



Information Technology for



**INFORMATION TECHNOLOGY
FOR SMALL BUSINESS**

**A Comprehensive Guide of Applications of
End User Computing, Social Media, Cloud
Computing, and Open Source Software to
Business Process, Decision Making, and
Outreaching for Students in Business
Programs and Small Business Owners**

**Shouhong Wang
Hai Wang**



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*Information Technology for Small Business:
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Media, Cloud Computing, and Open Source Software to Business Process,
Decision Making, and Outreaching for Students in Business Programs and
Small Business Owners*

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** *Electronic teaching material for this textbook includes model syllabus, quizzes, lecture PPT, computer artifacts, and others.*

PREFACE

Small businesses make critical contribution to the economy. Information technology (IT) has leveled the playing field for small business in many ways. Nowadays IT has given small businesses the abundant resources for competition with larger businesses. IT has enabled small businesses to have greater internal controls as well as external outreach. Despite the importance of IT for small business, university-level academic books of IT for small business are rare. The objective of this book is to help business students and small business owners understand the concept and develop practical skills of IT for small business.

IT for small business includes a wide range of topics. This book explores IT solution services beyond basic IT foundations for small businesses. End user computing paradigm is the central theme of IT for small business. End user software, end user decision support systems (DSS) development, end user business intelligence, social media, cloud computing, and open source software are all important topics of end user computing for small business.

The book makes a good balance between the general IT literacy and IT technical skills for small businesses. The prerequisite of using this book is basic knowledge of Microsoft Office and the Internet. The book contains nine chapters. Chapter 1 is a brief introduction to small business and an overview of IT for small business. Chapter 2 discusses end user computing, and presents a general overview of the context of IT for small business. It emphasizes the alignment of business strategy, organizational strategy, and IT strategy in small businesses.

Chapter 3 provides an overview of end user software for small business. It provides a guide of end user software acquisition for small businesses. This chapter is followed by three chapters on high-level end user computing applications beyond “mouse clicking.” Chapter 4 introduces end user DSS, a powerful technique for small business, discusses the process of end user DSS development, and presents a guide of design of end user DSS. Chapter 5 introduces Visual Basic for Applications (VBA), a tool of end user DSS development. It presents an essential set of technical knowledge needed for implementation of integrated end user DSS. The prerequisite of this chapter is basic knowledge of Microsoft Office. Chapter 6 introduces the concept of end user business intelligence for small business, and explains the techniques of OLAP (Online Analytical Process) using Microsoft Office. A step-by-step tutorial with a small data sample set is provided for practicing OLAP in the Microsoft Office environment. Chapter 7 discusses social media for small business in marketing, recruiting, customer services, and networking. Chapter 8 discusses cloud computing for small business, explains software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS), and provides numerous examples of cloud computing applications for small business. Chapter 9 explains open source software, discusses examples of open source software for small business, and presents the process of selection of open source software products for small business using a case study of open source ERP systems.

This book is self-contained. Each chapter lists key terms, learning objectives, and exercise questions to

highlight the learning outcomes. Each chapter, except for the first chapter, includes a course project topic for the chapter and a detailed guide for the project topic. A set of lecture presentation PPT handouts is appended at the end of the book.

In summary, this book is designed for university or college students in business programs as well as small business owners who are interested in IT for small business. It is a comprehensive guide of applications of end user computing, social media, cloud computing, and open source software to business process improvement, effective decision making, and outreaching for all types of small businesses.

Shouhong Wang, PhD
University of Massachusetts Dartmouth

Hai Wang, PhD
Saint Mary's University

CHAPTER 1. INTRODUCTION

1.1. Small Business

Small business refers to a type of business organizations of certain sizes which fall below certain criteria in terms of annual turnover, number of employees, total value of assets, and other characteristics. The definition of “small” varies by country and by industry in terms of government support and tax policies. Small businesses are normally privately owned corporations, sole proprietorships, or partnerships.

Small businesses are common in almost every country. Typical examples of small business include: convenience stores, small shops, independent lawyers, accountants, restaurants, artists, and small-scale manufacturing. There are many forms of small business. Partnership and small family business are typical forms of small business. Franchising is a way for small businesses to benefit from the economies of scale of the big corporation (franchiser). McDonald and Subway are examples of franchiser. The franchisees can leverage the strong brand name and purchasing power of the larger company by using affordable investment. Retailers’ cooperative is another type of small business. Locally owned grocery stores or hardware stores can share expenses and gain from the cooperative’s purchasing power to acquire discounts from manufacturers.

Small businesses make significant contribution to the economy. For example, in the United States, small businesses with fewer than 500 employees account for more than half the private GDP and provide around half the private sector employment.

1.2. Advantages of Small Business

There are many advantages of small business.

- (1) Compared with large businesses, a small business usually does not require a huge amount of investment.
- (2) Small business owners are their own bosses. They are able to practice independence, self-determination, and freedom in operations, and reap the rewards of their efforts.
- (3) A small business is usually close to its customers and clients, and is typically easier to respond to the marketplace promptly, not being tied to a bureaucratic inertia.
- (4) A small business tends to be intimate with the community, resulting in accountability and trust.
- (5) Small businesses are well suited to the Internet marketing, and can easily serve specialized niches.

1.3. Common Problems Faced by Small Businesses

Small businesses often face a variety of problems.

- (1) Undercapitalization is a common problem of small businesses. Undercapitalization is often a result of poor planning and mismanagement, and can cause a failure. Bankruptcy is the ultimate consequence if a small business fails.
- (2) Insufficient management capacity is another common problem of small business. Small businesses often have limited human capacity for the management beyond day-to-day business operations, such as rational decision making, business analysis, advertising, business networking, etc.

(3) The overall social reputation of small business could put small businesses into a disadvantage position. The organizational structures and organizational cultures in small businesses may not be as democratic as that in large companies. The quality of the jobs created by small businesses might not be parallel with that of large business firms. Employees of small businesses might receive less benefit in comparison with comparable employees of large businesses, including salary, paid leave, paid holidays, bonuses, insurance, and retirement plans.

1.4. Benefits of Supporting Small Businesses

There are many reasons for the government and the community to support small businesses economically as well as socially.

- (1) Small businesses depend on the resources that a local community can supply. They hire local employees, purchase local products, reserve financial assets in the community, and contribute to the local sub-culture, ultimately benefiting the community.
- (2) Small businesses provide diversified products and services for the consumers. They are flexible to serve wide-ranging consumers' needs.
- (3) Small businesses can be innovative, creative, and adaptable in response to the changes of business environment.

Support of small businesses is one of the important functions of the government in many counties. For

example, in the United States, there are government organizations, such as the US Small Business Administration (SBA), and Small Business and Self-Employed One-Stop Resource of the Internal Revenue Service, that provide help to the small business sector. Canadian small businesses can take advantage of federally funded programs and services such as Canada Small Business Financing Program.

1.5. Information Technologies for Small Business

The impact of IT on small business is enormous. Small businesses now can take advantages of IT to compete with larger companies. There are two fundamental IT strategies for ordinary small business organizations: **end user computing** (or **do-it-yourself (DIY)**) and **IT outsourcing**. In-house construction by hired IT professionals is not a practicable strategy for small businesses. The cutline between the end user computing and IT outsourcing strategies can never be sharp because end user computing often involves partial IT outsourcing. Total IT outsourcing could release a small business from tedious IT work; however, the downside of total IT outsourcing is significant for small businesses, including loss of managerial control, hidden costs, complicated contracting process and coordination, and others. Clearly, this book disseminates knowledge about how a small business can benefit from the use of IT, total IT outsourcing is not a topic of this book.

There is no single taxonomy of IT for all types of application areas. In this book of IT for small business, we consider that IT has two layers: **IT foundations** and **IT solution services**, as illustrated in Figure 1.1.

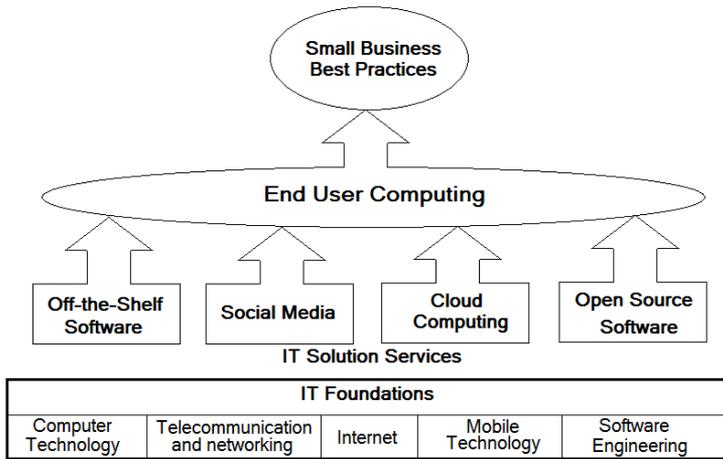


Figure 1.1. IT for Small Business in the End User Computing Context

1.5.1. IT foundations

The IT foundations include the following technologies:

- computer technology
- telecommunication
- Internet
- mobile technology
- software engineering

and others. These technologies generate powerful computers, operate the Internet for the public, produce diversified mobile devices, and create a great variety of computer software.

Nowadays simple applications that directly associate with the IT foundations have been widely used in business as well as people's life; they include:

- email

- instant message
- web browsing
- Wi-Fi and 4G WiMAX connection
- mobile application (e.g., GPS and smartphone)
- basic personal productivity tools (e.g., word processing)

and others. The skills of these essential applications of IT have become basic requirements for everyone who enters the job market. This book assumes that the reader possesses knowledge about these simple IT applications.

1.5.2. IT solution services

This book focuses on IT solution services above the IT foundations layer (Figure 1.1). In the context of IT for small business, an **IT solution service** is a self-contained IT application unit of business functionality that is available for IT consumers. IT solution services can be combined to provide the complete functionality of a large business application. In comparison with IT foundations, IT solution services provide more sustainable competitive advantages to business in creating and capturing more value, while requiring higher IT literacy of the users. For small businesses, the effective way to use IT solution services is end user computing. Therefore, the theme of this book is end user computing in the context of IT for small business. The general IT solution services for end user computing that are applicable to small business are introduced below, and will be discussed in detail in subsequent chapters.

1.5.2.1. Off-the-shelf software packages for small business

There have been countless off-the-shelf software packages

for small business on the market, including office automation and tools of end user applications development (e.g., Microsoft Office (www.microsoft.com)), business function packages (e.g., QuickBooks for accounting (www.quickbooks.com)), business management system suites, etc. Small businesses use off-the-shelf software to improve the productivity. More importantly, small businesses can use end user software tools to develop their own applications for unique needs to make the business operations more effective.

1.5.2.2. Social media for small business

Social media is web-based highly accessible and scalable publishing techniques on the Internet. facebook (www.facebook.com), Myspace (www.myspace.com), twitter (www.twitter.com), YouTube (www.youtube.com), LinkedIn (www.linkedin.com), Skype (www.skype.com), blogs, and wikis are examples of social media platforms. Small businesses use social media for advertising, recruiting, business networking, outreaching, and knowledge sharing.

1.5.2.3. Cloud computing for small business

Nowadays cloud computing has been a trend in the IT industry. In an ideal cloud computing environment, it is no longer for ordinary business organizations to own and manage their information systems. Small business can access computational power, software, data, business processes, and storages as services through cloud computing on the Internet without making significant investment in software and hardware.

1.5.4. Open source software for small business

Recently, open source software is growing at a fast rate as its popularity expands. Open source software is free for anyone to use. Open source software products are valuable computational resource for small businesses.

The central theme of IT for small business is the end user computing paradigm supported by the four major types of IT solution services (Figure 1.1). Clearly, a small business can use the above IT solution services in a unique way depending on various factors, including the type of business, the needs of business, the preferences of the small business owners and employees, and many others. The rest of the book discusses the concepts and issues of these four types of IT solution services, and how these IT solution services can be used as competitive advantages for small businesses.

Key Terms

Small business	Off-the-shelf software
End user computing	packages
Do-it-yourself	Social media
IT outsourcing	Cloud computing
IT foundations	Open source software
IT solution service	

Chapter 1 Learning Objectives

1. To understand the general characteristics of small business and the importance of small business in the economy.
2. To understand the strategic role of end user computing in small businesses.
3. To understand the general concept of IT solution services that can help small businesses.

Chapter 1 Exercises

1. Discuss the importance of small business in the economy.
2. Discuss your knowledge about small business.
3. Identify small business organizations you are familiar with for learning IT for small business.
4. Discuss the end user computing paradigm supported the four types of IT solution services, and how these IT solution services can help small businesses in coping with their common problems.

CHAPTER 2. END USER COMPUTING

2.1. End User

In general, there are two types of users of IT: technical users and end users, although the two types of users often overlap in many cases. **Technical users** are people whose occupations are IT products development or IT products maintenance. For instance, software engineers in a software company or the support team members of an IT department are technical users. **End user** refers to the ultimate operator of an IT product. Precisely, an end user is a non-technical person who uses IT for his or her own needs but does not develop or maintain IT products for others.

Generally, people in small businesses are end users. Clearly, people in small businesses in the IT industry (e.g., small software development firms, computer repair shops, and small web design companies) could be both technical users and end users. The principles of end user computing in the context of IT for small business we discussed in this book are generally applicable to all types of small businesses including those small businesses in the IT industry.

2.2. End User Computing

End user computing refers to a set of approaches to using IT solution services that aim at better integrating end users into the IT environment. End user computing has a wide range in complexity. Generally, there are two levels of end user computing supported by IT solution services: end user

software application and end user development, although the boundary between the two levels can never be clear-cut.

2.2.1. End user software application

At a lower level, end user computing attempts to integrate the user-computer interface ergonomically into the system that allows end users to use their own knowledge and skills to learn and ultimately to use the system. In this approach, end user computing tends to simplify the user-computer interface by including icons, menus, buttons to make the system easy to learn, easy to operate, and useable. There have been many types of ready-to-use end user software; yet, they can be classified into two major categories: off-the-shelf end user software package and web-based application. Chapter 3 will present a general framework of end user software for small business.

2.2.2. End user development

At a higher level, end user computing allows end users to have more control on the system, and even allows end users to develop applications to meet their unique needs. **End user development** refers to the approach to creating or modifying software artifacts by end users through the use of end-user-oriented computer languages (e.g., Microsoft Visual Basic for Applications) or other end user development tools (e.g., cloud computing tools) in the end user computing environment. For example, every small business has its unique decision making problems that can be solved efficiently and effectively through the use of IT, but it is impossible to have a single “small business decision support system” to support all types of decision making

problems for all types of small businesses. Thus, it can be argued that end user computing can't be filled by pre-defined systems in today's competitive world. In this sense, end user development is a critical component of successful end user computing. Clearly, an end user is not a professional developer. End users who are not properly trained can easily make mistakes or waste time when developing applications. In Chapter 4 and Chapter 5, we will discuss end user decision support systems, a typical topic of end user development for small business.

2.3. End User Computing Strategy in Small Businesses

Small businesses face various challenges as they strive to succeed in today's increasingly competitive global business environment. They must create innovative solutions and capture new opportunities rapidly. At the same time, they must optimize the internal efficiencies, improve the employee productivity, and reduce the operational costs. End user computing can help small businesses become more efficient and flexible than ever.

There have been so many end user computing software products on the market at relatively low costs, or even free. Generally, the costs involved in end user computing are low. However, end user computing for small business is by no means inexpensive. Hardware, time spent on learning, time spent on an end user development project, follow-up upgrading of free version of software, necessary technical support, and other items could raise unexpected costs for a small business. End user computing does require an investment and operational expenses which could be significant to a small business. To ensure accurate scope of

end user computing, a small business should assess the end user computing solutions to determine the costs.

A small business can become more productive by using end user computing technology. However, deploying, managing, and supporting end user computing can be a complex undertaking for a small business. Advanced end user computing applications require distinct knowledge and skills. More importantly, managing end user computing and keeping the continuity of end user computing are all challenging tasks for the small business owners.

While end user computing can enhance the workers' flexibility and mobility, a small business might still encounter resistance to change from the employees. The small business owners must be aware of the employee culture, anticipate possible challenges, and address employees' concerns in order to ensure a successful implementation of end user computing.

Security, IT ethics, and intellectual properties are also important issues related to end user computing for small businesses. The end user computing strategy of a small business should define end user computing policies, IT ethics code, intellectual property ownerships, and approaches to protecting the firm and customer information.

End user computing is an organizational venture for small businesses. A small business must establish end user computing goals, define its strategies, and address a full range of potential organizational challenges. **End user computing strategy triangle** is a simple framework for describing the alignment of end user computing with

business systems and for understanding the impact of end user computing on organizations, as illustrated in Figure 2.1.

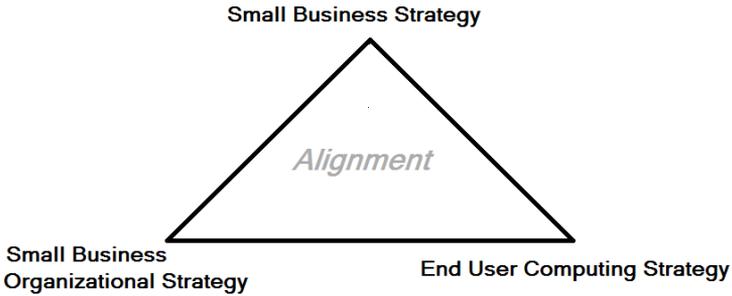


Figure 2.1. End User Computing Strategy Triangle

Small business strategy articulates the business mission, vision and objectives, and entrepreneurial development policies and plans which are designed to achieve these objectives. **Organizational strategy** articulates the design of organizational structure, coordination, and control of the organizational work processes. **End user computing strategy** articulates the plan and objectives of end user computing in the firm. A successful small business has a fitting business strategy that drives both organizational strategy and end user computing strategy. The tactics regarding the organizational structure, hiring and rewarding policies, vendor selection, business networking, and end user computing components are all driven by the firm's business strategy. End user computing strategy is affected by business strategy and organizational strategy, and can in turn affect business and organizational

strategies. To achieve the alignment between the three strategies, changes in the end user computing strategy must interplay with changes in the organizational strategy, and must accommodate the overall business strategy of the small business.

2.3.1. Brief overview of business strategy

A **business strategy** is a master plan that guides the business to achieve its goals. Three generic business strategies are: low cost, differentiation, and focus.

Applying the **low cost strategy**, the business offers a relatively low price of its product or service to attract more customers. Low cost is a bottom line issue for a small business. A small business must aim to be the low-cost producer in the marketplace. To implement the low cost strategy, the small business has to find right suppliers, to save advertising costs, to do-it-yourself for various office jobs, and to make effective decisions.

Applying the **differentiation strategy**, the business qualifies its product or service in a unique way that is different from the competitive ones on the market, and demonstrates the distinctiveness of the product or service for the identified customer segment. A small business is hard to survive without its unique product or service. To implement the differentiation strategy, the small business needs to understand the new demands, to access new technology for product or service development, and to make strong advertising.

The **focus strategy** allows a business organization to limit its scope of customers to a narrower segment of the market. This strategy is particularly effective for small