive competitive imitation when protected by isolating mechanisms such as time-compression diseconomies, historical uniqueness, embeddedness and causal ambiguity." These "isolating mechanisms" explain why two competitive businesses that use similar resources to compete can still have a basis for a sustainable competitive advantage. For example, causal ambiguity describes how some characteristics or processes of a firm can be so unique and tacit that they are imperfectly imitable. This makes it difficult if not impossible to ascertain what special characteristics or processes firms use that make them unique. In the area of mobile technology, we investigate how smart mobile devices, although they are not rare by themselves, can be used to create a bundle of resources that may be advantageously heterogeneous and imperfectly imitable.

TECHNOLOGY RESOURCES AND THE RESOURCE-BASED VIEW

The fields of information technology (IT) and information systems (IS) have been heavily researched (Ginsberg and Venkatraman, 1992; Feeny and Willcocks, 1998; Caldeira and Ward, 2003). The IT/IS domain is broad and largely dominated by research on computers, database systems, electronic

data interchange (EDI), and enterprise resource planning systems. Although strategies for successful adoption and the importance of technologies have been covered thoroughly, very little research addresses the relatively new and quickly growing area of mobile-device technologies, and how they may impact strategic management. Most IT/IS research is done on a macro-level which overlooks strategic implications of quickly developing technologies. It is noted, however, that the importance of such research has been profound as it relates to the field of business strategy. According to Clemons and Row (1991, p. 276), "resources are needed to exploit any innovation. For example, a new product requires manufacturing capacity, marketing support systems, and access to distribution channels. Such resources are complementary to the innovation when the value or uniqueness of the resources are altered by the innovation." Also supporting this relationship, Itami and Numagami (1992) describe how important the link is between strategy and technology. "Technology is the most fundamental of the core capabilities of a firm. It is a systematic body of knowledge about how natural and artificial things function and interact" (Itami and Numagami, 1992, p. 119). The authors continue this thought by stating that the two are connected by a dynamic relationship that can be understood only by examining how each affects the other. Further supporting this argument, Powell and Dent-Micallef (1997, p. 376) state that "from the outset, IT researchers advocated tight IT-strategy linkages, asserting that IT affects firm strategies, that strategies have IT implications, and that firms must somehow integrate strategic thrusts with IT capabilities." Inarguably, mobile devices are a form of information technology; thus the research pertaining to IT/IS relates to them. However, smart mobile devices are also quite revolutionary in the capabilities that they produce and, accordingly, merit direct and specific investigation.

Support for technology being a source of sustainable competitive advantage is offered not just in the attributes and capabilities that make the technology so appealing to firms. Research has shown that, although technology provides powerful opportunities for greater efficiency, communication, decision making, etc., there are certain inevitabilities that prevent it from singly being the answer for firm competitiveness (Mata et al., 1995; Powell and Dent-Micallef, 1997). Powell and Dent-Micallef (1997) use the strategic necessity hypothesis, as proposed by Clemons and Row (1991), to identify how technology can be used as a source of sustainable competitive advantage. "According to this view, firms would appear to have only three paths to IT-based competitive advantages: either (1) reinvent IT advantages perpetually through continuous, leading-edge IT innovation; or (2) move first and erect unassailable first-mover advantages; or (3) embed ITs in organizations in such a way as to produce valuable, sustainable resource complementarity" (Powell and Dent-Micallef, 1997, p. 378). Only the third path, according to the authors, provides a strong opportunity for sustainable competitive advantage. Thus, their further analysis examined the types of resources most suitable for resource complementarity with information technology. Those complementary resources include two broad, over-arching categories: human and business resources. Their findings indicated that, "human resources such as communication and consensus play a vital role in the successful implementation of IT" (Powell and Dent-Micallef, 1997, p. 394).

Mata et al. identified similar constructs and findings, stating that "there are four attributes of IT that have been suggested as possible sources of sustained competitive advantage - access to capital, proprietary technology, technical IT skills, and managerial IT skills" (1995, p. 495). Arguments are presented against all of the attributes except for managerial IT skills. The authors then state that, "if managerial IT skills are valuable and heterogeneously distributed across firms, then they usually will be a source of sustained competitive advantage, since these relationships are developed over time; and they are socially complex and thus not subject to low-cost imitation" (Mata et al., 1995, p. 499). This work suggests that smart mobile devices, seen as a form of IT, show only limited support for sustainable competitive advantages without the aforementioned *human* elements of managerial IT skills and human resources. We address in our propositions which of these resources produce positive relationships with firm performance through the use of smart mobile devices. These proposed interaction effects have special relevance given that direct-effects "research has suggested that IS assets (e.g., infrastructure) are

the easiest resources for competitors to copy and, therefore, represent the most fragile source of sustainable competitive advantage for a firm" (Wade and Hulland, 2004, p. 111).

Given that the purpose of this paper is to advance strategy research that connects mobile technological resources to sustained competitive advantage, and to provide the basis for further empirical analysis, our attention now shifts to theoretical development. First, we will communicate general assumptions and then relate propositions relating mobile technologies to performance. Bharadwaj noted the need for developments such as ours by observing that "despite the widely held belief that information technology (IT) is fundamental to a firm's survival and growth, scholars are still struggling to specify the underlying mechanisms linking IT to financial performance" (2000, p. 169).

ASSUMPTIONS

In this section we outline assumptions that guide our thinking about SMDs and their impacts. First, we assume that smart mobile devices, when used as intended, speed communication within organizations. Internet information, contact information, email communications, images, and documents can all be accessed or shared more quickly with smart mobile devices than without. Historically, the telegraph, telephone, facsimile machine, voice mail, electronic mail, online chatting and video-conferencing have all represented ways to share written, audio, or visual information faster, cheaper, or more effectively than was previously possible. Substantially, the telephone replaced the telegraph, while partially, electronic mail has substituted for faxing, and mobile phones or smart mobile devices are increasingly substituting for land-line phones. Not all older technologies are replaced; multiple, complementary technologies customarily are used for sharing information within organizations (e.g. electronic mail, letters, telephone, voice mail, etc.) according to their suitability to the particular wishes of the sender or receiver of the information. While the speed of information transfer between land-line phones is roughly equivalent to the speed transfer between mobile phone calls, the fact that a person typically carries his or her mobile device in a pocket or purse allows messages to be received that otherwise would be missed or received at a later time. This represents a speed improvement relative to fixed-line communications. Put another way, even though a phone call or email message can be sent relatively instantaneously to either a fixed-line or mobile device, the fact that a manager on a golf course can receive the communication instantly, instead of receiving it after getting back to the clubhouse, office, or home, demonstrates that speed of communication is affected both by how quickly a message can be sent and how quickly a message can be received; a caller could leave a message for a manager or colleague at the office quickly but if it is hours before the golf-playing manager gets back to his or her office to receive the message, there is a clear speed advantage to receiving the communication on a smart mobile device. Additionally, a manager or employee who comes up with an instruction, or a creative idea or valuable suggestion, while away from the workplace can communicate the information immediately back to the office or a co-worker using a smart mobile device. So, communication can be initiated as well as received more quickly with SMDs; in sum, smart mobile devices do not slow more traditional forms of communication and they can often result in information being received or sent more quickly than would otherwise occur. This leads to our first assumption:

Assumption 1: Use of smart mobile devices speeds communication within organizations.

In the same way that smart mobile devices allow email, phone or other communications to occur more quickly between organizational members, they also support quicker communications with stakeholders by employees in boundary-spanning roles. Communications with suppliers, customers, partners or other relevant external constituencies can occur more quickly with SMDs than without. Scholars including Bharadwaj et al. (1998, 2000) and Benjamin and Levinson (1993) have discussed how technology resources can be used to manage external relationships. While their focus was not on speed and mobile technologies, their concepts are consistent with our view that SMDs support quicker and

potentially more effective communications with external constituencies. Thus, our second assumption follows.

Assumption 2: Use of smart mobile devices speeds boundary-spanning communications.

If, through the use of smart mobile devices, managers, workers, or employees can send, receive and access written, audio, and visual information more quickly than they otherwise would be able to, then it follows that they can use this information to make decisions more quickly, and they can share their decisions with relevant parties more quickly. For example, if one must review a contract and indicate a response, or decide on an advertising, human resources, or other decision, the decision often can be made quickly based on an evaluation of information received on a SMD, and a choice, opinion, or decision can be shared quickly using the mobile device. Ultimately, many decisions can be made more quickly through the use of SMDs.

Assumption 3: Use of smart mobile devices speeds organizational decision making.

SMDs increase information available to those who carry the devices. For example, a bank president shared with the authors that he recognizes two benefits to communicating by email with his SMD, as opposed to by phone call. First, email communications produce a written (i.e. typed) legal record of statements and activity, and second, when examining emails the bank president is able to see the email message received along with forwards, replies, and attachments; this is much more information than could be gleaned through a voice-only phone call. Contact information, electronic mail, documents, voice mail, images, and all the world's information that is contained on the internet are available to a person with an SMD, and the information is generally available at all times of day and in all places with wireless phone service. The fact that one can carry this substantial information resource, a smart mobile device, everywhere and have access to it at all times represents a clear and dramatic increase and improvement in information availability relative to fixed-line devices such as traditional telephones and hard-wired computers. SMDs also have clear advantages over traditional cellular phones in terms information availability because traditional cellular phones are not well suited to accessing the internet or reviewing emails and documents. Lastly, it is worth noting that SMDs turn on nearly instantly and fit in one's pocket whereas computers, even if equipped with mobile broadband capabilities, take time to boot up and are too large to reasonably carry 24 hours per day. This leads to our final assumption.

Assumption 4: Use of smart mobile devices increases information availability within organizations.

PROPOSITIONS

Assuming that smart mobile devices increase information availability and speed communications and decision making, what organizational impacts can one expect to result? First, increased innovation is to be expected. Von Hippel (1988) has emphasized that ideas for innovation arise from multiple sources, including within the firm as well as from suppliers, customers and competitors. In the case of competitors Von Hippel describes the process of "know-how trading," which refers to an "informal, cooperative pattern of R & D. It involves routine and informal trading of proprietary information between engineers working at different firms-sometimes direct rivals" (Von Hippel 1988, p. 6). This routine trading of information can be influential for producing innovation, and if ideas for innovation originate both within and outside of the firm, then it follows that a smart mobile device, which enables efficient communication or "informal trading" of information, will lead to increased firm innovation. This line of thinking is consistent with Teece's (1996) arguments that firm formal and informal structures and their external linkages influence their rate of innovation. More recently, Von Hippel (2005) has argued that users are

playing an increasing role in the creation of innovation. Since SMDs provide a link between organizations and their external constituencies, including users and customers, it is reasonable to believe that organizations that use SMDs will access ideas and pressures for innovation that will not come to firms that do not use SMDs. This leads to our first proposition.

Proposition 1: Use of smart mobile devices is positively related to organizational innovation.

Sustainable competitive advantage may be considered nearly synonymous with a firm's ability to achieve enduring high performance. Firms and stakeholders may, of course, have different performance objectives and time horizons. In the case of time horizons, Geert Hofstede (2005) has identified that these do vary across cultures, while in the case of organizational performance objectives, sales, profits, market share, stock price, survival, leadership, balanced scorecard, and other individual or compound measures may be the preferred or choice measure. SMDs can be expected to enhance organizational performance inasmuch as they help organizations achieve their performance objectives. Scholars have observed in prior studies that technologies or technological portfolios have been effective for producing improvements in performance objectives, including product quality (Bharadwaj, 2000), cost effectiveness (Ross et al., 1996), market responsiveness (Ross et al., 1996; Zaheer and Zaheer, 1997), adaptability (Jarvenpaa and Leidner, 1998), and diversification activity (Silverman, 1999). Given these findings suggesting the existence of technology-performance links in other contexts, and given the capabilities described above that SMDs can produce, we argue that implementation and use of SMDs is associated with improved organizational performance.

Proposition 2: Use of smart mobile devices is positively related to organizational performance.

While our first two propositions address proposed direct relationships between SMDs and innovation and performance, our remaining propositions relate to interactions between SMDs and other influential constructs. First, timing is expected to be influential. Many scholars have identified that first-mover effects can benefit pioneers (Lieberman and Montgomery, 1988), but in special circumstances there may be reasons to follow rather than lead (Lieberman and Montgomery, 1998), such as when a company possesses substantial complementary or specialized assets or if the appropriability regime is weak (Teece, 1986, 1988, 2006). Appropriability regime refers to the context of competition insomuch as it influences a firm's ability to capture value produced by innovations or intellectual property assets. Because there is a learning curve associated with most information technology products we argue that firms which adopt SMDs earlier will realize an advantage greater than firms that adopt SMDs later.

Proposition 3: Firms that use smart mobile devices earlier than competitors will strengthen their relative competitive position, ceteris paribus.

Because acceptance is important to effective use of a technology, and because it is observed that some people welcome electronic devices while others resist, we propose that performance benefits from SMDs will be moderated by managerial and employee acceptance or resistance to the devices.

Proposition 4a: Use of smart mobile devices interacts positively with managerial enthusiasm for the use of smart mobile devices to influence organizational performance.

Proposition 4b: Use of smart mobile devices interacts positively with employee acceptance of smart mobile devices to influence organizational performance.

Consistent with the consensus of both strategy and information systems scholars (e.g. Mata et al., 1995; Powell and Dent-Micallef, 1997) we propose that SMDs positively influence performance when

they are combined with specialized or proprietary human, business, or technological resources. This is because SMDs are not a rare resource, and they are available in standardized fashion at relatively low cost to all firms; however when combined with specialized assets SMDs can be transformed from a homogeneous resource to a heterogeneous bundle of capabilities that is difficult to imitate. This leads to our fifth proposition.

Proposition 5: Use of smart mobile devices in conjunction with specialized or proprietary human, business, or technological resources increases organizational performance.

Finally, environmental conditions may influence how beneficial SMDs are to organizations. In particular, environments characterized by rapid and unexpected changes should realize higher benefits from SMDs because these environments require the kind of information sharing and quick responses that SMDs support. As an example, organizations such as firms, not-for-profits, governments, or even political campaigns would likely find SMDs highly beneficial for achieving high performance but their benefits would be especially true if the organizations face rapidly changing economic, political, or legal circumstances. This leads to our last proposition.

Proposition 6: Use of smart mobile devices will interact positively with environmental turbulence to influence organizational performance.

DISCUSSION, IMPLICATIONS AND RELEVANCE TO SCHOLARS AND MANAGERS

The research that we have presented is conceptual and presented within a resource-based framework. That being considered, we realize it is also an extension of the body of research that examines the relationship between information technology (IT) and firm performance. SMDs have distinct characteristics relative to immobile technologies, however, that make studying them as unique devices insightful, rather than studying technology as a whole. Consider that business transactions and decisions can be made exclusively through the use of a single device and can be made nearly anywhere, at any time. SMDs are one of the few technological devices that have become practically an extension of the human hand. It does, however, face the possibility of eventual commoditization, which could influence firms' ability to achieve a sustainable competitive advantage through a strategy based on mobile devices.

Scholars interested in strategic management, applications of the Resource-Based View, and technology can all benefit from this research. It contributes to the work already done by researchers who have studied the Resource-Based View in the context of technology (e.g. Mata et al., 1995; Powell and Dent-Micallef, 1997; Wade & Hulland, 2004) and in other disciplines. This research topic was chosen to identify specific constructs for further empirical research. It is intended to show the strategic implications associated with mobile device technology and encourage the use of RBV framework for empirical research in other disciplines. Our propositions suggest that firms can improve performance and develop strategies around SMDs. These ideas may be helpful for firms and for understanding other applications of the Resource-Based View.

We make note of several ways SMDs can be the medium by which firms combine resources to gain a sustainable competitive advantage. A better understanding of the strategic implications of SMDs will lead to better deployment of the technology. One goal with this research was to identify opportunities for deployment that may have been overlooked or not considered by managers. In terms of importance, managers could conceivably support generic firm strategies (e.g. cost, differentiation) based on the conclusions presented. Finally, the relevance of our work to managers can be summarized by the observation that information is perhaps the most valuable asset to a firm. Thus, finding ways to better input, share, use, and manipulate it is a powerful potential source of SCA. This research highlights the importance of speed in relation to communication. It is not enough to be able to communicate effectively

in today's mobile environment. Employees, managers, and all firm stakeholders must be able to communicate effectively *and* quickly in order to have a competitive advantage over other firms.

Both scholars and practitioners will find the arguments presented in this research relevant. Managers may better understand and observe the evolution of mobile commerce and the growing importance of mobile devices for business. Some steps firms are currently taking to manage SMDs are: creating clear policies on SMD usage, creating safe networks for employees to access the company's computer systems, and documenting acceptable forms of monitoring employees via their SMD. Some have called for cell phone operators to start providing business solutions for their wireless products. This has prompted operators to deliver secure, password-protected devices and solutions for mobile device management (e.g. easy system updates, remote device control, and data wiping). To face the issue of mobile device management, companies may revisit practices regarding the issuance of corporate SMDs. The costs of employees leaking or losing important information also merits consideration. Again, this wasn't the primary focus of our research, which was more oriented on the *strategic* implications of SMDs, but it yields merit in discussion of the technology.

DIRECTIONS FOR FUTURE RESEARCH

Although some scholars debate the strength of the Resource-Based View (e.g. Priem and Butler, 2001), it is an influential perspective in the field of strategic management, and we have further developed it by extending its application and creating a strong foundation for further empirical testing. Using recommendations put forth by Armstrong and Shimizu (2007) one might operationalize the appropriate variables needed for surveying businesses across several different industries to test our ideas. We suggest that surveys initially could be employed to gather information how firm strategies and performance are being impacted by smart mobile devices. A benefit of our research is that it identifies constructs and relationships that are appropriate for further development and testing.

One area of this research that we mentioned but did not discuss in great detail is the concept of user acceptance. This merits further investigation because the response of employees, customers, competitors, and other stakeholders to smart mobile devices may influence firm strategic choices and responses. Other areas to which our ideas might usefully be extended include the fields of change management, innovation, and culture, inasmuch as all of these areas are closely tied to firm strategy, and likely to be impacted by SMDs.

CONCLUSION

This research demonstrated the strategic implications of smart mobile devices by first identifying a framework used to study the concept of sustainable competitive advantages, the Resource-Based View. After mentioning the RBV's core concepts, we highlighted its use in prior strategic management and related IT/IS research. We proposed that the impacts SMDs have on firms include: increased speed of communication and decision-making, greater information availability, and consequently increased innovation and firm performance. Smart mobile devices enable the flow of information in a way that was previously restricted by time or location. It was also identified that the *human* resources, such as communication, consensus, and managerial IT skills, when aligned properly with this technology, show the strongest evidence for providing a sustainable competitive advantage, consistent with the views of Powell and Dent-Micallef (1997) and Mata et al. (1995). In conclusion, smart mobile devices are a form of technology with widespread implications for managers and researchers, especially as trends indicate that the future of business is indeed going mobile.

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