

Information Technology for Small Business

Katia Passerini • Ayman El Tarabishy
Karen Patten

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Managing the Digital Enterprise

 Springer

Katia Passerini
New Jersey Institute of Technology
Newark, NJ, USA

Ayman El Tarabishy
The George Washington University
Washington DC, USA

Karen Patten
University of South Carolina
Columbia, SC, USA

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*To Bruce, a mentor, an entrepreneur,
and a friend*

Preface

With information technology (IT) going mobile, thanks to the deployment of faster and more reliable broadband networks, we are experiencing yet another technology-driven transition. As technologists, we are intrigued by this rapid transformation and see a need to describe its impact on the small and medium enterprise (SME) based on our own experiences and that of successful entrepreneurs who have embraced emerging IT applications such as “as-a-service” systems and mobile technologies.

The innovative uses of IT by the firms described in the cases in this book are representative of a paradigm shift, from when only large IT driven companies realized the benefits of technologies, to a much more level and competitive playing field for SMEs using new, innovative and mobile broadband technologies. Part of this shift can be traced to the small and flexible nature of these firms, especially since most have essentially one person in charge. This allows SMEs to adopt these new technologies and use them in innovative ways much quicker and in a more effective manner than can older and much larger firms.

Included in the paradigm shift is an approach, which might be called “*IT for all*,” that we have seen across each analyzed company. Successful enterprises focus on building a specific skill set or niche, using innovative IT to adapt and expand their specific market needs. **Transport Designs** (TD) is a good example of this. Its small size allowed TD to adopt computer design software and use it in ways that large competitors were slow to react to. TD augmented this with market flexibility, specifically with a policy of never turning down customer requests, even if they had never been done before, and of producing unique designs.

New technologies are paving the way for new market creation. Social media are at the forefront of such efforts. This is especially true for markets that represent so narrow a niche that they might not, at first glance, seem commercially viable. *Niche market definition* can also extend to the creation of new markets within old markets, cases in which a firm defines itself as an alternative to the mainstream or norm. This is the strategy of **Wiggly Wiggles**: be a homegrown and environmental friendly gardening entertainment company instead of a large, impersonal commercial company.

New technologies can reinvent existing industries. These new technologies can go as far as reinvigorating stagnant industries that appear to be on their way out. This is

particularly true for industries that have traditionally been based on tacit employee knowledge, which is difficult to document or verbalize. IT, combined with innovative and effective knowledge management, can recombine and enhance existing knowledge, thus creating a great competitive advantage. **Tecnomodel** makes extraordinary use of its employee technical knowledge and skill sets to practically reinvent product design, expanding into full-blown partnerships and consulting with shoe brand holders. Tecnomodel has made itself much more efficient and effective by codifying tacit knowledge with shoe design specifications, transforming manufacturing in a way that would be impossible without IT.

Technology makes “mass customization” possible. Take the **Fifth P Solution’s** approach to marketing. Rather than having a product-based mass production and marketing strategy, Fifth P Solution (FPS) emphasizes the importance of a strategy based on customer needs. By using IT as the driver of learning (e-learning), FPS is able to scale its offerings to some of the largest corporations in the world, and to do so while remaining a small firm. FPS remains committed to not only its “anywhere, anytime” definition, but also to “anything” in this particular case. The small, flexible size of FPS, combined with the innovative possibilities of broadband technologies, enables customized e-learning in the same tradition of the marketing and brand strategy FPS advocates: flexibility to customer needs through people and the brand promise.

Unifying all the divergent factors in the selected cases and across this book is *flexibility*. Flexibility means not only adapting to new circumstances, but also being open to “thinking outside the box” and thus creating and delivering customized solutions to address customer needs. Forever desired on a marketing level, broadband technologies are finally making this flexibility possible for many firms at an organizational level. Being an early adopter is only part of the story. Making effective use of information technology to address changing industry needs and business strategies, and doing so while growing and developing a brand promise, represents the real challenge as well as the real opportunity. In this book, we examine emerging information technologies, industry needs, strategies, and implementation and maintenance of IT, particularly innovative IT, with the objective of providing suggestions on how to transform IT implementation challenges into growth opportunities for the small and medium enterprise.

Small and Medium Enterprises

Small and medium-sized enterprises (SMEs) are becoming a new driver of innovation in broadband technology, characterized by continuous or “always on” connectivity. Conversely, broadband technology is becoming a key enabler of such businesses. Although the economic importance of SMEs has long been recognized, they were considered comparatively unimportant during the great Internet boom of the 1990s and early 2000s. Significant innovation in and use of broadband information technology (IT) required extensive investment in technological assets and a long term

access to capital. Such capital requirements were, for the most part, not available to SMEs. Today however, with continual improvements in Internet technology as well as breakthroughs in cloud computing and mobile connectivity, these and other changes permit SMEs to compete and excel in ways that were never before possible.

What advantages do SMEs offer that larger entities cannot leverage? A large organization's main advantages are access to capital as well as an established brand name and value chain. On the other hand, one of the greatest advantages SMEs have is flexibility. Many SMEs have a single leader or owner who is free to change policies, technologies, or whatever the leader may wish to change, even on no more than a whim. The owner of a small grocery store may decide to use broadband to create an automatic reorder system with suppliers. The president of a small bank can decide to enable customers to process checks on mobile devices. In both cases, these leaders are free to make innovations. They can offer new services and change internal processes without having to clear a multitude of committees that would exist in a large organization. Nor would they have to worry about whether or not their innovations might create problems across a large employee population. Cloud computing, open source software, and the proliferation of "smart phones" have brought down the investment requirements and costs to a point where many SMEs can now use applications and adopt innovations that were once restricted to large organizations that could afford such expenditures. This has leveled competition to the point where SMEs are beginning to have as significant an effect on the technological playing field as their larger and better established rivals. As a result, SMEs, whether their goal is to streamline business processes, grow the customer base, or augment existing offerings, can now make use of the awesome and exponentially growing power of broadband technologies.

Although technological adoption of broadband among smaller firms has accelerated, SMEs are often constrained by struggling operations. SMEs tend to be more concerned with growing their core business than with supplementing and improving their offerings with broadband technology. Even so, some SMEs are able to commit to new technological trends and innovations. There are those SMEs that stay on top of technological trends and adopt brand new and high potential technologies as they become available. One might say these SMEs are striving to be among the "glamorous" few. Then, there are SMEs that adopt new technology only if it is clear that it will be of practical use to their business processes. We might call these the "ambitious" SMEs. IT innovation by both glamorous and ambitious SMEs is in stark contrast with those whose leaders see their firms as constrained by circumstances or as focused solely on their core business concerns. However, such enterprises should take heed of the increasingly technology-dependent business environment. Those delaying adoption of key technologies may find that their products or services have become obsolete. The rise of wireless and mobile Internet technologies and the new advantages they bring to early adopters make this an exceptionally relevant concern.

These mobile devices are the applications that perhaps best epitomize the nature of modern broadband, which is not only "*always on*," but also of an "*anywhere, anytime*" functionality. The rise of the "smartphones" in the form of the iPhone, Blackberry, Droid, etc., has given unprecedented growth and popularity to such technology.

Because mobile devices by definition are not tethered or attached to any one point, they are flexible enough to use almost everywhere, and offer a sort of interface combining the best of both Internet and telecommunications interconnectivity. The applications and possibilities are limitless, but there remain challenges. Besides technology itself, other obvious implications include having a skilled workforce to utilize such technology and being able to safeguard data security and privacy through these untested channels.

The workplace also has become something of a more digitized and abstract entity than an actual location for many SMEs. Distance working and “telecommuting” are rapidly becoming a standard for many technologically-inclined firms. Few have overlooked such innovations as videoconferencing, which has cut down on employee transportation and logistical costs tremendously. But with mobile devices and innovations in cloud computing for data transfer and storage, “work” for many intents and purposes can be conducted almost anywhere. This might extend to the point where, with no central business offices, all SME business will be conducted through diverse and diffused “satellite” offices. With this comes a much greater amount of flexibility for employees in how, when, and where they get their work done.

This changing work environment creates new challenges for managers and owners of SMEs to balance remote work environments without the added and irreplaceable benefit of physical presence. It has raised concerns about how international and globalized workplaces can avoid clashes among language, cultural, regulatory standards, and other barriers that inevitably exist. Along with bringing people together from around the world, increased interconnectivity brings competition closer together, with broad implications for outsourcing, cost pressure, and local economic conditions. Apart from these broader concerns, adjusting to these new realities might be hard or disorienting for employees who are used to working in the traditional “office,” which requires physical presence. As with any technology, SMEs must take care when switching to such radically different business methods and paradigms.

One major issue for skeptical SME owners and managers is to sort through a myriad of options concerning which information technologies to embrace and what applications and methods of delivery would be best. It may be that the “best of breed” is not the best for these organizations. Factors such as cost, capacity, user requirements, or limited space for upgrades (or protection against obsolescence) come into play. Whether a SME is seeking to administer its own backend systems, software, and applications or is seeking a more virtualized solution, “as a service” computing is a real opportunity that may eventually change the nature of the SME’s industry and business model.

Among the plethora of available services, practical concerns prevail. An enterprise must know if these investments will be profitable or add value to the organization. It must also know if security measures are sufficient, or the possibilities of data breach, denial-of-service attacks, and the resulting need to be protected are too great for whatever service or infrastructure it elects to use. Since several ways of protecting computer systems and data, as well as maintaining security, are available, therefore, evaluation is not only necessary, it is essential. This evaluation is also critical for

an even greater concern, the proliferation of smartphones and other mobile devices, which must be selected and secured to guarantee safe business practices.

The large number of applications, services, and technologies available in a rapidly changing technical environment has made it difficult for an organization to determine which tools to use. This is even more difficult for smaller firms who often do not have the skilled personnel to handle such inquiries and decisions, nor the capital to invest in such technologies. There are also different classes and hierarchies of technology, not only in terms of their technical specifications, but how the business will need and use them. This of course will vary greatly across different firms.

One might balk at the planning necessary to decide which services to use for SMEs in an IT context. And indeed, feasibility studies and planning to deploy IT services matter a great deal. Perhaps, most fundamental is the age-old question of how much added value the new technology will bring to the SME. It also matters if the technology is becoming a competitive necessity (i.e., business is beginning to depend on its use) and if the technology is compatible with the overall business strategy. Business needs, from the actual planning and implementation of the service to the operation and maintenance of the service, must also be considered. The key question remains whether there is indeed a concrete place for the new technology in the organization.

Project planning and implementing information technology for SMEs is one thing, but maintaining it is a whole other story. IT maintenance and administration services in many small and medium enterprises are often understaffed. Moreover, employees often are not trained to handle their duties effectively. How exactly and with what resources does the SME enterprise IT “department” maintain and operate its systems? This question can be answered by looking at the company’s technology strategy and its strategic goals. The answer is also furthered by understanding how the types of services offered by the firm impact the firm’s customers.

IT policy, infrastructure, and know-how are rarely sophisticated in the start-up phase of an organization, but eventually become a more advanced and operationalized system. Therefore, it is important to have an explicit IT strategy from the earliest organizational phases so that subjective personal attitudes and dispositions, which often define such firms are minimized. An IT organization resembles a pyramid, with infrastructure at the bottom representing the most crucial and integral of all services. The IT organizational pyramid tapers off at the top as the responsibilities become more specific. Knowledge management processes, which codify IT policy, structure, and strategy can become a critical advantage for any SME who wants to maintain a competitive edge, as well as know how its IT works during high turnover or extraordinary circumstances.

Once a company explores the opportunities opened by broadband technologies, decides on what services to add, and then implements them, the question becomes how does, or can, the company keep up with the new technology? This is an important question, as technology is continually improving and even the speed of improvement is increasing. How much and how often to upgrade are just two of the questions that must be addressed by SME owners and managers who intend to stay on top of technological trends and breakthroughs.

An Outline of the Book

This book provides an overview of how small and medium enterprises (SMEs) can use flexibility—anticipation, agility, and adaptability—strategies to better implement broadband information technology innovations. Small and medium businesses are generally late technology adopters. This laggard role often weakens the size, location, versatile workforce and dexterity advantages that could enable SMEs to achieve higher efficiencies and effectiveness by simply rethinking the way they use technology. This book alerts small and medium businesses about trends in technology (such as mobile communication services, customer and vendor management tools, scalable data and knowledge mining applications) that may have the potential to transform the nature of SME operations.

Chapter 1 defines what we mean by SMEs and explains the importance of broadband IT for SMEs' growth and success. In **Chap. 1**, we discuss how SMEs can use new technologies to compete successfully with larger and longer established firms. We particularly focus on how SMEs can make sound decisions about adopting broadband IT innovations.

In **Chap. 2**, we discuss how broadband-driven mobile technologies support SMEs' business needs. The focus is on innovative SMEs, their needs and interests. Finally, we review security and privacy protection review in the "anytime/anywhere" environment.

While Chap. 1 and 2 outline the opportunities and advantages that broadband IT can provide to SMEs, there are problems that can arise in parallel to these advantages. Issues that derive from changes in workplace and workspace brought about by broadband IT applications are the focus of **Chap. 3**. These changes center on the fact that broadband IT innovations make it possible for SMEs to operate with a workforce that is distributed across many physical locations. The challenges faced by firms with such a "remote" workforce are addressed.

The proper mix of information technologies can give an SME a competitive advantage. The key is the proper fit of multiple information technologies with the firm's actual needs. In **Chap. 4**, we discuss existing and emerging information technologies that enterprises can explore and adopt, as well as how to explore the question of "fit" within the firm.

Chapter 5 discusses how SMEs decide what IT applications they need and determine how best to deploy them. This chapter includes an "information technology implementation framework" that can be used to guide SMEs through critical decisions. The questions addressed concern business needs in terms of planning for, implementing, and operating new IT services, products, or applications.

A comprehensive model of the IT organization is presented in **Chap. 6**. Those process areas that are essential to promote SMEs' competitive positions through IT are emphasized. Employee training takes center stage in order to increase productivity and return on IT investments. Also vital is understanding and using knowledge management to build and sustain a knowledge-sharing culture. Such a culture supports the long term survival and competitiveness of the enterprise, especially smaller

enterprises whose processes and procedures are often stored “in the heads” of few employees.

The aim of **Chap. 7** is to further explain some of the concepts presented in the previous chapters with examples of successful practices. Toward this, end we have prepared a set of four case studies. Each involves a small entrepreneurial company that has effectively used IT in an innovative manner.

Throughout this book, we have referred to the leaders of SMEs without actually saying much about such individuals, even appearing to equate such leaders or owners with the organization itself. There is, of course, much more to understanding leadership in SMEs that engage in IT innovation. In the concluding **Chap. 8**, we discuss this issue, examining, in some detail, the nature of the “IT entrepreneur” and the crucial characteristics of successful IT entrepreneurs.

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In a book that discusses broadband technology, and remote and distributed workspaces, we cannot emphasize enough the vital role played by mobile tools, virtual servers, teamwork/collaboration applications, and remote storage systems in the writing of this book. Therefore, our heart-felt thanks goes to the individuals that work at Skype, Apple, Microsoft, and Dropbox for creating and providing the (in many cases free) environments that supported our work.

As entrepreneurs are the soul of SMEs, our virtual team was the soul of this book. Each team member contributed their unique skills and the chapters reflect the results of an extended collaboration. Two important members that joined the team as research partners need special recognition. Michael Bull worked tirelessly on elaborating the experiences of the innovative entrepreneurs, using the podcasts of the interviews to develop interesting and challenging written cases. Gilbert Gatchalian researched and wrote the chapter sections that reflected his daily experiences with cloud services management in various IT organizations. Being a remote worker himself, he is also truly positioned to best discuss advantages and challenges of the virtual workplace.

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Last but not least, our final thoughts go to our longtime friend and mentor, the late Distinguished Professor Dr. Bruce A. Kirchhoff, who suddenly left us in 2011. We still think we had so much more to learn from him about entrepreneurship, academia, and life in general. You will be missed!

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