Preface

The massive changes that have occurred in the business world over the last 12 months show how difficult it is to plan for the future. It is extremely important that organizations are able to counter the turbulence in the business environment. There have been many changes in information and communications technology (ICT) over the last 40 years. However, we may look back on this era as being rather static in terms of what happens in the next 10 years. As recently as 25 years ago very few small and medium-sized enterprises (SMEs) employed computers for their data processing requirements. Even today SMEs cannot afford to employ many computing professionals. However, they do rely on ICT to provide their businesses with that extra edge in a very competitive market place. Affordable computer software and hardware have added millions of organisations to those that rely on ICT. However, the vast majority of computer textbooks that have been written over the last 40 years have focused on large organisations that are in a position to either develop their own systems or purchase off-the-shelf software.

For many years individual departments had software developed especially for their particular requirements. This worked for the various functional areas, such as personnel, accounting & finance, and sales. Certain systems such as sales order processing would cross these functional boundaries. Those organisations that took advantage of integrated systems were able to see the benefits of efficient and effective computing. It is interesting to note that even in today's business environment, enterprise-wide systems are being sold worldwide in considerable numbers.

Increasingly, companies are looking outside their organisational boundaries to take advantage of ICT. Through the use of the Internet, extranets, and strategic alliances they are improving their business processes and translating this to bottom line profit. Firms are reaping benefits from having similar software to their customers or suppliers. This can enhance longer-term contracts and relationships even at times of increased competition.

Gaining business benefits from investment in ICT is far from guaranteed. There are too many examples of expensive information systems that have been developed with all good intentions – failing to realise expected benefits.

This book, entitled *Information and Communication Technology (ICT) Management in Turbulent Business Environments* aims to inform today's business managers the important ICT strategy in changing business environments, techniques for effective ICT development, and ICT challenges for the future. This is not a technical book. It provides a basis for senior managers who are responsible for ICT development for enterprises with some guidelines on ICT management under changing business environment. The authors prepare this book from the basis of over 25 years of experience on ICT research, development and management.

This book is divided into 3 sections: Section I focuses on ICT strategy in changing business environments; Section II focuses on technologies for effective ICT development; and Section III focuses on ICT challenges for the future. Section I of this book concentrates on putting in place a strategy that can deliver benefits for your organisation. The book concentrates on providing practical examples of how to build up the expertise and knowledge to undertake these activities on your own. The first two sections of the book are a combination of workshops and case studies. As already mentioned the vast majority of firms worldwide can afford software and hardware but not ICT professionals. Just reviewing the current developments that are facing senior managers in the 21st century global business environment will show how ICT is necessary to keep up with the pace of change.

Most of the issues covered at the beginning of Chapter I will be revisited later on in the book. A major point to remember is that when your firm introduces change through ICT there are likely to be several other change initiatives taking place in your organisation at the same time. Each of these initiatives will be competing for scarce resources. These resources may be finite and that is why it is important not to undertake an ICT journey that does not deliver for the organisation. Can e-business and e-commerce transform your organisation? Are you realising the potential benefits of integrated supply chain management? Can activity based costing provide your organisation with a consistent way of increasing profits? Does your organisation use ICT to take advantage of the vast amount of business intelligence available in the environment?

The increased information flow between organisations enables firms to set up temporary arrangements to take advantage of synergies from ICT. Through improved interrogation facilities, organisations are able to analyse data from the environment more effectively (there is still an extra training requirement). Many more organisations are viewing ICT as a strategic weapon rather than an operational tool. The use of ICT should reflect the dynamic business environment rather than being seen as a millstone around the neck of modern-day decision-makers. It has certainly changed the way that many companies view 'working'. Home-working has become feasible through the improved connectedness between work and home.

The geographical positioning of your staff is no longer a fundamental concern as ICT can shrink both time and distance. In the future, information and intelligence will be viewed more as commodities. One element of the modern organisation will

be the way that senior managers are more aware of the potential of ICT. However, that may necessitate a considerable education and training initiative for many firms. A significant number of organisations may feel that ICT is not one of their core capabilities and they may decide to outsource this facility.

Chapter II focuses on the need to view the provision of effective information and intelligence as key drivers for on-going success. Over the last 40 years, many different types of information systems have been viewed as capable of providing organisations with a competitive advantage in the market place: transaction-processing systems, management information systems, decision-support systems, executive information systems, expert systems, strategic information systems, knowledge management systems, and enterprise-wide systems. However, the future may require a fusion of the Internet, extranets, ERP II, and business intelligence systems to provide organisations with the ability to move their business forward.

It would be futile for any organisation to develop information systems or utilise ICT without using it to underpin their current and future business strategies. It is extremely important that these areas are closely aligned. Similarly, it may be necessary to closely align these two areas with the firm's training and education strategy. Through the use of workshops and case studies, the reader will be guided through various activities to try and engage their staff in this process. It will always be important to involve staff with these particular initiatives. The business planning process should not be static or a one-off exercise. The business plan should be continually revisited. In the final analysis, there are no ICT projects – only business projects.

It will be a useful experience to have staff from different functional areas working alongside each other trying to identify business opportunities through the use of ICT. It is very important to prioritise your development of your information systems as tying up strategic staff for several years could be costly to the firm. In the meantime, your competitors could be developing key strategic systems. Chapter III gives guidance in this area. If an organisation decides to develop an enterprise-wide system it will by its very nature involve the vast majority of staff. It will be a major change project and the firm will have to plan for this change.

All companies have a series of business processes in place to allow them to undertake their day-to-day activities. In many instances, these processes have evolved over a number of years. It is highly likely that when new information systems are introduced these business processes will change. Chapter IV follows on neatly from Chapter III in that it isolates the key issues that may confront an organisation when it decides to put in place an ICT strategy. Again, through the use of workshops different departments will identify how they interface with other functional areas in the firm.

Chapter V discusses the how organisations should manage and plan ICT change. This is a very important aspect and responsibility of managers because setting realistic expectations and goals are crucial at this stage to avoid disappointment

in performance after introducing ICT. Chapter V goes on to show how ICT can improve business relationships between firms. If two firms, one a customer and the other a supplier, purchase the same software, it could result in a win win situation. The customer is happy because he or she may have access to the supplier's systems so as to be sure of supplies, raw materials or parts. The supplier is content because the customer is more likely to do business with them and possibly negotiate a longer-term contract. SMEs can also gain from combining with other SMEs to provide a full range of services to larger organisations. This can be cemented by the use of ICT.

It would be inappropriate for any organisation to introduce new information systems without ensuring that its employees are prepared for what could turn out to be such a significant change. Recently, ICT managers have put change management at the top of the list of current concerns. Once again, this chapter relies on workshops to communicate important issues that must be addressed by most organisations. Chapter VI identifies resistance to change as a key issue that must be tackled in advance of introducing new ICT. The way that your organisation introduces ICT may decide whether the implementation is successful or not. To show the importance of this area, several workshops are included to reinforce the message regarding the management of change. In some situations, ICT staff may have to act as ambassadors for the new system – walking and talking any proposed changes.

The successful organisations of the 21st century are likely to be those who know when, and when not, to introduce ICT. There may be penalties for being the *first mover* – being the first organisation in your area to introduce a new piece of software. However, would you be able to hold your nerve while your competitors started developing or purchasing new systems? The development of an effective customer relationship management system (CRM) may be critical to the business success of your organisation. It is becoming more prevalent that the critical systems are those that glean intelligence from the environment. Business intelligence systems system is the fastest growing ICT sector. It is crucial that we are able to evaluate the potential business benefits of any future investments in ICT.

Chapter VII reveals how there are a range of tools, techniques, methods and methodologies that can be adopted to improve ICT development. The systems development life cycle (SDLC) is covered in detail in Chapter VIII. However, the majority of organisations will not have the ICT resources to undergo this process. They will be more likely to use certain techniques that they will find useful in certain circumstances. For instance, through the use of information requirements analysis (IRA) they will be able to identify data and information gaps within their organisations.

Through process mapping, they will have the potential to analyse and, hopefully, improve their business processes. For over a decade, organisations have been aware of the potential business process re-engineering. This is especially useful for companies that need to make radical changes to their existing working practices. They may decide to focus their energies on their critical, business-winning activities.

The development of information systems is a complex process and there are many opportunities for things to go wrong. System developments are usually time-consuming, costly and they involve many different stakeholders. It is for this reason that they need to be carefully project managed. Using system development and project management methodologies will not guarantee the success of a particular ICT initiative. However, there has been a general consensus in the industry for several decades that it is worth trying to control and coordinate the process.

Chapter VIII takes an even-handed perspective regarding these issues. The traditional SDLC is also viewed as being inflexible and 'hard,' so it is important that alternatives are explored. A comparison will be made between hard and soft system approaches. Normally, in large ICT projects, the SDLC is aligned with formal project management methodologies (i.e. Prince 2). These methodologies generally provide a series of steps to follow for the completion of a project. Once again, this chapter will look at a number of different approaches. Case study material will be used to isolate some of the key problems that may arise during a system development.

Chapter IX will view some of the key issues that can confront firms when they are preparing an ICT initiative. Through the use of workshops, a number of areas will be addressed. Does your organisation have flexible information systems? Do your existing systems provide accurate information and intelligence? Do your employees need to deal with data overload? Is the output from your ICT in the right format for managers to make effective decisions? How do you capture information and intelligence from your business environment? What techniques are your competitors using to capture information? In the final analysis, your organisation may decide to purchase a company-wide ICT package. This may be a radical decision – but it may be the correct one for your organisation at this particular point in time.

One of the most difficult decisions during any ICT initiative is when to go live with a new system. If you make a wrong decision, it could have serious consequences for your organisation. It is necessary to synchronise several problematic areas, i.e. training of staff. Has the proposed system been tested sufficiently in the right conditions? Chapter X addresses a number of these important issues using a series of relevant case studies. Does your organisation have the resources to run your old system alongside the new one for several weeks? This may put enormous pressure on your employees, but it may be a safe option for your organisation. Would it be better to introduce a new system one department at a time? This may appear to be a good option. However, there is every possibility that this department receives and sends out data to other areas of the organisation. It may be difficult to reconcile this approach in a company that interfaces directly with its customers. Another approach that has gained in popularity is the direct changeover or 'big-bang' approach. This approach is analysed in Chapter X through the use of case studies. This normally means ending the use of your old system on the Friday afternoon and starting with the new system on the Monday morning. As you can imagine, this requires precise risk management. What happens if things go wrong? Does

your firm have a recovery position – a plan B? Can you revert back to using your old system? These are important questions and they need to be considered well in advance of any implementation.

We have already identified that the introduction of ICT can be a time-consuming, costly, and risky undertaking. However, organisations are increasingly reliant on ICT for their business survival. It is inevitable that some ICT projects will encounter difficulties. However, it is possible to learn from the experiences of organisations who have been through these processes. In Chapter XI, it is argued that it is more likely that you will read about systems experiences in the public sector than the private sector. However, there is an increasing set of case studies from the latter sector that reveal various causes of concern from ICT projects. The chapter begins by identifying a number of issues that can lead to problems within ICT projects. A number of case studies are introduced to try and shed light on another complex area. The chapter ends by providing some useful advice on how to plan for ICT developments.

Chapter XII discusses the drivers and barriers for ICT development, specifically presenting them with respect to specific industries. This will be very useful for managers in the respective industry to identify the constraints they could be facing in introducing ICT, and also the reasons other similar industries adopt ICT. Chapter XIII reviews the current developments and diffusionXIV critically discusses the e-technology for today's businesses. It provides a detailed account of e-business, B2B and B2C cases. Chapter XV discusses the knowledge management aspects of ICT. This includes classifications of knowledge types and how they could be useful in introducing ICT. Chapter XVI gives a summarised account of the issues concerning with security and risk in using ICT. This chapter provides various methods to mitigate and manage risk.

In addition to the aforementioned material, you will have direct access to six global case studies relevant to this area. They cover a range of different critical issues that will concern small, medium and large organizations. They illustrate the global nature of information and communication technology at a time of major change.

To conclude, this book provides a managerial perspective of the introduction of ICT in turbulent business environments. It is a basis reading for managers who are involved in ICT development and introduction in organisations. Many lessons, cases and critical issues illustrated in the book will give the readers a collective and holistic view on this respect.