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IMPROVING YOUR
RESEARCH MANAGEMENT

A GUIDE FOR
SENIOR UNIVERSITY RESEARCH MANAGERS

ELSEVIER

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ACKNOWLEDGMENTS

FOREWORD

Managing a research group or faculty is an increasingly challenging task. On the one hand you need to be prepared to collaborate and compete at a global level, but on the other you are often obliged to depend on local sources of income. Furthermore, creating a strategy that will lead to the best outcomes in terms of research impact or innovation requires a highly-specific skill set which frequently lies outside the experience of those chosen to lead, regardless of their professional distinction. Given that you are reading this book, you are probably one of these people.

This is not to say that the skills you have acquired as a researcher are not also very valuable in the research management role. There is probably very little you don't already know about analytical rigor, networking or even what might be termed "scholarly diplomacy". There are, however, techniques and methodologies – as well as secondary tools like software products – which can help you to successfully apply this knowledge to the decision-making process you are now leading, and to thus optimize the outcomes of those decisions.

Elsevier is proud to serve researchers throughout their careers and has been doing so for a very long time. Recently we have started to take a more holistic view, complementing our journals, books and discovery offerings with a series of products for research management as well. Based on the successes of ScienceDirect and Scopus, the SciVal tools are comprehensive solutions that can help you lead and prepare your group for success in a challenging future.

This book by Professor Johnson is an additional source of knowledge and practical guidance for research managers. Professor Johnson has, throughout his career, successfully led research efforts at all levels in the Australian university system, one of the most competi-

tive and advanced in the world. We are privileged indeed that he has shared key strategies and insights gleaned from this extensive experience in this book.

The management of research isn't the same as research itself – although it can sometimes feel like it – but is nonetheless vital in a world whose growing interconnectedness presents us with challenges and opportunities of an unprecedented magnitude. Consequently, we are pleased to be able to offer you this book, which I hope through you, can make a small but significant contribution to the advancement of knowledge - one of the most important activities imaginable.

I wish you much success in your efforts and hope you enjoy this book.

BRAD FENWICK

Senior Vice President, Global Strategic Alliances, Elsevier. Former Vice Chancellor of Research, University of Tennessee; Vice President for Research, Virginia Tech; and chair of the Research University Futures Consortium

INTRODUCTION

This book is a companion to my earlier career-planning guide (Johnson, 2012) for Early Career Researchers (ECRs), also published by Elsevier and freely available in 12 languages as a service for researchers (http://www.biggerbrains.com/career-planning-guide).

ECRs need guidance on how to plan and carry out their research to ensure optimal career outcomes. Given the certainty that global competition for academic research grant funding will only become more intense in the next few years, mentoring ECRs will become even more critical. Your role as a senior university research manager in managing their career development is a major focus of this book.

You also play a major role in managing the senior research leaders at your university or within your faculty unit.[1] Much of this book is directed toward assisting you in improving your expertise and skills so that you can perform that role effectively. I have provided a comprehensive academic underpinning to the subjects covered in this book, but essentially it is a practical guide to what you need at hand on a day-to-day basis. I have also provided an extensive bibliography should you wish to explore these subjects in more detail.

This book is designed to cover most of the areas in which managers like you—who have direct responsibility but probably not supervisory authority for research in universities—need to be competent if you are to maximise the research productivity of your university or faculty unit.

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1 In this book I use the word "faculty" to describe a major Academic Organisational Unit (AOU) of a university, not, as commonly used in North America, as a generic term for all academic staff.

I also recommend this book to academics who are research leaders considering a future role in university research management. It will give them a good introduction into the skills and expertise they will need to ensure their future success as senior research managers.

Two important actions you could take are to make sure that the ECRs in your university have been given a copy of my ECR book, and to pass this book on to academics you are mentoring or considering for inclusion in your succession planning.

As a senior university research manager, it is your responsibility to ensure that the research outputs and outcomes[2] of your university or faculty unit are optimal. Your current position indicates that you, to your great credit, have managed over the last 5-15 years to conduct excellent research, and you probably possess a combination of natural ability and the capability to manage your career well.

You may now hold the title of associate/assistant/deputy dean (research) at the faculty level or perhaps deputy or pro vice-chancellor/rector/president (research) at the central university level. As such, you are responsible for the research activities of a dozen to hundreds of staff and students within your faculty unit, or perhaps your entire university.

In addition, senior research leaders in your university may be directors of major national research groups. These groups go by many names around the world, such as centre, institute, key strength, centre of excellence or something more specific to your national funding agency (for example, Sonderforschungsbereiche [German collaborative research centres], Australian Cooperative Research Centres, or Starka forskningsmiljöer [Swedish strong research environments]). So you may not only be responsible for your own university research output, but also for the outputs of all the staff and students in centres attached to your university.

I hope that you will receive value from the advice contained in this book. For the sake of clarity, I will refer to the position you oc-

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2   For the purposes of this book the term "research outputs" will be used to describe usually shorter-term research products, such as new theories, new devices or publications. The term "research outcomes" will be used to describe usually longer-term products that come from outputs, such as social, economic, and environmental impacts. (These are discussed in more detail in my ECR book.)

cupy using the North American terminology of vice-president (research) or associate dean (research) because they are probably the most common globally. And I will use the term president to include vice-chancellor, rector and similar titles referring to the chief executive officer of a university.

It is also necessary, for the sake of discussion, to separate the major issues in senior university management into sections that make up each chapter. However, it must be remembered that the topics in each chapter are interdependent: issues such as governance, leadership, strategic planning, ethics, and risk management are all interconnected and need to be practiced together holistically to ensure that your productivity is as good as it can be.

IMPORTANCE OF YOUR ROLE AS A SENIOR RESEARCH MANAGER

It is generally accepted that there are about 10,000 universities globally, with *Universities Worldwide* (Universities Worldwide 2011) providing links to 8,814 universities in 203 countries. The 21st edition of the *International Handbook of Universities* (2009) provides detailed data on over 14,000 higher education institutions in 183 countries.

Many of these institutions are modeled on the western style of the University of Bologna founded in 1088, although the University of Al-Karaouine in Fes is a madrassa, founded many years earlier, in 859. Growing out of what were essentially religious institutions, universities for hundreds of years pursued teaching and research for the benefit of society, with academic freedom as their core activity. Lohmann (2004) describes a short history beginning with the Reformation and leading to the establishment of a university model that remained relatively constant for hundreds of years in Europe. It then spread globally, especially to North America, then Asia, and the Middle East.

Often, major national research centres and especially the universities that house them are seen by national governments as global indicators of the prestige of the country's research, graduate education and innovation (Expert Group on Assessment of University-Based Research, 2010; Wendler et. al., 2010). Research performance is widely considered to be a major factor in a country's economic output and national innovation system, the so-called push toward a western-style knowledge economy (Rinne and Koivula, 2005; Holliday, 2012). This assumption is just as evident in newly developing research environments, such as those in the Middle East (Corbyn,

2010; Altbach, 2011a,b), as it is in more mature national research cultures. And the push to support business and industry by increasing university/industry linkages is occurring as much in middle- and lower-middle-income countries as it has in more developed countries (Baldini, 2006; Hershberg et al., 2007).

Your university is a major element in the so-called triple helix of relationships among university, government, and industry (Etzkowitz and Leyesdorff, 2000). So not only is there a local focus on your[3] research outcomes, but your research management is also of national and possibly international interest and importance. The economic and social viability of some towns and cities are dependent on the performance of the universities located there (Belkin, 2012).

However, leadership and management in universities, which will be discussed in detail in Chapter 5, has often been lackluster at best. Collegial and democratic self-governance has been the hallmark of universities globally over the centuries. Mintzberg (1979; 1983) classified universities as professional bureaucracies, and noted that they tended to be insular and received little external assessment or scrutiny. He found that senior university leaders were often appointed from within because of their teaching or research expertise, and not necessarily because of their outstanding vision, leadership, or management abilities. Many who have been appointed to leadership positions in universities have succeeded by being cautious and avoiding controversy, hoping to make few enemies (Southwick, 2012). Some individuals may even have been appointed largely because of what is usually termed "old-boy network cronyism" or nepotism, practices which have not necessarily ceased (Qiu, 2009; Denholm, 2010; Naghavi and Walsh, 2011).

Excellent senior management undoubtedly can be found in universities, such as documented at the University of Leeds (Donoghue and Kennerly, 2008) and the University of Arizona (Macilwain, 2007), but these instances are too infrequently identified and described in the published literature.

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3   In Chapter 6, I will discuss your personal research, but for the majority of this book, the term "your research" will refer to the research carried out by all the staff and students of your university or faculty unit.

In recent years, management of universities has come under increasing scrutiny, especially by way of external assessment and critique. More than 40 years ago, James Surface of Vanderbilt University wrote a short paper entitled "Universities aren't corporations: Why corporate management won't work." Surface (1971) considered five aspects of universities:
- ownership,
- the chief executive,
- the governing board,
- time frame commitment, and
- measurement of results.

His views may well have been persuasive 40 years ago. Even now, some component of the "university as citadel" or "silo" or "fiefdom" concept of academic self-governance is evident in most institutions, and in some it's thriving.

The teaching and research that universities conduct may benefit the moral, social, and economic aspects of society, and universities are publicly funded by governments for these purposes, but they are not necessarily responsible to society (Boulton and Lucas, 2008; Shellard, 2010; Rennison, 2011; Shaheen, 2011). Certainly, from the university's perspective, this situation, which has existed for centuries, could be seen as ideal. But today, and certainly even more so in the future, universities will be seen as corporations in the business of education. So-called "corporate management," " new managerialism," or "new public management" is becoming much more important in universities, although it will probably always be challenged by academics who believe that they are responsible to themselves, not to society (Deem, 2001; Derbyshire, 2010).

In fact, the financial value of quite a few universities on the world-wide list of 10,000 could put them on the Fortune 500 list of top global companies, and most universities are still largely government funded. The average university in Europe still receives about 80% of its funding from the public purse. Even in the United States, where the proportion is closer to 45% (Wolinsky, 2009; Fearn, 2010a), public support is still an extremely large amount of money. Government-

funded research performed in the higher-education sector as a share of gross domestic product in Australia, Canada, France, Germany, the United Kingdom, the United States, and Japan in 2008 was 0.48%, 0.39%, 0.37%, 0.36%, 0.32%, 0.24%, and 0.21%, respectively. And in 2012, the credit agency Moody's gave the University of Cambridge a AAA credit rating, much higher than the ratings of many countries (Matthews, 2012). So if your university is one of these major organisations, your president is effectively a member of a select group of global chief executive officers. And you bear responsibility for the research outcomes of this institution or one of its faculty units, which is a complex and difficult task to do well. As Taylor (2006a) said: *Research is an intensely personal activity, strongly dependent on the ideas and imagination of individuals or groups of individuals. . . . Research, therefore, does not lend itself to control and management. Yet, in the fast-changing competitive world of today's higher education, there are constraints that require the application of some sort of management framework.*

You will need to develop and use the management tools, skills, and expertise discussed in this book if your university or faculty unit is to achieve and maintain excellence. And although some argue that teaching undergraduates and conducting research are separate activities, they are intricately linked and interdependent. There is evidence that postgraduate students and research staff who teach become better researchers (Feldon et al., 2011). Yet teachers perceive researchers as enjoying higher status, better conditions of employment, and improved promotion prospects (Ball, 2007).

Many senior university managers, especially vice presidents responsible for teaching and learning, contend that research funding in universities is often supplemented or even fully supported by income brought in through undergraduate teaching. Using the Australian higher education sector as an example, in 2008, research expenditure represented 36% of all university outlays, with 40% of this research spending ($2.7 billion) coming from government non-research funding and student fees (Larkins, 2011).

The problem is that the costs of specific initiatives within a university are difficult to quantify accurately, if at all (Kocjancic, 2009). The many financial analyses conducted to show how much specific universities add

to society economically are open to reasonable criticism (Siegfried et al., 2008). The accuracy of the cross-subsidisation argument probably varies from university to university, but it is likely true to some extent because of the interdependence of teaching and research.

Universities often spend millions annually on marketing and communication, predominantly to highlight their undergraduate teaching profile (Thompson and Roberts, 2008). Even before the 2008 global financial crisis, public funding to universities had become increasingly tied to outcomes, consistent with the greater external critique and assessment of university performance.

There is no doubt that the global financial crisis has had and will continue to have marked effects on all facets of society, both directly (Eggins and West, 2010; Leading Article, 2010; Lopatto and Faler, 2011; Jha and Sample, 2011; Belkin, 2012) and indirectly (Lipsett et al., 2008; Wolinsky, 2009; Douglass, 2010; Leonard, 2012; Nicas and McWhirter, 2012; www.researchuniversitiesfutures.org accessed Feb. 10, 2012). These effects include major negative influence on university research. In 2009, American colleges with endowments larger than \$1 billion saw average 1-year losses in research funding of 20.5%, and even colleges with endowments less than \$25 million lost on average 16.8% (Stripling, 2010).

As stated in a report by PA Consulting group (2009) *Some commentators have likened the current combination of global recession, public spending constraints, and intensified competition to a perfect storm of coinciding shocks to the HE [higher education] system. We disagree. Life after a storm returns to relative normality, as UK universities have experienced before in the early 1980s and 1990s. What we see happening today is long-term and irreversible climate change in the HE environment.*

These changes are having an especially significant effect in European universities and may open up a continental divide in research and teaching (Abbott, 2011; Gibney, 2012). Certainly, significant reductions in government funding of universities, especially their research activities, are occurring globally. There are exceptions, such as in Sweden, although even there two-thirds of funding for university research will come from the private sector (Myklebust, 2012a). In the United Kingdom, reduced government funding has been accom-

panied by an increased focus on directing funds to certain research disciplines, such as medicine (Ramesh, 2011). This trend may offer some relief for researchers who work in selected highly competitive areas of medical research in the UK, but it is of little comfort to the tens of thousands of British university researchers who work in numerous other research disciplines affected by declining funding. This trend toward increasingly focusing research funds to achieve specific objectives, usually in line with strategic national priorities, is also happening in a number of European countries (European University Association, 2011).

Indirect factors relating to undergraduate teaching quality and overall quality as perceived in rankings may have as great an effect as direct factors on your continued research funding. As mentioned above, undergraduate teaching fees often cross-subsidise your research activities, and with decreasing government funding to universities, the competition for these fees has increased globally. A recent study on the Australian higher education system (Beaton-Wells and Thompson, 2011)—among the best national university systems in the world, ranking first of 17 OECD countries (Ederer et al., 2008) with close to half (19 of 38) of the country's universities ranked in the top 500 (Rowbotham, 2011) in the Shanghai Jiao Tong 2011 ranking—found that "*a direct correlation could be drawn between research quality and quantity, and higher than average international student fees that ended up subsidizing base research, especially in elite universities*" (Hare, 2011).

German universities have introduced a fee of up to €500 ($640 US) for each semester. Although it may be judged inequitable and overturned by some Länder (German states), the German fee is low relative to those charged in many countries, and its introduction was a significant initiative (Zora, 2007), which shows how some national governments are requiring universities to secure more of their own funding. "*The University of Melbourne depends on the $200 million a year it earns from foreign students, who make up 27% of the student body, to pay for new facilities and research scholarships and professional appointments*" (Slattery, 2009), and many British universities are planning to increase their foreign student numbers to boost their incomes following government cuts (Paton, 2011a).

Although fees for local students have risen globally, the justification for fee increases is not always clear, and some domestic students in Europe are challenging them (Myklebust, 2012b). This trend may be exacerbated as even world-renowned student-exchange programs run into major budget shortfalls (Osborn, 2012).

Fee increases are leading to greater student debt on both sides of the Atlantic (Shepherd, 2011), a situation that has been compared with the American housing mortgage crisis (Cohn, 2010). It's even been suggested that American student debt is actually encouraged by some colleges (Hacker and Dreifus, 2011), although perhaps not surprisingly, some senior university administrators may not share this view. At a recent annual policy conference, Illinois state higher education executive officers concluded that *"the typical student borrower is not in crisis."* But a report on the outcome of the conference (Kelderman, 2012) stated that: *while the level of student borrowing is not yet at crisis level, speakers said, there are problems with the number and amount of college loans, and serious policy considerations that need to be made, such as how to better inform students about the amount of money that they really need to borrow and what kind of loan they are receiving.*

Is it really only the students' problem? The US Consumer Financial Protection Bureau carried out a major study (http://files.consumerfinance.gov/f/201207_cfpb_Reports_Private-Student-Loans.pdf) of the private student-lending market and compared private student loans to the subprime mortgages that precipitated the 2008 global financial crisis. As a result, the Bureau urged Congress to consider letting borrowers discharge such loans in bankruptcy (Nelson, 2012).

Questions are also being asked on both sides of the Atlantic as to whether a university education is worth the substantial personal cost involved (Ferguson, 2011; Paton, 2011b; Williams, 2011). Margaret Spellings, secretary of education during the George W. Bush administration, has said"*People are up in arms. Tuition is going up, but an interest in reform is going up for the first time ever. . . . People are starting to ask the right questions that would have been heretical 5 years ago. Universities have enjoyed their ivory tower status of being above it all, but they're beginning to change, and it's happening worldwide*" (De Aenlle, 2010).

Despite this, however, a recent survey (Kiley, 2012a) found that

70% of American colleges and universities were still focused on increasing net tuition as a way to increase revenues, more than any other strategy. And in Great Britain, some have even suggested that universities are seeking the highest possible fees allowable under new government regulations, just so they don't look "second rate" (Paton, 2011c).

We know that when funding, especially research funding, is directly at stake, universities respond seriously, with the British Research Assessment Exercise (RAE) and now its successor, the Research Excellence Framework (REF), leading to many massive changes over the years they have been in operation (Pring, 1995; Kushner, 1996; Rogers, 2000; Thomas, 2001; Ashley and Rossiter, 2009; Slade, 2011).

The main point of this chapter is to provide evidence that the research outcomes of your university or faculty unit have a significant impact both directly and indirectly on your country's international prestige, which in turn attracts undergraduate students and leads to the likelihood of more funding for research from both internal and external sources.

This book will give you advice on the skills and techniques you will need to develop and practice to help you meet the international standard required by the university research activities you manage.

But first you need a plan.

CHAPTER 2

RESEARCH STRATEGY AND PLANNING

In fact, you need two plans.

The first plan you must work on is for your own academic career. You are currently a vice-president (research) or associate dean (research), and these positions usually entail contracts for defined periods of 3-5 years. So you must first decide where you want to be in 3-5 years. Are you going to reapply for your current position, apply for a position as a president or vice-president (research), move to a similar position in a more prestigious university, resume a full-time research position, retire, or perhaps move into a consulting career or some other position outside the academic environment?

Many options are open to you, but the academic environment is extremely competitive. There's a lot of opportunity, but it's up to you to decide how you wish to progress your career, and then plan how to get there. Universities with a strategic budget and a clear process for devising strategy are more confident that their strategic aims have been achieved (Langley and Green, 2009). And a major criterion on which your future career will be judged is how successful you've been in the second major area you must plan, the research productivity of your university or faculty unit.

Planning for your personal career is relatively straightforward, because it involves only you and perhaps your family, but the research productivity of your university or faculty unit involves input from the many staff and students who belong to it, as well as external stakeholders.

As previously described, universities have long histories of independence, often based around the concept of "academic freedom."

Academic researchers usually consider themselves free, within the limits of legality and ethics, to research whatever topic they choose. Based on this long history, many academics, especially prominent "high flyers," believe they should not be subject to central managerial processes they see as limiting their freedom and potentially constraining their productivity. Such academics may avoid work expectations such as teaching, submitting routine requests for information, appraisals, and committee work, but they can be extremely successful in their research (Kennie, 2009). Many academics don't consider plans for research productivity "imposed" on them as worthwhile, although this attitude is not uniform and is probably more prevalent in some research disciplines than in others (McInnes, 1998; Kolsaker, 2008). A recent study (Sa and Tamtik, 2012) of 27 faculties in 10 Canadian universities found that four even claimed research does not lend itself to planning; they saw pressuring faculty as a serious infringement of academic freedom.

An attitude that could be expressed as: "My research is great, so you need to give me lots of public money to spend on it without constraints or without my having to compete for it, so that I can do what I like" is not uncommon in academia. Although I have no doubt that if such funding were provided, some good research productivity would be achieved, unfortunately such "free" money is rarely available. When it is, because it is not based on competition, the projects it funds are not assessed for national or international quality, and possibly are not in the best interests of the university or faculty as a whole.

In fact, the way universities and their faculties have been structured over the centuries, with collegial focus on decisions having to be considered and ratified by committee or board after committee or board, could be seen as mitigating against any strategic planning, focus or increased productivity.

The Lambert (2003) review of British university/business relationships found that universities were slow-moving, bureaucratic and risk averse. This academic bureaucracy does help ensure that the greatest number of academics have input in all decisions made and that therefore the decision-making progress is more egalitarian and incorporates a range of perspectives. Focused, more managerial

strategic planning in universities may be seen by some academics as a negative way forward, because, just as in companies, with ever decreasing funding, some academics will "win" and others will "lose" (Rumelt, 2000).

A clear example of this type of strategic planning resulting in "losers" and leading to great angst at the national and disciplinary level is the response by more than 100 chemists to the strategic approach taken by the UK Engineering and Physical Sciences Research Council. In a planned response to expected budget cuts ranging up to 15% over the next few years, the Council announced earmarked reductions for funding in synthetic organic chemistry. This action resulted in a public letter sent by senior chemists, including six Nobel Laureates, to the British prime minister (Jha and Sample, 2011).

I have no doubt that unfortunately over the next few years most research disciplines and universities will face similar situations. You may be the one toward whom the angst is directed, with comments concerning your management ability, or lack of it, sent to your president or dean. It is therefore essential that you take every opportunity to exercise the research management strategies described in this book in order to reduce and ideally eliminate this possibility.

In addition, as Zagotta and Robinson (2002) state: "*Many executives shy away from circulating their strategies because it's time-consuming and difficult. … The failure to communicate strategy widely and effectively can create the kind of suspicion that undermines team effort and guarantees the failure of the strategy itself.*"

So why is it essential that universities and their faculties have well-formulated and well-disseminated strategic plans? Because they provide a sense of direction and purpose, promote research-oriented scholarship, and give substance to your university's mission. Public dissemination of your strategic plan also informs the public, who ultimately fund you, and other key stakeholders, such as the research funding agencies you wish to impress. A good example here is the corporate and strategic plan of Warwick University in the UK. (See http://www2.warwick.ac.uk/services/gov/corporateplan/cps_2010.pdf accessed 28/12/2011.) Some senior managers in developing universities also have acknowledged the value of planning. Chris

Nhlapo, deputy vice-chancellor for research, technology innovation and partnerships at the Cape Peninsula University of Technology in South Africa, said: *"universities should develop research strategies to sustain academic and professional reputation in a knowledge-based economy and to attract and retain high-quality staff and students. The strategies must make optimal use of the available resources . . . The law of physics says if you position everywhere, your momentum is zero. Universities must also align constitutional competences to national strategies"* (ResearchAfrica Team, 2010).

Failure to plan is planning to fail.

But good strategic planning is not easy. And over planning can be a challenge. Various other forms of planning, such as strategic dynamism and scenario planning, have also been advocated for academic pursuits (Anderson, 2012), but the overall objective is to think and manage strategically, not to blindly engage in strategic planning for the sake of strategic planning (Nickols, 2011). *"Most executives do not know what all the elements of a strategy statement are, but with a clear definition . . . formulation becomes infinitely easier because executives know what they are trying to create . . . and implementation becomes much simpler because the strategy's essence can be readily communicated and easily internalised by everyone in the organisation"* (Collis and Rukstad, 2008).

Newton (1992) classified the university into two distinct cultures, the "corporate community" and the "community of scholars," and identified planning strategies to encompass the nature of both. Although the culture of a university is much more complex than that, it is important to bear in mind that your planning should ideally cover both ends of this spectrum. It is most likely that you do have experienced personnel available to assist you. Your university probably has a section or unit for policy and planning, or in larger universities you may even have such personnel attached to your office. And even if you don't, many companies such as mine (Research Management Services International) are available as consultants to assist you in your strategic planning. If you can obtain "buy in" from the many university boards and committees that provide input into its formation, your plan is much more likely to be "owned" by the researchers in your university or faculty unit, and therefore much more likely to succeed.

But your university has already laid general ground rules for your planning. Every university has a mission statement, which may also have core values attached to it. These statements are usually defined by the senior board, council, trustees or senate of your university (hereafter referred to collectively as your council) and are widely and publicly available. The challenge in an ever more global academic environment is that most mission statements and core values are very similar and are therefore relatively non-informative as a way of defining your strategic direction. They all mention, in wording that ranges from a few lines to a paragraph, outstanding teaching and learning, the construction and dissemination of research and scholarship, and collaboration and innovation with industry and society, to the highest international standards. In fact, mission statements are often so general and *"wishy-washy"* (Brown, 2009) that they do not mean anything. Lokman (2012) described the slogans that describe business schools as *"grandiosity run amok."* Based on their experience across a range of company types, Collis and Rukstad (2008) believe that few executives could summarise their company's strategy in 35 words or less, or even in a similar way to their colleagues.

So you probably have a reasonably broad area in which to work. "Strategy" has been defined in many different ways (Nickols, 2010). For the purposes of this book, I will use Nickol's definition: *"Strategy is a term that refers to a complex web of thoughts, ideas, insights, experiences, goals, expertise, memories, perceptions, and expectations that provides general guidance for specific actions in pursuit of particular ends."*

The strategy you develop as a vice-president (research) at the central university level will not only reach a higher policy level than the one you develop as associate dean (research) at the faculty level, but also, university strategies are usually designed to cover the longer 3- to 5-year term, while 1- to 3-year plans are more appropriate at faculty level.

So why is it essential that you do strategic planning and that you do it well? The answer is that we know it works at all levels, from small research groups (Van der Weijden et al., 2008) to larger departmental groups (Schuetzenmeister, 2010) to universities (for example, ETH the Swiss Federal Institute of Technology, Litta, 2011) to coun-

tries such as the UK (the RAE has been associated with an increase in UK research performance, Adams, 2002) and probably Canada also (Sa and Tamtik, 2012).

The next critical questions are: What is strategic planning and, more importantly, how do you do it well? Perhaps we should start with what strategic planning is not. Porter (1996) believes: "*The root of the problem is the failure to distinguish between operational effectiveness and strategy. The quest for productivity, quality, and speed has spawned a remarkable number of management tools and techniques: total quality management, benchmarking, time-based competition, outsourcing, partnering, reengineering, change management*". For background on these, see Webster et al., (1989). Commonly, strategic planning, strategic thinking, and strategy making are all thought to be similar, but they are not. Strategic planning is not strategic thinking, and in fact strategic planning often spoils the ability to think strategically, leading managers to confuse the formation of a real vision with the analysis of numbers only (Mintzberg, 1994). However, strategy formulation and implementation are a major part of formulating a vision, and necessitate your gathering and monitoring information from multiple internal and external sources. The analysis of numerical data is an extremely important part of your strategic thinking, and many tools exist to assist you.

Unlike universities, businesses tend to have good quantitative indicators of productivity, but not good qualitative indicators. In fact, I think the reverse is probably the case for universities. To overcome the problem in business, Kaplan and Norton (1992) developed the balanced scorecard for use as a strategic management system (Kaplan and Norton, 2007). This scorecard puts strategy and vision, not control, at the centre, which establishes goals and assumes that people will act to achieve these goals. The scorecard includes four perspectives—financial performance, customer knowledge, internal business processes, and learning and growth—and bears strong similarities to *hoshin kanri*, the organisation-wide strategic planning system widely used in Japanese companies (Witcher and Chau, 2007; SkyMark Corporation, 2011). Parmenter (2010) believes two more perspectives—employee satisfaction and environment/community—should also be added.

While the scorecard approach was clearly designed for companies, because you are responsible for research productivity in a knowledge-generation company, I believe universities can benefit from many advantages if they at least consider these management strategies and techniques. Franco and Bourne (2003) reviewed published studies, although based again on industry performance, and also carried out their own survey to identify the critical factors that enabled organisations to manage through measurement. I believe that these factors provide a good background for consideration of performance measurement and its use in universities. Indeed, the University of Leeds has documented its use of the balanced scorecard to assist its transformation into a world-class institution (Donoghue and Kennerley, 2008).

But we must continually bear in mind that strategic thinking is an iterative process, and planning must be continuous and not a static process. Although not every university has a clear, focused and accepted research strategy, in most organisations, there is too much strategic planning and not enough strategic thinking (Nadler, 1994). A recent survey of a representative group of 20 English universities found that confidence in the effectiveness of having a research strategy was at best inconclusive and at worst very low among the 19 institutions that did have a research strategy. Only four felt they had achieved their strategic research objectives, and the research strategies of most of the other universities were under review or likely to be reviewed in the near future (Langley and Green, 2009).

But as I have discussed, the strategic plan you develop as vice-president (research) to cover the next 3-5 years of university productivity will be a higher-level plan than the one developed by the associate deans (research) who will cover the next 1-3 years of faculty research productivity. Ideally, while both plans are detailed and clear, there should be enough flexibility to enable updates or minor changes in direction should urgent attention be required. The challenge is that the academic world does not stand still, and although your strategic plan may be appropriate today, your competitor universities may be moving at an even faster pace than your university, resulting in greater research productivity. And as described in the introduction to this book, this

situation may lead not only to a reduction in your research activities, but also to changes in the number and quality of undergraduate students attracted to your university. Your national and global rankings and therefore your worth in terms of your government's assessment and recognition, may also suffer. Your strategies should be crafted, therefore, to ensure that you maintain a competitive advantage over your peer universities (Pilbeam and Jamieson, 2010).

The full details and amount of information needed to craft effective research strategic plans are too voluminous to include here, so let me just reiterate the essential need for such plans. Keep in mind that they are dependent on the current research culture of your organisation (university or faculty unit), and the amount of detail they require can change over time as the sophistication of the university's research culture changes. Also, the level of detail will increase the further "down" the university structural hierarchy you go.

Strategic planning is usually "top down," but can also be "bottom up" or an "integrated" mix of both. In an ideal top-down situation, the university council will prescribe general outcomes for the next planning period, and you will have the responsibility as vice-president (research) to prepare a detailed university-wide plan to achieve the research outcomes desired. This task is usually accomplished in consultation with senior staff in the faculties and may involve many meetings, a number of written versions, and much compromise in order to develop a plan your university research committee and then academic board/senate are willing to sign off on.

Of course, some universities follow a bottom-up approach, gathering data on what the departments can achieve for planning over the next 3-5 years. Often the best research policies—policies that are more widely known, accepted, and agreed to—come from a mixture of top-down and bottom-up approaches. What you do will depend on the research culture of your faculty and university, but you must know what you need to do and how to project manage and achieve an appropriate research strategic plan. (See Chapter 3.)

This plan will then be assessed by the faculties, which will prepare their plans based on what they can or should be able to achieve during the planning period as their part of the overall university plan. As

associate dean (research), you will have responsibility for these out-comes in your faculty unit; you will also be responsible for ensuring that schools/colleges and departments plan their goals and desired outcomes such that the total sum of all these "lower-level" plans will allow the university to achieve its overall goals. Unfortunately, I be-lieve that Hemlin (2006) was correct when he stated that "*a typical attitude in academia is . . . that management is not needed in research, be-cause researchers must follow their own minds and organise activities freely by themselves without considering manage*ment," and you must achieve in this environment.

As mentioned above, achieving a widely understood and accepted research strategic plan is not a trivial exercise. Strategic planning should be an iterative and continuous process; still, a new plan is usually produced every 3-5 years. The main reason for doing this is to facilitate the continual assessment of each organisational element's research performance compared with its plan. And you are wholly responsible for this at the university or faculty level. That's why it's essential that you distinguish between strategic planning and strate-gic management, which should be an ongoing process for reviewing and maintaining strategic momentum at all levels in the university.

For example, are your high-quality publications, PhD student completions, and research grant-funding successes per department and faculty unit on target? If not, why not? What factors were detailed in the plan to ensure that these targets were achieved? Do you focus on increasing productivity of only selected staff who already possess a high level of expertise, or do you focus on improving the expertise of less experienced staff? Or do you have the resources to pursue both strategies, or only a selected mixture of both? Do you increase high-quality publications and grant success by internal review of all submissions, and cull those not thought to be of sufficient excellence? Who decides? On what basis do you cull? Do you assign outstanding internal staff to run training courses, employ consultants, or invite external journal editors and staff of government funding agencies to assist? These are all real and possible strategies, and their appropriate-ness for your university will depend on a range of factors, including organisational culture and agreed performance indicators.

Whatever plan you choose, you must test it for critical flaws. Although there is no guarantee that a flawless plan will eventually lead to desired outcomes, it's clear that a plan that's flawed, with respect to consistency, consonance, advantage, and feasibility, is highly unlikely to achieve its objectives (Rumelt, 2000).

But having a well-developed, informative and detailed strategic plan, which has resulted from your strategic thinking and strategy-making, is just the start of the process. Your plan must be communicated widely and transparently throughout your university, and ideally then accepted and acted upon by all staff and ideally students. Appropriate communication is essential in every university. (Development of a communication plan will be discussed in Chapter 7.) A recent survey of 1,075 business leaders found that 72% thought communicating strategy in clear terms is a top priority in execution, because failure to communicate strategy causes frontline workers to invent their own strategies (Martin, 2010a). Compounding this issue, very senior researchers may not wish to be involved in strategic management, as they could see it as restricting their academic freedom.

Having developed a plan, tested it for flaws, and then communicated it appropriately, you must execute your plan. For the sake of discussion, I am considering strategic planning as separate from execution, and indeed, although this distinction has become firmly established in management thinking over the last 10 years, drawing a line between strategy and execution almost guarantees failure (Martin, 2010b). In fact, Charan and Colvin (1999) found that an estimated 70% of CEOs fail because of their inability to execute— not getting things done, being indecisive, not delivering on commitments. Implementation of organisational change is one of the more important yet least understood skills required of successful leaders, and success depends on the expertise, trustworthiness, and credibility of the person trying to implement the change (Armenakis and Harris, 2002; By, 2007). This requirement is not restricted to the private sector; it is even more important in higher education.

"There are high risks associated with the execution (rather than development) of strategy. These risks are amplified when dealing with the execution

of strategy in the university sector, where strategies and change are notoriously difficult to implement due to cultural, leadership, diversity, scale, and governance factors" (Donoghue and Kennerley, 2008).

Turnball and Edwards (2005) focused on how a multi-college higher education institution failed in its transformation efforts and found that organisational trust, empowerment, and identity were key inhibitors of change. Consultants were hired to make appropriate recommendations for change, but even with this input, neither the council nor chancellor ever followed up. Of course, over-reliance leading to a dependence on consultants, leaders not displaying the desired new behaviors, and leaders being unclear themselves about the objectives can be just as problematic (Greaves and Sorrenson, 1999).

Different types of institutions require different strategies for allocating resources. It is one thing for central administration to decide on the principle of selective cutbacks or reallocation of resources, but plans to phase out faculties and programs are difficult to impose on complex and decentralised universities. Your decisions will not be made in a vacuum, but in a very political context (Hardy, 1990).

A major problem is that there's usually too much focus in universities on debating and discussing what should change, and far too little focus on making it happen (Scott et al., 2010). This occurs despite the fact that the processes necessary for successful strategic planning and change management are extremely well documented. I have listed examples of the findings of seven major studies in this area in Table 1.

One of the more important factors that ensures the success of organisational change is organisational commitment. The more staff identify with their organisation, the higher their commitment to the organisation, and the greater their willingness to accept organisational change (Vakola and Nikolaou, 2005). Your major challenge in this respect, which will be further discussed in Chapter 5, is that university staff identify more strongly with their research group or department than their faculty or university. What will help with your efforts to manage change and convince staff to accept your strategic plan is painting a positive picture: "*Here is why change will be good*" rather than "*This is why we need to change*" (Armenakis and Harris, 2002).

Table 1. Major criteria in strategic planning and change management					
Kanter et al.,1992	Kotter, 1996	Armenakis and Harris 2002	Luecke, 2003	Vakola and Nikolaou 2005	Kaplan and Norton, 2008
Analyse the organisation and its need for change		First phase Readiness – staff prepare for change and ideally support it	Mobilise energy and commitment through joint identification of problems and their solutions	Participate in planning	
Create a shared vision and common direction			Develop a shared vision of how to organise and manage for competitiveness	Good and effective work relationships	Develop the strategy
Separate from past structures and routines					
Create a sense of urgency	Establish a sense of urgency				
Support a strong leader	Create a guiding team		Identify the leadership		
Line up political sponsorship				Top management commitment	
Craft an implementation plan	Develop a vision and strategy	By (2007) adds an implicit strategy conveying the importance of continuous change management	Focus on results, not activities		Plan the strategy
Develop enabling structures		Second phase Adoption – change is implemented and staff adopt new ways of operating	Start change at the periphery then let it spread to other areas without pushing it from the top	Allocation of resources	Alignment - Organisation - Financial resources - Human capital - IT - Process
Communicate, involve people and be honest	Communicate the change vision		Institutionalise success through formal policies, systems, and structures	Effective communications	

	Empower staff for broad based action	Third Phase – Institutionalisation – maintains the adoption period and reinforces changes until they become internalised and the norm			
	Generate short term wins			Participate in implementation	
Reinforce and institutionalise the change	Consolidate gains and produce more change		Monitor and adjust strategies in response to problems in the change process	Rewards Training	Execute the strategy - Communi-cation - Quality management programs - Initiative management - Best practice sharing
	Anchor new approaches in the culture				Feedback and learning

Effective completion of a strategic plan that has been well communicated, widely accepted and agreed upon requires strong skills in project management.

CHAPTER 3

PROJECT MANAGEMENT

Project management involves many aspects of management that are discussed in greater detail in their own chapter in this book. They are interrelated, and to be an effective project manager, you must practice all of them.

Although strategic planning and organisational change are ongoing processes, each major individual project should be seen as worthwhile, because staff commit themselves more to projects they consider justified and possessing high perceived value of change (By et al., 2008).

Project management is a clearly recognised research discipline in its own right, with national professional bodies, such as the US-based Project Management Institute Inc. (PMI), and British-based Association of Project Managers (APM), devoted to it. Project management constitutes a significant amount of the basic theory taught and practiced in technical degrees such as engineering, operations research, and optimisation. I found in a small global survey I conducted in 2009 that more than 95% of vice-presidents (research) came from Science, Technology, Engineering or Mathematics (STEM) or information technology backgrounds. So many of you may have been accustomed to using project management theory and techniques in your earlier research career. It is also essential that you practice them now in your senior management role.

The associate deans (research) reading this will have come from one of a diverse range of research backgrounds consistent with the profile of your faculty unit, so you may not be as familiar with project management techniques. And for those of you from humanities, arts, or social science backgrounds, they may be quite new to you.

A great deal of literature covers all aspects of project management, with some, as mentioned above, covered under topics such as "leadership," "risk management," and "communication," but there is also much documentation on project management as a subject in its own right. Perhaps the best examples of these are publications by the two professional associations mentioned above. They are the 5th edition of the APM Body of Knowledge (APM, 2006) and the 4th edition of the Project Management Body of Knowledge (PMBOK Guide – PMI, 2008). In fact, the latter is an approved American National Standard ANSI/PMI 99-001-2008 and a foundational reference for PMI professional development programs and certifications. You may also hear about PRINCE2 (PRojects IN Controlled Environments), a process-based method for effective project management (www.prince2.com). PRINCE2 is a business-focused de facto standard used extensively by the UK government. In addition, I personally have found the project management series of six books written by Rory Burke to be very informative. In his most recent book Burke, (2010) "*explains how to use the latest project management planning and control tools and techniques used by the planning software, the PMBOK 4ed and the APM BoK 5ed*."

In this book, I will attempt to acquaint you with the major aspects of project management you must understand to maximise your research management in a university environment.

So what is project management?

Given the vast literature on project management, it is perhaps not surprising that there are many definitions of the term, but as the APM president has said, "*At its most fundamental, project management is about getting things done*." The PMI states that "*project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements*." Above all, project management is all about the process of getting a project completed on time, within budget, to the desired level of quality, and in a university environment where it is almost unheard of to be able to please everyone, to the satisfaction of as many stakeholders as reasonably possible.

A discussion on project management naturally begs the question, "What is a project?" In a university research environment, this is an extremely important question, because much of what vice-presidents

(research) and associate deans (research) do is more operational activity than project management, and project management needs to be differentiated from management of a program.

A program is a way of managing change—it describes the activities that meet specific objectives and can be used to introduce new or existing products and services. *It is a unique, transient endeavour undertaken to achieve a desired outcome.*"

So regular activities such as planning, preparation, chairing, and following up after the monthly meeting of the university or faculty research committee are operational activities. But the preparation of a major strategic plan for the research activities of the university for the next 5 years or the faculty for the next 3 years would be a significant project that could certainly benefit from a project management approach.

Other programs requiring management, which would extend well beyond straightforward projects, might include your role as lead author, among many from several universities, of a major analysis and report for your national government on the public funding of university research for the next decade. Another example might be your role as lead author of a major disciplinary report to your national professional body on its needs to convince your government to ensure the long-term viability of your discipline. Managing a project typically includes: identifying requirements; addressing the various needs, concerns, and expectations of the stakeholders as the project is planned and carried out; and balancing competing project constraints, such as scope, quality, schedule, budget, resources, and risk.

A number of tools and techniques are available to assist you in your project management. These include mind mapping, force field analysis, the Gantt chart, the RASCI chart and management by objectives. I have included examples of these tools, applied to the university environment, as Appendices A-E. A popular choice among the many commercially available tools is Tom's Planner (www.tomsplanner.com), which is available online and is described as truly easy to use project planning software."

The PMI suggests that project management is accomplished through the appropriate application of logically grouped project-management processes comprising five process groups:

- Initiating,
- Planning,
- Executing,
- Monitoring and controlling, and
- Closing.

And Appendix F of the 5th edition of the PMBOK Guide lists 9 knowledge areas important for project management:
- Integration
- Scope
- Time
- Cost
- Quality
- Human Resources
- Communication
- Risk
- Procurement

Project management came out of engineering practice and has been adapted to many fields since. However, even when university research projects are well planned, they rarely comply with the specific guidelines and formal requirements of traditional project management.

I believe the approach recommended by Baker and colleagues (2003), suggesting the 12 "golden rules" of management success listed below, is more easily applied to your research management activities and allows you to practice key principles of project management without requiring a detailed level of documentation.

1. **Gain consensus on project outcomes.** You must obtain "buy in" from whomever you report to and the people who are responsible for the research outcomes you are responsible for. These include your president or dean, your academic or faculty board, and senior university research leaders.

2. **Build the best team you can.** You likely already have staff in your own office and your research office who can be complemented by the central university policy and planning office for the length of

the project. Also, depending on how much change you are trying to drive, your project team can be supplemented by external project management consultants, who should ideally have had previous experience working with or, even better, in universities.

3. **Develop a viable comprehensive plan and keep it up to date.** Even though your plan may not require the level of detail necessary to build a bridge or skyscraper, it must be detailed enough to convey your ideas and strategy to all those you need to convince of its worth, and, more importantly, to those who will achieve its research outcomes. And because the environments in which universities operate change quickly, you must adapt your plan as needed and keep it current. Remember that changes may need to be signed off by a university committee and probably by committees that may only meet infrequently.

4. **Determine the quantity of resources you'll really need to get things done.** In the current and increasingly constrained economic climate, you may not have enough qualified people to assist you in your management of a specific project. Therefore, it's essential that a request for staff for the project be timely, justified, and linked to a business case justifying the benefits of the investment.

5. **Have a realistic schedule.** Although you may be given a tight deadline by which to complete your project, it's essential that you state your case for what can be realistically achieved in the given timeframe, again remembering that things tend to take longer in universities than in other environments.

6. **Don't try to do more than can be done.** It's essential to accurately estimate the current quality and quantity of research outputs and the ability to test your capacity to improve them, so that you don't promise more than you can deliver. For example, you may find that it's possible to increase the number of your high-quality refereed publications by 1.4 but not by 2 in the next 3 years.

7. **Remember that people count.** People are more likely to be productive and also come on board more readily when you continually remember that they are critical to the success of your project. This level of people concern must be sincere, as research staff can easily see through a perfunctory management approach and are

likely to be alienated by it. Your engagement must apply equally to staff at all levels.

8. **Gain formal and ongoing support of management and stakeholders.** As stated earlier, universities are not organisations conducive to rigorous project management. Therefore, while it's essential to obtain management agreement on the project outcomes as described in the first golden rule, it's also imperative that stakeholders support and agree to your project. This is a two-way process, and you must provide regular reports on your progress.

9. **Be willing to change.** While always keeping your original project goals in sight, unexpected events may occur that necessitate changes to your plan. You must be prepared to communicate those circumstances to staff and negotiate the proposed changes with them. In a university environment, changes to a project can occur for a number of reasons, such as departure of key staff, unsuccessful funding applications, or changes in government funding policy.

10. **Keep others informed of what you are up to.** You must constantly consider that staff who will carry out the project and those who sign off on it need to be aware of your progress. These stakeholders will include the president, other senior research managers, your dean, academic/faculty board, senior research leaders, and all members of your implementation team.

11. **Be willing to try new things.** Projects vary in complexity and size, so you must be able to adapt your project management tools and techniques to each new situation.

12. **Become a leader.** Leadership in the academic sphere is so important that it's the subject of a separate chapter in this book. Just as good leadership is essential in all facets of university life, it is even more critical in the project management of research. The other 11 golden rules of project management depend on your leadership.

Although your project management skills and expertise are critical to the success of your research outcomes, your task will be easier if you are working in a university that is well organised, structured and governed.

CHAPTER 4

ORGANISATION, STRUCTURE AND GOVERNANCE

I cannot remember how often during my career, in discussions with senior academics and staff of fellow national grant-funding agencies, I have heard statements such as: "If only we had a clean sheet of paper to start fresh on this challenge from a new uncluttered structural perspective."

Universities are founded on long histories of well-established structures. I discussed the history of the "traditional" university structure in the introduction to this book. The point here is that as a senior research manager in a university, despite what you would like to do, you are part of a highly structured organisation, and you have to work within that structure. All too often, people assume that the way to resolve problems caused by poor processes is to restructure faculties, schools, and departments. Restructuring usually leads to the formation of fewer, larger academic units, often for "improved management and cost efficiency" (Morris, 2002; Taylor, 2006b; Valentine and Constable, 2007; Bolden et al., 2008). Many universities are currently under pressure because of decreasing funding and increasing global competition (Turnball and Edwards, 2005). In some institutions, drastic action has been required because of major funding reductions (Hardy, 1990).

The "traditional" western university model is so well entrenched that when a new university is formed anywhere in the world, it is invariably based on that model. Examples include massive investment in Saudi Arabia in government-funded universities and private universities established on the Indian sub-continent. But there is great confusion as to what the elements in this model are called.

In an annual report on the top American universities, Lombardi and colleagues (2002) said: "*American universities have a remarkably imprecise vocabulary to describe their activities. . . . Further complicating the nomenclature, we have the terms "school" and "college." . . . The academic meaning of these terms also varies from institution to institution*".

While Lombardi and colleagues addressed only American universities, their comments can be accurately directed at university systems in most countries. Similarly, a comment made in their report that "*equal variety attends the designation of campus officers above the level of dean*" can be made globally. An analysis of UK universities and their executive officers (Smith et al., 2007) noted that in 2005, 281 senior managers in pro vice-chancellor and equivalent posts used one of 23 different titles. This is a point I made in the introduction regarding choosing here to use the designation vice-president (research) from among the many titles used around the world.

All universities have a basic Academic Organisational Unit (AOU) called a department, school or college, usually depending on their size, breadth, depth, and focus. A number of AOUs may then make up a larger unit, and several of these may form a faculty (Hammond, 2004). The university then comprises a number of faculties. Interestingly, however, despite the great diversity and terminology used globally, there is a common "core" to the structure of most universities. For the sake of discussion, I am calling the smallest AOU a department (for example, microbiology or statistics or gender studies), several of which make up a school/college (for example, biology or mathematics or cultural studies), several of which make up a faculty (for example, science or engineering or social sciences). A general example of this structure is contained in Appendix F, and I will use this terminology throughout this book. An important point to reiterate here is that the icon box identifying the vice-president (research) does not fall under the direct supervision of the president/dean/head of school/head of college/head of department, and so I am assuming you have no direct official supervisory role in relation to the staff who perform the research for which you are responsible.

The point is that no matter which structure your university uses, or what your AOUs are called, or how many and how complex they

are, you are responsible for the research outcomes and outputs of several complex faculties (as vice-president [research]) or several complex schools/colleges (as associate dean [research]), without directly supervising the staff who do the research. Exercising that responsibility requires skills and expertise that this book is intended to acquaint you with. The structure of your university will largely influence how you perform in your role as vice-president (research) or associate dean (research). The complexity and size of your AOUs matter to you for many reasons.

The major challenge is that each of these organisational elements is usually its own cost centre. This means its supervisor, for example, head of department, head of school/college, and dean, has his or her own budget allocation, which is separate and distinct and, most importantly, not under your control. As noted by Smith et al., (2007), the majority of people at the level of vice-president in the United Kingdom have no budget and no direct line-management responsibilities, although they are responsible for policy and strategy in their portfolio areas—in your case, research. You are required to manage and improve the research output of dozens or hundreds of staff over whom you have no direct budgetary or official supervisory control. You also have to work within a complex governance framework of rules, policies and procedures. This is why your leadership is so important to you and your university or faculty unit, which is the subject of the next chapter.

University governance is critical to your ability to perform your leadership role. So what is within-university governance? The Organisation for Economic Co-operation and Development (OECD) Principles of Corporate Governance (OECD, 2004) apply to all types of organisations. Chapter 3 of the OECD Reviews of Tertiary Education (OECD, 2008) sets the right course for steering tertiary education. Appendix II of the Lambert review (2003) of business-university collaboration is a draft code of governance for a university governing body. The World Bank in association with the Marseille Centre for Mediterranean Integration released a report (Jaramillo et al., 2012) that details the implementation, data analysis and validation of a university-governance screening card piloted in Egypt, Morocco,

the West Bank, Gaza, and Tunisia. Although the aim of this card and an accompanying website (www.cmimarseille.org/highereducation/) is to introduce a culture of benchmarking universities in the Arab world, the card and report would be of great value for most universities. The University of Oxford (Governance Working Party, 2006) defines governance as: *"the processes of decision-making within an institution. It thus holds implications for the administrative organisation, which enables an institution to set its policies and objectives, to achieve them, and to monitor its progress towards their achievement. It also refers to the mechanisms whereby those who have been given the responsibility and authority to pursue those policies and objectives are held to account. The adoption of sound principles of governance helps those charged with taking important decisions to identify, assess and manage institutional risk, and to set up sound systems of financial control. Finally, a well-designed structure of governance will serve all members of the institution; but it will also serve the public by virtue of what it does to render an institution accountable to the outside world"*.

The University of Oxford then outlines a set of principles that inform governance arrangements, the most fundamental of which—accountability—is made up of democratic accountability, financial accountability, internal and external accountability. I believe that these factors should be such important components of your own governance strategy that I will discuss them in further detail under their own chapters on leadership, research integrity and ethics, and risk management. Similarly, audits, dealing with complaints, codes of conduct, and compliance are also major foci of governance; I will address them in Chapter 10 on research integrity and ethics.

Many academics see the focus on governance as intruding on their academic freedom. It is highly likely that as Hemlin (2006) suggests, there may be academic attitudes that see governance policies and principles as a burden, rather than as good practice in research. It is your role to ensure understanding, acceptance and compliance with your university's governance protocols to keep research within the bounds of best practice.

Unfortunately, the increasing number of cases that become public knowledge means that globally some academics exceed the boundaries of what is acceptable academic conduct. Specific cases and how

to deal with them will be covered in Chapter 10 on research integrity and ethics and Chapter 11 on risk management. However, here it is worthwhile saying that cases of plagiarism, falsifying research results, misuse of funds, inadequate or misleading reporting, bullying members of a research team, or inappropriately claiming credit or not giving due credit to others, are serious matters. It is your responsibility to minimise the likelihood of these cases arising and to deal with them promptly and competently when they do.

Good governance at all levels is essential to ensure that not only does the university perform to its optimal capacity in all areas, but also that academics conform to the global principles of good ethical practice. You are almost exclusively focused on research (although as described in the introduction, research in a university is not carried out in isolation from teaching and community service), so you are responsible for the research carried out by all members of the university.

In her OECD report, Connell (2004) identified four levels of governance in universities:

1. **Institutional Governance** at the level of the university council/board of trustees or governors, the uppermost level in the university. This body is usually composed of representatives from the worlds of business, public service, and politics, plus university staff and student representatives. The president and chair of the senior academic forum, commonly called the academic board or senate, are usually *ex-officio* members. This forum is responsible for the overall running of the university as a whole, and is accountable to the public and government. It is chaired by an individual whose position is similar to a non-executive chairperson of a private company. In the British system, this person is usually called a chancellor, and in the North American system, he or she is usually the president of the institution.

2. **Institutional Executive.** Here we have the president/vice-chancellor/rector, who is responsible to the council/board of trustees/governors, and various vice-presidents and directors of major non-academic elements, such as finance, human resources, etc. As vice-president (research) you have the major role for management of the whole university's research effort.

3. **Faculty/Department/Research Centre.** These designations refer to the cost centres I mentioned previously, which are responsible for research within disciplines/fields of research, as well as for teaching and graduate studies. As associate dean (research), you are responsible for the research outcomes of your faculty, although major research centres, such as those I described in the Introduction, may report directly to the dean or even the vice-president (research).

4. **Level of Separate Research Activities.** Here lies responsibility for each different project/program, whether individual researchers or research teams. Perhaps the most widely accepted definition of a research group describes at least three people working together for at least 6 months, over an expected time span of at least 1 year, with at least one leader, usually a professor (Rayner et al., 2010; Schuetzenmeister, 2010) who is significantly involved in the work of the group (Andrews, 1979). This level of governance is not an official part of the supervisory structure of the university, so I did not mention it in my discussion of AOUs above, but it is the major building block of university research.

Most likely, governance levels 1 and 2 sign off on the policies and delegations within which you have to operate, including such decisions as who can authorise spending money for research purposes, what is the process for terminating a PhD candidacy, and the relevant official criteria for designating a university research centre. Through your membership in the appropriate university and faculty committees, you will have the opportunity to influence the content of these policies, which you will also have to implement.

All levels of a university are covered by policies and procedures, perhaps even regulations, on how each element of the university should ideally work—cooperatively and synergistically. This makes up the university's governance. And in fact it is worth highlighting that even governments have similar policies and procedures on how all their universities should operate. In fact, public universities are founded on national or state government statutes that dictate what the university can and cannot do.

More countries are moving from a control model, in which the government seeks to control its universities, to a supervisory model, in which they monitor and regulate all aspects of their relationship with their universities (De Boer and Goedegebuure, 2007; Toma, 2007; Fielden, 2008). These changes increase the universities' administrative and reporting burden without an associated increase in real autonomy. The governance of research within a university depends on the national funding and organisational models in place, and many countries, such as Japan for example, document what is expected of their universities (National Institution for Academic Degrees and University Evaluation, 2009).

Fielden (2008) cited Australia, Denmark, and the United Kingdom as three countries that have led the way with guidance on good university governance. As already discussed, however, many academics in Australia and the United Kingdom think their universities are far too heavily regulated by their governments.

You will, of course, be assisted in your research governance role by internal university committees. As vice-president (research) you will probably chair the university research committee, and as associate dean (research) you will likely be a member of the central university committee representing your faculty, and also chair the faculty research committee. The university governing council usually delegates its authority in these areas to such committees and others within the university that are frequently composed of staff, students, and occasionally alumni and senior external appointments (Kaplan, 2004). In some cases, these committees can become large and unwieldy, and at least one university, the University of Exeter, has introduced a "dual-assurance" concept of governance (Weale, 2010). This has led to more executive decision-making by triumvirates of selected individuals, supplemented by temporary task-and-finish groups in place of committees, thereby turning the rhetoric of entrepreneurialism into reality without compromising the accountability the council requires.

But such drastic rationalisations are not common and are often considered unsuitable for the culture of many universities, so the academic board/senate and faculty board will continue to have input to key documents, such as the university research strategic plan,

the faculty research strategic plan, school/college research strategic plans, and even department strategic plans, depending on how big your university is. These plans usually cover a 3- to 5-year period, but should be constantly monitored and updated as necessary.

These documents are all a major part of a within-university governance system and specific to your university at a given time. In some cases, academics may see governance structures as providing an additional layer of unwanted bureaucracy. An example here is the documentation prepared by the Academy of Medical Sciences at the invitation of the British Government to review the regulation and governance of health research involving human participants, their tissue, or their data (Working Group, 2011). Although this document may be seen as very useful for the governance of research by medical researchers and medical faculties, it has come under criticism by social scientists (Jump, 2011). I give this example to highlight the fact that although they may not be considered perfect by everyone, there are many such external governance reports and guidelines, which you can use to further inform your internal governance documentation, especially when these documents are fostered by your national government.

You may also be aided by various government or professional governance documents provided by external agencies. Middlehurst (2010) discussed a number of government and professionally run programs such as the British Top Management Program, the American Council on Education's Fellows Program, and Harvard Institutes for Higher Education career development opportunities for academic leaders. I know of professional networks for vice- presidents (research) in a number of countries. You should take advantage of as many of these programs as possible to familiarise yourself with good governance practices in other organisations, both in your own country and in benchmarked organisations in other countries. Organisations such as the UK Leadership Foundation for Higher Education (see Middlehurst [2012] for a brief history) and the OECD offer publicly available guidance for all types of higher education governance. I have referenced a few examples here (Kennie and Woodfield, 2008; Santiago et al., 2008; Whitchurch, 2008; Schofield, 2009; Sayers, 2010).

Interestingly, Lombardi and colleagues in their 2002 report on the

top American research universities, mentioned earlier in this chapter, found that no matter what organisational model governed them, research universities with strong financial support did well. They stated that "*governance structure, in our view, is not a critical dimension of public research university success. . . . public and private universities with strong financial support do well—no matter what organisational model governs them*." Although I agree that financial commitment and the supply of resources such funding can provide certainly do have a positive effect on the output of research a university can aspire to, they are not the only, nor indeed the major, factors in a university's research success. Governance is extremely important. The report findings for the top American research universities were based on an analysis of structures of governance at a point in time. The productivity of your research will depend upon the proper functioning and adherence to governance processes, and not just having a structure of governance. It could be argued with significant justification that all universities have a structure of governance, but it is the robustness of governance practice, at the university and faculty levels, that will ultimately lead to optimal research productivity by the institution. Shattock (2002) found that those universities placed around the top 10 in the league tables seemed to emphasise collegial management styles rather than any form of executive dominance.

It is your role at the university or faculty level to ensure proper understanding, acceptance and adherence to your governance structure and procedures. Even some high-ranking North American universities still have to work very hard to make their forms of governance work effectively (Miller and Skinner, 2012).

I should also highlight that the report for the top American research universities was compiled more than 10 years ago. This was before the recent activity in most universities to focus funding and resources on specific areas considered more "efficient" and "managerially" identified as part of the universities' "corporate" activities (Larsen et al., 2009). And it was certainly well before the recent global financial crisis, which saw the funding available to most universities significantly reduced worldwide (Eggins and West, 2010).

It is extremely likely you have received funding levels to use in

planning over the next 3-5 years, which, if not lower than those you are working with now, will certainly be no more, meaning they will still be less due to inflation.

A number of databases and planning tools can assist you in determining how best to identify your university's strengths and weaknesses. Through your research leadership and following the proper governance processes and procedures you have developed and used, you will be able to identify areas where you want to continue to be world class, areas where you want to be world class in 3-5 years, and most importantly, areas you wish to cease committing your scarce internal funding to. As an academic with specialist staff available in the university and faculty unit, you should not find this task especially challenging What is challenging, and is perhaps the major challenge for university governance, is gaining understanding of your decisions, first by your peers, who are competing for scarce resources for their own areas, and then by dozens and probably hundreds of academics. After that, you will need to gain acceptance of their recommendations, and above all, be able to implement those recommendations. The challenge for you is, as Trakman (2008) said: *Good university governance . . . does not simply happen. . . . Governance models are created by people to govern people. They are only as good as they who devise and apply them, as well as those who live by them. . . . More often than not, resistance to change stems from lack of stomach to initiate or complete change for fear of acting precipitously, too soon or too late. The test of a governing body's capacity for change ultimately lies in its willingness and ability not only to recognise deficiencies in governance models, but also to arrive at viable means of remedying them*".

Trakman (2008) referred to governing bodies as commented on by the Carnegie Commission on Higher Education some 35 years earlier, but his statement applies equally to individuals in senior management positions in universities today. What and how it needs to be done in universities is quite clear; it's just that it can take significant vision, foresight, moral fortitude, and the other dozens of characteristics often associated with good leadership to be a senior academic manager.

So what is academic leadership?

CHAPTER 5

ACADEMIC LEADERSHIP

This next chapter is the largest, most comprehensive and most referenced section in this book because of the great importance of leadership in your role. The areas covered in other chapters, although also very important, could be described as administrative or management factors, the positive outcomes of which depend on your ability to achieve them: your leadership. And despite what many academics may think, leadership and management are essential to ensure optimal outcomes in research. Three key elements of leadership—be they classified as Adair's (1988) general *"achieving the task,"* *"developing the individual"* and *"building and maintaining the team,"* or Ball's (2007) academic *"goals,"* *"influence,"* and *"groups"*—depend largely on maintaining an environment in which research can flourish. And that is your responsibility.

Unfortunately, certainly in the past and even often today, leadership in universities is seen as portrayed in this Dilbert© cartoon; that is, as doing nothing.

However, despite its importance in most facets of life, especially academia, and numerous published studies on the subject, there is no single universally accepted definition of leadership. A footnote at the bottom of page 914 of the 1,182-page tome, Bass and Stogdill's Handbook of Leadership (Bass, 1990), states that the book, published over 20 years ago, covered about 7,500 studies. There have been numerous further studies since then. Rost (1991) analysed 587 works that referred to leadership in their titles and found as many as 62% did not specify any definition of leadership. Bennis and Nanus (1985) found that decades of academic analysis had led to over 350 definitions of leadership. Yukl (1989) summarised Stogdill, saying there are almost as many definitions of leadership as there are people who have attempted to define the concept, and Ball (2007) stated that "*a profusion and arguably confusion of leadership theories and models have been proposed.*"

Many leadership studies on university presidents have been published as autobiographies (Aitkin, 1998; Duderstadt, 2007; Bowen, 2010), as analyses of what presidents do and how they do it (Neumann and Bensimon, 1990; Birnbaum, 1992; Engwall et al., 1999; Bargh et al., 2000; Kulati, 2003; Bornstein, 2005; Brown, 2006; Burnim et al., 2007; Bolman and Gallos, 2011; Pierce, 2011), and as research profiles (Goodall, 2006; 2009; Ioannidis, 2010). Other presidential leadership studies focused on gender (Madsen, 2008), background, succession and recruitment (Neumann and Neumann, 1999; Smith et al., 1999; Blumenstyk, 2005; O'Meara and Petzall, 2007; Robken, 2007; Cook, 2012), what they thought (Morrill, 2010; PA Consulting, 2011; Boxall and Woodgates, 2011), and even how much each was paid (Morgan, 2011; Stripling and Fuller, 2012).

By contrast, only a few studies have focused on vice-presidents (Deem et al., 2001; Smith et al., 2007; Spendlove, 2007; Smith and Adams, 2008; Pilbeam and Jamieson, 2010; Scott et al., 2010), and even these did not specifically discuss vice-presidents (research). I have assessed the content of more than 120 academic papers and public reports, and 30 books on leadership and have selectively referenced many of them here, again in order to give you a bibliography you can refer to should the need arise or the time become available.

My review of knowledge in the general area, plus the expertise and experience I have gathered over 25 years working in and with universities, especially in research, allows me to give good advice on how to ensure optimal leadership of your portfolio.

Is your leadership actually important for research?

Most academic staff teach undergraduate students, and many undertake community outreach. Although most undertake research as part of their role, few win competitive national or international grant funding. Yet these funds are a critical resource, and contracts and grants are considered more important than undergraduate students by academics in research-intensive universities (Salancik and Pfeffer, 1977). Such research excellence is what differentiates academics within and among universities (Slaughter and Leslie, 1999) and forms the major focus of most global-university-league ranking systems. (See Chapter 9 on benchmarking.)

I mentioned earlier that many, often very high profile, academic researchers believe their research should be funded non-competitively, without "interference," such as the governance that should be led by their associate dean (research) or their vice-president (research). And many academic researchers believe it is not possible to manage research, as the search for knowledge is a process that can lead in many different directions, and therefore is not possible to either plan specifically or justify in advance (Hemlin, 2006; Taylor, 2006a). Although there is some accuracy in this belief, these days, with the ever-increasing competition for continually declining research funds and resources, it is essential that leadership and management obtain research funds and resources, and also ensure that they are used optimally.

Even recent studies suggest there is a degree of scepticsm about the extent to which managerial processes and practices support, as opposed to undermine, academic work. Leadership can have a negative connotation among academic staff and may well disengage rather than engage the excellent researchers you need to influence (Bolden et al., 2012). Nevertheless, leadership and management are essential for the optimal productivity of your research efforts. Strong leadership in universities can improve research outcomes by improving staff enthusiasm and increasing commitment to research (Ball, 2007).

This type of leadership and management is more frequently found and more readily accepted in STEM, where teamwork and centres are more common than in disciplines such as humanities, social science and creative arts, where research is more often a solo undertaking (Pilbeam and Jamieson, 2010). The increasing complexity of large research questions in many STEM fields also requires sound management to ensure the necessary social, cognitive and material preconditions (Schuetzenmeister, 2010). And many academic researchers, especially those in the STEM disciplines, need to have almost done much of the research they are applying to funding agencies to carry out. There is nothing necessarily unethical in this approach, and indeed pilot studies and preliminary results are usually demanded for successful grant applications. What should not occur is the submission of grant applications containing fabricated "preliminary results." This type of fraud should certainly not be seen as an acceptable part of *"a funding system that demands the answer before it will pay you to ask the question"* (Deer, 2012) nor should receiving funding twice for the same research project (Reich, 2012a) be acceptable. These points will be discussed further in the chapter on research ethics and integrity.

As I described in the introduction, universities hoping to succeed in the 21st century environment face increasing competition and resource scarcity. These pressures, especially those caused by the recent global financial crisis, have placed even greater emphasis on the necessity for management and leadership in universities. Therefore, it is highly likely that you, as a senior manager, will be involved in changing structures, shapes, sizes and methods of operations during your term of appointment (Smith and Adams, 2008). Leadership is closely associated with change, and university staff see people in positions such as yours as necessary and responsible for this change (Ball, 2007). And what is expected of university leaders in times of crisis is very different from what is needed when conditions are more favourable (Bolden et al., 2012).

In addition, many universities commit their scarce internal research funds to priority areas, and it is your responsibility to identify, assess and allocate these funds to areas in which you wish the institu-

tion to continue to excel or to become world class (Taylor, 2006a). As explained in earlier chapters, the fact that at least some of this internal funding for research comes from undergraduate teaching can make academics who generate such funding resentful of its "diversion" from teaching to research. It will again take vision, networking, and negotiating, that is, leadership, on your part to keep potential resentment to a minimum.

However, what is important for you in a practical sense is understanding the clear differences between the leadership and management you need to use within the unique academic culture of a university, and the leadership and management used in business, industry, and even nonprofit organisations.

Leadership in universities presents distinct challenges, because the academic culture is characterised by great heterogeneity of staff roles at all levels. In addition to the matrix structure comprising such areas as finance, human resources, library, postgraduate school, IT support, infrastructure, and facilities—which must all be coordinated to ensure maximum productivity—the roles and activities of academics are diverse and numerous. You must balance these to ensure appropriate administrative control allowing staff autonomy in a professional culture resistant to being managed, where collegiality is still seen as the best form of decision-making (Brown, 2001; Hellawell and Hancock, 2001; Turnball and Edwards, 2005).

Vice-presidents (research) with responsibility across the entire university rather than within a department or even a faculty unit must work across these academic and executive administrative domains, which requires a sophisticated understanding of the institution's values and principles (Smith and Adams, 2008). Although this book focuses on vice-presidents (research) and associate deans (research), there are numerous forms and levels of leadership in universities, and many leaders not in formal management positions. Indeed, by virtue of their academic rank, professors should be leaders in their field, and research is an area where credibility, enthusiasm, and collegiality can make anyone a leader of more junior academics (Bolden et al., 2009; Rayner et al., 2010). Because leadership in a university is a relationship based on influence rather than authority, it allows many people in the university

community to be leaders. This situation is especially true when these leaders are able to provide support, resources, and enabling environments that facilitate the work of junior academics by virtue of their successful grant-funding activities (Gronn, 2002; Bolden et al., 2012).

Bolden et al., (2009) found that the location of financial control, especially control of surpluses, was widely viewed as the most important, if not decisive feature, in the distribution of leadership. He also found that university leadership was better regarded as a responsibility shared among university staff. Perhaps not surprisingly, collaborative behaviour correlates with control of resources. In fact, the grant funding success of your researchers is something you are certainly aiming for because it serves as an indicator of your university's and faculty's success. And this reflects well on you. So you need your researchers to be successful in winning research grant funding, but you also need to understand that the financial autonomy this success brings them will embolden their leadership. Although having these leaders support and add to your initiatives can be extremely positive, your job can become much more difficult if they don't support you or if they work against you. Therefore, by your own words and deeds, you need to point them toward specific and challenging goals (rather than easy goals or "do your best" goals), as these expectations have been shown to induce higher levels of performance (Gist, 1987; Bennis, 1996). Even when research productivity is going according to your plans, you should be vigilant in challenging any indications of complacency to help keep your researchers from losing their edge and not meeting goals (Martin and Marion, 2005). Your efforts in this area will more likely be successful if done with a positive attitude (Chi et al., 2011).

You need to manage and lead leaders.

Many studies have concerned the difference between management and leadership or whether, in fact, there is a difference. Although there is no single "best practice" approach or clearly definable set of leadership competencies for those working in universities (Bolden et al., 2012), what vice-presidents (research) and associate deans (research) do on a daily basis mainly focuses around activities described by a range of authors as what good leaders do. I have summarised them in Table 2.

Table 2 competencies and behaviours for what good leaders do *left hand panel*		
Adair, 1973	Bartram, 2005	Bryman, 2007
action centred leadership theory based on British industry, local government agencies and the military	the great eight competencies based on meta-analysis of 29 studies mostly British but including American and European multiple industries	based on a literature review of 20 publications on leadership in mostly American but including British and Australian higher education departments
Planning - Seeking all available information - Defining group task, purpose or goal - Making a workable plan Initiating - Briefing group on the aims and the plan - Explaining why aim or plan is necessary - Allocating tasks to group members - Setting group standard Controlling - Maintaining group standards - Influencing tempo - Ensuring all actions are taken towards objectives - Keeping discussion relevant - Prodding group to action/decision Supporting - Expressing acceptance of persons and their contribution - Encouraging group/individuals - Disciplining group/individuals - Creating team spirit - Relieving tension with humour - Reconciling disagreements or getting others to explore them Informing - Clarifying task and plan - Giving new information to the group - Receiving information from group - Summarising suggestions and ideas coherently	Leading and Deciding Supporting and Cooperating Interacting and Presenting Analysing and Interpreting Creating and Conceptualising Organising and Executing Adapting and Coping Enterprising and Performing	Clear sense of direction/strategic vision Preparing department arrangements to facilitate the direction set Being considerate Treating academic staff fairly and with integrity Allowing the opportunity to participate in key decisions/encouraging open communication Communicating well about the direction the department is going Acting as a role model/having credibility Creating a positive/collegial work atmosphere in the department Advancing the department's cause with respect to constituencies internal and external to the university and being proactive in doing so Providing feedback on performance

Evaluating - Checking feasibility of an idea - Testing the consequences of a proposed solution - Evaluating group performance - Helping the group evaluate its own performance against standards		Providing resources for and adjusting workloads to stimulate scholarship and research Making academic appointments that enhance department's reputation

Table 2. Competencies and behaviours for what good leaders do *Middle panel*	
Spendlove, 2007 based on semi-structured interviews with Pro-Vice Chancellors at 10 British universities	Pilbeam and Jamieson, 2010 based on interviews with Pro-Vice Chancellors at four British universities
Work to maintain academic credibility/respect Act as role models Think broadly/strategically Engage with people Listen to others Consult with others Negotiate Communicate clearly Delegate Motivate others Act as mentors Build teams	Acting as a figurehead and leader of an organisational unit Liaison (the formation and maintenance of contacts, networking) Monitoring, filtering and disseminating information Allocating resources Handling disturbances and maintain work flows Negotiating Planning Innovating Controlling the direction of subordinates Human resource management (recruitment, selection, training and appraisal) Technical work (relating to the professional or functional specialisation of the manager)

Table 2. Competencies and behaviours for what good leaders do **Right hand panel**	
Scott et al., 2010 based on input from 31 Pro-Vice and Deputy Vice-Chancellors in 17 Australian universities	Mintzberg, 2011 from 'various sources' in a book based on observation of 29 people from "top" "middle" and "bottom" levels mostly in Canada and Britain but including Europe and Tanzania in government, business and not-for-profit sectors
Personal capability - Being true to one's personal values and ethics - Being willing to take a hard decision - Wanting to achieve the best outcome possible - Remaining calm under pressure or when things take an unexpected turn - Persevering when things are not working out as anticipated - Taking responsibility for program activities and outcomes Interpersonal capability - Being transparent and honest in dealings with others - Motivating others to achieve positive outcomes - Influencing people's behaviour and decisions in effective ways Skills and Knowledge - Understanding how universities operate - Being able to make effective presentations to a range of different groups - Being able to organise my work and manage time effectively - An ability to chair meetings effectively Intellectual Capability - Having a clear, justified and achievable direction in my area of responsibility - Seeing the best way to respond to a perplexing situation	Personal - Managing self, internally (reflecting, strategic thinking) - Managing self, externally (time, information, stress, career) - Scheduling(chunking, prioritising, agenda setting, juggling, timing) Interpersonal - Leading individuals (selecting, teaching/mentoring/coaching, inspiring, dealing with experts - Leading groups (team building, resolving conflicts/mediating, facilitating processes, running meetings) - Leading the organisation/unit (building culture) - Administering (organising, resource allocating, delegating, authorising, systematising, goal setting, performance appraising) - Linking the organisation/unit (networking, representing, collaborating, promoting/lobbying, protecting/buffering) Informational - Communicating verbally (listening, interviewing, speaking/presenting/briefing, writing, information gathering, information disseminating) - Communicating nonverbally (seeing [visual literacy], sensing [visceral literacy]) - Analysing (data processing, modelling, measuring, evaluating) Actional - Designing (planning, crafting, visioning) - Mobilising (fire fighting, project managing, negotiating/dealing, politicking, managing change)

But to describe the senior research manager's role as either management or leadership is inaccurate and would seem to make one more important than the other (Pilbeam and Jamieson, 2010).

Your responsibility for mission, direction, inspiration, and example-setting requires activities such as communicating a vision for research, assessing your research centres, and convincing staff to work toward world-class standards in research output. These tasks are clearly associated with leadership. By contrast, more bureaucratic tasks, typical of management rather than leadership roles, include responsibility for managing finances, staff, space, and resources, and involve such activities as confirming meeting agendas, establishing and using databases to measure research productivity, and "signing off" on annual reports to funding agencies (Yielder and Codling, 2007).

It's a common belief in universities, although perhaps not accurate, that a research leader is usually someone such as the professor mentioned in Connell's Level 4 governance (described in Chapter 4), an individual at the cutting edge of research activities, usually leading a team of researchers or even a centre. To reduce ambiguity, I have used the words "manager" and "management" in the title of this book. This (mis)understanding of terminology is probably the result of the complex culture in universities and also the overlap between management and leadership. Neither management nor leadership is uniquely confined to any specific individual in a university.

Early theories of leadership and management saw quite clear differences between them, for example:

- "*Managers are people who do things right, and leaders are people who do the right thing*" (Bennis and Nanus, 1985).
- Managers pursue stability but leadership is about change (Barker, 2001).
- Managers are concerned about how things get done, and leaders are concerned with what things mean to people.
- Managers tend to work within parameters and limit options, whereas leaders see "the bigger picture" with fresh approaches and new options (Zaleznik, 1977).

- Management is guided by formal rules, regulations and adminis-trative practices that meet the university's bureaucratic demands (Hansson and Monsted, 2008).

But more recent theories describe leadership and management as much more complementary, and, indeed, I see them in their "ex-treme" characterisations as perhaps the two ends of a spectrum for "getting things done."

Leadership may be different from management, but the two do overlap. Successful implementation and execution of good gov-ernance in universities often necessitate the blending of the two. This approach is especially prevalent at the department and school levels (Egron-Polak, 2006; Ball, 2007; Yielder and Codling, 2007). Many organisations may be over-managed and under-led, especially in times of change and uncertainty (Middlehurst et al., 2009), but "getting things done" within the university culture often requires a blend of horizontal, vertical, and emergent influence and direction, rather than a "one-size-fits-all" scenario. What it means to be an academic leader varies according to a number of factors, including research discipline, institution type, mission group, career stage, and gender (Bolden et al., 2012). In my experience, the focus on each of these—and also on the particular outcome needed to be achieved by whom—can and should vary from time to time. Leadership in a uni-versity takes different forms and levels: organisational/managerial associated with formal positions; professional leadership; personal leadership; team leadership; and political leadership (Middlehurst et al., 2009). You need to be able to use them all as the situation requires.

As Mintzberg (2004) stated, "*it's time to bring management and leadership back together and down to earth*," and your managerial ef-fectiveness is significantly influenced by your own insight into your work. Your performance depends on how well you understand and respond to the challenges of your job, which requires introspection and objectivity (Mintzberg, 1975).

So what is your management style?

Donoghue and Kennerley (2008), in their case study of leadership at the University of Leeds, reinforced Mintzberg's (2004) emphasis on the need to balance the art, science, and craft of strategy to keep the implementation of your vision from being railroaded because of over-emphasis on one or the other. The guide developed by Henry Mintzberg and Beverley Patwell (Mintzberg, 2011) allows one to easily identify management styles, and I thank Professor Mintzberg and Dr. Patwell for permission to reproduce their guide as figures 1a and 1b so that you can test your style here.

Figure 1a. Assesing your personal style of managing in terms of art, craft , science

	Ideas	Experiences	Facts	
Consider how you manage in your job.	Intuitive	Practical	Analytical	
Circle one of the three words from each row that best describes it.	Heart	Hands	Head	
	Strategies	Processes	Outcomes	
When you are finished, add up how many you have circled in each of the three columns.	Inspiring	Engaging	Informing	
	Passionate	Helpful	Reliable	
	Novel	Realistic	Determined	
(Together they should add up to 10.)	Imagining	Learning	Organizing	
	Seeing it	Doing it	Thinking it	
	"The possibilities are endless !"	"Consider it done !"	"That's perfect !"	
Total Column Score				= 10

Mintzberg and Patwell, 2008 ©

Circle one of the three words from each row that best describes your style. When you have finished, add up how many you have circled in

each of the three columns. Together, they should add up to 10. The left-hand column represents art; the middle column, craft; and the right-hand column, science.

Figure 1a.
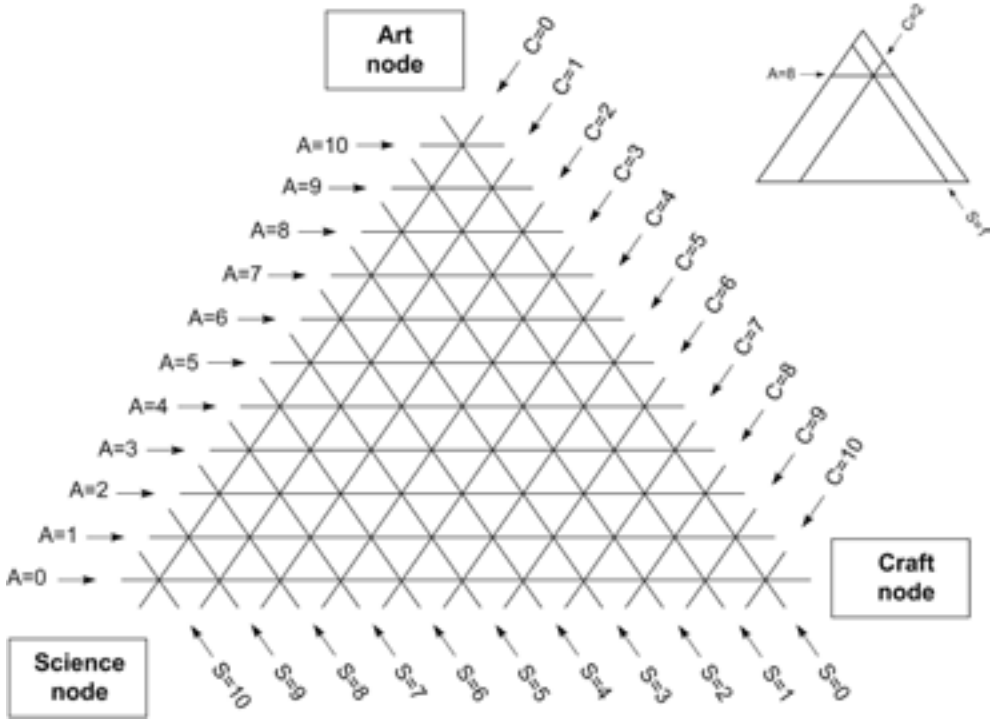
Mintzberg and Patwell, 2008 ©

Record your three scores on the triangle. The horizontal lines marked A0 to A10 represent art. Identify the line that corresponds to your score for art. (In the example on the little triangle on the right, line A8 corresponds to a score of 8 in the left hand column]. Do the same for the diagonal line represented by C for craft. Mark the point where these lines meet. The score for science, on the diagonal line marked S, should fall at the same point. (Otherwise your scores won't add up to 10.) This point represents your managerial style in this chart as you perceive it.

Guides such as this one, which provide straightforward information enabling you to understand how you perceive your style, as well as many other commercially available guides and surveys designed to give you information on how others see your style, are extremely important. Leadership and management style in universities is so important because of the unique nature of the university culture. Because of the collegial nature of the institution, and the fact that academics are creative individuals, successful academic leadership is fundamentally different from leadership required in other types of organisations, and it demands additional competencies. The competencies listed in Table 2 under the studies of senior managers in universities by Spendlove (2007), Pilbeam and Jamieson (2010), and Scott et al., (2010) are especially relevant here.

I said in Chapter 1 that universities can be seen as corporations in the business of education, and your main focus is knowledge generation and dissemination. To do this, universities must be innovative and creative, and the better ones are composed of many of the more creative academics. The excellence of your institution depends on its ability to recruit and nurture these gifted and productive individuals (Hardy, 1990), but this advantage comes with a number of challenges with respect to leading a very creative culture.

Leading these creative people requires unique skills and expertise because creative work involves the dissemination and implementation of ideas, not just their generation. The more complex the knowledge work, the more its productivity depends on the qualities of individual researchers. But these individuals can be hard to manage because they tend to be anti-bureaucratic; they resent top-down organisational changes; and they want to work in a collegial environment (Maccoby, 2006).

Leading creative efforts to bring new ideas into being requires an integrative style that allows you to orchestrate people, their expertise, and the relationships among them (Mumford et al., 2002; Connell, 2004). You must manage your often scarce research resources to ensure maximum output in terms of both quality and quantity, but creative research often demands difficult and risky tasks, and success

is certainly not assured. Although a more autocratic style involving your positional power could be appropriate in certain circumstances, such as the drastic changes required in some universities mentioned earlier, this style should be a last resort in most university situations, as it is likely to inhibit necessary exploration and be counterproductive in creative situations (Raelin, 1995).

The challenge you have to address in ensuring optimal research productivity in your university or faculty is the ill-defined nature of creative work, which can make it difficult to evaluate ideas and even outcomes. How can you as an expert researcher in your own area possibly assess the research outcomes of someone in a completely different research field, even within the same faculty unit, let alone the same university? This attitude is much more evident in the humanities, social sciences, and creative arts, although it is still prevalent in the STEM disciplines (Blackmore, 2007).

Although quite a number of excellent databases are available to assess the quantitative nature of an academic's research outcome, this is an area where you need to use your social skills, especially coaching and communication skills. You must be able to get academics from diverse research disciplines and their support staff to work together, to build support for risky new ventures and create a climate supporting idea generation by others. And this certainly requires more than technical skills. Successful leadership of creative efforts and your planning and assessment of the research of other disciplines require persuasion and social intelligence (Mumford et al., 2002).

It is not the aim of this chapter to discuss the many different leadership theories in detail, but Bensimon et al., (1989) classified higher education leadership theories into six categories: trait theories; behavioral theories; contingency theories; cultural and symbolic theories; and cognitive theories. Rayner et al., (2010) saw professorial leadership in universities as one or more of the following types: collegiate; transactional; transformational; collective; managerialist; remote or distant; and hybrid management. This last form of leadership, as described by Rayner and colleagues, is similar to what might be called situational leadership, a theory of leadership that I believe is one of the more commonly used approaches in universities.

Situational leadership is a style first proposed more than 30 years ago by Hersey and Blanchard (1969; see also a 25-year review of its use by Blanchard et al., 1993). Although it has come under criticism (Graeff, 1997), it is still widely practiced and taught, especially in fee-for-service management training courses run for business managers. Situational leadership theory is built on the belief that there is no single "best" style of leadership. Effective leadership depends on the task, and successful leaders adapt their leadership style to the maturity (the capacity to set high but attainable goals, willingness and ability to take responsibility for the task, and relevant education and/or experience for the task) of the group they are attempting to lead. Hersey and Blanchard list four main leadership styles: telling; selling; participating; and delegating. And they describe the maturity of people being led at four levels: bottom—lacking knowledge, skills, and confidence; second—willing but lacking skills; third—ready and willing with some skill, but lacking confidence; and fourth—highly confident and possessing skills to commit to the task. So effective leadership varies with the group and the task to be accomplished.

However, this and most other current models of leadership were developed based on more homogeneous "followers" than those in your university or faculty (Hogg et al., 2012). Not only do you have to lead academics from numerous and diverse research backgrounds, but you must also lead the many support staff that assist them with their research, as well as the various university staff in administrative areas, such as human resources, the research office, the library, and finance units.

Unlike research, teaching and learning are university activities that lend themselves to a departmental or smaller-group focus for delivery. It is not uncommon for deans or heads of departments to compete with each other to teach subjects requiring minimal resources that can be taught to large numbers of undergraduate students, in order to return large profits. In addition, as I mentioned in Chapter 1, these profits are often used to fund research projects across other faculties and departments. This can make your role even more difficult by causing resentment in teaching-focused academics if you are trying to coax researchers across faculties and departments out of

their "silos" to achieve collaborative research outcomes.

So perhaps the major leadership style you should practice for research management in universities is the style referred to as intergroup leadership. This approach is especially important when your research portfolio will be compared with the achievements of your colleagues, the vice-president and associate dean responsible for teaching and learning.

I have based these leadership discussions on widely known and understood concepts, and I assume that as a successful vice-president (research) or associate dean (research) you are generally familiar with these topics. I have gone over them here as refreshers for you, but also as new information for mid-career academics and ECRs reading this book to learn what skills and expertise they will need to develop to work into senior management positions.

I suspect that intergroup leadership and especially boundary spanning are concepts that even successful senior managers may not be familiar with; however, I believe they are essential for effective leadership in a university. Based on early work by Gladstein (1984) and expanded by Ancona and Caldwell (1992), intergroup leadership "*refers to leadership of collaborative efforts of more than one formal group or organisation toward a joint goal, in which the purpose of the collaboration relies on the presence of these groups or organisations*" (Hogg et al., 2012). Intergroup leadership, then, is leadership across group and organisational boundaries. When effective, it rests on your ability to construct an intergroup relational identity. This approach creates markedly different leadership implications than the more "traditional" focus on creating a shared superordinate identity, as most other theories suggest. They would see you proudly leading your university's or faculty's research academics as a representation of the university or faculty unit. But academics see their research as belonging to their own research group, centre or department, rather than to their faculty unit or university (Becher and Trowler, 2001). So to be productive, your leadership needs to span all these groups.

But as Hogg et al., (2012) suggest, attempts to build an overarching collective identity have little likelihood of success when groups define themselves as being important, especially when they are com-

peting and facing threats to their identities. And financial challenges, diminishing resources, and increased competition for research excellence at all university levels are certainly causing research groups to consider that there may, in fact, be threats to their identity. So you need to accept and work within the parameters of knowing that researchers will do what is best for their research groups before they will act for the greater department, faculty or university good. You need to explain how the university or faculty is greater than the sum of its parts, that is, its departments or faculties, and depends on the distinctive and valued qualities each group brings to the table.

In addition to bringing senior staff from diverse departments and faculties together to support university research, forming cross-disciplinary research centres is an ideal way to ensure that a number of departments and even faculties can collaborate synergistically to improve your research outputs. In addition, because you come with a history in a specific research discipline area, not focusing on an overarching collective identity will help you avoid staff perceptions that you are "one of them" or "one of us." Building an intergroup relational identity, rather than a collective identity based on similarity and oneness, offers you an especially strong tool for effective intergroup leadership (Hogg et al., 2012).

A major way to consolidate your intergroup leadership is boundary spanning, defined as "*a situation in which someone has one or more relationships that bridge two otherwise unconnected social networks*" (Hogg et al., 2012). University communities are divided by numerous boundaries—between academics and support staff; between paid academics and postdoctoral fellows and PhD students on scholarships; between academics and finance, library, human resources and IT staff. Another major divisional dimension is research discipline heterogeneities. And on top of these numerous boundaries we have the teaching-research boundary.

But as a boundary-spanning leader, you will be seen to represent a collaborative relationship rather than the collective identity most traditional leadership theories would recommend. Rather than treat your various constituencies as one group, which could lead to internal competition, you should acknowledge the valued differences among the

diverse groups and highlight the outcomes possible when they work together. Such boundary- spanning leadership in primary care trusts in the United Kingdom has been associated with less conflict between groups and higher intergroup productivity (Richter et al., 2006).

Boundary spanning will also reduce the likelihood of your being affected by the "tall poppy syndrome," which is not uncommon in university settings. By using boundary spanning, which renders inter-group leadership a joint effort of all group leaders involved rather than an activity championed by just yourself, you are less likely to be "cut down" to the same size as all the other "not so tall" poppies. A number of formal university structures allow you to practice intergroup leadership. You can boundary span by appropriate leadership of: the university or faculty research management committee; ad hoc committees focused on your research; and academic or faculty board committees that enable you to communicate to all staff and students to present the benefits of cooperation and collaboration in achieving successful research outcomes. In your official position, you do have major roles to play in communicating with external audiences (as vice-president) and faculty (as associate dean), and boundary spanning by disseminating knowledge acquired externally is a powerful way to further establish your intergroup leadership (Pilbeam and Jamieson, 2010).

You can also informally pursue a number of strategies to support your boundary-spanning role. Rotating individual boundary spanners into new assignments and promoting into boundary-spanning positions (for example, membership of committees you chair) staff who feel strong ties with their research group, their faculty unit, and the university as a whole can help to overcome ineffective intergroup relations (Richter et al., 2006). You can also improve boundary spanning by ensuring communication of organisational successes, promotion, values, and goals. An informal gathering to acknowledge and celebrate recipients of competitive national grant funding, for example, can be especially appreciated. Occasional informal drinks after work, especially with deans or heads of schools, can open channels to learn what's really happening on the ground (Smith et al., 2007), although such social gatherings can be counter-productive if excessive (Oh et al., 2004).

Although I have stressed intergroup leadership for vice-presidents (research) and associate deans (research) here, any academic can portray leadership by accessing external resources to enable academic work and/or facilitating knowledge dissemination between the university or faculty and external bodies (Bolden et al., 2012). So your relationships with your closest colleagues, your president, the other vice-presidents, your director of research, and the members of the committees you chair, are very important.

You may report to the president or perhaps a senior vice-president or a provost as vice-president (research) and the dean if you're an associate dean (research). This person, your direct supervisor, probably played a major role in your appointment to your current position. Some presidents can be quite focused and intent on exercising their role as a managerial chief executive officer, in addition to being recognised as an academic. In fact, former French President Nicolas Sarkozy passed a law to institutionalise autonomy, in order to create a new breed of university leaders who will streamline and rationalise staff and bureaucracy (Fearn, 2010b). And some British university presidents did take the advice of the Jarratt (1985) report, as long as 30 years ago, to become managerial chief executive officers as well as academics. They responded to the challenge of organisational change by expressing frustration at the inability of their senior research managers to deliver strategies across faculty or department boundaries. In these situations, in which the senior research managers did not exercise appropriate boundary spanning, the president's response was to devise new delivery models that excluded the manager (Smith and Adams, 2008).

Presidents and deans structure their senior management teams to suit their personal style and preferences, and you need to develop your own style to identify with the role that's appropriate for working with them. Always remember that you are responsible to them and they assess you. And depending on their personality and background, your strategic influence could be overshadowed by the president or dean; they can either hamstring or empower you. Not being involved in decisions regarding their own jobs is a major stressor for British academics, and the feelings of American academics are also greatly

influenced by their perceptions of the amount of autonomy they have (Bryman, 2009). This situation applies to you in your position just as it does to academic staff.

Some British university presidents and deans engage in "*heavyweight intellectual demolition*" (Smith et al., 2007) and give their vice-presidents little opportunity to engage in high-level strategic thinking. When projects work well, these presidents and deans claim credit for the vision; when things don't work, they say it was the fault of the vice-president or associate dean. So determining your leadership style with your president or dean on a continuing basis, or ideally before you even accept your position, is an extremely good idea. If the relationship does sour, it may not be your fault. As Hellawell and Hancock (2001) found in a study of hierarchical control and collegiality in "newer" British universities, "*the most charitable epithet applied to this former dean's managerial style by any of his erstwhile subordinates was 'autocratic,' and this was attributed by a number of them to his various alleged personal characteristics such as insecurity.*" This style of leadership is not as uncommon as one would hope.

There is a range of ways vice-presidents (research) and associate deans (research) can be assessed (Smith et al., 2007). Performance agreements are not usually a statutory requirement, so there are no formal levels of assessment, and some universities consciously avoid the requirement for senior research managers to meet explicit key performance indicators (KPIs) because it would reduce their flexibility (perceived as required) to manage the university's research. At the other end of the assessment spectrum, universities may maintain rigorous regimens for setting targets and KPIs for all senior managers in the university and faculty units. This process is usually bounded, and details, such as the quantity and quality of the KPIs to be achieved and the remuneration to be gained on achieving these KPIs, tend to remain confidential to the people involved.

Usually, however, the KPIs are agreed upon with your supervisor during negotiations over your appointment contract, and you should keep this in mind while negotiating. Although you need to establish high goals, your efforts will be judged by the outcomes of others, so your KPIs should be reasonable and achievable. A challenge in your

portfolio is that considerable time can elapse before you can see the benefits of policies, so they may not be seen as the result of something you once introduced. During good times, academic managers tend to be seen as doing well, but during bad times, they are often considered failures (Gonzalez, 2010).

It's a good strategy to establish five to 10 general goals relevant to research that could be assessed against your KPIs in an annual performance review, triggering a proportion of salary or bonus as an award for your achievement of performance targets. Examples of specific research KPIs can be found in US funding agencies' STAR MET-RICS project (www.starmetrics.nih.gov), Canadian investment in health research (Panel, 2009), the UK universities/Elsevier Snowball Project (www.projectsnowball.info/), the proceedings of the OECD (2010) performance-based funding workshop, and the report of the European Commission's Assessment of University-Based Research (Moed and Plume, 2011). General performance-assessment processes suitable for consideration in universities can be found in Hall (2006), Jain et al. (2010), Parmenter (2010), and Cardy and Leonard (2011). You need to be familiar with such techniques because not only can you use them to assess the performance of your staff, but also your supervisor will use them to assess your performance.

Scott et al., (2010) listed the following top 10 indicators that 25 Australian vice-presidents responsible for teaching and learning ranked for judging effective performance. I have added in brackets my suggestions appropriate for research managers.

1. Successful implementation of new initiatives.
2. Delivering agreed tasks or projects on time and to specification.
3. Achieving high quality [post] graduate outcomes.
4. Achieving a positive financial outcome for your area of responsibility.
5. Meeting [postgraduate] student load targets.
6. Producing significant improvements in [grant funding achieved and high-quality publications], learning and teaching quality.
7. Bringing innovative policies and practices into action.
8. Producing future [research] learning and teaching leaders.
9. Winning resources for your area of responsibility.

10. Establishing a collegial working environment.

Interestingly, when a much larger pool consisting of vice-presidents, deans, associate deans, heads of schools, directors, heads of programs and team leaders, albeit again with teaching and learning foci, were surveyed, the tenth item above, "Establishing a collegial working environment" ranked fourth. In my experience, with respect to the intergroup leadership you need to use in order to improve the research outputs of numerous staff in many diverse research disciplines, it probably ranks first in importance.

You may be an extremely fortunate vice-president (research) or associate dean (research), with a management team of colleagues who work collaboratively and collegially and for the greater good of the team. It is certainly possible for a management team to work together collegially, only needing to compete and act politically when competition for scarce resources arises. Decision-making quickly becomes a zero-sum game when certain areas are targeted for cutting rather than cuts being equally shared (Hardy, 1990). To a large extent, this relationship depends on the leadership of your president or dean. And even if you're in a perfect management team now, that is not to say that with a change in the president's or dean's office, or with decreasing resources, relationships will not significantly change into more of a power game.

The politics of the senior university group does have a great bearing on your current and future career in academia. It is well recognised that the politics of university governance unfortunately often lead to personal tensions among the governing board (Rytmeister and Marshall, 2007), and having to work in a dysfunctional and perhaps even divisive environment requires considerable resilience and political skill.

How institutional executives work together (Woodfield and Kennie, 2007) is another critical factor. It is not uncommon for the president to end the contract of an otherwise excellent vice-president (research) or let it expire, and in some cases the reasons for dismissal can be petty and purely political. Of course, it is not unheard of for even presidents to have their contracts cancelled or be forced to resign

because of lack of support from politicians, the council and/or staff. Former heads of the Louisiana State University System, the University of Oregon, Harvard, and Oxford are very high-profile public examples of forced resignations (Kellaway, 2006; Lederman 2011; Kiley, 2012b). In addition, the trustees of the University of Virginia forced their president to resign, only to reinstate her 16 days later due to overwhelming public support (Perez-Pena, 2012), and the president of the University of Cincinnati resigned over micromanaging by the board of trustees (Peale, 2012).

More common, but not nearly as widely publicised, is the fact that continuing reduction or refocusing of resources can cause increasing tension among the various vice-presidents or associate deans who may be responsible for research (you), teaching and learning, internationalisation, and community engagement or outreach. How you handle these relationships with your peers, who are also trying to improve their portfolios and—depending on the style of university management, may be in direct competition with you for resources at the vice-president or associate dean level—will obviously depend on the circumstances and personality of the individuals involved. But these relationships are extremely important for your long-term career.

Management teams are expected to visibly demonstrate close cooperation and mutual support and accountability for collective outcomes by operating as a tightly focused unit. However, group dynamics often act against collegiality because of the pressures of individual portfolio priorities and personal power relationships. In practice, rhetoric and reality do not match (Middlehurst et al., 2009).

And to be fair, while many vice-presidents recognise the need to be collegial and share information with other vice-presidents, time pressures related to their own portfolios often prevent interactive information sharing. In addition, there's a tension between collaboration and competition when organisationally sensitive information may be shared with colleagues inadvertently (Pilbeam and Jamieson, 2010). And while overwhelmingly in favor of transparency, associate deans can feel obliged to work in less-than-collegial ways because of the risk that premature disclosure could seriously disadvantage them and their organisations in the acquisition of new business (Hancock

and Hellawell, 2003).

So at some time you may need to exert your personal power among your colleagues on your management team. What is power in an academic context? Salancik and Pfeffer (1977) believed that power eluded definition, but was recognisable by its consequences: your ability to bring about the outcomes you desire. In your case, these will be outcomes you have decided are worth fighting for among your management team colleagues, for the good of your portfolio. Although this should be a rare exercise, you must be aware that not every senior academic acts collegially all the time, and it is reasonable and indeed essential that you are prepared to exercise this facet of leadership if necessary.

Much of your influence will be exerted via your committee memberships, and it's likely that you chair the university research committee as vice-president (research) or you are a member as an associate dean, and as associate dean you also chair your faculty research committee. You control the agendas of these formal committees, and they allow you to exercise the intergroup boundary-spanning type of leadership I mentioned earlier. You need to work within the university committee structure, using the collegial power invested in these committees as a source of authority. Although these committees are a forum for debate, not decision (Jarratt, 1985), it is essential that you obtain consensus. This will give you an opportunity to move your vision forward with the support of the senior members of the university or faculty by sharing information, making sensible and defensible analyses, and then entering and leading the debate. In fact, this may be the only way to exert your authority, not just to achieve change, but to avoid reductions in standards and reputation (Smith et al., 2007).

Of course, I do not need to remind those of you who spend most of every day just going from meeting to meeting, of Ibarra and Hansen's (2011) comment on the business world: "*When people try to collaborate on everything, they can wind up in endless meetings, debating ideas and struggling to find consensus.*" And in the unique culture of a university, which almost demands that all academics weigh in on decisions, you must ensure that your meetings are efficient and at least convey the

appearance of collegiality, while achieving the outcomes you need to move your research forward. It's not an easy job, but it's one you must bear in mind constantly and try to master.

The last major relationship you need to manage in your job is with your key staff member, your director of research.

PROFESSIONAL ACTIVITIES FOR YOU AND YOUR STAFF

Most vice-presidents (research) have few direct line-management responsibilities, but the ones that you do have are very important. These can include supervising the dean of the graduate school, the directors of university research centres, the director of technology transfer and commercialisation activities, and in some cases the librarian. Although it appears to vary globally, in some countries vice-presidents (research) have direct responsibility for the university research office, and especially its director. In other places, the director reports to an administrative head, with a dotted line to the vice-president (Langley and Green, 2009).

The staff of the research office usually carry out numerous important administrative functions, such as processing research grant applications; liaising with external grant-funding agencies; and compiling grant reports, financial reports, and research outcomes data and statistics. A major research-intensive university can employ from dozens to more than 100 staff, and in universities with devolved management systems, central administrative staff can also be placed in faculty units (Seyd, 2000).

The total number of research administrators in universities has risen significantly over the last 10 years as a result of the need for universities to increase their research and commercialisation productivity and funding (Collinson, 2006; Hockey and Allen-Collinson, 2009). These research administrators are managed by a director. This person is often a PhD graduate who may have had some research experience after graduation or focused more on research administration. Research directors often have long experience with research ad-

ministration and are seen as leaders by many staff. In North America, many research administrators and especially their directors also have acquired specialised qualifications and professional recognition in research administration (Atkinson et. al., 2007: Lintz, 2008; Deem, 2010), and there is strong support for such qualifications in other countries (Langley and Green, 2009; Brown, 2010; Deem, 2010).

Many high-quality research management associations, such as the Society of Research Administrators, the European Association of Research Managers and Administrators, and the Australasian Research Management Society, provide a strong professional basis for research administration. In fact, the increase in the numbers of research administrators in universities, and the importance of their role, have blurred the boundaries between professional staff and senior academic managers and other academic staff. These relationships do, however, depend on the university and the position of the administrator, as well as their personal aspirations and abilities (Whitchurch, 2006).

Some senior research administrators carry out roles and responsibilities that are usually part of the academic role. These contributions—in areas such as research student supervision and "coaching" inexperienced committee members or even senior research manager chairs (Hockey and Allen-Collinson, 2009)—are legitimate activities that should not be underestimated. Respondents at half of the 20 English universities surveyed by Langley and Green (2009) believed that research-support priorities were set by the pro vice-chancellor (vice-president research), with the other half indicating that priorities were set by the director of research support. If in this latter group the vice-president and director worked well together, if their roles were clearly defined, mutually agreed upon and mutually supportive, there would not be a challenge to your leadership. But the blurring of roles between academics and research administrators has led to a certain level of tension, and perhaps even conflict, between research administrators and academics (McInnes, 1998; Seyd, 2000; Collinson, 2007; Kerridge and Colquhoun, 2010).

I mentioned earlier that it's not uncommon for new presidents to appoint their own vice-presidents (research), and it's not unknown

for new vice-presidents (research) to appoint their own directors of research, when the reporting relationship is a direct line of responsibility. I am certainly not suggesting that you consider appointing a new director, but I am suggesting that you seriously consider whether or not your working relationship is optimal both for you and for the university, and if not, consider ways of improving the situation before it reflects negatively on your performance. Perhaps this area could be a component of the KPIs you negotiate with the director for their annual performance assessment.

In addition to the professional activities of your staff, the other professional activities you seriously need to consider are your own. You most likely have been appointed to your current senior management position because of your outstanding academic profile, usually based on your excellent research outcomes. If your research career has been in STEM, you likely have built up a strong research team, and if your background is in humanities, social science or creative arts, you have probably carried out your research in a supportive cultural environment.

Depending on the size and research intensity of your university, your role may be part-time or full-time. In the United Kingdom, many vice-presidents serve only part-time even in large research-intensive universities (Smith et al., 2007). Most senior managers lead in an environment where influence is more important than overt authority, and based on a culture of persuasion, so even vice-presidents who have lost touch with front-line research try to retain a link to academic activity (Spendlove, 2007; Smith and Adams, 2008).

If you have "risen through the ranks" in your current university, you still retain the ability, and likely the compulsion, to carry out and supervise your own research and probably also the research of staff and students. Be aware, however, that the complex demands of research management and high workload can reduce the rate of your research productivity (Schuetzenmeister, 2010).

The challenge for you, however, lies in how your relationship with your research discipline is perceived vis a vis your role as senior research manager. If your team or research area is perceived to receive inappropriate support, you'll face a negative reaction, but if

your research area draws reduced support, your colleagues in your research area may be aggrieved. So whatever you do you must be above reproach and your decisions must be seen as based on objective criteria. You must always act with transparency, although in a very competitive environment, you may have to accept that no matter how well you approach the issue of resource allocation, there will always be academics who are not happy.

If you moved to your current university to take a position as vice-president (research) or associate dean (research), you are unlikely to have your own strong research support, and it's even possible that the university you moved to may not carry out research in your area of expertise. Although overcoming the challenge described above, your lack of active research may not be well perceived by senior research leaders. They may see you as a "bureaucratic" full-time professional manager rather than an academic, which may reflect negatively on your leadership. And of course, the lack of continuing personal research activity may create major ramifications for your future beyond your role as vice-president (research).

Your ability to continue personal research depends on many factors. Whatever you do, you must give this situation very serious thought, ideally before commencing your senior management position.

CHAPTER 7

PROMOTING
YOUR RESEARCH

You have strategically planned, then project-managed and led the research productivity of your faculty unit or university, which has resulted in a large number of high-quality outputs. But it's not sufficient to assume that these results will speak for themselves. Even excellent articles in the most outstanding journals and books will likely not be read by the parents of your potential students or the representatives of your local or national governments. So it is essential that you promote your research outputs and outcomes, both within your university and externally. You must also make sure you have opportunities for grants and contract research, to attract good research staff, to attract the best PhD students, and to influence policy.

Like all your other activities, promotion requires a strategy to ensure maximum coverage in the most effective and efficient way. In today's competitive global environment, it's essential not only to be very good, but also to promote that fact widely. I mentioned earlier that most major universities spend millions on marketing, usually to attract the best undergraduate students. You should liaise with your marketing and communication department to ensure that your research is also promoted to best effect. And if funding is available, you should even consider paid community advertising. Billboards at airports or train stations that attract large numbers of potential students and their parents, as well as notices of upcoming public lectures on your research, can add to the public perception that your research is important and widely applauded.

It is very important that your promotion strategy be aligned and coordinated with your strategic plan. If you've decided that your re-

search strategy will focus on applied and commercial outcomes, your communication strategy should certainly include a major message regarding industries and commercialisation. For example, publicise increased patent applications, establishment of "spinoff" companies, memoranda of understanding with industry and big pharma companies, etc. Your planning and communication plans are living documents, which need constant review and updating; their focus may change from time to time. Your research productivity must keep pace with the research at your peer universities; otherwise you are standing still or, even worse, going backwards.

What you promote must always be accurate. Even when inaccuracies can be traced to external factors, the consequences for senior university research managers can be serious. The September 2005 *Times Higher Education Supplement* showed that Malaysia's top two universities had fallen about 100 places from the previous year. Although this slip apparently resulted from a change in the ranking methodology, it was very badly received politically, and a few weeks later the vice-chancellor of the University of Malaysia stepped down (Salmi, 2009). I am personally aware of one case in which, when the rankings were "good," the president was widely quoted about it in the lay press. But the following year, when the institution's ranking slipped, it was up to the vice-president (research) to explain the "lack of productivity."

The point is, that even for national or international surveys, you should use commonly available tools and databases to ensure the measures of your research productivity are accurate. It is highly likely that you will need more than one, and possibly several different data analysis tools to be able to describe your productivity accurately, as each of the major tools available appears to focus on different criteria. Figure 2 shows the results of a comparison carried out several years ago (Green et al., 2010) on 21 English universities. (Reproduced here with permission of the authors.) Your choice of which data analysis tools to use needs to be based on current information, but I have listed here examples of possible options you can use to accurately determine your research outputs.

Figure 2. Suppliers mapped to information needs

	Agresso	Alta	Atira (PURE)	BlueCube	Dspace	Elsevier (Scopus, Scival)	ePrints	Imprints	InfoEd	Inteum	MyIP	Oracle Grants	pFACT	ResearchResearch	SAP Grants Mgmt	Symplectic	TechnologyOne	Thomson (InCites, WoS)	Wellspring
1. Identify funding			X			X			X					X					
2. Calculate costs	X								X				X						
3. Monitor grant success			X						X										
4. Manage funds	X			X								X			X		X		
5. Monitor research outputs																			
Publication						X	X									X		X	
Intellectual property		X							X	X	X								X
Esteem			X													X			
6. Showcase strengths																			
Individual			X			X	X	X											
Institutional			X			X	X	X											
7. Researcher collaboration						X													
8. Institutional collaboration		X				X										X		X	X
9. Business development		X							X		X								X
10. Identify talent						X										X			
11. Scenario Plan																			

Of course, even at the faculty level and certainly at the university level, you can only collect, analyse, assess and then promote outcomes that you have organised for staff to accurately record and then submit to you. This process should all be part of your strategic plan and governance. Staff are more likely to submit information when agencies—either internal or external, such as the British REF and Australian ERA—offer financial or other rewards, But it's also more likely that you will need to affirm its accuracy. Although both are worthwhile, there really are differences between a proffered non-refereed conference presentation, and a publication in a refereed journal. Promoting the former as being the latter will not enhance your university's research profile.

High-quality, proffered, non-refereed conference presentations by your staff or PhD students are, in fact, a very good way to promote your research and the excellence of your students, and you should take every opportunity to reinforce this message. But you may well decide that staff will only be financially supported to give conference presentations when they can demonstrate they are of sufficiently high quality.

While much of this chapter concerns external promotion of your research, it's also important that you promote research outputs internally. Perhaps even more important is how you manage the promotion of high-ranking performance compared with lower-performing research areas—that is how do you balance the need for some areas to lift their performance while "lauding" the performance of other areas? Much will depend on your strategic plan and your leadership as discussed earlier. Your approach should be based on known and validated metrics using databases and tools under your control. For example, see the products listed in Figure 2.

The "Matthew effect" (Merton, 1968), is also important here. The better your research is perceived, the higher the quality of your PhD students and staff, and the more likely you will be able to attract good ones in the future. Certainly, some older "prestigious" universities with global rankings depend more on their history than on their current performance.

There are many ways of promoting your research, and in addition to specialised staff in your own office and university, many consultancies could assist you. Entrepreneurial universities vying to attract excellent staff and students often advertise their research on billboards, on TV, in magazines appropriate to academic and research endeavour, and via "pop ups" on university and academic websites. For internal promotion, messages generated by more than one source, especially sources external to the organisation, are considered more believable (Gist, 1987). Small ceremonies celebrating staff who have achieved significant outcomes—such as outstanding publications, national and international awards and honours, and especially major competitive national and international grant funding—often draw notice across campus. These promotional efforts should be supported by internal communication strategies. You need a good communication plan.

Staff in your specialist marketing or media division will be able to assist your communication planning efforts, but a free toolkit published by NPower Seattle (2006) and downloadable from (http://www.techsoup.org/binaries/files/communications_toolkit_for_screen.pdf) is a good guide.

Is there a weekly university research network email that advertises upcoming grant application deadlines you could use to promote your research success? Does the university publish a weekly or monthly newsletter for staff, students and alumni? And who will write the lay stories on your research productivity and organise appropriate photographs for local and national news organisations? Who is your contact at the local TV stations? Like any other strategy, your communication plan should not only be planned and carried out, but also followed up and analysed to ensure maximum benefit.

For example, some of your research "high flyers" may be too busy to want to be involved in lay publicity. Although some have egos of gigantic proportions and are very extroverted and seek out publicity, others are happy to ignore the limelight and do not want to publicise themselves or their research productivity. And some believe they don't need to, that they should just be given funding and left alone. To allow for all these personality types, there is merit in providing internal courses on working with the media. They can be run by consultants, if necessary, and should be offered often enough to ensure that research academics who are likely to benefit can attend at least once every few years.

In addition to more traditional formats for disseminating information to the lay public, you should also consider recent innovations in social media marketing. Appropriate use of Internet formats such as LinkedIn, FaceBook, My Space, YouTube and the Altmetrics app on Scopus; and Twitter and Weibo on mobile devices, can generate enormous followings and provide almost instant dissemination of news about good outcomes. Of course, these formats are even better at communicating negative news, so as always, your communication strategy needs to be well planned, thought through and carried out.

You can also pursue a number of external, research discipline-specific communication activities. Encouraging your senior research

leaders to take positions with national and international grant-funding bodies, on editorial boards and so on, will require a substantial time commitment and may not be the same as promoting specific pieces of research, but such academic "advertising" is an extremely effective way of promoting your research to other universities and government representatives.

Similarly, most governments and professional associations call for comment on possible new strategies or new policies or plans from time to time. It is usually your responsibility to prepare or at least coordinate a university response, and activity in these types of areas will also bring you significant kudos and highlight your university credentials in research.

Are all your key researchers networked and promoted on such websites and databases as www.biomedexperts.com and www.academia.edu and similar groupings for their specific discipline areas? Are they major players in national and international professional associations and conference forums? All these types of specific activities, when done well, establish and promote your university's high-quality research outcomes via discipline areas. Have you allocated central university and faculty funding to foster such activities? It will not only promote your research, but also substantially support your leadership profile.

And how do you encourage promotion of your research outputs via the highest possible quality public dissemination, while also ensuring the confidentiality of research with potential for commercialisation?

CHAPTER 8

PUBLISH, PERISH OR PATENT

I chose the title for this chapter because of the old adage in higher education that unless one publishes, their academic career perishes. This thinking is still very much alive today, and is largely the reason that in 2009, for example, almost 1.39 million research publications (excluding reviews and conferences) were indexed in Scopus (Plume, 2011).

In general, academics still largely focus on publishing and applying for research funding (Baldini et al., 2007; Wu, 2010; Thursby and Thursby, 2011). They tend to be more interested in reputational and career rewards, as well as intrinsic satisfaction such as salary increases, research grants, research prizes, fellowships and honors, and eponymy and peer-group esteem, than they are in the financial rewards that may or may not come from commercialisation (Louis et al., 1989; Dasgupta and David, 1994: Lam, 2011). Researchers who are active in commercialisation are usually also active in basic research, and professors with industrial funding publish more and collaborate more, both within the university and with industry (Louis et al., 1989; Gulbrandsen and Smeby, 2005). Promotion is very important, but most universities, even high-profile research-intensive institutions, still put more promotional emphasis on achievements in teaching or research than in commercialisation.

Although the title of the chapter suggests otherwise, it is possible to publish and still perish if the publications are only quantity and not quality, and the major focus of this chapter is that it's possible to publish and patent. In fact, as mentioned previously, the increasing focus of governments on university outcomes does have an economic basis, and with increasing competition for national grant-funding ap-

plications, researchers are looking for funding from sources other than grants (Bernstein, 2012).

There is global understanding that commercialisation of research outcomes will produce massive profits that will benefit the "bottom line" for researchers, the university, and the government. People do consistently overestimate the likelihood that events of high importance but very low probability will actually occur, and inventors of biomedical patents overvalue their discoveries (Heller and Eisenberg, 1998). As I will explain later, this widely held belief about massive profits is largely incorrect and only applies to an extremely small number of "blockbuster" cases. Nonetheless, it has had a major effect on research approaches globally.

In fact, there has been extensive debate on whether a push toward commercialisation has had negative effects on the quality and quantity of basic research production and the timeliness of its publication. Despite the findings of earlier academic studies suggesting that this increasing push toward commercialisation has had no major direct impacts on "traditional" research approaches and outcomes (Lambert, 2003; Owen-Smith and Powell, 2003; Thursby and Thursby, 2004: Thursby et al., 2007; Pugatch et al., 2012), more recent, lay press articles (Bhattacharya, 2012; Caulfield, 2012; Fisher, 2012) still decry the pressure to commercialise basic research to business. There is no doubt that an increasing push toward commercialisation exists, but the apparent controversy about its effects may be caused by lack of clarity concerning what commercialisation actually is.

Patents are certainly the major focus of what universities, governments and researchers think of with respect to commercialisation, but there are a number of aspects to intellectual property (IP), and also many other aspects, some direct and others indirect, to commercialisation. IP is a broad term that describes application of the mind to create something new or original. It can be classified as registered rights—patents, trademarks, designs, and plant breeders' rights—and unregistered rights—copyright, circuit layouts, and trade secrets. But in addition to IP, I would argue that the definition of commercialisation could be expanded to include direct and indirect items, such as licensing, research joint ventures, formation of start-up companies, royalties, material

transfer agreements, commercial-in-confidence agreements, incubator environments formation, and technology parks construction. Wu (2010) even considers that the university's third mission of knowledge diffusion, also called community outreach, can be narrowly defined as commercialisation. And even translational research that may lead to direct reductions in morbidity and mortality (Butler, 2008; Editorial, 2008; Pearson, 2008), although it perhaps doesn't make money, certainly has a major social effect and ultimately does save money.

The cultures of universities and commercial companies differ, creating challenges in working together, but the many advantages to both organisational types working together tend to predominate (Owen-Smith et al., 2002: Lambert, 2003; Ternouth et al., 2010). In fact, it's likely there will be more university/industry partnerships as industry withdraws from early-stage research because of the need to reduce costs (Editorial, 2012a).

Much of the push to commercialisation is based on the potential for massive profits, as mentioned above. The dozen or so blockbuster commercialisations commonly discussed list royalty rights of $45 million to $700 million, annual sales of $0.8 billion to $4.3 billion, and earnings from $93 million to $540 million (Edwards et al., 2003; Hamermesh et al., 2007; Baldini, 2008; Wadman, 2008). Without doubt, these are figures any university would love to see on its balance sheet, but the fact is that these are extremely rare cases. Although at least one of these blockbuster products is based on information technology (for a page-ranking Internet search engine), most are inventions in the biotechnology and pharmaceutical sectors (Edwards et al., 2003; Gewin, 2005; Baldini, 2008: Van Zeebroeck et al., 2008; Maxmen, 2012), and so are more usually associated with universities with a medical school and/or a major focus on biotechnology.

However, despite the enormous returns from a relatively small number of outcomes, the vast majority of universities fail to cover the expenses they put into their commercialisation activities, let alone generate revenue (Edwards et al., 2003; Thursby and Thursby, 2003; Gewin, 2005; Wadman, 2008; Powers and Campbell, 2009; Tinnemann et al., 2010). In the United States, where most university commercialisation occurs, in the 5-year period, 1998-2002, the top 20

universities accounted for 83% of the aggregate net license revenues generated, and the remainder earned negative or at best negligible returns. The distribution of net license returns as a fraction of the university's total research expenditure was also highly skewed, being less than 5% for 90% of them (Bulut and Moschini, 2006). Five years later, 77% of all university revenue from technology licensing was earned by just 10 universities (Powers and Campbell, 2009).

Most of the investment in universities goes through the Technology Transfer Office (TTO), and it is highly likely this office will be under your direct control as vice-president (research). TTOs usually comprise up to a dozen staff with expertise covering the major facets of commercialisation, including law, commerce, marketing, and financial analysis. TTO staff also ideally have experience with, and knowledge of, the industrial, commercial, and financial sectors of venture capital and angel investors. Although a handful of early TTOs existed before, the US University and Small Business Patent Procedures Act of 1980, otherwise known as the Bayh-Dole Act, led to an exponential increase in the number of TTOs. The Bayh-Dole Act instituted a uniform patent policy and removed many restrictions on licensing, but most importantly, it allowed universities to own the patents that resulted from federally funded research grants. The number of universities with TTOs increased from 25 in 1980, to 200 in 1990, and by 2000, virtually every American university had established a TTO (Nelson, 2001; Siegel et al., 2003).

Patents are certainly the prime focus globally when universities consider commercialisation, but interestingly, only one university is listed among the top 50 Patent Cooperation Treaty (PCT) applicants, 1978-2011 (Table 2, page 18, World Intellectual Property Organisation, PCT Yearly Review, WIPO 2012). The University of California ranks 23rd, possibly because its commercialisation culture dates back to 1926 (Mowery et al., 2001). University patenting is clearly American-focused. Of the top 50 university PCT applicants (Table A 3.5, page 37 World Intellectual Property Organisation PCT Yearly Review, WIPO 2012), the United States accounts for 26; Japan and the Republic of Korea, seven; Israel and the UK, three; and Australia, Singapore, Denmark and China, one each.

PCT applications globally have steadily increased from approximately 15,000 in 1990 to approximately 185,000 in 2011 (Figure A 1.1, page 23, World Intellectual Property Organisation, PCT Yearly Review, 2012). Despite the fact that many countries have since tried to introduce policies similar to those of the Bayh-Dole provisions, there has been debate on the actual real effect of the Act even in the United States (Mowery et al., 2001; Gewin, 2005; Baldini, 2009; Ponomariov, 2008; Thursby and Thursby, 2011). Although I believe there are many internal reasons why commercialisation in universities may not be working as well as governments and the universities may wish, the US government has encountered major challenges with the current patenting system. As of June 24, 2012, House Judiciary Committee Chairman Lamar Smith (R-Tex.) said: "*the current patent system is broken. The average wait time for patent approval in the United States is 3 years. The PTO (Patent and Trademark Office) has a backlog of 1.2 million patents pending approval. . . . In other words, the system intended to protect and promote new inventions has become a barrier to innovation and job creation* (http://www.genomeweb.com/update-patent-reform-bill-passes-house)".

My own experiences with the US PTO some years ago were not especially user-friendly, and the fact that there appears to be a focus on the US PTO, whereas it is possible to file a PCT patent covering over 140 Paris Convention countries at your national patent office, or ideally with one of the other seven major patent offices or directly with the World Intellectual Property Organisation (http://www.wipo.int/pct/en/faqs/faqs.html), could be exacerbating the backlog at the US PTO. But nevertheless, the United States has now passed a bill that fundamentally changed the US patent system. The Leahy-Smith America Invents Act [H.R. 1249] (http://www.uspto.gov/aia_implementation/index.jsp), was passed into law in September 2011. It changed the US system to one in which the first inventor to file a patent, rather than the first inventor, will receive a patent. The law also created a post-grant review and opposition system. The new patenting process made acquiring rights simpler, while maintaining a 1-year grace period that protects the inventor.

The other sweeping new change to commercialisation in the

United States consists of two bills (Holt-Bishop H.R. 4720 and Lautenberg, Brown, Gillibrand S. 2369) collectively called the America Innovates Act of 2012. This law established an independent agency for an American Innovation Bank to promote the commercialisation of discoveries in "*life sciences, medicine, computer science, communication, technology, physical sciences, engineering, and other research areas determined important for economic development*." Grants will be available on a competitive basis to institutions of higher education and nonprofit research institutions that focus on science research (Noonan, 2012).

Although this book is globally focused, much of my discussion has been based on US documentation and experience, because that is where the vast majority of commercialisation occurs, and consequently, most international researchers and their universities use the US model as a yardstick. However, even in the US, there is enormous diversity in commercialisation practices and policies (Argyres and Liebeskind, 1998; Thursby and Thursby, 2002). This diversity is not surprising given the cultural differences, social differences, biomedical and biotechnological maturity differences, industry interest levels, and financial resources available, within and among countries. Nevertheless, countries such as Austria, Denmark, Germany, Norway, Japan, and Korea have only relatively recently—20 years after the introduction of the Bayh-Dole Act in the US—introduced new legislation to grant universities title to IP resulting from publicly funded research (Cervantes and Callan, 2003).

However, whereas the Bayh-Dole Act changed IP rules, most European legislative changes have focused on changing employment laws to remove professor's privilege. Professor's privilege, which allowed university professors to choose whether or not they wished to commercialise their research outcomes, and to retain patents and rights, had been the law in German-speaking countries and Scandinavia. Denmark was the first country to abolish it in 2000, followed by Germany, Austria, Norway and Finland by 2007. Researchers in these countries were then invited to use the services of TTOs to commercialise their research outcomes (Tinnemann et al., 2010). In other European countries, such as France, Ireland and the UK, where university ownership was already in place, universities were encouraged

to enforce their rights (Geuna and Rossi, 2011; Cervantes, 2012). Japan passed a law in 1998 to establish technology licensing organisations and a subsequent law in 2000 to strengthen industrial technology capability by loosening restrictions, making it easier for researchers at national universities to receive funding from the private sector (Motohashi, 2004). IP rules vary across the provinces in Canada, and the current focus is on harmonising policies with respect to research funded by federal government contracts. China has enacted legislative reforms to give universities autonomy, allowing them to experiment with a wide range of policies that encourage commercialisation (Wu, 2010; Cervantes, 2012). Developing countries from Brazil to Malaysia to South Africa have all passed, and India has considered, laws promoting the patenting of publicly funded research, based on the Bayh-Dole Act (So et al., 2008). Even the latest strategic plan for Saudi Arabia looks to universities to create and grow entrepreneurial companies (Alshumaimri et al., 2012).

As stated above, with the enormous differences in the capacity of each country to push commercialisation of its university research outcomes, and the very low possibility that the money invested will provide any financial return, let alone blockbuster revenue, the philosophy of copying what happens in the United States must be questioned (Owen-Smith et al., 2002; Baldini, 2006; So et al., 2008; Wellings, 2008).

For the sake of effective discussion on how to improve your university's commercialisation, there are four major elements to consider.

1. **Your national legislative framework.** Your government provides the legislative framework in which you have to work. This context varies widely among nations, as detailed above, so whichever country your university is in, you will have specific, detailed policies and even laws that you and your colleagues in other national universities will have to comply with. This element you just have to accept.

2. **Your national industrial complex.** By this I mean the potential commercial industry partners you may work with and the external financial backers, such as venture capitalists and angel investors, who may fund you. It is not essential to restrict yourself to national partners, and if you can obtain foreign funding support,

that is excellent. But there are benefits in geographic closeness and cultural similarity, and it may be easier to seek support locally first. Although there is not much you can do to stimulate or expand the size of this element, you must ensure that your TTO and researchers are as widely known by this element as possible, and that you are aware of as many players in this element as possible.

3. **TTO.** It is likely that as vice-president (research) you are directly responsible for this element, and so it is an essential part of your portfolio, which you must concentrate on. Many of the papers quoted in this chapter appear to put the full blame for lack of commercialisation within a university on the TTO. Although some TTOs are not up to a reasonable standard, having been described in the past as inexpert and passive or even "hopeless" (Wadman, 2008), what I am trying to highlight here is that commercialisation is the outcome of the complex relationships among these four major elements, and your leadership will play a major role with at least three of them.

    Assuming that the TTO needs improvement, a number of observations in the literature should be considered:

    -   If your university does not have a TTO, forming one should be high on your priority list, as the lack of a TTO will certainly be an obstacle to your university's patenting activity (Baldini, 2009; 2010).
    -   The TTO must be staffed appropriately, be a reasonable size, and maintain good compensation practices (Siegel et al., 2003; Wadman, 2008; Powers and Campbell, 2009).
    -   It should ensure university-wide dissemination of national legal frameworks and commercialisation opportunities to all staff (Baldini, 2006);
    -   It should maintain barrier-free internal working relationships with research staff and students, and constant relationships with industry, IP attorneys (although larger TTOs may employ them on staff), and venture capital firms (Dalton, (2008)). The TTO should then put these external resource providers in contact with researchers committed to commercialisation (O'Gorman et al., 2008).

Expectations for financial gain should be appropriate so that vig-orous demands for excessive IP rights and subsequent royal-ties do not cause negotiations to break down before they even begin (Destler, 2008; Wadman, 2008).

- TTOs should be restricted to working in the research area specialisations present in the university, but perhaps could pro-vide specialisation depth or seek experience in new areas by working with other TTOs across geographic markets (Lach and Schankerman, 2008).

- In discerning and marketing potential revenue-generating patents, TTOs must ensure that universities are not seeking to patent almost everything, thereby not using valuable resources for no return, and downgrading the university's IP holdings (Gewin, 2005).

- TTOs should be proactive. Ideally, their business development managers should seek out faculty research with potential com-mercial applications early in the research process (Wadman, 2008). Many TTO directors believe researchers may be dis-closing less than half of inventions with commercialisation po-tential (Jensen et al., 2003). Their reasons for this lie not just with the TTO, but in the complex relationship between TTO directors, whose role it is to encourage internal disclosure, and the researcher, the last of the four elements in commercialisa-tion,

4. **Researchers.** Without researchers focused on commercialisation and prepared to disclose their research outcomes to the TTO, universities would not be able to commercialise anything. It is therefore essential that the university culture encourages com-mercialisation with strong, obvious support from all senior uni-versity managers, and especially the vice-president (research) and the associate deans (research).

As many as 25% of researchers in medicine and natural science receive funding from industry, with the average amount in one US study being $33,000 per academic year (Gulbrandsen and Smeby, 2005; Meija, 2008; Zinner and Campbell, 2009). So although com-mercialisation providing blockbuster revenues to the university

may be very rare, there is often an underlying university/industry relationship, albeit perhaps operating at a relatively low level. But even then, a number of observations in the literature should be considered to encourage researcher involvement. Depending on the number and experience of the staff in your TTO, either you or your senior TT officer must focus on these observations:

- Some university researchers use valuable university equipment to carry out private consulting activities for which they receive personal financial benefit. Although such consultancies can provide value to the institution, the TTO must establish and enforce policies and procedures to ensure consulting revenue returns to the university (Thursby et al., 2007; Markman et al., 2008). Bypassing activity—as many as 42% of researchers who invent patents bypass their university and go directly to outside firms (Dalton, 2008)—is reduced when departments receive greater shares of royalties from licensing (Markman et al., 2008).

- There are clear differences in the level of acceptance of commercialisation among academic researchers, but levels of training as evidenced by local group norms and culture do influence subsequent commercialisation acceptance and behaviour (Louis et al., 1989; Bercovitz and Feldman, 2008).

- Appointing leading figures who are serial-inventors/entrepreneurs and department heads who commercialise can help initiate a commercialisation culture (Louis et al., 1989; Bercovitz and Feldman, 2008; Goktepe-Hulten, 2008).

- Although most of my comments here have been about academic staff researchers, PhD students are also a major force behind your research outcomes. In many countries, PhD students own the rights to their research, so you should appropriately endeavour to have them sign these rights over to the university (Wellings, 2008).

- Company timelines are usually much shorter and more urgent than academic research timelines (Destler, 2008); consequently, you need to encourage researchers seeking commercialisation funding to work to shorter timelines;

- Co-location of researchers and industry, either in traditional university buildings or purpose-built incubators and technology parks, facilitates commercialisation outputs and outcomes (Agrawal and Cockburn, 2002; Motohashi, 2004; Markman et al., 2008).
- Researchers do not wish to be steered to commercialisation by administrators or politicians. When appropriately led, they are more likely to accept evolutionary change, rather than abrupt total transition to entrepreneurial activity (Goktepe-Hulten, 2008).
- And no matter how much you and the TTO encourage commercialisation, be aware that other vice-presidents and associate deans in the university are also encouraging academic researchers to do more teaching and community engagement.

Your leadership will be crucial in ensuring the success of all these challenges and the success of commercialisation in your university or faculty. I have discussed the pros and cons of each item in an academic sense so that you can consider whether to pursue them, and if so, to what level. Clearly, it is possible to gain massive financial returns from commercialisation, but on balance, the likelihood of this outcome seems remote for the vast majority of universities. If you decide to pursue commercialisation, or to pursue it further, using the suggestions above, then perhaps it should be for a number of reasons other than a pure financial basis.

Niels Reimers, the architect of Stanford University's approach to licensing recombinant DNA technology (which led to the emergence of the biotechnology industry) summed up their goals for recombinant DNA in this way: "*Our objectives were to develop a licensing program consistent with the public-service ideals of the university, to encourage the application of genetic engineering technology for public use and benefit, to minimise the potential for biohazardous development, and finally, to provide a source of income for educational and research purposes. Revenue generation is purposefully last in this list. As 10 years of data show, that is where it should be*" (Powers and Campbell, 2009).

CHAPTER 9

BENCHMARKING

Despite many criticisms of ranking systems addressing higher education, the lay public, especially in the Middle East and Asia, still judge an institution by its position in global ranking tables. Not only have rankings of undergraduate programs and university rankings or "league tables" become a growth industry over the last few years, but so has the production of assessments, reviews, analyses, comparisons, critiques and recommendations on the use of them.

The website of the Higher Education Evaluation and Accreditation Council of Taiwan (www.heeact.edu.tw accessed on October 3, 2012), lists at least 48 different ranking organisations, which do not appear to include University Ranking by Academic Performance (URAP), sponsored by the Middle East Technical University (http://www.urapcentre.org/2011/), or SCImago Institutional Rankings (http://www.scimagoir.com/). RankingWatch (http://rankingwatch.blogspot.com), a blog authored by Richard Holmes , lists 22 ranking sites and 14 other blogs that discuss rankings.

Unfortunately, some of the critiques found on these sites, even some of the more academic ones, are inaccurate and invalid. But it is not the purpose of this book to become yet another analysis of league tables. My point is that increasing external review of university productivity is extremely important for senior research managers, and so the impact of league tables must be considered.

It is well known that league table rankings affect how universities are managed (Hazelkorn, 2007; Siganos, 2008; Tapper and Filippakou, 2009), but rankings also trigger a range of external consequences. Denmark contemplated, and the Netherlands do consider,

graduation from "top ranked" universities a criterion in immigration approval (Holmes, 2012). The Universities Grants Commission of India, the government of Russia, and Brazil, recognise placement in global ranking systems in deciding whether or not to run joint degree programs or twin courses (Dhawan, 2012); recognise foreign degrees and study-abroad scholarships (Baty, 2012; Holmes, 2012), and grant Science Without Borders scholarships (Baty, 2012), respectively.

Falling rankings of Indian (Mishra, 2011), Malaysian (Siang, 2008), and French (Salmi, 2011) universities are causing significant disquiet among their countries' politicians. The Indian government passed the Universities for Research and Innovation Bill 2012 to create world-class universities, but because these universities will have "*complete autonomy or unbridled freedom*" it is difficult to see how society will benefit (Tilak, 2012).

There are, in fact, many negative aspects to the unbridled pursuit of ranking system status:

- Reliance on only one ranking system has been criticised because of the potential to disproportionally influence major social and economic policy decisions (Holmes, 2012).
- It is possible that reputational rankings are self-perpetuating (Bowman and Bastedo, 2011).
- University reorganisations, such as the amalgamation of Victoria University of Manchester and the University of Manchester Institute of Science and Technology to form the much larger University of Manchester in 2004, and the National Tsing Hua, National Chiao Tung, National Yang-Ming and National Central universities, which are currently forming a Taiwanese university system (Feng, 2011), and two federal universities, Siberian and Southern, in Russia (Smolentseva, 2010), tend to lead to higher rankings even before there is any evidence of improved outcomes.
- Universities with significant funds can "buy" affiliations that will raise their rankings significantly (Bhattacharjee, 2011; Linde, 2011).
- The rankings are often announced more for commercial than academic reasons (Olds, 2012).
- At least one ranking system has been considered biased by funding paid for ranking advice (Jobbins, 2012).

- Certainly, a number of limitations should be considered before using these systems (Leach, 2004; Baty, 2012). One article even provocatively suggested that "*the QS world university rankings are a load of old baloney*" (Blanchflower, 2011).

Even with all these caveats, it would be unwise to ignore the league tables, as it is likely the lay public do not appreciate their limitations. I am not recommending that you should focus merely on raising your ranking. If you do the right things to optimise your research outcomes as described in this book, then recognition, including higher rankings, will follow.

QS Top Universities publicises comments by senior academics in Australia and the UK who extol the virtues of an "education for education's sake" approach to higher education. QS also cites publications by Georgetown University that try to counter the argument that it's not worth going to college just to find employment (Iqbal, 2011). But this is perhaps not surprising coming from a company that supports one of the major annual-fee-for-service sources for potential students considering which college to attend, and one really must ask whether a degree accompanied by a debt reaching £60,000 [$90,000] is worth "an education for education's sake?"

Part of the challenge in quantifying the value of undergraduate teaching, which as I mentioned previously is inextricably linked with research and research training, is the fact that Altbach (2006) believes these rankings "*generally do not include teaching quality. There are, in fact, no widely accepted methods for measuring teaching quality, and assessing the impact of education on students is so far an unexplored area as well*." Although I agree that some ranking systems compare, without validity and inaccurately, undergraduate courses globally, there are excellent examples of how teaching quality has been assessed on a national basis. For example, the Australian Learning and Teaching Council assessed and rewarded teaching and learning nationally for a number of years. This highly regarded scheme has now unfortunately been replaced by the Office of Teaching and Learning (Le Grew, 2011), but nonetheless it is possible, in my opinion, to assess teaching as well as learning on a national basis, and this applies to research rankings as well, as long as the comparisons are appropriate.

The most valid criticism supported by analyses of the league tables can be explained by likening universities to automobiles. F1 racing cars, Winnebago motorhomes, family sedans, and exotic sports cars are all motor vehicles, but why on earth would anyone want to compare them? Even if you did, someone would likely say the comparison wasn't valid because bicycles weren't included as yet another means of transport. It is possible to do an accurate and worthwhile comparison of F1 racing cars, or of family sedans, or of Lamborghinis, Maseratis, Porsches and Ferraris, but comparing these different kinds of vehicles to one another and, even worse, ranking them, is just not sensible.

There are valid and worthwhile analyses of national university "report cards" on undergraduate courses (Dill and Soo, 2005; Guarino et al., 2005; Van Dyke, 2005) and, in fact, the whole "game" of league table rankings began with one of these, the US News and World Report ranking (Ehrenberg, 2002).

National undergraduate ranking surveys provide valuable information to potential students at the country level, and one of them, especially, the Centre for Higher Education Development/die Zeit (http://ranking.zeit.de/che2012/en/) (CHE, 2011), has received significant praise globally (Usher and Savino, 2006; Federkeil, 2008; Rauhvargers, 2011).

However, when universities are ranked globally, there is inevitably much complexity in the ranking systems. As with the task of ranking automobiles, most authors of papers describing international university ranking systems highlight the differences among them all (Van Raan, 2005; Marginson, 2007; Marginson and Van der Wende, 2007; Taylor and Braddock, 2007; Aguillo et al., 2010), which often leads to a common belief that the ranking is unreliable and therefore not worthwhile. Certainly, there are "biases" in the rankings, different foci, and different outcomes (Locke et al., 2008: Mishra, 2008; Billaut et al., 2010) but more fundamentally, there's little reason to rank Winnebagos against Lamborghinis and Ferraris. What is the value in comparing a very large, research-intensive, Russell-group British university with a small, provincial Chinese teaching college?

If the small college wishes to refocus and turn itself into an international research-intensive institution, several ranking systems

can be used to track progress towards this aim over time. In particular, three prominent ranking systems—the so-called "Shanghai Jiao Tong" (Liu and Cheng, 2005; Docampo, 2011), "Webometrics analysis" (Aguillo et al., 2008; Frequently Asked Questions, 2011) and the more controversial "Times Higher Education (THE)" survey—appear to be worth considering.

The Shanghai Jiao Tong (Academic Ranking of World Universities ARWU) is relatively objective, using defined and accepted data based on a range of indicators for STEM. This ranking is conducted annually and classifies the world's top 500 universities. Webometrics (Consejo Superior de Investigaciones Científicas, Spain) measures the size and visibility of a university on the web and could therefore be seen as assessing a range of characteristics, as well as research and teaching. It comes out every 6 months and classifies the top 12,000 universities and some non-university higher-education institutions. The annual THE analyses a broad range of academic and commercial indicators for the top 200 universities. THE has been open to significant criticism over the last few years, being associated with major cases of negative effects. These included: the resignation of a president; the exclusion of a "forgotten" high-quality international research-intensive university; a university with several Nobel prize winners in the early 20th century ranked above its current performance; and the apparent ignoring of a request from a university not to be listed (Salmi, 2009; Hare, 2010; Razak 2010a,b).

Perhaps because of these and other criticisms, the THE significantly changed its methodology in 2009, but it remains very complex in its efforts to cover teaching quality at an international level, and too much of it, in my opinion, is still reputational rather than objective and fact-based.

Consistent with the much greater global use of international ranking league tables and possibly because of apparent "errors," the International Ranking Expert Group (IREG) developed the so-called Berlin principles in May 2006 as a framework for assessing the worth of league ranking tables. These principles have been criticised (Cheng and Liu, 2008), and as of October 2012, the IREG had established a list of Audit Rules to try to provide a quality label for league tables

(http://www.ireg-observatory.org/index.php?option=com_content&
task=view&id=187&Itemid=162).

It will certainly be interesting to see what effect, if any, attaching
a "quality label" has on international league ranking tables, but as
suggested by Sadlak et al., (2008), "*although a positive view of rankings
is not unanimously shared, it is likely that the naysayers are fighting a los-
ing battle.*" One may not accept the validity or worth of international
ranking systems, and even one president of a major British university
has described them as "*pointless*" (Grant, 2010), but many people do
rely on them and hence they are certainly here to stay.

Largely because of the considerable problems with global ranking
surveys, the European Commission has invested considerable fund-
ing in what is now called U-Multirank (http://www.u-multirank.eu/).
Because it is "multi-dimensional," "multi-level," and "user-driven,"
there is considerable hope for its much wider adoption (Ziegele and
Federkeil, 2012). A recent phase of its introduction involved more
than 159 higher education organisations from 57 countries—109 in
Europe and 50 from outside Europe (van Vught and Ziegele, 2011).
U-Multirank comprises five broad categories: research performance;
teaching and learning; knowledge transfer; internationalisation; and
regional engagement, with teaching and learning being the most
heavily weighted.

But the problems with current global league tables have led to a
number of alternatives. Ioannidis et al., (2007), believe that analyses
of specific performance indicators for single scientists and teams may
be more valid than global rankings of schools or institutions, although
many countries have or are running their own performance-based
university research-funding systems (Hicks, 2012). Even groups of
universities that are not involved in national assessments, such as the
British REF and Australian ERA, are undertaking benchmarking ex-
ercises. Perhaps not surprisingly, these benchmarking exercises reach
similar results as university league table rankings (Proulx, 2007), es-
pecially when the number of people of tertiary age is used as a weight-
ing factor (Millot, 2012). This may also indicate that league tables
may be more valuable than critics have suggested.

I strongly recommend that your university use benchmarking

to assess your performance over time and inform your planning. Membership in an association of similar universities—such as the Russell Group in the United Kingdom, the Ivy League in the US, the Australian Technology Network, the Technical Universities 9 in Germany, the Association of Pacific Rim Universities, Universitas21, and the Association of Arab universities—can certainly be beneficial in assessing your productivity across a range of parameters. If you are not in one of these associations, I strongly recommend that you form such a benchmarking group. Using tools such as the six-perspective scorecard and the MENA card (which introduced a culture of benchmarking in the Arab world [Sawahel, 2012]), either individually, or ideally in association with four to six other similarly sized and structured universities, will be a great boost to your research productivity. This has been done within a larger range of Canadian universities (Jarvey and Usher, 2012).

Doing the right things internally to improve your research profile, and evaluating your achievements through benchmarking with a group of similar universities, are highly likely to lead to external recognition in the global university league tables.

CHAPTER 10

RESEARCH INTEGRITY
AND ETHICS

All research carried out within your university must meet the highest academic standards and be conducted according to the highest standards of integrity and ethics. It is your responsibility to ensure that your university has in place a rigorous research governance framework that documents the processes for assessing the quality, safety, risk management, and ethical acceptability of research. The roles, responsibilities, and accountability of everyone involved in research, including research ethics committees, should be clearly defined and communicated.

The Office of Research Integrity of the US Department of Health and Human Services defines research misconduct (http://ori.hhs. gov/definition-misconduct) as fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.

- **Fabrication** is making up data or results and recording or reporting them.
- **Falsification** is manipulating research materials, equipment, or processes; or changing or omitting data or results such that the research is not accurately represented in the research record.
- **Plagiarism** is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

Research misconduct does not include honest error or differences of opinion.

Unfortunately, the pressures of research competition, which will only increase in the future, are having negative consequences on re-

search integrity, and cases of research misconduct are reported much more frequently. There is increased pressure to maintain a research focus, especially in medicine (Perkel, 2011). Such competitive academic environments increase not only scientists' productivity, but also their drive to "publish or perish" and produce "publishable" results at all costs (Fanelli, 2010). "Mistakes" in research are certainly on the increase (Lowe, 2011; Naik, 2011; Zimmer, 2012), with published retractions in scientific journals increasing approximately 1,200% over the last decade, while the number of published papers only increased around 44% (van Noorden, 2011). Serious reform will require more consistent methodological rigor and a transformation of the current hyper-competitive scientific culture, which encourages the "publish or perish" mentality within a winner-takes-all system (Casadevall and Fang, 2012).

In order to document "mistakes" in research conduct, Fang and Casadevall (2011) developed the "retraction index," the frequency of which varies among journals and is strongly correlated with a journal's impact factor. But the vast majority of retractions are because of research misconduct rather than "mistakes."

"*A detailed review of all 2,047 biomedical and life-science research articles indexed by PubMed as retracted on May 3, 2012, found that only 21.3% were attributable to error. In contrast, 67.4% of retractions were attributable to misconduct, including fraud or suspected fraud (43.4%), duplicate publication (14.2%), and plagiarism (9.8%)*" (Fang et al., 2012).

A meta-analysis of research misconduct surveys found that 1.97% of authors admitted to have fabricated, falsified, or modified data at least once, and up to 33.7% admitted other questionable research practices, such as premature termination, changing methodology, failing to present data, and seriously misleading interpretation of results. In surveys asking about colleagues' behaviour, admission rates were 14.12% for falsification and up to 72% for other questionable practices (Fanelli, 2009). This behaviour is not just something that happens in other people's universities, and although many of the reported cases of research misconduct occurred in STEM disciplines, it is certainly not unique to these areas (Jha, 2012).

It could be that the actual incidence of research misconduct is increasing, or that the tools, procedures, and policies designed to detect

it are becoming more sophisticated and prevalent, or a combination of both factors. However, research misconduct is an extremely serious matter, which you must aim to eradicate completely. When it does occur, you must ensure that it is dealt with promptly, objectively, thoroughly, and with the utmost integrity. The procedures for managing allegations of research misconduct are a critical component of your research governance framework.

The challenge for you is that websites, policies, procedures, and tools designed to stop research misconduct clearly do not work in all cases. Despite cases of total disregard for the correct procedures (usually high-profile), it is your responsibility to ensure that all staff and students are at least aware of the rules and procedures for research conduct in your university. What are they? Where can they be found? Are they available on your research website; in university and faculty handbooks; in documentation provided to all new staff and students during their welcome orientation?

Many publicly available documents define research misconduct and describe what can be done to avoid it (Reich, 2012b; Anderson and Steneck, 2011; Fischer and Zigmond, 2011; Comment, 2012; http://ori.hhs.gov/TheLab/TheLabGuide.pdf; www.ethics.elsevier.com). One of the more globally recognised documents on research integrity is known as the "Singapore Statement." As described on the website, www.singaporestatment.org, it is: "*the product of the collective effort and insights of the 340 individuals from 51 countries who participated in the 2nd World Conference on Research Integrity. These included researchers, funders, representatives of research institutions (universities and research institutes), and research publishers.*"

"The Singapore Statement" was released for global use on September 22, 2010, and it is likely representatives from your country, your funding agencies, and possibly your institution were involved in its production.

The statement describes 14 responsibilities and these four principles:
- Honesty in all aspects of research
- Accountability in the conduct of research
- Professional courtesy and fairness in working with others
- Good stewardship of research on behalf of others

However, the documentation describing the statement notes that:

"*it is not a regulatory document and does not represent the official policies of the countries and organisations that funded and/or participated in the conference. For official policies, guidance, and regulations relating to research integrity, appropriate national bodies and organisations should be consulted.*"

Although it does go on to say the statement's "*publication and dissemination are intended to make it easier for others to provide the leadership needed to promote integrity in research on a global basis, with a common approach to the fundamental elements of responsible research practice,*" there is little focus on any publicly available documentation other than a statement saying it is the researcher's responsibility to adhere to standards of research conduct. What is not widely advertised is that the ethical conduct of research is the responsibility of both the university and the researcher. It is your university's responsibility to ensure that all staff and students are made aware of and accept, preferably in writing, their responsibility to adhere to your university's rules and procedures. Your university is as much responsible for the integrity of the research carried out on campus, as are the staff and students who carry out that research.

One government publication that makes it clear research integrity is the responsibility of everyone involved is the Australian Code for the Responsible Conduct of Research (http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/r39.pdf). It was written in 2007 by the National Health and Medical Research Council, the Australian Research Council, and Universities Australia. The Australian Code consists of two main parts: Part A describes the principles and practices <u>for encouraging the responsible conduct of research, for institutions and researchers</u>; Part B provides a framework for resolving allegations of breaches of the Code and research misconduct, <u>addressing the responsibilities of both institutions and researchers</u>.

The Australian code is an excellent resource if your institution has not already developed full documentation agreed upon and widely accepted by your university staff and students regarding how the institution should ensure that all involved in research fulfil their responsibilities for research integrity.

Plagiarism is probably the most common form of research miscon-

duct, because it is prevalent in both undergraduate and postgraduate education, as well as in publication of research results. Consequently, it has drawn additional scrutiny. A number of plagiarism cases have led to accusations, and even resignations, involving high-profile politicians in Germany, Hungary, Romania, Thailand, and the European Commission (Soboczynski, 2011; Editorial, 2011; 2012b; Day, 2012; Lamubol, 2012; Myklebust, 2012c; Schiermeier, 2012).

The ubiquity of plagiarism cases has led to significant focus in the German-speaking community, with one website, Vroniplag (http://de.vroniplag.wikia.com/wiki/About), winning the Grimme online prize in 2011 (http://de.guttenplag.wikia.com/wiki/Gutten-Plag_Wiki:Grimme_Online_Award) for uncovering plagiarism in the PhD thesis of the then-German defence minister, who subsequently resigned.

Another German website, Plagiat (http://plagiat.htw-berlin.de/start-en/), contains references and information regarding many aspects of plagiarism. One major use of this website is to publish comparisons of software used to detect plagiarism. The comparison carried out in 2010 compared 26 plagiarism-detection tests and found that the top scorers detected only 70% of plagiarism for a "grade of C-." Five were considered "partially useful;" nine were considered "barely useful for education;" 12 were considered "useless for education;" four had been discontinued; and one was classified "other." Problems with other plagiarism detection systems have also been described (Fearn, 2011: Garner, 2011), so it is important that whatever system you use to detect plagiarism in your university must be checked for accuracy and reproducibility.

In fact, plagiarism is such a prominent cause of research misconduct that one country, Slovakia, is running a national scheme to counter it, which is considered to be working (Kravjar, 2012). China, on the other hand, has been accused of rife scientific misconduct (Cyranoski, 2006), and at least one Chinese institution, Zheijiang University, is "*cracking down on misconduct*" (Cyranoski, 2012). With the use of a plagiarism-screening service (Butler, 2010), the new editor of the Journal of Zheijiang University-Science found that since October 2008, 31% (692/2,233) of papers submitted to the publica-

tion contained "*unoriginal material*" (Zhang, 2010). One alleged case in North America is also worth commenting on, because although the University of Kansas did have regulations in place, apparent failure of a research director to report a case of plagiarism he was not directly involved in, but had been made aware of, led to the US Office of Research Integrity censuring both the director and the individual who committed the misconduct (Reich, 2012b). If your staff or students commit research misconduct, it is your responsibility to act appropriately according to your university's rules and regulations. Vice-presidents (research) and associate deans (research) who do not perform their responsibilities when made aware of alleged research misconduct are potentially liable, even though they may not have been directly involved.

And although it does not feature prominently in public documentation on research misconduct, it is important to highlight the increasing problem with ghostwriting. This issue is most prevalent in North America, perhaps because of the presence of big pharma and other industries. Thirty-seven percent of 732 Canadian researchers reported having personally experienced or witnessed financial conflicts of interest, often as pressure to recruit a specific group of patients, particularly in industry-funded trials (Rochon et al., 2011). Yavitch et al., (2012) evaluated the presence of "spin" in press releases and associated media coverage of randomised controlled trials. They found this influence could distort the interpretation of research findings in a way that favors experimental treatments. Although there was no attempt to implicate industry ghostwriting in this study, the results do indicate the importance of researchers' taking responsibility for reporting their own results accurately and honestly. Certainly, ghostwriters have been paid by pharmaceutical companies to produce papers backing a certain therapy (Singer, 2009). Industry does use the International Committee of Medical Journal Editors guidelines to manipulate authorship (Matheson, 2011), and the situation of ghostwriting has become so critical that several authors have suggested it should be considered fraud under the US Racketeer Influenced and Corrupt Organisations Act (RICO), with medical academics held legally liable (Leo et al., 2011; Stern and Lemmens, 2011; Fischman,

2012; Bosch et al., 2012).

It is your responsibility to ensure that your university or faculty maintains the highest levels of research integrity and ethics.

CHAPTER 11

RISK MANAGEMENT

It is appropriate that this discussion of risk management is the last chapter, because although you may have followed all the advice given in previous chapters, if a "black swan" risk (Taleb, 2007) occurs because of factors beyond your control, it could mean the end of your senior research management role and even the end of your academic career. This type of risk is extremely rare but not totally negligible and is characerised by very large, even extreme consequences. It is a type of risk that few people, even in business, let alone the relatively "safe" academic environment, consider. The most recent example of a black swan risk was the global financial crisis, which few predicted, but which resulted in enormous global economic and social consequences.

Risk means many things to many people across different disciplines. Fischhoff et al., (1984) believed that the meaning of risk has always been fraught with confusion and controversy, and some business theorists believe "*investors can never operationally define risk. At best, they can operationally define only their perception of risk*" (Holton, 2004). "*Risk is incorporated into so many different disciplines, from insurance to engineering to portfolio theory, that it should come as no surprise it is defined in different ways by each one*" (www.stern.nyu.edu/~adamodar/pdfiles/valrisk/ch1.pdf). But it does always involve two essential components: exposure and uncertainty (Holton, 2004).

Risk therefore can be seen as the "*effect of uncertainty on objectives*," often expressed "*in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood of occurrence*." Risk management can be defined as "*coordinated activities to direct and control an organisation with regard to risk*," and the risk

management process "*is a systematic application of management poli-cies, procedures, and practices to the activities of communicating, consulting, establishing the context, and identifying, analyzing, evaluating, treating, monitoring, and reviewing risk.*" These are definitions contained in the Standards of the International Organisation for Standardisation (ISO 31000:2009) and are therefore intended for a general audience.

My aim here is to highlight how risk management can specifically impact your university or faculty research roles. To do this, I will use the five categories of risk as described by Slywotzky (2004). Although Slywotzky classified risk with regard to commercial industries, I will give examples for the types of activities that occur in universities glob-ally. Although thankfully most are rare, I highlight them here to show that they do actually occur. Some of these activities could actually be classified under several of Slywotzky's risk types, but for the sake of discussion I have included them under the type of risk that seems to predominate in the activity. Slywotzky listed them in decreasing quantifiability within a commercial context, but in a complex aca-demic environment, it is much more difficult to accurately quantify risk. However, as much as any can be quantifiable, I have listed these risk categories in decreasing order of frequency. And of course, these are just examples of the types of risk you need to consider.

1. HAZARD RISK

A major focus here is your responsibility to ensure safe working conditions for your researchers. Laboratories especially can be dangerous environments, so proper promulgation and adherence to safe working policies in occupational health and safety are es-sential. Access to such potentially dangerous environments must also be well controlled to protect outside visitors such as family members, delivery persons, and external contractors.

Hazard risks may seriously affect non-human objects such as equipment and research outputs. A clear example here that I am personally aware of was the failure of a power supply to an ultra-cold freezer, which did not have a backup power source or alarm system. In such a case, months or even years of research produc-tivity can be thawed and destroyed overnight. Floods and fires are

unfortunately not unknown in laboratories and occur in non-scientific research environments also. What policies and procedures do you have in place to reduce such accidental risk?

Cannot happen to you? As I am writing this, New York City Mayor Bloomberg is on television describing flooding of power sources at a university hospital in downtown New York because of Hurricane Sandy. Insurance may reduce the financial loss, but replacing unique research outcomes lost because of electrical power failure, flooding, or fire is usually not possible. It may potentially set the research back years, and possibly deny or at least delay PhD students their degrees. Duplicate safe storage of unique research outcomes is always an excellent approach.

And hazards are not always accidental. Hacking academic articles is theft and could potentially allow access to commercial-in-confidence or yet-to-be-publicised research, resulting in copyright infringement (Singel, 2011). Theft or improper use of cash itself is also not uncommon in university environments. It has even occurred at very high levels in universities, even by presidents (Fain, 2005: Anderson, 2011; FBI, 2011).

Although this type of risk may not necessarily happen within the research portfolio, you could indirectly be involved if your due diligence or policies and procedures are not sufficient or enforced. And theft can occur specifically with respect to the research portfolio. I am aware of a case in which a foreign visiting researcher was able to electronically transfer research funds back to her account in her home country. I have also been told of a case in which a researcher in a country where a national funding agency gives research funds directly to the researcher invested research funds on the stock market and had to obtain a personal loan to repay the agency when the shares lost value.

Even the indirect effects of theft or unethical research can have serious ramifications. Insurance companies may sue a university where the theft occurred (KCCI.com, 2011), and patients may sue a university where lack of research integrity occurred (Retraction Watch, 2011).

Perhaps a more common hazard risk that can affect your re-

search activities is transport breakdown. In today's global research environment, air transport has become essential, and transport delays, whether because of volcano dust, airline bankruptcy, or bad weather, can seriously affect activities such as national and international conferences your researchers might be organizing. Again, insurance is essential to counter the financial loss should such an event occur. Regarding a less severe but more likely possibility, when I travel globally to give workshops at universities, I always plan to arrive at least a day or two early in case of travel delays.

2. FINANCIAL RISK

Major university finance commitments are usually pan-university or pan-faculty, and items such as commercial investment and major construction are not specific to the research portfolio. But even so, within the research portfolio, a number of potential financial risks should be considered and ideally countered.

Your governance protocols must include detailed policies to ensure that researchers are not able to overspend their research grants. Frequent, accurate updates of money spent and funds remaining are essential to ensure that researchers can work within their budgets.

When researchers make overseas purchases, you must consider such issues as exchange rates to ensure that the correct amount of foreign currency is available for these purchases, which may take some time to process. For major items, not only is the purchase price affected, but transport costs and insurance should also be included in the purchasing contract.

The major cost to research in many discipline areas, and especially in STEM, is the salaries of non-continuing fellows. This issue must be a major focus of review to ensure that sufficient funds are available to cover appointments made.

3. OPERATING RISK

In a university research context, operating risk occurs in activities performed almost on a day-to-day basis. Even such common

practices as appointment and promotion can lead to significant negative impacts.

For example, lawsuits can result over a lack of agreement or delivery of items allegedly promised in research start-up discussions, plans for appointments of high-profile, tenured research staff (Mervis, 2011), or allegedly unfair promotion procedures (Lloyd, 2012).

Other significant cases have involved academics who attracted major external publicity while apparently going about their normal research responsibilities. In some cases, this attention can be positive, but it can also carry extremely high responsibility. For example, a professor at Princeton published a book that led to his becoming both an inspiration and an auditor of reforms in the Spanish national government (Reisz, 2011). On the other hand, a professor of international politics at a Danish university was accused of espionage for allegedly sharing colleagues' publicly available contact information with a foreign government (Myklebust, 2012d).

Even normal professional research operations may carry significant unseen risks. For example, extreme sections of society can cause major impacts. Terror tactics, bomb threats, and even actual bombings can result when small sections of society hold extreme views on aspects of research you may be carrying out (Corral, 2011: McKie, 2012; Jaschik, 2012).

A particularly shocking case highlighting professional operating risk occurred when four Italian university scientists—a volcanologist, geophysicist, seismic engineer, and seismologist—were sentenced to 6 years in prison for multiple manslaughter because they failed to predict a deadly earthquake in L'Aquila, Italy, in 2009 (BBC News, 2012; Cartlidge, 2012). Global responses criticising this verdict emphasised the lack of scientific ability to accurately predict earthquakes, so perhaps this is a good example of a "black swan" risk.

4. ORGANISATIONAL RISK

Risks in this category occur because of the way universities are established and governed and how they are perceived and accessed externally. Again, the risks associated with this category are usu-

ally pan-university or pan-faculty. For example, the quality and sizes of AOUs and profits generated from undergraduate teaching represent institutional risks not specifically or directly associated with the research portfolio.

One major risk in this category with respect to research involves highly cited researchers (usually referred to as HiCis). A HiCi researcher is one of the 250 most-cited authors in one of 22 different discipline areas. Their presence on your staff makes up 20% of the total scoring in the Shanghai Jiao Tong ranking system described in Chapter 9. So the inclusion of these researchers among your university staff can not only be a tremendous boost to your research productivity, but also significantly raise your overall global ranking.

Consequently, some have suggested that universities have "bought" the names of HiCis just to raise their rankings (Bhattacharjee, 2011). However, when these HiCis are permanent and continuing staff members in your university, they make a significant positive contribution to generating intense research activity and collaboration. What will happen to your research productivity if they leave? It is therefore essential that your HiCis' relationship with the university is a real one, well managed and mutually productive. Ideally, you also need plans to ensure the continuation of your research strength and global rankings should they leave.

5. STRATEGIC RISK

I started this book with the statement that you may be responsible for a major national research group in addition to your university or faculty responsibilities. (As an associate dean (research) you may be responsible for a major university centre.) So it is appropriate that I close my discussion on senior research management on the same topic.

National research centres are extremely powerful engines of research productivity and are therefore very highly regarded and extremely competitive. It is to your great credit that you have been successful at "winning" responsibility for one of these centres, and it no doubt took a great deal of time and effort, and internal re-

search funding, to convince your government to entrust you with millions or even hundreds of millions to establish a national research centre. But now that your centre is established and running well, how are you going to maintain it? Governments and universities rarely keep feeding money to these operations once established, so it is up to you as the vice-president (research) or associate dean (research), to ensure your centre's continuing viability.

I classify research centres as potential strategic risks, because you must ensure their continuing and, ideally, expanding productivity. In fact, the director of the centre may also report to you, extending your responsibility. Maintaining your centre probably means having to raise further funding from industry, philanthropists, and alumni, as well as commercialising your research. Not being able to do so would lead to major consequences.

In order to mitigate the major negative consequences that could occur because of these types of risk, you need a well-formulated risk-management plan. Such plans are not static. They depend on a continual process of scanning the situation, analysing the information gathered, acting to eliminate or reduce the risk, and collecting constant feedback.

Some risks, such as occupational health and safety, are quantifiable and relatively easy to address. All workplace hazards need to be identified; the potential of each to cause harm must be assessed; risks must be eliminated or minimised; and remaining hazards must be monitored, with implemented controls reviewed on a regular basis. Hiring an electrician to review laboratory equipment or a safety officer to monitor the use of dangerous chemicals can be time-consuming and expensive, but not addressing these risks could result in serious, even fatal consequences.

Your risk management plan should show how you have reviewed potential risks and decided to address them. This approach will entail avoiding risks where and when possible (which may even mean stopping an activity altogether if you determine the risks are too high); transferring them if you can (for example, to an insurer or through outsourcing); mitigating them when unavoidable; and in some cases (usually low-impact risks) accepting them.

Much of this book has discussed the various plans you need as a senior university research manager. These plans reinforce each other synergistically, and your risk management will be strongly supported by implementing, enforcing, and regularly reviewing all of these plans, which together will work to optimise your research outputs and outcomes.

CONCLUSION

I started this book by describing the importance of your position as a vice-president (research), associate dean (research), or someone who aspires to these positions, because of the importance of research in global higher education.

Your university's teaching, research and community outreach, as assessed by its global league ranking, is now seen as a major instrument of your country's innovation and knowledge production system, and you play a major role in this.

Some governments understand the importance of higher education and support it with additional resources. Some governments see its importance, but expect additional outcomes to occur without providing additional support. And some governments do not see that the country's future depends on knowledge production. The recent global financial crisis, on top of changes in the way governments use "new public management" of their universities to improve social, economic, and environmental outcomes, means that you are playing a key role in a challenging environment.

There is no doubt that higher education is in crisis, even in the world's largest economy (Sanburn, 2012). It is highly likely that the university resources provided by your government will not increase in future, and in fact, they may well decrease. Improving your university's or faculty's research output and outcomes will require great focus and a major investment of your time. You will need to provide leadership that inspires staff and students to produce their best possible outcomes.

When I give senior university research management leadership workshops around the world and describe the realities of global high-

er education, I am often asked, "What is the good news?" My answer is that knowing the current and potential future situation places you in an excellent position to achieve productive outcomes. Developing and applying the skills and expertise described in this book will give you the capacity to excel in a challenging position.

I wish you all good success in your senior university research management endeavors.

APPENDIX A

MIND MAPPING

Legend - "A mind map (in English) drawn by Japanese researchers who are considering a funding request to one of four potential agencies for 1,900 M yen, to be submitted by March 26th, with university partners Wollongong, Stanford and Leeds, to increase their research productivity and gain promotion, overseas fellowships and prestige."

APPENDIX B

Force field analysis
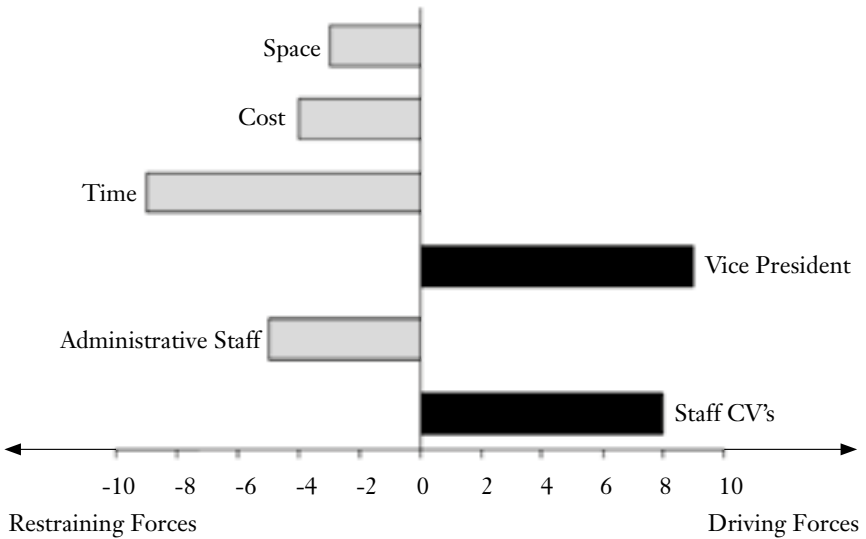
Legend - "A force field analysis drawn by a British researcher to submit a grant funding application who is under great pressure from their Dean because the staff have very good curriculum vitaes (CVs). The challenges to these forces are very limited time to complete the application, minimal administrative staff, few resources and not much space to do it with."

APPENDIX C

Gantt Chart

Task	01	02	03	04	05	06	07	08	09	010	011	012
Focus Groups		████	████	███					███	██		
Survey design	███	██			███	███	██				██	
Field trials								███	███	██		
Statistical analysis	███	██			███	██			███	██		███

Legend - "A typical Gantt chart for a 3 year research program described quarterly. For example, field trials will be conducted from the 8th quarter to the end of the 10th quarter, and focus groups will be held from the 2nd to 4th and then the 9th and 10th quarters."

APPENDIX D

RASCI modeling

Responsible - Person who owns the project

Accountable - Who must approve work

Supportive - Who can provide resources or play a supporting role in implementation

Consulted - Who has information and/or capability to complete the work

Informed - Who must be notified of the result but need not be consulted

Activity	Research Project Leader	Advisory Board	Dean	Assoc Dean (R)
Focus groups	R	A		
Electron microscopy	A	S		S
Staff appointments	R, A		I	
Publication of results	R, A			C

Legend - "RASCI modelling of a project, showing the roles and responsibilities of the three major people (Project Leader, Dean, Associate Dean [R[) and group (Advisory Board) involved."
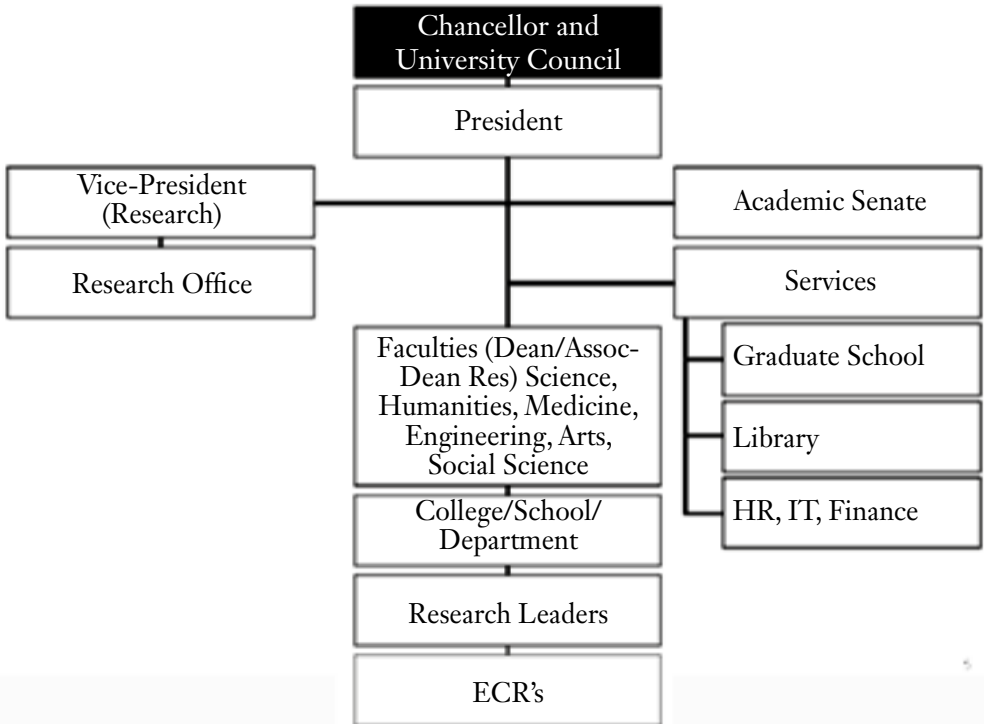
APPENDIX E

Management by objectives

MRC introduced the SMART method for checking validity of the objectives, wich should be SMART(ER)

- **Specific**
- **Measurable**
- **Achievable**
- **Realistic, and**
- **Time-related**
- **Evaluate**
- **Re-evaluate**

Legend - "MBO introduced the SMART method for checking validity of the objectives, which should be SMART(ER)"

APPENDIX F

Organisation and Governance

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                    ┌──────────────────────────┐
                    │   Chancellor and         │
                    │   University Council      │
                    ├──────────────────────────┤
                    │        President          │
                    └──────────────────────────┘
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| Vice-President (Research) | | Academic Senate |
| Research Office | | Services |

Faculties (Dean/Assoc-Dean Res) Science, Humanities, Medicine, Engineering, Arts, Social Science		Graduate School
College/School/Department		Library
Research Leaders		HR, IT, Finance
ECR's		

Legend- "A general schematic of a typical global university"

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ABOUT THE AUTHOR

Emeritus Professor Alan Johnson AM, MA (Hons), MEdMgmt, BAppSc, PhD, DSc, has 30 years of research, research management and research training experience in a range of organisations, including universities, Australian government agencies and international research organisations.

Professor Johnson obtained his bachelor's degree in biomedical technology from the South Australian Institute of Technology, followed by a PhD in parasite immunology from Flinders University. During 1985-1986, he was a Fulbright postdoctoral research fellow at the US Department of Agriculture. He received the Bancroft-Mackerras Medal of the Australian Society for Parasitology for outstanding research in 1989. In 1996, he received a DSc in protozoan biology from the University of Wollongong. Professor Johnson has published over 100 internationally refereed journal articles and received over $3.5 million in competitive grant funding.

Professor Johnson earned an MA (Hons) in technology and social change from the University of Wollongong and a master's degree in educational management from Flinders University, specializing in the use of citation indexing to measure university department performance. In 2007, he received a distinguished alumnus award from Flinders University.

He was made emeritus professor at the University of Technology, Sydney in 2002 and an adjunct professor in the Australian School of Business at the University of New South Wales in 2011.

Between 1997 and 2003, he was editor-in-chief of the *International Journal for Parasitology*, published by Elsevier Science Ltd. Under his editorial, scientific, and administrative leadership, the Science Citation Index impact factor of this journal more than doubled, and the journal became the highest-cited journal publishing original parasitology research. In recognition of his service to science in the field of molecular parasitology, to scientific research and education, and as editor-in-chief of the *International Journal for Parasitology*, Professor Johnson was made a member of the Order of Australia (AM) in 2006.

In 2002 he was a member of the Australian Research Council's (ARC) College of Experts, and from 2003 to 2006 he was seconded as executive director for biological sciences and biotechnology to the ARC. During this period, he was responsible for *Discovery Projects*, *Linkage Projects* and *Linkage International* across all disciplines and was involved with coordination and assessment of *Centres of Excellence* and *Federation Fellow* programs. He developed and implemented the feedback histogram to give unsuccessful *Discovery Projects* applicants a more detailed analysis of proposal assessments than had previously been offered.

Professor Johnson was a member of the National Health and Medical Research Council's Working Group on *Preventive Health and Strengthening Australia's Social and Economic Fabric*. He coordinated *Thinking Systems*, a $10 million cross-disciplinary scheme, which addresses the National Research Priority area, *Frontier Technologies for Building and Transforming Australian Industries*, jointly funded by the ARC and the NHMRC.

Under Professor Johnson's leadership as deputy vice-chancellor (research) at the University of Adelaide in 2006 and 2007, a Federation Fellow and an Australia Fellow were appointed, and the university's annual research revenue exceeded $100 million for the first time. He worked with senior members of the China Scholarships Council to facilitate Chinese postgraduate students' carrying out research at the university.

Professor Johnson is a member of the Academy of Management. He is a member of the External Review Committee of the Japanese National Research Centre for Protozoan Molecular Immunology. He was nominated "Ehrenmitglied" (honorary member) by the German Society for Parasitology in 1999 because of his outstanding research record and the fact that he trained a number of German PhD students and postdoctoral fellows in his laboratories.

Professor Johnson has established an international consultancy business, Research Management Services International www.rmsinternational.com.au. This Australia-based research project management company provides a range of services to improve the productivity and effectiveness of university, research organisation, and business investment in research. Professor Johnson works with universities in Asia, Europe, and the Middle East, as well as Australasia.