BTM FORUM

BTM Accreditation

Baccalaureate Programs
Version 2.0




baccalaureate

BTM™
Business Technology Management
BACCALAUREATE

Acknowledgements

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DIF is a non-profit organization incorporated in Québec, Canada, dedicated to developing the digital innovation profession, education, and research communities.

BTM Forum is a division of DIF responsible to promote the brand globally, especially by promoting program accreditations, professional certifications, community events, and academic research.

BTM Global Council (BTMGC) is the governing committee of BTM Forum composed of representatives from national organizations responsible for BTM accreditations in their respective countries.

BTM Accreditation Councils (BTMAC) are present in each country, each composed of an elected group of faculty and industry leaders helping to evaluate post-secondary educational programs.

Many people contribute to the development and application of BTM accreditation standards. Volunteers are critical to the work of the Accreditation Councils in each country. We could not operate without them. We are grateful for their dedication and for the support they receive from their employers.

This document summarizes version 2.0 of the BTM Standard adopted by BTM Forum on 2016-02-17.

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1.0 Purpose of Accreditation

The purpose of accreditation is to support the continuous improvement of qualify of BTM education. The process of accreditation emphasizes the quality of the students, the academic and support staff, the curriculum and the educational facilities.

Industry expects competence in Business+Technology+Management areas. Thus accredited programs must contain not only adequate technology content but must also develop communication skills, and understanding of the environment, cultural, economic, and social impacts of the program on society, the concepts of sustainable development, and the capacity for life-long learning.

The criteria for accreditation are intended to provide a broad basis for identifying acceptable programs, to provide sufficient freedom to accommodate innovation in education, to allow adaptation to different regional factors, and to permit the expression of the institution's individual qualities, ideals, and educational objectives. They are intended to support the continuous improvement of the quality of BTM education.

2.0 The role of the BTM Accreditation Council

The Business Technology Management Accreditation Council (BTMAC) is a new initiative and elements of the accreditation criteria will evolve over the next few years as a result of the accreditation exercises and related consultation. In particular, the aspects related to practical experiences and industry involvement are start-up activities for a number of institutions, and the need for flexibility in the early implementation of the BMT is recognized.

The BTMAC is an autonomous body and was established to accredit Canadian BTM programs that meet or exceed educational standards set by the BTMAC.

The Council has as its objectives:

1. To formulate and maintain high educational standards for Canadian educational institutions offering BTM programs, and to assist those institutions in planning and carrying out educational programs.

2. To promote and advance all phases of Business Technology Management (BTM) education with the aim of promoting public welfare through the development of better business technology professionals.

3. To foster a cooperative approach to BTM education among students, employers, and educators to meet the changing needs of these and other stakeholders.

The purpose of accreditation is to recognize programs whose graduates will have received an outstanding education in Business Technology Management – an education informed by state of the art knowledge and research, and the needs and applications of industry. These accreditation criteria incorporate principles of outcomes based accreditation.

3.0 Method of Evaluation

Programs submitted for accreditation will be evaluated on the basis of data submitted by the institution in the form of a self-study report and other supporting documentation, together with the report of an on-site visit by a team representing the Council.

The criteria are intended to specify minimum requirements. They allow for and encourage differentiation through innovative and specialized program content, distinctive pedagogy, and unique student experiences.

The self-study report should follow a structured outline and involves answering a series of questions and completion of tables. During the process of creating the report, the institution should demonstrate to itself and to the Council that it can meet the accreditation criteria or, if not, it should demonstrate that it is aware of the shortcomings and has a concrete plan to rectify them. In particular, the report should demonstrate how all aspects of the program, including students, faculty, resources and curriculum together enable the achievement of a set of defined program objectives. The self-study report will be used as primary input for the analysis of the program by the on-site visiting team.

The purpose of the site visit is three-fold:

First, the site visit should assess factors beyond those described in the questionnaire. The intellectual atmosphere, the morale of the faculty and the students, and the calibre of the staff, the students, and the work performed are examples of intangible qualitative factors that are difficult to document in a written statement.

Second, the visiting team should help the institution assess its weak as well as its strong points.

Third, the team should examine in further detail the material compiled by the institution and relating to:

1. Control and organization of the institution.

2. Education programs offered and degrees conferred.

3. The basis of and requirements for admission of students.

4. Number of students enrolled:

    a. in the college, faculty or division as a whole,

    b. in the individual educational programs.

5. Teaching staff and teaching loads.

6. Commitment to and support for research.

7. Resources:

a. financial: total budget, non-salary portion of budget and salary scales,

b. physical: classrooms, laboratories, equipment and offices,

c. support staff: administrative, clerical, laboratory, research and technical,

d. library.

8. Curricular content of the program.

9. Actual course selections, as reflected by a sample of anonymous transcripts.

10. Innovative and special features of the program.

4.0 Glossary

Learning Outcome

A learning outcome specifies what learners' new behaviours will be after a learning experience: the knowledge, skills, and aptitudes that the students will gain. A learning outcome begins with an action verb and describes something observable or measurable. (

Competency Standard

A competency standard is a description of the employers' requirements for a BTM graduate's level of competency for a learning outcome.

Defining competency standards for each learning outcome has the following objectives and benefits:

- Students need to reach minimum levels of competency to:
  - Be qualified for and benefit from co-op and other work experience during the program
  - Be hirable upon graduation into full time positions
- Employers clearly understand the minimum level of competency BTM graduates will have in each learning outcome
- Educators clearly understand the level of competency that must be achieved
- CCICT can fulfill its mandate of growing the market of and for appropriately skilled ICT workers.

Outcome

Something that is measurable that allows you to determine that an objective has been met.

Quality Indicator

Qualitative or quantitative data used to help assess whether an objective has been met.

Rubric

A document describing how an exam, assignment or other student activity should be evaluated. It specifically identifies the learning objectives that should be assessed.

5.0 Objectives and Learning Outcomes

5.1 General Criteria

Each program must have a set of learning outcomes, describing what students should know and be capable of doing following graduation.

Quality Indicators

In order that the BTMAC can accredit programs, they need to examine evidence that what students actually know and are capable of doing following graduation correspond with the defined program-level objectives. This is achieved by quality indicators. These are qualitative and quantitative data gathered by the institution.

The institution should gather quality indicators in each of the following areas: Faculty, Students, Curriculum and Resources. Suggestions for quality indicators are provided in each corresponding section. The self-study and accreditation process largely involves studying and verifying the quality indicators to ensure that the outcomes, in terms of education of students, correspond to the defined objectives.

Evidence should be provided that the department seeks to meet the defined objectives by regularly reviewing learning outcomes and the quality indicators, and then taking actions that should lead to continuous improvement.

Evidence That Learning Outcomes Have Been Met

Central to self-evaluation and accreditation is demonstrating that the Learning Outcomes have been met. Such evidence can include mappings from course-level objectives to BTM learning objectives, rubrics for assignments and tests indicating which learning outcomes are being assessed, and other quality indicators.

Learning objectives for each course should be presented. These objectives should be derived from the learning outcomes and should describe what students will have achieved by the end of each course. Each objective should be expressed as at least a sentence, with an active verb. Verbs implying deeper learning, such as ‘calculate’, ‘design’, ‘evaluate’, ‘apply’, ‘solve’, ‘create’, ‘build’, ‘determine’, ‘develop’, ‘assess’, ‘use’, ‘lead’ and ‘present’ are preferable to verbs implying more passive learning, such as ‘know’ and ‘understand’, although the latter would be appropriate for some types of knowledge.

Evidence should be presented that the objectives are actually applied in courses. Such evidence might include a written demonstration that elements such as course syllabi, textbooks, lecture notes, assignments and exams match the objectives. The use of rubrics for course activities is highly recommended. Rubrics describe what is to be expected of students in each course activity, and should indicate which learning objectives students would be demonstrating by successfully completing the activity.

Taken together, the objectives of the courses taken by each student, regardless of the path the student chooses, should satisfy the learning outcomes. To demonstrate this, the self-study report should contain a

table for each required course (or course group) describing how the course contributes to each learning outcome.

For a first accreditation it might be the case that learning objectives are developed for courses retrospectively. However, in subsequent accreditations it should be clear to the visiting team that the course level learning objectives are maintained and applied on an ongoing basis.

5.2 Specializations

BTM specialization degrees offer students with opportunities to focus on areas of growing significance in today's job market. Specialization programs combine the learning outcomes of the standard BTM with function specific skills, knowledge and competencies.

The learning outcomes and competency standards for following 5 specializations have been defined.

Baccalaureate Specialization in Digital Health

The demand for BTM health-related skills and competencies continue to increase across industries, hospitals and provincial health departments. The Health Sector BTM Learning Outcomes and Competency Standards have been defined to address specific domain and technical knowledge in the health related field. Expectations of BTM graduates in this area require knowledge and competencies of health related policies, health data analytics, health technology, and ethics. Graduates of this specialization are expected to perform responsibilities for roles such as: Health Enterprise Architecture, Solutions Architect and Developer, Business, Data and Systems Analysis; and, Solutions and Project Management.

Baccalaureate Specialization in Financial Services

Created to address the needs of organizations for BTM skills in the financial services area. The Core BTM Baccalaureate Learning Outcomes and Competency Standards have been adjusted to include financial services specific items. For instance, financial services graduates of the program should, in addition to their core BTM skills be able to exhibit knowledge and expertise in conducting finance related requirements analysis. Graduates of this specialization are expected to perform responsibilities for roles such as: Governance, Risk, and Compliance Management; Data Services; Enterprise architecture; and Quality Assurance.

Baccalaureate Specialization in Data Analytics

With the growth of analytics for business decision making, skills and competencies in data analytics are increasingly desired by industry. Graduates of this specialization are able to manipulate large data sets and produce information that informs businesses. BTM Data Analytics graduates assume roles such as data scientist, data analysts, enterprise data architects and business analysts. Detailed Competency Standards and Learning Outcome can be found in Part 2 Document.

Baccalaureate Specialization in Digital Security

This specialization permeates multiple sectors across multiple positions. Digital security graduates are expected to have sufficient skills to develop, deploy, and maintain security systems, identify security gaps, and provide support for a variety of security services and platforms. Graduates of this specialization assume roles such as security offices, security architect and analysts, and security testers and researchers.

Baccalaureate Specialization in Entrepreneurship and Innovation

This specialization is targeted to persons interested in intrapreneurship roles in existing industries and large corporations without restricting access to small business and start-up entrepreneurs. These people assume the responsibility of transforming existing business models, creating new and innovative ideas and models, developing and resourcing them. BTM Entrepreneurship and Innovation graduates are expected to perform responsibilities for roles such as: analysts for process improvements, product innovation, and strategy innovation.

The Business Technology Management Accreditation Council (BTMAC) defines the BTM in specific terms that describe learning outcomes and competency standards but does not prescribe curriculum, program flow or pedagogy. New and existing post-secondary institutions are therefore encouraged to define their own unique approach to teaching the outcomes and standards. Ultimately what counts is whether a program is producing the expected graduate outcomes that are aligned with the BTM and specialization learning outcomes and competency standards.

Here are just some illustrative examples how educational institutions could offer the specialization.

1. Electives: Schools can create the additional specialization courses and add these into their electives pool. Students who choose a particular elective course would have to take the other 4 to 5 courses required for the specialization. Upon graduation, they would qualify for BTM+ "specialization".

2. Minors: Similar to electives, minors are attainable if the student completes all the courses required for a minor within a specific BTM program by allowing the student to choose additional credit and courses on their own that they could add to their existing program. This is however unstructured, may not create the ideal program offering for schools. The assumption for both points 1 and 2 is that there is already room for electives in the program which would allow students to decide to specialize using their elective options as a route.

In the case that there are no available room for elective courses:

3. Mainstream specialization: Schools would have to find ways of mainstreaming the learning outcomes into existing BTM courses. In this way, no new course is created but existing courses are adjusted to include the learning outcomes for any particular specialization. For instance, a school could take its existing BTM program and rework the health specialization learning outcomes into existing courses and then brand the program as BTM Health Specialization. The advantage here is that the program duration is the same and the institution's program approval process may be minimal. Plus schools could decide to focus on the specialization in which there is the greatest need in their province/region.

4. Combine the learning outcomes from two or more existing courses to make room for 4 to 5 new specialization courses. Then introduce those specializations courses into the program. Market it to students as a BTM+ Specialization. Outcome will be similar to point 3; total credit remains unchanged, program duration remains unchanged.

5. Double major: The most tasking but probably preferred option is to introduce 5 to 6 new courses per specialization. Students will graduate after one year but would have a double major: BTM + Specialization

The specialization must be designed to provide a coherent education. In order to achieve this, it is suggested that:

A. The courses in the specialization may include courses supporting those disciplines, and the specialization may include courses from several related departments.

B. There be at least ten (10) courses in the specialization, with no single discipline having less than five (5) courses.

C. At least two (2) of the courses in each specialization should be advanced courses, defined as courses that would normally be taught in the latter two years of study and build upon the introductory and intermediate courses.

D. There must be a structure to the set of courses required in the specialization; in other words, allowing students to choose any random set of 10 courses is not appropriate, although allowing students to select from several groups of electives would be fine. Allowing students to select a custom program would also be fine provided this process is carefully guided by an advisor, such that the resulting program is coherent and meets the program objectives.

E. It is highly desirable, although not essential, for courses in the specialization to build upon Business Technology Management (BTM) courses, and vice versa. For example, a course in another discipline could involve BTM, and a course in BTM could present application programs related to the other discipline when illustrating concepts.

F. There must be an approval process in the institution for the sets of courses comprising the specialization, and there must be a process in place within the institution to regularly evaluate the curriculum in the Other Disciplines as well as the delivery of the courses.

6.0 Accreditation Criteria

6.1 Faculty

Faculty delivering the BTM curriculum are expected to have a high level of expertise and competence, and to be dedicated to the aims the BTM education.

A competent, qualified, and forward-looking faculty gives an overall scholarly and professionally responsible atmosphere to the operation. An excellent faculty will usually identify and overcome problems in other areas and continue to provide a program worthy of accreditation, but no degree of excellence in other areas can continually offset the handicap presented by poor faculty quality or inadequate numbers of faculty. Thus, the first consideration for a program to be acceptable for accreditation is the presence and future assurance of a continuing critical mass of quality faculty. Educational institutions seeking BTMAC accreditation of programs must have allocated the resources necessary to achieve a critical mass of quality faculty who are committed to professionalism, and must be committed to maintaining the allocations required for its continuation.

The proper size of the faculty depends on the enrolment and objectives of the program(s) being accredited, as well as factors that go beyond undergraduate education such as the amount of new knowledge produced by the faculty (e.g. articles, books, and trade publications), continuing education activities, and involvement in professional and technical societies.

The number of faculty members must be large enough to provide a broad range of experience and capability and to provide meaningful interaction among the faculty members so as to support these interests. The faculty should for the most part occupy permanent positions to ensure continuity and stability. Institutions with limited enrolment and resources are encouraged to select and emphasize a smaller number of quality programs rather than to compromise standards by initiating or trying to maintain programs with inadequate faculty support.

To function effectively as teachers, faculty members must devote a significant amount of their time to seeking new understanding through research and scholarship, interaction with working professionals, instructional innovation, consulting, or other professional development activities. A significant common aspect of these activities is communication of ideas to other practicing professionals and subject matter experts outside the home institution.

Teaching loads must leave enough time for professional development of the faculty. Evidence of institutional interest in faculty development, such as adequate resources for professional development, should be present.

Suitable quality indicators regarding faculty for the self-assessment and accreditation report include:

- The proportion of full-time faculty
- The teaching load (number of courses taught per year)
- Levels of research and research grants

- Some indication that recent hiring is leading to faculty renewal
- Gender distribution of faculty
- Job satisfaction of faculty as expressed in interviews or surveys
- Student satisfaction with faculty as expressed in evaluations

To evaluate the quality of the faculty, the visiting team will examine the data presenting the quality indicators in the self-study report, as well as the CVs of the faculty members and any collective agreement. It will also meet with groups of faculty members. The team will gather further insights from discussions with staff, students and administrators.

6.2 Students

An accredited program must have good students. Student selection and retention standards must be appropriate to the program. When students transfer from other institutions or from a branch campus, standards for evaluation and selection of these students should be clearly enunciated, and should show that these students are of similar quality and have substantially the same knowledge as those students who have taken all their work on the main campus. When Business Technology Management courses are regularly taken on other campuses, the main campus faculty should be involved in the development and assessment of curricular content.

A student advisory system is an important component in any educational program. The advisory system should embrace course selection and similar matters, and it should also include career guidance.

Suitable quality indicators regarding students for the self-assessment and accreditation report include:

- Feedback from employers, either assessed through questionnaires or interviews. Employers to be included might be those that have hired students in the past or members of the Advisory Boards that support the BTM program.
- Jobs offered for co-op and internship programs, and the proportion of students who find satisfactory employment following graduation
- Evidence of student involvement in university and extracurricular activities, as assessed through questionnaires and interviews.
- Student's satisfaction with their program and progress as assessed through questionnaires and interviews
- Attrition rates
- Admission averages
- Graduation averages

To assess the quality of students, the visiting team will interview or survey employers, students and alumni, study transcripts and samples of student work, and analyse data presented in the self-study report.

6.3 Curriculum

General

BTM Learning Outcomes (LOs) are specific but do not prescribe a curriculum, program flow, or pedagogy. Instead, they represent a Competency Framework (Figure 1), a set of Assessment Criteria (Figure 2), and a Logical Flow (Figure 3) of BTM professional capabilities. We encourage each institution to distinguish its own unique approach to reaching these outcomes and standards.

BTM students will experience academic courses in combination with relevant extracurricular activities and work experiences. BTM graduates will have learned to analyze business processes, design appropriate technology-based solutions, and communicate these effectively. They will be able to lead work-based teams, participate effectively in projects and understand practices of organizational change.

BTM graduates will be process and project oriented as well as technology and business trained. The program places distinct emphasis on developing interpersonal communications, collaboration, and leadership skills. BTM graduates will be ready to fill entry-level roles in projects, sales, process analysis, consulting, customer and vendor management, and marketing support.[1]

Structure

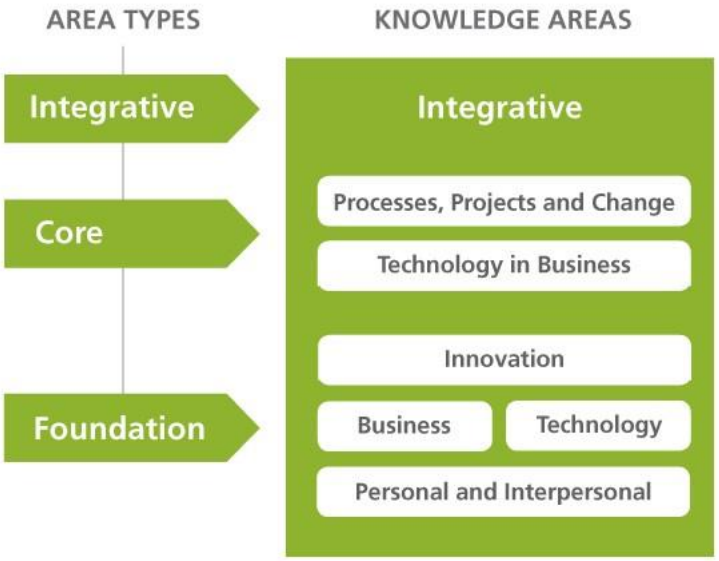

Figure 1 - BTM Learning Outcome - Competency Framework

[1] **Note for Quebec Institutions:** In Canadian provinces other than Quebec, a student typically obtains his or her degree after 16 years of study, including grades 1 through 12, plus four years of university. In Quebec, a student typically obtains his or her degree after 16 years: 11 years of primary and secondary school, 2 (general curriculum, pre-university) or 3 (technical curriculum leading to university) years of CEGEP, and 3 or 2 years of university. The criteria below (explained in terms of numbers of courses) are specified assuming a university program of four (4) years (40 courses). In order to satisfy the criteria, a program from Quebec may therefore include up to: 10 CEGEP courses for students who have obtained a (general curriculum) pre-university CEGEP diploma; 15 CEGEP courses for students who have obtained a technical CEGEP diploma (leading to a university program).

The BTM Learning Outcomes contain 70 Learning Outcomes in 7 broad competency areas, namely:

1. **Integrative (I1)**: This knowledge area contains learning outcomes that integrate the competencies developed in six knowledge areas. It produces a "deliverable" of relevance to employers.
2. **Personal and Interpersonal (F1)**: The ability to make a meaningful contribution depends upon one's self-knowledge and ability to have constructive, long term, interactions with others. Successful leaders have strong personal and interpersonal competencies.
3. **Business (F2)**: To be effective in the workplace one must have both the broad context of business – its role and place in society – and a working knowledge of how business operates.
4. **Technology (F3)**: BTM graduates must understand information and communications technologies, their current capabilities, and future trends.
5. **Innovation (F4):** BTM graduates are expected to be innovative in the workplace. Innovators should be able to identify new opportunities, validate and resource them.
6. **Technology in Business (C1)**: This knowledge area is designed to synthesize the knowledge and competencies gained in the foundational knowledge areas and create an additional competency in understanding: the potential (economic, personal, societal), the risks of, and the governance, acquisition, and management of ICTs in and for business.
7. **Processes, Project and Change (C2)**: BTM graduates will gain the foundations that enable them to help create well-designed business processes, well-managed projects, and support for the individuals and groups undergoing change.

I1	Integrative	Project Management	F3-1	Technology	IT Trends	C1-1	Technology in Business	Business Value of IT
I2		Business Analysis	F3-1.1		IT Operations	C1-2		Impact of IT on People
I3		Business Process Management	F3-1.2		Software Development	C1-3		nnovation Management
I4		Enterprise Architecture	F3-1.3		Infrastructure Lifecycle	C1-4		IT Industry Economics
I5		Technology Management	F3-1.4		Technology Lifecycle	C1-5		IT Function Economics
I6		Technology Assessment	F3-1.5		Contemporary Technology Lifecycle	C1-6		IT Function Trends
I7		Design Thinking	F3-1.6		Digital Business Technology	C1-7		IT Procurement
I8		Communicate Business Value	F3-1.7		Digital Business	C1-8		Enterprise Architecture
F1-1	Personal and Interpersonal	Self-Awareness	F3-1.8		Digital Marketing	C2-1	Processes, Projects and Change	Organizational Learning
F1-2		Communication	F3-2		IT Solution Design	C2-2		Project Management
F1-3		Workplace Diversity	F3-2.1		Requirements Analysis	C2-3		Business Change Management
F1-4		Interpersonal Relations	F3-2.2		Networking	C2-4		Project Process Management
F1-5		Teamwork	F3-2.3		Custom Software	C2-4.1		Stakeholder Requirement Analysis
F1-5.1		Persuasion	F3-2.4		Packaged Software	C2-4.2		Business Process Improvement
F1-5.2		Decision Making	F3-2.5		Technology Architecture	C2-4.3		Business Process Design
F1-5.3		Leadership	F3-3		IT Security and Compliance	C2-4.4		Quality Assurance
F1-5.4		Communication Technologies	F3-3.1.		Information Security or Cyber Security	C2-4.5		New Process Implementation
F1-6		Negotiation	F3-3.2		Technology audit	C2-5		Knowledge Management
F1-7		Coordination Skill	F3-3.3		Privacy			
F2-1	Business	Business and Society	F3-3.4		IT Governance and Standards			
F2-2		Business Models	F3-4		Information Management			
F2-3		Risk Management	F3-4.1		Business Intelligence			
F2-4		Strategic Management	F3-4.2		Decision Support Systems			
F2-5		Support Functions	F3-4.3		Data Warehousing			
F2-6		Value Chain	F4-1	Innovation	Opportunity Identification			
			F4-2		Validation			
			F4-3		Resourcing			

Figure 2 - BTM Learning Outcomes - Assessment Criteria

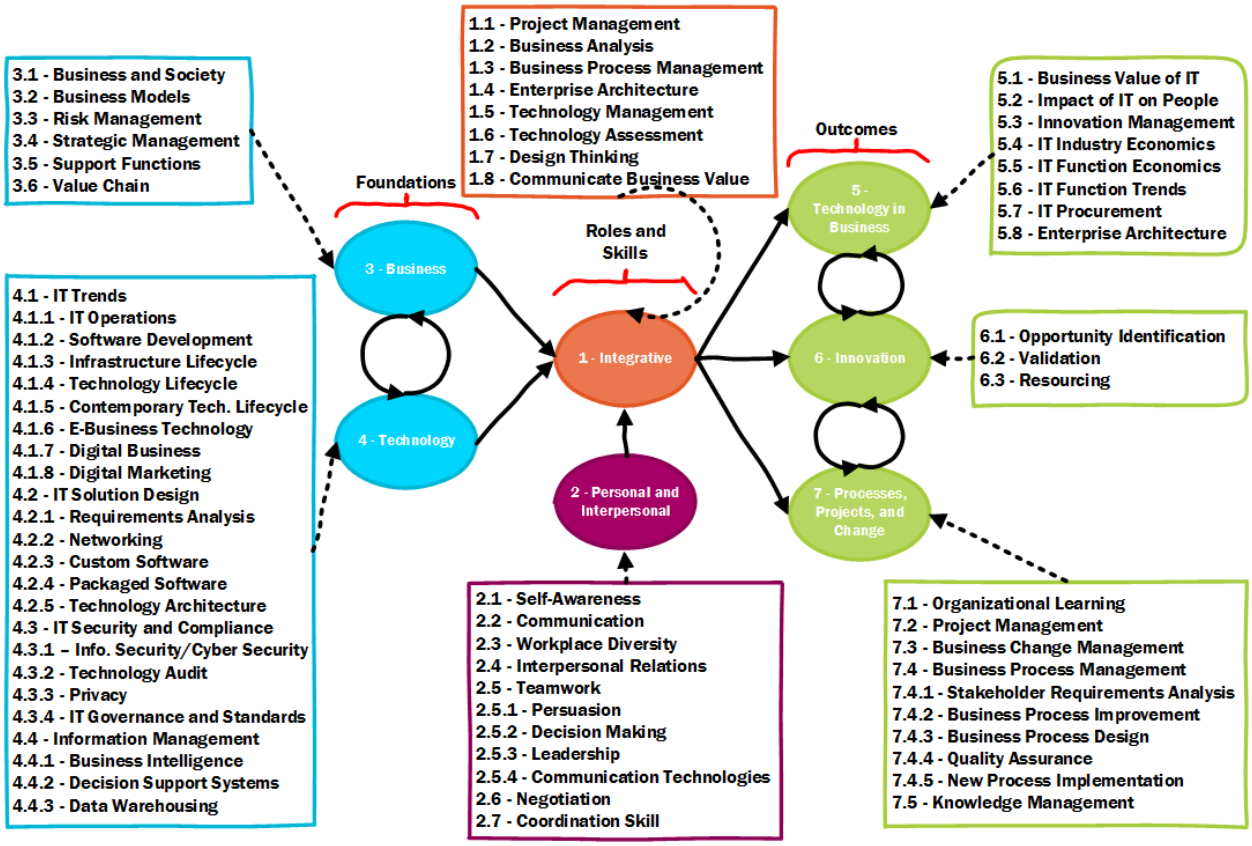

Figure 3 - BTM Learning Outcomes – Logical Flow

BTM graduates must demonstrate that 3 elements of learning have taken place: theories/best practices have been taught, students have received feedback, and students have reflected and improved.

BTM graduates will acquire competencies using an ***Experiential*** perspective and merging 2 key facets:

1. ***Knowing:*** For all learning outcomes students must be able to define, discuss, compare, and use applicable concepts analytically.
2. ***Doing:*** For just under half the learning outcomes an additional level of competency is required: students must be able to demonstrate the ability to use their knowledge and skills in a practical way. Students demonstrate "doing" when they can use knowledge to create a practical artifact (e.g., business process model, project plan, data model, business case).

BTM draws on existing competency models defined by recognized professional standards bodies and / or leading academics in the field of learning.

Assessment

For learning outcomes that only have *knowing* requirements, the competency standard uses a summarized version of Bloom's taxonomy[2] of levels of learning. Outcomes that have a *doing* competency requirement draw on recognized professional standards.

Bloom's Taxonomy

The revised Bloom's Taxonomy includes the following:

1. **Remembering**: Retrieving, recognizing, and recalling relevant knowledge from long-term memory.
2. **Understanding**: Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
3. **Applying**: Carrying out or using a procedure through executing or implementing.
4. **Analyzing**: Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
5. **Evaluating**: Making judgments based on criteria and standards through checking and critiquing.
6. **Creating**: Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

For the BTM, Bloom's taxonomy has been simplified so it has 4 levels:

1. Bloom's #1 Remembering and #2 Understanding. Learning outcomes at this level start with "Exhibit an understanding of…"
2. Bloom's #3 Applying. Learning outcomes at this level start with "Be able to explain…"
3. Bloom's #4 Analyzing and #5 Evaluating. Learning outcomes at this level start with "Demonstrate understanding of…" or "Describe…"
4. Bloom's #6 Creating. Learning outcomes at this level start with "Demonstrate the ability to…"

Professional competency models in the BTM

The BTM draws on competency standards from 5 recognized professional bodies.

1. Skills Framework for Information Age Version 4 (SFIA) published by the SFIA Foundation (publicly available)
2. Project Management Institute (PMI) Career Framework for Organizations (Version at www.pmi.org as of July 2009) which includes: the Project Manager Competency Development Framework (PMCDF) Second Edition, and PMI PathPro Job Ladders. The Project Management

[2] An introduction to Bloom's original taxonomy can be found here. A second reference, located here, introduces the updates to Blooms original taxonomy proposed in the 1990's

Body of Knowledge 4th Edition (PMBOK®) is referenced extensively in these documents. A Guide to the Project Management Body of Knowledge 4th Edition (PMBOK® Guide) is also a reference.

3. International Institute of Business Analysis (IIBA) Business Analyst Career Ladder (Version at www.theiiba.org as of July 2009) (must be a IIBA member to download). The Business Analysis Body of Knowledge version 2.0 (BABOK®) is referenced in this document.

4. Certified Management Consultants of Canada (CMC-Canada) CMC Competency Profile and CMC Competency Framework Summary. The CMC Common Body of Knowledge 2000 Edition (CMCBOK®) is referenced in these documents.

5. Management Standards Centre (MSC)[3], (part of the Chartered Management Institute) National Occupational Standards (NOS) for Management and Leadership 2008 Edition (publicly available, printed copy available for purchase)

Competency Standards and Guidance Labelling

Where a competency standard is defined or guidance is provided for a learning outcome the format of the label is:

<Label> { "-" *<Skill Reference Code>* | *<Guidance Reference>*} { "=" *<Required Competency Level Code>* }

Where:

<Label> indicates which model is used to define the competency standard or provide guidance. In summary:

1. BLOM = Updated Bloom's Taxonomy
2. SFIA = Skills Framework for the Information Age
3. PMI = Project Management Institute
4. IIBA = International Institute of Business Analysis
5. CMC = Certified Management Consultants of Canada, CMC Competency Profile and associated CMC Competency Framework Summary
6. MSC = Management Standards Centre, National Occupational Standard

<Skill Reference Code>. Where a competency standard for a "doing" learning outcome is being set, a skill reference code is provided which provides a pointer to the specific description of the relevant skill in the selected competency model. The skill reference code is only required for doing competencies.

<Guidance Reference> Where guidance on the employers' competency requirements for a "doing" learning outcome is being provided, the guidance source will indicate the applicable source document to be consulted.

Guidance is show in italics in this font.

[3] "The Standards Setting Body for Management and Leadership"

<Required Competency Level Code> specifies the required competency level the student must achieve using competency level scale from the selected competency model. In cases where the competency standard is provided for guidance only, this element is omitted (see below for details).

> Details of the Labels, Skill Reference Codes, Guidance References and Required Competency Level Codes for each competency model have been described above.

I1 – Integrative

This knowledge level area contains learning outcomes that integrates the competencies developed in the other knowledge areas. It produces a "deliverable" of direct relevance to employers.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
I1	Project Management	Demonstrate the ability to effectively plan, manage and lead a business technology project.	***SFIA-PRMG=4 (Project Management)*** **Introduction to this skill:** The management of projects, typically (but not exclusively) involving the development and implementation of business processes to meet identified business needs, acquiring and utilizing the necessary resources and skills, within agreed parameters of cost, timescales, and quality. **Level 4 Description:** Defines, documents and carries out small projects or sub-projects (typically less than six months, with limited budget, limited interdependency with other projects, and no significant strategic impact), alone or with a small team, actively participating in all phases. Identifies, assesses and manages risks to the success of the project. Agrees project approach with stakeholders, and prepares realistic plans (including quality, risk and communications plans) and tracks activities against the project schedule, managing

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			stakeholder involvement as appropriate. Monitors costs, timescales and resources used, and takes action where these deviate from agreed tolerances. Ensures that own projects are formally closed and, where appropriate, subsequently reviewed, and that lessons learned are recorded. **SFIA-PROF=4 (Programme and Project Support)** **Introduction to this Skill:** The provision of support and guidance on portfolio, programme and project management processes, procedures, tools and techniques. Support includes definition of portfolios, programmes, and projects; advice on the development, production and maintenance of business cases; time, resource, cost and exception plans, and the use of related software tools. Tracking and reporting of programme/project progress and performance are also covered, as is the capability to facilitate all aspects of portfolio/programme/ project meetings, workshops and documentation. **Level 4 Skill Description:** Takes responsibility for the provision of support services to projects. Uses and recommends project control solutions for planning, scheduling and tracking projects. Sets up and provides detailed guidance on project management software, procedures, processes, tools and techniques. Supports

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			programme or project control boards, project assurance teams and quality review meetings. Provides basic guidance on individual project proposals. May be involved in aspects of supporting a programme by providing a cross programme view on risk, change, quality, finance or configuration management.
I2	Business Analysis	Demonstrate the ability to understand and analyze a business problem or opportunity- collect relevant information, describe and compare options and risks, and make recommendations. Demonstrate appropriate use of relevant techniques such as systems thinking and quantitative analysis.	**BLOOM BTM=4**
I3	Business Process Management	Demonstrate the ability to analyze a business process, develop the "to-be" design, and then to create the implementation plan and the business change management plan to implement this design.	MSC-C5=FL (Facilitating Change – Plan Change – First Line Manager)
I4	Enterprise Architecture	Demonstrate the ability to design and communicate a moderately complex technology-enabled solution to a business problem.	***SFIA-SSUP=4 (Sales Support)*** **Introduction to this Skill:** The provision of technical advice and assistance to the sales force, sales agents, reseller/distributor staff existing or

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			prospective customers, either in support of customer development or sales activity or fulfillment of sales obligations. **Level 4 Skill Description:** Works closely with the sales team to help prospects to clarify their needs and requirements; devises solutions and assesses their feasibility and practicality. Demonstrates technical feasibility using physical or simulation models. Produces estimates of cost and risk and initial project plans to inform sales proposals. Resolves technical problems.
I5	Technology Management	Demonstrate understanding of how to analyze a business need, develop an RFx, evaluate the responses, and structure a contract with the successful vendor. Ability to evaluate the effectiveness, appropriateness and usability of an implemented information system	**BLOOM BTM=3**
I6	Technology Assessment	Demonstrate the ability to examine a new technology, understand its strengths and weaknesses, evaluate its usefulness to solve business problems,	***SFIA-RSCH=3 (Research)*** **Introduction to this Skill:** The advancement of knowledge by data gathering, innovation, experimentation, evaluation and dissemination, carried out in pursuit of a predetermined set of research

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
		and communicate the results.	goals. **Level 3 Description:** Within given research goals, builds on and refines appropriate outline ideas for research, i.e. evaluation, development, demonstration and implementation. Uses available resources to gain an up-to-date knowledge of any relevant field. Reports on work carried out and may contribute sections of material of publication quality.
I7	Design Thinking	Exhibit an understanding of how to use the 5 key elements of the design-thinking framework for future projects and initiatives.	**BLOOM BTM=1**
I8	Communicate Business Value	Demonstrate understanding of how to effectively communicate the value of current and new projects in a concise and compelling way.	**BLOOM BTM=3**

F1 – Personal and Interpersonal

The ability to make a meaningful contribution depends upon one's self knowledge and ability to have constructive, long term, interactions with others. Successful leaders have strong personal and interpersonal competencies.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
F1-1	Self-Awareness	Demonstrate self-awareness and self-management, including mastery of ethical reasoning, client relationship management, business courtesies and self-presentation	MSC-A1=TL (Manage your own resources – Team Lead) MSC-D1-TL (Developing productive working relationships with colleagues)
F1-2	Communication	Demonstrate proficiency in listening, oral and written communications skills in a business context	**BLOOM BTM=4**
F1-3	Workplace Diversity	Demonstrate understanding of the strengths of a diverse workplace (including ability, ethnicity, religion, gender, sexual orientation, age/generation).	**BLOOM BTM=3**

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
F1-4	Interpersonal Relationship	Demonstrate proficiency in working with individuals, including giving and receiving feedback and resolving differences using appropriate negotiation and conflict management skills.	MSC-D1=TL (Develop productive relationships with colleagues – Team Lead)
F1-5	Teamwork	Demonstrate proficiency in leading workplace teams (within or between organizations), including the ability in the four following areas:	**BLOOM BTM=4**
F1-5.1	Persuasion	Demonstrate the ability to persuade, influence, motivate and provide guidance	MSC-B6=TL (Providing direction; Provide leadership in your area of responsibility - First line managers and middle managers)
F1-5.2	Decision Making	Demonstrate the ability to facilitate a range of group innovation, analysis and decision making techniques	MSC-C2=TL (Encourage innovation in your area of responsibility –First line managers and middle managers)
F1-5.3	Leadership	Demonstrate the ability to engender and sustain trust	MSC-D1=TL (Develop productive relationships with colleagues – Team Lead)

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
F1-5.4	Communications Technologies	Demonstrate the ability to effectively use technologies to facilitate and support group activities and processes	MSC-E14=TL (Support team and virtual working – Team Lead)
F1-6	Negotiation	Be able to explain the various approaches to effective negotiation.	**BLOOM BTM=2**
F1-7	Coordination Skill	Demonstrate understanding of effective coordination of communications, time management, and task prioritization.	**BLOOM BTM=3**

F2 – Business

To be effective in the workplace one must have both the broad context of business – its role and place in society – and a working knowledge of how business operates.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
F2-1	Business and Society	Exhibit an understanding of the history, current role and future trends (e.g. globalization, social responsibility) of business within society and the global economy	**BLOOM BTM=2**
F2-2	Business Models	Demonstrate understanding of technology-enabled business design (e.g., digital business models including "platforms", supply networks, collaborative/proprietary innovation, disruptive innovation).	**BLOOM BTM=3**
F2-3	Risk Management	Demonstrate the ability to conduct financial, operational, and reputational risk management including their implications for business decisions of cyclical and event-driven external risks (e.g. credit crunch, pandemics, global warming, peak oil).	**BLOOM BTM=2**
F2-4	Strategic Management	Demonstrate understanding of the structure of various	**BLOOM BTM=3**

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
		kinds of organizations by industry sector, ownership, governance and size - their business models, key performance factors, dominant structures and processes.	
F2-5	Support Functions	Demonstrate understanding of the role, processes and structure of support functions of a business (e.g. general management, marketing, finance, R&D, IT, human resources)	**BLOOM BTM=3**
F2-6	Value Chain	Demonstrate understanding of the role, processes and structures of operational functions of a business (e.g. sales, manufacturing, distribution, customer support).	**BLOOM BTM=3**
F3-1	IT Trends	Be able to explain the current and future issues in the following topics:	**BLOOM BTM=2**
F3-1.1	IT Operations	IT operations (e.g. delivery of service levels, change control, green IT)	**BLOOM BTM=2**

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
F3-1.2	Software Development	Software development (e.g. methodologies, lifecycle, emerging techniques, usability, in-house vs. off the shelf / total cost of ownership)	**BLOOM BTM=2**
F3-1.3	Infrastructure Lifecycle	Infrastructure lifecycle (networks, desktop and data centre hardware, operating systems, databases)	**BLOOM BTM=2**

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
F3-1.4	Technology Lifecycle	Overall application and technology landscape lifecycle (e.g. make technology choices that will ease the integration of unpredictable future technologies).	**BLOOM BTM=2**
F3-1.5	Contemporary Technology Lifecycle	New and emerging technologies and methods (e.g. cloud computing, mobile, social media)	***SFIA-EMRG= 4 (Emerging technology Monitoring)*** **Introduction to this Skill:** The identification of new and emerging hardware, software and communication technologies and products, services, methods and techniques and the assessment of their relevance and potential value as business enablers, improvements in cost/performance or sustainability. The promotion of emerging technology awareness among staff and business management. **Level: Level 4 Description:** Maintains awareness of opportunities provided by new technology to address challenges or to enable new ways of working. Within own sphere of influence, works to further organizational goals, by the study and use of emerging technologies and products. Contributes to briefings and presentations about their relevance and potential value to the organization.

F3-1.6	Digital Business Technology	Be able to explain the overall functioning of the Internet, Web, mobile, IoT etc. Be able to explain a variety of Internet technologies, including those pertinent to Web applications, mobile apps, IoT etc.	**BLOOM BTM=3**
F3-1.7	Digital Business	Demonstrate understanding of Digital Commerce and the application of IT, and especially digital technology, to developing innovative business models within an existing or new business strategy; understand the business opportunities from innovative digital technology for both small and large enterprises, including e-commerce development platforms in the cloud, e-commerce hubs or marketplaces, e-commerce process and payment automation, etc.	**BLOOM BTM=3**
F3-1.8	Digital Marketing	Demonstrate understanding of Digital Marketing concepts and the tools which support them: Market	**BLOOM BTM=3**

		research and analysis; Search engine optimization (SEO); Social media marketing (SMM - blogging, LinkedIn, Twitter, etc); Online advertising tools (such as Google Adwords); The use of analytics and scorecards; Digital marketing programs; Marketing automation; Measurement and web performance optimization.	

F3 – Technology

BTM graduates must understand information and communications technologies, their current capabilities, and future trends.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
F3-2	IT Solution Design	Demonstrate the ability to meet business requirements by planning, designing, integrating into an existing landscape, implementing, configuring and operating contemporary technologies in each of the following:	*The following **seven (7)** competency standards apply to all parts of F3-2* **Skill (1)** ***SFIA-REQM=3 (Requirements Definition and Management)*** **Introduction to this Skill:** The definition and management of the business goals and scope of change initiatives. The specification of business requirements to a level that enables effective delivery of agreed changes. **Level 3 Description:** Defines scope and business priorities for small-scale changes and may assist in larger scale scoping exercises. Elicits and discovers requirements from operational management and other stakeholders. Selects appropriate techniques for the elicitation of detailed requirements taking into account the nature of the required changes, established practice and the characteristics and culture of those providing the requirements. Specifies and documents business requirements as directed, ensuring traceability back to source. Analyses them for adherence to business objectives and

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			for consistency, challenging positively as appropriate. Works with stakeholders to prioritize requirements. **Skill (2)** ***SFIA UNAN=3 (User Experience Analysis)*** **Introduction to this Skill:** The identification, analysis, clarification and communication of the context of use in which applications will operate, and of the goals of products, systems or services. Analysis and prioritization of stakeholders' "user experience" needs and definition of required system behaviour and performance. Resolution of potential conflicts between user requirements and determination of usability objectives. ***Level 3 Skills Description*** Identifies and engages with users/ stakeholders, defines relevant characteristics (e.g. "personas") and describes users goals and tasks (e.g. as "user stories"). Describes the environment within which the system will be used. Identifies and describes requirements of users with special needs (e.g. resulting from physical disabilities).

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			Skill (3) ***SFIA-DESN=2 (Systems design)*** **Introduction to this Skill:** The specification and design of information systems to meet defined business needs in any public or private context, including commercial, industrial, scientific, gaming and entertainment. The identification of concepts and their translation into implementable design. The design or selection of components. The retention of compatibility with enterprise and solution architectures, and the adherence to corporate standards within constraints of cost, security and sustainability. **Level 2 Description:** Undertakes complete design of simple applications using simple templates and tools. Assists as part of a team on design of components of larger systems. Produces detailed designs including for example: physical data flows, file layouts, common routines and utilities, program specifications or prototypes, and backup, recovery and restart procedures. **Skill (4)** ***BLOOMS BTM=3 (Quality Standards)***

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			Level 3 Description: Demonstrate understanding and can develop standards of quality based on business needs. **Skill (5)** ***BLOOMS BTM=3 (Quality Assurance)*** **Level 3 Description:** Demonstrate understanding of measuring, monitoring, reporting and recommending with respect to quality. **Skill (6)** ***BLOOMS BTM=3 (Testing)*** **Level 3 Description:** Demonstrate understanding of testing including the planning, design, management, execution and reporting of tests. **Skill (7)** ***SFIA-SLMO=3 (Service Level Management)***

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			Introduction to this skill: The planning, implementation, control, review and audit of service provision, to meet customer business requirements. This includes negotiation, implementation and monitoring of service level agreements, and the ongoing management of operational facilities to provide the agreed levels of service, seeking continually and proactively to improve service delivery and sustainability targets. **Level 3 Description:** Monitors service delivery performance metrics and liaises with managers and customers to ensure that service level agreements are not breached without the stakeholders being given the opportunity of planning for a deterioration in service.
F3-2.1	Requirement Analysis	Requirements Analysis	**Same as above**
F3-2.2	Networking	A network and computing platform	**Same as above**
F3-2.3	Custom Software	A custom software solution (implemented locally or in the cloud)	Same as above plus: ***SFIA-PROG=2 (Programming/software development)*** **Introduction to this Skill:** The design, creation, testing and documenting of new and amended software components from supplied specifications in accordance with

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			agreed development and security standards and processes. **Level 2 Description:** Designs, codes, tests, corrects, and documents simple programs, or scripts and assists in the implementation of software which forms part of a properly engineered information or communications system.
F3-2.4	Packaged Software	A packaged software solution (implemented locally or in the cloud)	**Same as above**
F3-2.5	Technology Architecture	Exhibit an understanding of technology architecture, and the various IT runtime infrastructures available to organizations of varying sizes to implement IT solutions.	**BLOOM BTM=1**
F3-3	IT Security and Compliance	Demonstrate an understanding of IT security and compliance in the following areas:	**BLOOM BTM=1**
F3-3.1	Information Security or Cyber Security	Demonstrate understanding of management of, and provision of expert advice on, the selection, design,	***SFIA REQM=3 (Requirements definition and management)*** **Introduction to this Skill:** The definition and management of the business goals and scope of change initiatives. The specification of business requirements to a level that enables effective delivery of agreed

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
		justification, implementation and operation of information security controls and management strategies to maintain the confidentiality, integrity, availability, accountability and relevant compliance of information systems with legislation, regulation and relevant standards.	changes. **Level 3 Description:** Defines scope and business priorities for small-scale changes and may assist in larger scale scoping exercises. Elicits and discovers requirements from operational management and other stakeholders. Selects appropriate techniques for the elicitation of detailed requirements taking into account the nature of the required changes, established practice and the characteristics and culture of those providing the requirements. Specifies and documents business requirements as directed, ensuring traceability back to source. Analyses them for adherence to business objectives and for consistency, challenging positively as appropriate. Works with stakeholders to prioritize requirements.
F3-3.2	Technology Audit	The independent, risk-based assessment of the adequacy and integrity of controls in information processing systems, including hardware, software solutions, information management systems, security systems and tools, and communications technologies - both web-based and physical. The structured analysis of the risks to	**BLOOMS BTM=2**

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
		achievement of business objectives, including the risk that the organisation fails to make effective use of new technology to improve delivery and internal effectiveness. Assessment of the extent to which effective use has been made of techniques and tools to achieve sustainability and business continuity.	
F3-3.3	Privacy	Exhibit an understanding of federal and provincial privacy laws such as HIPPA and PIPEDA and their impact on IT operations within an enterprise.	**BLOOM BTM=1**
F3-3.4	IT Governance and Standards	Exhibit an understanding of external Canadian and international IT governance and standards organizations such as ITIL, ISO, COBIT, and their impact on IT operations within an enterprise	**BLOOM BTM=1**
F3-4	Information Management	Demonstrate the ability to develop the role, management and	**BLOOM BTM=4**

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
		uses of information, including (***Two skills required)***:	

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
F3-4.1	Business Intelligence	The role of information and data to support operations, decision making, planning and risk management	**Skill (1):** ***SFIA-DTAN=4 (Data analysis)*** **Introduction to this Skill:** The investigation, evaluation, interpretation and classification of data, in order to define and clarify information structures which describe the relationships between real world entities. Such structures facilitate the development of software systems, links between systems or retrieval activities. **Level 4 Description:** Investigates corporate data requirements, and applies data analysis, data modelling and quality assurance techniques, to establish, modify or maintain data structures and their associated components (entity descriptions, relationship descriptions, attribute definitions). Provides advice and guidance to database designers and others using the data structures and associated components.
F3-4.2	Decision Support Systems	Demonstrate the ability to model, prepare, and structure data to support the creation and use of information and knowledge	**Skill (2):** ***SFIA-DBDS=4 (Database design)*** **Introduction to this Skill:** The specification, design and maintenance of mechanisms for storage and access to both structured and unstructured information, in support of business information needs.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			Level 4 Description: Develops and maintains specialist knowledge of database concepts, object and data modelling techniques and design principles and a detailed knowledge of database architectures, software and facilities. Analyses data requirements to establish, modify or maintain object/data models. Evaluates potential solutions, demonstrating, installing and commissioning selected products.
F3-4.3	Data Warehousing	Describe technologies for information management (e.g. reporting, analysis), knowledge management, collaboration management and content management	**BLOOM BTM=3**

F4 - Innovation

BTM graduates are expected to be innovative in the workplace. Innovators should be able to identify new opportunities, validate and resource them.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
F4-1	Opportunity Identification	Demonstrate understanding of how to use various approaches to generate new opportunities for projects, processes, and initiatives	**BLOOM BTM=3**
F4-2	Validation	Demonstrate understanding of how to use frameworks and tools to establish the value and cost associated with an opportunity (from the customer, market, and technology perspectives)	**BLOOM BTM=3**
F4-3	Resourcing	Exhibit an understanding of how to optimize the contributions of IT to competitive strategy, innovation, decision-making and operations in various sizes and types of organizations, industry sectors, processes and functions.	**BLOOM BTM=1**

C1 – Technology in Business

This knowledge area is designed to synthesize the knowledge and competencies gained in the foundational knowledge areas and create an additional competency in understanding: the potential (economic, personal, societal), the risks of, and the governance, acquisition, and management of ICTs in and for business.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
C1-1	Business Value of IT	Demonstrate understanding of optimizing the contributions of IT to competitive strategy, innovation, decision-making and operations in various sizes and types of organizations, industry sectors, processes and functions.	**BLOOM BTM=3**
C1-2	Impact of IT on People	Demonstrate understanding of utilizing IT to impact individuals, families, organizations and communities, including culture, social and environmental issues, considering both collaboration and competitive analysis	**BLOOM BTM=3**

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
C1-3	Innovation Management	Be able to explain the innovation process, and how to introduce, adopt, and practice innovation.	**BLOOM BTM=2**
C1-4	IT Industry Economics	Be able to explain the structure, business value, offerings, and dynamics of the Canadian and international IT industries. This includes the economics of ICTs and specific subsectors (e.g., ERP, open source, outsourcing, web, mobility).	**BLOOM BTM=2**
C1-5	IT Function Economics	Be able to explain the economics and governance of IT and the IT function within organizations, including IT's role, structure, challenges processes, economics, maturity and career paths.	**BLOOM BTM=2**
C1-6	IT Function Trends	Demonstrate understanding of the risks and mitigation strategies to business operations	***SFIA-CORE=3 (Compliance review)*** **Introduction to this skill:** The independent assessment of the conformity of any activity, process, deliverable, product or

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
		inherent in the implementation of information and communications technologies (e.g. systems development, data security and privacy, business continuity, outsourcing, off-shoring and infrastructure).	service to the criteria of specified standards, best practice, or other documented requirements. May relate to, for example, asset management, network security tools, firewalls and internet security, sustainability, real-time systems, application design and specific certifications. **Level 3 Description:** Collects and collates evidence as part of a formally conducted and planned review of activities, processes, products or services. Examines records as part of specified testing strategies for evidence of compliance with management directives, or the identification of abnormal occurrences.
C1-7	IT Procurement	Demonstrate understanding of and be able to evaluate the choices and activities in procurement and management of purchased IT products and services.	***SFIA-CSMG=3 (Customer Service Support)*** **Introduction to this skill:** The management and operation of one or more customer service or service desk functions. Acting as a point of contact to support service users and customers reporting issues, requesting information, access, or other services. **Level 3 Description:** Acts as the routine contact point, receiving and handling requests for support. Responds to a broad range of service requests for support by providing information to fulfill requests or enable resolution. Provides first line investigation and diagnosis and promptly

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			allocates unresolved issues as appropriate. Assists with the development standards, and applies these to track, monitor, report, resolve or escalate issues. Contributes to creation of support documentation.
C1-8	Enterprise Architecture	Demonstrate understanding in Enterprise Architecture in the three components listed below:	

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
		1. Demonstrate understanding of enterprise architecture as the application of architecture principles and practices to guide organizations through the business, information, process, and technology changes necessary to execute their strategies.	**BLOOM BTM=3**
		2. Demonstrate understanding of enterprise analysis, design, planning, and implementation, using a holistic approach at all times, for the successful development and execution of strategy.	**BLOOM BTM=3**
		3. Demonstrate the ability to utilize the various aspects of an enterprise to identify, motivate, and achieve these changes.	**BLOOM BTM=3**

C2- Process, Project and Change

BTM graduates will gain the foundations that enable them to help create well-designed business processes, well-managed projects, and support for the individuals and groups undergoing change.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
C2-1	Organizational Learning	Be able to explain the overall organizational learning and innovation process / life cycle, and its role in organizational success.	**BLOOM BTM=2**
C2-2	Project Management	Project Management - demonstrate appropriate understanding of the Project Management Institute's Project Management Body of Knowledge (PMBOK)	***(Two skills required)*** **Skill (1)** ***SFIA-PRMG=4 (Project management)*** **Introduction to this skill:** The management of projects, typically (but not exclusively) involving the development and implementation of business processes to meet identified business needs, acquiring and utilizing the necessary resources and skills, within agreed parameters of cost, timescales, and quality. **Level:** **Level 4 Description:** Defines, documents and carries out small projects or sub-projects (typically less than six

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			months, with limited budget, limited interdependency with other projects, and no significant strategic impact), alone or with a small team, actively participating in all phases. Identifies, assesses and manages risks to the success of the project. Agrees project approach with stakeholders, and prepares realistic plans (including quality, risk and communications plans) and tracks activities against the project schedule, managing stakeholder involvement as appropriate. Monitors costs, timescales and resources used, and takes action where these deviate from agreed tolerances. Ensures that own projects are formally closed and, where appropriate, subsequently reviewed, and that lessons learned are recorded.
			Skill (2): ***SFIA-PROF=4 (Portfolio, Programme and Project Support)*** **Introduction to this skill:** The provision of support and guidance on portfolio, programme and project management processes, procedures, tools and techniques. Support includes definition of portfolios, programmes, and projects; advice on the development, production and maintenance of business cases; time, resource, cost and exception plans, and the use of related software tools. Tracking and reporting of programme/project progress and performance are also covered, as is the capability to facilitate all aspects of portfolio/programme/ project meetings, workshops and documentation.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			Level 4 Description: Takes responsibility for the provision of support services to projects. Uses and recommends project control solutions for planning, scheduling and tracking projects. Sets up and provides detailed guidance on project management software, procedures, processes, tools and techniques. Supports programme or project control boards, project assurance teams and quality review meetings. Provides basic guidance on individual project proposals. May be involved in aspects of supporting a programme by providing a cross programme view on risk, change, quality, finance or configuration management.
C2-3	Business Change Management	Demonstrate understanding and application of best practices in organizational IT change management.	***SFIA-CHMG=3 (Change Management)*** **Introduction to this skill:** The management of change to the service infrastructure including service assets, configuration items and associated documentation. Change management uses requests for change (RFC) for standard or emergency changes, and changes due to incidents or problems to provide effective control and reduction of risk to the availability, performance, security and compliance of the business services impacted by the change.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			Level 3 Description: Develops, documents and implements changes based on requests for change. Applies change control procedures.
C2-4	Business Process Management	Demonstrate competence in process analysis and design using applicable knowledge areas from the International Institute of Business Analysis (IIBA) Business Analysis Body of Knowledge (BABOK).	***(Two skills required)*** ***SFIA-BUAN=3 (Business analysis)*** **Introduction to this skill:** The methodical investigation, analysis, review and documentation of all or part of a business in terms of business functions and processes, the information used and the data on which the information is based. The definition of requirements for improving processes and systems, reducing their costs, enhancing their sustainability, and the quantification of potential business benefits. The collaborative creation and iteration of viable specifications and acceptance criteria in preparation for the deployment of information and communication systems. **Level 3 Description:** Investigates operational needs and problems, and opportunities, contributing to the recommendation of improvements in automated and non-automated components of new or changed processes and organization. Assists in defining acceptance tests for these recommendations.

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
			Skill (2) ***SFIA-BSMO=2 (Business modelling)*** **Introduction to this skill:** The production of abstract or distilled representations of real world, business or gaming situations in traditional or trans-media applications, to aid the communication and understanding of existing, conceptual or proposed scenarios. Predominantly focused around the representation of processes, roles, data, organization and time. Models may be used to represent a subject at varying levels of detail and decomposition. **Level 2 Description:** Understands the purpose and benefits of modelling. Uses established techniques as directed to model simple subject areas with clearly defined boundaries. May assist in more complex modelling activities. Develops models with input from subject matter experts and communicates the results back to them for review and confirmation.
C2-4.1	Stakeholder Requirement Analysis	Demonstrate understanding of stakeholder requirements analysis	**BLOOM BTM=3**

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
C2-4.2	Business Process Improvement	Describe business process improvement or re-engineering process	**BLOOM BTM=3**
C2-4.3	Business Process Design	Demonstrate understanding of Business Process notations/symbology – BPMN, UML	**BLOOM BTM=3**
C2-4.4	Quality Assurance	Demonstrate understanding of quality assurance and testing, go-live, end of life, life cycle management, ticket management (help desk).	***SFIA-QUAS=3 (Quality Assurance)*** **Introduction to this skill:** The process of ensuring that the agreed quality standards within an organization are adhered to and that best practice is promulgated throughout the organization. **Level 3 Description:** Uses appropriate methods and tools in the development, maintenance, control and distribution of quality and environmental standards. Makes technical changes to quality and environmental standards according to documented procedures. Distributes new and revised standards.
C2-4.5	New Process Implementation	Demonstrate understanding of new process implementation and maintenance.	**BLOOM BTM=3**

Ref (1)	Title (2)	Learning Outcome (3)	Competency Standard (4)
C2.5	Knowledge Management	Be able to explain the importance of knowledge transfer, development, and dissemination for both explicit and tacit knowledge	**BLOOM BTM=2**

6.4 Workplace Experiences and Industry Involvement

The BTM places a premium on workplace experiences. Its learning outcome requirements are and will continue to be designed with significant employer input. Since employers prefer BTM graduates who have applicable experience, educators offering the BTM will need to work with employers in a variety of ways, for which they will require the time and organizational resources.

Specifically, an accredited BTM program will provide for the following:

- An Advisory Committee consisting of employer representatives from a variety of sectors
- Mechanisms to support students in finding relevant and appropriate business experiences
- Engagement with industry through networking events, “real life” case competitions, mentoring, employer lectures, and the like

6.5 Resources

All the disciplines in an accredited program must have buildings, offices, laboratories, equipment, support staff, and fiscal resources that are appropriate for the characteristics of the program that is being undertaken. Evidence to this effect should be presented.

The availability of sufficient resources and support staff is of vital importance to the BTM aspect of the program. An appropriate variety of facilities must be readily accessible to all students and faculty, and access should be provided not only during scheduled laboratory class hours but also at other times.

The program must have competent administrative and technical support and services. Salary budgets must be consistent with the faculty size and student enrolment. Current expense budgets must allow reasonable amounts of travel and supplies. Computer budgets must allow students and faculty enough computer time that they use it as an effective learning aid.

There must be adequate access to electronic and other reference resources, such as digital libraries. The collections must be maintained and refreshed so as to remain current, and there must be a breadth of materials included. Electronic networking sufficient to provide students and faculty access to external resources is also important.

Suitable quality indicators for the self-assessment and accreditation report include the following, all assessed relative to the student population

• Budget for resources

• Computers and software in labs (if applicable)

• Numbers and levels of expertise of technical and support staff

• Satisfaction of students and faculty with the resources available

• Sufficiency of the resources to teach the courses discussed in the Curriculum section, and to meet the Learning Outcomes

To evaluate the quality of resources, the visiting team will inspect them while touring the facilities, and will interview students, staff and faculty. The team will also study budgets and policies in place for ensuring the resources are maintained and replaced as they become obsolete.

Appendix A: Details and background on Competency Standards

Defining competency standards vs. providing guidance

The definition of the BTM is forward looking and seeks to leverage professional competency models as fully as possible to describe competency requirements in version 1.0 of the BTM.

However, some professional models are not yet mature enough to provide a competency standard whose achievement can be tested and measured.

We have used these less mature models to provide guidance – i.e. the model, in general terms, is directionally aligned with employer needs but lacks sufficient detail to be used to set a specific competency standard.

Later versions of the BTM learning outcomes and competency standards will use improved versions of the professional bodies' models as these become available.

Overview of professional body models

1. ***SFIA***. Provides the largest number of "doing" competency standards, mostly in the Technology knowledge area.

   A later version of the learning outcomes may use a Canadian equivalent[4] should one become available.

   For specific learning outcomes, specific SFIA skills are referenced for guidance.

2. ***PMI***. PMI competency models are not used to define specific competency standards for individual learning outcomes. This is because they are built from the perspective of a certified project manager (i.e. an individual holding the PMP designation) – above the expected maturity of competency of a BTM graduate.

   The PMI does have a junior certification, the Certified Associate in Project Management (CAPM). The CAPM certification demonstrates an understanding of the fundamental knowledge, processes and terminology of project management (see PMBOK and PMBOK Guide) that are needed for effective project management performance. CAPM is a standard that BTM graduates can realistically attain.

[4] Three approaches to defining maturity of competency are currently taken by industry bodies:

- Skill by skill (e.g. the UK based – SFIA and MSC)
- Role by role (e.g. the Canadian based Information and Communications Technology Council - ICTC ICT Competency Profiles Framework
- Discipline by discipline (e.g. the UK based e-skills PROCOM. Built on IT professional National Occupational Standards, PROCOM defines knowledge, understanding and competencies for seven broad disciplines (and their sub-disciplines) at five levels of progression, incorporating technical, business and personal skills. e-skills PROCOM Overview and Diagram

The skill by skill approach has been found to be more flexible and maintainable by the professional bodies themselves, and most have plans to move in this direction, if they don't already take this approach. Further, from a BTM perspective, it is much easier to map skills, rather than the positions (aka rungs on the career ladders) to individual learning outcomes. For this reason skill by skill models from elsewhere are being used to define the competency standards at this time, even if a Canadian model exists covering the same professional domain.

We recommend that BTM students who have an interest in project management write the CAPM examination during their final year of study. This will illustrate their commitment to the project management to potential employers.

CAPM spans multiple learning outcomes in the Personal and Interpersonal, Process, Projects and Change and Integrative Knowledge areas. PMI-CAPM is indicated on the applicable learning outcomes.

The following PMI documents / sections of documents have been consulted for BTM learning outcomes and competency standards:

- PMBOK and PMBOK Guide
- PMCDF (especially chapters 2 and 3 that define professional and personal competency requirements for project management)
- PMI PathPro Job Ladder Title Project Manager I (the most junior level)

These PMI documents span the same learning outcomes as CAPM. As guidance PMI-PMCDF, PMI-BABOK, and PMI-Project Manager I is indicated on the applicable learning outcomes.

3. ***IIBA***. At this time the IIBA Career Ladder does not define specific competency standards.

   However, the IIBA Business Analysis Body of Knowledge (BABOK) in general, the BABOK Chapter 8 - Underlying Competencies, and the definition of the Business Analysis role (the most junior) on the Business Analysis Career ladder have been consulted during the development of the learning outcome and competency standards.

   We strongly recommenced these be consulted for guidance on the meaning of, and competency requirements for the relevant learning outcomes.

   As the IIBA Career Ladder and associated skills and competency models mature, subsequent versions of BTM learning outcomes will define competency standards based on these refined models.

4. ***MSC***. Used to define “doing” competency standards in the Personal and Interpersonal and Integrative knowledge areas.

   A later version of the learning outcomes may use a Canadian equivalent should one become available.

   The National Occupational Standards (NOS) for Management and Leadership has been consulted during the development of the learning outcomes and competency standards. We recommenced this be consulted for guidance on the meaning of, and competency requirements for the relevant learning outcomes.

Details of Professional Bodies’ Models use to Define Competency Standards

The following describes, for those professional bodies whose models are used to define competency standards (not guidance), how each model is specifically used.

Skills Framework for the Information Age

The SFIA model defines 7 skill levels and provides detailed descriptions of the applicable skill levels for each of approximately 100 skills grouped into 6 categories. 20 of these skills, from all 6 of the categories, are used to define competency standards.

The skill level selected to define the competency standard varies by skill – but is always towards the junior end of the 7 levels (e.g. 2 – assist, 3 – apply, 4 – enable).

For a learning outcome with a SFIA related competency standard the SFIA 4 character skill code (e.g. DTAN for Data Analysis, PROG for Programming) is quoted along with the required skill level number.

For example SFIA-BSMO=3 should be taken to mean that competence in a learning outcome can be demonstrated by achieving level 3 (Apply) of the SFIA framework in Business Modelling (BSMO).

Management Standards Centre

The MSC National Occupational Standards (NOS) model defines 6 broad skill sets (from junior to senior) and provides detailed descriptions of the applicable skill sets for each of approximately 74 skills (known as units). 5 of these skills are used to define competency standards.

The skill level selected to define the BTM competency standard varies – but is always towards the junior end of the 6 broad skills sets (e.g. 1 – Team Leader or 2 – First Line Manager).

For a learning outcome with a MSC NOS related competency standard the NOS 2 character skill code (e.g. A1 for Manage Your Own Resources) is quoted along with the required skill set (e.g. TL for Team leader, or FL for First Line Manager).

For example MSC-A1=TL should be taken to mean that competence in a learning outcome can be demonstrated by achieving Team Leader of the MSC NOS skill Manage Your Own Resources (A1).

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