Accounting & Productivity
Answering the big questions

Edited by
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The launch of this book is timely, given Deputy Prime Minister Tharman Shanmugaratnam’s announcement in January 2012 that the accountancy sector has been included in the productivity drive spearheaded by the National Productivity and Continuing Education Council.

Accountancy was added to the national movement because of the positive multiplier effect it could have for businesses throughout Singapore. This book is very relevant to that cause. It will help accounting professionals in industry and business, as well as professional accounting firms, to answer the big questions on the interface between accounting services and productivity – “Why is productivity important? How is productivity measured? How do we achieve greater productivity? What is the impact of greater productivity on quality? Whom can we learn from? And where do we get help on productivity improvement efforts?”

The accountancy profession itself continues to evolve as Singapore strives to become a leading global accountancy hub in Asia-Pacific. This aim requires the profession to re-think its practices and traditions to respond to external forces, such as new generations of talent and the changing needs of businesses. Preserving trust must be part of this journey. As Singapore’s audit regulator, ACRA is heartened to see that when firms embrace the culture of productivity in everything they do, audit quality will improve.

Similarly ACRA sees a positive role for eXtensible Business Reporting Language (XBRL) in enhancing productivity and business intelligence by providing all businesses with easily accessible data and data analytics for decision making.

While accounting is heavily influenced by technical and technological developments, the heart of a trusted profession remains its people. This book is a collaboration of members of the profession and includes their stories and insights into the relationship between accountancy and productivity, and the value created by it.

I am pleased to commend this book to Singapore’s accountancy profession and business community in the hope that it will further the important partnership between accountants and their clients.

Juthika Ramanathan
Chief Executive
Accounting and Corporate Regulatory Authority (ACRA)
August 2012
Preface by CPA Australia and SMU School of Accountancy

CPA Australia and SMU School of Accountancy are pleased to be working together on this publication focusing on the important issue of productivity in the accounting profession.

The need to raise productivity and build value-adding capabilities for the accounting sector in Singapore was one of the key issues highlighted in a 2010 report by the high-level public-private sector Committee to Develop the Accountancy Sector (CDAS). The CDAS report outlined a vision of Singapore as a leading global accountancy hub for the Asia Pacific region by 2020.

This publication aims to support improving productivity in the accounting sector, which encompasses accountants in business, industry and those in practice. It provides perspectives on what enhancing productivity means to accountants. In particular, it offers some suggestions on how the profession can improve its productivity, how it can measure success in this endeavour, how higher quality output can positively impact profitability in accounting practices, as well as showcase real life stories from corporates and accounting firms on how they have successfully implemented productivity measures.

We hope this publication will serve as a starting point to think about the major productivity issues that matter to organisations and how to go about striving for better use of their limited resources and people.

We thank the editors, contributors and the support team at CPA Australia who have worked tirelessly to produce this timely publication. We dedicate this book to the accounting profession in Singapore and wish it every success in boosting productivity for accountants and all their stakeholders.

Deborah Ong
Divisional President – Singapore
CPA Australia

Professor Pang Yang Hoong
Dean, School of Accountancy
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August 2012
The level of interest in productivity is evident from various economic policies and initiatives rolled out by the Singapore government. Productivity has been lauded as one of the keys to economic growth and prosperity. In January 2012, the accountancy sector was added to the list of sectors identified by the National Productivity and Continuing Education Council (NPCEC) as having potential for productivity improvements. As all businesses have some form of accounting functions, and many also consume professional accountancy services, any productivity improvements in the accounting sector will have a multiplier effect on the rest of the economy.

As editors of this book, we explored the interface between productivity and the accounting sector. To do this, we brought together authors to answer the big questions on productivity. Why is it important? What is it anyway? How do you achieve it? Whom can we learn from? And where do you get help on your productivity improvement efforts?

Our objective was not to proclaim a fixed way of measuring or improving productivity. Instead, it is to bring forth issues in academic and professional literature on productivity in accounting functions and professional accounting services for further study and discussion.

The term productivity itself may mean different things to different people. The most common definition is based on the concept of machine or labour efficiency ("outputs / inputs"). For example, the number of widgets produced by employees in one month. On its own, an efficiency ratio has no meaning without context. Thus, some favour a definition of productivity that adds effectiveness ("outputs / goals") to the mix. For example, the number of widgets produced by employees in one month in relation to the target for the month. In this book, we have defined productivity as how well an organisation uses all its resources to achieve its goals ("inputs ➔ output ➔ goals"). Goals can be matching or improving previous year’s productivity level, a stretch target or industry benchmarks.

We have defined accounting sector as comprising two components: accounting functions in businesses and professional accounting services. Accounting functions are the various accounting processes that businesses undertake, such as transaction processing, performance measurement, preparation of financial statements and communication of results to users of financial information. In an organisation, this is typically performed by an accounting or finance department, headed by a Chief Financial Officer (CFO) or Finance Director. We define professional accounting services as professional accountancy services performed by small and medium size accounting practices, mid-tier and the “Big 4” accounting firms for their clients.

This book is organised as follows.

**Chapters 1-2 explore why productivity matters.** In Chapter 1, you will read about various views from the top, from leaders in the accounting profession to business leaders. They share their productivity journey in their own organisation and why it matters to them and their organisations. Chapter 2 examines more than 1,400 publicly-listed companies in the Asia-Pacific region over the six-year period from 2005 to 2010 and finds evidence that there are significant tangible rewards to shareholders for firms that achieve productivity enhancements.

**Chapters 3-4 investigate what productivity measures would be appropriate for accounting functions and professional accounting firms.** The productivity journey starts with measurements. CFOs and finance departments, used to setting KPIs and scorecards for other business units, are being asked for their own productivity measures. For accounting firms, there is a productivity-quality paradox. Concentrating on cost savings alone may be detrimental to audit quality. We conclude that meaningful productivity improvements can only be achieved when accounting firms embrace the culture of productivity in everything that they do, culminating in the delivery of quality service to their clients.
Chapter 1
Productivity Matters: Views from the Top

Melvin Yong, CPA Australia

Introduction
Productivity has been a concept and catch word so widely used in recent times that some may wonder – does it really matter?

Proponents say greater productivity helps organisations achieve smarter use of their limited resources and people, make their systems and processes more efficient, and reap the greatest benefit from their technology investments. Opponents, however, say it is simply an excuse for cost-cutting – increasing output for the same or even less input.

In the accounting profession, the philosophy to productivity goes a bit deeper. It is unlike, say, the traditional manufacturing industry where production lines and equipment are simply added to raise output. The biggest input for the accounting profession is people. So how do you really quantify the pay-offs in productivity? What is a reasonable measure of success? And how would the drive to increase productivity actually work in the accounting profession?

In the corporate sector, productivity matters a great deal too. Shareholders demand a reasonable rate of return for their investment, for which companies need to ensure they turn a healthy profit margin. This has led many firms to innovate and transform their operations through providing more value to their customers to increasing the use of automation to better enterprise resource planning initiatives.

Chapters 5-10 explore how businesses and firms can undertake productivity improvements. Chapter 5 examines a critical, but often neglected, issue of change management in productivity improvement projects. Chapter 6 continues the discussions on the issue of productivity in accounting and finance functions, drawing on PwC’s experiences in helping MNCs and SMEs in this pursuit. Chapter 7 takes a look at the challenges and opportunities in productivity improvement efforts in the banking and finance sector. Chapter 8 discusses KPMG’s Value for Money and 3Es (Economy, Efficiency, and Effectiveness) approach in a public sector setting. Chapter 9 provides an example of how accounting professionals can tear down the business intelligence wall, moving from primarily a model of collect, clean, transform, integrate, store and report to explore, analyse, communicate, monitor, and use financial information. And finally, Chapter 10 describes how information technology such as cloud computing can transform a business and improve productivity.

Chapter 11 concludes this book by directing readers to where they can obtain assistance for their productivity initiatives. It explains the three broad schemes to help businesses improve their productivity: the SME-Productivity Roadmap (SME-PRO), the Inclusive Growth Programme (IGP), and the Increase SME Productivity with Infocomm Adoption & Transformation (iSPRINT).

We are pleased to be a small part of this collaboration between CPA Australia and SMU School of Accountancy. We thank all other parties involved in the production of this book – the contributing authors, interviewees, and ACRA for their support in this project. We hope you, the readers, find this collection of articles thought-provoking and useful in your drive for greater productivity.

Themrin Suwardy and Gary Pan
Singapore Management University
To better understand how productivity really matters, we spoke with three Singapore-listed corporate chiefs and three leaders of accounting firms and asked them what advice they would give their peers in the quest for greater productivity.

What systems and processes or business restructuring initiatives have you implemented to raise productivity at Deloitte?

Our initiatives to increase productivity are in a few broad areas:

- Getting the best out of our people
- Maximising the use of technology
- Increasing the effectiveness of processes and systems
- Capitalising on our Southeast Asia firm structure

Getting the best out of our people

In a professional services organisation like Deloitte, staff costs make up about 60 to 70 per cent of total costs. As lowering salaries is not an option and we cannot reduce headcount below a certain level to maintain our client service quality, we need to ensure that our people are not only productively employed but also concentrating on work that yields the best outputs in terms of quality and efficiency.

In certain cases, we might need to re-design jobs so that their specialist skillsets are fully optimised. For example, if we have auditors who are spending a significant portion of their time doing admin work, it might be more efficient to hire a junior executive to take over such work. This will free the auditors to do more meaningful client work which will result in better services and more satisfied clients. As such, more and more admin and time consuming tasks, such as engagement conflict checks and risk assessments are being done centrally.

We also ensure that our people are optimally occupied and we use an efficient scheduling system to staff engagements. This system, StaffTrak, enables advanced planning to ensure that all engagements are efficiently staffed. With this, we avoid situations where people are either too stretched or left idle because they have not been assigned.
Capitalising on our Southeast Asia firm structure

Deloitte Singapore is part of the Deloitte Southeast Asia member firm which comprises eight countries within the region. Operating as one single firm across Southeast Asia as opposed to each country practice functioning independently gives us a distinct advantage in terms of the depth and range of services we offer to meet our clients’ needs, our efficiency and our ability to make the most of white space market opportunity.

Leveraging on the combined size, scale and expertise of the various practices in the region and working together “As One”, enables us to share resources which result in increased productivity, less duplication and reduction in costs. More significantly, we are able to provide a more comprehensive range of innovative services to our clients by mobilising cross-functional and cross-border teams to meet the varied needs of our clients. With a strong team of experts and specialists in various fields and industries based in different countries around Southeast Asia, we have the flexibility to assign people to various projects in different locations. This allows us to deliver faster and better services to our clients because they now have access to a wide spectrum of expertise that might not have been readily available in their marketplace.

At the same time, we are cost efficient and are getting the most out of our people without the heavy costs of duplicating such teams in every country. Besides benefitting our clients, this mobility programme also benefits our people who can look forward to challenging, overseas assignments. This offers a broad range of learning opportunities and keeps them fulfilled, hence reducing our turnover rate. This contributes positively to our bottom line as a high turnover rate is very costly. Besides resulting in inconsistent services and lack of continuity, studies in the United Kingdom and the United States have shown that losing a senior manager in a professional services firm can ultimately cost two to three times the annual salary of that position due to head-hunting and training costs as well as loss of knowledge and even potential loss of business.

Maximising the use of technology

Technology is employed in every aspect of our business and we use state-of-the-art tools to improve our productivity.

In auditing, which is a highly complex process, Deloitte uses a proprietary international audit approach known as AuditSystem/2 (AS/2), which includes a fully integrated audit methodology, common documentation and enabling software. This has made audit more technology-based and much more efficient compared to the past where the work was manual and paper-based.

Besides using technology in control checks and acceptance testing, another area which we are leveraging on more and more is business analytics. Business analytics has great potential to enhance the audit process by enabling us to review more in a shorter time: it allows us to derive deeper insights into an organisation and quickly spot patterns so that we can focus on potential problem areas. Hence, we are able to give a higher level of assurance to our clients without a corresponding increase in fees.

Increasing the effectiveness of processes and systems

Our audit methodologies are constantly reviewed and changes made to enhance our efficiency. One example is the introduction of the Mid-market Audit Pack.

Previously, when conducting an audit, we followed a standard set of audit processes regardless of the size of the organisation. This could be inefficient when auditing small and medium enterprises (SMEs) because we were auditing to a level of detail that was unnecessary, given the nature of the enterprise. To address this, we created the Mid-market Audit Pack which enables us to effectively conduct an audit for SMEs which fully meet all their requirements and provides the necessary assurance without being inefficient and over-exhaustive.
How would you define success in those initiatives?
When providing services such as an audit, our first gauge of our success is when our methodology has worked well and we have met all the objectives of the audit with no issues. Secondly, our clients must be happy with the audit and we gauge their level of satisfaction by conducting regular surveys. Through this feedback process, we continuously review and make improvements in our audit process. Finally, as a business, we are only successful if the services provided are profitable. If we are not careful, we can be very successful in the first two areas because we are spending an excessive amount of time doing the audit but might end up losing money on the engagement.

Where our people are concerned, we gauge our success by the reduction in our turnover rate. While our turnover rate varies by level and function, market data shows it is equivalent to our competitors or better.

What advice would you give to others who would like to learn from your experience in driving productivity?
I would advise them to look at the areas mentioned above in terms of getting the best out of people, maximising the use of technology and increasing the effectiveness of processes and systems. In our case, we are able to reap the benefits of being part of a larger firm. Perhaps for SMEs, they can explore the possibility of collaborating with other firms to benefit from some economies of scale.

Another area which we have also found very useful is to ask our new joiners for their suggestions on how we can do things better from their experience. In Deloitte, we bring in many new people, either from other Deloitte practices or from other organisations. We often find that new people have very interesting ideas and we can benefit from their fresh perspectives.

To what extent was there resistance to gaining acceptance for your policy and how did you overcome that?
We did not encounter much resistance because our people are always willing to accept changes that lead to improvements. When we communicate the need for the various initiatives and their benefits, these are usually well accepted.

Our “As One” internal strategy which is about how we cooperate across geographic, functional, and business borders to reach our vision of becoming the Standard of Excellence and the first choice of the most sought-after clients and talent. This helps to build consensus as it sets a clear direction and guides every person in Deloitte to do their best and work together to achieve our vision.

What is your philosophy on productivity at KPMG? What advice would you give to others who would like to learn from your experience?
As a professional services firm, we are in the people business. It then follows that our guiding principle for everything we do is “it starts with our people”. This principle is at the heart of our firm, in how we motivate our people and how we respond to our clients. For this reason, our productivity and efficiency initiatives focus not on technology or processes, but on people.

Firms that invest in raising skills and improving processes are doing the right thing to improve productivity, but only if they have staff who stay on to apply those skills and be part of those processes. Unhappy people vote with their feet, and leave. Therefore, no productivity improvement is possible without raising job satisfaction.
It is sometimes said that productivity improvements are difficult because they involve change, and people are generally unwilling to change. While this is generally true, it works differently in a professional services firm. The majority of our professional staff join us to have the opportunity to work on and learn new things. Projects that offer fresh challenges are preferred to the tasks that have become routine and mundane. Challenging and interesting projects bring out the best in our people. Assigning our people to the right projects, in a way that continuously improves their job satisfaction, therefore is the starting point for our productivity gains. Putting the right people on the right projects sometimes looks too simple to be a productivity initiative, until one contemplates what productivity is like when one puts the people on projects in a way that demotivates them.

There is room for technology to be used in the right way. Spreadsheet software is commonly used in the profession to match staff to the right projects, whether in audit or in non-audit businesses. This under-utilises the IT investment that all firms have already made. Staff scheduling software offers a far better answer, with jobs automatically matched by software to staff with the right skills, cost, availability and preferences. The right computerised software also allows larger staff pools to be managed. Besides achieving economies of scale, it also offers more choices for better matches of people to projects in a way that raises both job satisfaction and client satisfaction.

For many people in and outside the audit profession, the business is characterised by the “peak” season. Levelling out the peaks and troughs in the use of staff resources is an obvious solution. The audit profession already has techniques in place to do this, with interim work and hardclose work done away from the peak season. We apply different charge rates for professional time in the peak and off-peak seasons, so that audit teams are motivated to minimise the overall “cost” of the audit by applying the optimal proportion of off-peak work. This has been effective in rebalancing the demand for peak and off-peak resources.
What is your philosophy on productivity at DBS Bank?
DBS’ vision is to become the Asian bank of choice for the new Asia. At DBS, we believe that to achieve our ambition of becoming a leading Asian bank, we must consistently deliver a heartfelt form of Asian service that puts our customers at the front and centre of all that we do. And in an industry as highly commoditised as ours, putting ourselves in the customers’ shoes is essential if we want to stay ahead of the competition. Hence, DBS’ drive for greater productivity centres around the customer: it is about how we can deliver greater customer value and make it easier for customers to bank with us.

What systems and processes or business restructuring initiatives have you implemented to raise productivity at DBS?
To support the development of a culture where customers are at the front and centre of all that the bank does, in 2010, DBS set up a Customer Experience Council (CEC), which our group CEO, Piyush Gupta, chairs. The CEC, which meets every month, drives DBS’ strategic service agenda, and anticipates and addresses customer service needs.

Initiatives to cut clutter and make banking more hassle-free cannot occur in a vacuum. Furthermore, it must be done in partnership with our staff. They have the most customer interaction and are thus best-placed to improve the customer experience. With that in mind, we launched a central process improvement programme, aimed at empowering and activating staff at all levels across all our key markets to look at how we can enhance the customer’s banking experience.
Over the past two years, the bank has completed over 100 service improvement projects which have resulted in time saved for our customers. In 2011, customers calling the DBS hotline were served within 12 seconds on average, surpassing industry standards of 15 seconds and representing an 80 per cent decrease in waiting times from 2010. Customer wait-times were cut down via various initiatives, such as an enhanced interactive voice response solution and improved forecasting technology that helped optimise manpower allocation to better meet customers’ needs.

It is not just about shaving off waiting time: a key component of increasing productivity is also leveraging technology to facilitate customer self-service. In 2010, DBS introduced a comprehensive mobile banking suite, which is compatible with more than 600 handsets across different mobile phone operating systems. This allows customers to carry out key banking transactions, conduct trading, access banking products and information, and meet their lifestyle needs while on the move.

How would you define success in those initiatives?
The objective is to make banking more convenient, faster and more hassle-free for our customers, so the success of our initiatives is usually measured in terms of customer impact. It was therefore most rewarding for us to be ranked number 1 for customer satisfaction among a total of 18 measured banks and insurance companies in the industry by the SMU Institute of Service Excellence’s annual Customer Satisfaction Index of Singapore. This was a turnaround from just a year ago when we were the last of 15 measured companies in the financial sector. While our service improvement journey is still work in progress, this proves that our initiatives are kicking in and we are on the right track.

To what extent was there resistance to gaining acceptance for your policy and how did you overcome that?
Having the right understanding of and attitude towards creating change in an organisation is key to making it a painless transition. While top-down strategic direction is essential, the ideas must come from the ground up and communication plays an important role here. Most of the time, there is resistance because there is a lack of understanding of how innovation will benefit the staff even as it helps the organisation deliver better service to customers. It certainly helped that at DBS, we have a common vision of making DBS a bank that is respectful, easy to deal with and dependable. People could see how the central process improvement programme fit into that, so almost everyone was in from the start.

Organisations can also face resistance when their staff is not properly equipped to begin thinking of and implementing changes. That is why one of our priorities in launching our central process improvement programme was equipping the staff with brainstorming tools and resources, and empowering individuals to make changes. This includes bringing people from different departments, putting them in the same room and helping them to manage their workload while they take time off their usual duties to focus on process improvement projects. It is important to have the right processes and policies in place to support staff initiatives.

If you had to go back to redo your chosen initiatives, what would you have done better?
Transformation programmes such as these are not easy. When you need to fundamentally shift thinking and behaviours in a sustained way, you need to be in it over the long term. You need to continually experiment with new ways of achieving results, and be prepared to get some wrong and to drive hard when you hit a winning approach. The approach needs to be balanced between re-wiring the hardware – the processes and policies – and re-shaping the heartware – the knowledge and attitude of the people.
One area where we still have some work to do is around how we recognise people who are role modelling truly customer-centric behaviour. Historically we have singled out heroics for recognition. The problem is that these are usually one-off events that only take place under unique conditions, and there is another group of unsung heroes who fly below the radar, delivering good customer service as part of their daily operations. We need to recognise people who are systematically thinking and behaving in a customer-centric fashion. We are putting in place a regular recognition programme which will highlight role models who have customer-centric attitudes and behaviours, and inspire others to adopt a similar approach to customer service.

What advice would you give to others who would like to learn from your experience in driving productivity?

There are a few lessons that I have learnt from our Asian service journey so far. First, it is important to have a common vision so that everyone can see how the initiatives fit into the grand scheme of things and it is not just change for change’s sake. Second, it must be approached as a partnership with staff at all levels: the role of senior management is to set the general direction, set the tone and enable staff to initiate meaningful change. Third, staff must be empowered to be change initiators. Their collective experience in dealing with customers and internal processes is a valuable asset that an organisation can tap on as it seeks to continuously deliver customer value and positive customer experience. Finally, the organisation must be ready to support change, be it having the right processes and policies in place or the right attitude towards change.

Chow Kam Wing
Executive Director and CFO
Micro-Mechanics Holdings

What is your philosophy on productivity at Micro-Mechanics Holdings?

Micro-Mechanics designs, manufactures and markets high precision tools, parts and assemblies for the semiconductor, medical, aerospace and other high technology industry. We have six manufacturing facilities in Singapore, Malaysia, China, Thailand, the Philippines and the USA, serving a global market and over 600 customers worldwide. Productivity to our company is a critical process and involves the entire organisation working continuously to improve costs, quality and cycle time to better serve our customers.

What systems and processes or business restructuring initiatives have you implemented to raise productivity for Micro-Mechanics Holdings?

During the global financial crisis in 2008, the CFO office took the initiatives and opportunity to introduce Enterprise Resource Planning (ERP) system into our group. Instead of focusing on cost cutting like most other companies, we began planning our investments for the future. Not only did we have the advantage of negotiating a better price and terms with the ERP vendors at that time, we also had more human resources to work on the implementation of the new system. Our willingness to invest also showed our people that we were confident in riding through the storm.

We are now able to standardise and apply the same best practice procedures for business processes and workflow across all locations. This includes the flows from orders received, to invoicing and receipts of payment from customers. We also have the same set of chart of accounts and reporting formats to speed up the consolidation of our group accounts.
Through the redesigned business processes and documentation flows, we have been eliminating inefficiencies that were inevitable with our old processes. With standardisation, we created a common language for all our locations to communicate and co-ordinate more efficiently and effectively. Besides saving time to get things done, this has also enabled us to avoid a lot of misunderstanding, which in turn improves our services to customers.

Integrating information efficiently is also key to better productivity. Our ERP system links up and shares data of the functional departments, which reduces data duplication and human errors. For example, after the sales department enters the data of sales orders from customers, the information will automatically flow to the production department to allocate human resources and production capacity. The information also flows to the store and purchasing department to check for availability of materials and tooling, which if insufficient, will trigger the issue of purchase orders accordingly. After the goods are produced, the finance department will issue invoices by pulling the data from the sales orders and at the same time, accounts receivables are established. As management now gets a bird’s eye view of the whole workflow from order to cash, it allows them to see where they can eliminate road blocks and ease bottle necks.

Using business intelligence (BI) tools, we are able to generate reports from our database in minutes instead of days previously. Today, over 90 per cent of our financial and operational reports are generated by the BI tool instead of spreadsheets which used to take much longer. This has saved a lot of time in the preparation of reports while benefiting from the most updated information for our decision making.

After the implementation of ERP, we have seen big improvements in areas like accounts receivables and cycle time because of accessibility to real time information and higher visibility of business processes. In turn, we have achieved gains in productivity both financially and operationally, which helps us serve our customers better and faster.

How would you define success in those initiatives?
For the implementation of ERP system, we achieved several goals. The system went ‘live’ according to the schedule in all locations and none of our ERP team members left during and after the implementation. Most of our planned tasks were also accomplished, which has helped speed up the processes and workflow. Financially, we have great savings from the ERP implementation in terms of acquisition of licences, annual licence fees and training fees. In all, the total saving is more than 30 per cent of today’s cost.

To what extent was there resistance to gaining acceptance for your policy and how did you overcome that?
The implementation of the ERP system meant standardisation and integration of all business processes. This is a complete change from the previous practices. All business processes and workflow had to be re-designed and all transactions had to be automated and transparent. It is natural for people to resist change, especially when it means a totally new way of doing things. People may even feel threatened and become uncertain about their future in the company.

To overcome the big change, we had to start from the top management. Being the CFO, I was appointed to be the chairman of the ERP steering committee and took charge of the selection, planning and implementation of the ERP system, together with the best performer from each department. Before the implementation, I visited each location to introduce the ERP system to all our employees. Employees were informed of the benefits of the ERP system and changes that could be expected under the ERP environment. We also provided ERP team members with the best ERP trainers and all the necessary equipment and support.

Most important is that the ERP team members knew the top management would be working hand-in-hand with them. It was critical for us to build a team spirit and motivate them to take up the tasks of learning and implementing the ERP system, so that they would be able to train the ERP users in their
respective department. It was really a challenge for us and we had to spend extra hours daily and even weekends to fulfil the tasks. You can imagine the ERP team members had to key in the latest data into the new system and at the same time do their jobs on the existing system. Statistics show that more than 60 per cent of ERP implementations have failed with a large number of ERP team members departing during the implementation.

If you had to go back to redo your chosen initiatives, what would you have done better?

In view of the results, I would like to say that we have done a very good job in implementing the ERP system and I must give 100 per cent credit to the ERP team members. After going through the process from selection of ERP vendors, implementation and set-up of ERP infrastructure, I would suggest appointing an independent ERP consultant to start with, unless the CFO has experience in ERP implementation. With the independent consultant, we could have done a better job in our negotiations with the ERP vendors in terms of time schedule and support. We would also have been able to right-size the ERP infrastructure with the right equipment and right set up. Without experience in this area, we had to spend unnecessary time, money and efforts.

What advice would you give to others who would like to learn from your experience in driving productivity?

Continuous improvement with goals and measurements is the only way for a company to increase productivity. On the ERP implementation, my conclusion is that there are three major pillars to make it successful - support from the top management; a good trainer; and a good and dedicated ERP team. To appoint an independent ERP consultant is a bonus. To me, the most important is the support and involvement from the top management. This also applies to all programmes and exercises pertaining to productivity, top management must get involved and support the team. I always believe in management by example.
Chapter 1  Productivity Matters: Views from the Top

What systems and processes or business restructuring initiatives have you implemented to raise productivity at Qian Hu?

As Qian Hu strives to be the world’s biggest ornamental fish and pet services provider, one of the issues we face is how to get more efficiency out of our operations without a big rise in manpower and expenses. We do this through a number of productivity projects, such as increasing the level of automation.

For instance, we have semi-automated our fish packing facility which we can use less time and use 30 per cent less manpower to pack the fish for export. We designed a system incorporate IT, weighting machine, and packing machine to improve the process by using less people and prevent human error.

We have also reengineered our quarantine areas. We can now keep more fish with less water and same manpower. We cannot share too much about the specifics as this is a trade secret. However, the process was reengineered in such a way that instead of two layers of tanks, we use three layers now to save space. We also build in some innovative design in the tanks so that we do not need to change water often, and if we need to, it is automatic.

How would you define success in those initiatives?

So far we believe those initiatives are yielding result as we have not increased our expenses that much and our staff turnover is lower than the industry average.

Qian Hu has the distinction of being the first company in the industry in Singapore to achieve ISO 9001 accreditation for conditioning and exporting ornamental fish. This is a testimony to Qian Hu’s quality service and commitment to provide the best for our customers.

Through the years, Qian Hu and its subsidiaries have successfully captured a number of awards through our team of qualified and experienced management committed to provide first-class fish and services.

To what extent was there resistance to gaining acceptance for your policy and how did you overcome that?

Staffs need to be rewarded when they have contributed to the productivity gain. Also, the top management has to be committed and lead by example to reduce the resistance. In Qian Hu, our top management openly share their mistakes and lessons learnt. They are also involved in all productivity projects as well.

If you had to go back to redo your chosen initiatives, what would you have done better?

No hindsight here. We have been quite conscious in driving productivity since 1997 after I read a book from Michael Porter called Competitive Advantage of Nations. What Michael Porter taught me is because of the Internet, information has become easily available. So the only way a company can earn more money as compared to its competitors is to become more productive than others. It has always been our culture.

What advice would you give to others who would like to learn from your experience in driving productivity?

Make it your mission, lead by example and make sure the journey never ends.
Conclusion

The road to greater productivity is clearly not an easy path and also a long-term commitment. But there are few, if any, other options for businesses in an age where getting and retaining good staff is at best challenging. Companies are constantly grappling with the fine balance of watching their manpower overheads and their staff seeking ever better remuneration.

In the Singapore context, employers are facing the added challenge brought about by government measures that control the influx of foreign labour, while encouraging companies to automate and find innovative ways to boost productivity.

The six interviewees featured here have showed that while productivity practices and initiatives vary with industry, some good ideas can cut across sectors. For instance, constantly finding new ways to provide value to customers, enhanced use of automation to handle routine tasks, and tailored enterprise resource planning initiatives suitable for a given business. Other chapters in this book will also expand some of the points raised in these interviews. For example, Chapter 4 talks about building a productive firm culture and informal recognition strategies for staff, Chapter 5 talks about change management and Chapter 9 talks about business intelligence and analytics.

Just as important, if organisations and their staff are to benefit from the quest for greater productivity, top management must set the correct tone and bring the rest of the rank and file with it.
In this article, we relate a firm’s overall productivity to its financial return-on-capital measure and examine whether or not a firm’s return-on-capital performance is, in turn, reflected in its stock price performance. If productivity yields tangible benefits on an enterprise-wide basis, then the market would reward firms that achieve higher productivity with higher returns to its shareholders.

**Return-on-capital**

Return-on-capital measures the earnings generated by a firm on capital invested in the firm, irrespective of whether that capital is contributed by banks, bondholders or shareholders. Return-on-capital is widely used by managers and analysts to evaluate the operating performance of corporations.

Following the well-known DuPont decomposition of return on equity, return-on-capital can be decomposed into a profit margin component and an asset productivity component as follows:

\[
\text{Return-on-capital} = \frac{\text{Earnings}}{\text{Invested capital}} = \frac{\text{Earnings}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Invested capital}} = \text{Profit Margin} \times \text{Asset Productivity}
\]

Return-on-capital can be decomposed into a profit margin component and an asset productivity component. The profit margin component is widely acknowledged as a driver of a firm’s performance. However, profit margin can also be viewed as a productivity measure, since it measures the ability of a firm to maximise its dollar revenues for each dollar of expense incurred in operating the business. Although external factors certainly also impact revenues (for example, through product demand and selling prices) as well as expenses (for example, through factor supply and input prices), a productive firm can generate more revenues for each dollar of cost spent.

The asset productivity component measures the ability of a firm to maximise its dollar revenues for each dollar of capital invested in the firm’s assets. A firm that is able to enhance the productivity of its invested assets can generate more revenues out of its capital invested.

Putting the two components together, we conclude that productivity is therefore related to return-on-capital.
Exhibit 2.1 below shows the trend of return-on-capital over the six-year period from 2005 to 2010. The median return-on-capital across the 1,414 sample firms ranged from a low of 8.0 per cent in 2008 to a high of 11.5 per cent in 2007.

Research Methods (part 2):
We collected financial statement data on publicly-listed companies from the Standard & Poor’s Compustat® GLOBAL database over a six-year period from 2005 to 2010. Companies were selected if they have the relevant financial data to compute return-on-capital measures as well as stock returns for each of the six years. To make the data collection manageable, we only included companies with revenues of at least US$100 million for the year 2010.

The final sample comprised 1,414 companies from 22 industry sectors and 12 markets in the Asia-Pacific region – Australia, China, Hong Kong, India, Indonesia, South Korea, Malaysia, New Zealand, Philippines, Singapore, Taiwan and Thailand. We excluded Japan because it would have otherwise dominated the sample – Japan alone would have constituted 35 per cent of the total sample, and a sub-sample of Japanese companies with very low return-on-capital also significantly skewed the results.

Exhibit 2.2 below summarises the distribution of return-on-capital, averaged over the six years, for each of the 22 industry sectors as well as for the entire sample. From Exhibit 2.2, the mining industry topped the list with the highest median return-on-capital of 24.3 per cent for the period 2005 to 2010. This is not surprising, given the boom in commodity prices during that period. Like mining, the oil and gas sector also experienced strong return-on-capital of 14.2 per cent during the period. The retail industry also did well with return-on-capital of 16.1 per cent, attributed largely to the retail boom in Asia. On the other hand, airline and semiconductor companies fared poorly, with among the lowest median return-on-capital of 5.0 per cent and 7.8 per cent respectively, as they continued to face very challenging market conditions.

<table>
<thead>
<tr>
<th>Sector</th>
<th>No. of firms</th>
<th>5th percentile</th>
<th>25th percentile</th>
<th>Median</th>
<th>75th percentile</th>
<th>95th percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airlines</td>
<td>11</td>
<td>-0.6%</td>
<td>3.0%</td>
<td>5.0%</td>
<td>8.4%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Automobile</td>
<td>39</td>
<td>1.2%</td>
<td>7.4%</td>
<td>13.7%</td>
<td>19.3%</td>
<td>30.7%</td>
</tr>
<tr>
<td>Chemicals</td>
<td>118</td>
<td>-0.1%</td>
<td>5.8%</td>
<td>10.7%</td>
<td>14.2%</td>
<td>25.5%</td>
</tr>
<tr>
<td>Construction &amp; Engineering</td>
<td>87</td>
<td>1.2%</td>
<td>6.3%</td>
<td>10.2%</td>
<td>17.4%</td>
<td>33.9%</td>
</tr>
<tr>
<td>Electrical &amp; Electronic Equipment</td>
<td>147</td>
<td>-7.3%</td>
<td>3.1%</td>
<td>8.4%</td>
<td>13.9%</td>
<td>21.2%</td>
</tr>
<tr>
<td>Food &amp; Beverage</td>
<td>94</td>
<td>1.6%</td>
<td>7.5%</td>
<td>11.2%</td>
<td>15.4%</td>
<td>22.9%</td>
</tr>
<tr>
<td>Industrial &amp; Manufacturing</td>
<td>231</td>
<td>-0.3%</td>
<td>5.5%</td>
<td>9.3%</td>
<td>14.6%</td>
<td>24.3%</td>
</tr>
<tr>
<td>Marine Transportation</td>
<td>33</td>
<td>4.2%</td>
<td>8.5%</td>
<td>11.5%</td>
<td>17.4%</td>
<td>24.2%</td>
</tr>
<tr>
<td>Mining</td>
<td>17</td>
<td>-22.7%</td>
<td>20.2%</td>
<td>24.3%</td>
<td>37.0%</td>
<td>47.7%</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>19</td>
<td>5.9%</td>
<td>10.3%</td>
<td>14.2%</td>
<td>18.4%</td>
<td>36.9%</td>
</tr>
<tr>
<td>Retail</td>
<td>52</td>
<td>4.2%</td>
<td>10.3%</td>
<td>16.1%</td>
<td>21.8%</td>
<td>41.5%</td>
</tr>
<tr>
<td>Semiconductors</td>
<td>50</td>
<td>-8.7%</td>
<td>4.9%</td>
<td>7.8%</td>
<td>11.0%</td>
<td>25.1%</td>
</tr>
<tr>
<td>Services: IT &amp; Software</td>
<td>33</td>
<td>-1.9%</td>
<td>3.7%</td>
<td>9.1%</td>
<td>22.9%</td>
<td>42.2%</td>
</tr>
<tr>
<td>Services: Other</td>
<td>34</td>
<td>2.2%</td>
<td>8.3%</td>
<td>13.1%</td>
<td>18.1%</td>
<td>34.8%</td>
</tr>
<tr>
<td>Steel</td>
<td>89</td>
<td>-0.7%</td>
<td>5.0%</td>
<td>8.5%</td>
<td>12.8%</td>
<td>16.7%</td>
</tr>
<tr>
<td>Technology Hardware</td>
<td>47</td>
<td>-9.9%</td>
<td>2.2%</td>
<td>7.5%</td>
<td>15.1%</td>
<td>23.4%</td>
</tr>
<tr>
<td>Telecom Services</td>
<td>18</td>
<td>6.2%</td>
<td>8.8%</td>
<td>14.2%</td>
<td>22.1%</td>
<td>41.7%</td>
</tr>
<tr>
<td>Textiles &amp; Apparel</td>
<td>55</td>
<td>-3.9%</td>
<td>2.5%</td>
<td>6.1%</td>
<td>10.9%</td>
<td>20.1%</td>
</tr>
<tr>
<td>Utilities</td>
<td>53</td>
<td>2.5%</td>
<td>6.7%</td>
<td>9.8%</td>
<td>12.9%</td>
<td>20.6%</td>
</tr>
<tr>
<td>Wholesale</td>
<td>70</td>
<td>0.4%</td>
<td>6.2%</td>
<td>9.4%</td>
<td>13.9%</td>
<td>21.2%</td>
</tr>
<tr>
<td>All Other Industries</td>
<td>117</td>
<td>1.2%</td>
<td>6.1%</td>
<td>10.1%</td>
<td>14.9%</td>
<td>27.8%</td>
</tr>
<tr>
<td>All Firms</td>
<td>1,414</td>
<td>-1.2%</td>
<td>5.8%</td>
<td>9.9%</td>
<td>15.1%</td>
<td>26.7%</td>
</tr>
</tbody>
</table>
**Link between Productivity and Return-on-capital**

Some companies may find it easier to manage their profit margins in the short term (by managing their revenue and cost structures) than to manage their asset productivity, since capital assets once employed in the operations may be more difficult to be re-deployed in the short term. Other companies, however, may find it more difficult to manage their profit margins due to uncontrollable market factors.

Exhibit 2.3 shows the industry-adjusted profit margins and asset productivity of firms within each return-on-capital decile, from firms in decile 1 on the far-left of the chart (lowest return-on-capital) to firms in decile 10 on the far-right of the chart (highest return-on-capital). For each return-on-capital decile of firms, the bar chart (measured against the left axis) shows the industry-adjusted profit margin, while the line graph (measured against the right axis) shows the industry-adjusted asset productivity.

**Research Methods (part 3):**

We examined to what extent each of the two components of return on capital – profit margin and asset productivity – actually drove return on capital of a firm.

We first ranked our sample of companies by their average return on capital and partitioned them into 10 groups (deciles) accordingly, from the 1st decile with the lowest average return-on-capital to the 10th decile with the highest average return-on-capital.

For each firm, we then decomposed its return-on-capital into its profit margin and asset productivity components. Because different industry sectors experience different profitability and different asset utilisation rates, we adjusted each firm’s profit margin and asset productivity measure by computing an *industry-adjusted profit margin* as well as *industry-adjusted asset productivity* measure.

The industry-adjusted profit margin for each firm is calculated by subtracting the median profit margin for that industry from the profit margin of that firm. Similarly, the industry-adjusted asset productivity measure has calculated by subtracting the median asset productivity measure for that industry from the asset productivity measure of that firm. A negative industry-adjusted profit margin (or asset productivity) therefore meant that the firm’s profit margin (or asset productivity) was below-average relative to its industry. Conversely, a positive industry-adjusted profit margin (or asset productivity) meant that the firm’s profit margin (or asset productivity) was above-average relative to its industry.

From Exhibit 2.3, it can be seen that return-on-capital increases with profit margin. With the exception of a small decline in asset productivity for return-on-capital deciles 7 and 8, return-on-capital also generally increases with asset productivity.
While this observation can be expected, Exhibit 2.3 is more telling from another perspective. Firms that deliver superior return-on-capital (on the far-right) significantly outperform their industry peers on both profit margin and asset productivity. In a similar vein, firms that deliver sub-par return-on-capital (on the far-left) significantly underperform their industry peers on both profit margin and asset productivity.

**Link between Return-on-capital and Stock Price Performance**

*Research Methods (part 4):*

We next examined whether firm productivity was rewarded by investors in terms of its stock price performance. We measured stock price performance of a firm by computing its total shareholder return (TSR) per year from 2005 to 2010 and averaging it over the six-year period.

Exhibit 2.4 below shows the relationship between TSR and return-on-capital based on our sample partitioned into 10 return-on-capital deciles. Since TSR is also affected by other market-wide factors, we express each decile’s TSR as an index based on a multiple of the lowest return-on-capital decile’s TSR rather than as an absolute TSR. As Exhibit 2.4 shows, TSR is generally increasing with return-on-capital, suggesting that firms with higher return-on-capital generate higher returns to their shareholders.

For instance, firms in the highest return-on-capital decile (far right) generate TSR that is almost twice (TSR index of 1.96) that of firms in the lowest return-on-capital decile (far left). Even firms with average return-on-capital (i.e. those in the middle return-on-capital deciles 5 or 6) generate TSR that is about one-third higher than that of firms in the lowest return-on-capital decile.

The evidence suggests that firm productivity, as measured by return-on-capital, is rewarded by the market in terms of higher stock returns to the firm’s shareholders.

*Research Methods (part 5):*

Finally, we examined the stock price effects of the two separate components of return-on-capital – profit margin and asset productivity – to see if each component separately contributed to TSR beyond the other component.

We first partitioned our sample into three equal-sized profit margin groups, representing low, average and high industry-adjusted profit margin respectively. Within each profit margin group, we then partitioned the firms again into three equal-sized asset productivity groups, representing the low, average and high industry-adjusted asset productivity respectively. This resulted in nine groups (3x3 groups) based on industry-adjusted profit margin and asset productivity. We then computed the average annual TSR of each of these nine groups.
The findings in this study show that a firm’s productivity, as measured by its return-on-capital, is strongly correlated with its stock price performance. Further, when return-on-capital is decomposed into its separate components, shareholders of firms that outperform their industry peers on profit margin or asset productivity enjoy significantly higher stock returns. Even among firms with similar profit margins, shareholders of firms that outperform their peers on asset productivity enjoy higher stock returns beyond that associated with profit margins.

Overall, the evidence suggests that there are significant tangible rewards to shareholders for firms that achieve productivity enhancements in their businesses. The evidence should provide some comfort to those business managers and owners who may be sceptical whether productivity improvements actually yield positive benefits to their businesses beyond the costs.
Chapter 3
Productivity Measurements for Accounting Functions

Themin Suwardy, Singapore Management University

Productivity in Accounting Functions

Sir William Thompson (Lord Kelvin, 1824-1907) proclaimed over a century ago, “If you cannot measure it, you cannot improve it!” He was talking about measurements in the world of thermodynamics, but it would have been entirely appropriate for a keynote address in a business conference today. Peter Drucker said something similar many years later, “What gets measured, get done!”

The measurement of efficiency and effectiveness are indeed close to accountants and their traditional training. They are used to evaluating profitability of business units, analysing cost variances and tracking key performance indicators (KPIs). They are the “scorekeepers” of every unit, function and process in a business. Little has been asked about their own efficiency, let alone their productivity.

This has now changed. CFOs, controllers and accountants have put “streamlining processes and improving productivity” as the most critical challenge facing their organisation (IMA, 2011). In the last year, respondents have undertaken business process improvement efforts (75 per cent of respondents), automation of business processes (67 per cent), data analysis and business intelligence (52 per cent) and improving staff training (41 per cent). Despite these efforts, respondents indicated that there are still many accounting functions that require improvements, as shown in Exhibit 3.1.

Clearly, the finance department is under pressure to enhance its own value contribution to the business, deliver high quality information and maintain effective controls. It is subject to the same continuing internal demands to reduce the cost of its own operations. To be more efficient, be more productive.

But many finance departments are in a quandary. They are unsure how to demonstrate whether they are delivering real value to the business and to what extent they meet best practice standards for world-class finance departments. If productivity is how well an organisation uses its resources to achieve its goals (“inputs ➔ output ➔ goals”), what exactly are the inputs, outputs and goals of the accounting function? How do we measure and improve productivity in the accounting function?
The Big Picture

Benchmarking studies use an overall “cost to sales” indicator as a proxy for the effectiveness of a finance department. This is calculated as the percentage of total finance costs over total sales or revenue. Finance cost would include both internal staffing costs and any outsourcing costs. It is a very simplistic measure but a useful reference point that most companies can relate to. Recent benchmarking studies seem to indicate an overall trend that finance costs, as a percentage of revenue, have decreased to about 1 per cent.

- Stutt (2005): Across all industries, the cost of finance departments averages about 1.5 per cent of sales. Top performers with world-class best practices were able to reduce this to 0.4 to 0.8 per cent of sales, depending on the nature of the industry.
- Deloitte (2006): On average the companies spent about 1.2 per cent of their revenue on the finance department.
- CFO Executive Board (2008): Average finance budget as a percentage of revenue is 1.13 per cent, with a range from 0.71 per cent for large companies to 2.16 per cent for smaller companies.
- PwC (2011): Median cost of finance costs as a percentage of revenue is 0.93 per cent and the top quartile performers incur only 0.56 per cent.

As expected, all benchmarking studies report lower cost of finance department as a percentage of sales for larger companies than smaller ones. Larger companies enjoy economies of scale and have the ability to invest in automated systems and technologies. Robert Half’s (2011) benchmark study of over 200 companies offers a detailed breakdown of finance department’s cost by revenue. Note that in this study, only internal finance costs were used.

Specific Measurement Metrics

The academic and professional literature offers a long list of potential efficiency and effectiveness measures for various accounting functions. A quick summary is provided below, along with indicative benchmarks. The indicative benchmarks are provided for illustrative purposes only and based on this author’s analysis of various benchmarking results. Where overall results are not available, the results for the largest demographics are shown.

<table>
<thead>
<tr>
<th>Overall Finance Department Measures:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Total finance full-time equivalent (FTE) over total TFE .................. 5.2% (listed) 2.9% (non-listed)</td>
</tr>
<tr>
<td>• Number of finance applications used in the finance department ........ 3 applications</td>
</tr>
<tr>
<td>• Number of general ledger accounts ............................................ 81% has less than 1,000 accounts</td>
</tr>
<tr>
<td>• Number of days to produce financial statements (“close days”) ........ 10 days (quarter) 22 days (annual)</td>
</tr>
<tr>
<td>• Number of key internal controls ............................................. 77% has less than 100 controls</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Budgeting and Planning:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Budgeting cycle days ......................................................... Median: 120 days</td>
</tr>
<tr>
<td>• Forecasting cycle days ......................................................... Median: 20 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accounts Payable:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Accounts payable invoices per assigned FTE .......................... Median: 7,398-9,552 invoices</td>
</tr>
<tr>
<td>• Percentage of electronic invoices ......................................... Median: 30-40%</td>
</tr>
<tr>
<td>• Percentage of available early payment discounts taken ............. Median: 89.3%</td>
</tr>
<tr>
<td>• Percentage of disbursement that are first time error free ........... Median: 99.6%</td>
</tr>
<tr>
<td>• Cycle time from receipt of invoice to payment scheduled .......... Median: 5.0 days</td>
</tr>
<tr>
<td>• Total cost per supplier invoice ............................................. Median: US$9.59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accounts Receivable:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Accounts receivable remittances per assigned FTE ................... Median: 5,828 remittances</td>
</tr>
<tr>
<td>• Number of invoices processed per assigned FTE ...................... Median: 12,801 invoices</td>
</tr>
<tr>
<td>• Cycle time to generate complete and correct invoices .............. Median: 3 days</td>
</tr>
<tr>
<td>• Percentage of invoiced line items paid in full the first time ...... Median: 94.0%</td>
</tr>
<tr>
<td>• Cycle time to resolve an invoice error .................................. Median: 7 days</td>
</tr>
<tr>
<td>• Total cost per invoice to customer ........................................ Median: US$7.65</td>
</tr>
</tbody>
</table>

Exhibit 3.2 – How Much Does a Finance Department Cost?

Exhibit 3.3 – Selected Finance Department Benchmarks
Unfortunately, there are no equivalent benchmarks specifically for Singapore businesses. Professional accountancy firms and consultants do offer benchmarking services but there is a clear lack of industry-wide publicly-available data on accounting productivity in Singapore.

Selecting the Right Metrics
The big trap in productivity measurements is to go overboard with all the possible measures you can think of, resulting in a tortuous affliction appropriately nicknamed “death by KPI”. The pitfalls of KPI selection apply to accounting functions just like any other department or function in the organisation. Too many KPIs (and worse, non-relevant KPIs that no one in the organisation relies on for any real decision making), too much manual effort to tabulate KPIs, badly defined KPIs that result in inconsistencies, KPIs that are not reflective of organisational aims and strategy, and many others.

So, how do you pick the right metrics for your accounting functions? The Institute of Finance and Management (IOFM, 2012) suggests that each potential metric be put through a set of big questions: why, what, how, when, whom, and so forth. Answers to these questions should be documented and reviewed by parties involved in, and/or affected by, each of the steps. As an illustration, let us use a simplified version of the IOFM framework for selecting a metric for the Accounts Payable (AP) function.

Step 1: Why is it measured?
The AP function generally works on an auto-pilot basis. It receives invoices, expense claims and other business documents and processes them for payments. Occasionally, it spends significant amount of time and effort when the input quality is poor. IOFM claims that invoices requiring exception processing consumes 10 times as much effort than those that can be processed without intervention. This is probably outside the direct control of the accounts payable department but it is the one that “pays” for it. It may have to seek clarification from suppliers, submitter, approver or other departments before it can proceed with AP processing.

Step 2: What is to be measured?
The next step is to identify and define what is being measured. It may not be a perfect definition but the idea is to get something started quickly and improve it as you go through the framework. You may decide that you will track “invoices needing intervention prior to processing” as the metric for AP input quality.

Step 3: When and how should it be measured?
Several factors should be considered in deciding when measurements should be taken. For some measures, accuracy may be more important than timeliness, others may be too voluminous to track individually and a sampling strategy may be used. Other important considerations include whether the measurement is manually collected or automated through some system processes or applications, and how frequent are the measures used and evaluated.

In this case, we could track each exception as they occur by logging information such as date/time of exception, vendor, submitter, amount and type of exceptions.

Step 4: How are the measurements reported?
Similarly, the same factors (costs, benefits, frequency, etc) should be considered in terms of reporting the metrics. Some businesses have used “dashboards” or visual representations of the various metrics they track, where as others prefer a more structured reporting format. The other reporting intangibles could include sharing the KPI metrics prominently on a wall in the office, “mini” celebrations for good results, and so forth.

Over time, our tracking of “invoices needing intervention prior to processing” may show that there are common reasons for the exceptions. You may notice, for example, that the following reasons keep appearing: vendor not on file, unit prices and/or quantity not matching purchase order, line items on invoice not on purchase order (or vice versa), approval is above signing limit, and so forth.
Step 5: What do you do with the measurements?
This brings us back to the first starting point on why we want to establish the metric in the first place. The metric must be able to help the finance department identify problems, perform cause and effect analysis, determine appropriate corrective actions and manage resources more effectively.

For example, if certain vendors, submitters or approvers are responsible for a significant proportion of the metric, perhaps re-training (or "re-education session") is necessary. Alternatively, new automated controls may be added prior to submissions of AP inputs.

Productivity Measurement Model for Accounting Functions

Once you have selected the metrics for your accounting functions, how do you keep track of different metrics with different units and different targets? The IRF (2004) offers a way to summarise your metrics into one single productivity index. IRF suggests that businesses identify a group of measures that can measure the achievement of the specific functions, along with their relative degree of importance, taking into account company’s strategies and priorities. For each metric, indicate if the desired direction is an increase or decrease, and assign priority levels (out of 100 per cent) to each metric.

For example, let us say after going through the selection process described earlier, we have decided to use the following accounting metrics:\1:

- Routine report cycle ("number of person-days to prepare routine reports")
- Post-issue error rates ("number of errors identified subsequent to issuance of reports")
- AP input quality ("invoices needing intervention prior to processing")
- Special report cycle ("number of person-days to produce special reports")
- Special report quality ("average rating of report satisfaction by requester, scored out of 10")
- Net cash flow index ("receivable days less payable days")

Once the measures and their respective weights are determined, performance may be tracked and total weighted results can be used as an annual productivity indicator. Exhibit 3.4, with hypothetical data, provides an example of how this can be accomplished.

Base data and new data are results from prior and current period, respectively. Change is indicated as percentage change with an index of 100, taking into account the desired directions. For example, a 1 day improvement on routine report cycle (from 15 to 14 days) equals to 100 × (1/15*100) or 106.67.

<table>
<thead>
<tr>
<th>Productivity Metrics</th>
<th>Desired Direction</th>
<th>Base Data</th>
<th>New Data</th>
<th>Directional Change</th>
<th>Weight</th>
<th>Weighted Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine report cycle</td>
<td>↓</td>
<td>15 days</td>
<td>14 days</td>
<td>106.67</td>
<td>25%</td>
<td>26.67</td>
</tr>
<tr>
<td>Post-issue error rates</td>
<td>↓</td>
<td>12 errors</td>
<td>10 errors</td>
<td>116.67</td>
<td>25%</td>
<td>29.17</td>
</tr>
<tr>
<td>AP input quality</td>
<td>↓</td>
<td>369</td>
<td>369</td>
<td>106.56</td>
<td>20%</td>
<td>21.32</td>
</tr>
<tr>
<td>Special report cycle</td>
<td>↓</td>
<td>20 days</td>
<td>22 days</td>
<td>90.00</td>
<td>10%</td>
<td>9.00</td>
</tr>
<tr>
<td>Special report index</td>
<td>↑</td>
<td>6.5</td>
<td>9.2</td>
<td>108.24</td>
<td>10%</td>
<td>10.82</td>
</tr>
<tr>
<td>Net cash flow index</td>
<td>↓</td>
<td>-47 days</td>
<td>-50 days</td>
<td>106.38</td>
<td>10%</td>
<td>10.64</td>
</tr>
</tbody>
</table>

When summed up, the weighted index shows that the accounting functions showed a productivity improvement of 7.61 per cent over the previous year. This productivity index can then be charted over the periods for review and overall productivity targets.

\1We limit the metrics selected to 6 for simplicity of explanation. It is likely that each accounting function may have a number of metrics.
Conclusion

Accounting functions are not immune to productivity improvements efforts. However, for many, the journey to measuring productivity of accounting functions has barely started. At the broadest level, benchmark studies suggest that larger companies can operate with total finance costs of about 1 per cent of sales. There are also other benchmarks across various accounting functions that can be selected.

Selecting the right metrics will help an organisation focus on measurable KPIs that can be used as basis for productivity improvements. The selection process must be meaningful, documented and reviewed periodically. Ask the big questions (why, what, how, when, etc) for each candidate metric, and only choose those that pass muster, suitable, easy to understand, quantifiable and “actionable”.

Once you have decided on your metrics, you can use a weighted index, with prior period’s results as a base, to calculate your own accounting productivity index.

References and Further Reading

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Deloitte (2006), The Finance Function under Review. [URL]

IOFM, Institute of Finance and Management (2012), Must Have Metrics for Accounts Payable. [URL]

IMA, Institute of Management Accountants (2011), Rising to the Challenge: Productivity in Accounting and Finance Organizations. [URL]

IRF, Incentive Research Foundation (2004), The Master Measurement Model of Employee Performance. [URL]

PricewaterhouseCoopers (2011), Drifting or Driving? Finance Effectiveness Benchmark Study. [URL]

Robert Half Management Resources (2011), Benchmarking the Finance Functions. [URL]

For example, a single partner firm with, say, 500 clients with the same financial year end would be extremely productive on any measure, but that would clearly raise questions on the firm’s ability to adequately service its clients. There is a need to dedicate sufficient time and resources to perform audits to the required standards and further, to add value to such services. A “low cost, high volume” model has been identified as one of the systemic issues in smaller firms in Singapore (ACRA, 2009).

Thus, productivity in professional accounting services cannot be simply achieved by decreasing inputs in the productivity equation (“inputs ➔ output ➔ goals”). It has to be driven from the desired level of value and service that a firm intends to offer to its clients.

**IFAC’s Guide to Practice Management**

The International Federation of Accountants (IFAC) published the first edition of its “Guide to Practice Management for Small- and Medium-sized Practices (SMPs)” in June 2010. The guide was developed by CPA Australia to provide SMPs with knowledge of practice management principles and best practice guidance on a whole range of practice management topics including strategic planning, managing staff, client relationship management, and succession planning. As such, the Guide will help SMPs operate with greater proficiency and professionalism and in so doing help them cope in an increasingly complex and competitive environment. The Guide, about 500 pages long, was updated in December 2011 and is available at www.ifac.org.

The topic of productivity is embedded across many topics in the Guide, from strategic objectives, benchmarking, redesigning internal processes, performance appraisals and incentive structures, the necessity to set aside “non-productive” for firm management and relationship building, to using technology and nurturing a cohesive work environment. It is clear that productivity is a firm-wide effort and not just about controlling input costs.

For example, the Guide suggests that firms seek ways to build and improve their productive culture by changing people’s attitudes to their environments, each other and themselves. This is one of the most important ways to improve a firm’s overall productivity.

Negative influences, such as lack of recognition or different sets of standards for different employees, should be reduced and eliminated as much as possible. And positive influences such as fair and equal treatment of and opportunities for all employees, regular training and feedback, open and honest communication, and recognition of achievements, must be celebrated and acknowledged, both formally and informally.

A cohesive work environment automatically yields productivity gains. Tangible gains may include increased recovery rates, lower absenteeism and staff turnover, and intangible gains such as attitudes and behaviour. Top performers should be recognised through formal recognition strategies. As these formal recognitions often take place once a year, the Guide suggests a complimentary set of informal recognition strategies during the year.

**Exhibit 4.1 – Informal Recognition Strategies**

<table>
<thead>
<tr>
<th>Written/Verbal</th>
<th>Job-related</th>
<th>Symbols and Honours</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Thank-you letter, card</td>
<td>• Additional development opportunities (for example, attend conferences)</td>
<td>• Provide certificates or plaques</td>
</tr>
<tr>
<td>• Positive job reference</td>
<td>• Learning resources (for example, management books, videos)</td>
<td>• Take the person out to lunch</td>
</tr>
<tr>
<td>• Email message (copied to others)</td>
<td>• More challenging assignments</td>
<td>• Hold a presentation ceremony at a breakfast or afternoon tea</td>
</tr>
<tr>
<td>• Informal verbal feedback</td>
<td>• Cross-training opportunities</td>
<td>• Give them a gift voucher for something related to a personal interest</td>
</tr>
<tr>
<td>• Affirming performance feedback</td>
<td>• Higher proportion of more enjoyable work, fewer tasks that are less enjoyable</td>
<td>• Donate money to their favourite charity</td>
</tr>
<tr>
<td>• Public praise (for example, at employees meeting)</td>
<td>• Opportunity to represent the team at an important meeting</td>
<td></td>
</tr>
<tr>
<td>• Sharing accomplishments (for example, at employees meeting)</td>
<td>• More involvement in setting goals, generating ideas and making decisions</td>
<td></td>
</tr>
</tbody>
</table>

Exhibit 4.1 – Informal Recognition Strategies
Technology can also be enlisted to improve the overall productivity of an accounting firm. The Guide argued that effective selection, implementation and management of technologies, as well as training employees to use these tools, are fundamental to the success of any firm. Furthermore, practitioners must ensure that they commit sufficient resources to the selection and implementation of their firm’s core technologies. Failure to do so will negatively impact the quality of service provided to clients as well as the morale of team members. In fact, the Guide suggests that from a strategic perspective, firms should consider explicitly aim to invest a certain percentage of annual profits into capital enhancement, such as equipment for enhanced productivity, system development or major personnel development projects.

The Guide provides further illustrations and factors to consider when choosing software platforms and applications (open source versus commercial software such as Microsoft Office), firm management software (including budgeting, business-planning, document management and workflow software, and Customer Relationship Management applications), and functional software (for example statistical sampling, audit and tax software).

**Benchmarking**

The Guide suggests that firms can use both internal and external benchmarks to monitor their performances, relative to their peers, past performances or goals. External benchmarks are where a group of firms (or respondents to a survey or study) volunteer performance data for the purpose of identifying the 25th, 50th (median) and 75th percentile results for each item, grouped by key demographic variables such as various measures of size and geographical coverage. Participating firms can then assess how they perform by looking at the relevant demographic groupings, compare their own performance to the indicators, and decide whether any difference represents a strength, a weakness, or simply a difference of approach or deliberate firm strategy.

In some countries, industry-wide studies may be conducted by consultancy firms to assist accounting firms to benchmark their performance against others in the industry. For example, in Australia, Business Fitness (www.businessfitness.net) offers its “The Good, the Bad and Ugly of the Australian Accounting Profession” benchmarking study, and similarly, Nixon Advantage conducts a “Accountants Benchmark Report” service (www.accountantsbenchmarkreport.com).

In other countries, the local professional or regulatory body may sponsor research into productivity that can be used as broad indicators by public accounting firms. The American Institute of CPAs (AICPA), for example, publishes the “PCPS/TSCPA National Management of Accounting Practice Survey”.

In the absence of industry wide data, some firms with similar demographic characteristics may also develop an informal network and exchange agreed benchmark data amongst themselves, similar to how some hotels share their occupancy rates and REVPAR (revenue per available room). For this to work, the firms must have inherent trust in each other as the numbers are likely to be sensitive and confidential.

Another source of benchmarks is the ones generated internally, typically compared to prior period results or targets/goals (instead of median or 50th percentile). One of the key advantages of using internal benchmarks is the ability to focus on its special aspects or attributes that may differ from other firms in the market. The IFAC Guide suggests that the use of internal benchmarks is most powerful when it tracks firm-specific facts that are not easily or reliably compared with other firms.
A list of potential external and internal benchmarks includes the following measures:

**Productivity**
- Average fees per client
- Average fees per professional, administrative staff and total employees
- Average costs as a percentage of revenue, per professional, administrative staff and total employees
- Fees to wage/salaries ratio
- Aging of debtors, work in progress
- Write-downs and/or write-offs
- Productive hours worked per person per annum, or as percentage of total available time
- Investment in training or mentoring

**Client Engagement/Service**
- Number of new clients gained and clients lost during the year
- Percentage attainment of each fee-earning division’s objectives (for example, percentage of clients who were offered additional services during discussions with the client)
- Client satisfaction ratings and/or client disputes
- Client referrals
- Client seminars or other engagement activities

**Exhibit 4.2 – Sample External and Internal Benchmarks**

**Selected Benchmarking Studies on Public Accountancy Services**

There is very little data available on the productivity of Singapore’s public accountancy services sector beyond broad economic numbers. For example, the Yearbook of Statistics Singapore (2011) showed that the “business services” sector, which includes professional accountancy services, has shown little labour productivity improvements in the last 6 years.

**Exhibit 4.3 – Labour Statistics (Yearbook of Statistics, 2011)**

Thus, to have a broader understanding on key productivity benchmarks specific to the public accountancy sector, we have to draw from studies outside Singapore. There are obvious structural differences but the studies will still give accounting firms some ideas on the types of benchmarks that they may measure and track. You could also compare your own firm’s performance measurements against these data, especially when it is expressed in percentage (as opposed to absolute dollar amounts). Different studies classify their size demographics differently and may report somewhat different measures. Exhibits 4.4 to 4.7 show key findings from various studies.

**Exhibit 4.4 – Selected AOMAR 2008 Benchmarks by Firm Revenue**

**Exhibit 4.5 – Selected AICPA MAP 2010 Benchmarks**
Exhibit 4.6 – Selected Accountant’s Benchmark Report 2011 Benchmarks

<table>
<thead>
<tr>
<th>Quartile</th>
<th>Median</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>$650,498</td>
<td>$2,205,135</td>
</tr>
<tr>
<td>per director/partner</td>
<td>$495,431</td>
<td>$1,100,762</td>
</tr>
<tr>
<td>per fee earner</td>
<td>$140,191</td>
<td>$212,382</td>
</tr>
<tr>
<td>per full-time equivalent</td>
<td>$107,668</td>
<td>$159,731</td>
</tr>
</tbody>
</table>

Average hourly rate recovered: $125 $159 $183

The Good, Bad and Ugly of the Accounting Profession 2010 (AUD$, 246 firms surveyed)

<table>
<thead>
<tr>
<th>Quartile</th>
<th>Median</th>
<th>Upper Quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>$660,974</td>
<td>$2,216,041</td>
</tr>
<tr>
<td>per director/partner</td>
<td>$493,779</td>
<td>$1,170,106</td>
</tr>
<tr>
<td>per fee earner</td>
<td>$143,779</td>
<td>$175,401</td>
</tr>
<tr>
<td>per full-time equivalent</td>
<td>$111,324</td>
<td>$131,808</td>
</tr>
</tbody>
</table>

Profit:

- Gross profit % (BPS*)
  - 55.7%
  - 66.1%
  - 66.6%
- Gross profit per partner (BPS)
  - $366,045
  - $520,401
  - $711,648
- Net profit % (BPS)
  - 24.1%
  - 33.3%
  - 42.9%
- Net profit per partner (BPS)
  - $162,969
  - $272,122
  - $397,028
- Net profit per FTE (BPS)
  - $28,166
  - $43,999
  - $61,506

People:

- FTE (excluding partner) per partner
  - 3.5 persons
  - 5.0 persons
  - 7.0 persons
- Chargeable/Non-chargeable ratio
  - 2.3 times
  - 3.3 times
  - 4.6 times
- Salaries as % revenue
  - 44.3%
  - 38.9%
  - 33.4%
- Productivity** per chargeable person
  - 66.4%
  - 72.9%
  - 82.9%

Expenses as percentage of revenue:

- Total salaries (excluding equity partners)
  - 44.3%
  - 38.9%
  - 33.4%
- Rent occupancy
  - 7.9%
  - 5.7%
  - 4.5%
- Marketing
  - 1.1%
  - 0.6%
  - 0.2%
- Telephone
  - 1.3%
  - 0.9%
  - 0.6%
- Printing
  - 1.6%
  - 1.2%
  - 0.8%
- Subscriptions
  - 1.3%
  - 0.7%
  - 0.4%
- Depreciation
  - 2.5%
  - 1.4%
  - 0.8%
- Information Technology
  - 3.2%
  - 2.3%
  - 1.5%
- Training
  - 1.6%
  - 1.0%
  - 0.7%
- Total expenses (excluding salaries)
  - 31.8%
  - 27.2%
  - 21.9%

* BPS = before partner salaries
** Productivity, measured as number of hours charged based on 1,687.5 available chargeable hours per year

Exhibit 4.7 – The Good, Bad and Ugly of the Accounting Profession 2010 Benchmarks

A CPA Australia survey concentrating on smaller accounting firms showed that average labour cost excluding principal or partners represents 31 per cent of revenue. Other overheads amount to about 30 per cent of revenue. For these smaller firms, the top 5 and top 10 clients represent 20 per cent and 30 per cent of total revenue. The firms in the study reported average debtor days of 43 and average works in progress days of 47. On average, firms expect time recovery of about 76 per cent from their staff, based on an expected 1,535 chargeable working hours per annum (standard working hours of 37.5 hours per week less allowances for annual leave, other leave entitlements and statutory holidays). To the extent that principals and partners need to allocate time to marketing, client relationship management, staffing issues and the other administrative and management demands of practice, this time will substantially add to their professional work. The survey shows that their expected chargeable hours are only marginally less than the 1,535 hours per year for professional staff (at 1,489 hours).

**Conclusion**

What do these benchmark studies mean to our accounting firms in their quest for higher level productivity? First, practice management takes effort and time. Firms should select appropriate benchmarks and assess their own firm’s performance against the benchmarks. Given the absence of external benchmarks for accounting practices in Singapore, accounting firms would have to select, define, measure and monitor their own internal benchmarks. Just like businesses need KPIs to monitor performance, accounting firms should deploy their own knowledge on performance management unto their own practice.

Second, productivity in the professional services sector is not just about cost control or audit fee increases. Studies have shown that many other factors beside costs and fees improve overall productivity, service delivery and value to clients. The IFAC Guide clearly links productivity to all elements of a firm’s operation, from induction and training, staff evaluation, using information technology to building a productive culture.
Chang (2011) offered additional supporting evidence based on a 10 year study of accounting firms in Taiwan. He analysed the Ministry of Finance’s Annual Survey of Accounting Firms in Taiwan. In this study, productivity improvements of 51 per cent were achieved primarily because of investments in IT capital (30 per cent) and human capital (6.3 per cent). Firms that make investments in computer equipment, computer software and databases, and those that have staff with higher education and work experience are shown to have greater productivity than those with lesser investments in IT and human capital.

It is clear that meaningful productivity improvements can only be achieved when firms embrace the culture of productivity in everything they do, culminating in the delivery of quality service to their clients.

References and Further Reading

ACRA, Accounting and Corporate Regulatory Authority (2009), Practice Monitoring Programme: Third Public Report.  

AICPA, American Institute of Certified Public Accountants (2010), PCPS/TSCPA National Management of Accounting Practice Survey Commentary.  

Business Fitness (2010), The Good, the Bad and Ugly of the Australian Accounting Profession.  


CPA Australia (2004), Public Practice in Australia: Results for members of CPA Australia Benchmark Survey.  


In many of these change initiatives, managing delicate people issues is always a major stumbling block for any change programme. In particular, having executives and employees change their thinking, beliefs and behaviours is demanding and difficult. This is because change is a complex, multi-stage process rather than a silo event (Kotter, 1995) and much has to be done to create a sense of urgency, win support, and silence cynics. The sentiment is reflected in a McKinsey's global survey (McKinsey, 2006) that indicates 30 per cent of organisational transformation did not succeed. This suggests managing change effectively is no easy task and organisations must learn how to do new things better.

The objective of this chapter is to introduce several guiding principles of change management specifically relevant to the people dimension. These principles of change management are situation awareness, visioning, communication, collectivity, and assimilation and institutionalisation. The application of these principles is demonstrated by examining the case study of the Inland Revenue Authority of Singapore’s (IRAS) implementation of its Inland Revenue Integrated System (IRIS) to improve its tax collection workflow and efficiency (Sia and Neo, 1998). The case is relevant because the implementation of IRIS is a large-scale change that requires managing delicate people issues and smoothing the change process. IRAS's experience can help other firms anticipate and prepare for their future change initiatives.

Five Principles of Change Management

Exhibit 5.1 presents five principles of change management. While not all of these principles may apply in every change situation, their systematic consideration is likely to improve the quality of any change programme.

The Principle of Situation Awareness

The situation awareness principle requires that executives and employees be set in their organisational contexts, understand the situations, and recognise and accept the need to change. They have to be convinced of the reasons for change and understand what is in it for them and the consequences if change is not enacted. In other words, it is essential for both executives and employees to recognise that radical change is imperative and accept the new direction. In some cases, a strong wake-up call is useful. Executives may deliberately communicate change reasons dramatically to get employees to face up to the situation. Without a clear awareness of the situation, executives and employees may underestimate the consequences of keeping the status quo. As a result, they may not be committed to the change initiative and may find it hard to pull themselves out of their comfort zones.

The Principle of Visioning

The visioning principle requires executives and employees to craft out a strategic direction for the change initiative. Without a clear and appropriate vision, a change effort may turn into plenty of misdirected plans and programmes, causing confusion and chaos within the organisation. Many organisations would assign change leaders in such initiatives who clearly see the need for change and agree that the status quo is more dangerous than launching into the unknown. Further, to boost the chances of change happening, obtaining visible backing from the most influential executives may be critical. Top level commitment is vital to getting commitment from others. It is important for change leaders to explain the purpose of the change to all of the people involved in making change happen, so that their efforts and contributions will be worthwhile to them as individuals. Besides understanding the purpose, executives must also be clear about employees’ roles in the change initiative. In fact, one may even consider letting employees chart their change paths. Executives may provide the overall change direction and involve employees in coming up with the change programmes, so that employees may be more committed to the change process. One important note is that executives and employees must have faith in the vision and be motivated to make the change before one would see any change in their behaviours. Interestingly, there are apparently five forms of impact that may motivate executives and employees.
(Aiken and Keller, 2009): society, customer, the company and shareholders, the working team and “me” personally. Ideally, a good change story ought to cover these five dimensions that motivate executives and employees.

The Principle of Communication

The communication principle requires that executives and employees are kept informed and in-the-loop about the change initiative and progress. With complete information, executives are able to make effective decisions and employees can act in the most productive way. Usually, executives would deploy all available communication channels to broadcast the vision. They should make use of every opportunity to communicate the vision directly with employees. For example, they may write inspiring articles about the vision or turn ritualistic meetings into exciting discussions of the change initiative. The guiding principle is to talk with employees at every opportunity to discuss their concerns. More importantly, executives should strive to preserve a receptive climate for change. In many instances, persuasion may be used as a tool to promote understanding and acceptance. It is important for employees to feel that their sacrifices are worthwhile and that their accomplishments have been recognised.

The Principle of Collectivity

The collectivity principle requires the participation of the executives and employees as a whole that propels the changes towards the objective. In most successful change initiatives, it is common to see the formation of alliance networks (Meyerson, 2001) or even formal “mini-advisory boards”. Through alliances, individuals may gain a sense of legitimacy, access to resources, emotional support and even advice. Executives who are in positions of influence tend to form these advisory boards as people identify them as role models within the organisation. The more people change leaders engage, the likelihood of moving the change initiative is higher. One caution for change leaders or advisory board members is for them to count themselves out among the ones who need to change.

The Principle of Assimilation and Institutionalisation

The assimilation and institutionalisation principle requires executives and employees to incorporate new changes into existing practice, and applying and socialising new practice with organisational values and norms. For a start, both executives and employees need to operate outside their comfort zones and accept ambiguity and adversity as part of the new status. Generally for assimilation to take place, organisations’ reporting structures, management and operational processes, and measurement procedures must be in line with the new behaviours that people are asked to embrace. For institutionalisation to occur, it involves reinforcing organisational values on new changes which leads to a new set of behaviours. Most importantly, people must be able to see how the new approaches, behaviours, and attitudes have helped their own and overall organisational performance.

It is easy to forget about support and resources needed for change to take place successfully. Many companies underestimate the fact that employees are already busy with their day-to-day responsibilities and much time is needed for employees to obtain the skills they need for the change. In fact, trainings have to be included as part of the change programme and they should not be a one-off event. They should be spread over a series of learning forums. It is important for employees to learn new knowledge, and experiment and integrate it to existing practice.
Case Study: Inland Revenue Authority of Singapore (IRAS)

This case was originally described by Sia and Neo (1998).

In 1996, IRAS embarked on an enterprise-wide organisational transformation to shift from a highly compartmentalised management structure that was based on tax types to process structures that eliminate “hand offs” across tax types. The transformation was centred on the implementation of a S$69 million Inland Revenue Integrated System (IRIS) that would allow one-stop automated processing of all tax transactions from various tax types. Notably, the technologies that were encapsulated within IRIS include workflow management, intelligent character recognition, three-tier client server, Fiber channel gateways and super local area network that helped IRAS to become one of the world’s most technologically-advanced tax administrators at that time. Exhibit 5.2 shows a list of workflow improvements after IRIS implementation.

<table>
<thead>
<tr>
<th>Accessing files</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Officers often had to find out which officer was holding onto the folder and wait for 2-3 days to have the folder routed to them</td>
<td>Multiple officers can access the same folder at the same time. These imaged documents take less than 10 seconds to retrieve.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Composition of letters</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Either type the letter with a word processor or write the letters and send them to be typed by clerks. Took up to 1-2 days</td>
<td>Correspondence management tool enables officers to draft letters easily by providing a selection of templates. The entire process takes 15-30 minutes or overnight (batch printing).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Return status inquiry</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>With IMS, officers could tell if a return had been received or supplied out. To ensure the physical copy of the return, they would have to manually note down the batch and entity IDs and then notify the processing centre to locate that particular return. The process could take as long as 1-2 days</td>
<td>With the return status dialogue, an officer can know within minutes the precise status of the return. If the officer needs to look at the return, the imaged document can be simply retrieved through Adhoc Browse dialogue in less than 10 seconds</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Routing of work</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whenever one officer needed to route a piece of work to another officer, he/she would leave the files in his/her Out tray. The files would be manually routed. It could take 1-2 days before the second officer received the files</td>
<td>The first officer simply creates a sub-work item through the Work Item Creation dialogue and routes it to the second officer to receive the item within minutes or half a day (depending on the internal work supply schedule)</td>
<td></td>
</tr>
</tbody>
</table>

Situation Awareness: At that time, IRAS was faced with a deeply entrenched bureaucratic culture that needed revamping. A change readiness survey conducted by IRAS found that most employees were with the organisation for a long time, had little change experience, loyal only to their functional heads, narrow in their organisational view, and also hesitant to be open. Recognising the importance of addressing these concerns, the Commissioner decided that it was critical for the entire organisation to incorporate service excellence and continuous performance improvement into the IRAS culture. The aim was to transform IRAS into an excellent tax administration for the 21st Century. Guided by an understanding of the situation, IRAS executives and employees participated actively in several focus groups to analyse the changes required within the organisation to overcome these concerns.

Visioning: IRAS had always strived to be an excellent tax administration, respected for its integrity, fairness and professionalism. Its executives and employees had conscientiously operationalised these high level concepts into change strategies and activities. Notably, a two-day off-site visioning workshop involving senior management, divisional heads, and a handful of younger staff was organised to shape the vision statement. According to an officer who attended the workshop: “the workshop had a number of warm, soul-searching sessions that examined why we are where we are today and gathered what we have heard or seen and crystallised these thoughts into concrete ideas.”

Communication: To communicate the transformation to its staff, a variety of communication channels were established within IRAS. They include system owners meetings, staff committees, briefing sessions with division/branch heads, video production promoting IRIS, help desks, suggestion box and two internal newsletters. Many of these communication channels were useful in gathering employees’ feedback and responding to their queries. In addition, at least three separate organisation climate surveys were conducted to assess employees’ views on issues related to morale, training, core values, communication and leadership. Besides obtaining employee feedback, weekly integrative
Commissioner’s meetings were conducted to bring all divisional heads together to identify problems, challenge ideas, and iron out operational issues. Importantly, the Commissioner also made it very clear in one of the meetings that there would be no retrenchment of any sort as a result of the transformation. The message helped to assure the staff and enhance their commitment to the change initiative.

**Collectivity:** Altogether over 100 selected staff from different levels and parts of the organisation were appointed as system officers in the change teams. These staff acted as change leaders with the purpose of “walking the talk”, hence forming the core “change infrastructure” within IRAS. According to the Commissioner, “what you need is a handful of good people to support you, a handful to support those who support you and that should be sufficient.”

**Assimilation and Institutionalisation:** An interim organisational structure was set up half a year before the IRIS implementation. The major departure from the previous structure was that the interim structure followed the reporting lines of the new organisational structure. Subsequently, an organisation migration work group was formed to manage staff expectations and morale. Weekly Commissioner’s meetings were set up to coordinate across divisions and more importantly, to make sure all divisions were moving in the same direction. A lunch club was also initiated to encourage interactions between management and tax specialists, and these meetings helped to quickly identify and resolve thorny issues faced by the tax specialists. In addition, a series of training courses was organised to prepare tax specialists to handle inquiries across income tax, property tax and goods-and-service tax. Overall, new changes to information flow, authority structure, competency mapping and rewards structure within the business process were assimilated and institutionalised over time. Exhibit 5.3 provides excerpts of performance indicators before and after the change initiative that indicates a significant improvement in tax return processing time and taxpayer satisfaction.

**Conclusion**

To raise productivity, accounting entities have no choice but to face a plethora of change-inducing pressures. These pressures affect the organisation at multiple levels and in many ways, most visibly in the form of resistance from employees. The five guiding principles of change management introduced in this chapter should improve the quality of any change program, particularly managing the people side of change. The IRAS experience has highlighted that at the heart of change, it is the pool of people resources that matters. Organisations planning enterprise-wide transformation should therefore treat people issues seriously.

**References and Further Reading**


Institute of Management Accountants (2011), Rising to the Challenge: Productivity in Accounting and Finance Organizations.


The Need for Productivity in the Finance Function

The need for businesses to create value and enhance productivity to compete in an increasingly globalised economy is well documented. Similar to many developed countries, companies operating in Singapore face the additional challenge of rising costs, particularly rising labour costs. Labour costs are rising because companies are dealing with a small local talent pool coupled with increasing difficulties in recruiting talent from overseas. In order to stay competitive and profitable, it is critical that Singaporean entities are able to offset increased costs of doing business with a more than proportional increase in their underlying productivity.

Historically, productivity has been primarily viewed from a core value-chain perspective, such as the manufacturing process. Productivity increases have typically been measured by how much more a company has been able to produce with the same amount of resources. If a company’s tangible output increases, it is perceived and termed as doing well. However, in today’s age and environment, productivity increases need to span the entire business and not just remain confined to the core business activity. The question arises as to how a finance function can look at its own productivity in a systematic manner, and what measures it should take to increase productivity and value add from an overall business context.

Challenges to Increasing Productivity in the Finance Function

Before we get around to looking at suitable frameworks that could apply to finance function productivity, let us take a look at some of its common ailments.

Timely and accurate financial data is critical for all companies, regardless of size and growth stage. Following a period of growth, many companies face great difficulty coping with larger and more complicated operations that are geographically spread out. Given the current economic climate, CEOs are demanding more and better information, on a faster basis, to support their strategic decision making. However in practice, rapid business expansion often means companies have spent little time and funds investing in improvements to their back office activities, including the finance function. For multinationals, different regulatory and tax regimes across multiple jurisdictions further complicate matters.

Earlier this year, PwC conducted a study based on data collated from more than 200 companies, including an in-depth comparative assessment of the finance functions of 72 companies with operations located around the world. PwC’s 2012 Finance Effectiveness Benchmarking Study “Putting your business on the front foot” shows that it takes companies an average of 13 days to close their accounts and report to executive management. In addition, top performing finance teams take only seven days to produce financial forecasts, however a typical finance function requires 19 days. These timeframes represent valuable time spent away from key tasks such as partnering with the business and developing strategic insights. Reporting deadlines and ongoing time pressures mean there is a tendency for accountants to produce information fit for compliance filing but with little value-add analysis. Often, these reports lack sufficient insight to help improve business performance, productivity and sales, and reduce costs.
Effective integration of IT systems is another key challenge for companies which have grown rapidly. Typically, a mid-size company operates with several IT systems and software programs, and the finance function takes responsibility for integrating the data from these systems manually. Often, these ERP systems and software programs were implemented by companies during earlier stages of their growth when fully integrated systems such as SAP were considered less affordable. Integrating these different platforms internally and meeting reporting requirements poses a great challenge in terms of the manual labour involved and time required. As with any task performed manually, the risk of human error is also a key threat. As noted in PwC’s benchmarking survey on Finance Effectiveness, many companies are still relying on manual workaround to meet increasing reporting demands. Around 60 per cent of survey participants still rely on manual spreadsheet manipulation for reporting. Others have made significant investment in technology but see little improvement in the speed and quality of reporting processes.

The high pressure, lower value adding activities completed by finance functions often result in finance employees suffering from low morale, which invariably leads to higher staff turnover rates. Many companies also do not have a systematic training programme to invest in skills training for their finance staff. This can develop into a vicious downward productivity cycle, which ultimately destroys value and profitability.

In the face of the challenges outlined above, it is evident that the finance function represents a key area in which a strategic focus on productivity improvement can directly contribute to organisational growth. Accordingly, a clear understanding of the role of the finance function can help us understand its value drivers and show a clearer path to assessing and improving finance function productivity.

Assessing Productivity in the Finance Function

According to extensive research performed by PwC, modern day finance functions have three key roles. The following exhibit illustrates these roles:

These roles are the following:
- **Business Insight**: where the finance function is able to spend the bulk of its time to interpret the numbers and partner with the business to help chart business strategy;
- **Compliance and Control**: where the finance function is able to manage and maintain an appropriate control environment in the business; and
- **Transaction Processing**: where the finance function is required to undertake its transaction processing roles with the utmost efficiency.

While the finance function is required to balance these roles, in effect it needs to be trying to maximise its impact across all three dimensions. According to PwC’s Finance Effectiveness Benchmarking Study 2012, 80 per cent of the respondents say that the accuracy of their forecasts is critical to running the business, but only 45 per cent believe that the outputs are reliable. Further, more than 90 per cent of respondents believe that they have established a governance framework to manage risk, but less than 25 per cent are truly confident that key controls operate effectively.
Finance functions typically have the following breakdown of effort across the three areas shown in Exhibit 6.2 below.

<table>
<thead>
<tr>
<th>Area</th>
<th>Approximate Effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Insight</td>
<td>65%</td>
</tr>
<tr>
<td>Compliance and Control</td>
<td>15%</td>
</tr>
<tr>
<td>Transaction Processing</td>
<td>20%</td>
</tr>
</tbody>
</table>

Exhibit 6.2 – Efforts Expended in Finance Functions

It is clear that there is tremendous room for improvement across all the critical dimensions of activity within the finance function. Increases in productivity in Business Insight, Compliance and Control, and Transaction Processing roles would not only save costs but more importantly, make a significant contribution to the success of the business.

The following case studies provide examples of successful finance transformation on different scales. Both examples were facilitated by the assistance and experience of qualified finance consultants, and resulted in significant productivity and profitability improvements for these Singapore based companies.

Case Study 1: Business Process Re-design for an MNC

Master Steel (name changed) is one of the world’s leading producers of steel and high technology steel products. It has operations throughout South East Asia. As Master Steel expanded rapidly, its operating entities throughout the region struggled to cope with the sudden increased sales volume using its current outdated processes and systems. The company lacked effective and automated processes in several areas of the finance function, and had limited visibility over activities performed by the regional finance functions. It was not uncommon for Master Steel’s entities to mistakenly contact customers multiple times for invoicing; alternatively some customers were never issued invoices or responded to after making complaints. Managing discounts became increasingly difficult as its systems did not clearly show the amount ordered by a single customer. Complaints and the need to process refunds further complicated matters.

The invoicing difficulties, which caused significant disruptions to clients, resulted in a drop in customer satisfaction. Master Steel also experienced substantial cost rises as processing time per invoice increased with these mistakes. The company was forced to address the situation and its impact on profitability after several key customers voiced their concerns with Master Steel’s poor customer service in this regard. Master Steel approached PwC to analyse and rectify the issues with its invoicing processes.

PwC’s review commenced with an analysis of Master Steel’s ‘order to sales’ process to determine if there were any revenue leakages. The review then broadened to focus on the effectiveness of all sales and invoicing processes. Throughout the review, PwC’s business consulting specialists assessed aspects such as master data management, process controls, filtering of quotations and invoicing. The team worked closely with members of Master Steel’s operational staff to understand how these processes interacted with the day-to-day operations of the business. Multiple interviews, focus group discussions, data mining, mapping of internal controls and documentation of current-state processes revealed several other processes for potential streamlining and improvement. These included customer order consolidation and refunds. In addition to process inefficiencies, the review also uncovered several potential international tax risks associated with Master Steel’s regional sales and invoicing model.

Ultimately, PwC recommended a transformation of Master Steel’s entire sales, customer relationship management, SAP and data management processes across the region. A new operating model was developed based on the process reviews and discussions with Master Steel’s personnel across several functions. The new operating model involved...
multiple re-designed business processes and IT integration. This simplified the company’s operating procedures, and also aligned with its overall goals and strategy. The simplified processes eased compliance with reporting and IFRS requirements, and were also more efficient from an international tax, customs, and transfer pricing perspective.

As a result of the re-designed processes, Master Steel’s customer service improved significantly. Employee morale and engagement increased as staff had a clear understanding of their roles and customer complaints declined. Employees’ roles now have a greater strategic focus as more time is available to analyse, rather than simply integrate and produce data. Potential tax risks from the company’s regional operations have decreased, and overall productivity and profitability of the company have risen.

Case Study 2: Process Improvement and Standardisation for an SME

Pay Less Machineries (PLM – name changed) is a small European group manufacturing construction equipment, with a Singapore subsidiary. As a growing small to medium enterprise (SME), the local entity was constrained in how many resources it could recruit. PLM had trouble with its budget and reporting due to a lack of resources in the finance function, as well as poor integration amongst its various IT systems. The company needed to understand how to integrate its IT systems, report to its headquarters more efficiently, and extract business data to boost sales. Sales opportunities were often lost as the company’s complicated systems and accounting processes meant that timely and accurate cost data was not available to provide to clients. Too much time was devoted to the routine accounting and compliance aspects of the business instead of more strategic areas, such as its upcoming expansion in China and Indonesia. Although the company made do with these ad-hoc processes when its operations were small, the inefficient processes were proving to be a significant barrier to operational efficiency and increased sales as the business grew. Given the significant impact on profitability and strategy execution, PLM’s European headquarters approached PwC to help them review the situation and develop a solution.

PwC conducted a situation analysis to identify the major issues facing the accounting department. The first finding was that PLM’s annual budget was over-complicated and no longer provided a constructive direction and forecast for the company. The data included in PLM’s budget took considerable time and resources to extract from multiple IT systems, and much of the data was regarded as meaningless by the time it was produced and verified. In addition, the budget process was not designed for a volatile market. Therefore it did not keep pace with fluctuations frequently experienced by PLM. Numerous spreadsheets were used to prepare the budget, which was rarely used as a real-time reference during the year. As a result, the budget was difficult to understand and only the person who originally created the budget could effectively manage it.

The second finding related to the company’s accounts receivable process. This activity was driven by the sales team and treated more as a relationship building exercise (e.g. invoices would be discussed over an informal meeting) rather than a compliance mechanism. Accordingly, there was a significant lack of consistency and control, as individual sales agents used their own discretion on collection methods and the amounts to be recorded as bad debts. As the volume of sales and customers grew, personalised collection methods became less efficient.

Subsequently, PwC discovered that although PLM maintained a data warehouse, the company rarely applied consistent data standards required for true comparability; yet important business decisions were based on this data. Headquarter reporting was also done in an ad-hoc manner, mainly to meet deadlines, which resulted in the quality of the data being compromised.

As PwC’s review progressed, further problems regarding standardisation and documentation were uncovered. Several finance processes across the firm were not documented, and employees did not recognise how
processes in other functions would impact the financial budget. For example, HR policies were not documented. This affected how much was provided for leave/severance/bonuses in the financial budget. Several processes were completely dependent on how the person responsible interpreted their role and the process. Instead of standard ways of operating, the methodologies were inherited from ‘on the job’ training provided by predecessors of existing employees. This resulted in inconsistent reporting and significant time wasted for people who were required to review documents in different formats.

Having understood the issues that faced PLM, PwC dedicated a team of business consultants to the project who not only understood accounting and finance, but also business processes and HR management. The team of consultants first started with standardising the financial reporting tool. Instead of making all budget changes in Excel manually and then keying them into SAP again, they used pre-developed templates and technology to link Excel with the SAP system. Simple functions in Excel were employed to create a connected file and for faster upload. This reduced the number of days spent on adjustments to the budget and meant that more time could be spent on tailoring the budget to the business environment without compromising timeliness and hurting growth. For accounts receivable, better visibility and standardisation meant less time spent on the collection process.

Secondly, PwC worked on documenting the various processes that PLM used. A Standard Operating Procedure was created for several processes such as accounts receivable, budgeting and HR policies. It became easier for new hires to perform their tasks consistently with their predecessors, and reduced the monopoly some employees held over individual processes. This more structured way of learning consumed less time and resources than on-the-job training.

The new standardised, transparent and documented processes led to increased reporting efficiency for PLM, a fairer allocation of work between employees and better resource planning and visibility.

The Way Forward

As evident from the above case studies, business process improvements can take the form of large scale business model overhauls, or smaller adjustments made to individual methodologies. Depending on a business’ circumstances, either approach has the ability to drastically increase efficiency and profitability. What finance functions need to do is to think of the key initiatives in each critical area that would help them increase productivity and value add. The following illustration shows a possible roadmap for finance functions to consider:

A key enabler to driving productivity improvements in the finance function is the CFO. He/she needs to show leadership by being the change agent. Both employees and management look to the CFO to demonstrate vision and leadership when the company is embarking on a drive to improve productivity. As change is never easy, the CFO needs to spend time preparing and socialising their plan to obtain broad buy-in and acceptance. The CFO also needs to choose the business and technology consultants who would work with him/her on the change journey. Finally, the CFO needs to prepare
a robust business case that clearly documents the vision for the finance function, the rationale for change, the road map for getting there and the financial implications for the business for approval by management.

With the ever challenging business landscape, the most nimble organisations with the best vision and leadership are the most well positioned to excel. Singaporean companies have an advantage because of the active support of the government in driving increased productivity, and the relative stability of our economy. It is important that our local enterprises recognise the sign of changing times and embrace productivity with gusto.

References and Further Reading
PricewaterhouseCoopers (2012), Finance Effectiveness Benchmarking Study 2012 – Putting Your Business on the Front Foot. URL

In this article, the same theme of productivity improvement will be followed. Although this article is primarily set in the context of banks, the same principles may be applicable to non-banks. This article is organised as follows: The first section covers the interaction between accounting and other functions. This is followed by discussions on the measurement of productivity and the possible obstacles to higher productivity in banks respectively. Finally, it concludes by suggesting possibilities to enhance productivity.
Interaction between Accounting and Other Functions

Within the accounting function, myriad systems and inconsistent data sources for multiple financial reports are some of the causes of low productivity. The systems and data problems are exacerbated when banks start to merge and become larger. As banks become more complex with multiple entities and special purpose vehicles, all accounting activities become significantly more difficult. In particular, financial consolidation and reporting becomes an increasing challenge.

In addition, rapid changes in businesses, regulations and accounting standards demand a resilient accounting system and process to cope with these changes. There is also a demand for varied data analysis from front office and management. From front office and management, there is an increasing expectation for accountants to play a larger role in supporting businesses and to take the lead in influencing change within the banks.

In order to better support businesses, in many banks, new accounting functions are set up to report to the heads of major business units. For example, the treasury division employs accountants specialised in treasury products and treasury systems. These accountants, alternatively called product controllers serve the dual roles of providing information to the treasury traders for making business decisions and ensuring the proper accounting of treasury activities for financial reporting and regulatory reporting. The product controllers need to analyse the risks together with the profitability of each business and thus interact with the risk management unit on the risk analysis. The product controllers need to interact with their regional/global counterparts and the accountants responsible for financial and regulatory reporting.

As the roles of accountants evolve and they become more involved in business activities, their interactions with other departments increase and these interactions pose new productivity issues. The functions which accountants interact include settlement/operations, IT, legal and compliance, risk management, front office and internal audit. Exhibit 7.1 shows an example of such interactions.

Accounting interfaces with the settlement/operations department. The settlement/operations department is the first “line of defence” to ensure controls over the transactions are in place and positions are reconciled between the front and the back office systems. It also posts any manual accounting entries to the general ledger when systems are not able to generate these entries. A weak settlement/operations department with inexperienced staff is a bane to the accounting function as the latter will be busy cleaning up transaction data errors and trouble-shooting. Conversely, a strong settlement/operations department is half the battle won to a resilient, efficient and most importantly high quality accounting and control process. In many banks, the accounting function also works with the middle office, which carries out reconciliations between front office and back office systems.

The accounting function also interacts with the legal and compliance departments because in many banks, the CFOs are responsible for control and compliance matters which span regulatory issues. Usually, the business unit controllers and compliance department work together to ensure controls over business processes are in place. The accounting function naturally interacts with the internal auditors who audit the accounting and control processes.
The interfaces between the accounting function and other departments demonstrate that productivity of accounting function is affected by the activities in other departments. In particular, accounting is a downstream function. From a supply chain perspective, accounting relies heavily on all other departments for their inputs in order to generate the outputs, such as financial reports to investors and management. The importance of linkages among the parties in the business reporting supply chain has been emphasised in a report based on interviews of key business leaders globally. The report quotes a business leader as saying that the reporting supply chain is only as strong as its weakest link (IFAC, 2011).

The quality of the accounting information and the costs required to generate this information are driven substantially by the quality and the productivity of the IT systems, the settlement/operations functions and crucially the front office functions. If the IT system is poorly-designed and generates a lot of accounting errors, significant resources in the accounting function have to be utilised to ‘clean up’ the accounting errors.

**Measurement of Productivity**

The measures of productivity in the accounting function may differ depending on the output of the accounting activity. There are four broad roles of the accounting function. The first role is to meet legal, regulatory and accounting rules. The complexity of financial reports differs across different legal, regulatory and accounting regimes. The productivity of the financial reporting and regulatory reporting functions can be benchmarked against the legal, regulatory and accounting rules that the firm has to meet. A possible reference point may be the costs of the same functions of other banks with similar activities operating in similar countries, which can be obtained by carrying out some market research. The productivity of the financial reporting function can be measured by the costs used to generate the reports benchmarked against the costs of the same functions in other banks. The costs should be weighed against the quality of the financial reports in terms of the accuracy, clarity and amount of information in the reports.

The second role is to ensure that internal controls over all accounting activities are in place. To the extent that many operational, legal and compliance issues have financial impacts, the accounting function is inevitably involved in instituting controls over business operations. The productivity measure could be based on the financial impact of the control issues in terms of additional costs and lost revenues, which should be allocated to the departments which cause the financial losses. The accounting productivity may be measured in terms of the financial losses arising from control issues compared against the costs of the financial control function.

Third, some accounting functions are operational in nature. Examples are payment activities. One productivity measure for the payment function is the dollar cost per payment processed. Improvements in accounting productivity can be measured in terms of cost savings given the same volume of payments.

Fourth, reconciliation activities are typically treated as operational activities. However, the nature of reconciliation is that it is unstructured and entails investigation work. Thus, the productivity measure cannot be based on a standard measure such as the number of reconciliation items per dollar. Rather, it should be treated as a joint fixed cost to be eliminated. Accounting reconciliation is a non-productive activity and reflects inefficiencies in the bank’s business processes, operational processes and information systems. The responsibility and cost of reconciliation should be shared among the departments which generate the reconciliation items. The reconciliation function should estimate the time spent attributable to each department and allocate its cost to the respective department. This will incentivise all departments of the bank to work together jointly to eliminate reconciliations.

Fifth, the accounting function such as the management reporting team and the business unit controllers provide management information for business decision making. Productivity can be measured in terms of the cost that it takes to produce a specific piece of information. The cost of such information should be analysed against the benefit of the business decisions to be made. This approach is similar to the model of the IT functions, in which business specifications have to be raised for changes to be made to IT systems.
and the costs of changes are estimated based on the specifications. The revenues generated or costs saved attributable to a piece of management accounting information may be quantified and compared against the costs of that accounting information. This measure prevents management accounting information from being treated as a free good.

Admittedly, all productivity measures involve some elements of judgement and subjectivity. They may lead to additional time spent to collect data on the performance measures. However, if the performance measures lead to the right incentives and motivate the relevant departments to reduce accounting process inefficiencies, the improvements in productivity should outweigh the costs. In order to enhance productivity, the accounting function should strive to create sustainable value to businesses while making the present processes more efficient. In the long run, the CFOs should aim to improve efficiency while maintaining controls over the third and the fourth operational roles, invest in the first and the second financial control roles to protect value for the banks and build up its fifth role to create value by providing information for business decision making. This can be achieved by reinvesting efficiency gains from the third and fourth roles into the fifth role (KPMG, 2011).

Obstacles to Raising Productivity

Operational and System Problems

A lot of time is spent by bank accountants to reconcile data generated from different systems and to correct errors in the data. The accounting errors may be created because of operational errors, data input errors, systems not specified correctly for certain conditions and others.

A key cause of operational errors is the lack of experience in the operation staff. One common myth is that all operational work is routine and can be delegated to junior staff. When a bank embarks on cost cutting, operational costs are top of the list even while the bank increases costs by adding the levels of managerial hierarchy and the number of checkers to oversee the operational work. When it comes to outsourcing to low-cost locations, operational activities are the chief target while a ‘skeleton’ team remains in the original location to support the front office.

This mode of operation overlooks the following key points. Operational work requires skilled and experienced staff to execute efficiently and effectively. Operational work forms the engines of a bank that supports the revenue-generating activities. Skilled and experienced staff is especially crucial when the revenue-generating activities create products and transactions that are non-standard and complex, which incidentally yield higher profit margins. The experience and knowledge of the operation staff determines success or failure in the execution of major revenue-generating transactions and the degree of operational errors in downstream financial and regulatory reporting processes.

For example, in one bank, the treasury operations and finance teams that carry out reconciliations between front office treasury systems and back office systems as well as prepare treasury performance reports is originally located in country A with the treasury business. In order to reduce costs, the teams in country A are disbanded and new teams are set up in a low cost country B. A “skeleton” team remains in country A to meet the needs of the treasury traders but the outsourced teams do not report to the traders. The “skeleton” team lacks access to the data for reconciliations and preparation of the reports. The end result is that the teams in the outsourced low cost country B produce very low quality financial reports and reconciliation work. The “skeleton” team struggles to fix errors to the best of its ability but the real problems are never solved. The reconciliation difference increases significantly to millions of dollars and the bank suffers a loss due to the reconciliation difference.

The problem of this model is that the outsourced teams have no incentives to improve their productivity since they neither face the traders nor report to the “skeleton” team. If the “skeleton” team were to remain in country A, it should play the role of advisers but the primary responsibility on the financial reports and reconciliation output should be transferred to the outsourced teams. Instead of muddling through, the actual impact of outsourcing will be known by the front office, which will then push for improvements in the accounting productivity of the outsourced low cost country. If prior to outsourcing, the assessment is that the drop in output quality far outweighs the cost savings, outsourcing should not have been implemented.
Another issue is the creation of additional levels of managerial hierarchy and staff to check on operational work, which only impose additional burden on the few operational staff. There is anecdotal evidence that in some situations, one junior operation staff trouble-shooting has to answer the same queries from six or more different parties. The additional levels of checkers impose a drag on operational work and do not add value. In one example, a key system generates significant erroneous accounting entries. One operation employee works together with an accountant to fix the system issue. The supervisors of each employee and the heads of operations and accounting departments, the internal auditors, the front office department head, the compliance department officer, the external auditors ask the two employees repeatedly for status updates, hence hindering their attempts to solve the problem.

There are banking system issues to note. The banking systems can generally be classified into front end transaction processing systems (including trader systems), middle office and back office settlement systems, general ledger and other financial systems (such as financial data warehouse, regulatory reporting systems). A few examples of situations when the systems are not specified correctly for financial reporting are listed here:

- The accounting configuration of transaction processing systems is not set up to generate correct accounting entries.
- The accounting entries are not posted to the correct legal entities.
- Similar products and transactions are booked and accounted for differently in multiple systems, creating position and profit/loss reconciliation differences.
- The systems do not generate the correct interest accruals for month end, year end and public holidays, especially when the last day or the first day of the month/year falls on a public holiday.
- The functional currency equivalent of foreign currency transactions are not converted correctly by the systems.

**System and Process Changes**

In the present day, it is a myth to aim for a perfect system or a process that caters to every situation. There are occasions when a bank spends enormous resources and time to come up with a ‘perfect’ system, which is inflexible and difficult to make changes. As a result, when changes occur, the system cannot meet the new requirements and blame is typically placed on the users for not providing the ‘perfect’ requirements/specifications. The fact is no user can foretell all possible future changes. There can be unexpected changes in business, products, organisation structure, laws, regulations and accounting rules.

Any inflexibility of information systems, operational and accounting processes to meet the present pace of changes impacts adversely the productivity levels. It leads to temporary workarounds which become permanent processes. Once the temporary workarounds are in place, there are few incentives for front office business heads to push for the optimal institutional system changes. The temporary workaround is vulnerable because there is little institutional documentation and information is lost when individuals leave the bank. In one bank, the financial reporting processes relied heavily on ad-hoc complicated Excel spreadsheets with little documentation. During economic booms, there was a shortage of skilled experienced accountants in the job market and many of the bank’s accountants left for better pay. The newly-joined accountants are unable to decode the existing spreadsheets and have to rebuild new processes and new systems from first principles.

**Organisational, Power and Politics Dimensions**

Productivity in the accounting function can be analysed from the organisational, power and politics perspectives. Firstly, there are always immense pressures from the front office on the accountants to launch products before the information systems, operational and accounting processes are fully in place. Despite the formal new product process in which the accounting and operation departments have to sign off before the launch of new products, in many cases they succumb to the immense pressure from the front office which yields significantly more power than the back office.
A second point is that different information systems may be developed for similar products due to organisational and power structure. Different business units may want to retain their own information systems to retain power and control over the information. This creates multiple system interfaces, which generate significant reconciliation work and errors that in turn lead to more accounting work and a reduction in productivity.

Third, it has become a cliché to claim that anyone who objects to system/process changes is being resistant to change. There are many cases when new-joiners institute system and process changes without understanding the legacy systems and the institutional background. These new-joiners want to prove themselves in a ‘big-bang’ approach and merely copy the systems/processes in the banks they come from without understanding the business and regulatory context, the existing systems and processes and the organisational structure of the bank they are joining. They adopt a ‘quick-win’ approach to gain recognition with little regard for the long term sustainability of the business processes. In one bank, the newly joined CFO implemented the same vendor system as the one used by her old company. Without understanding the local legacy systems of the bank and how the new vendor system would integrate with the legacy systems, the CFO simply asked the vendor to replicate the accounting configuration in her old company for implementation in the bank. This approach created significant system integration issues and costs later.

Finally, there should be a balance between retaining institutional knowledge and injecting fresh ideas. The right attitudes towards improving productivity must start from the top: business heads, settlement/operation heads, CFOs, IT department heads and so on. The senior managers need to set the right tone at the top, and genuinely set out to improve long term productivity while meeting business needs without settling into power and political games.

**Approaches to Raising Productivity**

*Eliminate Redundant System Interfaces and Reconciliations*

The basic principles to achieve higher productivity are to minimise the number of systems and the number of downstream checks. The ideal state is to move towards global systems and for most data integrity checks to be performed upstream. The objective is to reduce the number of system interfaces and hence the number of data reconciliations. One approach commonly employed is straight through processing (STP), in which the front end position monitoring, back end settlement/processing, risk management and accounting are contained in a single system for the same product and for the same transaction. In order to reduce the number of systems, similar products should be booked in the same system. This avoids the situation when different business units book the same product in different systems, which may revalue the product and generate accounting entries differently. When system interfaces are inevitable because individual systems have limitations in handling certain products or functions, the systems should carry out transaction reconciliations daily. For multiple currency ledgers, the local currency equivalents and foreign currency conversion rates should be reconciled between the general ledger and the front office transaction processing systems to ensure that the foreign exchange profits/losses are reconciled between systems.

*Flexibility of Systems to Meet Changes*

Another common information system issue to consider is whether to use end user computing tools such as Excel spreadsheets or institutional mainframe systems. Many controllers keep Excel spreadsheets for the flexibility to respond to business requirements. This only reflects the rigidity of the institutional mainframe system and its inability to cater to business requirements. Controllers are under pressure to meet the needs of businesses, yet the information systems cannot respond to the business needs. This is a responsibility and accountability issue as the onus should fall on the IT system heads to explain to business heads their inability to respond to business requirements. The number of temporary workarounds should be minimised because only a few people have detailed knowledge of these spreadsheets, making the systems and processes vulnerable to staff movements. Usually
such workarounds become permanent and there are few incentives for business heads and IT heads to work on the permanent system solutions since the ‘temporary’ workarounds serve the business needs. In the process of new product development, it is crucial that the systems, operational and accounting processes are fully in place before the launch of new products.

The flexibility of systems to meet possible business and regulatory changes is the key to long term productivity. This system flexibility should not be in the form of end-user computing but should be built into mainframe IT systems to ensure continuity. Documentation of institutional systems is critical as there have been situations when accountants build their spreadsheets because there is a lack of knowledge on the institutional systems and these institutional systems cannot respond quickly enough to business and regulatory needs.

Flexible accounting systems and processes provide the foundation for the bank accounting functions to move up the value-chain. The accounting functions need to be able to meet the financial reporting and transactional processing needs arising from new products, new organisation structure, new accounting rules and regulations quickly before business managers would entrust them with the value-added business partnership roles.

Management Accounting Information

The management accountants and business unit controllers need to have deep understanding of the banks’ business strategies in order to build the delivery of accounting information around the desired output (KPMG, 2011). For example, if a bank aims to build its fixed income business, the accountants need to understand the fixed income products and plan the potential changes to the accounting processes and systems. Some accounting information relevant to the business managers include the funding and transfer pricing policies, the accounting methodologies such as fair value hedging versus cash flow hedging and the valuation methodologies.

In terms of the information systems, the general ledger may produce management reports at a consolidated group level but a financial data warehouse may still be required for the flexibility to provide diverse analytical information to business managers. The financial data warehouse can contain detailed data from transaction processing system such as yield rate, spread, transaction date, maturity date and internal transfer rate between fund collection and fund deployment units. The management accountants and business unit controllers may require data outside the data warehouse, in which case they should strive to obtain such data from the source system. This is because the data in the source systems are richer and more accurate, on the basis that any errors are corrected at source and no data ‘cleaning’ takes place downstream. The accountants also need tools to perform their control and analysis roles. For instance, the systems should provide reports for the accountants to perform checks on the rates and positions. The accountants can specify the conditions which they would like to check. Examples include trades which give exceptional profits and losses and trades which are inputted in systems with off-market rates.

Model of Accounting Function

The accounting function should aim to reduce the transactional processes and move towards more strategic business partnership roles. In order to achieve this, the accountants need to have a good understanding of the business, systems and processes of the bank. The leading-edge accounting functions effectively take charge of the financial control of the bank and lead the bank-wide system and operational process changes to meet the business requirements.

One way to achieve efficiency is to merge the management accounting and financial accounting functions. This is possible when management accounting earnings and balance sheet aggregate to the numbers in financial reports. The implication is that shadow accounting and multiple income accounting should be abolished. Revenues recorded in financial reports should be allocated between the departments which generate the revenues using a transfer pricing mechanism.

Next, the costs and benefits of accounting activities should be analysed. The accounting function can adopt the same approach as the IT departments in costing its activities. The accounting function may require that any request for an additional piece of accounting information be tracked. If a business head requests for a new accounting report, he or she should specify the
requirements, which will be logged. This will better track the accounting costs incurred to meet business needs. For the common accounting costs incurred in general ledger reporting and regulatory reporting, an estimate of the proportion of costs attributable to business lines can be made so that each business line and product bears the full accounting cost. A full allocation of accounting costs to business lines and products will lead to a more accurate profitability measurement of each business line and product.

Finally, the bank may reassess the performance evaluation process of business managers and CFOs. While CFOs take on greater business partnership responsibilities, business managers should be assessed by CFOs, risk management heads, heads of operations, compliance managers and internal auditors on the levels of business controls. Controls need to be present from the front office to the back office processes. Trader input errors in transaction processing systems create a lot of work downstream and are control issues. Operational costs attributable to trader errors should be charged to the traders’ business units.

In many major banks, the pass/failure of an internal audit has an effect on the performance assessment and bonuses of the business heads. Still, an internal audit takes place once every few years, which reduces the motivation for business heads to consider controls seriously until an internal audit occurs. Many business heads and even senior product controllers continue to hold the attitude that the front office is only responsible for generating revenues and the responsibility for controls fall solely on accountants. Their argument is that without the front-line people generating revenues, the firm will not exist. However, a counter-argument is that a firm that is out of control will also not survive for long – look at the banks that suffer significant losses due to liquidity issue, counterparty/credit risk (failures of major borrowers), trader frauds, accounting irregularities and so on. Eventually firms need both short term earnings and long term business control to survive. Business managers need to partner CFOs and play a greater role in financial and business controls.

**Conclusion**

Although the approaches laid out appear to be common logic, yet in the midst of the fast-paced environment in which bank accountants work, many are barely staying on top of meeting the reporting and business needs, not to mention going through these changes. There are power and politics issues to contend with. It takes strong leadership not just in the accounting function but at the CEO and bank-wide level to set the right tone at the top and to see that controls are instituted from the front office to the back office, in the same way that risk management is part of banking business. Resources should be channelled to the right places instead of having additional layers of checks and systems, which create more reconciliation work. If the transaction processing system is not able to capture the right data or the traders input their trades incorrectly, this problem should be corrected at source. At present, resources are usually channelled to hire senior people at high cost to check the errors and to serve as reporters to report to senior management what has happened or to set up a separate process/system to ‘clean’ the data. They are not directly involved in problem solving and create more reconciliation work. Because of the additional costs incurred to hire the reporters or to set up new systems and processes, further cuts have to be made to the operation staff, leading to more errors and control problems. This article discussed only a few examples of the obstacles to raising productivity. It also discussed a few pathways to improve productivity. The applicability of the examples depends on the context of individual banks and departments. Nonetheless, this article would have achieved its objective if it led to heightened awareness and consideration of some of the productivity issues involved in the accounting function at banks and steps being taken to address these issues.

**References and Further Reading**

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Chapter 8
Value for (Public) Money

Irving Low and Richard Tan, KPMG Singapore

Introduction

Around the world, governments and their agencies are facing increasing pressure to show that they are utilising public funds responsibly and productively. Not surprisingly, what is coming under particular scrutiny is their procurement processes.

In Singapore, amid a rising number of lapses in the procurement areas, recent audits by the Auditor-General’s Office (AGO) have been zeroing in on the procurement practices of public sector agencies (Straits Times, 12 January 2012). In 2011, the AGO handled 21 procurement-related complaints in the public sector versus 14 in 2010 and 9 in 2009. An AGO spokesman told a local newspaper that the increase did not mean such lapses had become more common or serious. Instead, the AGO is paying more attention to procurement during audits after uncovering a few serious cases in recent years.

Based on the AGO’s report for the 2010/2011 financial year, Singapore’s Public Accounts Committee (PAC) issued its own report in April 2012. The PAC report pointed out “underlying broad-based weakness” in the way some government agencies purchased products and services. This weakness, it added, had led to numerous lapses, including:

- committing to a purchase beyond the approved budget;
- using inappropriate term contracts which resulted in gross overpayment for the items purchased; and
- setting an unrealistically-short period for bid submissions, thus limiting competition.

The PAC report stated, “The Committee is concerned that such lapses undermine the Government procurement principles of open and fair competition, transparency and value for money and could erode public confidence in public sector procurement. A number of these lapses have also resulted in the Government being overcharged, in some cases, with no recourse for recovering the money.”

Increasing Focus on Accountability

These developments in Singapore reflect a global trend where governments and their agencies are increasingly coming under the microscope of public scrutiny. Measuring the performance and productivity of public agencies is not as clear cut as it is for organisations in the private sector. Private organisations generally seek to achieve and maximise profitability and growth for their shareholders.

For the public agencies, their social objectives often cannot be measured and judged solely by the contribution to profits. They therefore do not have a single bottom line to measure the operational performance.

Their social objectives and outcomes, which aim to maximise public service and welfare, may be both tangible and intangible. The end output or desired outcome may not be easily measured using quantifiable performance indicators. Indeed, public sector agencies are expected to account for the use of public funds in other ways, such as how well they manage resources and spend public money.

Value For Money (VFM)

Since their performance cannot be fully tested by any profitability criterion, how can these agencies measure their performance and productivity, especially in their use of public funds? The answer lies in the concept of Value For Money (VFM).
While the VFM concept is relevant to both the private and the public sectors, it is the public sector that has taken the lead. Public accountability means that those in charge of a government programme are held responsible for its efficient and effective running. As a result, government agencies have a special need to demonstrate their accountability and their regard for economy, efficiency and effectiveness (3Es) in the use of public funds.

There is no universally-agreed definition of VFM as it means different things to different people. For example, Singapore’s Ministry of Finance defines VFM as “yielding the best returns for each dollar spent in terms of quality, timeliness, reliability, after-sales service, upgradeability, price and source” (Singapore’s 2004 Budget Glossary).

In 2009, Singapore’s Minister of Finance, Mr Tharman Shanmugaratnam, said in a written response to a question raised in Parliament, “Value for money and not cost alone is the key consideration for best sourcing for government procurement in general. Public agencies will evaluate the bids received taking into account not only the price, but also other factors such as compliance with all requirements in tender specifications and quality of goods and services.”

The Ministry of Finance has already started the VFM ball rolling through five major procurement initiatives, namely:

- **Demand aggregation**, where an appointed public agency coordinates and gathers demand information, calls for bulk tenders and establishes master contracts with vendors to achieve greater economies of scale in government spending for common goods and services;
- **e-Procurement**, through the one-stop Government Electronic Business portal (www.gebiz.gov.sg) which enhances equal competition and transparency of government tenders;
- **Best Sourcing Initiative (BSI)**, which helps agencies focus on their core functions and outsource the non-core. Market testing is performed to determine which approach would generate the better VFM;
- **Centre for Shared Services**, which aggregates common corporate services to reap economies of scale; and
- **Public Private Partnership (PPP)** arrangements, which are an extension of the BSI, where the:
  - public sector purchases services
  - private sector brings in innovation, efficiency and finance to provide a public service, and
  - two partners cooperate and share risks.

In the United Kingdom, the National Audit Office defines VFM as the optimal use of resources to achieve the intended outcomes. The NAO audits most public-sector bodies in the UK and produces value for money reports into the implementation of Government policies.

In economist-speak, VFM is about maximising the net present value of government spending, subject to other non-quantifiable constraints (KPMG, 2011). To the layman, it simply means getting “more bang for my buck”.

However, VFM may also be defined at the micro level. The concept essentially rests on three underlying principles – the 3Es of economy, efficiency and effectiveness.

### 3Es Defined

Central to the VFM concept is the principle that public funds should be put to the best possible use and that those who conduct public business should be accountable for the economical, efficient and effective management of the resources entrusted to them. After all, public sector managers do have an obligation to demonstrate that resources such as people, goods and money are used as productively as possible to achieve the intended results. Performance accountability, through VFM, is about achieving the right balance among the 3Es in order to reduce wastage, extravagance and inefficiencies.
For public agencies, they should strive to achieve the value-driven state. This is where a desired outcome, measured in terms of maximising public welfare, is achieved in the most cost-effective manner. The value-driven agency scores high on both the outcome and cost-effectiveness scales. Exhibit 8.1 below illustrates the point.

**Efficiency:** Achieving maximum output for any given set of inputs or minimum inputs for any given quantity and quality of goods and services provided. The underlying objective behind the second E is increased productivity and reduced unit costs. In gauging the efficiency of an organisation’s resource utilisation, the key lies in determining the level of efficiency of its operating procedures. The two main elements of efficiency are the efficient utilisation of:
- **goods, financial resources and information technology,** which includes taking advantage of quantity discounts or lower unit prices through economies of scale and making forward purchases in anticipation of price increases, and
- **staff, including implementing an incentive scheme** to encourage increased output and ensuring optimal skills for optimal output.

**Effectiveness:** This is the extent to which the predetermined goals and objectives of a policy or programme are being achieved. Among the 3Es, effectiveness is the most difficult to measure. To establish the effectiveness of an organisation’s resource utilisation, these following questions have to be answered.
- Is its management system for measuring effectiveness adequate?
- To what extent does an activity achieve the desired level of results?
- What are the factors that inhibit satisfactory performance?

An organisation’s effectiveness can be affected by a host of factors. For example:
- Its management’s strategic and operational plans must be able to chart the agency’s pursuit of its public service mission and vision.
- Its programmes or activities must remain relevant and appropriate so that the agency can continue to achieve its mission and vision.
- It must be responsive to changes and adapt swiftly and appropriately.
- It also needs to have an adequate and robust performance monitoring and reporting process.

Organisations keen on implementing VFM do have to bear in mind that the distinctions drawn between the 3Es, although useful, can also be arbitrary.
In practice, VFM may straddle across more than one category, particularly between economy and efficiency. What is significant about the definitions for VFM and the 3Es is the linkage between inputs and outputs.

The goal of VFM is to ensure that the optimal amount of input in dollar terms is employed to deliver the planned output and outcome in the most efficient way. In line with this goal, the organisation’s internal processes and key systems must be designed to emphasise the 3Es.

**Measuring the 3Es**

Various performance indicators can be used to measure the 3Es as they can quantify either the output resulting from the activities of the entity or the ratio of that output to the input or resources employed. Typically, the output-input ratio is used to gauge an agency’s operating efficiency.

In the private sector, an organisation’s output is quite readily measureable. For instance, in terms of sales volume and production levels. For a public sector agency, VFM output measurement may be more difficult.

In services such as education and health, obtaining absolute quantitative output values may be impracticable. In such instances, measures of the population served or the number of times the service has been taken up serve as proxies.

In choosing the key performance indicators (KPIs) for the 3Es, public sector agencies need to be aware that they function as performance assessment tools that help them understand and investigate their current situation. The KPIs are not intended to give all the answers.

An agency must be aware that each KPI should not be viewed in isolation as this reduces its potential value in understanding the performance of the organisation’s core business functions. It must also understand that VFM indicators are meant to complement and reinforce, not replace, existing performance management frameworks.

In choosing KPIs, public sector agencies can use four broad criteria:

- **Relevance**: Indicators should be directly relevant to each activity under review, with as little duplication or overlap as possible between performance indicators for different activities. In particular, the indicator must be relevant to the agency’s objectives.

- **Availability**: The timely availability of suitable data allows for their abstraction and analysis.

- **Measurability and comparability**: The KPIs need to be quantifiable, reliable and well defined. Because the essence of performance assessment is comparative analysis, performance indicators should be comparable over time and between operating units.

- **Ease of interpretation**: The selected performance indicators should be capable of ready interpretation. This will tend to favour the choice of simple rather than complex indicators, possibly making meaningful comparisons more difficult. Ease of interpretation will depend in part upon the availability of adequate background information against which to judge performance.

Simply put, KPIs should be **Specific, Measurable, Achievable, Realistic** and **Timely** (SMART) in measuring the identified outcomes and characteristics.

While some elements of desired outcomes are intangible and not quantifiable, a proxy indicator could be used to demonstrate if the monies spent are meeting the desired outcomes.
To effectively assess and interpret the performance of an entity in achieving its desired outcomes, there needs to be a comparative analysis of the chosen indicators. Four types of comparisons can be made, namely:

- **Comparison with past performance:** This trend assessment will be particularly useful for analysing indicators expressed in physical terms, such as productivity measures. Care should be taken as the effects of inflation on costs can muddy the waters. A reliable trend assessment of indicators expressed in monetary terms would then be difficult.

- **Comparison of the performance of constituent units:** The relative performance of separate but similar operating units within the agency or across other agencies can be analysed and compared. Where the relative performance appears to vary widely, the agency could enquire and investigate further to identify the root cause of the underperforming units in order to seek improvements.

- **Comparison with performance outside the organisation:** Such an external assessment will depend on the availability of comparative statistics. Where comparative statistics are used, the agency will need to exercise considerable judgement in interpreting the figures. It needs to take into account the differences in the character and circumstances of the different entities. Otherwise, such a comparison may not be meaningful.

- **Comparison with intended performance:** This assesses the effectiveness of the entity in achieving its stated objectives, in terms of its resource budget, its goals, needs, and service and efficiency targets.

In making comparisons, agencies also need to be aware that there is usually a time element to the achievement of outcomes. Therefore, the impact, benefits or consequences for stakeholders resulting from the output of a programme or organisation could and usually would differ over the short, medium and long term. Understanding this time element provides greater clarity on how resources should be used.

**Linking Risks with VFM**

By identifying the critical risks, organisations can prioritise and direct resources to address the most important areas in their operations and processes. They are also able to attain the desired outcomes of their processes and programmes cost effectively in line with their mission and vision.

Once they have pinned down the CSFs and the key associated risks, they can install KPIs, key risk indicators (KRIs) and VFM indicators into their programmes and activities to monitor and measure their economy, efficiency and effectiveness.

Existing KPIs and VFM indicators will track entity performance and the 3Es while KRIs will provide trigger points to warn them of possible process or programme failures. In essence, risk treatment plans are embedded in the processes and programmes.

**Self-Assessment**

A public sector agency can determine how VFM-ready it is by answering these simple questions (KPMG, 2012):

- **Do you**
  - know what returns you are getting on your assets – social, environmental and financial
  - understand the cost of delivering each of your services and the quality of those services
  - know what factors affect the cost and quality of your services
  - demonstrate how your service costs and quality compare with your peers
  - involve your customers in determining VFM
  - understand your priorities for improvement
  - know what the various options are for improving VFM?
• **Can you**
  ○ show how you prioritise your services for investment or divestment
  ○ articulate clearly the efficiency gains you have made or plan to make
  ○ demonstrate a robust strategy for maximising future return on assets
  ○ show how you will deliver improvements year on year?

• **Have you**
  ○ got a clear strategy for optimising VFM, and robust systems to make sure the strategy is delivered
  ○ gained assurance on your organisation’s assessment of its VFM?

If you are unsure about how your organisation performs against any of these questions, KPMG can help you find the answers. We have a vast store of experience and expertise, and are helping public sector agencies around the world to determine and improve the VFM of their activities and programmes.

In Singapore, KPMG has helped several public sector organisations apply the VFM concept to several of their key processes. We have helped them leverage the 3Es to achieve their goals and objectives. For example, through policies and programmes that generate maximum output of optimal quality through the efficient use of inputs.

In New Zealand, KPMG was commissioned to complete a VFM review of problem gambling services funded by the Ministry of Health. The Ministry, whose problem gambling services’ strategy is to minimise and prevent harm, has an obligation to ensure that all the programmes it supports meet a clear VFM test. KPMG’s report focused on the economy, efficiency and effectiveness of the use of the fund.

KPMG has also carried out VFM work for various registered providers (RPs) of social housing in the UK. We helped these RPs better understand how to measure productivity as well as prioritise services for improvement and cost reduction.

**Conclusion**

KPMG’s VFM concept is based on the premise that public funds should be put to the best possible use and that those who conduct public business should be accountable for the economical, efficient and effective management of the resources entrusted to them. In a nutshell, VFM for such entities means their policy or programme is characterised by relatively low cost (economy), high productivity (efficiency) and the achievement of successful outcomes (effectiveness).

The pinnacle of VFM achievement for these agencies is to reach the value-driven state, where a desired outcome, measured in terms of maximising public welfare, is achieved in the most cost-effective manner.

In doing so, public sector agencies can achieve an optimum balance among the 3Es. Similar concepts are also applicable for companies in the private sector. To achieve the 3Es, they need to ensure that they implement sound and robust internal systems and processes for the planning, appraisal, authorisation and control over the use of resources.

Scoring high on both the outcome and cost-effectiveness scales, they would be able to prove to the public that the resources under their stewardship are being utilised in the most economical, efficient and effective manner.
Chapter 9
Business Intelligence and Analytics

KK Tang* and Elaine Chong, Institute of Business Analytics

The Role of the CFO

The role of an accountant has transformed from its humble beginnings as a steward of performance and cost controller to the complex and demanding role of a strategic business partner. Back at the corporate office, whilst the CFO bears ultimate responsibility for the finance department, he or she has to work closely with the other departments as an adviser and process expert. CFOs are getting more frequent — and always urgent — requests from other senior executives who want accurate, timely and relevant financial and non-financial information that can provide insights to business operations.

In carrying out their roles, CFOs and members of the accounting and finance department, rely heavily on information technology (IT) as a business enabler, tapping on the technologies such as transaction processing systems, Supply Chain Management Software (SCMS), Customer Relationship Management (CRM), and various Enterprise Resource Planning (ERP) initiatives. These technologies have undoubtedly increased the amount of financial and non-financial data at the CFO's disposal. However, having too much information that is never analysed, let alone acted upon, is worse than having no information at all.

*Editors’ Note: We extend our appreciation to Mr KK Tang, who dictated the outline to this article before he passed away on 22 July 2012.
Therefore, it is not surprising that a report published by PwC (2007) found that “improving management information” was the top goal of CFOs in fulfilling their role as business partners and advisors. In particular, in an interview in an E&Y report (2012), the CFO of a large bank in Canada said “The highest value add of the (CFO) role is really on the analytics … being able to bring insights and wisdom to the CEO, the board and the senior executive team.”

Business Intelligence and Analytics

After years of investment deploying applications that capture key business transactions and relationships with customers, suppliers, and other stakeholders, businesses are turning to business analytics and intelligence to extract the most value from that data.

Business intelligence and analytics is one of the fastest-growing parts of the software industry. The business of information management, helping organisations to make sense of their proliferating financial and non-financial data, is growing by leaps and bounds. In recent years Oracle, IBM, Microsoft and SAP have between them spent more than US$15 billion buying software firms specialising in data management and analytics.

Stephen Few, author of a number of books on business intelligence and analytics, in a keynote speech at a 2010 conference described the wall that prevents us from doing more meaningful things with data.

This representation can easily be used to describe the things we do in our traditional accounting functions. We spend significant time and resources to collect, clean, transform, integrate, store and report on financial information. He argued that “… the activities that actually make sense of information and use it to support better decisions have remained behind a wall that they have failed to scale and have never seriously tried to scale. For information to be useful, we must explore it, analyse it, communicate it, monitor it, and use it to predict the future.”

Using Microsoft Excel as Entry to Business Intelligence

At the Institute of Business Analytics, we developed the i3BAR (integrated, interactive and intelligent Excel Models for Business Analytics and Reporting) course that has trained over 3,500 accounting and finance professionals from more than 1,200 companies in 7 countries around the world. We promote the use of Microsoft Excel as an entry to field business intelligence and analytics. Whilst we teach some Excel functions (for example, VLOOKUP, INDEX, OFFSET, form control functions and many more) that are relevant to business analytics, the key aspect of any venture into business intelligence is on developing new insights and understanding of the business based on data that is already on the company’s system. We help our participants build dynamic models by using creative combination of these functions.

Most accounting systems already provide reasonably adequate data source (“inputs”), but inefficiencies arise when they are not in the format that is required for printed or dashboard reports (“outputs”). Sometimes the inputs are from two or more different sources. For example, the accounting system’s ledger has historical and year-to-date results, a separate Excel file for target sales, and another set of files kept by local store managers for tracking weekly sales. Many members of the accounting and finance department spend hours and hours trying to manipulate the inputs for the desired outputs, and this inefficiency is magnified many times over for every reporting period (monthly, quarterly, annually). Accountants earn an extra CPA qualification with this endeavour – they become “Copy and Paste Artists”. 
For those who are better in using spreadsheets, they fall into the trap of creating very complicated formulas, nested functions and macros in an attempt to transform inputs to required outputs. This is also inefficient because the spreadsheet becomes too difficult to understand by anyone else other than the creator, with lack of documentation and robustness to be applied consistently from period to period.

What we really need is a systematic way to work out the step-by-step logic that will transform the data into suitable outputs. This is our i3BAR methodology. Users create a “data block” (imported from ERP or accounting system), which is processed by a “logic block” and interactive outputs are displayed in the “report block”.

This following example illustrates the key components. Exhibit 9.2 shows a sample data block which is downloaded from the accounting system. The raw data may come from multiple sources/systems and in different formats.

The logic block (Exhibit 9.3) is then used to logically categorise and organise the data that can be used in the report block. The key retrieval functionalities are built inside this block, so whenever new data is imported (or appended), the logic block will automatically updates without further interference (or additional copy and paste manoeuvres) from the user.

The report block (Exhibit 9.4) then puts the organised data in the logic block to an interactive display and automated commentary. Users, including senior management, are empowered with navigational tools and thus able to select overall totals or individual items, period covered and/or other desired dimensions to examine the data. The tables, charts and commentaries will update automatically depending on selection.

Here are some real cases where this method has helped our participants and companies cut short report preparation time, for some at up to 80 per cent time savings. The accounting and finance department becomes more productive and can afford the time for higher value-added activities on the right-hand side of the business intelligence divide.
Case Study 1: A Cosmetic Retailer with Multiple Brands and Multiple Outlets

To promote a less paper working environment, our Information System Department started email distribution of key standard JDE/Oracle generated reports to key managers since last year. Whilst the JDE/Oracle reports are very detailed and timely, presentation of reports is restrictive and not interactive. Information provided may be too much in detail to give a quick overview for management oversight and review. Hence, for presentation and review with General Management, each brand has to prepare its own business review reports in its preferred presentation format before the monthly review. There is no central area where key performance information for brands and support departments are readily accessible. Comparison of information across brands is difficult as the information is in different reports and in different presentation formats.

We use data analytics to create a spreadsheet model that provides a central desktop management report for a quick overview of corporate and comparisons of individual brands’ performance. This improves our efficiency and productivity as it certainly helps us to save time and effort to re-create reports for different users. Comparison of performance across brands can now be done instantly once the model is readily set.

Case Study 2: A Supplier of Medical Products to Hospitals in the United Kingdom

The chief executive and sales director need to know how each region’s sales representatives are performing. They also need to know how well each product group from each manufacturer is selling. The current reporting system is unable to provide this information in an easily readable, timely or dynamic way. This is due to the fact that the accounting system does not store the sales target data for comparison with actual sales, and does not produce reports graphically or dynamically. Sales target figures are entered into an Excel file but there is no easy tie up to the actual sales figures.

We built our analytics model using the iBAR methodology. Sales invoices are imported into a link sheet by querying the accounting database. This data is then sorted by a pivot table into an input sheet. Target figures are easily be imported into another input sheet. An interactive profile chart
shows the user how the monthly spread looks, as an aid to data entry. Logic blocks carry out the necessary calculations for the Pareto chart and the bullet charts. Our company was able to create a spreadsheet model that automatically produces:

- A sales summary report shows sales by region on a month and year to date basis, together with target figures and variances there with, prior year sales figures are also shown as comparatives. The sales summary report also shows the best selling product groups in a Pareto chart, so that the cumulative contribution to total sales can easily be seen and compared to a percentage of total sales bar line that can be set to whatever percentage the reader wants. An interactive commentary to the chart assists the reader’s understanding of it. The report interactively shows data for any region or whole company, or month or year, according to selections made by the user.
- A more detailed report, showing sales by product group, also on a month and year to date basis, together with target figures and variances therewith. Prior year sales figures are also shown. The report shows sparklines to indicate year to date trends, and bullet graphs to enable a quick visual comparison of actual sales with targets. A key explaining the graphs can be interactively displayed for new readers of the report. In addition, conditional alerts flag up significant variances based on a combination of value and percentage variances. The report interactively shows data for any region or whole company, or month or year, according to selections made by the user.
- Drill down reports showing actual sales and targets by month for each product group.

Case Study 3: A Venture Capital Company Investing in Start-up Businesses in the Leisure Sector

We invest in small-to-medium size start-ups businesses in the leisure sector. Each management team is independent of the others and outsourced accounting solutions are often used. Information was being delivered to us on time and in useful formats, either in Excel sheets, or more commonly PDF format. What was lacking was the ability to interrogate and analyse this data effectively. Often to compare month-on-month it would require two sets of hard-copy reports to be open at any one time. In addition, trend analysis was limited, so that ad hoc information requests from our management team resulted in a lot of time spent re-keying data as well as copying and pasting information.

By creating a tool that was both interactive and flexible, senior management became empowered with the ability to easily analyse their own data. The model allowed users to focus on both the company and also individual selected sites. The user was also given control over the data they were looking at so that any combination of current period, previous period, budget, last year, forecast and last forecast could be compared. The user could also select whether the longer-term data was presented on a year-to-date basis or for the last 12 months. Finally a number of Moving Annual Totals were added so that management could see key trends at both company and unit level that were absent in the traditional reporting formats. With our spreadsheet reporting tool, we are now able to present information to management within 90 seconds of importing data!

By empowering senior management with the interactivity, ad-hoc reporting requests have been reduced and senior management receive the answer they require much more quickly. Productivity and quality of our business have both been enhanced.
Case Study 4: A Stem-cell Banking Company

Currently, our company is relying on a very simplified budgeting template made available from our US parent company. The template, unfortunately, serves neither the specific needs of the company nor takes into consideration the existence of a branch office in Country A which requires a separate budget to be built. It is exceedingly difficult and time consuming to review or make comparison of the budgets for both business units, in Country A and Country B, alongside each other. In most cases, changes to the budgets have had to be manually updated. We also face challenge in establishing a meaningful and systematic basis for budgeting of specific expenditure as well. Assumptions are usually arbitrarily determined and applied across all months and categories of outlay on a straight-line basis.

Our objective is to build a budgeting model that could be integrated to produce real time updates to the end results whenever changes are made to the budget input tabs. It should also be interactive to provide a user friendly experience to management who would ultimately be working on and finalising the budget.

With this model, management would be able to alternate spontaneously between the business units whilst preparing and reviewing the budget numbers. The budgeting exercise could commence any time during the year, since the baseline budget for certain expenditure would have been built upon the current full year projected trend, which is in-turn derived from an amalgamation of the actual year-to-date numbers and budgeted numbers for the rest of the year. As the full year projected numbers change with each month’s actual numbers being updated, the baseline budget would also change accordingly. For the rest of the outlay, budgeting templates have been customised for each expense category.

In short, changes to the budget numbers could be made in the budget input tabs at any time. For an enhanced user friendly experience, a budget simulation template has been built in as well so that prior to finalising the baseline budget, an overall sensitivity testing could be performed.

A Business Report and KPI Report have also been built in to provide an overview of the business performance. As the purpose is to facilitate commencement of the budgeting exercise, the reports have been streamlined to offer only an annual outlook. A detailed presentation by months would have been addressed as part of the monthly management reporting deliverable. Additionally, the KPI Report focuses on selected annual projected numbers by providing a snapshot of the quarterly distribution throughout the year.

Conclusion

Accounting departments are spending more time and effort to generate ever-increase volume of information. Worse still, these reports often do not translate to better reporting quality, as they are often rigid in structure and offer little flexibility to users.

Business intelligence and analytics can provide a route through these vast quantities of information by looking firstly at the precise information requirements of the end user. By presenting this data in a clear way, using as few pages as possible, a tool is created that becomes much more useful. Interactivity with this data enables end-users to generate their own analysis in real-time rather than relying on other departments to produce additional reports.

The key to the process is linking the large amounts of data available to the reporting requirements of the end user. Once the two ends are identified, a solution can be found. Large systems can be inflexible in this regard and changes expensive to implement. By automating much of the period end process, the accounting department can increase its efficiency and effectiveness. The reporting process moves towards higher value activities, yielding businesses better-quality information and higher productivity for its accounting and finance departments.
Introduction

Research has shown that investment in IT is a key driver of productivity improvement in the accountancy sector. IT enables accounting firms to increase their productivity by automating tasks and enhancing collaboration within the firm and with their clients. Cloud computing has generated much interest from the business and IT communities these days as an emerging technology to increase productivity.

Many analysts have predicted cloud computing to be the next big thing in IT. Gartner, a world-leading IT research and advisory company, identifies cloud computing as one of the top 10 strategic technologies for 2012 (Gartner, 2011). Gartner also estimates that the global cloud computing market will reach US$150 billion in 2014. Another premier global provider of market intelligence for the IT markets, International Data Corporation (IDC), predicts that 80 per cent of new commercial enterprise applications in 2012 will be deployed on cloud platforms (IDC, 2011). IDC forecasts that worldwide spending on public IT cloud services alone will reach US$55.5 billion in 2014, with a strong annual growth rate of 27 per cent over the period from 2009 to 2014. These numbers reflect the growing importance of cloud computing for organisations.

Cloud computing is also gaining traction in the Asia Pacific region. IDC projects that the annual growth rate for cloud computing services in the Asia Pacific (excluding Japan) market is 40 per cent, reaching US$4.9 billion in 2014. A major driver of this strong growth in Asia Pacific is the investment of new data centres to support cloud computing. Several cloud computing
pioneers are making their presence felt in Singapore. In 2010, IBM opened a US$38 million Asia Pacific Cloud Computing Data Centre in Singapore. Salesforce.com also opened its first international data centre in Singapore in 2009 to serve increased adoption of cloud computing in Asia Pacific. Amazon Web Services also launched its first Asia Pacific platform in Singapore in 2010 so that it can better support customers based in Asia.

The Infocomm Development Authority of Singapore (IDA) has identified cloud computing as a key technology for shaping the competitiveness of Singapore. Based on IDA’s cloud adoption study in 2012, Singapore is ranked third, after Australia and Japan in terms of cloud adoption in the Asia Pacific region (IDA, 2012). To encourage the investment of local organisations in productivity and innovation, IDA announced in 2011 that it will include cloud computing under the government’s Productivity and Innovation Credit (PIC) Scheme. Organisations can now qualify for a 400 per cent tax deduction for the first $400,000 expenditure incurred on cloud computing. Alternatively, cash-constrained organisations may opt for 60 per cent non-taxable cash payout for up to $100,000 expenditure incurred on cloud computing (see Chapter 11: Helping Hands). These incentives give impetus to the adoption of cloud computing in Singapore.

The next section presents an overview of cloud computing. It examines the definition, key attributes, service models and deployment models of cloud computing. Subsequent sections will cover the business values and considerations of cloud computing.

**What is Cloud Computing?**

Cloud computing facilitates “anywhere, anytime” access to real-time data. Therefore, accounting firms and clients can work together better to increase productivity and reduce costs. Previously, accounting firms and clients typically exchange data files through email in order to share information. With the accounting software and data in the cloud, accounting firms and clients can now look at the same data together. Any adjustment to the data can be seen immediately by both parties, eliminating the need to pass information to and fro, resulting in effective communication and collaboration. Mr Eric Tan, founder of SPT Advisory, which advises accounting firms, estimated that cloud computing could help his firm save up to 20 per cent of expenses by cutting down on travel time, printing fees and other related costs (Straits Times, 2012).

The National Institute of Standards and Technology, an agency within the U.S. Department of Commerce, describes cloud computing as a model for enabling network access to a shared pool of configurable computing resources (for example, networks, servers, storage, applications, and services). In short, cloud computing is the delivery of computing resources as a service primarily over the internet. Cloud computing signals a move away from traditional on-premises IT systems to an on-demand delivery/consumption model.

The cloud computing model is characterised by the following five key attributes.

1. Cloud service providers adopt a multi-tenant model by pooling their computing resources to serve multiple customers. Computing resources are dynamically assigned and reassigned based on customers’ needs.
2. Cloud computing allows customers self-service capabilities for service provisioning. Customers do not require human interaction with cloud service providers.
3. Cloud computing caters for rapid elastic scaling. Customers can quickly scale computing resources in any quantity at any time to meet their needs.
4. Cloud service providers incorporate usage-based pricing for their cloud services. Customers are charged on a pay-per-use basis.
5. Cloud computing caters for ubiquitous network access. Customers access the cloud services via the internet, using diverse clients such as desktops, laptops, tablets and smartphones.

Cloud computing is associated with three service models: software as a service (SaaS), platform as a service (PaaS) and infrastructure as a service (IaaS). Exhibit 10.1 illustrates the three service models of cloud computing.
Besides software, another service model for cloud computing includes an IT platform. SaaS caters for end-users while PaaS caters for application developers. PaaS is a cloud platform for the creation of applications. Under the PaaS model, application development tools are hosted in the cloud. Developers have access to a computing platform such as operating system, programming language, execution environment and database for building and running applications, without focusing on the underlying infrastructure. Examples of PaaS are Microsoft Windows Azure Platform and Force.com Platform. Both PaaS platforms enable developers to focus on building applications in the cloud.

The third service model of cloud computing relates to IT infrastructure. Under the IaaS model, cloud service providers provide fundamental computing resources such as server, storage and network as an on-demand service in the cloud. IaaS is the cloud platform for the deployment of applications. It differs from traditional hosting services where hosting companies typically charge a fixed amount for a pre-configured computing resource irrespective of usage. IaaS service providers offer customers on-demand capability to scale their computing requirements to match their needs. Instead of paying an upfront fee, IaaS customers only pay for their actual consumption of computing resources. Amazon Elastic Compute Cloud (EC2), IBM SmartCloud Enterprise and StarHub Argonar are examples of IaaS, providing scalable computing capacity in the cloud.

Organisations can deploy cloud computing in three deployment models: public cloud, private cloud and hybrid cloud. Public clouds are opened to the general public and exist on the premises of the cloud service provider. On the other end of the continuum, private clouds restrict access to people within the organisation and may exist on or off premises. Hybrid clouds contain both elements of public and private clouds and imply integration between internal and external environments.

SaaS is the most familiar service model for cloud computing. Checking email on Gmail, collaborating on Google Docs, sharing files on Dropbox, updating schedule on Google Calendar, social networking on Facebook, accessing customer’s data on Salesforce.com are examples of SaaS. SaaS is the delivery of applications over the internet. Under the SaaS model, cloud applications are delivered and consumed via the internet. Unlike the traditional on-premises software model, SaaS model does not require organisations to buy and install software on multiple local machines. End-users use web browsers to access applications in the cloud for a subscription fee. For example, organisations pay $39.90 per month for six user licences to access QuickBooks Online on SingTel myBusiness, SingTel’s online store for SaaS. In October 2011, IDA launched the SaaS Enablement Programme (SEP) to provide funding support for software vendors to SaaS-enable their software.

Exhibit 10.1: Service Models of Cloud Computing

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The Business Values of Cloud Computing

Cost savings was the initial selling point of cloud computing. Cloud computing changes the way organisations think about IT costs. Advocates of cloud computing suggest that cloud computing will result in cost savings through the sharing of computing resources such as networks, servers, storage, applications and services. Organisations that adopt cloud computing avoid significant capital expenditures on purchasing computer hardware and software compared with organisations that adopt the traditional on-premises IT system model. Instead of the upfront capital expenditure, organisations incur either monthly subscription fees or pay only for what they consume.

Knorex Pte Ltd, a software development company, significantly cut down its IT operating costs by eliminating its in-house servers with the adoption of cloud computing.

In addition to the initial purchase costs of the computer hardware and software, organisations should also consider the total cost of ownership such as the subsequent costs to configure, implement, maintain, backup and upgrade the applications. Cloud applications are managed by the SaaS providers on their premises. Organisations do not have to manually install applications on their local desktops and laptops. Users simply access the cloud applications via the web browser. Users also end up using the same version of the application at any one point in time as software updates are handled by the SaaS provider. Since there is only a single version of the application in the cloud, managed by the SaaS provider, organisations do not have to worry about configuration, maintenance and upgrading issues. Thus, cloud computing lowers the total cost of ownership by eliminating the significant upfront and ongoing costs. This enables organisations to channel more funds into growing their business. For example, SingTel estimated that the total cost of ownership over three years of its ONEOffice, a suite of office solutions in the cloud, is $3,725. In contrast, the total cost of ownership over three years for a comparable traditional email and office software package is estimated at $59,595. ONEOffice represents a cost savings of 94 per cent. SingTel’s total cost of ownership calculator can be accessed at business.singtel.com/sme/oneoffice/calculator.html.

Besides applications, organisations also have to manage their IT infrastructure such as computer servers. Before cloud computing, organisations over-invest in servers to cope with potential spike in customers’ activities. With cloud computing, organisations do not physically own the servers. Instead, organisations purchase computing resources from the IaaS providers, similar to how they purchase electricity from the utility company. As cloud computing offers elastic scaling, organisations can rapidly scale computing resources to manage peaks and troughs in usage. This allows organisations to keep costs proportionate to their IT requirements. Instead of waiting for monthly invoices, organisations can track their actual usage in real-time to manage their spending. For example, ReadySpace, a cloud service provider, bills its customers on daily billing block instead of binding its customers with long-term subscriptions or contracts. ReadySpace’s customers can terminate the services at any time. Mr Dumas Chin, SingTel’s vice-president of business sales, commented that cloud computing finally enables small and medium-sized enterprises (SMEs) to access computing resources at a fraction of the cost (Business Times, 2012). Without cloud computing, many expensive computing resources are out of reach for SMEs.

Another impetus for the adoption of cloud computing is the push to improve productivity. HSR Property Group, a leading real-estate company in Singapore, adopted Google Apps to improve information flow and collaboration among its 2,000 agents. Google Apps enable HSR to share floor plans, maps, pricing, availability and other real-estate data in real-time, both internally among its agents and externally with clients. Besides Google Apps, another popular cloud application is Microsoft Office 365. SD Group, a technology solution and services provider, adopted Office 365 to boost productivity and improve communications. According to Mr Daniel Soh, the Managing Director, SD Group saved US$1,000 to $2,499 per month with Office 365. Mr Soh added that productivity increased by 80 per cent, as Office 365 enabled employees to access all employees’ calendars and minimise time required to set up meetings. Previously, SD Group’s employees have to send multiple emails to coordinate schedules.
Eurokars, Singapore’s largest privately-held car distributorship, implemented an IT system in a private cloud to provide its sales employees with real-time access to customer and inventory information regardless of location. Prior to this, Eurokars’ sales employees can only access information in the office. Another SME, KSL Resources, a repainting and decorating contractor, also adopted cloud computing to increase productivity. Similarly, KSL’s staff could only manually report their work status in the office. Now, they could use the cloud application to update job status directly regardless of location. Real-time updating also allows KSL to manage workflow more efficiently. SMEs that are implementing information and communication technology solutions for the first time can apply for the IDA’s Increase SME Productivity with Infocomm Adoption and Transformation (iSPRINT) scheme for up to 70 per cent of qualifying expenditure, capped at $10,000 (See Chapter 11: Helping Hands for more information).

Issues to Consider in Adopting Cloud Computing

Despite the potential business values of cloud computing, organisations should be aware of the possible pitfalls. Many organisations are cautious about adopting cloud computing because of a fundamental data security concern. Organisations are worried about hosting sensitive and confidential data in the public cloud. Organisations typically opt for private clouds to restrict access if they have data security concerns. Besides data security, organisations are concerned about data ownership. Cloud computing involves handing control of data over to external cloud service providers. Therefore, the ownership of data in the cloud is questionable not only in this case but in the advent the cloud service provider is no longer operational. Cloud service providers must specify clearly what they can do with customer data. Lastly, organisations do not want to be locked in to a specific cloud service provider and require assurance that they can easily export their data to other cloud service providers.

Availability is another barrier for the adoption of cloud computing. Organisations are dependent on the cloud service providers for their IT infrastructure and applications. If the cloud is down, organisations will not be able to function. For example, Microsoft Windows Azure platform experienced a severe worldwide outage on 29 February 2012 due to a leap year coding error, leaving their customers without cloud access (eWeek, 2012). In the event of extended downtime, cloud service providers must have good disaster recovery plans in place. In addition, organisations are worried about slow internet connection speeds as cloud computing is essentially the delivery of computing resources over the internet. The reliability of cloud service providers is also a concern. If the cloud service provider goes out of business, organisations will face serious disruption to business operations.

Organisations need to work closely with their cloud service providers. Below are some questions to discuss with potential cloud service providers:

- What is your service level agreement (SLA)? How do you handle compensation in the event of downtime?
- What is your backup policy? How often do you perform backup?
- What is your disaster recovery plan? How often do you test it?
- What is your security policy? How will data be protected?
- What is your data ownership policy? Who owns the data?
- What is your privacy policy? Do you sell information to third parties for marketing?
Conclusion
Cloud computing, the delivery of computing resources as a service primarily over the internet, is here to stay. Organisations are excited about the potential of cloud computing to reduce costs and improve productivity. The Singapore government has included cloud computing under the PIC Scheme to encourage the adoption of cloud computing. Under the PIC scheme, organisations can either enjoy tax deduction or cash payout. SMEs that are implementing information and communication technology solutions for the first time can also apply for the IDA's iSPRINT scheme. However, as with any technology, organisations must always consider their business needs before their adoption of cloud computing. Data security, data ownership and availability are some issues that organisations will need to consider carefully.

References and Further Reading
- eWeek (2012), Microsoft Windows Azure Downtime Blamed on Leap Year Bug. [URL]
- Gartner (2011), Gartner Identifies the Top 10 Strategic Technologies for 2012. [URL]
- IDA, Infocomm Development Authority (2012), Address by IDA CEO at CloudAsia 2012. [URL]
- Business Times (2012), Boost your Productivity with the Cloud, 3 April.
- Straits Times (2012), Accountancy Sector Urged to Raise its Game, 2 March.
Roadmap (SME-PRO), Inclusive Growth Programme (IGP) and Increase SME Productivity with Infocomm Adoption & Transformation (iSPRINT) scheme. IGP is available to all Singapore-registered businesses operating in Singapore. SME-PRO and iSPRINT are available to small-and-medium size accounting practices and also, accounting/finance functions within SMEs to support their productivity drives. The next few sections will elaborate on the objectives of these endorsed programmes and highlight some of the available grants (as at 1 August 2012).

**SME-Productivity Roadmap (SME-PRO)**

SME-PRO is a systematic three step approach for SMEs to improve their productivity. SME-PRO is a joint initiative by SPRING Singapore and the Singapore Workforce Development Agency. The first step involves promoting productivity awareness through activities such as organising productivity seminars and workshops, collection of productivity information (for example, Productivity@Work website www.enterprisone.gov.sg) and performance of productivity self-diagnosis test. The second step involves upgrading employees’ skills. There are several Singapore Workforce Skills Qualification (WSQ) courses designed for serving the purpose of raising productivity. Accounting professionals may pursue courses such as executive development and growth for excellence, service excellence, leadership and business management. The third step involves exploring various government support programmes and getting into action.

Examples of these programmes under SME-PRO are

1. Productivity Management Programme (PMP)
2. SME Management Action for Results (SMART) Initiative
3. Customer-Centric Initiative (CCI)
4. Grant for Energy Efficient Technologies (GREET)
5. Technology Innovation Programme (TIP) - Projects
6. Local Enterprise Finance Scheme (LEFS)
7. Productivity and Innovation Credit (PIC)

(1) **Productivity Management Programme (PMP)**

The objective is to help SMEs to improve their productivity by providing training, productivity diagnosis and advice on productivity-related matters and projects. Under PMP, SMEs will be able to:

- Attend productivity seminars and workshops on productivity basics, best practices and measurement methods.
- Attend productivity clinics to perform a diagnosis of an organisation’s productivity using the Integrated Management of Productivity Activities (IMPACT) Assessment tool. The diagnosis can be used to identify areas to focus on and develop productivity.
- Get recommendations on relevant Government schemes that organisations can utilise for productivity improvements.
- Get referrals to certified consultants for productivity projects. These consultants can provide a deeper analysis of organisation’s productivity and help to implement productivity improvement initiatives.
- If SMEs wish to find out more about the initiative, they can visit productivity.enterprisone.gov.sg/en/performance_management_programme.aspx
(2) SME Management Action for Results (SMART) Initiative

The objective is to develop and strengthen SMEs’ management systems and processes in a systematic manner. The SMART initiative allows businesses to develop a roadmap to build business capabilities in areas of priority. If SMEs wish to find out more about the initiative, they can visit www.spring.gov.sg/EnterpriseIndustry/BC/Pages/smart-initiative.aspx and attend the SMART briefing sessions conducted by SPRING Singapore. Exhibit 11.1 lists the qualifying conditions for SMART and its funding details.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>A business qualifies as long as:</td>
<td>• A qualified business excellence consultant will work with the management team for up to 6 man-days over 1 to 2 months. SPRING will support up to 70% of qualifying cost for the consultancy incurred by the company on the project during the qualifying period subject to a maximum grant of S$3,500.</td>
</tr>
<tr>
<td>• It is registered or incorporated in Singapore</td>
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<tr>
<td>• 30% - 100% of shareholding is local</td>
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<tr>
<td>• It has at least 3 years of business operations</td>
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</tr>
<tr>
<td>• Annual sales turnover is S$5 million - S$100 million (computed on a group basis)</td>
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<tr>
<td>• It has 10 - 200 employees</td>
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</tbody>
</table>

Exhibit 11.1 – Qualifying Conditions for SMART and its Funding Details

(3) Customer-Centric Initiative (CCI)

The main objectives of CCI are to improve service levels of organisations, increase customer satisfaction through better service, cultivate service leaders who, in turn, will motivate other organisations in the industry to improve their service levels and to develop service benchmarks that organisations in the land transport industry can use to measure their service levels. SMEs can find out more about the initiative by visiting www.spring.gov.sg/enterpriseindustry/ccipages/customer-centric-initiative.aspx. Exhibit 11.2 lists the qualifying conditions and project type for CCI and its funding details.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Project Type</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>A business qualifies as long as:</td>
<td>Service improvement projects may involve:</td>
<td></td>
</tr>
<tr>
<td>• project involves the introduction of new service standards or lead to an improvement in one of the following areas: service leadership, service agility or customer experience.</td>
<td>• service audits (e.g. customer satisfaction surveys, mystery audits) to identify service gaps</td>
<td></td>
</tr>
<tr>
<td>• project should lead to specific and quantifiable outcomes that will upgrade the industry to be among the best-in-class internationally.</td>
<td>• development and implementation of service strategies, service blueprints, service standards and service systems</td>
<td></td>
</tr>
<tr>
<td>• company is must be willing to share the results with other industry counterparts at cross-learning platforms.</td>
<td>• implementation of technology to improve service levels (e.g. centralised call system to better manage taxi bookings)</td>
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</tr>
<tr>
<td>• company provides service excellence roadmap/plan, past projects done and indicate where they are now.</td>
<td>• development of training programmes under the Workforce Skills Qualifications (WSQ) framework to train staff on service competencies</td>
<td></td>
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<tr>
<td>• project has not commenced at the time of application.</td>
<td>• participation in overseas study missions for local land transport companies to learn best practices in customer service from their foreign counterparts or industry players</td>
<td></td>
</tr>
</tbody>
</table>

Exhibit 11.2 – Qualifying Conditions and Project Type for CCI and its Funding Details
(4) Grant for Energy Efficient Technologies (GREET)

The objective is to encourage SMEs to upgrade to more energy-efficient equipment or technologies. To qualify for the grant, it has to be Singapore-registered owners or operators of existing or proposed industrial facilities sited in Singapore. Exhibit 11.3 lists the types of project for GREET and its funding details.

Exhibit 11.3 – Types of Project for GREET and its Funding Details

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>To qualify, proposed project must:</td>
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<tr>
<td>• involve the installation and use of energy efficient equipment or technologies with a proven track record of energy savings in an industrial facility</td>
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<tr>
<td>• result in measurable and verifiable energy saving</td>
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<tr>
<td>• not have been contracted at the time of application</td>
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<tr>
<td>• be completed within 18 months from grant approval</td>
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<tr>
<td>Up to 50% of the qualifying costs, capped at S$2 million per project. Qualifying costs include:</td>
<td></td>
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<tr>
<td>• manpower cost</td>
<td></td>
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<tr>
<td>• equipment and materials</td>
<td></td>
</tr>
<tr>
<td>• professional services, e.g. detailed engineering design, and measurement and verification services</td>
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<tr>
<td>• only projects with a payback of more than 3 years and up to 7 years will be considered for funding</td>
<td></td>
</tr>
</tbody>
</table>

(5) Technology Innovation Programme (TIP) – Projects

The objective is to encourage local enterprises to use technology by subsidising technology innovation projects that help SMEs to develop and improve new and existing products, processes and business models. The technology innovation project should lead to an increase in revenue and value. Up to 70 percent of the qualifying costs depend on the “Level” of the project. Qualifying costs would include manpower-related costs, professional services, prototyping–related services, technical support services such as testing, certification, equipment, materials and consumables, and software costs and intellectual property rights.

(6) Local Enterprise Finance Scheme (LEFS)

SMEs may apply for a loan of up to S$15 million to automate and upgrade their factories and equipment or even to purchase a factory (only for Jurong Town Corporation or Housing and Development Board properties). To find out more, SMEs may visit www.spring.gov.sg/EnterpriseIndustry/FS/Pages/local-enterprise-finance-scheme.aspx. Exhibit 11.4 lists the loan category for LEFS and its repayment details.

Exhibit 11.4 – Loan Category for LEFS and its Repayment Details

<table>
<thead>
<tr>
<th>Loan Category</th>
<th>Repayment</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Factory Loan</td>
<td>4 years and below</td>
</tr>
<tr>
<td>• Machinery Term Loan / Machinery Hire Purchase</td>
<td>More than 4 years</td>
</tr>
</tbody>
</table>
(7) **Productivity and Innovation Credit (PIC)**

PIC offers significant tax deductions or cash payouts for businesses to invest in a broad range of activities along the innovation value chain to improve innovation and productivity from Years of Assessment (YAs) 2011-2015. Generally, all businesses are eligible for PIC. If SMEs wish to find out more, they should visit www.iras.gov.sg/irashome/PlcREDIT.aspx. Exhibit 11.5 lists the qualifying expenditure and quantum of benefit for PIC.

### Exhibit 11.5 – Qualifying Expenditure and Quantum of Benefit for PIC

<table>
<thead>
<tr>
<th>Qualifying Expenditure</th>
<th>Quantum of Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PIC covers spending on 6 business activities in the following areas:</strong></td>
<td></td>
</tr>
<tr>
<td>• Research &amp; development (R&amp;D) - including R&amp;D projects conducted outside Singapore</td>
<td></td>
</tr>
<tr>
<td>• Registration of intellectual property rights – patents, trademarks, designs and plant varieties</td>
<td></td>
</tr>
<tr>
<td>• Acquisition of intellectual property rights – e.g. when a company buys a patent or copyright for use in its business</td>
<td></td>
</tr>
<tr>
<td>• Acquisition or leasing of prescribed automation equipment</td>
<td></td>
</tr>
<tr>
<td>• Training of employees</td>
<td></td>
</tr>
<tr>
<td>• Approved design projects</td>
<td></td>
</tr>
<tr>
<td><strong>Tax Deduction:</strong> All businesses claiming PIC. Businesses can deduct 400% of their qualifying expenditure on each of the 6 qualifying activities from their income, subject to:**</td>
<td></td>
</tr>
<tr>
<td>• a combined cap of S$800,000 of expenditure for each activity (from YA 2011-2012)</td>
<td></td>
</tr>
<tr>
<td>• a combined cap of S$1,200,000 of expenditure for each activity (from YA 2013-2015)</td>
<td></td>
</tr>
<tr>
<td><strong>Cash Payout:</strong> Small &amp; Growing Businesses converting their Qualifying Expenditure to a cash payout. These businesses will have the option to convert S$400 to S$100,000 of their qualifying expenditure for all 6 activities taken together into a cash payout. The conversion is done at a rate of 30% up to a S$30,000 payout per year from YA 2011-2012; nd 60% up to S$60,000 payout per year from YA 2013-2015. For YAs 2011 and 2012, businesses can convert up to a combined total of S$200,000 qualifying expenditure for all 6 activities into a cash payout. This works out to a cash payout of up to S$60,000 (30% x S$200,000)</td>
<td></td>
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</tbody>
</table>

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### Exhibit 11.6 – Types of Project for IGP and its Funding Details

**Inclusive Growth Programme (IGP)**

The Inclusive Growth Programme was set up in 2010 to drive productivity and improve the skills and pay of low-wage workers (Channel NewsAsia, 2012). It replaced the previous Job Re-Creation Programme and tapped into the S$2 billion National Productivity Fund set up by the government. The programme focused on measurable productivity. Companies will be tracked on how they have enhanced productivity, how they measure it and how they share their gains with workers. It seeks to encourage businesses to become more productive by co-funding projects that improve productivity using measurable indicators, such as productivity per worker, revenue per worker, value-added per worker, etc; improve the value of low-wage jobs and raise the wages of the bottom 20 per cent of the workforce (earning S$1,700 or less per month). All Singapore-registered businesses operating in Singapore are eligible to apply for IGP. To find out more, companies should visit www.e2i.com.sg/services/employers/inclusive-growth-programme. Exhibit 11.6 lists the types of projects for IGP and its funding details.

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>To qualify for co-funding, your project must demonstrate benefits to both operations and workers:</td>
<td>Up to S$150,000 per project and S$500,000 per company per year:</td>
</tr>
<tr>
<td>• business operations are more efficient, produce higher quality products and services and/or become faster in adapting and responding to market conditions</td>
<td>• up to 50 per cent co-funding for use of equipment/technology and process re-engineering</td>
</tr>
<tr>
<td>• productivity gains are shared with low-wage workers (e.g. higher salaries, performance incentives, etc.)</td>
<td>• up to 90 per cent co-funding for training directly relevant to productivity improvement</td>
</tr>
<tr>
<td>Eligible projects include:</td>
<td></td>
</tr>
<tr>
<td>• automation and mechanisation (e.g. purchase of equipment)</td>
<td></td>
</tr>
<tr>
<td>• process re-engineering</td>
<td></td>
</tr>
<tr>
<td>• registration of intellectual property rights</td>
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<tr>
<td>• adopting Best Sourcing Initiative (BSI) standards</td>
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<tr>
<td>• training programmes</td>
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<td>• job redesign</td>
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</table>
Increase SME Productivity with Infocomm Adoption & Transformation (iSPRINT)

In March 2010, in collaboration with SPRING Singapore and the Inland Revenue Authority of Singapore, the Infocomm Development Authority of Singapore (IDA) launched iSPRINT to accelerate the infocomm adoption amongst SMEs to raise their productivity and sharpen their competitive edge (IDA, 2007). The iSPRINT scheme was aimed at addressing various computerisation needs of SMEs, from simple IT applications to innovative use of technology to transform the business.

The objective is to encourage SMEs to use technology to improve or innovate their business operations. The infocomm project is expected to lead to an increase in productivity and revenue. To find out more, visit www.ida.gov.sg/Sector%20Development/20060929142757.aspx. Exhibit 11.7 lists the project type, grant cap and qualifying costs for iSPRINT.

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Grant Cap</th>
<th>Qualifying Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaged solutions pre-qualified by IDA for Finance/Accounting/ Human Resources/ Payroll</td>
<td>Up to 50 per cent of qualifying cost, capped at $1,500 per packaged solution</td>
<td>Software, Consultancy Services, Training</td>
</tr>
<tr>
<td>Customised solutions E.g. Customer Relationship Management, Enterprise Resource Planning</td>
<td>Up to 50 per cent of qualifying costs, capped at $10,000 per SME</td>
<td>Consultancy services</td>
</tr>
<tr>
<td>Advanced customised solutions that requires extensive development efforts and business re-engineering</td>
<td>Up to 50 per cent of qualifying costs (Grant amount is determined based on a case-by-case basis)</td>
<td>Manpower-related costs, Consultancy services, Hardware/ software</td>
</tr>
</tbody>
</table>

Exhibit 11.7 – Project Type, Grant Cap and Qualifying Costs for iSPRINT

Conclusion

With uncertain economic times and increased competition, accounting entities should strive to invest in enablers such as training and information communication technology to raise productivity. The Singapore government has taken the lead in the productivity drive by providing a long list of assistance schemes and grants to local companies to raise their productivity and improve business growth. However, government efforts will be futile if accounting entities do not participate actively and fail to make productivity a top priority.

References and Further Reading

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