

The Canadian University Business Primer

Richard J Marceau

Second Edition

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“Neither governments nor individuals should ever be satisfied with conditions as they are.”

Walter Gordon

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Preface

Universities embody some of the highest ideals and values of our society. Their complex governance involves balancing the expectations and representation of varied stakeholders, while fostering the necessary collegial processes required for academic decision-making.

However, like all legally constituted entities in society, universities interact financially with the world in which they exist. In Canada, yearly cash flows range from tens of millions of dollars for the smallest, to billions for the largest. While doing what they do, they must pay their employees and pay their bills. Regardless of size, universities thrive if they are financially sustainable: if not, they struggle to deliver on their most elementary commitments.

The second edition of the Canadian University Business Primer is the culmination of my 25-years of university experience as a doctoral student, term instructor, professor, department chair, dean, provost and vice-president academic, and vice-president research in five Canadian Universities across three provinces. These many roles provide me with a unique vantage point from which to discuss the complexities facing universities in today's world.

In the first edition, I introduced the reader to the operations of public universities in Canada, and explored the perspective of the university as a business despite it having a governance structure more appropriate to a nation. I did this through the creation of a model designed to provide unique insight on the complex inter-relationships which characterize university activities and outcomes. In particular, the model describes the core business of universities, and the many non-core and blended business activities that differentiate them from other educational institutions. Over the years, this model has successfully assisted me in university decision-making, often with paradigm-shifting impact.

This second edition offers a fresh, reader-friendly format. Improvements to the text, diagrams and tables emphasize the differences between core, non-core and blended business activities. However, the key message remains the same: every dollar taken out of the core business for other types of activities adds

risk to the university's ability to achieve its core business outcomes. This doesn't mean that non-core or blended business activities should be avoided; rather, it underscores the need for non-core and blended business models which minimize – and preferably eliminate – their financial dependence on the core business.

As before, because it is a Primer, this book is not meant to be an all-inclusive approach to the business of universities. The ideas contained in the Primer will be of interest to university administrators, business leaders, government officials and members of the general public. While it is not a book on university leadership, leadership is required to implement the ideas found here. While it is not a book on strategic planning, concepts and examples found herein will guide strategic planning. While it is not a book on the management of teaching, research and learning, there is a focus on core business activities that will positively impact the quality and quantity of university outcomes. While it is not a book on university governance, university governance boards will benefit from its emphasis on core business objectives, metrics, performance tracking and risk management.

For the many stakeholders of Canada's universities, this Primer offers a fresh perspective on the business of university education. It suggests ways for universities to develop innovative, creative and evidence-based strategies for achieving their goals of quality, accountability and sustainability, while remaining respectful of university governance models. However, as is the case with most things concerning academia, the reader may find much that is controversial here.

Acknowledgements

This Primer offers a personal perspective of the business of universities in Canada, based on a twenty-five year career trajectory in five Canadian universities across three provinces. Over these many years, I am grateful to the innumerable colleagues who willingly shared their thoughts with me on this book's important topic. I am especially grateful to my wife Sheila Jones-Marceau for her invaluable support throughout the long hours spent in writing this book.

Glossary of Abbreviations

AAU	Association of Atlantic Universities
ACUDS	Atlantic Common University Data Set
BCI	Bureau de coopération inter-universitaire
CAFCE	Canadian Association for Co-operative Education
CIGI	Centre for International Governance Innovation
CIHR	Canadian Institutes for Health Research
COU	Council of Ontario Universities
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CRC	Canada Research Chair
CRD	Collaborative Research and Development
CUDO	Common University Data Ontario
FTE	Full-time equivalent
HEQCO	Higher Education Quality Council of Ontario
HQP	Highly qualified personnel
ICT	Information and communication technologies
IP	Intellectual property
IRC	Industrial Research Chair
IT	Information technology
NSERC	Natural Sciences and Engineering Research Council
PEC	Privately endowed chair
PSE	Post-secondary education
ROI	Return on investment
RUCBC	Research Universities' Council of British Columbia
SSHRC	Social Sciences and Humanities Research Council

1. Introduction

Universities are complex institutions. Beyond their core business of providing quality undergraduate, graduate and post-graduate education, society's expectations of universities reflect the high ideals that they embody [Canadian Council on Learning, 2009; Clark et al., 2009]. For example, some people hold the view that universities should explore and generate new knowledge, ideas, technologies, and forms of artistic creation and cultural expression. Others expect universities to contribute to industry, and to enhance the nation's economic competitiveness. Still others believe that universities should actively engage in critical thinking, question those things we think we understand, contribute to a deeper understanding of the universe, and learn from past events to better shape the future of society. By virtue of the activities which characterize undergraduate, graduate and post-graduate education, these expected outcomes are in fact deeply connected. Universities successful in achieving these outcomes – and satisfying their wide range of stakeholders – find their reputation enhanced, along with their ability to recruit students.

Though universities have long embraced a plurality of stakeholders and outcomes, there is no standardized view of how universities should optimally be governed or managed, either individually or as a sector. Governments wishing to maximize the social and economic impact of their investments in post-secondary education (PSE) refer to the need for greater quality of university outcomes. This results in much controversy in the definition of quality outcomes or of quality universities. As pointed out by the Canadian Council on Learning [2009; p. 4], "... a necessary step toward understanding and demonstrating quality in PSE is clarification of the overarching purposes and objectives of Canada's collective post-secondary efforts." In other words, does quality refer to some combination of characteristics of university graduates? Does it refer to the successful achievement of government objectives, such as improved access within an increasingly democratized society, or greater retention, resulting in increased graduation rates? Does it refer to some predetermined social and economic outcomes? Is it a matter of achieving a balanced budget? Or, is it some combination of the above?

Unfortunately, the answer depends on the lens through which individual stakeholders view the world. The multiplicity of expected outcomes, reflecting

the plurality of stakeholders, leads to a blurring not only of what truly “counts”, but of accountability. National and international ranking instruments contribute to this confusion by demonstrating such diversity in criteria and their interpretation, that rankings only coarsely align with perceived quality [Nelson & Strohl, 2013]. To make matters worse, a “debate persists on how best to structure institutions and systems – a debate which further confuses our understanding of quality in PSE” [Canadian Council on Learning, 2009; p. 4]. This debate is exacerbated by an increasingly divergent view of the institution by university administration versus faculty members. As pointed out by Glotzbach [2009] in his review of Morrill [2009], “Colleges and universities are strikingly bifurcated organizations. They consist, on the one hand, of administrative divisions that function (for the most part) in ways reminiscent of corporate hierarchies. On the other hand, at their core are academic divisions that operate according to quite different principles.” In fact, this bifurcation is enshrined within the university’s own governance structures, where administrative and financial decision-making largely rely on hierarchical processes, while academic decision-making emphasizes collegial processes.

Adding to this complexity are significant financial pressures. Some of these are due to actuarial pension fund liabilities and government cuts in public spending following the recession of 2008. In leaner times, governments are more intent than ever on maximizing return on investment. They consequently subject such investments to increased scrutiny, and intervene less reservedly in internal university affairs [Howlett & Church, 2010]. There are also growing concerns that the cost of university education is too high, that the research-intensiveness of universities is a key contributor to this trend, and that the sector is financially unsustainable [Clark et al., 2009]. Provincial governments have responded, with limited success, by attempting to reduce redundancies, either of program offerings, research activities or strategic direction of individual institutions. Nevertheless, the overriding necessity of financial sustainability, both institutional and sectoral, underscores the fact that universities are fundamentally businesses, despite the fact that their governance differs from that of conventional for-profit business organizations.

Clearly, universities must respond more effectively to concerns over university quality, accountability and financial sustainability. This can be achieved if universities and stakeholders have a shared understanding of what is core to the business of university education, and what is not. They must also share an

understanding of why the university might occasionally engage in activities that are not core, and how to do so at minimum risk to core operations. Finally, they must agree on metrics for tracking progress in achieving university business outcomes, and for demonstrating quality, accountability and sustainability. This book describes a framework by means of which all of these can be achieved, without suggesting changes to existing university governance models.

Chapter 2 begins by modeling university business activities using a systems approach to define inputs and outcomes. University business operations are classified in terms of core, non-core and blended business activities.

Chapter 3 addresses core business activities, with a particular emphasis on revenue streams, cost structure, core business components, resource allocation, business planning and risk management. A three-level risk management framework is described for core business activities.

Chapter 4 addresses non-core business activities. For each activity, the key issues are identified, and an appropriate business strategy is proposed along with goals and metrics for tracking performance. Non-core business activities introduce significant risks to core business activities, and a three-level risk management framework is described which connects organically to the core business risk management framework.

Chapter 5 addresses blended business activities. Such activities combine characteristics of both core and non-core business activities. Again, a three-level risk management framework is described which connects organically to core business risk management.

Chapter 6 identifies metrics for tracking university outcomes, and Chapter 7 concludes this book.

2. University Business Model

The Introduction showed how valuable “an informational framework through which to understand, measure and clearly demonstrate the quality of its PSE sector” [Canadian Council on Learning, 2009; p. 8] would be to all stakeholders of university activities in Canada. The present chapter proposes a framework based on a systems approach, where the university is observed to interact with the external world in much the same way as do all other legally constituted entities in society, in terms of inputs and outcomes.

2.1 The Outcomes of University Activities

To construct a model describing university operations, the inputs and outcomes must first be identified. The following are widely regarded to be the core business outcomes of universities:

- highly qualified personnel;
- knowledge creation (e.g., in the form of concepts, discoveries, inventions, processes, systems, technologies, theories, etc.), and artistic creation (e.g., in the form of works of art, ballet, dance, fiction, music, opera, poetry, sculpture, theatre, etc.), both of which result in intellectual property;
- reputation; and
- student recruitment.

Because some of their activities lend themselves to the generation of intellectual property, universities are also expected to contribute to:

- the evolution of industry and the economy (e.g., through the invention of new goods and services; quality enhancements to existing goods and services; increased productivity, profitability, etc.); and
- the evolution of society (e.g., through the development of new knowledge, new technology; and influences on culture, governance, laws, habits, practices, etc.).

The education of highly qualified personnel is the *raison d'être* of the university.

It remains its primary outcome and defines the core business of undergraduate, graduate and post-doctoral university education.

Intellectual property is another core business outcome of university education. Whether it is leveraged into new goods or services, or simply widely adopted (as in the case of new knowledge), it can contribute to the evolution of industry and the economy, the evolution of society, government's ability to invest in new or improved social programs, and the quality of life in society as a whole.

The university's reputation depends first and foremost on the recognition it obtains from educating and graduating highly qualified personnel. The university's reputation is also significantly enhanced by the positive impact of its successful intellectual property on industry, government and society.

Finally, the better the university's reputation, the greater its success in student recruitment. Student recruitment is unique in that it is both a core business outcome, and the single most important input for generating all other outcomes. Student recruitment is the foundation of the university's ability to conduct its business, and of its financial sustainability.

From a system perspective, the strong interdependence between these outcomes and student recruitment – the key system input – characterizes a closed-loop model which is the foundation of any successful business. Closed-loop systems are also marked by complexity, not only in business, science and engineering, but in all areas of human endeavor: over time, changes arising in any part of the loop ripple through the entire system.

2.2 Model Overview

This chapter introduces a model of the inter-relationships between the key overarching blocks of university activities and the six previously described outcomes. Activities directly related to the delivery of university education are identified as core business activities. Though the university's primary focus should always be its core business, significant synergies exist, as evidenced further on, between core business activities, and non-core and blended business activities, the latter referring to activities incorporating both core and non-core characteristics.

Figures 2-1 to 2-6 progressively describe the model. The model is composed of discrete elements, each of which is identified within its own box representing either a key university activity or outcome. To facilitate the description of this system, each box is identified numerically. For example, element/box “1” is referred to as [1] in the text. A model of university operations arises from linking each element to another by means of an appropriate causal relationship, explained below. The result is a process flow from one element to the next, generating the above six outcomes, and looping back on itself.

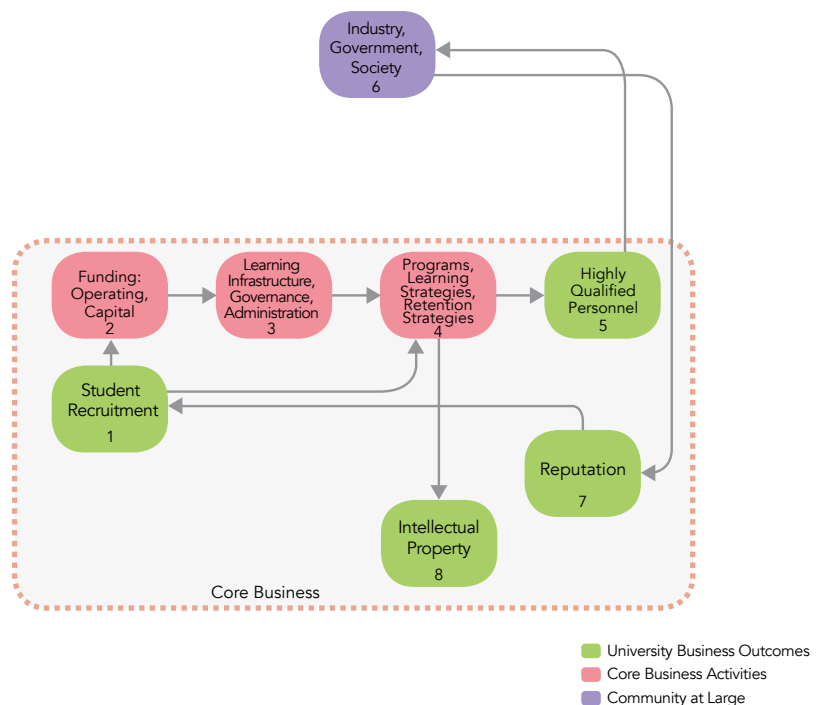


Figure 2-1. Model of core business activities and outcomes

The closed-loop characteristic of this model, incorporating multiple feedback links between core, non-core and blended business activities, generates the complexity characteristic of university environments. The collection of university activities and outcomes identified in Figures 2-1 to 2-6 also represents a high-level taxonomy of the university business.

2.2.1 Core Business Activities

The core business of universities is to provide university education. Figure 2-1 illustrates the key features of the core business and begins with student recruitment [1] which provides the foundation for the university's funding for operating and capital needs [2] through tuition fees and government funding for publicly-funded universities.

The availability of adequate financial resources enables the university to create the learning infrastructure consisting of all human, space, equipment and financial resources needed for a successful university enterprise, and the governance, administration and financial structures and processes for the proper stewardship of these resources [3]. The learning infrastructure also includes the elements needed to support research which, from the student perspective, is a learning strategy employed with increasing intensity in bachelor, master, doctoral and post-doctoral programs. These combined resources are leveraged to create and implement the programs, learning strategies (including research) and retention strategies [4] which attract and educate students. Students who successfully complete the requirements of a university program graduate as highly qualified personnel [5].

When programs employ research as a learning strategy, they can generate intellectual property [8]. When the university's graduates (i.e., highly qualified personnel) successfully contribute to industry, government and society [6], they enhance the university's reputation [7], which strengthens student recruitment [1], thereby closing the loop on the university's core business.

The primary customer of core business activities is the student. Though highly qualified personnel [5] are the principal outcome, intellectual property [8], reputation [7] and student recruitment [1] are equally important core outcomes from the perspective of long-term sustainability. All other outcomes are non-core. Activities outside the scope of core business activities are either non-core or blended. Chapters 3, 4 and 5, respectively, address the topics of core, non-core and blended business activities in greater detail.

2.2.2 Non-core Business Activities

IP Management

As mentioned before, intellectual property [8] can arise from core business activities when research-based learning strategies are employed in undergraduate, graduate or post-doctoral education. Intellectual property (IP) is valuable in that it can benefit industry, government, society, its creators (e.g., faculty members, students, etc.) and the university long after it has been developed. To achieve its potential, IP must be managed. Referring to Figure 2-2, the first step in IP management [9] is to determine whether the intellectual property should be:

- made freely available by the dissemination of scholarly activity and production [10] through published articles, books or the various venues of artistic creation (e.g., art works, published compositions, performances, readings, sculptures, etc.) ;
- protected (e.g., through copyrights, patents, trade secrets, etc.); or
- protected in part, while some other part is made freely available for dissemination.

In the event that IP is protected, additional actions are required to bring it to market. These are addressed further below in the context of IP transfer activities.

Research Grant Support Services

A key characteristic of scholarly activity and production [10] is that it defines eligibility for grant requests [11]. University research grant support activities provide valuable mentoring and assistance to faculty members, and occasionally students, for accessing research grants from provincial or federal government agencies, or even private foundations. The objective of such support is to increase the probability of success of grant requests. There are two types of grants:

- equipment grants [12], and
- operating grants [12].

Equipment grants enable faculty members to purchase research infrastructure [13]. Operating grants enable faculty members to offer financial assistance [13] to students, though they also cover a variety of research-related expenses such as computers, software, laboratory supplies, instrument access fees, operation and maintenance of instruments, travel, books, etc. Research infrastructure – an

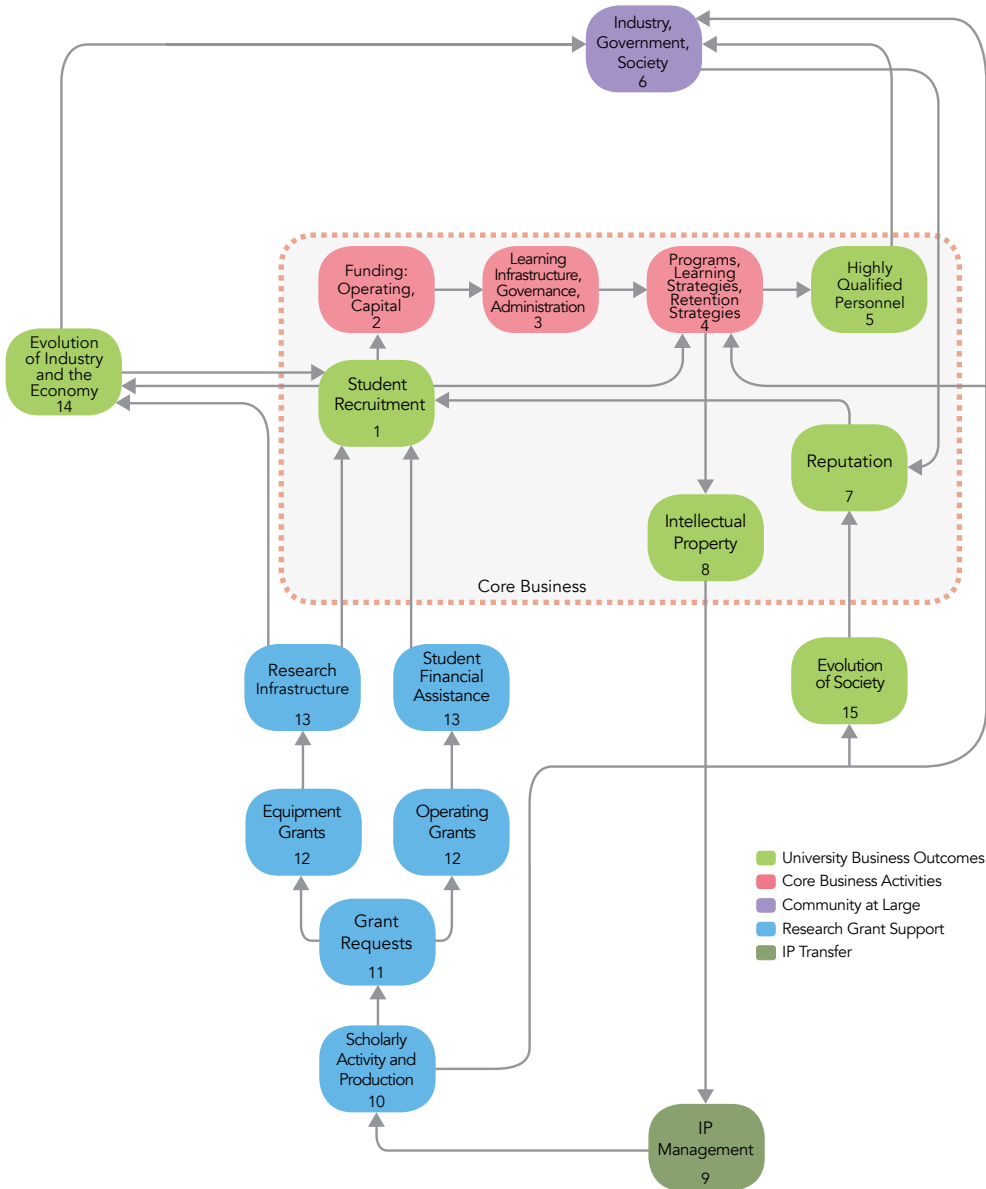


Figure 2-2. Integration of research grant support activities and outcomes to Figure 2-1

important part of the university's learning infrastructure – is a powerful attractor of graduate students, post-doctoral fellows and faculty member candidates, while student financial assistance helps retain graduate students and

post-graduate fellows once they have been recruited. Grant-based funding strengthens the core business revenue stream by stimulating student recruitment over and above what would have been the case in the absence of grants. Generally, equipment purchased by means of research grants is owned by the university, and operating grants only exceptionally defray the salary of faculty members.

The availability of funds for research infrastructure [13] can influence the evolution of industry and the economy [14] (a non-core outcome) by stimulating the development and purchase of new or advanced products or services. As industry evolves and the economy is strengthened, this increases the probability of student recruitment [1], which in turn contributes to the evolution of the economy [14], since increasing numbers of graduate students and post-doctoral fellows create new markets for the goods and services of a more cultured, educated clientèle. A strengthened economy positively impacts the actions, policies, investments, etc. of industry, government and society [6] as a whole.

Finally, scholarly activity and production [10] can also influence the actions, policies, investments, etc. of industry, government and society [6], the content of university programs [4], and the evolution of society as a whole [15] (another non-core outcome), further enhancing the university's reputation [7]. An excellent example of this is the impact of Rutherford's discovery of the atomic nucleus in the early years of the 20th century on the stature of McGill University. Another is that of the discovery of insulin by Banting and Best in the early 1920s on the reputation of the University of Toronto. The university's reputation has an appreciable effect on both the perceived value of its graduates and student recruitment [1]: the greater its reputation, the greater the attractiveness of its graduates in industry and society, and the greater the incentive to attend.

Faculty members represent the primary customers of research grant support services, and their immediate outcome is the acquisition of grants in support of research activities. Because students do not constitute the primary customer base of research grant support services, they are deemed to be non-core business activities.

IP Transfer Services

IP transfer services augment the value and impact of intellectual property generated by university core business activities by helping to bring IP to

market. Figure 2-3 illustrates how IP transfer activities integrate into the model of Figure 2-2. IP management [9] builds on IP protected either by copyright, patent, trade secret, etc. to a) identify which of the three innovation strategies is most appropriate for bringing it to market (i.e., licenses, spin-offs or the sale of IP [16]), and b) facilitate the implementation of the appropriate strategy [17]. Successful innovation contributes directly to the first non-core outcome, the evolution of industry and the economy [14], but can also contribute to the second, the evolution of society [15], as in the case of many new information and communication technologies which transform people's habits. Successful innovation also leads to innovation revenue [18] which benefits both the university and the creators of IP. Such revenues can be significant: for example, between 2001 and 2005, the Université de Sherbrooke's Faculty of Engineering generated roughly one third of all university IP revenue in Canada as a result of voice compression algorithms licensed to the Nokia telecommunications equipment provider.

A key characteristic of innovation revenue is that it is unpredictable, varying from year to year according to market conditions and/or ongoing competition from similar IP goods and services. Such unpredictability is equally true of the growth or contraction of funds placed in financial investment vehicles (e.g., IP revenue, endowments, pensions, etc.), as witnessed during the severe downturn of financial markets in 2008. The university must therefore avoid financing recurring cost commitments from unpredictable revenue streams. Instead, innovation revenue should serve primarily to support the creation of new IP. This is most effectively accomplished by employing the university's share of innovation revenue as leverage funds in successful grant requests [11] which enrich the research infrastructure [13], enhance the availability of graduate student financial assistance [13], and strengthen student recruitment [1]. The latter then contributes to increased university operating funds [2], new generations of highly qualified personnel [5], and new intellectual property [8], laying the foundation for future innovation revenue. In other words, leveraging of innovation revenue ensures that every dollar invested in successful grant requests is matched in some proportion by government, enhancing its potential impact.

IP transfer services require specialized competencies related to the management and protection of IP (in accordance with the university's IP policy), the identification of the appropriate innovation strategy for a given IP and context,

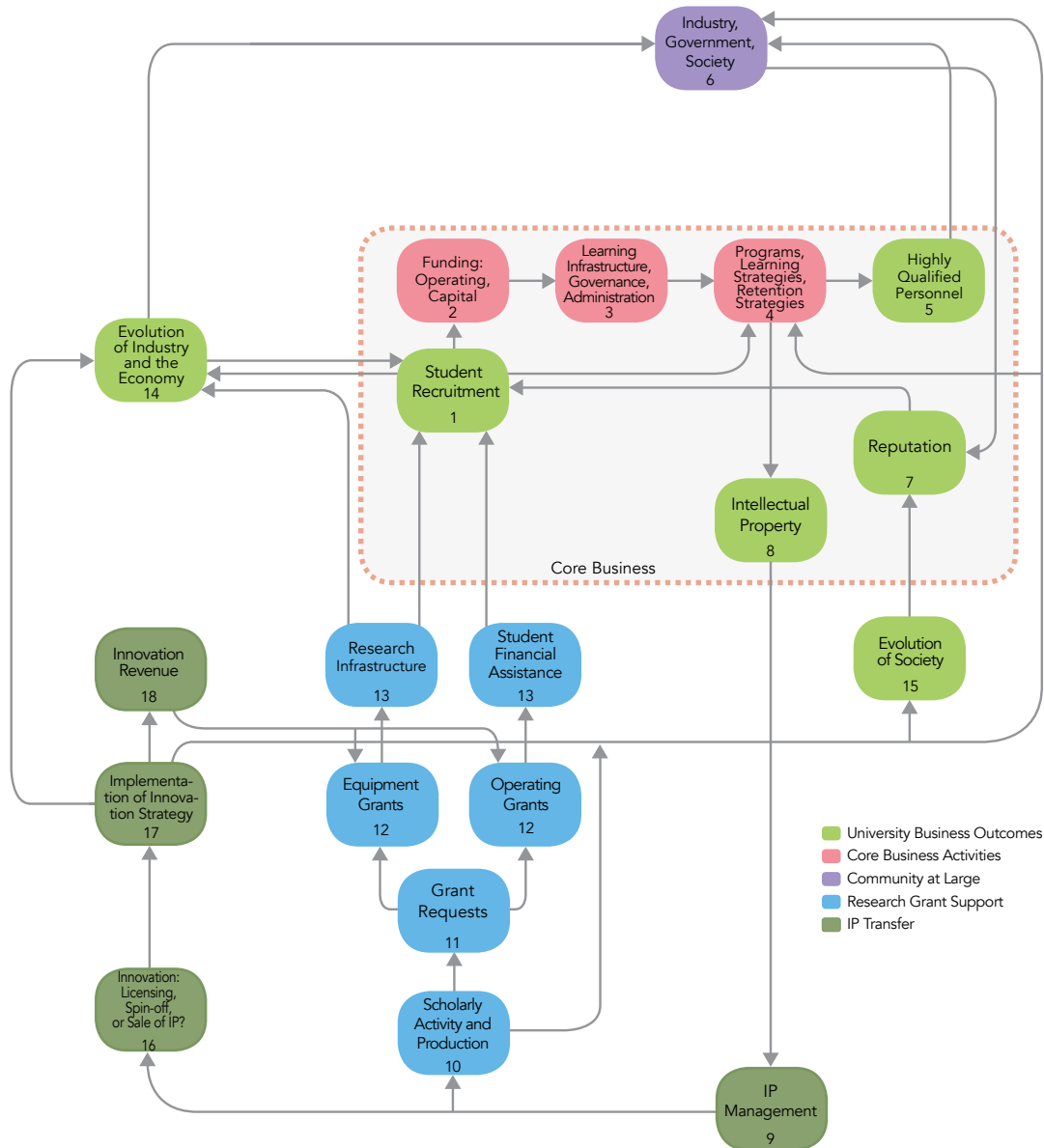


Figure 2-3. Integration of IP transfer activities and outcomes to Figure 2-2

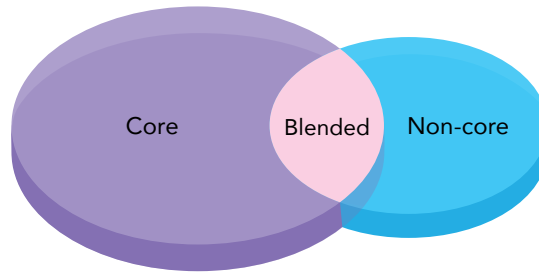


Figure 2-5. Core, non-core and blended business relationships

the facilitation of its implementation through appropriate partnerships, and the preparation of suitable contractual arrangements. Faculty members, students and other university personnel are typical customers of IP transfer services, and the outcome of such services is the successful commercialization of IP. For this reason, IP transfer services are deemed to be non-core business activities.

**Other
Non-core
Business
Activities**

Many other activities characteristic of university business environments are not directly involved with the delivery of university education, even though they may contribute either to the quality of life of personnel and students on campus, or long-term institutional growth. Figure 2-4 illustrates how such other non-core business activities integrate into the model of Figure 2-3. Alumni relations [21] keep track of highly qualified personnel [5] who successfully graduate from university so that they continue to be engaged with their alma mater in a variety of roles, such as providing advice on programs and content, participating in learning strategies, facilitating networking opportunities (i.e., for students and faculty members), and assisting with fundraising. Advancement [22] aims to nurture relationships in industry and society, and eventually raise funds for the university's learning infrastructure [3] (e.g., capital projects, major renovations, etc.) or its retention strategies [4] (e.g., student scholarships, bursaries, loans, etc.). Campus services [23] represent a variety of university investments, the purpose of which is to enhance the quality of the university environment, and in some cases obtain a financial return on investment. Advocacy [24] aims to secure new funding commitments from government. Chapter 4 addresses the topic of non-core business activities in greater detail.

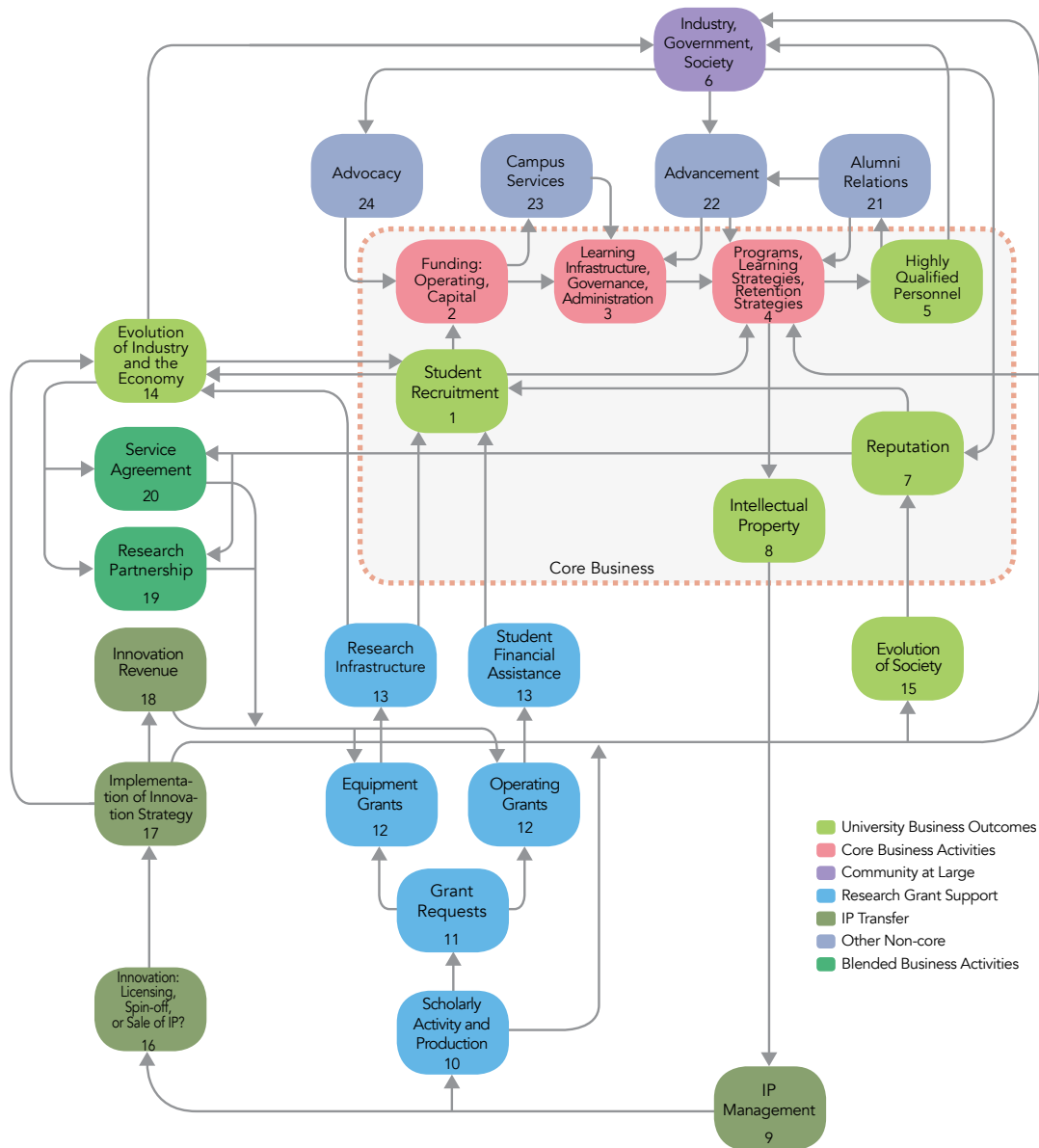


Figure 2-6. Model of university business activities and outcomes

2.2.3 Blended Business Activities

Referring to Figure 2-6, the university's reputation [7] and its contributions to the evolution of industry and the economy [14] are powerful incentives for corporate partners to establish long-term research partnerships [19] or short-term service agreements [20] in support of their own core business needs. Such activities are referred to as "blended business activities" since they involve a "blend" of core resources (e.g., faculty members, students, research facilities, etc.) and non-core resources (e.g., government or industry financial support, "in-kind" contributions, etc.), leveraged through scholarly activity and production [10], equipment and operating grants [12], licenses, spin-offs or the sale of IP [16, 17], and innovation revenue [18], for achieving both core outcomes (student recruitment [1], highly qualified personnel [5], reputation [7], intellectual property [8]) and non-core outcomes (evolution of industry and the economy [14], evolution of society [15]). Figure 2-5 illustrates the relationships between core, non-core and blended business activities and outcomes.

Blended business partnerships can take many forms, from contractual relationships between the university and industry partners, to complex collaborative initiatives and governance structures involving grants, contractual agreements, and multiple university and industry partners. For example, research chairs are a type of blended industry-university research partnership familiar to most universities.

Blended business activities require the support of personnel with highly specialized competencies in university grant activities, IP management and protection, and contractual partnership arrangements, all of which intersect with either research grant support services or research contract and IP transfer services. For this reason, research grant support services are often co-located with research contract and IP transfer services within a single administrative structure, even though they are distinct operations. Chapter 5 addresses blended business activities in greater detail.

2.3 Summary

This chapter describes a closed-loop model of the university business based on cause-and-effect relationships observed among key university inputs, activities and outcomes. The model generates the six expected outcomes of university

activities, and clearly delineates core business activities from non-core and blended business activities, the latter referring to activities incorporating both core and non-core characteristics. Four of the six university outcomes are seen to arise directly from core business activities, while two result from a mix of core, non-core or blended business activities. The closed-loop characteristic of the model, incorporating multiple feedback linkages between core and other business activities, captures the complexity characteristic of university environments. The next chapter examines the core business of university education in greater detail.

3. Core Business Activities

The previous chapter described a model of the university business, including an overview of core, non-core and blended university business activities. The present chapter provides a deeper understanding of the core business of undergraduate and graduate degree education by focusing on the revenue and cost structure of Canadian universities, with a particular emphasis on publicly-funded universities. The risk management of university business activities is also addressed.

3.1 Core Business Overview

Referring to Figure 2-6, the box numbered “1” in the figure is referred to as [1] in the text. Student recruitment [1] provides the foundation for the university’s operating and capital funding [2] through tuition fees and government funding. The availability of the appropriate financial resources enables the university to create the learning, governance, administration and finance infrastructure [3] enabling the proper stewardship of the human, space, equipment and financial resource base of university education. These combined resources are leveraged to create and implement the programs, learning strategies and retention strategies [4] which serve to attract, educate and benefit students. Students who successfully complete the requirements of a university program graduate as highly qualified personnel [5]. The successful contributions of the university’s highly qualified personnel to industry, government and/or society [6] enhance the university’s reputation [7] which, in turn, strengthens student recruitment [1]. When programs employ research as a learning strategy in either undergraduate or graduate curricula, they can generate intellectual property [8] which can also contribute to reputation [7] and student recruitment [1].

Clearly, the primary customer of core business activities is the student, and the principal outcome of such activities is highly qualified personnel [5], though intellectual property [8], reputation [7] and student recruitment [1] are equally important and related core business outcomes from the perspective of the university’s long-term sustainability. This particular combination of “customer” and “outcomes” sets the stage for identifying those activities

which can be characterized as “core business activities”. Let us now consider university core business operations in greater detail, with a particular focus on the resources needed to serve the student “customer,” and to achieve the targeted core business outcomes.

3.2 University Finances and Operations

For any business to be sustainable, costs must not exceed revenues, and this is equally true of university business. The university thrives if it is financially sustainable, and struggles to deliver on its most elementary commitments if it is not. This suggests that the university’s long-term financial sustainability is dependent both on the responsible stewardship of its financial resources, and a clear understanding of what its “most elementary commitments” to the core business of university education are. This section provides a high-level overview of university operations through the important lens of university finances, and differentiates core business activities from other types.

3.2.1 Operating Revenue

The customer of university core business operations is the student, and operating revenue arises almost exclusively from student recruitment [1]. There are three types of student-based revenue:

- tuition fees (including registration fees, late payment fees, etc.)
- ancillary fees (e.g., copyright charges, co-op placement fees, laboratory expendables, mobile computer hardware, program-specific equipment, software licenses, sports infrastructure, wireless fees, etc.), and
- government funding (i.e., referred to as “formula funding” in some provinces, often – but not always – distributed on the basis of the number of full-time-equivalent (FTE) students in the case of publicly-funded universities).

The latter generally varies in terms of:

- discipline (e.g., arts, business, education, engineering, humanities, law, medicine, music, science, social sciences, etc.),
- undergraduate programs, and
- graduate programs.

Government policies also tend to provide special funding favouring a variety of social objectives such as accessibility, student success, “first-generation” students, targeted enrolment growth, under-represented groups, etc.

From a core business perspective, the university must determine:

- the number of students it aims to recruit, including the ratio of graduate to undergraduate students, and that of international to domestic students;
- the learning infrastructure, consisting of the human, equipment and space resources required for it to be successful;
- the governance, administrative and financial structures and processes it needs to ensure the proper functioning and stewardship of the university;
- the programs and learning strategies it will offer; and
- the retention strategies it will implement.

These represent the core competency areas and activities of the university business (Figure 2-1). Each of these decisions is shaped by a variety of inputs, including long-term institutional vision and mission, public policy objectives and approvals, workforce trends, strategic planning priorities, prior investments, and financial constraints. In publicly-funded universities, government policy weighs heavily on the institution’s character and trajectory. For example, revenue streams associated with graduate study programs tend to be higher than their undergraduate counterparts: such enhanced revenue streams serve to cover the cost of highly specialized learning infrastructure and resources for graduate students (e.g., research laboratories, appropriately qualified faculty members, library services, etc.), including greater personal interaction between faculty member and student. However, in some provinces, the university may be unable to offer such opportunities – or benefit from the prescribed funding - without prior government approval of individual graduate programs.

In any given year, the university endeavors to attract students in sufficient numbers to cover its annual operating costs. In practice, the rising cost of personnel (e.g., yearly salary adjustments, performance increases, benefits, etc.) and operations (e.g., energy, water, information and communication technology networks, maintenance, repairs, etc.) represent major structural challenges to sustainability. To meet yearly rising costs, either student numbers, tuition fees, provincial funding, or some combination of these must also rise. To partly

offset such increases and remain competitive, the university often attempts to develop revenue streams in non-core business areas. This is considered in greater detail below.

3.2.2 Capital Revenue

Capital funding provided through government funding, private donations or some combination thereof, serves to create or expand the university's physical environment. Provincial governments provide modest capital funding on a yearly basis, largely based on student numbers, to ensure the maintenance or renovation of existing physical infrastructure. When governments request universities to grow enrolments, new funding programs generally support the construction of new physical infrastructure. Occasionally, to meet rapidly expanding growth and facilitate planning, the university finances capital projects from operating revenue. The key is to do so without weakening the ability of front-line academic units to deliver quality and quantity core business outcomes. The economic downturn of 2008 has renewed interest in low-cost, functional, dynamically-allocatable, pre-engineered, rapidly-built structures rather than high-cost, custom-architectural "signature" structures.

3.2.3 Operating Costs

Operating costs are grouped into three types of activities:

- core business activities,
- non-core business activities, and
- blended business activities.

The unique co-habitation of these activities differentiates the university environment from other post-secondary institutions. For each activity, sustainability requires the implementation of an appropriate business strategy. This section provides an overview of each type before addressing core business activities in greater detail. Chapters 4 and 5 respectively describe non-core and blended business activities in greater detail.

The university's core business activities are determined here by adapting the "component business model" approach described by [Pohle, Korsten & Ramamurthy, 2005] to university education. This framework generates

**Core
Business
Activities**

a mapping of individual business functions (i.e., “components”) in terms of the competencies characteristic of a particular core business and suitable accountability levels. Based on Figure 2-6, the core business competencies of university education support the following activities:

- student recruitment;
- learning infrastructure;
- governance, administration, finance;
- programs, learning strategies; and
- retention strategies.

The accountability levels employed by this approach represent “a simple framework for separating strategic decisions (i.e., direct), management checks (i.e., control) and business actions (i.e., execute)” [Pohle, Korsten & Ramamurthy, 2005, p. 7]. The core business components identified through this mapping are found in Table 3-1, and described in section 3.3. Individual components not identified in this table are either non-core or blended business activities.

Human resources occupy the greatest proportion of all university core business costs, and include tenured, tenure-track and teaching-intensive faculty members, part-time instructors (referred to as either “term” or “sessional” instructors), teaching assistants, marker/graders, student advisers, and a wide variety of professional, administrative and maintenance personnel. Core business operating costs also include the furniture and equipment required by personnel. In technology-intensive learning environments, information and communication technology (ICT) networks and resources represent a significant cost.

Non-core Business Activities

The university invests in a variety of non-core business activities which contribute to the quality of life of campus stakeholders or to long-term institutional growth. The customers of non-core activities can be students, faculty members, staff, members of the public, or the university as a whole. There are three classes (see Table 3-2):

- **Cost-based Services:** These non-core activities provide value-added services to the university, its employees, and/or students but generate no revenue. Examples include: caretaker services; management of capital projects; management of the employee pension fund; security services; specialized legal services; student job placement; etc.;

Table 3-1. Core Business Components ¹

	Core Business Competencies/Activities				
	Student Recruitment	Learning Infrastructure	Governance, Admin, Finance	Programs, Learning Strategies	Retention Strategies
Direct	Planning of: • Market-specific marketing, communication, and public relations campaigns • Market-specific recruitment campaigns • Market-specific tuition strategies	Planning of: • Personnel and talent • Physical infrastructure • Library resources • Teaching and/or research laboratory infrastructure • ICT systems and networks	Planning of: • Corporate governance • Academic governance • Corporate administration • Corporate finance	Planning of: undergraduate and graduate: • Program inventory management • Program quality assurance • Learning strategies and course design	Planning of: • Retention strategies
Control	Management of:] • Market-specific marketing, communication, and public relations activities • Market-specific recruitment campaign activities • Market-specific tuition strategy activities	Management of: • Personnel and talent • Physical infrastructure • Library resources • Teaching and/or research laboratory infrastructure • ICT systems and networks	Management of: • Corporate governance • Academic governance • Corporate administration • Corporate finance	Management of undergraduate and graduate: • Program inventory management • Program quality assurance • Learning strategies and course support services	Management of: • Retention strategies
Execute	Operations related to: • Market-specific marketing, communication, and public relations activities • Market-specific recruitment campaign activities, including applicant confirmation and conversion activities • Market-specific tuition strategy payment activities	Operations related to the management, maintenance and upgrading of: • Personnel and talent • Physical infrastructure • Library resources • Teaching and/or research laboratory infrastructure • ICT systems and networks	Operations related to: • Corporate governance • Academic governance • Corporate administration • Corporate finance	Operations related to undergraduate and graduate: • Program inventory management • Program quality assurance review • Learning strategies and course delivery	Operations related to: • Retention strategies

¹ Based on the “component business model” approach described in [Pohle, Korsten & Ramamurthy, 2005]

- **Cost-recovery Services:** These non-core activities provide value-added services to the university, its employees, and/or students, and generate revenue as part of their normal operations. Examples include: bookstore; child care services; fitness services; food services; health services; merchandizing (e.g., through trademarks, logos, etc.); parking; student residences; varsity sports; etc.; and
- **Long-term Growth Services:** These non-core activities contribute to the university's long-term growth strategy by generating targeted, significant revenues. Examples include: advancement (e.g., relationship building, fundraising, etc.); advocacy; alumni relations; research grant support (e.g., mentoring and facilitation of research grants, ensuring compliance with government regulations, etc.); research contract and intellectual property transfer services (e.g., contracts, protection of IP, licenses, sale of IP, spin-offs, etc.); etc.

For each of these three classes, the university can choose to contract services to external suppliers whose core business is the specialized delivery of specific services. Contracting a service can be done at minimal risk to university

Table 3-2. Non-core Business Activities

Class	Example Activities
Cost-based Services	• Caretaker services • Employee pension fund management • Management of capital projects • Security services • Specialized legal services • Student job placement
Cost-recovery Services	• Bookstore • Child care services • Fitness services • Food services • Health services • Parking • Student residences (undergraduate, graduate) • Varsity sports
Long-term Growth Services	• Advancement • Advocacy • Alumni relations • Research grant support services • Research contract and Intellectual Property transfer services

operations, provided that adequate contractual structure, accountability, oversight and controls are implemented by the university's core business structures and processes. The university can also choose to deliver such services on its own, provided they are managed as internal business centers with clearly enunciated goals, expectations of value or return on investment, and appropriate implementation and management strategies.

Non-core operating costs include the cost of providing personnel tasked with these activities with the space, equipment and furniture appropriate to their functions. Some non-core activities may be elevated to core business status for reasons of institutional differentiation, social responsibility, community engagement, or because they are an integral part of the university's government-approved vision and mission statements. The recognition by government of a unique feature of the university's mission can translate into targeted government funding, justifying activities beyond the normal scope of core business activities. Examples of such activities include specialized archives, art collections, botanical gardens, museums, performing arts centres, public engagement, and many others. When such choices are not approved by government, they amount to mission creep, divert resources from the core business (if other sources of funding are not found), and introduce risk to the university's ability to generate core outcomes of desired quality and quantity. Examples of non-core activities often elevated to core status are: advancement, advocacy, alumni relations, research grant support, contract support and IP transfer activities. Another is the subsidy of food services over and above considerations of normal market economics to favor student recruitment and retention. Though non-core revenue activities can generate new revenue streams, such gains must be carefully weighed against the added risk of new commitments. Chapter 4 addresses non-core business activities in greater detail.

Table 3-3. Blended Business Activities

Class	Example Activities
Research-driven Blended Activities	• Business incubators • Early-stage spin-off companies • Research chairs • Research centres • Research institutes • Research networks • Research and innovation parks

**Blended
Business
Activities**

The university invests in blended business activities incorporating both core and non-core business resources to achieve desirable core and non-core business outcomes. More often than not, such business activities are founded on university-industry partnerships articulated around shared research objectives, and facilitated by financing from provincial and federal government programs. In some cases, blended business activities involve numerous universities and companies, as in certain types of research networks. Research-driven blended business activities leverage scholarly activity and production [10], equipment and operating grants [12], licenses, spin-offs or the sale of IP [16, 17], and innovation revenue [18] to achieve core business outcomes (student recruitment [1], highly qualified personnel [5], reputation [7], intellectual property [8]) and non-core business outcomes (evolution of industry and the economy [14]; evolution of society [15]). Examples of blended business activities include: business incubators, early-stage spin-off companies, research chairs, research centers, research institutes, research networks, research and innovation parks, etc. (see Table 3-3). Considerable variability exists in the governance, management structure, industry and university resource commitments, government grant opportunities, targeted outcomes, partner responsibilities, business plans, and legal agreements which characterize such partnerships. Because of this, blended business activities can be the subject of intense scrutiny by stakeholders concerned over the extent to which external partnerships and/or financial contributions might unduly influence the university's core values, scholarly activities, and reputation. The inherent complexity of blended business activities is a significant contributor to risk, whether financial or reputational. Chapter 5 addresses blended business activities in greater detail.

3.2.4 Capital Costs

Capital costs relate to the creation of new physical infrastructure, renovations or modifications to existing structures, the refurbishment of existing facilities or the replacement of major equipment (e.g., boilers, fans, heating systems, air conditioning systems, etc.). When the university's physical space is insufficient to meet needs, private developers are occasionally approached to lease off-campus buildings or provide new, dedicated structures; depending on the type of agreement, such structures may or may not revert to the university over time. In the event of cost overruns, shortfalls must be covered by operating funds, presenting a risk to university operating budgets.

3.3 Core Business Components

Having characterized university business activities in terms of core, non-core and blended business activities, we now examine the core business components in greater detail.

3.3.1 Student Recruitment

Student recruitment [1] activities are focused on attracting new students to the university. Students are attracted to university education by the aspiration to greater knowledge, competencies, credentials, career opportunities, or any combination thereof. Student recruitment is unique in that it represents the primary input of core business activities, an essential outcome, and the foundation of the university's financial means and sustainability. By virtue of the university business model's closed-loop relationships of Figure 2-6, every aspect of the university business ultimately influences student recruitment.

The university's unique mix of learning infrastructure [3], programs, learning strategies and retention strategies [4], differentiates it from other universities, and these are presented as competitive advantages to prospective students. The university's strategic enrolment strategy aims to enhance awareness of these advantages in all of its targeted recruitment markets and to strengthen these advantages over time.

As shown in Table 3-1, the business components of student recruitment comprise the integrated planning, management and operations related to:

Business Components

- **Market-specific marketing, communications and public relations campaigns** of undergraduate and/or graduate programs, targeting either local, provincial, national or international markets. Though the key messages remain the same, certain features of the university may be more attractive for different markets, and are highlighted as a result in market-specific activities;
- **Market-specific recruitment campaigns** which follow marketing, communications and public relations efforts. Key elements of successful recruitment activities include the prior identification of specific targets for different markets, the generation of a significant applicant pool in each one, and the subsequent implementation of effective applicant to

enrolment conversion activities (e.g., social media strategies, personal phone calls from the president, vice-presidents and/or deans to selected candidates, scholarship offers, etc.); and

- **Market-specific tuition strategies** for local, national and international markets. This strategy should include appropriate payment option strategies (e.g., credit card options, Internet payment options, etc.) depending on the extent to which the university has developed a customer-focused culture.

3.3.2 Learning Infrastructure

The learning infrastructure [3] consists of all human, equipment and space resources needed to support the university's core business of undergraduate, graduate and post-doctoral university education. The learning infrastructure also includes the infrastructure required for research which, from the student perspective, is a learning strategy employed with increasing intensity in bachelor, master and doctoral programs, respectively. Without an appropriate learning infrastructure, the university is incapable of carrying out its activities.

Business Components

As shown in Table 3-1, the business components of learning infrastructure support comprise the planning, management and operations of:

- **Personnel and talent requirements** including: tenured and tenure-track faculty members, full-time lecturers (i.e., teaching-intensive faculty members) and librarians; part-time instructors (referred to as "term" or "sessional" instructors), teaching assistants, and marker/ graders; student advisers; and a wide variety of professional, administrative and maintenance staff. Personnel and talent planning, management and operations also include: identifying appropriate talent profiles; searching, hiring and/or upgrading; performance management (i.e., yearly goal-setting, regular tracking and feedback, yearly assessment, etc.); tenure, promotion, and research leave/sabbatical processes (for faculty members); benefits (e.g., pension, vacation, various types of insurance), etc.;
- **Physical infrastructure requirements** including classrooms, library, personnel office and work spaces, research laboratories, student work and study spaces, teaching laboratories, etc. Physical infrastructure support includes facilities operations (e.g., physical plant, HVAC systems; etc.);

the short-term planning and delivery of course scheduling; maintenance, repair and renovation activities; and the long-term planning and delivery of new space needs, construction projects, and major personnel moves;

- **Library resources** including: library services; electronic books and journals; internal databases; traditional hard copy books and journals; etc. University library resources and systems have significantly evolved with the advent of the Internet. Before the Internet, university libraries focused on maximizing local hard copy resources to library users, providing assistance by means of specialized librarian support, inviting users to benefit from on-site work and study spaces, and offering access to outside resources by means of exchange protocols with other libraries. Library services were limited by physical storage resources, and financial resources for acquisitions and library research personnel. Though libraries continue to support hard copy resources, they now cost-effectively expand their offerings by providing access to distant electronic resources and databases in a rapidly widening spectrum of disciplines, limited only by their financial ability to do so, and the sophistication of their ICT infrastructure. This supports teaching and learning in undergraduate and graduate programs, and research activities in a large variety of disciplines. As a result, library resources and systems are less dependent on space resources than before, and grow more strongly dependent on ICT resources;
- **Teaching, learning and/or research infrastructure** for classroom-based, ICT-based, activities-based, outcomes-based, research-based and experiential learning strategies for achieving targeted student learning outcomes. As outlined in 3.3.4 below, different learning strategies have different learning infrastructure requirements. For example, research-based or experiential learning strategies frequently require the design, construction, procurement, commissioning and possible accreditation of complex infrastructure (e.g., animal care facilities) involving the acquisition of highly specialized, expensive, low-volume equipment with long lead procurement times. The management of highly specialized teaching and/or research infrastructure must take numerous factors into account, including the qualifications of support personnel, laboratory safety protocols, user volume, appropriate scheduling (e.g., to refresh, maintain and dispose of high-technology and/or high-risk consumables), equipment operations protocols, etc. Opera-

tions must also take into account the proper functioning of complex HVAC systems (e.g., “clean rooms,” animal care centres, etc.), fire control systems, emergency washing stations, etc.; and

- **Information and communication technology (ICT) systems and networks** including: backup systems; computers (e.g., desktop, laptop, tablet, etc.); cloud systems; clusters; financial information systems; learning management systems; learning object repositories; management and financial information systems; network switches and systems; public communications and display systems; server farms; telephone systems; website systems and services; etc. ICT systems support a wide spectrum of core business activities, from facilitating the management of financial information and services, providing critical information to students, employees, outside stakeholders and potential students, to enhancing the on- and off-campus learning environment. The planning of ICT for university-wide systems or in support of academic operations (e.g., learning management systems; learning object repositories; course outline repositories; annual faculty reporting systems, management information systems, etc.) requires significant consultation and collegial decision-making processes. However, the management and operation of ICT systems usually follow hierarchical business delivery models.

3.3.3 Governance, Administration, Finance

Governance, administration and finance [3] provide the formal structures and processes for defining strategic direction of university activities, establishing the proper stewardship of the university resource base (i.e., human, space, equipment, and financial resources), and ensuring the accountability and success of plans, operations and outcomes with respect to all stakeholders.

Business Components

As shown in Table 3-1, the business components of governance, administration and finance comprise the planning, management and operations of:

- **Corporate governance** such as the approval of corporate values, vision and mission; strategic corporate directions; corporate policies; corporate governance committees; administration structures; hiring and termination of university executives; oversight of financial stewardship, government compliance and accountability, integrated resource planning; real estate, etc.;

- **Academic governance** such as the approval of strategic academic directions; academic policies; academic governance committees; academic unit structures; program quality assurance structures and processes; the creation, modification or closure of academic programs; etc.;
- **Corporate administration** such as human resources, benefits and pensions; institutional research and data collection; labour relations, collective bargaining, management of collective agreements; legal counsel; marketing, communication and public relations; student registration, tuition fee payment, and records (i.e., registrarial functions), etc.; and
- **Corporate finance** such as accounting, auditing, bookkeeping, budgeting, reporting, tracking and other financial services; compliance with government regulations; real estate; risk management including insurance, legal and regulatory compliance; etc.

Section 3.4 explores the university's organizational structure in greater detail.

3.3.4 Programs, Learning Strategies

The university's choice of undergraduate and graduate programs [4] is shaped by long-term institutional vision and mission, public policy objectives and approvals, workforce trends, strategic planning priorities, prior investments, and financial constraints, all of which aim for alignment through proper governance and administrative decision-making. The development and implementation of effective learning strategies which enhance student learning outcomes in individual programs are also core to university education. Different learning strategies have different learning infrastructure [3] requirements in terms of personnel, space or equipment, resulting in a wide array of cost structures. From a pragmatic perspective, the university's portfolio of programs and learning strategies must be attractive enough to ensure short- and long-term financial sustainability through adequate student enrolment.

As shown in Table 3-1, the business components of programs and learning strategies comprise the planning, management and operations of:

Business Components

- **Program inventory management** including demand forecasting, construction and/or improvement and/or phase-out of undergraduate and graduate

programs. Program demand forecasting activities identify trends in program attractiveness in relation to economic or societal needs, or the aspirations of multiple stakeholders. Program inventory management activities translate these findings into program creation, modification or windup strategies, and attendant resource allocation adjustments. Program construction responds to positive demand forecasting outcomes, and includes the choice of learning strategies. Program modification strategies (e.g., adjustments to program maps, individual course content, etc.) are the result of quality assurance program review processes. Program phase-out responds to negative demand forecasting outcomes. Course phase-out arises from specific program quality assurance recommendations;

- **Program quality assurance** of undergraduate, graduate and post-doctoral programs, for improving the quality of program content or program delivery. This includes the optional or required accreditation of appropriate professional programs (e.g., business, engineering, nursing, medical laboratory, medicine, pharmacy, etc.), by their respective professional bodies; compliance with policy frameworks enforcing accepted standards of academic conduct, integrity and ethics, particularly but not exclusively in the conduct of research, and requiring their own respective structures and processes; and
- **Learning strategies**, in particular as they relate to course design, support (e.g., laboratory management and operations, library services, etc.) and delivery, including handling of various student academic issues (e.g., cheating, missed deadlines, plagiarism, etc.). Classroom-based, ICT-based, activities-based, outcomes-based, research-based and experiential learning strategies (e.g., co-operative or “co-op” education placements, internships, laboratory learning, etc.) can enhance student learning outcomes in undergraduate and graduate education. Different learning strategies have different space, equipment and human resource requirements, and these must be taken into account. Research-based learning, used with increasing intensity in bachelor, master, doctoral and post-doctoral studies, is key to generating intellectual property.

3.3.5 Retention Strategies

The university invests in retention strategies in order to maximize both student success and revenue generation.

As shown in Table 3-1, the business components of retention strategy activities comprise the planning, management and operation of a variety of student support services including: counseling, dealing with issues of non-academic misconduct (e.g., bullying, sexual harassment, etc.), disabilities' support, financial aid services, ombudsperson services, orientation, etc. Teaching mentoring services (i.e., for faculty members, sessional/term instructors, and teaching assistants) for enhancing the quality of university education also represent an important retention strategy, as student success in achieving course and program outcomes naturally translates into high retention rates.

Business Components

3.4 Organizational Structure

We now examine the key leadership portfolios of university organizational structures and show how core, non-core and blended business activities are distributed among them. We begin with an overview of the governance of Canadian universities, and the structures characteristic of academia. The diversity of organizational structures, leadership portfolios, and terms used to describe both structures and portfolios lends complexity to such an exercise. Also, because the university's size has a significant impact on structure, large and small universities are addressed separately.

The governance of the university is different from that of organizations found in industry, commerce or government agencies. It is inspired by the aim to include representation of its extensive internal and external stakeholder base at the highest level of decision-making, and a long tradition of collegial academic decision-making inherited from European universities. Because of this, university governance resembles that of a nation, having either bicameral structures and processes (i.e., where separate governance bodies exist respectively for academic decision-making and corporate decision-making), or unicameral (i.e., where a single governance body is responsible for both academic and corporate governance decision-making). In Canada, bicameral governance is the prevalent model. The university's academic governance rests within a body called either "senate" or "academic council," chaired either by the executive head of the university or a

Governance

duly-elected member, consisting of a majority of faculty members, and including representatives of the university's administration and students. Corporate governance rests within a body called a "board," the members of which have the title either of "director," "governor," "regent" or "trustee," each of which is representative of key internal and external stakeholder groups, and chaired by one of its members, typically elected by the board membership. Oversight for the management and operations of academic and corporate governance rests with the university's executive head, who is accountable to both governance bodies for all university activities and operations. The title of the executive head can either be "president," "principal," or "rector" (prevalent in French-speaking institutions, though the term also refers to an elected representative of students in some English-speaking institutions) depending on the size, character and traditions of the university. The "chancellor" is the ceremonial head of the university.

Academic Units

Academic units responsible for the planning, management and delivery of programs and learning strategies are structured along disciplinary lines, and are called either "faculties," "schools" or "departments," usually based on size and the university's tradition. Faculties tend to be relatively large academic units, serving thousands to tens of thousands of students, while schools and departments are typically smaller, from hundreds to thousands of students. In some universities, schools are standalone academic units having identical reporting structures to faculties, differentiated only by their smaller size. In others, schools are essentially independent institutions, rivalling faculties in size, with ties to the university by virtue of an affiliation agreement. The head of a faculty or a school is usually called a "dean," though some universities give the title of "director" to the heads of schools. Where the number of students and programs warrants it, faculties and schools are subdivided along disciplinary lines called "departments" to strengthen the collegial processes characteristic of academic decision-making and facilitate the management of academic operations. The head of a department is typically called a department "chair" or "head." Proposals for new programs, program modifications or the closure of programs are prepared by the appropriate academic unit through collegial academic processes and submitted for approval to the body responsible for the university's academic governance.

3.4.1 Large Universities

Large universities have student populations exceeding twenty thousand students, and yearly budgets of half a billion dollars or more.

Corporate governance activities are the responsibility of a corporate governance board where day-to-day governance management and operations are delegated to the executive head, with the assistance of a university secretariat headed by a university secretary. Where the governance model is bicameral, academic governance is the responsibility of an academic governance board, with day-to-day management and operations of academic governance activities delegated to the executive head, again with the assistance of the university secretariat. Often, the university legal counsel portfolio rests within the university secretariat. Also reporting to and accountable to the executive head are a number of vice-presidents, including a provost and vice-president academic, a vice-president research, a vice-president for external affairs, and a vice-president administration and finance. The number and types of additional vice-presidential portfolios depend on the complexity of the university's business environment.

The provost (a medieval term for “manager” or “head”) is generally considered to be the senior vice-president (i.e., *primus inter pares*) responsible for coordinating university-wide processes (e.g., budget construction, infrastructure projects, strategic planning, etc.), and is often referred to as the chief academic officer of the university. To ensure strong coordination of academic operations, academic unit heads typically report to and are accountable to the provost, though this is not a general rule: in some universities, academic unit heads may have a joint reporting relationship to both the executive head and the provost. The provost's portfolio normally incorporates that of the vice-president academic, adding a variety of academic and student-related responsibilities to the provost's leadership role. The vice-president academic portfolio typically includes academic quality assurance, the support of academic units in their academic governance processes, the university library, student recruitment, a variety of student-related administrative functions such as student enrolment, tuition fee payment and record-keeping (i.e., typical of registrarial functions), and student retention services, though this varies considerably from one institution to another.

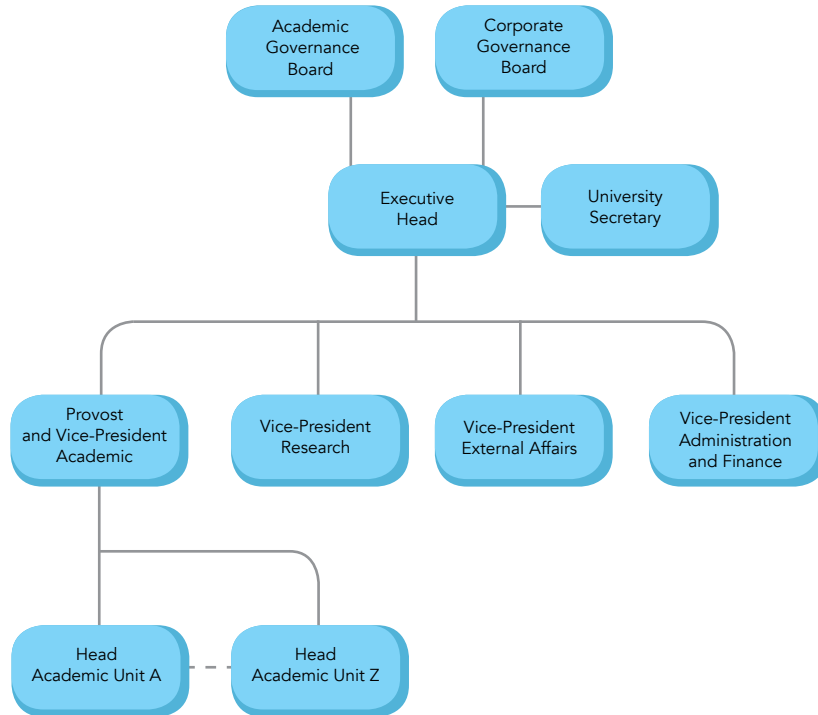


Figure 3-1. Large universities: sample organization chart

Academic units are responsible for establishing strategic direction and planning, and (following approval of academic governance) ensuring the management and operations of activities related to programs and learning strategies in their respective disciplinary areas. Academic units also have responsibility for their internal structures, though changes typically require the approval of academic governance. Where the number of students and disciplines warrants it, operations are structured along disciplinary lines which facilitate both collegial decision-making and the empowerment of faculty members in academic operations. While day-to-day management and operations related to student recruitment and retention can be delegated to academic units in various degrees, strategic direction and planning remain in the office of the provost and vice-president academic.

Table 3-4. Large Universities: Typical Portfolios and Responsibilities

Portfolio	Core Business Competencies/Activities					Other Business Activities	
	Student Recruitment	Learning Infrastructure	Governance, Admin, Finance	Programs, Learning Strategies	Retention Strategies	Non-core	Blended
Corporate Governance Board		Strategic direction	Strategic direction of corporate governance, administration, and finance			Strategic direction	Strategic direction
Academic Governance Board	Strategic direction		Strategic direction of academic governance	Strategic direction	Strategic direction		Strategic direction
Executive Head	Strategic oversight	Strategic oversight	Strategic oversight	Strategic oversight	Strategic oversight	Strategic oversight	Strategic oversight
University Secretary			Management and operations of corporate governance, academic governance				
Vice-President Administration and Finance		Planning, management, operations of facilities, etc.	Planning, management, operations of administration, finance			Planning, management, operations of cost-based and cost recovery services	Joint oversight of blended research-based activities (with VP Research)
Vice-President External			Planning, management, operations of marketing, communications, public relations			Planning, management, operations of long-term growth services	
Vice-President Research						Planning, management, operations of research grants and contracts, IP transfer and other research support and innovation services	Joint oversight of blended research-based activities (with VP Administration and Finance)
Provost and Vice-President Academic	Planning, management, coordination	Planning, management, coordination of academic operations	Planning, management, coordination of academic operations and other VP portfolios	Planning, management, coordination	Planning, management, coordination		
Head Academic Unit	Unit planning, management, operations	Unit planning, management, operations	Unit planning, management, operations	Unit planning, management, operations	Unit planning, management, operations		Unit oversight of research-based blended activities

See Table 3-1 for detailed core business components, and Tables 3-2 and 3-3 for non-core and blended business activities.

The vice-president external affairs is responsible for marketing, communications and public relations functions. Responsibilities may also extend to long-term growth services such as advancement, advocacy and alumni services if no other vice-presidential portfolio covers these areas.

The vice-president research is responsible for research grant and contract support services, IP transfer services, and the university's innovation strategies and initiatives. Responsibilities can also include the planning, management and operations of non-core research support units, such as translational research support units (e.g., animal resources), large research infrastructure, technical services (e.g., for custom-manufacturing of sophisticated research infrastructure, equipment and/or devices), innovation centres (including business incubation centres) and others. The vice-president research also shares oversight of research-driven blended business activities (e.g., research chairs, research centres, etc.) with the appropriate academic unit head and, in some cases, the vice-president administration and finance.

The vice-president administration and finance is responsible for strategic direction, planning and delivery of a wide variety of learning infrastructure, administrative and financial functions. The portfolio also has responsibility for cost-based and cost-recovery non-core business activities. A sample organizational chart of large universities is illustrated in Figure 3-1. Typical portfolios and responsibilities are described in Table 3-4, though significant variations can be found.

3.4.2 Small Universities

Small universities have student populations of fewer than five thousand students. Corporate governance activities are the responsibility of a corporate governance board with day-to-day governance management and operations delegated to the executive head (i.e., typically with the assistance of a dedicated corporate board secretary). Where the governance model is bicameral, academic governance activities are the responsibility of an academic governance board, with day-to-day management and operations delegated to the executive head (again, normally with the assistance of a dedicated academic board secretary).

Reporting to and accountable to the executive head are fewer vice-presidents than in large universities, and fewer administrative layers. The key vice-presidential portfolios include the provost and vice-president academic, and the vice-president administration and finance. The executive head generally has direct responsibility of long-term growth services such as advancement, advocacy and alumni relations. Marketing, communications and public relations functions also frequently report to the executive head.

The provost is the senior vice-president responsible for coordinating university-wide processes (e.g., budget construction, infrastructure projects, strategic planning, etc.).

The vice-president academic's portfolio adds the responsibilities of supporting academic units in their quality assurance and academic governance processes, and typically includes the university library, student recruitment, student-related administrative functions such as student enrolment, tuition fee payment and record-keeping (i.e., typical of registrarial functions), and student retention services, though this varies considerably from one institution to another.

The vice-president academic portfolio is also responsible for non-core business activities such as research grant support, contract support and IP transfer services, innovation strategies and initiatives, and shares oversight of research-based blended activities with the appropriate academic unit head and/or the vice-president administration and finance. Where the volume of research activities warrants it, these responsibilities are delegated to a dedicated associate provost or associate vice-president.

To ensure strong coordination of academic operations, academic unit heads typically report to and are accountable to the provost, though academic unit heads may have a joint reporting relationship to both the executive head and the provost. In some cases, there is no provost: the executive head oversees and coordinates the university's activities, the academic unit heads report directly to the president, and the vice-president academic focuses on the portfolio described above.

Academic units are responsible for establishing strategic direction and planning, and (following approval of academic governance) ensuring the management and operations of activities related to programs and learning

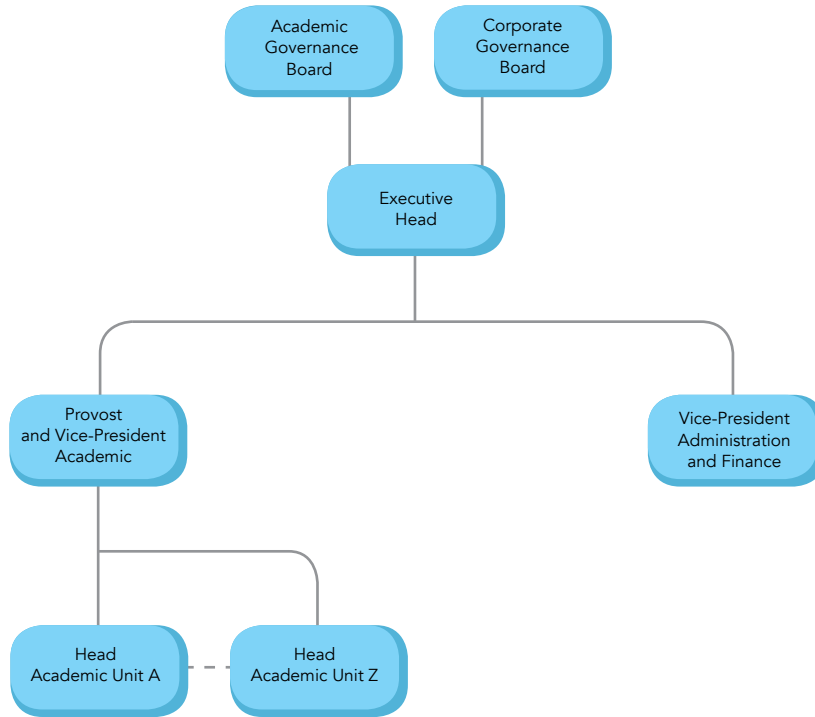


Figure 3-2. Small universities: sample organization chart

strategies in their respective disciplinary areas. Academic units also have responsibility for their internal structure, though changes typically require the approval of academic governance.

The vice-president administration and finance is responsible for strategic direction, planning and delivery of a wide variety of learning infrastructure, administrative and financial functions. The portfolio also includes cost-based and cost-recovery non-core business activities. A sample organizational chart of small universities is provided in Figure 3-2. Typical portfolios and responsibilities are described in Table 3-5, though significant variations can be found.

Table 3-5. Small Universities: Typical Portfolios and Responsibilities

Portfolio	Core Business Competencies/Activities					Other Business Activities	
	Student Recruitment	Learning Infrastructure	Governance, Admin, Finance	Programs, Learning Strategies	Retention Strategies	Non-core	Blended
Corporate Governance Board		Strategic direction	Strategic direction of corporate governance, administration, and finance			Strategic direction	Strategic direction
Academic Governance Board	Strategic direction		Strategic direction of academic governance	Strategic direction	Strategic direction		Strategic direction
Executive Head	Strategic oversight	Strategic oversight	Strategic oversight of activities; planning, management, operations of marketing, communications and public relations	Strategic oversight	Strategic oversight	Strategic oversight of cost-based and cost-recovery services; planning, management, operations of long-term growth services	Strategic oversight
Vice-President Administration and Finance		Planning, management, operations of facilities, etc.	Planning, management, operations of administration, finance			Planning, management, operations of cost-based and cost-recovery services	Joint oversight of blended research-based activities (with Provost and VP Academic)
Provost and Vice-President Academic	Planning, management, coordination	Planning, management, coordination of academic operations	Planning, management, coordination of academic operations and other VP portfolios	Planning, management, coordination	Planning, management, coordination	Planning, management, operations of research grants and contracts, IP transfer and other research support and innovation services	Joint oversight of blended research-based activities (with VP Administration and Finance)
Head Academic Unit	Unit planning, management, operations	Unit planning, management, operations	Unit planning, management, operations	Unit planning, management, operations	Unit planning, management, operations		Unit oversight of research chairs

See Table 3-1 for detailed core business components, and Tables 3-2 and 3-3 for non-core and blended business activities.

3.4.3 Evolving from a Small to a Large University

The administrative structures of “large” and “small” universities described above are not universal, and serve only to indicate trends. As universities grow from “small” to “large,” each one adapts in its own unique manner to the scale and complexity of its business environment, resulting in significant diversity in administrative structures, leadership portfolios, roles and responsibilities.

Adding to this complexity is the growth of many universities to new geographical regions through the creation of distant campuses. In many cases, such campuses implement an organizational structure mimicking that of a small university, led by a campus-specific vice-president or principal which reports to and is accountable to the executive head.

In Canada, only two universities currently exercise province-wide mandates, in contrast to the United States, where state-wide public university systems are more common. In Newfoundland and Labrador, Memorial University of Newfoundland (MUN) is a centralized institution whose mandate is to serve the province and its people, with a single president, academic senate and board of regents financially accountable to the provincial government, and where campuses distant from its founding campus are led by their respective vice-presidents. In Quebec, the Université du Québec is a network of constituent universities, research institutes and superior schools with their own respective principals and boards of directors, reporting to an overarching president, academic council and board of governors, financially accountable to the provincial government.

Example 3.4.1: The Sources of Tension in University Governance and Core Business Management

In the Introduction to this book, a “bifurcation” is described in university operations whereby administrative and financial decision-making is largely seen to rely on hierarchical processes, and academic decision-making is seen to emphasize collegial processes. Why is this the case, and how is it managed?

Bicameral governance is similar to the governance model of a parliamentary democracy. For example, the Chancellor can be viewed as having the role of the titular head of the “country” (e.g., Queen, King, etc.); the Board can be

viewed as having the role of the Upper Chamber (e.g., House of Lords, Senate, etc.); Senate (or Academic Council) can be viewed as having that of the Lower Chamber (e.g., the House of Commons); faculty members can be viewed as the citizens, and tenure is the process of entry into academic citizenship.

Senate membership is dominated by faculty members (i.e., the citizens) to ensure the highest quality strategic decision-making in all matters academic. Board membership consists of representatives of the university's key stakeholder groups (e.g., alumni, government, industry, faculty members, students, etc.) for strategic decision-making in other areas such as university finances and real estate. The role of the university's governance bodies is legislative, and each of the two chambers has exclusive powers to establish policies within its own respective sphere of influence. Overall, these policies serve to direct the conduct of university operations.

Since the university must offer a value proposition to students to fuel its operations, it is also a business. In this regard, the executive arm of the university (i.e., the administration) serves the university's legislative arm (i.e., the two governance bodies): its role is to apply all legislated policies to the conduct of university business, and ensure their compliance by the university's students, faculty members and other personnel. Combining the governance structure of a country and the value proposition of a business, the university is therefore subject to two underlying sources of tension, sometimes described as a "bifurcation".

As citizens of the country, faculty members enjoy unique privileges. As mentioned before, they control legislative decision-making in the academic realm (i.e., through Senate or Academic Council). They also enjoy academic freedom, the freedom to express oneself on all matters of an academic nature. Alternatively, as employees of the business, they are subject to a controlled, business-like operational environment which aims to deliver value to students, on time and on budget. Differences of opinion occasionally arise on the scope of legislative decision-making versus that of executive decision-making, resulting in tension between faculty members and administration in such matters as space management, course scheduling, budgetary planning, personnel planning, etc.,

A second source of tension arises from the very different goals involved in governing a country, and those of managing a business. The goal of a country is to keep all of its stakeholders happy. This is evidenced by decisions made

by Boards favoring the establishment of a wide variety of non-core business activities in response to pressures from one or many stakeholder groups, such as child care centres, fitness centres, health centres, food services, parking, student residences, varsity sports, etc. This contrasts with the goal of the core business which is focused on offering value to students. When core business activities are burdened by too many non-core obligations, significant financial pressures can arise on core business activities, adding risk to the quality and quantity of core business outcomes.

The need to address these two sources of tension adds complexity to the management of university operations. To avoid the first source of tension, university administrators should be respectful of the spirit of academic governance in operational decision-making; in other words, when in doubt, it is best to err on the side of collegial processes, as an established track record of respecting academic governance facilitates acceptance of command and control decision-making when such decisions are clearly necessary.

To avoid the second type of tension, the key is to remain focused on core business activities. When mission creep is unavoidable, appropriately sustainable business models and strategies must be applied to non-core activities so that the financial burden on core business activities – and the risk to core business outcomes – is minimized.

3.5 Resource Allocation

The university's annual resource allocation process requires three key decisions:

- 1.** the allocation of operating funds to core business activities (i.e., with respect to non-core and blended business activities)
- 2.** the allocation of operating funds among core business activities; and
- 3.** the allocation of physical infrastructure.

The internal allocation of resources for non-core and blended business activities (i.e., financial, human, equipment, physical infrastructure) is related to their respective business goals and strategies, and is addressed in chapters 4 and 5.

It should be noted that professional faculties, such as business, engineering, nursing, medicine, pharmacy, and others, can have access to revenue sources

unavailable to other faculties. Such sources include innovation revenue [18], research partnership revenue [19], service agreement revenue [20] (i.e., from administrative overheads), and/or philanthropic revenue from advancement activities [22]. The financing of the university's faculty of medicine is even more complex: its funding usually includes a contribution from the province's ministry of health. All of these introduce both opportunity and complexity to faculty budgets, as these are taken into account by the university. Table 3-6 summarizes the key elements of the university's annual resource allocation, described below.

3.5.1 Allocation of Operating Funds to Core Business Activities

This decision relates to the proportion of operating fund resources allocated to core business activities in relation to non-core and blended business activities. The greater the financial resources allocated to core business activities, the greater the likelihood of quality and quantity of core business outcomes, strengthening the prospect of long-term sustainability. Alternatively, the greater the resources allocated to non-core and blended activities, the greater the risk of weakening both core business outcomes and long-term sustainability.

3.5.2 Allocation of Operating Funds Among Core Business Activities

After the university has determined the proportion of resources to be allocated to core business activities, the university then distributes financial operating resources across its core business units. There are essentially two types of allocation strategies:

- needs-based allocation; and
- revenue-based allocation.

In each case, two additional elements need to be taken into account:

- yearly revenue variations; and
- service courses.

Needs-based allocation provides financial resources to academic units on the basis of the number of courses to be delivered in a given year, and to other units on the basis of projected numbers of personnel-customer interactions or predetermined targeted outcomes. Despite its name, needs-based allocation

Needs-based Allocation

sometimes only indirectly provides resources in relation to the number of students served. For example, the use of large course sections rather than small ones lowers academic delivery costs on a per-student basis, but generates much debate on whether the quality of student learning is adversely affected.

The following steps describe a typical needs-based approach for budget construction. The approach is applied yearly, and aims to estimate the additional full-time, part-time and other operational resources required beyond current full-time and operational resources. The process is fundamentally iterative: if the initial assumptions lead to a scenario where the cost of additional resources is prohibitive, these assumptions are modified and the process repeated until a scenario is achieved within the university's financial means:

- 1.** Estimate the total number of course sections to be offered based on a) the number of students to be served, b) available space resources (e.g., classrooms, laboratories, etc.), c) the number of hours of course delivery per academic day, d) the number of academic days per calendar week (i.e., this can exceed five days), and e) institutional guidelines for the maximum and minimum number of students per course or course section (i.e., a course is offered in multiple instances called “course sections” when the number of students exceeds the maximum for a single course).
- 2.** Establish the number of courses and course sections to be delivered by current full-time faculty members (i.e., tenured, tenure-track and teaching-intensive faculty members), taking into account other faculty member responsibilities such as: a) graduate student supervision, b) new program construction, c) existing program modification, d) new course development, e) existing course modification, f) program quality assurance, etc.
- 3.** Establish the number of courses and course sections which require additional resources for their delivery (i.e., the difference between 1 and 2 above).
- 4.** Estimate the number and cost of additional full-time faculty members, full-time senior laboratory instructors, part-time instructors and part-time academic support personnel (e.g., marker/graders, teaching assistants, etc.) based on institutional guidelines for a) student-faculty

ratios, b) the percentage of courses taught by part-time resources with respect to full-time, c) the number of part-time academic support personnel per course or course section, and d) other course-specific learning strategy requirements.

5. Estimate the number and cost of additional full-time academic support staff (e.g., technicians, etc.) and non-academic support staff (e.g., student advisors, etc.) based on institutional guidelines for a) the ratio of the number of support staff to the number of academic personnel, b) the ratio of the number of support staff to the number of courses or course sections, or c) some combination of the two.
6. Estimate the costs associated with other operational requirements (e.g., equipment, furniture, maintenance, minor renovations, software, etc.).
7. The costs of 4, 5 and 6 are added: this is the cost of the scenario.
8. If 7 exceeds available financial resources, a new scenario must be developed by modifying the underlying assumptions of 1, 4, 5 and 6 (e.g., minimum and maximum number of students per course or course section, student-faculty ratios, percentage of courses taught by part-time resources with respect to full-time, the number of part-time academic support personnel per course or course section, etc.).
9. A successful scenario finds a balance between costs and means. Typically, a number of different scenarios will eventually be found to accomplish this, due to the large number of parameters which can be modified in the assumptions. The chosen scenario is ultimately that which provides the closest fit to the university's values. Long-range projected student estimates must also be taken into account to ensure the sustainability of new full-time hires.

Needs-based funding of human resources can be implemented in one of two ways: position-based funding, or block funding. Position-based funding is focused on providing units with the employee positions needed to meet their academic or administrative needs. Units are provided with allocations in terms of individual positions, and the financial risks or benefits of variations in employee compensation are borne centrally. For example, if a position

becomes available through the departure of an employee and is filled by a new employee whose salary is higher, central university authorities are committed to covering the salary differential. Alternatively, block funding is focused on providing units with a “block estimate” of the financial resources required to meet their human resource needs, and associated risks or potential benefits are assumed by the unit itself. For example, the unit retains full control of any salary differential resulting from hiring employees at lower salary. Each method possesses unique advantages and disadvantages: while block funding empowers units to optimize the impact of their budget allocation, position-based funding places greater control of the university’s financial resources within the hands of central authorities.

Revenue-based Allocation

Revenue-based allocation distributes operating funds to academic units on the basis of full-time-equivalent student numbers enrolled in individual programs of study. Different programs are given different funding allocations according to preset criteria or formulae. Government funding formulae (i.e., formulae used to allocate funds among the universities of a provincial system) are often employed, though some institutions apply internal fund-allocation formulae based on government formulae, local practices, experience and history. By allocating revenue to the different programs “owned” by each academic unit, the university allocates a budget for each one. Even when academic unit budgets are revenue-based, the budgeting of other units remains needs-based.

The key advantage of revenue-based allocation is that it eliminates the need for arbitration between programs and units through the use of accepted, predetermined formulae. Another advantage is that it ties academic unit revenue closely to student enrolment, which is a significant incentive for achieving recruitment targets.

However, there are disadvantages. The first has to do with the imperfections of fund-allocating formulae. For example, when universities base their internal allocations on government formulae, this can result in local inadequacies and the need for internal compensating mechanisms, such as the creation of a central “strategic fund” where some proportion of revenues is put aside prior to formulae-based allocations to deal with issues. Provincial formulae, though effective for distributing government funding to different universities, are often found to be less so for distributing financial resources within a single university, though they can be an excellent starting point. Another

disadvantage is that yearly variations in student recruitment and retention can result in revenue shortfalls or windfalls – sometimes simultaneously, in different units – resulting in unique budgetary pressures. Finally, after revenue-based allocations have been made to their respective academic units, the internal distribution of financial resources is determined on the basis of needs. This underscores the fact that revenue-based allocation inevitably incorporates some additional downstream needs-based component. Small universities tend to favour a centrally-driven needs-based approach while large universities often migrate to a revenue-based approach, despite its complexity, for purposes of enhanced accountability and transparency.

Yearly revenue variations are a challenge to both types of budgeting processes. However, the impact of such variations is minimized where needs-based budgeting is employed since they are spread across the entire university. In the case of revenue-based funding, yearly variations in student enrolment introduce unpredictability in the annual allocation of financial resources to units dedicated to program delivery. Since academic unit costs are largely predictable, revenue-based budget allocation strategies must provide some measure of predictability. One strategy for addressing such unpredictability is to mitigate the impact of changes in student enrolment by introducing a rolling, multi-year average in budget construction. There are many ways of doing this. Here is one example:

Yearly Revenue Variations

1. Determine a notional budget estimate on the basis of the academic unit's projected number of students for the coming budgetary year.
2. Determine another notional budget estimate on the basis of the academic unit's average number of students over the previous X years (e.g., 3 years).
3. Sum these two estimates, then divide by two.

The purpose of this strategy, and others like it, is to dampen the financial impact of rapid downturns in student numbers. However, it also imposes a slow buildup of resources when rapid increases in student numbers occur.

Service courses are courses delivered by one academic unit as a service to another academic unit. In needs-based budget allocation, there is no need to differentiate home student courses (i.e., a course delivered by the academic unit responsible for the program to which the student is registered) from

Service Courses

service courses (i.e., a course delivered by a different academic unit than the one responsible for the student's program). All needs are budgeted regardless of the origin of the program for which the course is delivered.

In revenue-based budget construction, home student course delivery must be differentiated from service course delivery. Resource allocation employing revenue-based approaches first distributes funds on the basis of student home academic units as these units generate revenue through the students enrolled in their programs. The home academic units then negotiate equitable service-level agreements with the academic units from which they wish to obtain academic services. In the ideal case, such service-level agreements are built from institutional templates. They should also incorporate metrics for the appropriate measurement of service delivery outcomes, and mechanisms for dispute resolution for dealing with issues when they arise.

Additional Considerations

Whether the university's financial allocation strategy is needs-based or revenue-based, a number of additional considerations are taken into account when allocating resources. These are considered below.

Student Recruitment: The costs of student recruitment activities are largely dependent on geography and intensity: the larger the recruitment area, the greater the cost; the more aggressive the effort, the greater the cost. The allocation of funding for student recruitment planning, management and operations supports the core business components described in 3.3.1, and is needs-based.

Learning Infrastructure: The costs associated with supporting the learning infrastructure are largely driven by the size of the student body, the relative proportion of graduate to undergraduate students (which reflects the university's research-intensiveness), and the age of the university. For example: the greater the number of students, the larger and more diverse the human, equipment and space resource base required to support a wide variety of university disciplines; the greater the ratio of graduate students to undergraduate students, the greater the complexity of supporting a sophisticated research-intensive university; the greater the age of the university, the higher the probability of older physical infrastructure with higher maintenance costs. The allocation of funding for learning infrastructure planning, management and operations supports the core business components described in 3.3.2, and can employ a combination of revenue-based and needs-based approaches.

Governance, Administration, Finance: The costs of governance, administration and finance activities are also largely dependent on the size of the student body, and the relative proportion of graduate students to undergraduate students (which reflects the university's research-intensiveness). The allocation of funding for governance, administration and finance planning, management and operations supports the business components described in 3.3.3, and is needs-based.

Programs, Learning Strategies: The quality of the university's programs and learning strategies is heavily dependent on the quality of its faculty members and other personnel. This explains why budget allocation strategies place human resources at the top of their priorities. To this end, employee compensation strategies often include provision for "market differentials" to cover higher-than-expected costs in high-demand disciplinary areas. In research-intensive universities, the ideal profile of tenured and tenure-track faculty members includes a balance between teaching and learning competencies on the one hand, and research competencies on the other. Teaching and learning competencies facilitate the outcome of student learning, and are founded on high disciplinary expertise combined with knowledge and experience in applying effective learning strategies. Research competencies are essential for successfully leveraging research-based and experiential learning strategies which strengthen the student's ability to solve problems that are open-ended and complex, and more closely resembling those found in the real world. Though more commonly associated with graduate programs, research-based learning strategies are applied in both undergraduate and graduate curricula, and can result in intellectual property.

In determining the mix of human resources needed to deliver the university's programs and learning strategies, there is often the erroneous view that traditional teaching activities are the sole revenue generator, and that research-based activities do not contribute to revenue generation. Though traditional teaching activities represent the dominant revenue stream in many universities, the time faculty members devote to the supervision of individual students in a master-apprentice relationship employing research as a learning strategy also represents an important revenue stream. If the time dedicated to mentoring individual undergraduate and graduate students in research-based learning activities equals that dedicated to all other types of learning activities (e.g., classroom-based learning, activities-based learning strategies employing

problem-, case-, and project-based learning, etc.), such activities should translate into equivalent revenue streams.

The quality of programs and learning strategies is supported through program quality assurance structures and processes, both internal and external (e.g., in the case of professional programs by their respective professional bodies in business, engineering, nursing, medicine, pharmacy, etc.). Program quality assurance guarantees that the university's graduates meet accepted, benchmarked standards in every one of its programs. The accreditation of professional programs is also essential to the university's continuing reputation and competitiveness in attracting and recruiting students into such programs.

The allocation of funding for program and learning strategy planning, management and operations supports the business components outlined in 3.3.4, and can be needs-based or employ a combination of revenue-based and needs-based approaches.

Retention Strategies: The cost of student retention strategies is largely dependent on the quality of the student intake: the lower the average entrance marks, the greater the need for retention strategies to assist students in being successful (e.g., personal counselling, health services, financial aid, writing support, etc.). The retention of international students also tends to be more resource-intensive than that of local students: the greater the distance from normal family support systems, the greater the demand for retention services and resources. In Canada, the availability of financial assistance plays an important role in student retention. Because of this, provincial and federal government programs offer financial aid to both undergraduate and graduate students. For reasons of compliance with government regulations or increased competitiveness for the best students, the university also provides funding opportunities through internal bursaries, scholarships, loans, and opportunities for student placements in part-time university staffing roles. However, care must be exercised in funding bursaries and scholarships from operating revenue when insufficient funds are available from philanthropic origin: as in the case of non-core business activities, the diversion of too many funds from core business activities introduces risk to the university's ability to deliver quality and quantity core business outcomes. The allocation of funding for retention strategy planning, management and operations supports the business components outlined in 3.3.5, and is needs-based.

3.5.3 Allocation of Physical Infrastructure

The university generally distributes physical infrastructure resources (i.e., space) among the following four areas:

- undergraduate programs and learning strategies;
- graduate programs and learning strategies;
- student recruitment and retention; governance, administration and finance; and
- non-core and blended activities.

In most Canadian universities, undergraduate learning infrastructure, programs, learning strategies and associated operations serve the largest proportion of the university's student population. Undergraduate learning strategies require space for classrooms, teaching laboratories (i.e., for problem- and project-based learning), teamwork, self-study, library consultation and offices. From a core business perspective, the spaces dedicated exclusively to academic operations represent the university's primary revenue-generating capability. For every course of every semester, the scheduling of all dedicated learning spaces, such as classrooms, laboratories, meeting rooms, etc., at appropriate times is a critical function of successful learning environments.

Undergraduate Programs

Different learning strategies have different space requirements. For example, where traditional (i.e., face-to-face) learning models are preferred, fixed, dedicated, relatively expensive space infrastructure, such as classrooms and teaching laboratories of various sizes, is required. Where activities- or outcomes-based learning models are preferred (i.e., self-, problem-, case-, project-, and/or team-based learning), the emphasis is less on dedicated space and more on dynamically allocatable and flexible infrastructure. Where online or blended (i.e., a mix of face-to-face and online) learning models are preferred, a strong ICT infrastructure must be available. Uncertain economic times tend to drive the search for learning strategies that are less dependent on expensive infrastructure [Higher Education Quality Council of Ontario, 2010; Young, 2010].

In Canada's most research-intensive universities, graduate students currently represent up to 25% of the student population. In graduate programs, class sizes are generally smaller than undergraduate class sizes. Such programs normally require some combination of research laboratories, office areas for

Graduate Programs

student work and study, library space, and office space for other personnel (e.g., technicians, etc.). Thesis-based graduate study programs rely less on classroom-based learning strategies, and more on research-based strategies within a master-apprentice relationship between professor and student. Professional graduate programs emphasizing a heavy course load and well-circumscribed research activities, similar to undergraduate education, can have space requirements based on either traditional or blended learning models enhanced with experiential learning initiatives.

**Other
Needs**

Office and meeting space is required for other core business activities, such as student recruitment, student retention, governance, administration and finance needs. The university must also provide for non-core and blended business needs. The key to effective space allocation is to match a building's inherent capabilities to a particular need. For example, high-cost buildings characterized by high floor-load capacity are better suited for housing classroom and laboratory functions than management functions which can be accommodated in lower-cost, lower-floor-load structures. In the end, the greater the proportion of space dedicated to core academic activities, the greater the university's capacity to host students, and the greater its revenue-generating capability.

**New
Space**

The university generally owns its physical infrastructure. When space resources become inadequate, needs can temporarily be met through rentals and leases. Before embarking on large capital projects (e.g., new construction, major renovations, etc.), prior financial commitments from either government or philanthropy, and a sound, long-term business plan will mitigate financial risks. Once the financial architecture is in place, the hiring of appropriately qualified project management personnel significantly contributes to mitigating construction and associated risks. Project costs and risks can also be reduced by emphasizing functional, dynamically-allocatable, pre-engineered, rapidly-built structures rather than "signature" custom-architectural, custom-built structures.

3.6 Core Business Planning

The purpose of core business planning is to shape the future of the university. The output of the planning process is a formal, documented statement of the desired future core business goals (i.e., desired outcomes) incorporating a detailed implementation plan over a certain time period. The plan specifies the actions,

resource requirements, persons responsible and deadlines for achieving these goals. Core business planning can consider three overarching types of objectives:

- 1.** grow core business outcomes. For example, the university may aim to grow the number of bachelor, master and doctoral graduands over a designated period, each by a specific amount;
- 2.** grow certain outcomes, maintain some constant, and potentially reduce others. For example, the university may aim to grow the number of thesis master and doctoral graduands, maintain non-thesis master and doctoral graduands at current levels, and reduce the number of bachelor graduands to more sustainable levels over a designated period;
- 3.** maintain outcomes constant while focusing on increased efficiencies within the learning infrastructure. For example, the university may aim to maintain the number of bachelor, master and doctoral graduands at current levels while decreasing the university's operating cost per graduand over a designated period.

More complex sets of objectives can be developed by alternating these overarching types over time. For example, the university may choose to implement the first until it achieves a targeted yearly bachelor graduand population, then implement the second by growing only the number of thesis master and doctoral graduands for a specified period.

Core business planning is fundamentally an iterative process. A set of desirable scenarios is first identified, each one characterized by one or more of the above sets of objectives. An initial triage process selects a small set of scenarios for detailed modeling and study. For each selected scenario, university-wide targets are broken down in terms of contributions from each academic unit; for each academic unit, unit targets are then translated in terms of individual academic programs. Resource estimates (including costs) are obtained based on past experience and data, taking potential sharing of equipment, human and space resources into account. Once these are integrated for the entire university, trends in resource requirements assist in selecting the preferred scenario. In the end, the selected scenario incorporates the goals, strategies, actions, resource requirements, persons responsible and deadlines amounting to a core business plan.

Core business planning becomes strategic planning when either the university's sustainability is at risk, or the planning scope extends beyond small, incremental changes to the university's academic programs, learning strategies or resource base.

3.7 Risk Management

Risk management is essential for planning, managing and mitigating risk, and ensuring the university's long-term sustainability. Enterprise risk management, fully integrated within the university's strategic and operational decision-making, enables the university to deliver core business outcomes of quality and quantity in the face of uncertainty and the occasional contingency. The design and implementation of the university's enterprise risk management strategy is based on recommended practices of such organizations as the Committee of Sponsoring Organizations (COSO) of the Treadway Commission dedicated to "the development of frameworks and guidance on enterprise risk management, internal control, and fraud deterrence" [Curtis & Carey, 2012]. The size of the university directly impacts the enterprise risk management strategy: the larger the university, the more sophisticated the risk management strategy.

Risk Analysis

The grouping of university activities in terms of core, non-core and blended business activities brings greater clarity to university risk management. This section describes a university risk management framework based on this taxonomy. Let us begin by identifying the key risks to the university's core business activities and outcomes (see Figure 2-6):

- **Student recruitment:** The key risk to meeting university student recruitment targets is inadequate reputation. If perceptions are negative, prospective students will be unwilling to stake their future career and earning potential on an institution whose reputation hinders rather than helps. The risks related to the business components of student recruitment are: inadequate market-specific marketing, communications and public relations campaigns (i.e., for local, provincial, national and international markets, each one having its own strong competitive environment); inadequate market-specific recruitment campaigns; and inadequate tuition fee strategies. Associated risks include: inadequate regional/provincial demographics; inadequate differentiation of programs with respect to other universities; inability to obtain or maintain accreditation

Table 3-6. Annual Resource Allocation: Summary

Key Resource Allocation Decisions	Objectives	Additional Considerations
1. Allocation of Operating Funds to Core Business Activities	Find balance between: • Core business activities, and • Non-core and blended business objectives	• The greater the resources for core activities, the greater the probability of quality and quantity core outcomes
2. Allocation of Operating Funds Among Core Business Activities	Choose between: • Needs-based allocation, • Revenue-based allocation, and • Some combination of the two For each one, account for: • Yearly revenue variations, and • Service course funding	• Student recruitment: costs largely depend on recruitment area and the intensity of recruitment efforts • Learning infrastructure: costs largely depend on a) the size of the student body, b) the relative proportion of graduate students to undergraduate students (which reflects its research-intensiveness), and c) the age of the university • Governance, administration and finance: costs largely depend on a) the size of the student body, and b) the relative proportion of graduate students to undergraduate students (which reflects its research-intensiveness) • Programs and learning strategies: costs depend primarily on the quality and quantity of faculty members and personnel. Costs must also include effective program quality assurance systems, including accreditation of professional programs by their respective professional bodies • Retention strategies: costs are highly dependent on the quality of the student intake: the lower the grades, the greater the needs. For international students, the greater the distance from normal family support systems, the greater the demand for services. Care must be exercised in diverting operating funds to scholarships and bursaries
3. Allocation of Physical Infrastructure	Find balance among: • Undergraduate programs and learning strategies, • Graduate programs and learning strategies, • Student recruitment, retention, governance, administration, and finance, and • Non-core and blended activities	• Learning strategies: each one has different space, equipment and ICT needs • Space needs: space needs and building characteristics should ideally be matched • Capital projects: require prior financial commitments and a sound business plan. Once these are in place, appropriately qualified project management personnel contribute to risk mitigation • Capital project costs and risks: can also be reduced by considering functional, dynamically-allocatable, pre-engineered, rapidly-built structures over “signature” custom-architectural, custom-built structures • The greater the capacity for hosting academic activities and students, the greater the potential for core business revenue

of professional programs by their respective professional body (e.g., business, engineering, nursing, medical laboratory, medicine, pharmacy, etc.); etc.

- **Operating and capital funding:** The key risk to meeting the university's operating and capital funding targets in any fiscal year is that of not meeting student recruitment targets. If targets are not met, all aspects of university operations are impacted: budget revenue estimates are too high, and appropriate corrective measures need to be applied either selectively or universally to all units. Associated risks include: unforeseen reductions in government funding; changes in government resulting in changes in priorities and to prior commitments; inadequate capital funding for new construction or regular or deferred maintenance; inadequate performance of non-core and/or blended business activities (e.g., inadequate research grant performance which affects the university's ability to recruit and retain graduate students); inadequate return on investment of reserve or pension funds; students defaulting on tuition fees; fraud; etc.
- **Learning infrastructure, governance, administration, finance:** The key risk to the university's ability to create and maintain an adequate learning, governance, administration and finance infrastructure is inadequate operating and capital funding. The risks related to the business components of learning infrastructure, governance, administration and finance are: inadequate personnel and talent of appropriate quality and quantity; inadequate physical infrastructure of appropriate quality and quantity; inadequate library resources; inadequate teaching, learning and/or research infrastructure; inadequate information and communication technology (ICT) systems and networks for teaching, learning, research and/or financial purposes; inadequate corporate governance or inadequate academic governance (i.e., structures, policies and processes); inadequate administration structures and processes; and inadequate finance structures and processes. Associated risks include: inadequate compliance to government requirements (e.g., financial, legislative, etc.); inadequate management of labour relations, bargaining units and collective agreements; etc.
- **Programs, learning strategies, retention strategies:** The key risk to the

university's ability to deliver adequate programs, learning strategies and retention strategies is an inadequate learning, governance, administration and finance infrastructure. The risks associated with the core business components of programs, learning strategies and retention strategies are: inadequate program inventory management; inadequate quality assurance structures and processes (e.g., accreditation); inadequate learning strategies (e.g., design, resourcing, management, etc.); and inadequate student retention strategies (e.g., early-warning strategies, student support services, etc.). Associated risks include: inadequate handling of student issues (e.g., academic and non-academic misconduct, appeals procedures, legal proceedings, mental health, etc.); inadequate student success outcomes; inadequate human resource issue strategies (e.g., including prevention and handling of mental health issues, personnel misconduct, human rights violations, theft and fraud, etc.); inadequate research-based policy compliance environment (e.g., ethical conduct, academic integrity, granting agency requirements, etc.); etc.

- **Intellectual property:** The key risks to the university's ability to deliver intellectual property of adequate quality and quantity are: a) inadequate learning infrastructure, and b) inadequate programs, learning strategies and retention strategies. An associated risk relates to the need to find an adequate balance between faculty member teaching and graduate student research supervision responsibilities.
- **Highly qualified personnel:** The key risks to the university's ability to graduate highly qualified personnel of adequate quality and quantity are: a) an inadequate learning infrastructure, and b) inadequate programs, learning strategies and retention strategies.
- **Reputation:** The key risks to the university's reputation are a) graduates of inadequate quality and quantity, and b) inadequate intellectual property outcomes. However, all of the risks enumerated above can ultimately have a negative impact on the university's reputation.

These risks are summarized in Table 3-7. They are all strongly interdependent due to the closed-loop nature of the core business. If core business risks are inadequately managed, they can negatively impact the quality and/or quantity of all four core business outcomes:

Table 3-7. Core Business Risk Summary

Core Business Activities and Outcomes	Risk Factors
Student Recruitment	• Reputation • Market-specific marketing, communications and public relations campaigns • Market-specific recruitment campaigns • Market-specific tuition strategies • Regional or provincial demographics • Differentiation with other universities • Accreditation of professional programs
Operating and Capital Funding	• Student recruitment • Government funding • Changes in government • Capital funding for new construction, or regular or deferred maintenance • Non-core or blended business activity performance • Return on investment of reserve or pension funds • Students defaulting on tuition • Fraud
Learning Infrastructure, Governance, Administration, Finance	• Operating and capital funding • University personnel and talent • University physical infrastructure • University library resources and systems • Teaching, learning and/or research infrastructure • Information and communication technology (ICT) systems and networks • Corporate governance • Academic governance • Administration structures and processes • Finance structures and processes • Compliance with government requirements • Labour relations, bargaining units, collective agreements
Programs, Learning Strategies, Retention Strategies	• Learning, governance, administration and finance infrastructure • Program inventory management • Program quality assurance • Learning strategies • Retention strategies • Handling of student issues • Student success outcomes • Human resource management strategies • Research-based policy compliance
Intellectual Property	• Learning infrastructure • Programs, learning strategies and retention strategies • Balancing of faculty member teaching and graduate student supervision responsibilities
Highly Qualified Personnel	• Learning infrastructure • Programs, learning strategies and retention strategies
Reputation	• Quality and quantity of graduates (i.e., highly qualified personnel) • Intellectual property outcomes

For core business activities and outcomes, see Figure 2-6.
Note, key risk factors are identified in bold.

- highly qualified personnel [5];
- reputation [7];
- intellectual property [8]; and
- student recruitment [1].

If the core business' primary input, student recruitment, shows evidence of reduced quality and quantity, the university's long-term sustainability and survival is at risk.

Effective core business risk management begins by reducing the probability of adverse events through sound business practices in every core business unit. This includes enunciating clear objectives and goals in alignment with institutional priorities, defining risks in terms of identifiable adverse events and their associated likelihood of occurrence, identifying how such events are handled when they occur, choosing suitable metrics for tracking of performance, ensuring ongoing acquisition of data, analyzing performance at regular intervals, proactively mitigating risks, and applying corrective actions when risk thresholds are met. If every core unit is managed with the appropriate due diligence, the probability of negative outcomes in each unit is low, and that of cascading negative effects throughout the core business is also low.

Risk Management Framework

Even so, unsuccessful core activities can occur and impact others: adequate core business risk management must therefore account for all direct and indirect interdependencies among core business units. Another dimension of core business risk is the potential negative impact of unsuccessful non-core and blended business activities on core business finances and outcomes. Finally, the focus of integrated core business risk management is to manage all risks affecting the university's capability to deliver its four core business outcomes. As a result, core business risk management incorporates three distinct levels (Figure 3-3):

1. risk management of individual core business activities;
2. risk management of the impact of:
 - a) core business activities on other core business activities,
 - b) non-core business activities on core business activities,
 - c) blended business activities on core business activities; and
3. risk management of the core business portfolio, taking all risks into account.

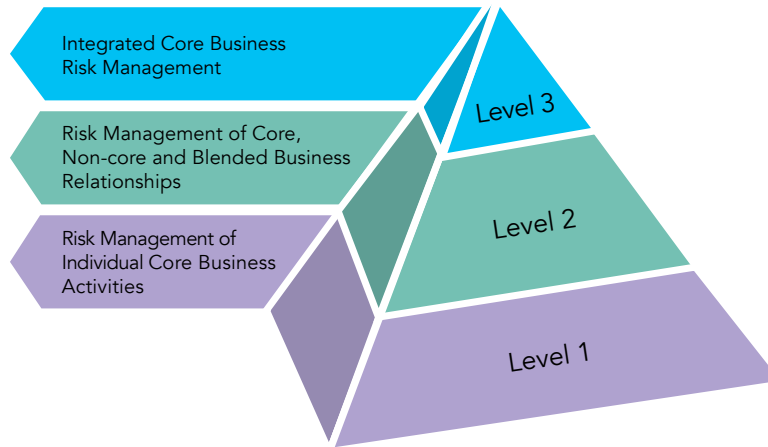


Figure 3-3. Risk management framework for core business activities

3.7.1 Risk Management of Individual Core Business Activities

Level 1

Level 1 risk management focuses on individual core business activities. There are two parts to this: current activities, and new activities.

Level 1 (current activities): This deals with the risk management of current core business activities. As mentioned before, effective risk management begins with the implementation of sound business practices, and the following approach formalizes a simple Level 1 risk management process applicable to every core business activity:

- Define the objectives and goals to be met.
- Identify risks and associated handling (i.e., for each identifiable adverse event).
- Identify the metrics to be employed for measuring outcomes, and targeted values.
- Identify risk thresholds for triggering corrective actions.
- Acquire data for timely tracking of metrics.
- Analyze performance.
- Implement corrective actions when risk thresholds are met.

Level 1 (new activities): This deals with the risk management of creating new core business activities. For new core business activities to be successful, the need must be evident, the value to be obtained must be clearly defined, and the activities must lend themselves to the Level 1 risk management strategy described above for current activities. The creation of new core business activities should also carefully differentiate activities which are core from activities which are either non-core or blended business activities. In times of optimism, activities which would normally be considered non-core are sometimes viewed as core, causing the university's cost structure to rise. This is often referred to as "mission creep."

3.7.2 Risk Management of Core, Non-core and Blended Business Relationships

Level 2 risk management deals with the risks of:

Level 2

- core business activities impacting other core activities (i.e., Core – Core (CC));
- non-core business activities impacting core activities (i.e., Non-core – Core (NC)); and
- blended business activities impacting core activities (i.e., Blended – Core (BC)).

Level 2 CC: Level 2 CC risk management identifies the risks of negative outcomes from any core business activity impacting the outcomes or finances of other core activities, and how such risks are mitigated.

Level 2 NC: Level 2 NC risk management identifies the risks of negative outcomes from non-core business activities (e.g., unfulfilled revenue expectations, unsound financial architecture of large capital projects, cost overruns of large capital projects, etc.) impacting core business outcomes or finances, and how these risks are mitigated. This is addressed in greater detail in Chapter 4.

Level 2 BC: Level 2 BC risk management identifies the risks of negative outcomes from blended business activities (e.g., cost overruns, inadequate management of industry partnerships, etc.) impacting core business outcomes or finances, and how these risks are mitigated. This is addressed in greater detail in Chapter 5.

3.7.3 Risk Management of the Core Business Portfolio

Level 3

Level 3 risk management integrates individual core, non-core and blended risk management activities within a single portfolio. The focus of integrated risk management of the core business portfolio is to manage all risks affecting the institution's capability to deliver its four core business outcomes, and to apply appropriate risk mitigation and/or corrective measures where necessary.

A simple strategy for achieving this is to establish yearly targets for each of the four core business outcomes. In turn, this provides a framework for identifying specific goals for every core business component and integrating these goals into their respective risk management activities. The objective is to equal or exceed yearly targets for each individual core business component, and ultimately the four core business outcomes.

3.8 Summary

This chapter provides an overview of the activities, outcomes and risks associated with the core business of university education. The core business is composed of a large number of business components which require timely planning, management, and coordinated execution for successful university operations. Decisions made within core business activities also carry some measure of risk, and a summary risk analysis introduces the reader to the key risks and the need for risk management.

Numerous non-core and blended business activities are found to gravitate around the core business of university education, introducing complexity and risk to decision-making. There are two reasons for this. First, the knowledge, experience, and competencies of university management do not always map well to these other lines of business. Second, non-core and blended activities can introduce both mutually beneficial (e.g., when surplus revenues are generated) and mutually detrimental (e.g., when they are not) interactions with the core business. As a result, an integrated risk management framework is described which takes these interactions into account. Chapter 4 further addresses decision-making and risk management of non-core business activities. Chapter 5 addresses these same issues for blended business activities.

4. Non-core Business Activities

In the previous chapter, non-core business activities were seen to offer valuable indirect contributions to the core business of university education. However, they also introduce complexity in decision-making, and risk to core business management. The present chapter provides an overview of non-core business activities, and addresses the challenges and risk management of such activities in greater detail.

4.1 Overview of Non-core Business Activities

Non-core business activities contribute to the quality of life of campus stakeholders or long-term institutional growth, thereby strengthening the university's capacity to generate core and non-core business outcomes. There are three classes:

- **Cost-based Services:** These non-core activities provide value-added services to the university, its employees, and/or students but generate no revenue. Examples include: caretaker services; management of capital projects; management of the employee pension fund; security services; specialized legal services; student job placement, etc.;
- **Cost-recovery Services:** These non-core activities provide value-added services to the university, its employees and/or students, and generate revenue as part of their normal operations. Examples include: bookstore; child care services; fitness services; food services; health services; merchandizing (e.g., through trademarks, logos, etc.); parking; student residences; varsity sports; etc.; and
- **Long-term Growth Services:** These non-core activities contribute to the university's long-term growth strategy by generating targeted, significant revenues. Examples include: advancement (e.g., fundraising); advocacy; alumni relations; research grant support (e.g., mentoring and facilitation of research grants, ensuring compliance with government regulations, etc.); research contract and intellectual property transfer services.

For each of these three classes, the university can choose to contract services to external suppliers whose core business is the specialized delivery of specific services. Contracting a service can be done at minimal risk to university operations, provided that adequate contractual structure, accountability, oversight and controls are implemented by the university's core business structures and processes. The university can also choose to deliver such services directly provided they are managed as internal business centers with clearly enunciated goals, expectations of value or return on investment, and appropriate implementation and management strategies. Some non-core activities may be elevated to core business status for reasons of institutional differentiation, social responsibility, community engagement, or because they are an integral part of the university's government-approved vision and mission statements. The recognition by government of a unique feature of the university's mission can translate into targeted government funding, justifying activities beyond the normal scope of core business activities. When such choices are not approved by government, they amount to mission creep, divert resources from the core business (if other sources of funding are not found), and introduce risk to the university's ability to generate core outcomes of desired quality and quantity.

Considering any resource type (e.g., financial, human, equipment, space, etc.) to be a valid potential "investment" on the part of the university, non-core business activities aim to achieve any combination of the following three objectives:

- Obtain appropriate value in return for the university's investment.
- Recoup the university's investment.
- Generate a return, over and above the university's investment.

Each of these corresponds to a different non-core business strategy.

To achieve any combination of these objectives, investments in non-core business activities must be managed with care: inadequate performance can weaken the university's financial position, alter its capacity to deliver core business outcomes, and impact long-term sustainability. Risk management of non-core business activities is therefore an essential element of core business risk management.

This chapter examines the three classes of non-core business activities, identifies an appropriate business strategy for each activity type, and proposes a risk management framework suitable for all non-core business activities. As before, numerical references in the text such as [1] refer to box “1” of Figure 2-6.

4.2 Cost-based Services

The customers of cost-based service activities can be students, faculty members or staff, or the university itself (i.e., as an institutional customer). The outcomes of such services provide some clearly identifiable value to each customer. Examples of such services are: caretaker services, management of capital projects, management of employee pension fund, security services, specialized legal services, etc. Each of these services represents a distinct line of business (i.e., independent of the university’s core business), with its own specific personnel, equipment, activities and outcomes. As independent businesses frequently specialize in such areas, the university has the option of procuring such services at a competitive cost and quality rather than providing them internally.

Business Strategy

For each cost-based service activity, the business strategy is to:

- obtain appropriate value in return for the university’s investment.

The specific goals are to:

- maximize the quality and quantity of outcomes in a timely manner, consistent with available resources; and
- decrease the ratio of yearly service costs to the number of graduates (i.e., bachelor, master and doctoral combined).

These goals apply independently of whether these services are contracted to external service providers, or delivered internally by the university.

The first goal, that of maximizing the quality and quantity of outcomes in a timely manner, requires identifying appropriate performance metrics for each activity, and taking action. The second goal, that of decreasing the ratio of yearly service costs to the number of graduates, shows the impact of efforts aimed at increasing efficiencies in terms of graduating highly qualified personnel, the

primary outcome of university education. Economies of scale resulting from increasing numbers of bachelor, master and doctoral graduates over time will also be evident from this metric. The specific target will depend on whether or not the university is in a growth phase. Average yearly reduction targets are on the order of 0.1 to 2%.

Such services can be contracted to external service providers, enabling the university to focus its attention on core business activities. For each contracted activity, one member of the university’s personnel must have the domain expertise to oversee the contracted party, and targeted performance metrics are explicitly identified in the contract. Alternatively, if such services are delivered internally, costs must be consistent with industry benchmarks, and the same performance metrics as required of external contractors apply. Table 4-1 summarizes this approach.

Table 4-1. Cost-based Services: Business Strategy, Goals and Metrics

Business Activity	Business Strategy	Specific Goals and Metrics	Suggested Targets
All	Obtain appropriate value in return for the university's investment	Maximize the quality and quantity of outcomes consistent with available resources	Activity dependent
		Decrease the ratio of yearly service costs to the number of graduates	0.1 to 2%

Example 4.2.1: Caretaker Services

What is the appropriate strategy for delivering caretaker services?

Caretaker services are typical of many non-core business services integral to the university’s cost structure: they contribute to the cleanliness, hygiene, and public health and safety of the university’s environment. Because they have no revenue-generating capacity, caretaker services are often delivered by contract through external suppliers, primarily due to cost considerations. However, other factors can weigh equally heavily in the assessment of delivery options, such as the university’s values or government direction.

When the decision is made to contract the university's caretaker services to an external supplier, the expected yearly outcomes and performance metrics must be identified in return for an agreed-upon sum. The contract must be managed by a dedicated university contract manager responsible for effective two-way communication between the university and supplier, and for sorting out operational details on an ongoing basis. The contract manager must also ensure that the targeted performance metrics are successfully achieved in terms of quality, quantity, and timeliness. If all targeted outcomes are achieved, the goal of decreasing the yearly cost per university graduate by some value between 0.1 to 2% will also be achieved as this will have been built into the contract.

When the decision is made to deliver caretaker services internally, the university must ensure that costs are consistent with industry benchmarks, that the same performance metrics as would be required of external contractors are applied, and that the university's yearly cost per university graduate decreases between 0.1 to 2%.

Example 4.2.2: Student "Co-op" Placements

Is "student co-op placement" a non-core business activity?

Job placement activities are non-core activities unless mandatory experiential learning placements are an integral part of a program's learning strategy.

A co-operative program (i.e., often referred to as "co-op") is a disciplinary program of study formally approved by the body responsible for academic governance in the university (i.e., "senate" or "academic council"). A co-operative program is generally designed to alternate semesters of university-centred learning with industry-focused experiential learning [CAFCE, 2014], making the experiential learning component an integral part of the student learning experience. The alternation of learning experiences in university and industry settings contributes to enhanced student learning. Industry placements normally include compensation, significantly reducing the student's debt burden upon graduation.

Because the program is formally approved by the body responsible for academic governance, the experiential learning component is a commitment by the university to every student accepted in its co-operative program. For this reason,

co-op job placement is an integral part of the delivery of co-operative programs, and represents a core business activity. Generally, students enrolled in cooperative programs are charged special fees covering co-operative placement activities.

4.3 Cost-recovery Services

The customers of cost-recovery service activities are students, personnel, and in some cases, the public at large. The outcomes typically consist of services which contribute to enhancing the campus environment [23], and which generate revenue on an ongoing basis. Many of these services are able to generate annual cash surpluses which can be reinvested at least partially in university operations. Examples of such services are: bookstore, child care, fitness facilities, food services, health services, merchandising (e.g., through trademarks, logos, etc.), student residences, parking, varsity sports, etc. Such services are also frequently accessible to the public at large, contributing not only to the university's financial sustainability, but to continuing strong relations within the community.

Here again, each service represents a distinct line of business with its own personnel, equipment, activities, physical infrastructure, revenue stream, cost structure, and outcomes.

As in the previous class of non-core activities, independent businesses can be found offering such services as part of their own core business. If such non-core activities are outsourced, external service providers should be managed as described in the case of cost-based services. If the university chooses to offer any one of these services internally, the university must invest operating funds to structure a new, internal line of business with the required personnel, furniture, equipment, space, projected cash flows and return on investment.

For each cost-recovery service activity, the business strategy is to:

- generate a return, over and above the university's investment.

The specific goals are to:

- maximize the quality and quantity of outcomes in a timely manner, consistent with available resources; and
- provide a yearly return on investment.

**Business
Strategy**

Table 4-2. Cost-recovery Services: Preferred Strategy, Goals and Metrics

Business Activity	Business Strategy	Specific Goals and Metrics	Suggested Targets
All	Generate a return over and above the university's investment	Maximize the quality and quantity of outcomes consistent with available resources	Activity dependent
		Provide a yearly return on investment	2 to 20%

These goals apply independently of whether these services are contracted to external service providers, or delivered internally by the university. The first goal, that of maximizing the quality and quantity of outcomes in a timely manner, requires identifying yearly performance outcome metrics appropriate to each cost-recovery activity, and taking action. The second goal, that of providing a yearly return on investment, should aim for a target between 2 and 20%, or some appropriate activity-specific industry benchmark.

Cost-recovery Services as a Competitive Advantage

Some universities hold the view that some campus services represent a competitive advantage for recruiting students and personnel. On that basis, they justify subsidizing them from operating funds, over and above the capacity of each one to support its own costs. Such decisions amount to “mission creep” and must be approached with great care. Providing funds to non-core revenue-generating activities carries the risk of weakening core business finances.

Nevertheless, when such a decision is made and an activity is funded over and above its own yearly revenues, the business strategy reverts to that of cost-based service activities (see Table 4-1):

- obtain appropriate value in return for the university’s investment.

As in the case of cost-based service activities, the goals are to:

- maximize the quality and quantity of outcomes in a timely manner, consistent with available resources; and
- decrease the ratio of yearly service costs to the number of graduates.

The first goal, that of maximizing the quality and quantity of in a timely manner, requires identifying appropriate yearly performance outcome metrics, and taking action. The second, that of decreasing the ratio of yearly service costs to the number of graduates, shows the impact of efforts aimed at improving efficiencies, and economies of scale arising from increased numbers of graduates (i.e., bachelor, master and doctoral combined). In this case, average yearly goal targets are on the order of 0.1 to 2%.

Example 4.3.1: Financing of Child Care Activities

What is the appropriate approach for dealing with child care activities?

The care of children of preschool age for parents that are either employees of the university or engaged in some other university activity (e.g., a student) is an important function, both for the university and society as a whole. However, the core business of university education does not encompass the care of preschool-age children. The university, as a result, should avoid entering into child care activities, either as a service provided by the university, or as part of a separately incorporated entity with ties to the university.

For the benefit its employees and students, the university may agree to facilitate access to child care services by external providers, for example by negotiating special fees, services or even geographic proximity in return for a guaranteed customer volume. In exceptional circumstances, the university may agree to provide a one-time investment to help establish child care services, in partnership with other stakeholders.

Despite these considerations, the decision is often made to subsidize child care services (i.e., over and above user fees), elevating child care planning, management and operations to core business status. Typically, this is because access to child care services either near or on campus is viewed as a significant competitive advantage in the hiring of new faculty members and other valuable university personnel. When this is the case, the university must ensure that the yearly cost per child is consistent with industry benchmarks, and that the university's yearly cost per university graduate, on average, decreases between 0.1 to 2%.

4.4 Long-term Growth Services

A number of other non-core service activities generate revenues over time:

- advancement (through fundraising; also referred to as “development”);
- advocacy (through lobbying of federal and provincial governments);
- alumni relations (through gifts from graduates of the university, or their efforts);
- research grant support (through federal and provincial research grant programs); and
- research contract support and IP transfer (through industry partnerships and innovation).

Each of these activities contributes to the long-term growth of the university and, in the case of IP transfer, the community and its economy. Here again, each of these is a distinct line of business, with its own financial, human, furniture, equipment, and space resources, and targeted outcomes and revenue stream. Let us consider each one in turn. Table 4-3 summarizes the approach for long-term growth services.

4.4.1 Advancement

The university itself, as an institution, is the customer of advancement activities [22]. The university invests in advancement to build relationships with a variety of philanthropic sources: associations, corporations, foundations, and individuals. Prospective donors are persuaded to give provided that a warm, reciprocal relationship has developed, and that the expected outcomes of their donations reflect mutually shared values and priorities. As a rule, donors have a significant preference for specific projects over general contributions.

Successful advancement outcomes include funding for students (e.g., bursaries, scholarships, loans, etc.), faculty members (e.g., faculty member hires, endowed research chairs, research funds, etc.), the learning infrastructure (e.g., library collections, laboratories, etc.), and major capital projects (e.g., construction of new buildings or facilities, major renovations of existing buildings or facilities, etc.).

The result of such outcomes is to:

1. provide direct incentives for new students to register (e.g., scholarships, bursaries, loans, etc.);
2. improve the attractiveness of the university's learning infrastructure for current and future students; and
3. increase the university's capacity to host additional students (e.g., capital projects, renovations, etc.).

Clearly, these outcomes contribute to the expansion of the student body, over and above what the university would have achieved in their absence. However, there can be a significant time lag between the university's initial investment in advancement, consisting primarily of the cost of maintaining a team of dedicated personnel, and the attendant increase in student numbers. Also, donors are rarely comfortable with the notion of funding the cost of advancement activities directly. As a result, operating funds must generally be diverted from core business activities to provide for advancement. Since the impact of advancement is to contribute to the expansion of the student body, what is the appropriate business strategy?

Let us consider the three non-core business strategies:

Business Strategy

- obtain appropriate value in return for the university's investment;
- recoup the university's investment; and
- generate a return, over and above the university's investment.

The third is the preferred though least likely strategy. Even when yearly donations significantly exceed the university's investment, donors prefer contributing to specific projects or outcomes rather than to university operating funds or advancement costs. This also eliminates the second strategy, leaving only the first:

- obtain appropriate value in return for the university's investment.

As mentioned before, the added value of successful advancement activities, over time, is to contribute to the expansion of the student body. The specific goals are to:

- maximize the quality and quantity of advancement outcomes in a timely manner, consistent with available resources; and
- decrease the ratio of yearly advancement costs to the number of graduates (i.e., bachelor, master and doctoral combined).

The first goal, that of maximizing the quality and quantity of advancement outcomes in a timely manner, concerns aiming for typical advancement performance outcomes, such as:

- the yearly scholarship, bursary and loan fund revenue;
- the yearly capital fund revenue;
- the ratio of yearly advancement revenues to advancement costs; and
- the number of major funding commitments within some predetermined time frame.

For the first two performance outcomes, average yearly growth targets should be on the order of 1 to 10%. For the third, the ratio of all yearly advancement revenues to advancement costs, average yearly targets for the ratio should be well in excess of 10, and growth should be between 1 and 10% yearly. For the fourth, the number of major funding commitments within some predetermined time frame, growth targets should be set between 1 and 10% for periods ranging from 1 to 5 years, depending on the age and stature of the university. All four outcomes normalized in terms of numbers of graduates should provide evidence of growth.

The second goal, that of decreasing the ratio of yearly advancement costs to the number of graduates, will show the impact of efforts aimed at improving efficiencies, and economies of scale arising from increased numbers of graduates. Average yearly goal targets are on the order of 0.1 to 2%.

Example 4.4.1: Financing of Advancement Activities

A large university invests one million dollars per year in advancement personnel for the purpose of raising large donations. Suppose that the university invests this yearly amount for nearly five successive years without success. At the end of the fifth year, a generous individual comes forward and commits a fifty million dollar capital donation for a new capital project. Given that the university's investment in advancement activities comes from operating funds, can the university reimburse its operating fund

account so that these funds can finally be invested into the academic operation? If not, how does it justify this expense to its students and other stakeholders?

The successful capital donation of fifty million dollars will increase the university's capacity to host additional students in the future, and enhance the university's environment with unique infrastructure which will benefit all future students. Unfortunately, the university's five million dollar investment in achieving this outcome is unlikely to be reimbursable: donors expect their commitment to be matched, leveraged or enhanced by other contributions, including the university's, not reduced. Equally unfortunately, this investment diverts operating funding from current students to the benefit of future students.

For stakeholders to be satisfied with the university's responsible stewardship of tuition fees and public funding, two types of metrics must be tracked and compared: investment metrics (i.e., costs) and return on investment metrics (i.e., revenues). In terms of investment, the university's costs dedicated to obtaining major donations over the past five years (i.e., in this case, five million dollars), normalized in terms of the number of graduates over the same period, should be lower than the equivalent metric of the preceding five-year period. In terms of return on investment, the university's successful capital donations over the past five years (i.e., in this case, fifty million dollars), again normalized in terms of the university's graduates over the same period, should be higher than the equivalent metric of the preceding five years. The university's ability to quantify these trends will demonstrate its ongoing commitment to current students while responsibly planning long-term growth.

4.4.2 Advocacy

The university regularly attempts to obtain revenue from government that is not program-related, resulting from advocacy directed to the political arm of government. As in the case of advancement, the university itself is the customer of advocacy activities[24]. Since governments prefer to provide operating funds through existing programs, the outcome of advocacy is usually to obtain funding for large capital projects which grow the university's capacity to host students. Investments in advocacy resources and activities amount to a calculated risk in diverting student-based revenue from core business activities to secure significant capital funding. In addition to the cost of maintaining a team of dedicated personnel, investments in advocacy include: purchase of services of registered lobbyists (i.e., in provinces where

this is allowed); and membership in organizations which advocate for system-wide capital, research and other funding initiatives such as Universities Canada, formerly the Association of Universities and Colleges of Canada (AUCC), and regional and provincial university organizations (e.g., Association of Atlantic Universities (AAU), Council of Ontario Universities (COU), Quebec's Bureau de coopération interuniversitaire (BCI), formerly Conférence des Recteurs et Principaux du Québec (CRÉPUQ), Research Universities' Council of British Columbia (RUCBC), etc.).

Business Strategy

Here again, government funding obtained through advocacy cannot normally be converted to operating funds to recoup the university's investment. Mirroring the case of advancement, the business strategy of advocacy is to:

- obtain appropriate value in return for the university's investment.

The specific goals are to:

- maximize the quality and quantity of advocacy outcomes in a timely manner, consistent with available resources; and
- decrease the ratio of yearly advocacy costs to the number of graduates (i.e., bachelor, master and doctoral combined).

The first goal, that of maximizing the quality and quantity of advocacy outcomes in a timely manner, concerns aiming for typical advocacy performance outcomes, such as:

- the yearly capital fund revenue;
- the ratio of yearly advocacy revenues to advocacy costs; and
- the number of major funding commitments within some predetermined time frame.

For the first outcome, capital funding, average yearly growth targets should be on the order of 1 to 10%. For the second, the ratio of advocacy revenues to costs, average yearly targets should be well in excess of 10, and growth should be between 1 and 10% yearly. For the third, the number of major funding commitments within some predetermined time frame, growth targets should be set between 1 and 10% for periods ranging from 1 to 5 years, depending on the age and stature of the university. All three outcomes normalized in terms of numbers of graduates should provide evidence of growth.

The second goal, that of decreasing the ratio of advocacy costs to the number of graduates, shows the impact of efforts aimed at improving efficiencies, and economies of scale arising from increased numbers of graduates. Average yearly goal targets should be on the order of 0.1 to 2%.

Example 4.4.2: Financing of Advocacy Activities

The university's investment in advocacy activities comes from operating funds. Can advocacy investments be reimbursed so that these funds are, in turn, invested into the academic operation? If not, how does the university justify this expense to students and other stakeholders?

The financing of advocacy activities is very similar to that of advancement activities, and their resulting outcomes are similar. Successful advocacy activities result primarily in capital commitments from government which increase the university's capacity to host additional students in the future, and enhance the university's environment with unique infrastructure which will benefit future students. However, as before, the university's advocacy investment is unlikely to be reimbursable, and such investments divert operating funding from current students to the benefit of future students.

As in the case of advancement, two type of metrics should be tracked and compared: investment metrics (i.e., costs) and return on investment metrics (i.e., revenues). In terms of investment, the cumulative advocacy costs of, say, the past five years, normalized in terms of the number of graduates over the same period, should be lower than the equivalent metric of the preceding five-year period. In terms of return on investment, the university's capital commitments from government for the past five years, normalized in terms of the university's graduates over the same period, should be higher than the equivalent metric of the preceding five years. These two metrics should reassure stakeholders of the university's responsible stewardship of tuition fees, public funding and long-term planning, while delivering value to its future students.

4.4.3 Alumni Relations

The university's graduates, commonly referred to as "alumni", represent an important group cultivated by the university for relationship-building. More often than not, alumni are grateful for the opportunities afforded to them by

their degrees, and remain loyal to the institution that opened the door for them to pursue a successful career. As in the case of advancement and advocacy, the university itself is the customer of alumni relations activities [21]. Successful alumni relations result in a wide range of valuable outcomes, from offering internships, co-op placements, and practicum placement opportunities to students, to participating on advisory committees, mentoring programs, alumni speaker programs, and the university's governance structures. All contribute indirectly or directly to the university's core business activities. Grateful alumni can also be persuaded to contribute financially to the university in fundraising initiatives, along with their time, talents, and gifts-in-kind.

Business Strategy

Where alumni relations activities contribute to the university's core business activities, these can be attributed directly to the core business cost structure. Where alumni relations activities contribute to fundraising, the business strategy should be identical to that of advancement. The business strategy is therefore to:

- obtain appropriate value in return for the university's investment.

The specific goals are to:

- maximize the quality and quantity of alumni relations outcomes in a timely manner, consistent with available resources; and
- decrease the ratio of yearly alumni relations costs to the number of graduates (i.e., bachelor, master and doctoral combined).

The first goal, that of maximizing the quality and quantity of alumni relations outcomes in a timely manner, concerns aiming for typical alumni relations performance outcomes, such as:

- the yearly scholarship, bursary and loan fund revenue;
- the yearly capital fund revenue;
- the yearly alumni event participation rates;
- the ratio of yearly alumni relations outcomes revenues to the university's alumni relations costs; and
- the number of major funding commitments within some predetermined time frame.

For the first three outcomes, average yearly growth targets should be on the order of 1 to 10%. For the fourth, the ratio of combined yearly alumni relations outcomes revenues to the university's alumni relations costs, average yearly targets should be well in excess of 10, and growth should lie between 1 to 10% per year. For the fifth, the number of major funding commitment targets within some predetermined time frame, targets should be set between 1 and 10% for periods ranging from 1 to 5 years, depending on the age and stature of the university. All five outcomes normalized in terms of number of graduates should provide evidence of growth.

The second goal, that of decreasing the ratio of yearly alumni relations costs to the number of graduates, shows the impact of efforts aimed at improving efficiencies, and economies of scale arising from increased numbers of graduates. Average yearly goal targets should be on the order of 0.1 to 2%.

Example 4.4.3: Financing of Alumni Relations Activities

Should alumni relations activities be financed by the university, or self-sufficient?

The financial architecture of alumni relations activities is very different than that of advancement and advocacy activities. Advancement and advocacy activities have no dependable source of revenue for their operations apart from the university's operating funds. On the other hand, successful alumni relations networking events generate revenues which help finance alumni relations operations. As a result, alumni relations activities should aim to be self-sufficient, while serving the interests of both the university and its alumni. If the university's alumni relations activities are not self-sufficient, the university should aim for the above recommended performance outcomes.

4.4.4 Research Grant Support

Federal and provincial research grant programs represent, by far, the most significant and reliable source of non-core revenue available to universities. The purpose of research grant support services is to provide mentoring and assistance to faculty members in their quest for research grants. Faculty members are therefore the primary customers of research grant support services. Once grants are secured, research grant support services provide assistance in the effective management of research funds, and proper compliance of their usage with the appropriate granting council or agency.

The ability to compete for grants hinges on the successful development and dissemination of intellectual property (IP) arising from the use of research as a learning strategy in the core business of teaching and learning, resulting in knowledge creation (e.g., in the form of concepts, discoveries, inventions, processes, systems, technologies, theories, etc.) and artistic creation (e.g., in the form of works of art, ballet, dance, fiction, music, opera, poetry, sculpture, theatre, etc.). There are two distinct IP management approaches for leveraging intellectual property within universities: scholarly activity and production [10], and innovation (i.e., through licensing, spin-offs or the sale of IP) [16, 17].

The first approach leverages IP by disseminating it through conferences, journals, and other scholarly vehicles of presentation or communication. The act of making IP freely available to society renders its author (e.g., faculty member, student, external partner, etc.) eligible for government research grants. From the institutional perspective, the primary intent of stimulating scholarly activity and production [10] is to strengthen student recruitment by obtaining grants [12] for research equipment (which attracts students) and financial assistance (which retains students). From the perspective of the individual faculty member, successful scholarship outcomes impact one's individual and institutional reputation.

The second approach, innovation, through the successful implementation of any one of the three innovation strategies (i.e., licensing, spin-offs or the sale of IP), leverages IP by focusing on its adoption in industry, government and/or society. The successful penetration of IP into new markets impacts the evolution of industry and the economy [14], and often contributes to the evolution of society [15] (as in the case of new information and communication technologies). Depending on the university's IP policy, successful innovation can also generate revenue for the university [18], along with reputational and financial rewards for its author(s) and business investor(s).

Both of these approaches contribute to increasing the number of graduate students far beyond what would have been possible in their absence. From the core business perspective, this is the key motivation for offering research grant support and IP transfer services. The two IP management strategies need not be considered mutually exclusive: for any given IP, the university should be creative in employing one to reinforce the other.

The direct outcome of research grant support services is to help generate equipment and operating grants [12]. In Canada, the most significant equipment grants are offered by federally-sponsored institutions (e.g., Canada Foundation for Innovation (CFI), Natural Sciences and Engineering Research Council (NSERC), etc.). The same is true for operating grants through the three key federal granting councils (i.e., NSERC, Social Sciences and Humanities Research Council (SSHRC), and Canadian Institutes of Health Research (CIHR)), frequently referred to as the “Tri-Agency.” Provincial bodies also offer equipment and operating grant programs, although not to the same extent as the federal government. As a rule, the university owns the equipment purchased by faculty member research grants, although the faculty member is its primary steward. Operating grants only in exceptional cases defray the salary cost of faculty members: the latter being employed by the university, salary is typically accounted for in grant requests as part of the university’s contribution to the research.

Equipment and operating grant requests frequently require industry partnerships: tangible proof of such partnerships must include either specific funding commitments and/or in-kind contributions. Industry-university partnerships are generally formalized by means of one or more contracts containing provisions for the management of any resulting IP (which may be constrained by the grant program), and for “administrative overheads” covering the “indirect costs” of the research enterprise (e.g., lighting, heating, cooling, ICT systems and networks, research grant and contract support services, etc. which must otherwise be supported by university operating funds). Typical charges for indirect costs are on the order of 20 to 40%, depending on the university’s policy. If the industry partnership wishes outright ownership of the resulting IP, an appropriate purchase price usually requires a separate negotiation, over and above the other provisions of the industry-university partnership. To explore this further, see Example 4.4.6 “Sale of Intellectual Property”.

Some federally-sponsored research grant programs contribute to the cost of maintaining active research grant support services through the federal “indirect costs program”. This program provides funding for ongoing overhead expenses in proportion to the applicable federally-sponsored grants obtained by the university. The funding is based on a predetermined formula and results in revenues on the order of 20 to 25% of these grants. This is due to growing recognition of the fact that research grant support activities do not normally

fall within the university's core business activities. A number of provincial programs provide for either overhead charges or financial contributions to the university's research grant enterprise in support of indirect costs.

There is significant value generated indirectly by investments in research grant support services: the growth of student recruitment [1] (i.e., by attracting more graduate students through enhanced research infrastructure and financial assistance), the attendant growth in operating revenue [2], the growth of the learning infrastructure [3] (i.e., through continued investments in the research infrastructure), and in time, the growth of the university's reputation [7] as a result of the successful impact of IP [8] on industry, government and/or society [6] as a whole. The residual costs of offering research grant support services, above and beyond contributions from the federal "indirect costs program", can therefore be viewed as an acceptable cost of doing business. The business strategy for research grant support services is to:

- recoup the university's investment in part (e.g., through the "indirect costs" subsidy and administrative overheads, etc.); and
- obtain appropriate value in return for the residual investment.

The specific goals are to:

- maximize the quality and quantity of research grant support outcomes in a timely manner, consistent with available resources; and
- decrease the ratio of yearly research grant support costs, either to the number of graduates (i.e., research-based master and doctoral), or to the number of successful grant requests (all types).

The first goal, that of maximizing the quality and quantity of research grant support outcomes in a timely manner, concerns aiming for such typical performance outcomes as:

- the yearly number of successful grants (all types);
- the yearly revenue of successful grants (all types);
- the yearly "indirect costs program" funding;
- the ratio of yearly research grant revenues to research grant support costs; and
- the ratio of total grant revenue (all types) to FTE faculty members.

For the first three performance outcomes, average yearly growth targets should be on the order of 1 to 10%. For the fourth, the ratio of all combined yearly research grant revenues to research grant support costs, average yearly targets should be well in excess of 10, and growth should be between 1 and 10% per year. For the last, the ratio of total grant revenue to FTE faculty members, average yearly growth targets should be on the order of 1 to 10%.

The second goal, that of decreasing the ratio of yearly research grant support costs to the number of graduates or successful grant requests, shows the impact of efforts aimed at improving efficiencies, and economies of scale arising from increased numbers of either research-based master and doctoral graduates, or successful grant requests. Average yearly goal targets should be on the order of 0.1 to 2%.

Example 4.4.4: Financing of Research Grant Support Activities

The university's ability to compete successfully for equipment and operating grants is key to supporting a strong research-based graduate studies portfolio. A research grant support organization of appropriate size, experience and qualifications is a significant asset to both faculty members and the institution, freeing the former from burdensome administrative and compliance details, and contributing to the latter's graduate student enrolment growth. How does the university determine how much it should invest in research grant support activities?

The university's investment in research grant support activities should be determined on the basis of an identifiable and sustainable revenue source. Faculty member grants contribute to attracting and retaining graduate students: as a result, should research grant support activities be financed in part from graduate student revenue (i.e., tuition fees and government funding)? Unfortunately, the degree to which individual grants contribute to graduate student revenue varies significantly, both in the number of students supported, and the amount per student. This makes it difficult to determine the extent to which grants resulting from research grant support activities contribute to graduate student revenue.

Another source of revenue for supporting research grant support activities is the federal government's indirect costs program. On average, the current formula used to distribute indirect costs revenues to universities typically provides an

amount between 20 to 25% of the university's successful Tri-Agency grants (i.e., CIHR, NSERC and SSHRC). This represents an excellent starting point for determining an appropriate investment in research grant support activities. The amount ultimately allocated also needs to take into account the fact that Tri-Agency grants are not the only grants accessible to universities, that the federal indirect costs program grant applies only to successful applications, that it can be applied to many other costs, and that the cost of dealing with other granting agencies is generally not offset by indirect costs revenues.

If the university wishes to grow its successful grants portfolio to a higher level of performance, it will consider investing in research grant support activities above and beyond current levels. The objective is to maintain a specific level of investment until the university's grants performance has generated an equivalent additional indirect costs revenue, largely offsetting the original investment. Here, again, this temporary investment can only be justified on the basis of graduate student enrolment growth.

4.4.5 Research Contract Support and IP Transfer

The purpose of the university's research contract support and IP transfer unit is to facilitate blended business and innovation activities. Blended business activities require personnel with highly specialized competencies in university grant activities, IP management and protection, and contractual partnership arrangements, in particular for addressing the important issue of transfer of IP ownership. Innovation activities require specialized competencies not only in the management, protection and transfer of IP (in accordance with the university's IP policy), but also in the identification of an appropriate innovation strategy for a given IP and context, the facilitation of its implementation through appropriate partnerships, and the preparation of suitable contractual arrangements. As many of these competencies intersect with research grant support, research contract support and IP transfer are often co-located with research grant support within a single administrative structure.

The three innovation strategies (i.e., licensing, spin-offs or sale of IP [16]) are key to bringing intellectual property successfully to market. The role of the university's IP transfer unit is to identify the appropriate innovation vehicle, and facilitate its implementation, preferably by partnering with external organizations with a proven successful track record. Faculty members,

students and other university personnel involved in IP creation are the primary customers of IP transfer services. The outcome of such services is the successful commercialization of IP.

Research contract support can generate administrative overhead revenues when external organizations require the expertise of university personnel for blended business activities, such as research service agreements [20] or industry-university research partnerships [19]. Depending on the university's IP policy, successful innovation outcomes can also result in significant revenue streams for the university [18], though such revenues usually take years to build, and likely vary over time. The primary business strategy of research contract support and IP transfer services should therefore be to:

- generate a return, over and above the university's investment.

This strategy ignores the significant value indirectly generated by such activities in the meantime. For example, the growth in successful grant requests [11] by leveraging innovation revenue [18] as matching funds in suitable government programs can result in the growth of student recruitment [1], the growth of the graduate-student operating revenue [2], the growth of the learning (research) infrastructure [3] and, in time, the growth of the university's reputation [7] through the successful penetration of intellectual property [8] in industry, government and/or society [6]. Such outcomes, though indirect, strengthen the university's core business revenue streams. As a result, the burden of supporting the residual costs of research contract support and IP transfer services, as in the case of research grant support services, can be viewed as an acceptable cost of doing business. Until the combination of innovation revenues and administrative overhead revenues exceed the cost of IP transfer services resources, the correct business strategy is to:

- recoup the university's investment in part (e.g., through overheads, IP licensing revenue, spin-off dividends, etc.); and
- obtain appropriate value in return for the residual investment.

The specific goals are to:

- maximize the quality and quantity of research contract and IP transfer outcomes in a timely manner, consistent with available resources; and

- decrease the ratio of yearly research contract and IP transfer services costs to the number of graduates (i.e., research-based master and doctoral), or to the number of successful service agreements and research partnerships (all types).

The first goal, that of maximizing the quality and quantity of research contract and IP transfer outcomes in a timely manner, concerns aiming for such typical performance outcomes as:

- the yearly number of service agreements;
- the yearly number of industry-university research partnerships;
- the yearly number of patents;
- the yearly number of licenses;
- the yearly number of spin-off companies;
- the yearly number of IP sales;
- the yearly overhead revenue;
- the yearly license revenue;
- the yearly spin-off company dividend revenue;
- the yearly IP sale revenue; and
- the ratio of yearly research contract and IP transfer revenues to costs.

For the first ten performance outcomes, average yearly growth targets should be on the order of 1 to 10%. For the last performance outcome, the ratio of yearly research contract and IP transfer revenues to research contract and IP transfer costs, average yearly targets should be well in excess of 10, and growth should be between 1 and 10% per year. All eleven outcomes may also provide valuable information on a “per FTE faculty member” basis over time.

The second goal, that of decreasing the ratio of yearly research contract and IP transfer costs to the number of graduates or service agreements and partnerships, shows the impact of efforts aimed at improving efficiencies, and economies of scale arising from increased numbers of research-based master and doctoral graduates, or successful service agreements and research partnerships. Average yearly goal targets should be on the order of 0.1 to 2%.

Example 4.4.5: Commercial Research versus University Research

What are the differences between the research activities of commercial research organizations and those of university education?

Commercial research organizations offer a variety of research services for a predetermined or negotiated fee. Such services aim to resolve problems of significant interest to the purchaser of the service. The fee includes the direct costs attributable to personnel, equipment usage, laboratory consumables (where applicable) and all additional overheads (e.g., administrative, energy, lighting, etc.). If the purchaser wishes to own the resulting intellectual property, the cost of ownership represents an additional negotiated cost, over and above the fee. When industry, government or related agencies wish to access the expertise of an individual university faculty member on a fee-based research basis, the university's approach is indistinguishable from that of a fee-based commercial research organization.

In university education, research is a learning strategy employed with increasing intensity in bachelor, master and doctoral programs to enhance student learning. In research-based master and doctoral programs, the student is given a problem for which a solution – or a set of solutions – must be found through research. The role of the faculty member is to guide the student through this journey of discovery, creativity, professional maturation and personal growth. In the process of identifying one or more appropriate solutions, the student fulfils the requirements of his/her graduate program, and can contribute new and valuable intellectual property. Depending on the supervisor's role, intellectual property arising from this work may be owned by both student and supervisor, in partnership with the university (depending on the university's intellectual property policy). To graduate, the student must write a thesis which is successfully defended in a public forum, and thereafter made publicly available through the university's library.

An industry partner will occasionally offer financial support for research-based master and doctoral student research activities, with the expectation of finding a practical solution to a problem of significant interest. Typical costs include financial support of the student, equipment usage, laboratory consumables (where applicable) and administrative overhead. The cost of supervision and the faculty member supervisor's expertise (i.e., the faculty member's financial

compensation) is generally borne by the university (being core to master and doctoral education), underscoring the university's significant contribution to the partnership. In return for the industry investment, the university typically provides the industry partner with a license in perpetuity to employ all useful IP arising from the partnership within its internal operations, though not for purposes of commercialization. If the industry partner wishes to own the intellectual property (e.g., in order to adapt it, improve on it, and/or commercialize products based on it, etc.), this requires a separate negotiation. If the industry partner wishes to delay publication of the student's thesis within the context of the agreement, this can be accommodated for only a limited period of time (i.e., typically between six to twelve months) as the student's graduation cannot be unduly delayed.

Example 4.4.6: The Sale of Intellectual Property

When intellectual property arises from university research activities, how is its value determined for sale?

There are two contexts in which the cost of ownership of intellectual property is negotiated: a) the "pre-project" context (i.e., where the research has yet to be undertaken, and the outcome is unknown), and b) the "post-project" context (i.e., where the research has been completed, and the outcome is known).

In the "pre-project" environment, the research has yet to be undertaken and there are many unknowns and risks. For the university, the risk is to cede valuable, future IP for too low a price; for the prospective buyer, the risk is to pay too high a price for what may amount to worthless IP.

Given the uncertainty on both sides, one method of approaching this is to consider the intrinsic value of the IP as being equal to the cost of the work. The total cost of the research, including full ownership of the IP, is then estimated to be twice the cost of the work. This approach provides the starting point of a typical IP negotiation in the "pre-project" context.

If the purchaser of the research does not choose to acquire the intellectual property during contract negotiations, and the subsequent research generates intellectual property of interest to the purchaser, the cost of acquisition in the "post-project" environment can be considerably higher. This is because

Table 4-3. Long-term Growth Services: Business Strategies, Goals and Metrics

Business Activity	Business Strategy	Goals and Metrics	Suggested Targets
Advancement	Obtain appropriate value in return for the university's investment	Maximize the quality and quantity of advancement outcomes consistent with available resources: • Grow yearly scholarship, bursary and loan fund revenue • Grow yearly capital fund revenue • Grow the ratio of yearly advancement revenues to advancement costs • Grow the number of major funding commitments within some predetermined time frame	• 1 to 10% per year • 1 to 10% per year • 1 to 10% per year (ratio > 10) • 1 to 10% per 1 to 5 year period
		Decrease the ratio of yearly advancement costs to the number of graduates	0.1 to 2% per year
Advocacy	Obtain appropriate value in return for the university's investment	Maximize the quality and quantity of advocacy outcomes consistent with available resources: • Grow yearly capital fund revenue • Grow the ratio of yearly advocacy revenues to advocacy costs • Grow the number of major funding commitments within some predetermined time frame	• 1 to 10% per year • 1 to 10% per year (ratio > 10) • 1 to 10% per 1 to 5 year period
		Decrease the ratio of yearly advocacy costs to the number of graduates	0.1 to 2% per year
Alumni Relations	Obtain appropriate value in return for the university's investment	Maximize the quality and quantity of alumni relations outcomes consistent with available resources: • Grow yearly scholarship, bursary and loan fund revenue • Grow yearly capital fund revenue • Grow yearly alumni event participation rates • Grow the ratio of yearly alumni relations revenues to alumni relations costs • Grow the number of major funding commitments within some predetermined time frame	• 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year (ratio > 10) • 1 to 10% per 1 to 5 year period
		Decrease the ratio of yearly alumni relations costs to the number graduates (i.e., combined bachelor, master and doctoral)	0.1 to 2% per year

(continued...)

Table 4-3. Long-term Growth Services: Business Strategies, Goals and Metrics (cont'd)

Business Activity	Business Strategy	Goals and Metrics	Suggested Targets
Research Grant Support	Recoup the university's investment in part, and Obtain appropriate value in return for the residual investment	Maximize the quality and quantity of research grant support outcomes consistent with available resources: • Grow yearly percentage of successful grant requests (all types) • Grow yearly total grant revenues (all types) • Grow yearly "indirect costs" grants • Grow the ratio of yearly research grant support revenues to research grant support costs • Grow the ratio of total grant revenue (all types) to FTE faculty members	• 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year (ratio > 10) • 1 to 10% per year
		Decrease the ratio of yearly research grant support costs to the number of graduates or to the number of successful grant requests (all types)	0.1 to 2% per year
Research Contract Support and IP Transfer	Recoup the university's investment in part, and Obtain appropriate value in return for the residual investment	Maximize the quality and quantity of IP transfer outcomes consistent with available resources: • Grow yearly number of service agreements • Grow yearly number of industry-university research partnerships • Grow yearly number of patents • Grow yearly number of licenses • Grow yearly number of spin-off companies • Grow yearly number of IP sales • Grow yearly overhead revenue • Grow yearly license revenue • Grow yearly spin-off company dividend revenue • Grow yearly IP sale revenue • Grow the ratio of yearly research contract and IP transfer revenues to research contract and IP transfer costs	• 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year • 1 to 10% per year (ratio > 10)
		Decrease the ratio of yearly IP transfer costs to the number of graduates, or to the number of successful service agreements and research partnerships (all types)	0.1 to 2% per year

a solution to the stated problem has been found, and there is now at least approximate knowledge regarding the originality, attractiveness, ease of production, cost, and potential market of the solution. As a result, in the “post-project” environment, the cost of acquiring the intellectual property is no longer based on the cost of the research, but on some fraction of the estimated value of the market.

4.5 Risk Management Framework

As in the case of core business risk management, effective non-core risk management begins with the application of sound business practices within every non-core business unit. If a non-core business unit is managed with the appropriate due diligence, the probability of negative outcomes is low, and low probability negative outcomes translate into low risk. Even so, unsuccessful non-core business activities sometimes occur and impact core business activities and finances. The university must therefore implement adequate core business risk management to anticipate such eventualities.

In turn, core business activities sometimes negatively impact non-core business activities (e.g., when the core business is under financial hardship and the non-core business is financially dependent): adequate risk management must therefore explicitly account for all core and non-core inter-dependencies.

Finally, the greater the number of non-core business investments, the greater the probability of not achieving targeted returns of the non-core business portfolio as a whole, and this too needs to be taken into account. Non-core business risk management therefore incorporates three distinct levels, as illustrated in Figure 4-1:

- 1.** risk management of individual non-core business activities;
- 2.** risk management of the impact of each non-core business activity on the core business, and that of core business activities on each non-core business activity; and
- 3.** risk management of the university’s portfolio of non-core business activities.

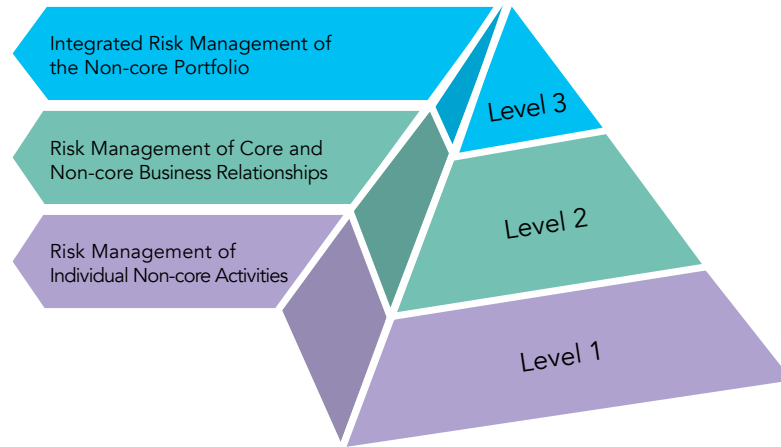


Figure 4-1. Risk management framework for non-core business activities

4.5.1 Risk Management of Individual Non-core Business Activities

Level 1 risk management focuses on individual non-core business activities. As in the case of core business activities, there are two parts to this: current activities, and new activities.

Level 1

Level 1 (current activities): This deals with the risk management of current non-core business activities. As in the case of core business activities, effective risk management begins with the implementation of sound business practices. The following approach formalizes a simple Level 1 risk management process applicable to every non-core business activity:

- Define the objectives and goals to be met.
- Identify risks and associated handling (i.e., for each identifiable adverse event).
- Identify the metrics to be employed for measuring outcomes, and targeted values.
- Identify risk thresholds for triggering corrective actions.
- Acquire data for timely tracking of metrics.
- Analyze performance.
- Implement corrective actions when risk thresholds are met.

Level 1 (new activities): This deals with the risk management of creating new non-core business activities. For non-core business activities to be successful, the need or opportunity must be evident, the anticipated return on investment must be clearly defined, a business model appropriate to the activity must be identified, and the activities must lend themselves to the Level 1 risk management strategy described above for current activities. New non-core business activities should also carefully be differentiated from core business activities to avoid mission creep. In times of optimism, non-core activities can inappropriately be classified as core, causing the university's cost structure to rise equally inappropriately.

4.5.2 Risk Management of Core – Non-core Business Relationships

There are two parts to Level 2 risk management of core and non-core business activity relationships:

Level 2

- core business activities on non-core activities (i.e., Core – Non-core (CN)); and
- non-core business activities on core activities (i.e., Non-core – Core (NC)).

Level 2 CN: This relates to the impact of core business activities on non-core business activities. The key risks are financial: a) if the financial position of a non-core business activity is dependent on core business funding, this is a risk in the event of financial strain within the core business; and b) if core business financial processes inappropriately access non-core business accounts, such as restricted research funds, this also represents a risk.

Level 2 NC: This relates to the impact of non-core business activities on core business activities. The following four questions, addressed sequentially and on an ongoing basis, provide an effective framework for addressing such risks (see Figure 4-2):

- What is the purpose of the non-core business activity?
- Does it strengthen core business outcomes?
- What are the risks?
- How are risks mitigated?

Each question is now considered in turn.

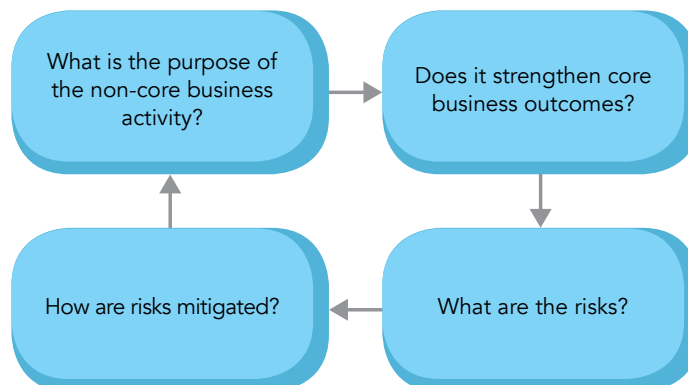


Figure 4-2. Risk management of non-core activities on core activities

What is the purpose of the non-core business activity?

Non-core business activities must either add value to the university's environment, generate revenue which can be directed to normal operations, or contribute to accelerated growth within a predetermined time frame. More specifically:

- *For cost-based services:* the purpose of these services is to return adequate, bench-marked value to the university environment.
- *For cost-recovery services:* the purpose of these services is to deliver quality cost-recovery services to the university community while providing a targeted return on investment.
- *For long-term growth services:* the purpose of these services is to contribute to the university's long-term growth strategy while decreasing the yearly cost per graduate.

Does it strengthen core business outcomes?

The non-core business activity must strengthen the university's ability to deliver core business outcomes; otherwise, it should not be undertaken.

What are the risks?

Non-core business activities impose three types of risks on core business activities: structural, operational and reputational

- 1. Structural:** Non-core business activities can require familiarity with very different types of business activities and highly specialized competencies not normally found within core business management.

2. Operational: These can include inadequate a) business strategy and/or oversight, b) enunciated goals, c) metrics for tracking performance, d) outcomes, e) intervention when risk thresholds have been triggered, and f) management of conflicts of interest in the case of employees having both core and non-core business responsibilities. The foremost operational risks are as follows:

- *For cost-based services:* costs and outcomes must be within set targets. If they are not, this represents a risk.
- *For cost-recovery services:* revenues, expenditures and outcomes must be closely tracked to ensure that business goals are achieved. Activities that are not progressing as expected, or goals that no longer appear to be achievable, represent significant risks.
- *For long-term growth services:* revenues, expenditures and outcomes must closely be tracked to ensure that business goals are achieved. The key risk is to spend too much for too long without achieving adequate outcomes, needlessly burdening the university's cost structure, and weakening the university's ability to generate core business outcomes of appropriate quality and quantity.

3. Reputational: If the university's focus on non-core business activities is perceived to be more important than that of its core activities, it exposes itself to criticism either of inadequate attention to core business activities, or to excessive influence of its non-core business partners on university operations. Finally, unsuccessful non-core business activities can alter partnerships with either industry or government, and harm future initiatives.

Five strategies contribute to mitigating the risk of non-core business activities negatively impacting core business activities:

How are risks mitigated?

1. Planning: The process of investing in new non-core business activities and reaping the anticipated rewards can take years. Multi-year planning of expected outcomes is essential. If such plans anticipate that the university is exposed to unacceptable risk, either the goals must be modified, or the proposed plans abandoned altogether.

2. Partnership: Successful non-core business initiatives frequently

require partners with recognized expertise of the non-core area. It is always preferable that such partners have the financial means to assist in the event of contingencies.

- 3. Focus:** The university must strike an appropriate balance between core and non-core business activities. Non-core business activities must aim to support core business operations, not detract attention from core business activities.
- 4. Oversight:** Strong oversight of each non-core business ensures that the full range of risk management options are available, and that potential negative impacts are mitigated in a timely manner. Formal governance structures enable the expertise and wisdom of partners to contribute to strategic direction and ongoing risk management.
- 5. Tracking:** Regular tracking of appropriate metrics within each non-core business activity ensures that unforeseen pressures are identified in a timely manner. When performance tracking triggers risk thresholds, corrective measures must rapidly be implemented.

4.5.3 Risk Management of the Non-core Business Portfolio

Level 3

Level 3 risk management views the university's collection of non-core businesses as an investment portfolio. A simple means of implementing a portfolio approach is to identify a yearly target for the expected return on investment of: a) each individual non-core business activity, and b) the entire non-core business portfolio (i.e., accounting for the probability of not achieving individual targets within the designated time frame). The overall objective is to meet or exceed individual and portfolio targets on a yearly basis.

4.6 Summary

In this chapter, non-core business activities are seen to present both opportunities and challenges to core business operations. In terms of opportunities, non-core activities can enhance the university's environment, generate revenues which contribute to operating budgets, and provide opportunities to accelerate growth of either the learning infrastructure, highly qualified personnel, intellectual

Table 4-4. Non-core Business Strategies, Goals and Metrics: Summary

Class	Business Activity	Business Strategy	High-level Goals and Metrics
Cost-based Services	All	Obtain appropriate value in return for the university's investment	- Maximize the quality and quantity of outcomes consistent with available resources - Decrease the ratio of yearly service costs to the number of graduates
Cost-recovery Services	All	Generate a return, over and above the university's investment	- Maximize the quality and quantity of outcomes consistent with available resources - Provide a yearly return on investment
Long-term Growth Services	Advancement	Obtain appropriate value in return for the university's investment	- Maximize the quality and quantity of advancement outcomes consistent with available resources - Decrease the ratio of yearly advancement costs to the number of graduates
	Advocacy	Obtain appropriate value in return for the university's investment	- Maximize the quality and quantity of advocacy outcomes consistent with available resources - Decrease the ratio of yearly advocacy costs to the number of graduates
	Alumni Relations	Obtain appropriate value in return for the university's investment	- Maximize the quality and quantity of alumni relations outcomes consistent with available resources - Decrease the ratio of yearly alumni relations costs to the number of graduates
	Research Grant Support	- Recoup the university's investment in part, and - Obtain appropriate value in return for the residual investment	- Maximize the quality and quantity of research grant support outcomes consistent with available resources - Decrease the ratio of yearly research grant support costs to the number of graduates, and/or - Decrease the ratio of yearly research grant support costs to the number of successful grant requests
	Research Contract Support and IP Transfer	- Recoup the university's investment in part, and - Obtain appropriate value in return for the residual investment	- Maximize the quality and quantity of IP transfer outcomes consistent with available resources - Decrease the ratio of yearly IP transfer costs to the number of graduates, and/or - Decrease the ratio of yearly IP transfer costs to the number of successful service agreements and research partnerships

property creation, innovation outcomes, operating revenue, reputation, student recruitment, or any combination thereof. In terms of challenges, successful non-core business activities require clarity of purpose, appropriate business strategies, goals, performance and accountability structures, and the application of the comprehensive three-level risk management framework described in this chapter. The next chapter addresses blended business activities, where core and non-core business activities uniquely intersect.

5. Blended Business Activities

In the previous chapter, non-core business activities were seen to introduce complexity and risk to core business decision-making and management. Blended business activities incorporate both core and non-core business resources and outcomes, introducing additional layers of complexity and risk. The present chapter addresses the unique challenges of blended business activities, and describes an appropriate risk management framework.

5.1 Overview of Blended Business Activities

Blended business activities bring together core and non-core business resources to achieve core and non-core business outcomes. More often than not, such business activities are founded on industry-university partnerships articulated around shared research objectives, and facilitated by financing from provincial and federal government programs. In some cases, numerous universities and companies are involved.

Referring to Figure 2-6, research-driven blended business activities aim to achieve a variety of core (i.e., student recruitment [1]; highly qualified personnel [5]; reputation [7]; intellectual property [8]) and non-core business outcomes (i.e., evolution of industry and the economy [14]; evolution of society [15]) through scholarly activity and production [10], equipment and operating grants [12], licenses, spin-offs or sale of IP [16, 17], and innovation revenue [18]. Examples of blended business activities include: business incubators, early-stage spin-off companies, research chairs, research centres, research institutes, research networks, research and innovation parks, etc. From the university's perspective, the intent of the blended business activity model is to leverage some of its human, equipment, space and financial resources in order to accelerate the achievement of specific core and non-core business outcomes.

The governance and management structures of individual blended business activities can vary significantly as they are tailored to the needs of the partnership. Blended business agreements include industry and university

resource commitments, government grant opportunities, reciprocal partner responsibilities and commitments, business plans, legal arrangements, targeted core and non-core outcomes, and accountability metrics. Because of their complexity, blended business activities are occasionally the subject of intense scrutiny by faculty members and other stakeholders concerned with the possible negative influence of industry financing on the university's core values, scholarly activities or reputation (see, e.g., [Brown, 2012]).

Blended business activities cover a wide spectrum of possibilities. Consequently, it is not the purpose of this chapter to cover all types of blended business activities, but rather to provide guidance in the important area of risk management. Research chairs are a familiar type of blended business activity to universities, and are therefore used here to introduce the concepts of risk management for blended business activities.

5.2 Research Chairs

Research chairs are special academic appointments which emphasize learning through research and discovery, primarily within graduate studies programs. They are created by submitting a research plan to an appropriate funding organization, either a government agency, an industry partner, a philanthropic donor, or some combination thereof. A research plan includes a clear purpose, proper governance, management and accountability structures, and a multi-year research program with specific goals, human and equipment resource requirements, metrics for tracking performance, commitments from stakeholder partners, and anticipated outcomes.

The expected outcomes of research chairs include both core and non-core outcomes. Research chairs can also provide the core expertise for creating and delivering innovative master and doctoral programs, and stimulating collaborations with colleagues beyond traditional disciplinary areas. When the research chair is successfully funded, the chairholder leads the implementation of chair's research plan, and is accountable to its multiple stakeholders for its success.

The Government of Canada's Natural Sciences and Engineering Research Council (NSERC) sponsors a number of research chair programs [NSERC, 2014]:

- Chairs for Women in Science and Engineering (a regional program for increasing the participation of women in science and engineering, providing role models for women considering careers in these fields);
- Chairs in Design Engineering (for improving the level and quality of design in engineering activity);
- Industrial Research Chairs (for major research endeavours of interest to industry, and/or to assist in the development of new research efforts in response to important industrial needs);
- Industrial Research Chairs for colleges (for supporting the establishment of applied research leaders and promote their role as catalysts in the advancement of business-focused applied research programs); and
- Northern Research Chairs (for augmenting and promoting northern research and training in the natural sciences and engineering);

The Industrial Research Chair (IRC) program is generally acknowledged to be the most prestigious, and supports chairs in many universities. Canada Research Chairs (sponsored by the Government of Canada, and corporately or privately sponsored chairs are also found in many universities. For the purpose of addressing blended business activities, this chapter will focus on the three most widely adopted types of research chairs in Canada's universities: NSERC Industrial Research Chairs, Canada Research Chairs, and corporately or privately sponsored chairs.

5.2.1 NSERC Industrial Research Chairs

Purpose

The purpose of NSERC Industrial Research Chairs [NSERC, 2014] is to:

- “assist universities in building on existing strengths to achieve the critical mass required for a major research endeavour in natural sciences and engineering of interest to industry; and/or
- assist in the development of research effort in fields that have not yet been developed in Canadian universities but for which there is an important industrial need; and
- provide an enhanced training environment for graduate students and, where appropriate, post-doctoral fellows by exposing them to research challenges unique to industry and the opportunity for significant ongoing interactions with the industrial partner(s).”

Chairholders carry out the above by finding solutions to problems of national or international significance in a particular discipline or industry while educating highly qualified personnel at the bachelor, master, doctoral and post-doctoral levels.

There are three types of IRCs, depending on the profile of the targeted chairholder candidate [NSERC, 2014]:

- Senior IRCs, aimed at distinguished senior researchers. These are 5-year renewable appointments;
- Associate IRCs, aimed at promising junior researchers. These are 5-year appointments, renewable once; and
- Executive IRCs, aimed at outstanding research and development professionals. These are 5-year, non-renewable appointments.

The IRC program can match industry funding up to 100%, in some cases doubling the industry funds committed to the IRC. The IRC funding structure covers the chairholder's compensation, provides financial assistance to graduate students, and supports the cost of infrastructure, research tools and instruments, and other expenses related to the program of research.

A successful IRC funding request addresses the following elements [NSERC, 2014]:

- excellence of the researcher;
- quality of the research proposal;
- industrial relevance and benefits;
- training of HQP;
- benefits to the university; and
- appropriateness of the setting.

To obtain the IRC, the university typically agrees to the following commitments:

- space to accommodate the IRC's personnel, graduate students and research equipment;
- financing for graduate student scholarships and bursaries, over and above the chair's allocation of operating funds;
- reduced teaching for the IRC chairholder, so that the latter can dedicate a significant time commitment to IRC personnel and activities;

- hiring of an additional junior faculty member (i.e., in the case of an internal IRC candidate, to cover the IRC chairholder course releases; when the chairholder is hired externally, this is not required);
- access to the university's research grant support services personnel;
- access to the university's research contract and IP transfer services personnel;
- access to the university's advancement personnel (for additional funding opportunities); and
- access to other university services (e.g., university library, ICT networks, etc.).

Expected Benefits

The IRC is a blended business unit, led by its chairholder, benefiting from core business commitments, financed in part by non-core funding, and accountable for the core and non-core business outcomes identified in the IRC research plan. The university's expectation is that the IRC will contribute to increasing the quality and quantity of core business outcomes, while delivering on the expected non-core business outcomes of its industry partners. The expected core business outcomes are:

- increased graduate student recruitment, and attendant graduate student revenue;
- increased graduation of highly qualified personnel;
- increased generation of intellectual property; and
- enhanced university reputation.

In addition to these, two other outcomes are expected, directly related to the above:

- increased quality of graduate student supervision; and
- increased knowledge and expertise of faculty members.

The expected non-core business outcomes are:

- successful innovation activities leading to the evolution of industry and the economy [14];
- increased probability of successful additional equipment and operating grants (e.g., by leveraging the IRC's performance and reputation on grant requests, etc.); and
- increased probability of "indirect costs" grant revenue.

A successful IRC will attempt to leverage additional grant funding opportunities such as through NSERC's Industry-driven Collaborative Research and Development grant program, and other appropriate federal and provincial programs. Ideally, the IRC will add new industrial partners and grow its financing, increasing not only its volume of activities but also the number of successful core and non-core outcomes.

The creation and operation of IRCs entail the following risks:

Risk Analysis

- 1. Failure to meet targeted core business outcomes:** There are four core business outcomes: increased graduate student recruitment, highly qualified personnel, intellectual property, and enhanced reputation. If the IRC invests in full-time research personnel rather than graduate students, intellectual property can still result, but such an approach fails to increase student recruitment or generate highly qualified personnel. If no highly qualified personnel result from the IRC's activities, the probability of non-renewal is extremely high, as this is a required outcome of the IRC program. If no intellectual property is created, this compromises both the IRC's capacity to achieve its non-core business goals, and the reputation of the IRC and the institution: here, again, the probability of non-renewal is extremely high.
- 2. Failure to meet targeted non-core business outcomes:** Even if intellectual property has successfully been created, there remains the risk that non-core business goals (e.g., innovation targets related to licensing, spin-offs, the sale of IP, etc.) are not successfully achieved. If the IRC generates intellectual property, but of no commercial value, the IRC will fail to meet its non-core business goal targets, and the probability of non-renewal is high.
- 3. Failure to meet core and non-core targeted business outcomes:** If the IRC meets no targeted core and non-core business goals, the IRC is a complete failure, and the IRC will not be renewed. This is a very rare occurrence.
- 4. Failure to meet academic, governance and ethical standards:** If the IRC is not held to high academic, governance and ethical standards, its operations and scholarly outcomes can draw criticism from the

university community or the public at large, and expose the university to reputational risks, even when targeted core and non-core business outcomes occur. Failure to meet academic, governance and ethical standards introduces high risk to the IRC's renewal.

- 5. Failure to cover the IRC chairholder's salary at the end of the IRC mandate:** When the IRC ends, the chairholder's salary is no longer supported by IRC funding, and must be incorporated into the university's cost structure. There is a risk that, at the end of the IRC, the university's revenue structure may not have sufficiently expanded its undergraduate and graduate student base to incorporate this additional salary into its cost structure.

**Risk
Mitigation**

These risks are mitigated by applying high standards in the selection of chairholder candidates, providing adequate institutional support, enforcing compliance of high academic, governance and ethical standards in all chair operations, implementing strong multi-year planning and oversight of the IRC including the timely tracking of performance metrics, and rapidly applying appropriate corrective measures when risk thresholds are met.

5.2.2 Canada Research Chairs

Purpose

The purpose of the Canada Research Chairs (CRC) program is to contribute to making "Canada one of the world's top countries in research and development" [CRC, 2014]. The Canada Research Chair program provides faculty members the means to find solutions to problems of national or international significance in either "engineering, natural sciences, health sciences, humanities, and social sciences," on areas closely aligned to the university's research plan, to "improve our depth of knowledge and quality of life, strengthen Canada's international competitiveness, and help train the next generation of highly skilled people." The CRC also aims to educate highly qualified personnel at the master, doctoral and post-doctoral levels. The CRC program is managed within SSHRC by the Canada Research Chairs Secretariat on behalf of CIHR, NSERC and SSHRC.

The number of CRCs allocated to the university by the Canada Research Chairs Secretariat is in proportion to the funding it receives from admissible federal research granting programs (i.e., in relation to all other Canadian universities).

There are two types of Canada Research Chairs appointments:

- Tier 1, aimed at senior faculty members, which provides \$200,000 per year for a period of seven years, renewable; and
- Tier 2, aimed at junior faculty members, which provides \$100,000 per year for a period of five years, renewable once.

Allocated CRCs require application and should meet the following criteria:

- excellence of the researcher;
- quality of the research proposal;
- training of HQP;
- benefits to the university; and
- appropriateness of the setting.

These criteria are virtually identical to those covered by IRC funding requests except for the criterion of industrial relevance, benefits and commitments which is not mandatory for CRCs.

Similarly to the IRC, the university typically agrees to the following commitments:

- space to accommodate the CRC personnel, graduate students and research equipment;
- financing for graduate student scholarships and bursaries, over and above the chair's targeted allocation of operating funds;
- course releases for the CRC chairholder, so that the latter can dedicate a significant time commitment to CRC personnel and activities. This normally translates into a commitment for additional term instructors;
- access to the university's research grant support services personnel;
- access to the university's research contract and IP transfer services personnel; and
- access to other university services (e.g., university library, ICT networks, etc.).

Because industry commitments are not mandatory, there is normally no need to engage the university's advancement (i.e., fundraising) services for the purpose of finding industry matching funds. However, CRC candidates may

wish to include additional partners and funding commitments in their chair proposal in order to achieve appropriately ambitious research outcomes.

Expected Benefits

The CRC is a blended business unit, led by its chairholder, benefiting from core business commitments, financed in part by non-core funding, and accountable for the core and non-core business outcomes quantified in the CRC research plan. The expected benefits are virtually identical to those of IRCs with the exception that CRCs have no obligation to emphasize downstream innovation activities or commercial outcomes leading to the evolution of industry and the economy [14] (though many do). However, CRC activities in either knowledge creation or artistic creation, as appropriate, are expected to contribute to the evolution of society [15]. As before, if the CRC is successful, it will engage in additional grant requests, thereby increasing its volume of activities, and the number of successful core and non-core outcomes.

Risk Analysis

The risks previously identified for IRCs apply to CRCs except for a reduced emphasis on innovation outcomes. A risk unique to CRCs arises from the university's freedom to choose whether or not it will use the CRC funding to cover the chairholder's salary. There are two possible strategies:

- employ part of the CRC funding for the chairholder's salary; or
- maintain the chairholder's salary on the university payroll, and dedicate the CRC funding to research activities.

The first strategy reduces pressure on the university payroll in the short term, but also reduces the funds available for research activities and graduate student expansion. In the longer term, there remains the issue of securing budgetary allocations for the chairholder's annual salary increases, and for the chairholder's full salary after the chair has run its course. The second increases pressure on the university payroll, but maximizes research funding available to the CRC for core and non-core outcomes.

Which of these two strategies enhances both core and non-core business outcomes? A strategy which maximizes core and non-core business outcomes while minimizing risk is essential, especially if many CRCs are to be structured identically. The scenarios are as follows, in order of increasing risk:

1. The CRC chairholder occupies an allocated faculty member position:

In this case, the CRC chairholder occupies a previously-allocated faculty member position in the CRC's targeted academic unit. The salary of the CRC is therefore built into the university cost structure, and virtually all of the CRC funding is flowed to the chairholder for research (i.e., apart from administrative overhead, typically on the order of 10 to 25%, the CRC program not currently being covered by the federal government's indirect costs program). Since the CRC funding is dedicated to financing research activities, the probability of maximizing core and non-core business outcomes is high.

2. The CRC chairholder does not occupy an existing faculty member position: In this case, the CRC chairholder occupies a faculty member position which had not previously been built into the university cost structure. There are three scenarios here, again in order of increasing risk:

- *Hire the CRC as an anticipated "replacement hire":* In this scenario, the CRC is hired with the understanding that the chairholder is deemed to be the replacement hire for the next faculty member departure within the CRC's academic unit. Here again, virtually all of the CRC funding is flowed to the chairholder (i.e., excluding administrative overhead). The university takes on the chairholder's salary until a position is freed. Since the CRC funding is dedicated to financing research activities, the probability of maximizing core and non-core business outcomes is high.
- *Hire the CRC without an allocated position:* In this scenario, the CRC is hired despite the fact no position has been allocated, and a position is created outright to accommodate the CRC. As a result, virtually all CRC funds are flowed to the chairholder (i.e., excluding administrative overhead) in the expectation of achieving positive core and non-core outcomes. Since the CRC funding is dedicated to financing research activities, the probability of maximizing core and non-core business outcomes is high.
- *Leverage the CRC funds to hire the faculty member:* In this scenario, the CRC is hired by employing part of the CRC funding to this effect. This provides the university with a new hire, and significantly

reduced funding for achieving expected core and non-core business outcomes. Such an approach requires the CRC to focus its initial activities on preparing grant requests for additional equipment and operating funds rather than on achieving expected outcomes, thereby slowing down progress considerably. If no provision is made for increasing the chairholder's yearly compensation from CRC funding, the university must assume an increasing yearly residual salary commitment. Since the CRC funding is only partially dedicated to financing research activities, the probability of maximizing core and non-core business outcomes is low, at least initially.

**Risk
Mitigation**

Apart from the salary allocation issue, the mitigation of risks in the case of CRCs is identical to that of IRCs. As for salary allocation, the lower risk strategies outlined above are preferable to the higher risk alternatives.

5.2.3 Corporately or Privately Sponsored Chairs

The purpose of a corporately or privately sponsored chair is to find solutions to problems of significance to a specific company, an industry, or a particular discipline. Though donors such as corporations, associations, or individuals prefer to leverage their contribution through government funding programs, this is not always possible. For example, programs may not be available for the particular discipline or area under consideration, or because sponsor constraints on intellectual property or the chair's activities are such that they do not conform to government requirements. The investment, expected benefits, and risks are identical to those of either CRCs or IRCs, depending on the source of funding, potential constraints imposed on the funding, and expected outcomes.

Example 5.2.1: Research Chairs and Graduate Student Supervision

Chairholders benefit from course releases, as provided for in their respective research plans. Does this impact the minimum number of graduate students the chairholder must supervise?

Faculty members are typically governed by a 40% - 40% - 20% time allocation, as follows:

- The first 40% is dedicated to “teaching and learning.” From the faculty member’s perspective, this is time dedicated to the delivery of courses in either bachelor, master or doctoral programs. In many universities, this 40% is equivalent to four three-credit courses. From the university’s perspective, this is the time dedicated by a faculty member to the core business activity of teaching and learning.
- The second 40% is for “research.” From the faculty member’s perspective, this is time dedicated to research-based learning strategies employed with increasing intensity in bachelor, master, and doctoral programs. From the university’s perspective, this is time dedicated by a faculty member to the core business activity of supervising the research activities of master and doctoral students, though this may also include the supervision of bachelor students in research or experiential learning projects.
- The 20% is for “community engagement.” From the faculty member’s perspective, this represents time dedicated to program construction, program review committees, tenure and promotion committees, hiring committees, strategic planning, etc. From the university’s perspective, faculty member participation on such committees is an invaluable contribution to both the university’s collegial processes and to long-term planning.

For all faculty members including research chairholders, if the time allocation of any one of these is reduced, some combination of the other two must be increased so that the total remains 100%. As the first two contribute to revenue generation, reductions in one should be compensated by increases in the other.

If a research chairholder is given two course releases out of a total of four, this reduces the chairholder’s “teaching and learning” obligations by 50%. Since this reduced time allocation must be compensated by other activities, the supervision of research activities should rise from 40% to 60% of the total, translating into 50% more graduate students than a faculty member without course releases. In fact, this could represent an even higher number of graduate students, depending on the chair’s financial architecture and the commitment of the chair’s research plan to graduate student supervision.

For example, if the university’s normal expectation of a faculty member without

course releases is to supervise 6 graduate students (e.g., 4 master, 2 doctoral), a research chairholder with two course releases should supervise at least 50% more graduate students for a total of 9 (e.g., 6 master and 3 doctoral).

5.3 Risk Management Framework

As in the case of non-core business activities, the risk management of blended business activities incorporates three distinct levels (see Figure 5-1):

1. risk management of individual blended business activities;
2. risk management of the impact of each blended business activity on the core business, and that of core business activities on each blended business activity; and
3. risk management of the university's overall portfolio of blended business activities.

Each of these is now considered individually.

5.3.1 Risk Management of Individual Blended Business Activities

Level 1

Level 1 risk management focuses on each individual blended business activity. There are two parts to this: current activities and new activities.

Level 1 (current activities): This deals with the risk management of current blended business activities. Effective risk management of blended business activities begins with the implementation of sound business practices, and the following approach formalizes a simple Level 1 risk management process applicable to every blended business activity:

- Define the objectives and goals to be met.
- Identify risks and associated handling (i.e., for each identifiable adverse event).
- Identify the metrics to be employed for measuring outcomes, and targeted values.
- Identify risk thresholds for triggering corrective actions.
- Acquire data for timely tracking of metrics.
- Analyze performance.
- Implement corrective actions when risk thresholds are met.

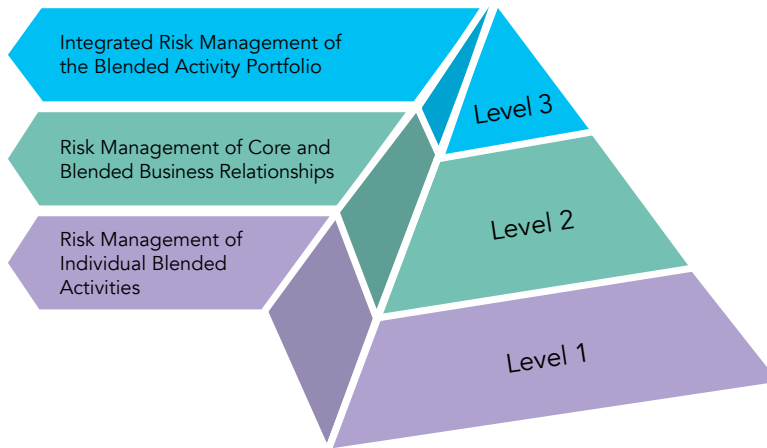


Figure 5-1. Risk management framework for blended business activities

Level 1 (new activities): This deals with the risk management of creating new blended business activities. For such activities to be successful, the need or opportunity must be evident, the anticipated return on investment clearly defined, a business model appropriate to the activity identified, and the activity lend itself to the Level 1 risk management strategy described above for current activities. New blended business activities should also carefully be differentiated from core business activities to avoid mission creep: in times of optimism, blended activities can inappropriately be classified as core, causing the university's cost structure to rise equally inappropriately.

5.3.2 Risk Management of Blended – Core Business Relationships

There are two parts to Level 2 risk management of core and blended relationships:

Level 2

- core business activities on blended activities (i.e., Core – Blended (CB)); and
- blended business activities on core activities (i.e., Blended – Core (BC)).

Level 2 CB: This relates to the impact of core business activities on blended business activities. The key risks are financial: a) if the financial position of a blended business activity is dependent on core business funding, this poses

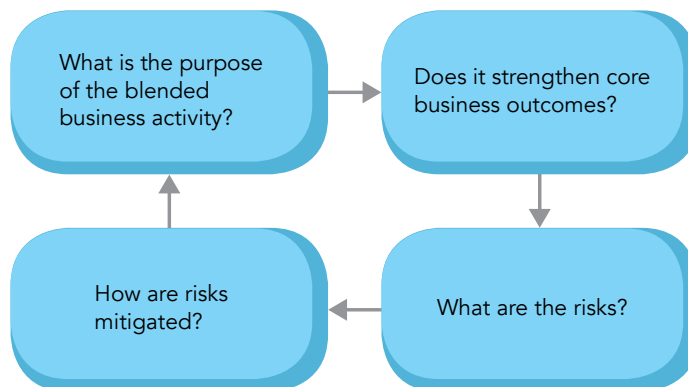


Figure 5-2. Risk management of blended-core relationships

significant risk in the event of financial strain within the core business; b) if core business financial processes inappropriately access blended business accounts, such as restricted research funds, this also represents a potential risk.

Level 2 BC: This relates to the impact of blended business activities on core business activities. The following four questions, addressed sequentially and on an ongoing basis, provide an effective framework for addressing such risks (see Figure 5-2):

- What is the purpose of the blended business activity?
- Does it strengthen core business outcomes?
- What are the risks?
- How are risks mitigated?

Each question is now considered in turn.

What is the purpose of the blended business activity?

The university's investment in any blended business activity aims to achieve specific core and non-core business outcomes within a predetermined time frame, as defined in each activity's research or business plan. Similarly to core business activities, the blended business activity must contribute to strengthening the quality and quantity of the four core business outcomes, thus positively impacting the university's long-term sustainability. Similarly to non-core business activities, blended business activities must add value to core business activities, generate

revenue which can be directed to normal operations, or contribute to the accelerated growth of core business outcomes within a predetermined time frame.

The blended business activity must strengthen the university's ability to deliver core business outcomes; otherwise it should not be undertaken.

Does it strengthen core business outcomes?

As in the case of non-core business activities, blended business activities impose three types of risks on core business activities: structural, operational and reputational.

What are the risks?

- 1. Structural:** Non-core components of blended business activities can require familiarity with very different types of business activities and highly specialized competencies not normally found within core business management.
- 2. Operational:** These can include inadequate a) blended business strategy and/or oversight, b) core and non-core business goals, c) metrics for tracking performance, d) outcomes, e) intervention when risk thresholds have been triggered, and f) management of conflicts of interest in the case of employees having both core and blended business responsibilities.
- 3. Reputational:** If the university is perceived to spend an inordinate amount of time on managing blended business activities, it exposes itself to criticism, either of inadequate attention to core business activities, or excessive influence of its blended business partners on university operations. Finally, unsuccessful blended business activities can alter partnerships with either industry or government, and harm future initiatives.

Five strategies contribute to mitigating the risk of blended business activities negatively impacting core business activities:

How are risks mitigated?

- 1. Planning:** The process of investing in new blended activities and reaping the anticipated rewards can take years. Multi-year planning of expected outcomes is essential. If such plans anticipate that the university is exposed to unacceptable risk, either the goals must be modified, or the proposed plans abandoned altogether.

- 2. Partnership:** The successful achievement of the blended business activity's non-core business outcomes can require industry, government, university and/or other partners with recognized expertise in the non-core business areas. It is preferable that such partners have the financial means to assist in the event of contingencies.
- 3. Focus:** Blended business activities must strike an appropriate balance between core and non-core business activities. Blended business activities must neither detract nor appear to detract (i.e., in the eyes of stakeholder communities) the university's focus on core business activities.
- 4. Oversight:** Strong oversight of each blended business activity ensures that the full range of risk management options are available, and that potential negative impacts are mitigated in a timely manner. Formal governance structures enable the expertise and wisdom of partners to contribute to strategic direction and ongoing risk management.
- 5. Tracking:** Regular tracking of the blended business activity's core and non-core business metrics ensures that unforeseen pressures are identified in a timely manner. When performance tracking triggers risk thresholds, corrective measures must rapidly be implemented.

5.3.3 Risk Management of the Blended Business Portfolio

Level 3

Level 3 risk management views the university's collection of blended business activities as an investment portfolio. A simple means of implementing this is to identify a yearly target for the expected return on investment of: a) each individual blended business activity's core and non-core related operations, and b) the entire blended business portfolio (i.e., accounting for the probability of not achieving individual targets within the designated time frame). The overall objective is to meet or exceed individual and portfolio targets of return on investment on a yearly basis.

5.4 Summary

Blended business activities are especially complex as they bring together core and non-core business resources to achieve core and non-core business outcomes which synergistically impact core business activities over time. As in the case of core and non-core risk management, a three-level risk management framework is presented for maximizing the probability of success, and for mitigating the risks of unsuccessful blended business activities on university operations. The next chapter addresses the issue of suitable metrics for tracking university outcomes.

6. Tracking University Outcomes

The previous chapters describe core, non-core and blended business activities and outcomes. The present chapter proposes metrics for measuring the six university business outcomes so that the university's performance is effectively tracked, risks mitigated, and goals achieved. Metrics normalized in terms of core business outcomes are especially helpful: core business outcomes serve to contextualize data, and the resulting metrics lend themselves to comparison independent of the university. As before, numerical references in the text such as [1] refer to box "1" in Figure 2-6.

6.1 Student Recruitment

Student recruitment [1] is unique in that it is both an input and outcome of core business activities. Student recruitment can be measured directly from applicant and registration data found within the university's student information systems. The following metrics are suitable for tracking student recruitment:

- number of first-year applicants (undergraduate, graduate, overall; per program; per year; percent change);
- number of first-year full-time equivalent (FTE) students (undergraduate, graduate, overall; per program; per year; percent change); and
- total number of all FTE students (undergraduate, graduate, overall; per program; per year; percent change).

Useful normalized metrics include:

- ratio of first-year FTE students (undergraduate, graduate, overall) to number of first-year applicants (per year, percent change); and
- ratio of (undergraduate, graduate, overall) recruitment costs to the number of first-year FTE (undergraduate, graduate, overall) students (per year; percent change).

The first normalized metric measures the strength of the university's brand: over time, the lower the ratio, the stronger the brand. The second is an indication of the financial efficiency of the university's recruitment efforts and can be used to track such efficiencies over time.

6.2 Highly Qualified Personnel

The core business outcome of highly qualified personnel [5] can be measured directly from data found within the university's student information systems. The following metric measures the outcome of highly qualified personnel [5]:

- total number of graduates (per program; overall; per year; percent change).

Useful normalized metrics include:

- ratio of (bachelor, master, doctoral, all) university revenue to the number of (bachelor, master, doctoral, all) graduates (per year; percent change);
- ratio of (bachelor, master, doctoral, all) graduates to the number of faculty members (per year; percent change);
- ratio of number of (bachelor, master, doctoral) graduates who graduate in the expected number of years (i.e., 4 for honours bachelor, 2 for master, 3 for doctoral) to the total number of (bachelor, master, doctoral) graduates (per year; percent change);
- ratio of the number of (combined master and doctoral) graduates to research grant (equipment, operating, combined) revenue (per year; percent change);
- ratio of the number of (bachelor, master, doctoral, all) graduates hired in "A" months following graduation to the number of (bachelor, master, doctoral, all) graduates; and
- ratio of the number of bachelor program graduates pursuing graduate studies to all bachelor program graduates (per year; percent change).

These normalized metrics measure different types of efficiencies. The first is a core business efficiency metric which provides an indication of the average cost per type of graduate, or of all graduates. The second also measures efficiency, this time in terms of the number of graduates per faculty member. The third provides evidence of the efficiency of the university's learning and

retention strategies over the expected period of university studies. The fourth measures the efficiency of translating research grant funding into graduates when tracked over time. The fifth focuses on measuring the satisfaction of key stakeholders, the university's hiring community, with respect to the key outcome of graduating highly qualified personnel (reasonable numbers for "A" can range from 6 to 24 months). The sixth indicates how many graduates are pursuing graduate studies, and provides insight on the proportion of graduates aiming to join the work force.

6.3 Reputation

The core business outcome of reputation [7] can be measured either directly or indirectly. In Figure 2-6, reputation is seen to be a direct consequence of industry, government and/or society's [6] views on the university's outcomes, and its impact on the evolution of society [15]. Reputation is therefore measured directly by undertaking surveys of appropriately sized populations in industry, government and/or society, quantifying media mentions (including media tone) in targeted publications, or measuring online engagement.

Reputation can also be measured indirectly by quantifying trends in outcomes and activities immediately downstream of reputation in Figure 2-6, and impacted by it as a result. These are: student recruitment [1], service agreements [20], and research partnerships [19]. Helpful indirect metrics for tracking trends in reputation over time from the university's own information systems are as follows:

- number of first choice applicants to the university (per year; percent change);
- number of first, second, and third choice applicants to the university (per year; percent change);
- number, or dollar value, of service agreements (per year; percent change);
- number, or dollar value, of research partnerships (per year; percent change); and
- number, or dollar value, of research chairs (per year; percent change).

The first two metrics indirectly measure changes to the university's reputation over time; for example, the greater the increase in first choice applicants, the stronger the reputation. The last three metrics track the university's growing

reputation through its offering of successful research partnerships and services to industry, government and/or society.

Useful normalized metrics are as follows:

- ratio of number of first choice applicants to the number of graduates (per year; percent change); and
- ratio of number of first, second, and third choice applicants to the number of graduates (per year; percent change).

These two normalized metrics act as a barometer of the university's evolving reputation by focusing on its ability to attract new applicants in terms of its primary outcome, highly qualified personnel (i.e., graduates): over time, the greater the number of applicants per graduate, the better the reputation.

Other useful normalized metrics include:

- ratio of number, or dollar value, of research service agreements to FTE faculty members (per year; percent change);
- ratio of number, or dollar value, of research partnerships to FTE faculty members (per year; percent change); and
- ratio of number, or dollar value, of research chairs to FTE faculty members (per year; percent change).

The growth of the above normalized metrics, particularly in terms of percent change, also indirectly measures the university's increasing reputation. It should be noted that the process of translating applicants, service agreements, research partnerships or research chairs into reputation-related outcomes takes time: this underscores the fact that Figure 2-6 is a dynamic system characterized by time lags between cause and effect relationships.

6.4 Intellectual Property

Intellectual property [8], the outcome of either knowledge creation or artistic creation, can be measured directly or indirectly. Direct measurement is possible in cases where the university possesses effective information systems for encouraging and supporting the disclosure of IP.

IP can also be measured indirectly by quantifying trends in outcomes or activities immediately downstream of it in Figure 2-6. These include: a) scholarly activity and production [10] and b) innovation outcomes (through IP licensing, spin-offs and sale) [16, 17]. Often, universities are ill-equipped for tracking the scholarly activity of its faculty members, staff and students, and the compilation of such data represents a significant effort. However, equipment and operating grants [12] resulting from successful scholarly activity are normally well-documented within university information systems, and can easily be accessed. Such grants are the result of past successful scholarly activity, and are indicative of the university's future IP-generating potential. Metrics for quantifying the successful creation of intellectual property include:

- number of journal articles, conference papers, or both (by faculty members, students, overall; per year; percent change);
- number of books (by faculty members, students, overall; per year; percent change);
- number of compositions (e.g., art, ballet, dance, music, poetry, opera, sculpture, theatre, works of fiction, etc.) (by faculty members, students, overall; per year; percent change);
- number of original performances (e.g., ballet, dance, music, poetry, opera, readings, theatre, etc.) live or recorded (by faculty members, students, overall; per year; percent change);
- number of leadership performances (i.e., conducting, directing), live or recorded (by faculty members, students, overall; per year; percent change);
- number of performances (e.g., ballet, dance, music, poetry, opera, readings, theatre, etc.) live or recorded by third parties of compositions created by faculty members and/or students (per year; percent change);
- number of juried art shows (by faculty members, students, overall; per year; percent change);
- number of archival projects (by faculty members, students, overall; per year; percent change);
- number of invention disclosures (by faculty members, students, overall; per year; percent change);
- number of patents (by faculty members, students, overall; per year; percent change);
- number, dollar value of grants (equipment, operating, overall; per year; percent change);

- number of licenses, dollar value of university licensing revenue (per year; percent change);
- number of spin-offs, dollar value of university spin-off revenue (per year; percent change);
- number of IP sales, dollar value of university IP sales (per year; percent change); and
- dollar value of all university innovation revenue (per year; percent change).

Useful normalized metrics are as follows:

- ratio of grant revenue (equipment, operating) to the number of (combined master and doctoral) graduates (per year; percent change); and
ratio of scholarly contributions to the number of (combined master and doctoral) graduates (per year; percent change).

The above two ratios measure performance in relation to scholarly activity: the first measures research grant funding generated per graduate; the second measures the quantity of IP (e.g., scholarly contributions such as publications, disclosures, patents, etc.) generated per graduate. The latter ratio has the added merit of combining two core business outcomes into a single normalized performance metric. Other useful normalized metrics include:

- ratio of journal articles to FTE faculty members (per year; percent change);
- ratio of conference articles to FTE faculty members (per year; percent change);
- ratio of books to FTE faculty members (per year; percent change);
- ratio of compositions (e.g., art, ballet, dance, music, poetry, opera, works of fiction, sculpture, theatre, etc.) to FTE faculty members (per year; percent change);
- ratio of live or recorded original performances (e.g., ballet, dance, music, poetry, opera, readings, theatre, etc.) to FTE faculty members (per year; percent change);
- ratio of live or recorded leadership performances (e.g., conducting, directing, etc.) to FTE faculty members (per year; percent change);
- ratio of performances (e.g., ballet, dance, music, poetry, opera, readings, theatre, etc.), live or recorded by third parties of compositions created

by faculty members and/or students, to FTE faculty members (per year; percent change);

- ratio of juried art shows to FTE faculty members (per year; percent change);
- ratio of archival projects to FTE faculty members (per year; percent change);
- ratio of invention disclosures to research grant revenue (per year; percent change);
- ratio of patents to research grant revenue (per year; percent change); and
- ratio of grant revenue (equipment, operating) to FTE faculty members (per year; percent change).

These normalized metrics contribute to measuring the intensity with which IP is generated. Metrics normalized with respect to faculty members recognize the central role of faculty members in the production of scholarly outcomes, even though graduate students are significant contributors. As mentioned before, Figure 2-6 models a dynamic system where cause and effect relationships are inherently characterized by relationship-specific time lags (e.g., the time between a faculty member's successful grant and the subsequent creation of IP). When tracking metrics related to the creation of intellectual property over time, due consideration should be given to such time-dependent causal relationships.

6.5 Evolution of Industry and the Economy

In Figure 2-6, the evolution of industry and the economy [14] is seen to be directly impacted by IP licensing, spin-offs, and sale [16, 17], and research infrastructure grants [13]. The university's contributions to the evolution of industry and the economy can therefore be directly quantified by the following metrics:

- business revenue, investments, or number of jobs resulting from university licenses (per year; percent change);
- business revenue, investments, or number of jobs resulting from university spin-offs (including those related to artistic creation) (per year; percent change);
- business revenue, investments, or number of jobs resulting from university IP (including IP related to artistic creation) sold to third parties (per year; percent change);

- business revenue, investments, or number of jobs, resulting from the purchase of research infrastructure (per year; percent change);
- number, or dollar value, of commissioned works of artistic creation (e.g., art, ballet, dance, music, poetry, opera, sculpture, theatre, works of fiction, etc.) (per year; percent change);
- number, or dollar value, of research service agreements (per year; percent change);
- number, or dollar value, of research partnerships (per year; percent change); and
- number, or dollar value, of research chairs (per year; percent change).

Useful normalized metrics are as follows:

- ratio of the number of spin-off businesses created to the number of graduates (per year; percent change);
- ratio of the number of spin-off businesses created (including those related to artistic creation) to the number of inventions (per year; percent change);
- ratio of business revenue, investments, or number of jobs, resulting from university IP licensing, spin-offs and sales to the number of graduates (per year; percent change);
- ratio of business revenue, investments, or number of jobs, resulting from university IP licensing, spin-offs and sales to the number of inventions (per year; percent change);
- ratio of innovation revenue (from university IP licensing, spin-offs, and sales) to the number of graduates (per year; percent change);
- ratio of innovation revenue (from university IP licensing, spin-offs, and sales) to the number of inventions (per year; percent change);
- ratio of number, or dollar value, of commissioned works of artistic creation (i.e., art, ballet, dance, music, poetry, opera, sculpture, theatre, works of fiction, etc.) to FTE faculty members (per year; percent change);
- ratio of the number, or dollar value, of research service agreements to FTE faculty members (per year; percent change);
- ratio of the number, or dollar value, of research partnerships to FTE faculty members (per year; percent change); and
- ratio of the number, or dollar value, of research chairs (to FTE faculty members per year; percent change).

The first six ratios contribute to measuring the intensity of innovation at the university in terms of its core business outcomes of either highly qualified personnel [5] or intellectual property [8]. The first and second ratios measure the impact of research activities on the creation of spin-off businesses. The third and fourth ratios measure the impact of the university's innovation activities on society. The fifth and sixth ratios measure the impact of such activity on the university's own innovation revenue. The last four ratios measure the university's direct contribution to industry, government or society through commissioned works of artistic creation, research service agreements, research partnerships or research chairs.

Other useful normalized metrics include:

- ratio of number of spin-off businesses (including those related to artistic creation) created to research grant dollars (overall; per year; percent change);
- ratio of business revenue, investments or number of jobs, resulting from university IP licensing, spin-offs and sales to research grant dollars (overall; per year; percent change);
- ratio of the dollar value of all research service agreements, partnerships and chairs to FTE faculty members (per year; percent change); and
- ratio of all innovation revenue (from university IP licensing, spin-offs, and sales) to research grant revenue (overall; per year; percent change).

The last ratio is of particular interest. It provides insight on the university's financial return on investment arising from the government's investment in research. This is an indicator of both the commercial quality of the research outcomes and of the quality of innovation processes of the university. As mentioned before, Figure 2-6 models a dynamic system where cause and effect relationships are inherently characterized by relationship-specific time lags. When tracking metrics related to the evolution of industry and the economy over time, due consideration should be given to such time-dependent causal relationships.

6.6 Evolution of Society

The university's contributions to the evolution of society [15] through new knowledge, artistic creation, science and technology – in many ways, our quality of life – can be measured either directly or indirectly. Based on Figure 2-6, two upstream activities directly impact this outcome: scholarly activity and production [10] and successful innovation outcomes [17]. The first, scholarly activity and production [10], involves metrics already proposed for indirectly quantifying the university's production of IP. The second, innovation outcomes, involves quantifying the impact of products arising from the university's IP licensing, spin-off and sales [16, 17] activities, and metrics already proposed for determining the evolution of industry and the economy [14] apply here.

Indirect measurements involve quantifying the impact of downstream outcomes or activities. Referring to Figure 2-6, the evolution of society is seen to impact reputation [7]. The university's contributions to either can therefore be measured by a) targeted surveys of appropriate populations, b) regular tracking of media mentions (including media tone) in targeted publications and online media, or c) the frequency with which the university's authors are asked to present their findings, perform or present their works, or are cited in scholarly, artistic, popular or specialized literature, providing evidence of their growing influence. In this regard, the following are useful metrics:

- number of times university personnel are cited (i.e., citations) in the publication record (e.g., scholarly publications, artistic publications including critiques of artistic compositions and performances, trade publications, popular publications, etc.) (per year; percent change).
- number of public presentations made by faculty members and/or students (per year; percent change);
- number of commissioned works of artistic creation (e.g., art, ballet, dance, music, poetry, opera, sculpture, theatre, works of fiction, etc.) (per year; percent change);
- number of performances (e.g., ballet, dance, music, poetry, opera, readings, theatre, etc.) live or recorded by faculty members and/or students (per year; percent change);
- number of leadership performances (i.e., conducting, directing) live or recorded by faculty members and/or students (per year; percent change);
- number of performances (e.g., ballet, dance, music, poetry, opera,

readings, theatre, etc.) live or recorded by third parties of compositions created by faculty members and/or students (per year; percent change);

- number of juried art shows by faculty members and/or students (per year; percent change); and
- number of archival projects by faculty members and/or students (per year; percent change).

Useful normalized metrics include:

- ratio of number of citations to FTE faculty members (overall; per year; percent change);
- ratio of number of citations to grant dollars (overall; per year; percent change);
- ratio of number of citations to the number of scholarly contributions (per year; percent change);
- ratio of public presentations made by faculty members and/or students to FTE faculty members (per year; percent change);
- ratio of commissioned works of artistic creation (i.e., art, ballet, dance, music, poetry, opera, sculpture, theatre, works of fiction, etc.) to FTE faculty members (per year; percent change);
- ratio of performances (e.g., ballet, dance, music, poetry, opera, readings, theatre, etc.), live or recorded by faculty members and/or students, to FTE faculty members (per year; percent change);
- ratio of leadership performances (i.e., conducting, directing), live or recorded by faculty members and/or students, to FTE faculty members (per year; percent change);
- ratio of performances (e.g., art, ballet, dance, sculpture, music, poetry, opera, readings, theatre, etc.), live or recorded by third parties of compositions created by faculty members and/or students, to FTE faculty members (per year; percent change);
- ratio of juried art shows by faculty members and/or students to FTE faculty members (per year; percent change); and
- ratio of archival projects by faculty members and/or students to FTE faculty members (per year; percent change).

The first normalized metric is a measure of the impact of the university's research outcomes per faculty member. The second measures the impact of these outcomes with respect to the value of successful research grants. The

third expresses these same outcomes in terms of another core business outcome, that of intellectual property as expressed in terms of scholarly contributions. The other normalized metrics quantify presentations or different forms of artistic creation on a per faculty member basis. Here again, Figure 2-6 models a dynamic system where cause and effect relationships are characterized by relationship-specific time lags. Due consideration should be given to such time-dependent causal relationships.

6.7 Financial Efficiency

Beyond the normal due diligence of establishing the university's financial position in terms of generally accepted accounting principles, there is significant merit in tracking the financial efficiency of university operations with respect to the primary outcome of highly qualified personnel. To this end, the following normalized metrics are of interest:

- ratio of core business operations costs to number of graduates (per year; percent change);
- ratio of cost-based non-core business activity costs to number of graduates (per year; percent change);
- ratio of cost-recovery non-core business activity net revenues to number of graduates (per year; percent change);
- ratio of advancement costs to number of graduates (per year; percent change);
- ratio of advocacy costs to number of graduates (per year; percent change);
- ratio of alumni relations costs to number of graduates (per year; percent change);
- ratio of research grant support services costs to number of graduates (per year; percent change);
- ratio of research contract and IP transfer services costs to number of graduates (per year; percent change);
- ratio of long-term growth non-core business activity costs to number of graduates (per year; percent change);
- ratio of all non-core business activity costs to number of graduates (per year; percent change); and
- ratio of the cost of overall university operations to number of graduates (per year; percent change).

Finally, intellectual property being a core business outcome, there is significant merit in tracking the following metrics:

- ratio of core business operations costs to the total IP generated (per year; percent change);
- ratio of the cost of overall university operations to the total IP generated (per year; percent change); and
- ratio of all innovation revenue (from university IP licensing, spin-offs, and sales) to research grant revenue (overall; per year; percent change).

6.8 Summary

In this chapter, metrics are identified for tracking the six university business outcomes. A few normalized metrics are also suggested for tracking financial efficiency.

The closed-loop business model of Figure 2-6 is found to be helpful in identifying both direct and indirect metrics for measuring outcomes. Direct metrics arise from activities or outcomes immediately upstream of the outcome of interest, while indirect metrics result from activities or outcomes that are downstream. Indirect metrics are especially helpful for quantifying trends in the case of outcomes that are difficult to measure directly, such as reputation and the evolution of society.

Normalized metrics, especially those expressed in terms of such core business outcomes as highly qualified personnel or intellectual property, provide insight into the efficiency with which the university delivers its other outcomes and ensures the stewardship of its financial resources. Normalized metrics also facilitate comparisons of the university's performance over time despite variations in student population, and of different universities despite differences in size. The tracking metrics identified in this chapter are summarized in Tables 6-1 and 6-2.

Table 6-1. Tracking Metrics Summary: Outcomes

Outcome	Suggested Metrics	Normalized Metrics
Student Recruitment	• Number of first-year applicants (undergraduate, graduate, overall; per program; per year; percent change) • Number of first-year FTE students (undergraduate, graduate, overall; per program; per year; percent change) • Total number of all FTE students (undergraduate, graduate, overall; per program; per year; percent change)	• Ratio of first-year FTE students (undergraduate, graduate, overall) to the number of first-year applicants (per year; percent change) • Ratio of recruitment costs (undergraduate, graduate, overall) to the number of first-year FTE (undergraduate, graduate, overall) students (per year; percent change)
Highly Qualified Personnel	• Total number of graduates (per program; overall; per year; percent change)	• Ratio of (bachelor, master, doctoral, all) university revenue to the number of (bachelor, master, doctoral, all) graduates (per year; percent change) • Ratio of (bachelor, master, doctoral, all) graduates to the number of faculty members (per year; percent change) • Ratio of number of (bachelor, master, doctoral) graduates who graduate in the expected number of years to the total number of (bachelor, master, doctoral) graduates (per year; percent change) • Ratio of the number of (combined master and doctoral) graduates to research grant (equipment, operating, combined) revenue (per year; percent change) • Ratio of number of (bachelor, master, doctoral, all) graduates hired in A months following graduation to the number of (bachelor, master, doctoral, overall) graduates • Ratio of the number of undergraduate program graduates pursuing graduate studies to all undergraduate program graduates (per year; percent change)
Reputation	• Number of first choice applicants (per year; percent change) • Number of first, second, and third choice applicants (per year; percent change) • Number, or dollar value, of service agreements (per year; percent change) • Number, or dollar value, of research partnerships (per year; percent change) • Number, or dollar value, of research chairs (per year; percent change)	• Ratio of number of first choice applicants to the number of graduates (per year; percent change) • Ratio of number of first, second, and third choice applicants to the number of graduates (per year; percent change) • Ratio of number, or dollar value, of research service agreements to FTE faculty members (per year; percent change) • Ratio of number, or dollar value, of research partnerships to FTE faculty members (per year; percent change) • Ratio of number, or dollar value, of research chairs to FTE faculty members (per year; percent change)

(continued...)

Table 6-1. Tracking Metrics Summary: Outcomes (cont'd)

Outcome	Suggested Metrics	Normalized Metrics
Intellectual Property	• Number of journal articles, conference papers or both (by faculty members, students, overall; per year; percent change) • Number of books (by faculty members, students, overall; per year; percent change) • Number of compositions (by faculty members, students, overall; per year; percent change) • Number of original performances live or recorded (by faculty members, students, overall; per year; percent change) • Number of leadership performances, live or recorded (by faculty members, students, overall; per year; percent change) • Number of performances live or recorded by third parties of compositions created by faculty members and/or students (per year; percent change) • Number of juried art shows (by faculty members, students, overall; per year; percent change) • Number of archival projects (by faculty members, students, overall; per year; percent change) • Number of invention disclosures (by faculty members, students, overall; per year; percent change) • Number of patents (by faculty members, students, overall; per year; percent change) • Number, dollar value of grants (equipment, operating, overall; per year; percent change) • Number of licenses, dollar value of university licensing revenue (per year; percent change) • Number of spin-offs, dollar value of university spin-off revenue (per year; percent change) • Number of IP sales, dollar value of university IP sales (per year; percent change) • Dollar value of all university innovation revenue (per year; percent change)	• Ratio of grant revenue (equipment, operating) to the number of (combined master and doctoral) graduates (per year; percent change) • Ratio of scholarly contributions to the number of (combined master and doctoral) graduates (per year; percent change) • Ratio of journal articles to FTE faculty members (per year; percent change) • Ratio of conference articles to FTE faculty members (per year; percent change) • Ratio of books to FTE faculty members (per year; percent change) • Ratio of compositions to FTE faculty members (per year; percent change) • Ratio of live or recorded original performances to FTE faculty members (per year; percent change) • Ratio of live or recorded leadership performances to FTE faculty members (per year; percent change) • Ratio of live or recorded performances by third parties of compositions created by faculty members and/or students to FTE faculty members (per year; percent change) • Ratio of juried art shows to FTE faculty members (per year; percent change) • Ratio of archival projects to FTE faculty members (per year; percent change) • Ratio of invention disclosures to research grant revenue (per year; percent change) • Ratio of patents to research grant revenue (per year; percent change) • Ratio of grant revenue (equipment, operating) to FTE faculty members (per year; percent change)

(continued...)

Table 6-1. Tracking Metrics Summary: Outcomes (cont'd)

Outcome	Suggested Metrics	Normalized Metrics
Evolution of Industry and the Economy	• Business revenue, investments, or number of jobs, resulting from university licenses (per year; percent change) • Business revenue, investments, or number of jobs, resulting from university spin-offs (including those related to artistic creation) (per year; percent change) • Business revenue, investments, or number of jobs, resulting from university IP (including IP related to artistic creation) sold to third parties (per year; percent change) • Business revenue, investments, or number of jobs, resulting from the purchase of research infrastructure (per year; percent change) • Number, or dollar value, of commissioned works of artistic creation (per year; percent change) • Number, or dollar value, of research service agreements (per year; percent change) • Number, or dollar value, of research partnerships (per year; percent change) • Number, or dollar value, of research chairs (per year; percent change)	• Ratio of the number of spin-off businesses created to the number of graduates (per year; percent change) • Ratio of the number of spin-off businesses (including those related to artistic creation) created to the number of inventions (per year; percent change) • Ratio of business revenue, investments, or number of jobs, resulting from university IP licensing, spin-offs and sales to the number of graduates (per year; percent change) • Ratio of business revenue, investments, or number of jobs, resulting from university IP licensing, spin-offs and sales to the number of inventions (per year; percent change) • Ratio of innovation revenue (from university IP licensing, spin-offs, sales) to the number of graduates (per year; percent change) • Ratio of innovation revenue (from university IP licensing, spin-offs, sales) to the number of inventions (per year; percent change) • Ratio of number, or dollar value, of commissioned works of artistic creation to FTE faculty members (per year; percent change) • Ratio of number, or dollar value, of research service agreements to FTE faculty members (per year; percent change) • Ratio of number, or dollar value, of research partnerships to FTE faculty members (per year; percent change) • Ratio of number, or dollar value, of research chairs to FTE faculty members (per year; percent change) • Ratio of number of spin-off businesses created to research grant dollars (overall; per year; percent change) • Ratio of business revenue, investments, or number of jobs, resulting from university IP licensing, spin-offs and sales to research grant dollars (overall; per year; percent change) • Ratio of dollar value of all research service agreements, partnerships and chairs to FTE faculty members (per year; percent change) • Ratio of all innovation revenue (IP licensing, spin-offs, sales) to research grant revenue (overall; per year; percent change)

(continued...)

Table 6-1. Tracking Metrics Summary: Outcomes (cont'd)

Outcome	Suggested Metrics	Normalized Metrics
Evolution of Society	• Number of times university personnel are cited in the publication record (per year; percent change) • Number of public presentations made by faculty members and/or students (per year; percent change) • Number of commissioned works of artistic creation (per year; percent change) • Number of performances live or recorded by faculty members and/or students (per year; percent change) • Number of leadership performances live or recorded by faculty members and/or students (per year; percent change) • Number of performances live or recorded by third parties of compositions created by faculty members and/or students (per year; percent change) • Number of juried art shows by faculty members and/or students (per year; percent change) • Number of archival projects by faculty members and/or students (per year; percent change)	• Ratio of number of citations to FTE faculty members (overall; per year; percent change) • Ratio of number of citations to grant dollars (overall; per year; percent change) • Ratio of number of citations to the number of scholarly contributions (per year; percent change) • Ratio of public presentations made by faculty members and/or students to FTE faculty members (per year; percent change) • Ratio of commissioned works of artistic creation to FTE faculty members (per year; percent change) • Ratio of performances, live or recorded by faculty members and/or students, to FTE faculty members (per year; percent change) • Ratio of leadership performances, live or recorded by faculty members and/or students, to FTE faculty members (per year; percent change) • Ratio of performances, live or recorded by third parties of compositions created by faculty members and/or students, to FTE faculty members (per year; percent change) • Ratio of juried art shows by faculty members and/or students to FTE faculty members (per year; percent change) • Ratio of archival projects by faculty members and/or students to FTE faculty members (per year; percent change)

Table 6-2. Normalized Metrics for Tracking Financial Efficiency

Tracking Element	Suggested Metrics	Normalized Metrics
Financial Efficiency		• Ratio of core business operations costs to number of graduates (per year; percent change) • Ratio of cost-based non-core business activity costs to number of graduates (per year; percent change) • Ratio of cost-recovery non-core business activity net revenues to number of graduates (per year; percent change) • Ratio of advancement costs to number of graduates (per year; percent change) • Ratio of advocacy costs to number of graduates (per year; percent change) • Ratio of alumni relations costs to number of graduates (per year; percent change) • Ratio of research grant support services costs to number of graduates (per year; percent change) • Ratio of research contract and IP transfer services costs to number of graduates (per year; percent change) • Ratio of long-term growth non-core business activity costs to number of graduates (per year; percent change) • Ratio of all non-core business activity costs to number of graduates (per year; percent change) • Ratio of the cost of overall university operations to number of graduates (per year; percent change) • Ratio of core business operations costs to the total IP generated (per year; percent change) • Ratio of the cost of overall university operations to the total IP generated (per year; percent change) • Ratio of all innovation revenue (IP licensing, spin-offs, sales) to research grant revenue (overall; per year; percent change)

7. Conclusion

This Primer views the university as a business system with inputs and outcomes. A closed-loop model of the university business environment, illustrated in Figure 2-6, characterized by cause-and-effect relationships between inputs and outcomes, is seen to account for its observed complexity. The model differentiates core business activities from non-core and blended activities, and provides a common language for promoting exchange and substantive dialogue among university stakeholders, both internal and external. The classification of the university's business environment in terms of core, non-core and blended business activities is of particular relevance to risk management as it supports the identification of the appropriate business approach for any given activity. In this regard, the book's primary message is a simple one: every dollar taken out of core business operations to finance non-core or blended activities adds risk to the university's ability to achieve its core business outcomes. This doesn't mean that non-core or blended business activities should be avoided; as we have seen, many of these activities strengthen core business operations. However, a successful sustainability strategy will emphasize business models for non-core and blended activities which minimize – and preferably eliminate – their financial dependence on core business revenues.

Of course, metrics are central to achieving targeted business outcomes, and managing risk. Metrics normalized in terms of the core business outcomes of Figure 2-6 are found to be especially helpful in contextualizing data: they provide insight on the university's true performance over time, and enable meaningful comparisons of different institutions. Figure 2-6 is also helpful in identifying metrics for quantifying trends of outcomes that are difficult to measure directly, such as reputation. The establishment of metrics, however, leads to the contentious issue of quality in university management. It rapidly becomes apparent that the model of Figure 2-6, along with the metrics identified in this book, represent a rigorous framework for measuring, understanding and comparing the university's quality in terms of achieving core and non-core business outcomes.

By implementing the framework proposed here, the university will be in a better position to track core and non-core outcomes, and improve their quality and quantity. It will reduce business risks, avoid mission creep, facilitate accountability to its academic and corporate governance boards, government, and other stakeholders, and strengthen financial sustainability. It will also be able to compare its performance to its peers, identify possible avenues of improvement, and make decisions based on facts. Such comparisons will also help inform government policy, where advocacy often fills the void of inadequate frameworks for comparing quality.

In the corporate world, the concepts of business models, core business focus, performance metrics and risk management are widely accepted. For universities to strengthen their quality, accountability and sustainability, they too must embrace these concepts. In the end, let us be inspired by Walter Gordon, who once said that “Neither governments nor individuals should ever be satisfied with conditions as they are” [Newman, 2010]. If he were alive today, no doubt he would include universities.

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The Canadian University Business Primer

The second edition of the Canadian University Business Primer is the culmination of the author's 25-years of university experience as a doctoral student, term instructor, professor, department chair, dean, provost and vice-president academic, and vice-president research in five Canadian Universities across three provinces. By exploring a unique perspective on the business of university education, this second edition, with a fresh, reader-friendly format, provides insight on the complex relationships which characterize university activities and outcomes. As with the first edition, the Primer offers a way forward for universities to develop innovative and creative strategies for achieving their goals of quality, accountability and sustainability, while remaining respectful of existing university governance models.

The second edition of The Canadian University Primer is a "must read" for anyone who would like to see Canadian universities governed in a way that strengthens their quality, sustainability and accountability. Based on his vast experience in university administration, Dr. Marceau presents innovative models that allow universities to meet their core business outcomes and satisfy the often conflicting requirements of varied stakeholder groups.

Keith W. Hipel

University Professor of Systems Design Engineering, University of Waterloo

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Many of our organizations are caught in the tension between a values-based approach to the services provided, and a metrics-based approach to the outcomes. As the head of a national non-profit, I can attest that you need both. Richard Marceau's primer eloquently argues for embedding metrics in universities. Doing so will strengthen our academic institutions at a time of tight budgets, demands for greater transparency, and the need to demonstrate high levels of performance.

Peter Robinson

Chief Executive Officer, David Suzuki Foundation

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