

**BTM LO Annotations: Standard and Specializations (Data Analytics and Financial Services)**

Line	Code1	Code2	Learning Outcome (LO)	BTM Standard	BTM Specialization in Data Analytics	BTM Specialization in Financial Services
1	I	1.0.	Integrative			
2	I1	1.1.	Project Management	Demonstrate the ability to understand and analyse 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.	Integrate Project Management (PM) best practices within a Data Analytics context, with a keen understanding of the analytics Work Breakdown Structure, and the complexity and uncertainty of certain analytics tasks.	Integrate Project Management (PM) best practices within a financial services organization, helping to customize generic IT PM standards for the organization, and adapting project leadership skills to the particularity of IT governance in financial institutions, constantly handling high stakes, high risk, and high complexity.
3	I2	1.2.	Business Analysis	Business analysis is a core competency that all great analytics practitioners must display.	Integrate Business Analysis best practices within a Data Analytics context, understanding how analytics fits within business operations, and how to leverage insight for decision-making.	Integrate Business Analysis best practices within a financial services organization, helping to develop a true partnership between financial services and technology professions, to support diverse professions and stakeholders in learning from the value of IT, and its value for financial management tasks and processes.
4	I3	1.3.	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.	Integrate Business Process Management (BPM) best practices within a Data Analytics context, integrating analytics in support of process automation, and reusing analytics services creatively for process innovation.	Integrate Business Process Management (BPM) best practices within a financial services organization, helping to overcome the silo mentality associated with more conservative businesses, to generate a taste or willingness for change, and helping to leverage BPM tools and methods for organizational performance.

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5	I4	1.4.	Enterprise Architecture	Demonstrate the ability to design and communicate a moderately complex technology-enabled solution to a business problem.	Integrate Enterprise Architecture (EA) best practices within a Data Analytics context, understanding the interdependencies between architecture layers to deliver analytics value.	Integrate Enterprise Architecture (EA) best practices within a financial services organization, helping to translate the complexity of interactions between the various architecture layers of the whole organization, and rely on leading edge standards and patterns applied by the best in the industry segment.
6	I5	1.5.	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.	Integrate Technology Management best practices within a Data Analytics context, advising on every lifecycle steps in managing an analytics solutions.	Integrate Technology Management best practices within a financial services organization, helping to improve IT services management while ensuring conformity with governance and regulatory obligations of financial firms, and tapping on the latest IT trends to ensure more flexible solutions, such as cloud services and big data analytics.
7	I6	1.6.	Technology Assessment	Demonstrate the ability to examine a new technology, understand its strengths and weaknesses, evaluate its usefulness to solve business problems, and communicate the results.	Integrate Technology Assessment best practices within a Data Analytics context, remaining abreast of the latest IT solutions available for analytics projects.	Integrate Technology Assessment best practices within a financial services organization, helping both the IT and financial professions to stay abreast of the latest IT in various industries, and how they can be used innovatively in the context of financial processes, always trying to find better solutions to serve end-users, financial clients, and industry stakeholders.

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8	I7	1.7.	Design Thinking	Exhibit an understanding of how to use the 5 key elements of the design-thinking framework for future projects and initiatives.	Integrate Design Thinking best practices within a Data Analytics context, creating innovative designs for analytics solutions, especially for insight discovery and visualization.	Integrate Design Thinking best practices within a financial services organization, helping to conceive business technology solutions that rely on both innovative technology and original business ideas, strengthening the overall solution or model by relying on solid design principles, and reflecting the capability for change specific to the financial institution.
9	I8	1.8.	Communicate Business Value	Demonstrate understanding of how to effectively communicate the value of current and new projects in a concise and compelling way.	Integrate Value Communication best practices within a Data Analytics context, helping various professions discover the value from hidden business insight, and develop a culture for analytics throughout the organization.	Integrate Value Communication best practices within a financial services organization, helping to translate technology and business knowledge and priorities, supporting project leaders and governance instances in properly gauging the value, direction, and progression of projects, while creating consensus to foster a spirit of action and due diligence proper to a financial institution.
10	F1	2.0.	Personal and Interpersonal			
11	F1-1	2.1.	Self-Awareness	Demonstrate self-awareness and self-management, including initiative, mastery of ethical reasoning, client relationship management, business courtesies and self-presentation.	Position analytics as an emerging transdisciplinary competency area, well aware of its integration within the IT profession, but actively blending the perspectives of various professions contributing to its body of knowledge.	Position IT and financial professionals as equal partners, finding equilibrium even when a key profession may be dominant within the organization, leveraging IT as enabler of innovative financial products and services, and demonstrating leadership and initiative beyond traditional IT roles.

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12	F1-2	2.2.	Communication	Demonstrate proficiency in listening, oral and written communications skills in a business context	Speak the language of various professionals, helping to translate technology and business requirements, and sharing expertise in implementing analytics solutions.	Speak the language of financial professionals, with current knowledge of the distinctive strategic and operational challenges of the industry, including such complex issues as quantitative analysis, value-at-risk, service and portfolio performance, regulatory compliance, and competitiveness.
13	F1-3	2.3.	Workplace Diversity	Demonstrate understanding of the strengths of a diverse workplace (including ability, ethnicity, religion, gender, sexual orientation, age/generation).	Develop common values with professionals from all around the globe, showing respect for the diversity of the analytics profession in different countries, and cultural sensibility in multinational organizations and/or involving international customers, where trust is a key element of service delivery.	Develop common values with financial professionals from all around the globe, showing respect for the diversity of the financial services industry in different countries, and cultural sensibility in multinational organizations and/or involving international customers, where trust is a key element of service delivery.
14	F1-4	2.4.	Interpersonal Relations	Demonstrate proficiency in working with individuals, including giving and receiving feedback and resolving differences using appropriate negotiation and conflict management skills.	Perform tasks diligently under stress, responding positively to criticism from professions with various perspectives (qualitative vs. quantitative, individual vs. team-based), and sharing responsibility where analytics solutions require diverse expertise.	Perform tasks diligently under stress, responding positively to criticism from professions with a quantitative approach, keeping focus throughout complex financial services processes, and sharing responsibility for highly critical processes, such as handling financial transactions that may put the organization at risk at any moment.

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15	F1-5	2.5.	Teamwork	Demonstrate proficiency in leading workplace teams (within or between organizations), including the ability in the four following areas:	Take part in multidisciplinary teams, involving diverse technical and analytics professions, along with customer and partner representation, so as to effectively provide IT expertise in support of business, and reflect a keen understanding of the shared responsibility and accountability of mission-critical analytics solutions.	Take part in multidisciplinary teams, involving diverse technical and financial professions, along with customer and partner representation, so as to effectively provide IT expertise in support of business, and reflect a keen understanding of the shared responsibility and accountability of work teams within financial institutions.
16	F1-5.1	2.5.1.	Persuasion	Demonstrate the ability to persuade, influence, motivate and provide guidance.	Convince coworkers and management by using and/or interpreting analytics astutely, leading by example in accessing and relying on the best data and most intelligent solutions, with a keen understanding of risk and performance, while creating trust by showing respect towards the analytics capabilities of various professions.	Convince financial professionals by using and/or interpreting quantitative analysis astutely, leading by example in accessing and relying on the best data and most intelligent solutions, with a keen understanding of risk and performance, while creating trust by showing respect towards diverse financial professions.
17	F1-5.2	2.5.2.	Decision Making	Demonstrate the ability to facilitate a range of group innovation, analysis and decision making techniques.	Contribute to IT-related decisions by linking technology, operational, management, and strategic facets, focusing on the value from analytics and hidden business insight, its impact on performance, and proposing solutions that fit the organization's culture.	Contribute to IT-related decisions by linking technology, operational, management, and strategic facets, focusing on value-at-risk and performance, while proposing solutions that fit the organization's risk culture, and a concern for the business value of IT from the viewpoint of financial services customers.

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18	F1-5.3	2.5.3.	Leadership	Demonstrate the ability to engender and sustain trust.	Engage both IT and analytics professionals to share common goals, exploiting hybrid interpretation skills for addressing the complex interdependencies between technology and advanced analytics tasks, and distinguishing oneself by conceiving innovative solutions that surpass results from traditional approaches.	Engage both IT and financial professionals to share common goals, exploiting hybrid interpretation skills for addressing the complex interdependencies between technology and financial service, and distinguishing oneself by conceiving innovative solutions that surpass results from traditional approaches.
19	F1-5.4	2.5.4.	Communication Technologies	Demonstrate the ability to effectively use technologies to facilitate and support group activities and processes.	Lead by example in teaching diverse analytics professionals how to leverage seamless IT-based communications for leveraging data and analytics expertise, especially in organizations with a conservative culture, primarily by demonstrating the value of new technologies, while ensuring keeping organizations human-friendly and ensuring trust and reliability.	Lead by example in teaching financial professionals how to leverage seamless IT-based communications, especially in organizations with a conservative culture, primarily by demonstrating the value of new technologies, while ensuring keeping organizations human-friendly and ensuring trust and reliability.
20	F1-6	2.6.	Negotiation	Be able to explain the various approaches to effective negotiation.	Understand the diversity of positions and potential conflicts among the various units, professions, and stakeholders involved in developing and managing analytics processes and systems, and identify the various negotiation strategies used to overcome obstacles to	Understand the diversity of positions and potential conflicts among the various units, professions, and stakeholders within a financial institution, and identify the various negotiation strategies used to overcome obstacles to IT management to meet organizational goals.

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					IT management to meet organizational goals.	
21	F1-7	2.7.	Coordination Skill	Demonstrate understanding of effective coordination of communications, time management, and task prioritization.	Coordinate tasks among colleagues through a keen appreciation of the due diligence required in analytics processes and solutions, along with a clear perspective in how tasks and delays must be communicated to different groups, while maintaining balance and equity among groups sharing work tasks.	Coordinate tasks among colleagues through a keen appreciation of the due diligence required in financial administration, along with a clear perspective in how tasks and delays must be communicated to different groups, while maintaining balance and equity among groups sharing work tasks.
22	F2	3.0.	Business			
23	F2-1	3.1.	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.	Understand the impact of the emerging analytics capabilities of organizations for economic development, and the critical impact of IT and analytics technologies on customer information and the industry.	Understand the impact of the financial services industry for economic development, the critical impact of IT on customer information and the industry, and the complexity of shareholder value, customer performance, and social responsibility toward stakeholders in financial institutions of various segments in the industry.
24	F2-2	3.2.	Business Models	Demonstrate understanding of technology-enabled business design (e.g., digital business models including "platforms", supply networks,	Position IT and analytics as core enablers and competitive differentiators within business models, showing how the organization can respond to rapid industry and	Position IT as a core enabler and competitive differentiator within business models specific to the financial services industry, showing how the organization can respond to rapid industry and technological

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				collaborative/proprietary innovation, disruptive innovation).	technological changes, and emphasizing innovation in leveraging and using IT for smarter services and processes.	changes, and emphasizing innovation in leveraging and using IT for smarter financial services and processes.
25	F2-3	3.3.	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, disruptive markets entrants, cyber threats, peak oil).	Manage IT-related risk and interpret sources of business insight, relying on analytics models adapted to the risk culture of specific industries, integrating IT risk factors within broader Governance, Risk, and Compliance Management (GRCM) processes, and conforming to industry standards.	Manage IT-related risk and interpret financial and operational risk, relying on risk models adapted to the risk culture of specific financial institutions and industry segment, integrating IT risk factors within broader Governance, Risk, and Compliance Management (GRCM) processes, and conforming to industry standards.
26	F2-4	3.4.	Strategic Management	Demonstrate understanding of the structure of various kinds of organizations by industry sector, ownership, governance and size - their business models, key performance factors, dominant structures and processes.	Assess the value of IT and analytics capabilities for strategy building and implementation in various industries, analyzing performance both quantitatively and qualitatively, while showing how IT and analytics can advance the organization's strategic goals and competitiveness in a global industry.	Assess the value of IT for strategy building and implementation in various financial institutions and industry segments, analyzing performance both quantitatively and qualitatively, while showing how IT can advance the organization's strategic goals and competitiveness in a global financial services industry.



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27	F2-5	3.5.	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)	Integrate the IT and analytics concerns of both service line and support functions, conceiving cross-functional processes that fully leverage analytics capabilities for business value in all divisions, while addressing the complexity and value contribution of support functions in operations.	Integrate the IT concerns of both service line and support functions, conceiving cross-functional processes that fully leverage IT for business value in all divisions, while addressing the complexity and value contribution of support functions in service delivery of financial institutions in various industry segments.
28	F2-6	3.6.	Value Chain	Demonstrate understanding of the role, processes and structures of operational functions of a business (e.g. sales, manufacturing, distribution, customer support).	Understand how analytics can help strengthen an organization, and possibly help change the landscape, of industry dynamics and competitiveness, while identifying how IT and analytics capabilities of various organizations impact their respective strategic focus, while impacting the performance of a particular organization in the value chain.	Understand the industry dynamics, competitiveness, and interdependencies among financial institutions of a specific industry segment, identifying how the IT capabilities of various organizations impact their respective strategic focus, while impacting the performance of a particular organization in the financial value chain.
29	F3	4.0.	Technology			
30	F3-1	4.1.	IT Trends	Be able to explain the current and future issues relating to IT Trends, etc.	Observe IT trends that impact on analytics, throughout various industries, by staying abreast of the latest development, and helping the organization assess the value of trend adoption or following.	Observe IT trends throughout various industries, and across the various segments of the financial services industry, by staying abreast of the latest development, and helping the organization assess the value of trend adoption or following.

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31	F3-1.1	4.1.1.	IT Operations	IT operations (e.g. delivery of service levels, change control, green IT).	Manage IT operations applying the latest best practices and technologies to specific requirements of the analytics runtime environment, with concerns for the criticality of intelligence reliability and business continuity, and constant challenges of risk prevention, information privacy, cybersecurity, and regulatory conformity.	Manage IT operations applying the latest best practices and technologies to specific requirements of the financial services industry, with concerns for the criticality of transaction integrity and business continuity, and constant challenges of risk prevention, information privacy, cybersecurity, and regulatory conformity.
32	F3-1.2	4.1.2.	Software Development	Software development (e.g. methodologies, lifecycle, emerging techniques, [e.g., machine learning], usability, in-house vs. off the shelf / total cost of ownership).	Help customize the latest trends in software development, such as agile methods and Platform as a Service (PaaS), by analyzing the impact of these new methods and technologies for data analytics applications.	Help customize the latest trends in software development, such as agile methods and Platform as a Service (PaaS), by analyzing the impact of these new methods and technologies for financial institutions, finding opportunities to rapidly solve financial processes, and proposing innovative approaches to deliver solutions.
33	F3-1.3	4.1.3.	Infrastructure Lifecycle	Infrastructure lifecycle (networks, desktop and data centre hardware, operating systems, databases).	Understand the lifecycle of IT infrastructure required for data analytics, the limits it imposes on application development and service reliability, the quality and cost-of-non-quality these impose on IT services, decision-making processes and their end-users, as well as to IT strategy and budgets.	Understand the lifecycle of IT infrastructure generally found in financial services (e.g., mainframes), the limits it imposes on application development and service reliability, the quality and cost-of-non-quality these impose on IT services, financial service processes, and their end-users, as well as to IT strategy and budgets.

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34	F3-1.4	4.1.4.	Technology Lifecycle	Overall application and technology landscape lifecycle (e.g. make technology choices that will ease the integration of unpredictable future technologies).	Understand the technology lifecycle of key solutions specific to data analytics, identifying the potential and limits of emerging trends that can help unlock the value of information previously difficult to integrate in analytics.	Understand the technology lifecycle of key solutions specific to the financial services industry (e.g., payment systems), envisioning the interdependencies between various organizations throughout value-chains of each segment, and identifying the potential and limits of emerging trends that disrupt risk-averse industry forces.
35	F3-1.5	4.1.5.	Contemporary Technology Lifecycle	Current and emerging technologies, their business impacts and methods (e.g. big data, machine learning, cloud computing, mobile, social media, robotics, Internet of Things) .	Understand the lifecycle of contemporary or emerging new technologies (e.g., merging data and text analytics), how they impact decision-making, which business processes are best candidates to apply emerging technologies, their cost-effectiveness and performance impact, and feasibility given industry risk culture.	Understand the lifecycle of contemporary or emerging new technologies (e.g., data and text analytics), how they impact financial institutions, which financial services processes are best candidates to apply emerging technologies, their cost-effectiveness and performance impact, and feasibility given industry risk culture.
36	F3-1.6	4.1.6.	E-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., HTML, CSS etc.; Scripting, such as JavaScript Web APIs; Graphics such as SVG WebGL, etc; Other Web authoring tools; and, Web analytics tools.	Manage IT projects involving e-business technologies (e.g., analytics for Customer Relationship Management, CRM), assessing their impact on the architecture of business processes and decision-making, the changes necessary to practices of various analytics professions, and the potential for developing competitive advantages from organizational innovation.	Manage IT projects involving e-business technologies (e.g., Customer Relationship Management), assessing their impact on the architecture of financial services, the changes necessary to practices of various financial professions, and the potential for developing competitive advantages from organizational innovation.

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37	F3-1.7	4.1.7.	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.	Manage IT projects where traditional business processes are being converted as hybrid physical/digital or purely digital business (e.g., mobile banking), integrating the concerns of various analytics professions and end-users, and analyzing the functional and non-functional requirements within the scope of intelligence functionalities and decision-making automation.	Manage IT projects where financial services are being converted as hybrid physical/digital or purely digital business (e.g., mobile banking), integrating the concerns of various financial professions and end-users, and analyzing the functional and non-functional requirements within the scope of financial services strategies.
38	F3-1.8	4.1.8.	Digital Marketing	Demonstrate understanding of Digital Business concepts and the tools which support them including computer and mobile solutions for Market research and analysis; Search engine optimization (SEO); Social media marketing (SMM - blogging, LinkedIn, Twitter, etc); Online advertising tools (such as Google Adwords); and applications in various functional areas (e.g., marketing, sales, collaborative business processes, operational information management); analytics and scorecards.. Digital marketing programs; Marketing automation; Measurement and web performance optimization.	Manage IT projects involving hybrid physical/digital or purely digital marketing methods, where new intelligent features can help enhance functionality (e.g., mobile and context-aware advertising), analyzing the value proposition end-users, and relating these technologies to marketing principles and legal constraints specific to each industry, where intelligence is often constrained by access to information and third party data services.	Manage IT projects involving hybrid physical/digital or purely digital marketing methods (e.g., mobile and context-aware advertising), analyzing the value proposition to financial services customers and end-users, and relating these technologies to marketing principles and legal constraints specific to financial institutions.

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39	F3-2	4.2.	IT Solution Design	Demonstrate the ability to meet business requirements by planning, designing, integrating into an existing landscape, implementing, configuring and operating contemporary technologies.	Design complex applications for data analytics, integrating the knowledge of both technology and business experts, while advising on the most appropriate solution design given the specific risk and innovation culture of the industry.	Design complex applications for financial institutions, integrating the knowledge of both technology and business experts, while advising on the most appropriate solution design given the specific risk and innovation culture of a financial institution.
40	F3-2.1	4.2.1.	Requirements Analysis	Demonstrate the ability to perform Requirements Analysis, whether as individual tasks or in a team, so as to capture the complexity of business operations, and ensure a proper alignment of technology to end-user and organizational needs.	Analyze functional and non-functional requirements of various IT projects, especially in the context of app development and extension, integrating the concerns of various analytics professions and end-users, developing expertise at translating and formalizing business needs, and identifying innovation opportunities.	Analyze functional and non-functional requirements of various IT projects, especially in the context of app development and extension, integrating the concerns of various financial professions and end-users, developing expertise at translating and formalizing business needs, and identifying innovation opportunities.
41	F3-2.2	4.2.2.	Networking	Exhibit knowledge of the various network and computing platforms for business operations of various sizes and scopes.	Analyze the network requirements and/or implications within IT projects, understanding the latest network technologies both generic and specific to analytics and big data solutions, with special concerns for cybersecurity, privacy and business continuity challenges related to both data analytics and the delivery of business intelligence.	Analyze the network requirements and/or implications within IT projects, understanding the latest network technologies both generic and specific to financial institutions, with special concerns for cybersecurity, privacy and business continuity challenges that any IT project must address within financial institutions.

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42	F3-2.3	4.2.3.	Custom Software	Demonstrate understanding of custom software solutions (implemented locally or in the cloud), and the development efforts typically involved for the organization.	Analyze the needs for custom software development within data analytics projects, taking in consideration infrastructure and application maintenance lifecycle within this rapidly changing technology space, the cost-effectiveness of custom development relative to decision-making requirements changes, and the specific innovation vs. risk-avoidance culture.	Analyze the needs for custom software development within IT projects, taking in consideration infrastructure and application maintenance lifecycle within the financial services industry, the cost-effectiveness of custom development relative to regulatory compliance, and the specific innovation vs. risk-avoidance culture.
43	F3-2.4	4.2.4.	Packaged Software	Exhibit knowledge of various types of packaged software solution (implemented locally or in the cloud), the costs and benefits typically offered to organizations, and the challenges of procuring, implementing, and maintaining such applications.	Analyze the needs for packaged software procurement within data analytics projects, taking in consideration IT strategies within the organization, relying on the latest knowledge and benchmarking of IT vendors both generic and specific to various analytics technologies, and challenges of app implementation in the organization.	Analyze the needs for packaged software procurement within IT projects, taking in consideration IT strategies within the industry segment of the financial institution, relying on the latest knowledge and benchmarking of IT vendors both generic and specific to the sector, and challenges of app implementation in the organization.
44	F3-2.5	4.2.5.	Technology Architecture	Exhibit an understanding of technology architecture, and the various IT runtime infrastructures available to organizations of varying sizes to implement IT solutions.	Analyze the needs for a specific or combination of technology architectures within data analytics projects, taking in consideration the enterprise architecture standards related to analytics and intelligence, and identifying opportunities for cost-effective renewal through	Analyze the needs for a specific or combination of technology architectures within IT projects, taking in consideration the enterprise architecture standards of the financial institution and its industry segment, and identifying opportunities for cost-effective renewal through innovative

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					innovative architectures (e.g., big data through cloud).	architectures (e.g., cloud computing).
45	F3-3	4.3.	IT Security and Compliance	Demonstrate an understanding of IT security and compliance, as well as organizational data governance.	Ensure data analytics projects are fully compliant with IT security policies and regulatory obligations, as a shared responsibility of interdisciplinary teams, where high risk, high stake, and high reliability decision-making processes must be supported, while ensuring regulatory agencies can rely confidently on IT and analytics experts in the organization to maintain security controls and regulations.	Contribute to IT security and regulatory compliance tasks, as a shared responsibility of work teams within financial institutions, where high risk, high stake, and high reliability conditions must be maintained, while ensuring financial regulatory agencies can rely confidently on IT experts in the organization to maintain security controls and regulations.
46	F3-3.1.	4.3.1.	Information Security or Cyber Security	Demonstrate understanding of management of, and provision of expert advice on, the selection, design, 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.	Manage IT functions related to information security and broader cybersecurity, ensuring data analytics projects and their requirements meet standards of the organization and its industry, and developing a culture of discipline, alertness, and diligence throughout the IT division and among the various analytics professions.	Manage IT functions related to information security and broader cybersecurity, ensuring IT projects and their requirements meet standards of the financial institution and its industry segment, and developing a culture of discipline, alertness, and diligence throughout the IT division and among the various financial professions.

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47	F3-3.2	4.3.2.	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 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.	Participate in audits of IT solutions supporting various decision-making processes backed by analytics solutions, ensuring audit methods rely on standards of the organization and its industry, working within prescribed IT strategies and policies, while harmonizing end-user requirements, regulatory compliance, and performance expectations of decision-making and intelligence functions.	Participate in audits of IT solutions supporting various financial service processes, ensuring audit methods rely on standards of the financial institution and its industry segment, working within prescribed IT strategies and policies, while harmonizing end-user requirements, regulatory compliance, and performance expectations.
48	F3-3.3	4.3.3.	Privacy	Exhibit an understanding of federal and provincial privacy laws and their impact on IT operations within an enterprise.	Analyze the privacy requirements of data analytics projects, ensuring requirements meet standards of the organization and its industry, advising on privacy-enhancing IT solutions, and developing a culture of discipline, alertness, and diligence throughout the IT division and among the various analytics professions.	Analyze the privacy requirements of IT projects, ensuring requirements meet standards of the financial institution and its industry segment, advising on privacy-enhancing IT solutions, and developing a culture of discipline, alertness, and diligence throughout the IT division and among the various financial professions.



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49	F3-3.4	4.3.4.	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	Participate in IT Governance, Risk, and Compliance Management (GRCM) processes, conforming to generic standards as well as those of the organization and its industry, with keen awareness of risk exposure in decision-making, industry regulations, and senior IT leadership.	Participate in IT Governance, Risk, and Compliance Management (GRCM) processes, conforming to generic standards as well as those of the financial institution and its industry segment, with keen awareness of risk exposure in financial asset management, financial industry regulations, and senior IT leadership in the sector.
50	F3-4	4.4.	Information Management	Demonstrate the ability to develop the role, management and uses of information.	Master information management methods and techniques in the context of data analytics projects, especially by understanding the diverse sources and relevance of intelligence sources, their link to operational and strategic decision making, and the insight that can be delivered by improving their processing and analytics, relying on the latest IT solutions available to the industry.	Master information management methods and techniques in the context of financial services, especially by understanding the diverse sources and relevance of financial information, their link to operational and strategic decision making, and the insight that can be delivered by improving their processing and analytics, relying on the latest IT solutions available to the financial services industry.
51	F3-4.1	4.4.1.	Business Intelligence	The role of information and data to support operations, decision making, planning and risk management.	Analyze the needs for Business Intelligence (BI) technologies within IT projects, staying abreast of how diverse analytics professions leverage the latest and most innovative IT solutions for business reporting, dashboard mashups, data and predictive analytics, text mining and	Analyze the needs for Business Intelligence (BI) technologies within IT projects, staying abreast of how financial professions leverage the latest and most innovative IT solutions for business reporting, dashboard mashups, data and predictive analytics, text mining and contents analytics, and business rules management.

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					contents analytics, and business rules management.	
52	F3-4.2	4.4.2.	Decision Support Systems	Demonstrate the ability to model, prepare, and structure data to support the creation and use of information and knowledge.	Analyze the needs for the development or extension of Decision Support Systems (DSS) within IT projects, taking in consideration the complexity of real-time and team-based decision making in the organization and its industry, and the integration of DSS within the enterprise Governance, Risk, and Compliance Management (GRCM).	Analyze the needs for the development or extension of Decision Support Systems (DSS) within IT projects, taking in consideration the complexity of real-time and team-based decision making in financial professions, and the integration of DSS within the enterprise Governance, Risk, and Compliance Management (GRCM).
53	F3-4.3	4.4.3.	Data Warehousing	Describe technologies for information management (e.g. reporting, analysis), knowledge management, collaboration management and content management.	Analyze the needs for Data Warehousing (DW) technologies within IT projects, staying abreast of the latest advances in database technologies with most impact in analytics solutions (e.g., big data and parallel processing, column-oriented, stream processing, ontology triple stores), and the potential for new DW for business intelligence.	Analyze the needs for Data Warehousing (DW) technologies within IT projects, staying abreast of the latest advances in database technologies with most impact in the financial services industry (e.g., big data, column-oriented, stream processing, ontology triple stores), and the potential for new DW for business intelligence.
54	F4	5.0.	Innovation			

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55	F4-1	5.1.	Opportunity Identification	Demonstrate understanding of how to use various approaches to generate new opportunities for projects, processes, and initiatives	Identify opportunities to leverage data analytics in creating new product and service models, new decision-making and business processes, new IT solutions to support and improve analytics professions and their tasks, and new ways of using information, intelligence, and communication tools to improve service quality and productivity.	Identify opportunities to leverage IT in creating new financial service models, new financial management processes, new IT solutions to support and improve existing financial analysis tasks, and new ways of using information and communication tools to improve service quality and productivity.
56	F4-2	5.2.	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)	Validate the value creation potential of innovative data analytics projects, taking into account the diverse facets of and beyond financial performance, putting both the end-user and organization's stakeholders at the centre of value realization, while ensuring proper alignment with the business model and logic driving the enterprise.	Validate the value creation potential of innovative projects, taking into account the diverse facets of and beyond financial performance, putting both the end-user and financial services client at the centre of value realization, while ensuring proper alignment with the business model and logic driving the enterprise.
57	F4-3	5.3.	Resourcing	Exhibit an understanding of how to organize and manage resources necessary to move forward with an initiative, including considerations of people, finances, and intellectual property (IP); how to optimize the contributions of IT to competitive strategy, innovation, decision-making and operations in various sizes and types of organizations,	Analyze existing uses of data analytics within the organization and its industry, compared to other industries and organizations, by pinpointing the strengths and weaknesses of competitors in various industry segments, and understanding how the build-up of innovative resources and dynamic	Analyze existing uses of IT in financial services, compared to other industries and organizations, by pinpointing the strengths and weaknesses of competitors in various financial industry segments, and understanding how the build-up of innovative resources and dynamic capabilities help tilt this balance in favour of the organization.

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				industry sectors, processes and functions.	capabilities help tilt this balance in favour of the organization.	
<b>58</b>	C1	6.0.	Technology in Business			
<b>59</b>	C1-1	6.1.	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.	Translate the multi-faceted benefits of IT and data analytics in terms of business value, linking direct and indirect impacts on process and enterprise performance in the context of the organization's strategy, and formulating analytics value propositions that fit the decision making framework of different industries.	Translate the multi-faceted benefits of IT in terms of business value, linking direct and indirect impacts on process and enterprise performance in the context of a financial institution, and formulating IT value propositions that fit the value-at-risk decision making framework of different industry segments.
<b>60</b>	C1-2	6.2.	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.	Integrate all the dimensions of end-user experience in analytics processes, with balanced concern for productivity/quality and ergonomics/friendliness of data analytics solutions, while fitting the end-user perspective with the performance and risk culture of the organization and its industry, along with concern for the priority given to security and conformity.	Integrate all the dimensions of end-user experience in financial services, with balanced concern for productivity/quality and ergonomics/friendliness of IT solutions, while fitting the end-user perspective with the performance and risk culture of financial institutions, and the priority given to security and conformity.

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61	C1-3	6.3.	Innovation Management	Be able to explain the innovation process, and how to introduce, adopt, and practice innovation.	Promote an innovative culture throughout the IT and data analytics users and developers communities, demonstrating innovative ways of accessing and leveraging information and intelligence for decision making, integrating processes in new ways that provide breakthrough performance, and open innovative opportunities for new services and products.	Promote an innovative culture throughout the IT function and among IT users, demonstrating innovative ways of accessing and leveraging information for financial decision making, integrating processes in new ways that provide breakthrough performance, and open innovative opportunities for new financial services/products.
62	C1-4	6.4.	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., platform firms, traditional players, professional services, outsourcing, telecom ERP, open source, web, mobility, etc.).	Understand the interdependencies between data analytics vendors and the organizations in your industry, relying on IT industry analyses and analytics technology evaluations specific to one or more service segment, and anticipating the costs and benefits of IT vendor competitiveness and reliability for the enterprise.	Understand the interdependencies between IT vendors and financial institutions, relying on IT industry analyses and technology evaluations specific to one or more financial services industry segment or function, and anticipating the costs and benefits of IT vendor competitiveness and reliability for the enterprise.
63	C1-5	6.5.	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.	Understand the cost structure of IT and data analytics within the industry, linking analytics effectiveness to overall enterprise performance, analyzing transaction unit costs and processing economies of scale, and benchmarking traditional and cloud services for analytics applications.	Understand the cost structure of IT for different segments of the financial services industry, linking IT service effectiveness to overall enterprise performance, analyzing transaction unit costs and processing economies of scale, and benchmarking traditional and cloud services for financial processes.

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64	C1-6	6.6.	IT Function Trends	Demonstrate understanding of the risks and mitigation strategies to business operations inherent in the implementation of information and communications technologies (e.g. systems development, data security and privacy, business continuity, outsourcing, off-shoring and infrastructure).	Monitor current and emerging trends in IT and data analytics, anticipating technological advances and diffusion of major innovations, blending generic and industry-specific practices and standards, renewing the partnership between the IT function and analytics professions across the organization, and making the IT division a key enabler for innovation in analytics and intelligence.	Monitor current and emerging trends in IT for financial services, anticipating technological change in key industry segments, blending generic and industry-specific practices and standards, renewing the partnership between the IT function and other divisions, and making the IT division a key enabler for financial innovation.
65	C1-7	6.7.	IT Procurement	Demonstrate understanding of and be able to evaluate the choices and activities in procurement and management of purchased IT products and services.	Manage IT and data analytics procurement with concern for the specificity of the organization and its industry, addressing technological, operational, management, and strategic issues when choosing an analytics product and service, and advising on solutions while balancing the interests of stakeholders within analytics processes.	Manage IT procurement with concern for the specificity of the financial institution and IT trends in its industry segment, addressing technological, operational, management, and strategic issues when choosing an IT product and service, and advising on solutions while balancing the interests of financial services stakeholders.
66	C1-8	6.8.	Enterprise Architecture	Demonstrate understanding in 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.	Analyze enterprise architecture with concern for the specificity of data analytics and decision-making within the organization and its industry, integrating the best of generic and industry standards, creating bold IT and analytics strategies that fit the risk and performance culture	Analyze enterprise architecture with concern for the specificity of the financial institution and IT trends in its industry segment, integrating the best of generic and industry standards, creating bold IT strategies that fit the risk and performance culture, and creating effective architectures to support innovative financial services.

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					of the organization, and creating effective architectures to support innovative analytics-oriented services and products.	
67	C2	7.0.	Processes, Projects, and Change			
68	C2-1	7.1.	Organizational Learning	Be able to explain the overall organizational learning and innovation process / life cycle, and its role in organizational success.	Support learning and change in IT and data analytics projects throughout the organization, responding diligently to knowledge gaps in projects by staffing the best people and skills for analytics expertise, learning how to integrate knowledge and models from the relevant analytics professions, and developing the organizational memory through successive projects.	Support learning and change in IT projects throughout the organization, responding diligently to knowledge gaps in projects by staffing the best people and skills, learning how to integrate knowledge from the relevant IT and financial professions, and developing the organizational memory through successive projects.
69	C2-2	7.2.	Project Management	Demonstrate appropriate understanding of traditional as well as agile project management principles and methodologies, such as at the level of Associate Project Manager (APM) certification of the Project Management Institute's referencing the Project Management Institute's Project Management Body of Knowledge (PMBOK)	Integrate the best of generic, IT, and industry-specific project management practices and standards for data analytics projects, ensuring they remain aligned with the evolving needs of the organization and its industry, and developing a strong project learning culture for sustained performance	Integrate the best of generic, IT, and industry-specific project management practices and standards, ensuring IT projects remain aligned with the evolving needs of the financial institution and its industry segment, and developing a strong project learning culture for sustained performance improvement.

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					improvement in both project delivery and analytics services.	
70	C2-3	7.3.	Business Change Management	Demonstrate understanding and application of best practices in organizational IT change management.	Advise on process and organizational change with concern for the evolving needs of analytics professions and decision-making processes within the organization and its industry, analyzing the technological, operational, management, and strategic implications of intelligence-driven change, and respecting the pace and risk culture of the organization.	Advise on process and organizational change with concern for the evolving needs of the financial institution and its industry segment, analyzing the technological, operational, management, and strategic implications of business-driven change, and respecting the pace and risk culture of the financial industry segment.
71	C2-4	7.4.	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).	Leverage the latest advances in data analytics and they plugin within the generic as well as best-in-class Business Process Management (BPM) platforms, especially the features of BPM Suites that are most adapted to the analytics, such as ensuring business rules are properly embedded within processes, facilitating rapid audits and information security assurance, and integrating complex analytics tasks	Leverage the latest advances in Business Process Management (BPM), especially the features of BPM Suites that are most adapted to the financial services industry, such as ensuring financial management rules are properly embedded within processes, facilitating rapid audits and financial information security assurance, and integrating complex analytics tasks required by highly specialized financial professions.



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					required for automation supporting highly specialized professions.	
72	C2-4.1	7.4.1.	Stakeholder Requirements Analysis	Demonstrate understanding of stakeholder requirements analysis.	Analyze data analytics project requirements with a keen understanding of decision making processes, defining clearly the needs of various analytics professionals and service end-users, with concern for standards and regulatory compliance specific to the industry segment, and the privacy and security expected from the organization.	Analyze IT project requirements with a keen understanding of financial service processes, defining clearly the needs of various financial professionals and service end-users, with concern for standards and regulatory compliance specific to the industry segment, and the privacy and security expected of financial institutions.
73	C2-4.2	7.4.2.	Business Process Improvement	Describe business process improvement or re-engineering process.	Improve business processes by finding opportunities for innovative applications of data analytics solutions, helping all units of the organization to learn from best practices of their industry segment, and help diverse analytics professions to evolve their practices and work smarter to surpass the organization's performance goals.	Improve financial services processes by finding opportunities for innovative applications of IT solutions, helping all units of the organization to learn from best practices of their industry segment, and help diverse financial professions to evolve practices and work smarter to surpass the organization's performance goals.

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74	C2-3.3	7.4.3.	Business Process Design	Demonstrate understanding of Business Process notations/symbology – BPMN, UML.	Design data analytics and decision making processes that reflect the capabilities and constraints of the organization, relying on industry segment best practices, representing enterprise architecture coherently at all levels given the context of large organizations, and ensuring business rules and intelligence services meet regulatory and performance standards.	Design financial service processes that reflect the capabilities and constraints of financial institutions, relying on industry segment best practices, representing enterprise architecture coherently at all levels given the context of large organizations, and ensuring business rules meet regulatory and performance standards.
75	C2-4.4	7.4.4.	Quality Assurance	Demonstrate understanding of quality assurance and testing, go-live, end of life, life cycle management, ticket management (help desk).	Evaluate data analytics project deliverables based on generic and industry-specific testing best practices, exposing solutions to all relevant analytics professions in order to reflect the diversity and stringent criteria of business processes, and develop best practices to help reduce the compliance and risk management overhead.	Evaluate project deliverables based on generic and industry-specific IT testing best practices, exposing solutions to all relevant financial professions in order to reflect the diversity and stringent criteria of financial service processes, and develop best practices to help reduce the compliance and risk management overhead.
76	C2-4.5	7.4.5.	New Process Implementation	Demonstrate understanding of new process implementation and maintenance.	Deploy data analytics project deliverables with concern for the change capability, business continuity, and risk culture of the organization, assessing potential breaches in conformity due to slower learning during process launch, and developing analytics project leadership	Deploy project deliverables with concern for the change capability, business continuity, and risk culture of financial institutions, assessing potential breaches in conformity due to slower learning during process launch, and developing project leadership practices that enable faster and

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					practices that enable faster and frequent change in complex intelligence-driven services and products.	frequent change in financial services.
77	C2-5	7.5.	Knowledge Management	Be able to explain the importance of knowledge transfer, development, and dissemination for both explicit and tacit knowledge.	Respond to knowledge gaps and support organizational learning by finding opportunities in reusing knowledge and expertise from various data analytics projects, especially related to the specific requirements of complex intelligence and modelling-intensive decision making processes, and helping teams leverage analytics solutions to foster organizational memory and tap on its extensive resources just-in-time.	Respond to knowledge gaps and support organizational learning by finding opportunities in reusing knowledge and expertise from various IT projects, especially related to the specific requirements in financial services, and helping teams leverage IT solutions to foster organizational memory and tap on its extensive resources just-in-time.