Business Technology Management (BTM)

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Outline

1. Introduction
2. From Information to Business Technology Management
3. Digital Strategy
4. As-Practice Perspective
5. Rethinking IT Talent Management
6. Unified Digital Profession
7. Methodology
8. Results
9. Conclusion

Summary

- Invitation to join the Business Technology Management (BTM) initiative
- Digital transformation is accelerating causing an IS/IT leadership talent gap.
- Digital leaders need more hybrid skillsets, and work across dozens of fragmented IS-IT professional specializations (e.g., Business Analysts, IT Architects, IT Services Management, etc.).
- Must shift from an “information” to a broader “business” focus, co-creating digital organizations, processes, products, services, experiences, etc.
- BTM and its applied research project for a BTM Body of Knowledge (BOK).
- Launched in Canada and supported by 22 colleges and universities, BTM aims at rebranding IS and IT programs within a united framework, ensure collaboration between disciplines, and create more seamless career paths.

1. INTRODUCTION

Digital Project Leadership

- **Digital Transformation** > multi-year programs of IT-enabled change
- **Regular IT vs. Digital Projects** > beyond “IT-as-usual” - significantly new processes and infrastructures, products and services, business models, as well as behaviors and culture
- **Digital Leadership** > more than leading an IT project - must lead a business unit and all its people in becoming digital, e.g., Chief Digital Officer (CDO)
  - *evolving requirements imply greater agility*
  - *new approaches in recruiting and coaching IT and Digital Project teams and leaders*
  - *keeping organizational performance stable and avoiding “digital failure” (Ramesh and Delen 2021)*

Evolving IS-IT Profession

- Acceleration of Digital Transformation, transdisciplinary IS-IT roles
- Digital projects beyond just IT, require new tasks and new skillsets
- Roles span technology and business units, co-development leaders
- Senior digital leaders must promote IS-IT roles focused on:
  - *developing an **innovative** mindset throughout the organization*
  - *gaining the necessary **authority** to negotiate with executives*
  - *developing a wide-ranging set of **technical** competencies*
  - *exercising **influence** through technical leadership*
  - *acquiring the necessary **experience** in the business*

Research Questions

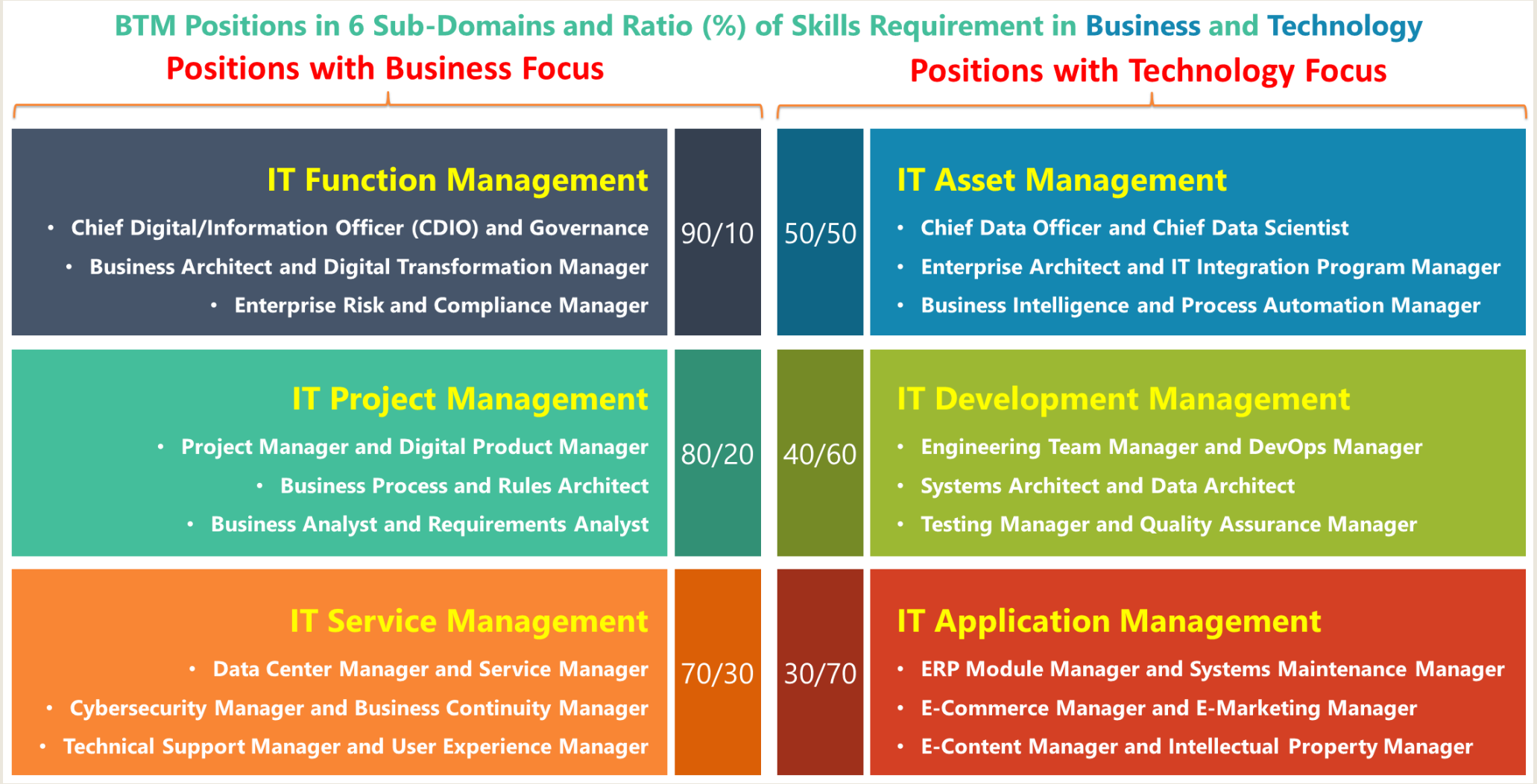
1. How can IT executives best identify and position IT professionals and managers to fit digital leadership roles?
2. How to build upon recent studies of Chief Digital Officer (CDO), adapting to digital teams and leaders recruited at lower ranks?
3. How to link digital leadership competencies to IT and digital strategy outcomes, building upon IT strategy theories?
4. How to ground these competencies and explain their enactment using Strategy-as-Practice, along with its related concept in project management, Project-as-Practice?

2. FROM INFORMATION TO BUSINESS TECHNOLOGY MANAGEMENT

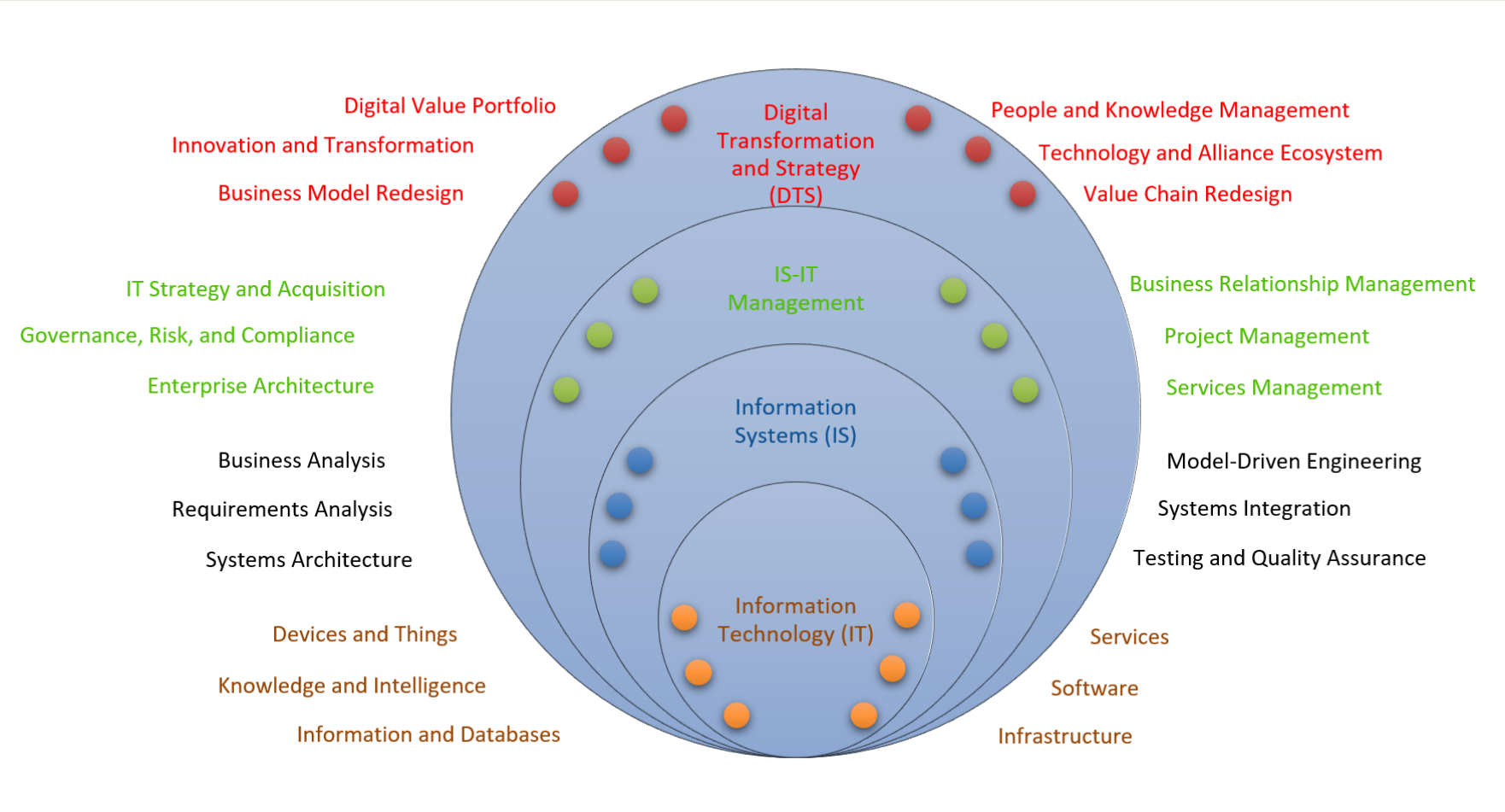
BTM Initiative – Opening Door to AIDAF

- New professional designation, with Registered Trademarks in Canada and the US:
  - ***Business Technology Management (BTM)***
  - ***Gestion des technologies d'affaires (GTA)***
- Unifying Information Systems (IS) and Information Technology (IT) graduates within a stronger community of practice
  - ***Rebranding IS/ITM programs as BTM in Canadian Business Schools***
- Stakeholders moving from an information to a broader business focus
- Emphasize distinctive professional abilities for digital leadership:
  - *Renewed focus on innovation and digital value*
  - *Leaders of the digital lifecycle and transformation*
  - *Hybrid acumen as key to effective leadership*

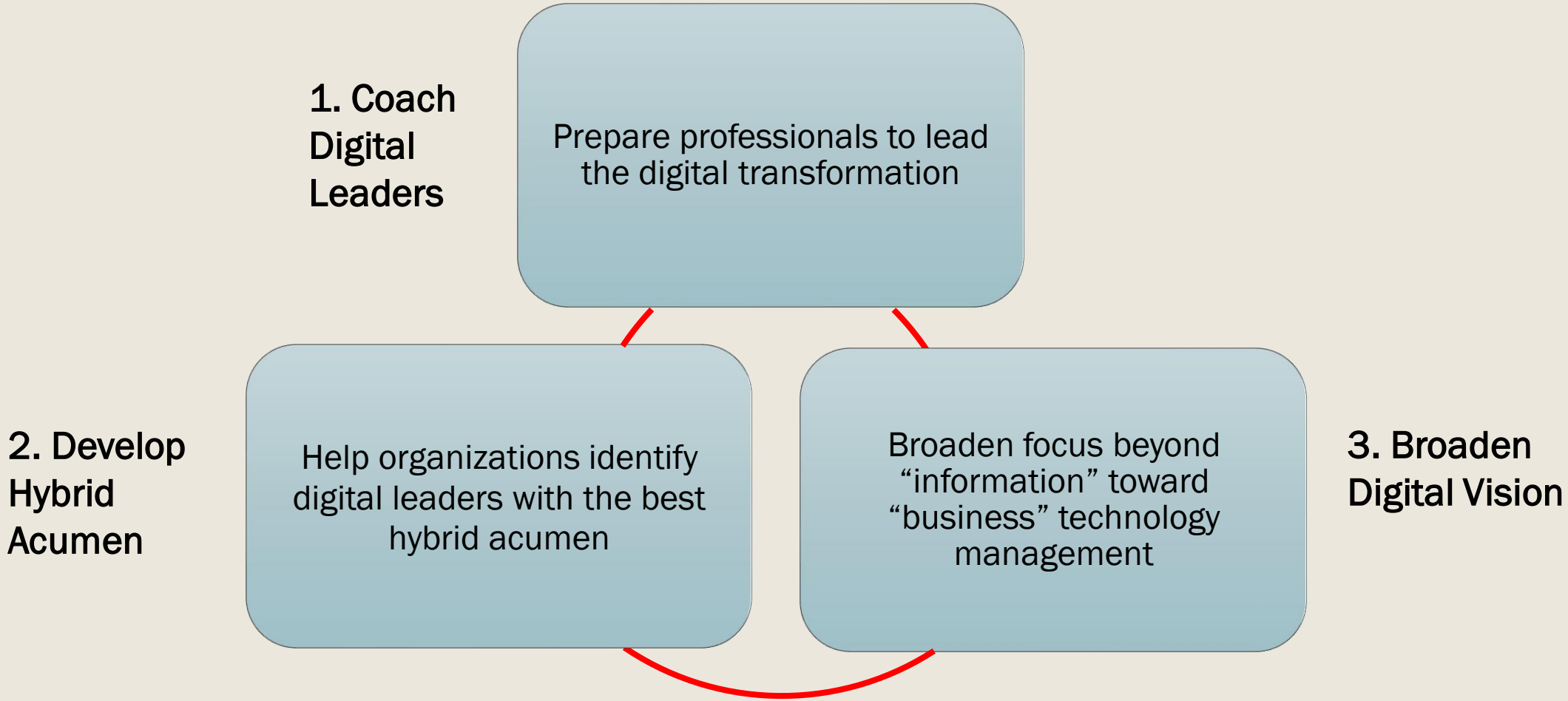
BTM Hybrid Professional Roles



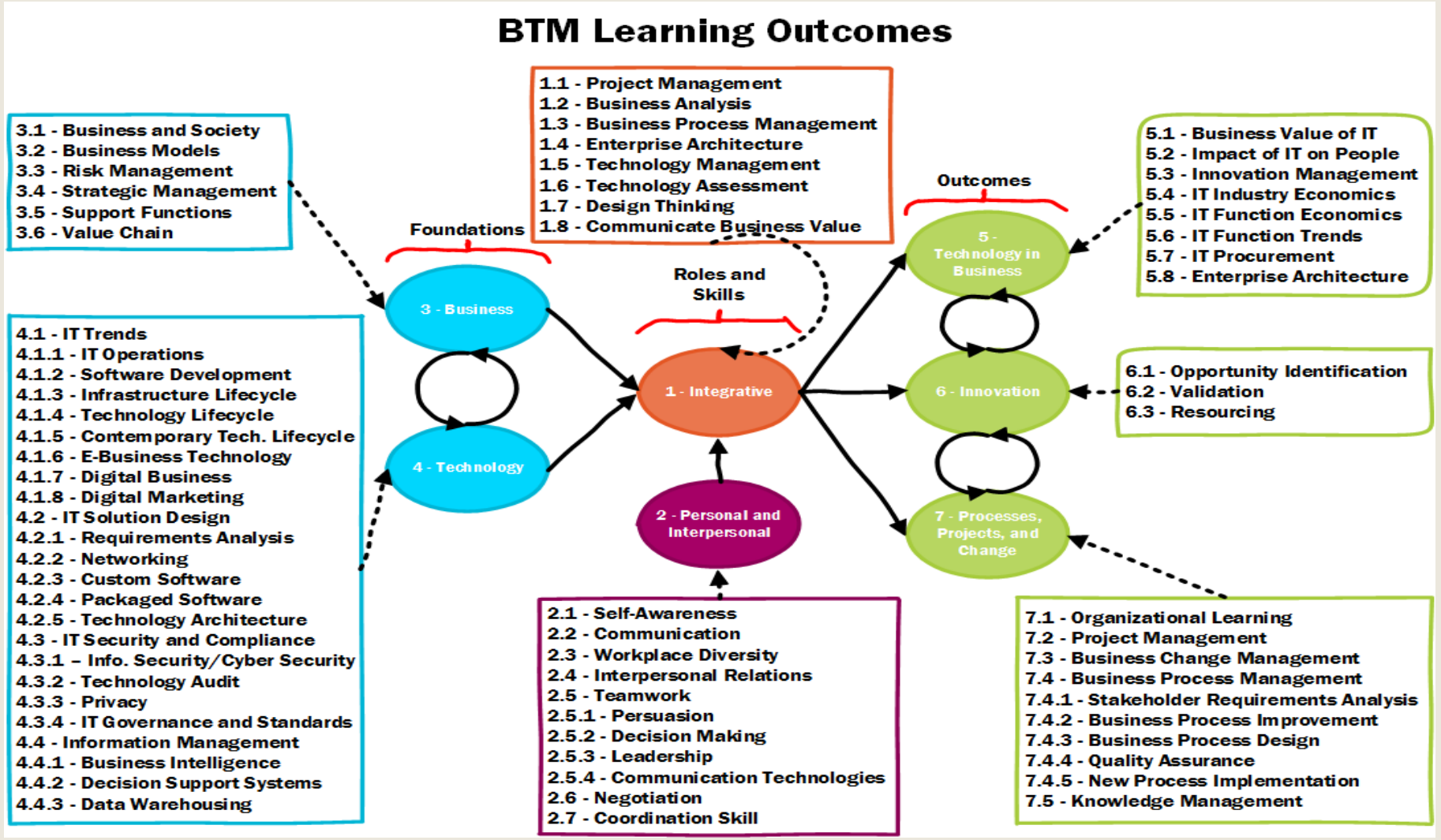
From Information to Business Technology Management



BTM Forum Mission



BTM Accreditation Standards



BTM Forum Timeline

- **2009:** A team of faculty and industry leaders attend a meeting at the Toronto Metropolitan University (TMU) organized by the Canadian Coalition for Tomorrow's ICT Skills (CCICT); they launch the ***Business Technology Management (BTM) initiative***, with the ***BTM Advisory Council (BTMAC)*** as its steering committee; a set of 40 criteria are synthesized in the ***BTM Accreditation Criteria 1.0*** administered by Canadian Information Processing Society (CIPS).
- **2010:** Government of Canada Launches National Consultations on a Digital Economy Strategy; CCITC publishes the white paper entitled "*Canada: The go-to country for brainpower resources in the global digital economy*".
- **2011:** Based on the consultation, Government of Canada allocates CAN$ 720 million to a new digital economy strategy; CAN$ 60 million are dedicated to IT human resources development.
- **2013:** Simon Fraser University (SFU) programs obtain the first BTM accreditation from CIPS.
- **2014:** CCITC obtains a Government of Canada grant of CAN$ 1.6 million to develop and promote BTM programs; it merges with the IT Association of Canada (ITAC) to become ***ITAC Talent***; first edition of ***BTM TalentMash*** is launched, which will develop into a Canada-wide annual job fair and competition, held every Fall until 2018 in 5-7 Canadian cities.
- **2015:** The *National Business Technology Management (BTM) Conference 2015* is organized in Halifax, NS, during the Administrative Sciences Association of Canada (ASAC) Conference.
- **2016:** The *BTM Accreditation Criteria 2.0* are published, growing to 70 criteria organized in 7 knowledge domains; a second edition of the *BTM Conference* is organized in Edmonton, AB, during the ASAC Conference; the ***BTM Forum*** is created with the BTM Governing Council (BTMGC) to run a professional networking organization, and the BTM Accreditation Council (BTMAC) to administer program reviews.
- **2017:** The number of BTM accreditations and recognitions reaches 10 institutions among 20+ that offer BTM branded programs; a third edition of the ***BTM Conference*** is organized at Université du Québec à Montréal (UQAM), Montréal, QC; students of the TMU win the first *Annual BTM Case Competition*; ITAC Talent obtains CAN$ 160,000 MITACS Accelerate grant with Université du Québec en Outaouais (UQO), Gatineau, QC, to launch an applied research project and develop the *BTM Body of Knowledge*.
- **2019:** The first edition of the BTM BOK (v.0.1) is published on GitHub; ITAC changes name to become TECHNATION Canada; ITAC Talent is disolved given the end of Government of Canada funding.
- **2020:** The global pandemic stalls the development of BTM Forum activities.
- **2021:** TECHNATION Canada signs an agreement to transfer all BTM initiative trademarks, assets, and operations to the Digital Innovation Foundation (DIF).
- **2022:** CIPS signs an agreement with BTMGC members to reintegrate BTM accreditation operations.
- **2023:** BTMGC votes to become the BTM Council for Canada; BTM Forum develops into a global initiative, with Canada chairing the first BTM Global Council.

Canadian BTM Programs

6 in Ontario

1. https://www.senecapolytechnic.ca/programs/fulltime/BTM.html
2. https://www.torontomu.ca/programs/undergraduate/business-technology-management/
3. https://www.yorku.ca/laps/sas/bcom/degree-options/business-technology-management/
4. https://academiccalendars.romcmaster.ca/preview_program.php?catoid=53&poid=27123
5. https://www.wlu.ca/programs/business-and-economics/undergraduate/business-technology-management-btm/index.html
6. https://telfer.uottawa.ca/en/bcom/your-program-of-study/program-options-and-minors/business-technology-management/

5 in West

7. https://www.athabascau.ca/programs/summary/bachelor-of-commerce-in-business-technology-management.html
8. https://www.ualberta.ca/business/programs/bachelor-of-commerce/majors/business-technology-management.html
9. https://www.ucalgary.ca/future-students/undergraduate/explore-programs/business-technology-management
10. http://www.sfu.ca/students/calendar/2024/spring/programs/business-technology-management/certificate.html
11. https://mybcom.sauder.ubc.ca/courses-money-enrolment/options/business-technology-management

1 in East

12. https://business.acadiau.ca/programs.php?id=btm

6 in Québec

13. https://www.concordia.ca/academics/undergraduate/business-technology-management.html
14. https://www.fsa.ulaval.ca/etudier/programmes/baa/concentration-gestion-technologies-affaires/
15. https://etudier.uqam.ca/programme?code=4668
16. https://www.uqar.ca/etudes/etudier-a-l-uqar/programmes-d-etudes/4077
17. https://uqo.ca/mod/sciences-administration/certificat-gestion-technologies-daffaires
18. https://oraprdnt.uqtr.uquebec.ca/pls/public/gscw031?owa_no_site=2571&owa_no_fiche=194&owa_bottin=

3. DIGITAL STRATEGY

3.1. Business-Technology Alignment

- Emergence of IT strategy from an organizational perspective, beyond the traditional functional viewpoint of IT, with a greater emphasis on its innovative potential (Chen et al. 2010)
- Reconceptualizing IT beyond its artefact nature, and toward a broader value perspective integral to business (Gable 2010)
- Complex adaptive system perspective conceptualizes digital as the vast network of relationships among business and technology concerns, wholly integrated, assessed, co-designed, and co-executed (Merali et al. 2012)
- Explain how business and technology strategies are enacted, beyond alignment itself (Chan and Reich 2007)
- Process amplified by the mediating interdependencies between the six relationships between four alignment components (Gerow et al. 2015)

3.2. Digital Transformation

- Digital Strategy creates a seamless integration of business and technology (Bharadwaj et al. 2013)
- Requires a hybrid skillset of business technology leadership, that must be further adopted throughout the organization (Grover et al. 2018)
- Develop the necessary abilities to manage a hybrid strategy process (Johnson and Lederer 2010)
- Greater expectation on the business performance impact of IT (Peppard 2010; Varajão et al. 2016)
- Greater freedom in contributing to business strategy (Ding et al. 2014)

3.3. Leadership Competencies

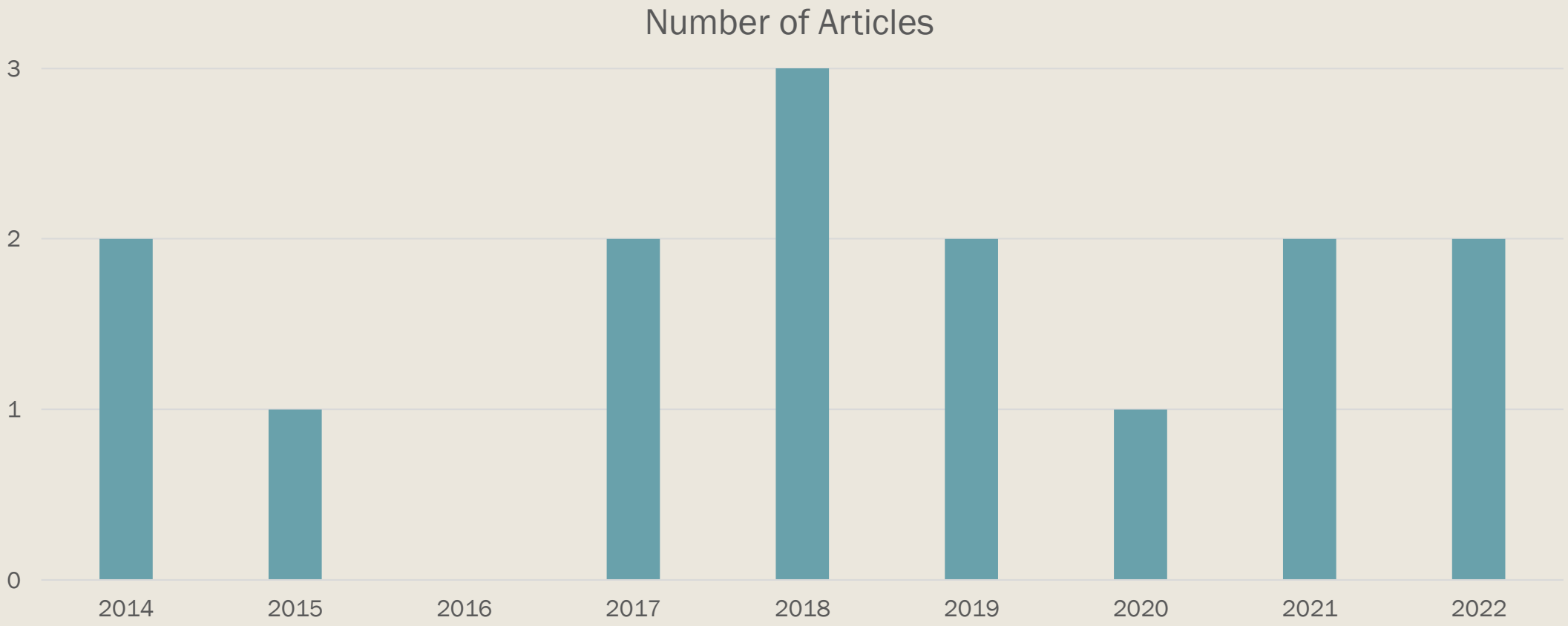
- Digital Strategy has emphasized hybrid leadership skills for digital project success (Kane et al. 2019)
- Digital project leaders are required to help people learn and co-create both new technology applications and new organizational capabilities
- Chief Digital Officer (CDO) role is a hybrid role with focus on business value from IT (Horlacher 2016; Locoro and Ravarini 2019)
- Match and master the business strategies pursued by the organization (Li and Tan 2013; Shaughnessy 2018)
- Acquiring the necessary understanding of the business and its industry through varied experience (Sobol and Klein 2009)

Digital Leadership Competencies

Competency	Link to Digital Strategy	Example Authors
Business model redesign	Formulate digital strategies departing from established models for competitive advantages	(Berman 2012; Schallmo et al. 2017)
Value-driven and user-centric innovation	Focus IT-enabled change on actual value impact and end-user behaviors	(Kohli and Melville 2019; Vial 2019)
Data-centric transformation	Enhance strategies or formulate new ones based on data and intelligence capabilities	(Brock and von Wangenheim 2019; Raisinghani 2021)

4. AS-PRACTICE PERSPECTIVES

As-Practice Perspective in IS-IT



Scopus: (TITLE (*"as practice"*) AND SRCTITLE (*"information"* OR *"technology"* OR *"system"* OR *"software"*))
Found 26, only 15 relevant, started in 2014 with Special Issue in ***Journal of Strategic Information Systems (JSIS)***
After 2014, only 6 articles in journals, others all in proceedings and books.

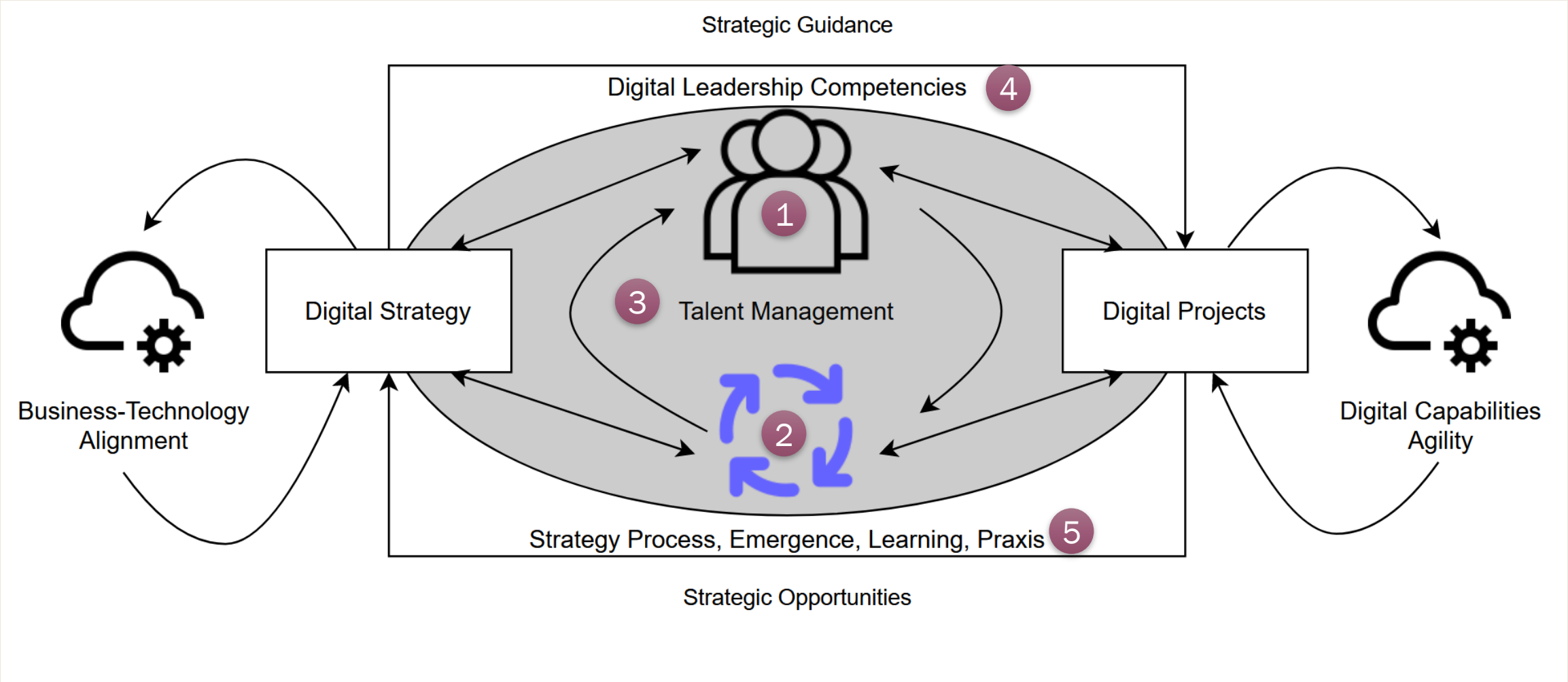
4.1. Strategy-as-Practice

- Strategy-as-Practice is fundamentally a more dynamic and complex perspective of strategy making
- Interplay of strategy making, strategy makers, strategy artefacts, and strategy processes are co-constructed through a dynamic, emergent, and learning-oriented praxis (Jarzabkowski 2008; Whittington 1996)
- Still emerging in the IS literature, since 2014 with Special Issue in ***Journal of Strategic Information Systems (JSIS)*** (Arvidsson and Holmström 2017; Whittington 2014)
- Extend the alignment literature and respond to calls for more dynamic and micro-focused research

4.2. Project-as-Practice

- Project-as-Practice poses to view project execution from the viewpoint of what actually happens in projects
- Ensure that theories of project management are more accurately depicting the reality of project life (Blomquist et al. 2010; Hällgren and Söderholm 2011)
- Integration of strategic and operational levels is also a challenge studied from the “as-practice” perspective in project and their governance, a key aspect as well of digital strategy enactment (Brunet 2019; Karanasios and Slavova 2019; Kwayu et al. 2018)
- As digital strategies and projects are enacted and executed, the ongoing strategy process and emergence allows for a continuous learning and co-development or praxis in digital leadership competencies

As-Practice Perspective on Digital Leadership



5. RETHINKING IT TALENT MANAGEMENT

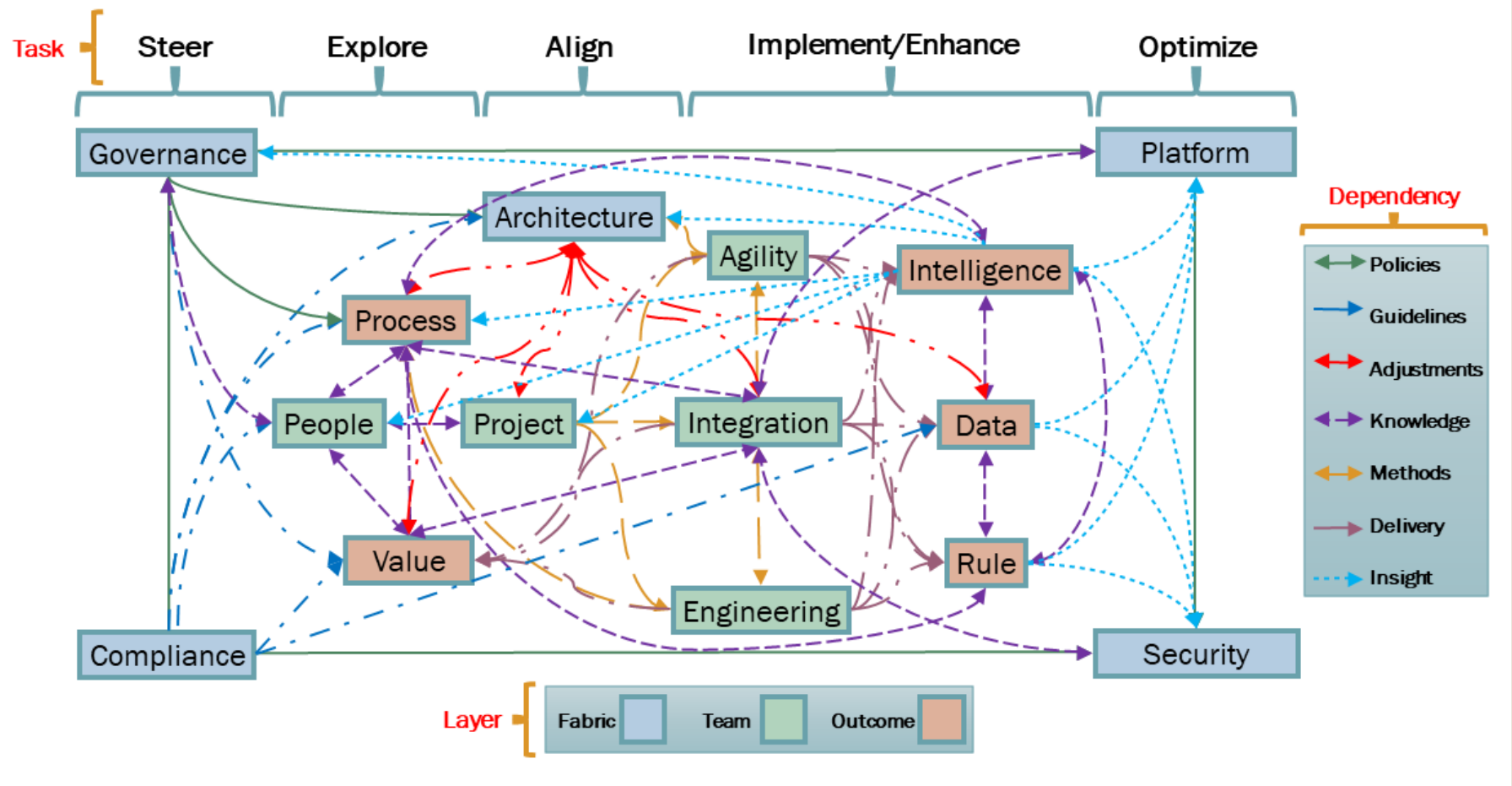
Talent Management (TM)

- TM is one of the most strategic practices in Human Resources Management (HRM)
- Focused on developing the “Competency Architecture” of an organization as the matching point between operations and people
- Ontology of tasks, processes, roles, and outcomes, along with required knowledge, skills, and experience (Lewis and Heckman 2006)
- Systematically plan and invest in the best people as strategic resources, enriching roles and allowing to influence strategy (McDonnell et al. 2017)
- Requires renewed focus on people and culture (Ulrich and Dulebohn 2015)
- Maintain career coherence using logical competency anchors for talent and job pools (Schein and Van Maanen 2016)

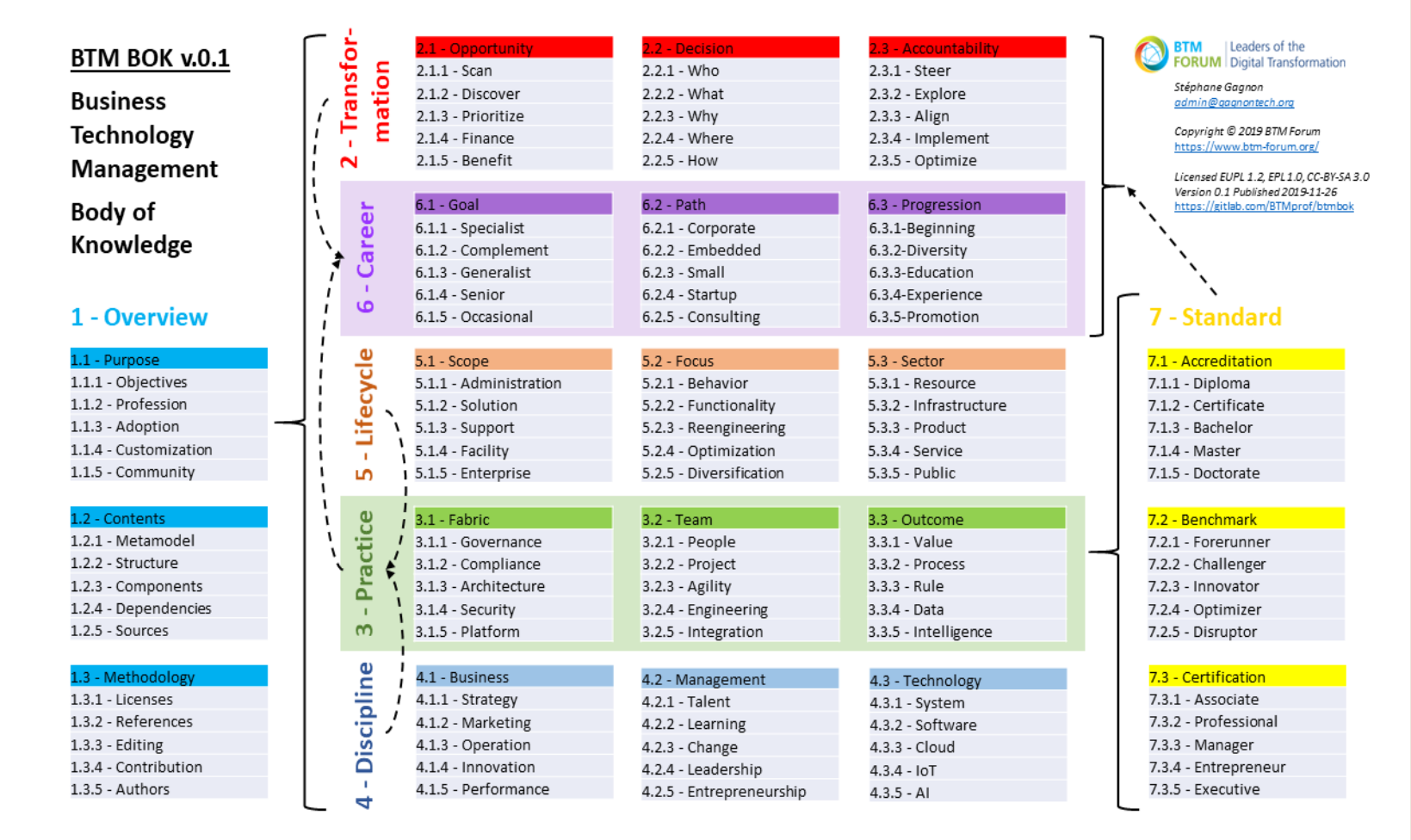
BTM Specializations and BOK References

Specialization	Standard	Title
1. Agile Methods	CSM	Certified Scrum Master
2. Business Analysis	BABOK	Business Analysis Body of Knowledge
3. Business Process Management	OCEB	OMG Certified Expert in BPM
4. Data Analytics	CAP	Certified Analytics Professional
5. Data Management	DMBOK	Data Management Body of Knowledge
6. Digital Marketing	OMCP	Online Marketing Certified Professional
7. Electronic Commerce	CECM	Certified E-Commerce Manager
8. Enterprise Architecture	TOGAF	The Open Group Architecture Framework
9. Information Governance	COBIT	Control Objectives for Information and Related Tech.
10. Information Management	CIP	Certified Information Professional
11. Information Security	CISSP	Certified Information Systems Security Professional
12. Management Consulting	CMC	Certified Management Consultant
13. Portfolio Management	Val-IT	Information Technology Value Management
14. Project Management	OPM^2	Open Project Management Methodology
15. Services Management	ITIL	Information Technology Infrastructure Library
16. Software Quality	CSQE	Certified Software Quality Engineer
17. Software Testing	CTFL	Certified Tester Foundation Level
18. Technology Architecture	CITA	Certified IT Architect
19. Technology Management	IT4IT	Information Technology for Information Technology
20. User Experience	UXBOK	User Experience Body of Knowledge

Transdisciplinary Competency Framework



BTM BOK Outline v.0.1



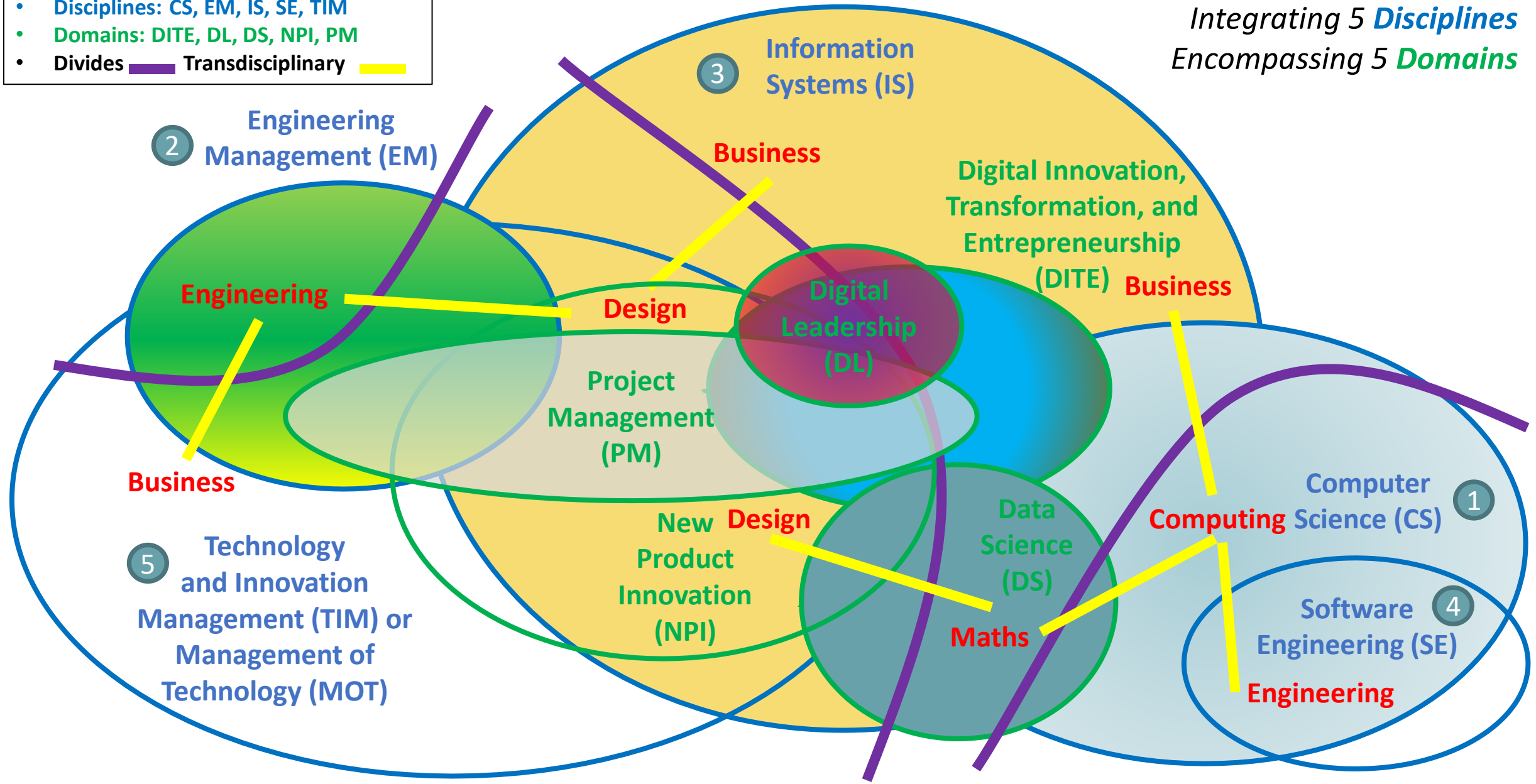
https://gitlab.com/BTMprof/btmbok/-/tree/master/doc

Business Technology Management (BTM)

Cutting Across 5 ***Fields***
Integrating 5 ***Disciplines***
Encompassing 5 ***Domains***

Legend: *Deconstructing* BTM

- **Fields: Business, Computing, Design, Engineering, Mathematics**
- **Disciplines: CS, EM, IS, SE, TIM**
- **Domains: DITE, DL, DS, NPI, PM**
- **Divides** **Transdisciplinary**



BTM BOK Objectives

1. Develop a single Body of Knowledge (BOK), building upon existing practices, to guide upcoming digital leaders toward the common core competencies of their profession
2. Use the BOK for:
   - *Design of seamless career paths across multiple specializations for more complete experience and knowledge*
   - *Define learning guidelines to develop new BTM expertise*
   - *Certification of digital leaders at Associate, Professional, Manager, and Executive competency levels*
   - *Accreditation of degree programs, helping them meet job requirements for digital leadership roles*

BTM BOK Contents

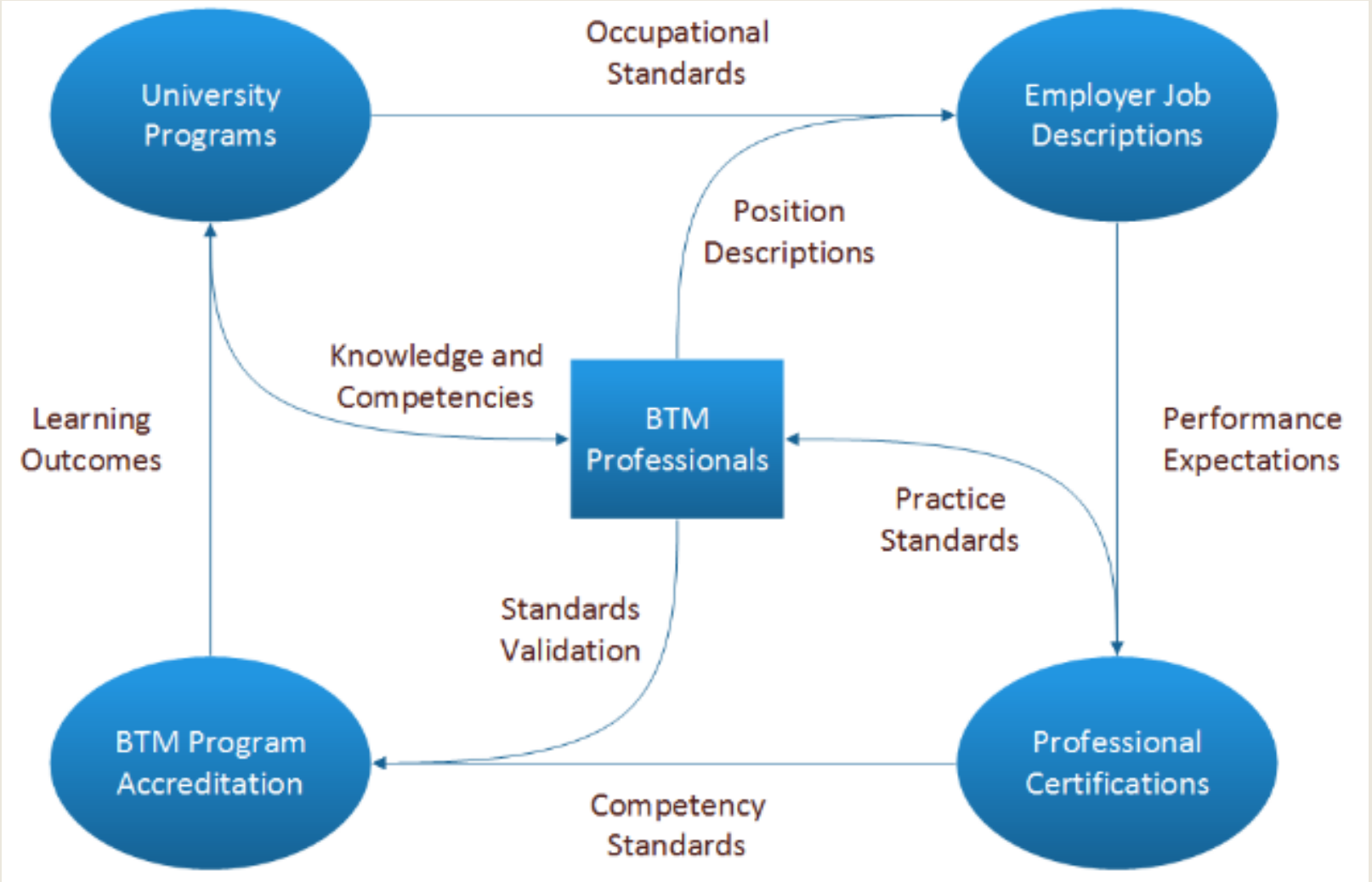
- BTM BOK developed using the Eclipse Process Framework (EPF) platform
- Supported by open community to help map the relationships between several BOKs
- Integrating citations to academic and professional literature, build reading guides
- Open and customizable, with API to reuse its contents in various Talent Management functions
  - *Custom BTM-compliant job descriptions*
  - *Automated matching of CVs and job competencies*
  - *Learning path recommendations given prior experience for recognized BTM careers*

6. UNIFIED DIGITAL PROFESSION

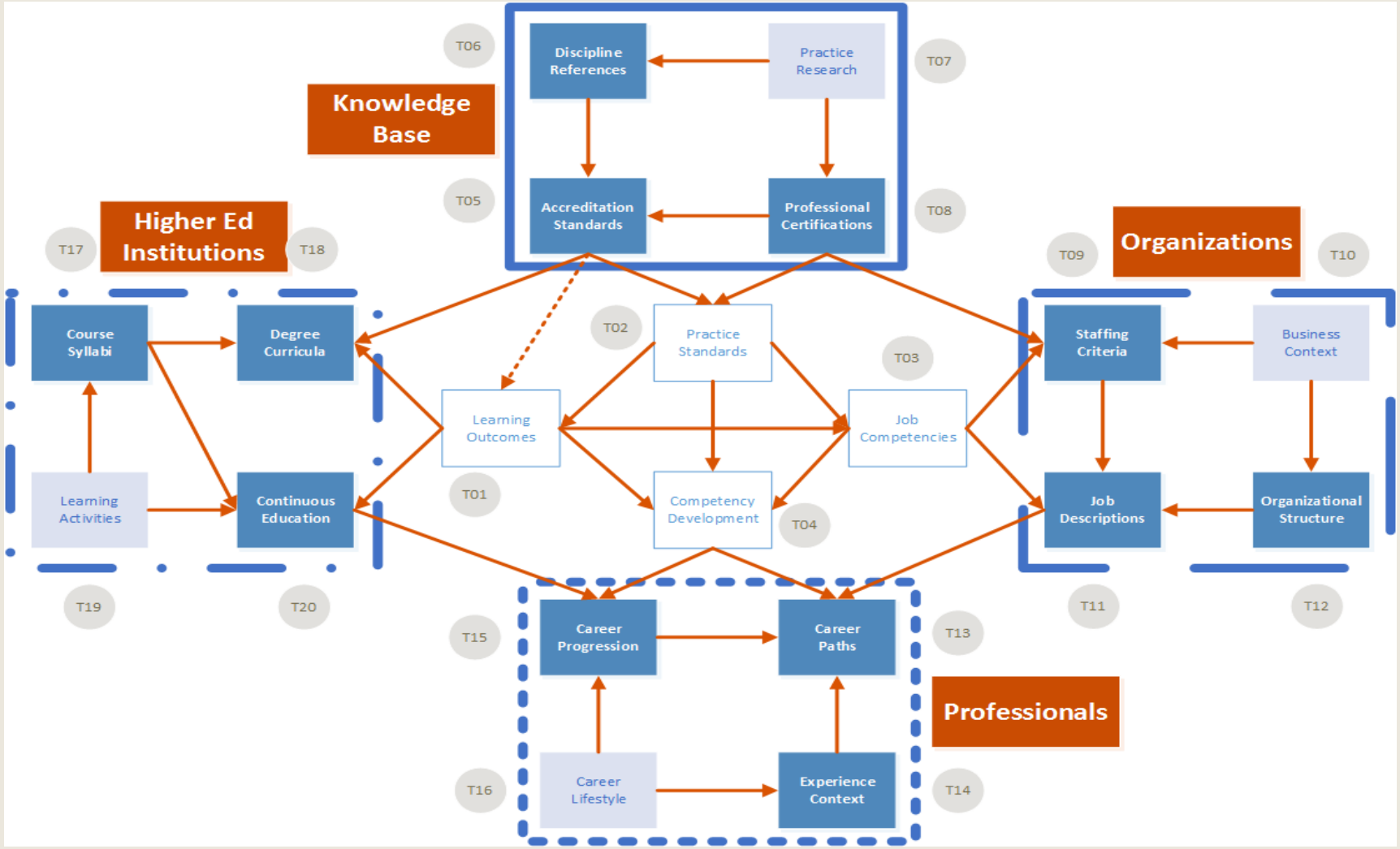
New Talent Management for Digital Projects

- Designing a BTM BOK helped identify new TM methods for digital project leadership, focused on competency framework redesign
- Iteration 1 results provide scaffolding of upcoming iterations
- DevOps methods and infrastructure ready for community-led phase
- Evolution from SPEM to Essence standards requires new tooling
- Assets “uploading” is a first phase focusing on “harvesting” open-source contents, assets “alignment” should follow rapidly
- Should link BTM BOK assets to IS-IT program accreditation

BTM Professionals at Core



BTM BOK Customization Opportunities

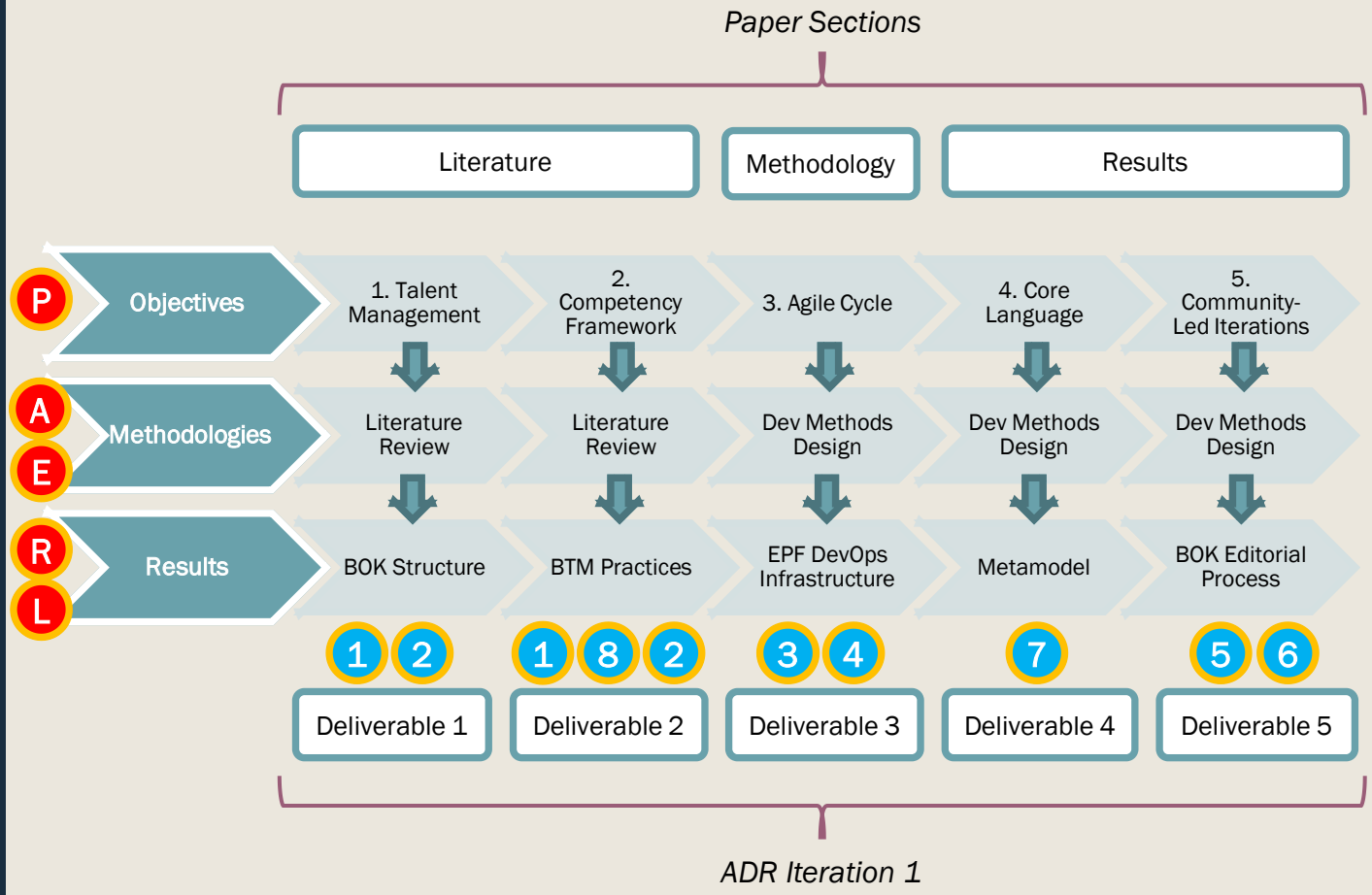


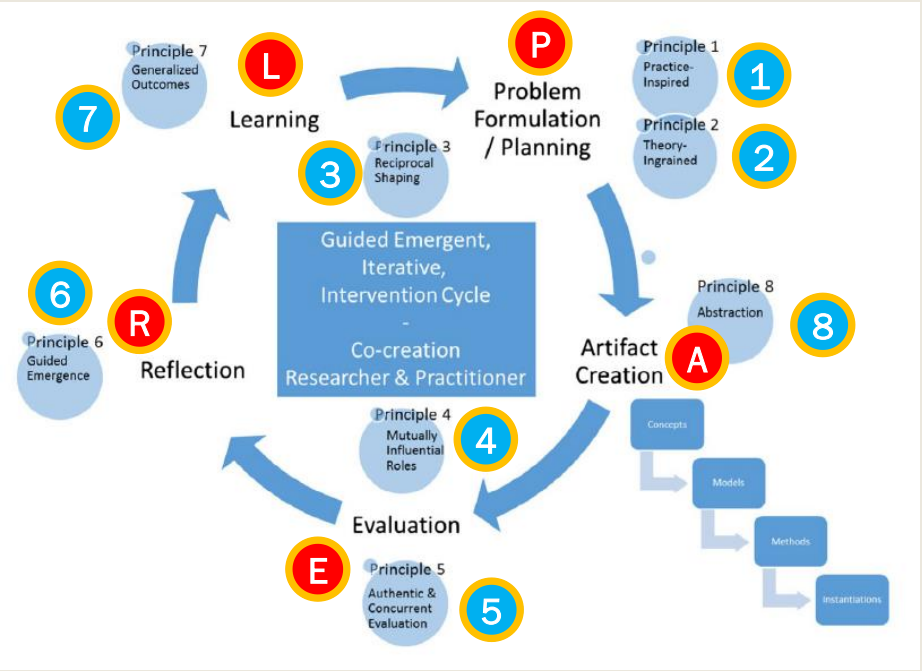
Benefits of BTM

Benefits for …	… from BTM BOK	… from BTM Certifications	… from BTM Community
Professionals	Students: clear guidance on career paths/growth	Practitioners: add new business/management skills	Careers: easy recognition of skill level by open network
Associations	Specializations: formal integration of several BOKs	Multi-Certified: complement certifications, no competition	Membership: recruit new members, wider visibility
Academia	Faculty: implement research across all specializations	Schools: clear accreditation and curriculum guidance	Enrollment: attract talent to get best jobs (cf., CPA, PEng)
Employers	Managers: formal transdisciplinary job profiles	Promotion: standards for promoting through ranks	Markets: well-defined talent pools, easier skills discovery
Industry	Innovation: more open, cross-specialization ideas	Vendors: all specializations have same tech. acumen	Start-ups: facilitate careers in-and-out of corporate
Society	Government: specializations share same principles	Business: higher org. to address complex ethics cases	Economy: fill talent gap, accelerate digital adoption

7. METHODOLOGY

Action Design Research (ADR) Project Cycle



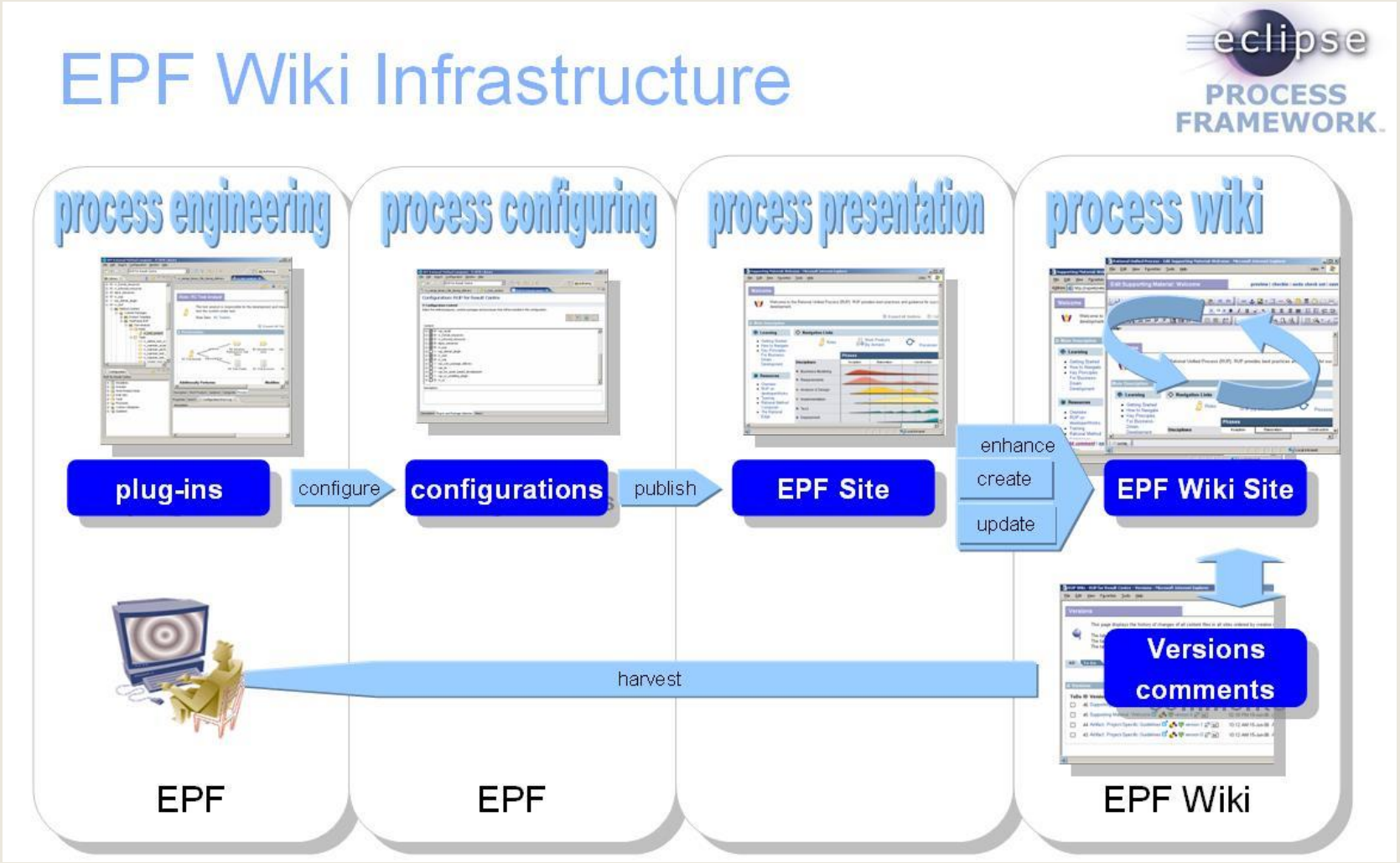


Source: Fig.1, p.3, Mullarkey, M. T., and Hevner, A. R. 2019. "An Elaborated Action Design Research Process Model," *European Journal of Information Systems* (28:1), pp. 6-20.

DevOps Cycle

- BTM BOK development relies on DevOps methods that emphasize **continuous integration**
- Assets are **co-developed at various stages by community** that produce code published on a Git repo on a continuous basis
- Eclipse Process Framework (EPF) serves to integrate 3 cycle steps:
  1. *EPF **Composer** to design the BTM BOK framework and integrate various external assets*
  2. *EPF **Wiki** to maintain and add contents and citations to external BOKs and references*
  3. *EPF **Wiki** and **Git** Application Programming Interfaces (API) to reuse BTM BOK assets into key TM tasks*

BTM BOK DevOps Lifecycle Based on EPF



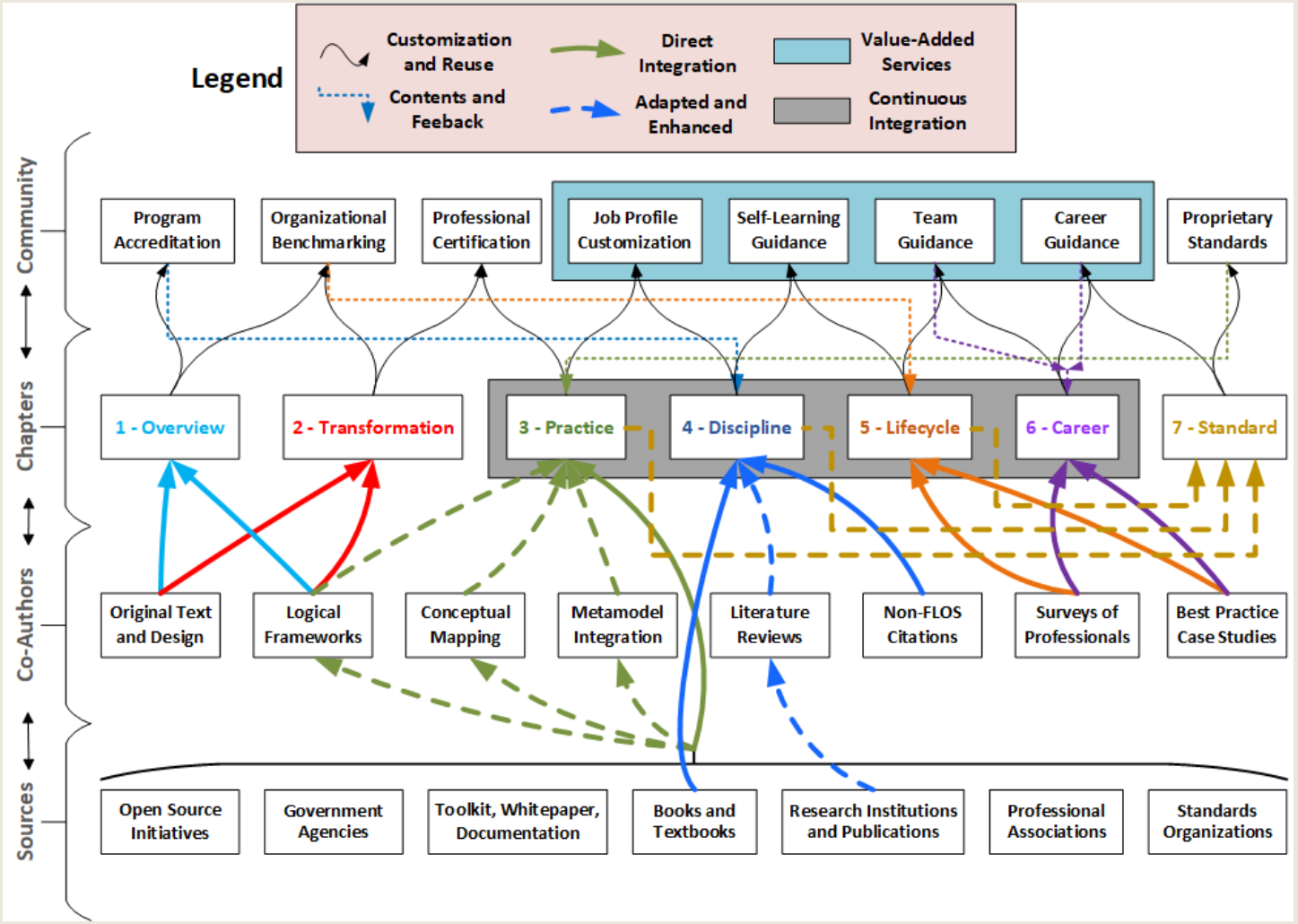
Source: https://github.com/siguremon/epfwiki/blob/master/doc/infrastructure.jpg

8. RESULTS

Open-Source Knowledge Integration

- Integrate contents to the 7 BTM BOK chapters, all Free Libre Open Source (FLOS) publications and projects in Creative Commons — Attribution-ShareAlike (CC BY-SA) and similar licenses
- Focus on Ch. 3 Practice and Ch. 4 Discipline references, which are further edited to ensure continuous integration and harmonization
- Find a common and converging language between specifications, both open and proprietary
  - *e.g., harmonizing the Project Manager role as described in Architecture, Engineering, and Project practices*
- Future iterations, forking, and redistribution to occur more sporadically
- Requiring formal releases of assets, with roadmap, do not evolve too fast
- Target assets reuse in a variety of community activities, ranging from BTM community functions to value-added services
- Ideally, Ch.3 Practice can be extensively reused by proprietary standards

BTM BOK Sources, Integration, and Reuse



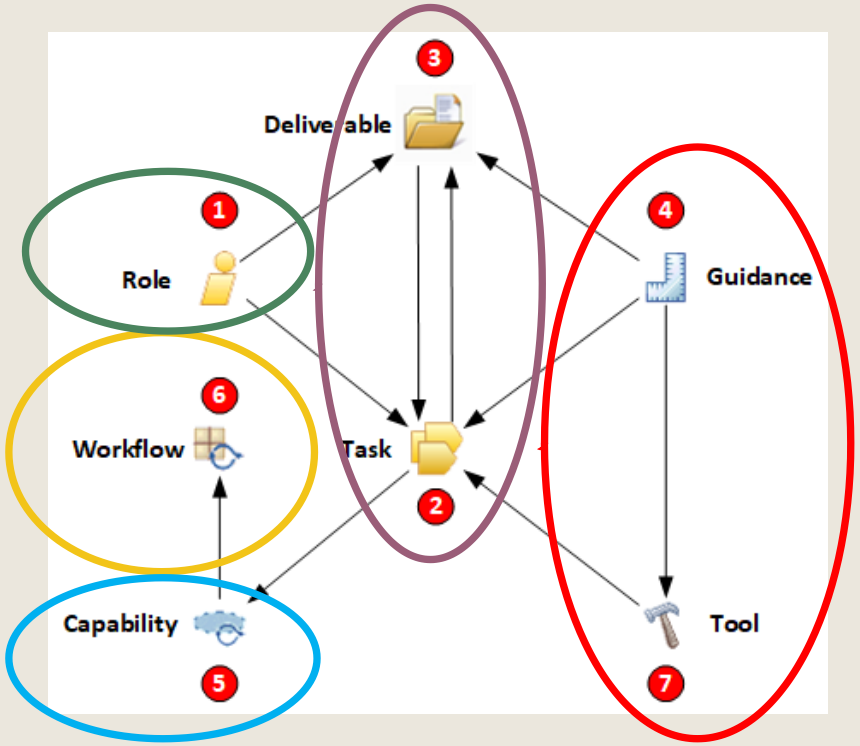
Source: https://gitlab.com/BTMprof/btmbok/-/tree/master/doc

Metamodel Components

1. **Role:** outline of job functions and qualifications, related to tasks and deliverables accountability.
2. **Task:** outline of role(s)-centered activities, with step-by-step, and deliverables as inputs-outputs.
3. **Deliverable:** artefacts delivering value for digital transformation, with templates and guidelines.
4. **Guidance:** glossaries, practices, and roadmaps to perform tasks, deliverables, and use tools.
5. **Capability:** combination of tasks as a short “way or work” or set of “states” to reach a milestone.
6. **Workflow:** combination of capabilities across iterations of varying scales to reach stage-gates.
7. **Tool:** documentation of techniques and *-wares used to perform tasks and support teamwork.

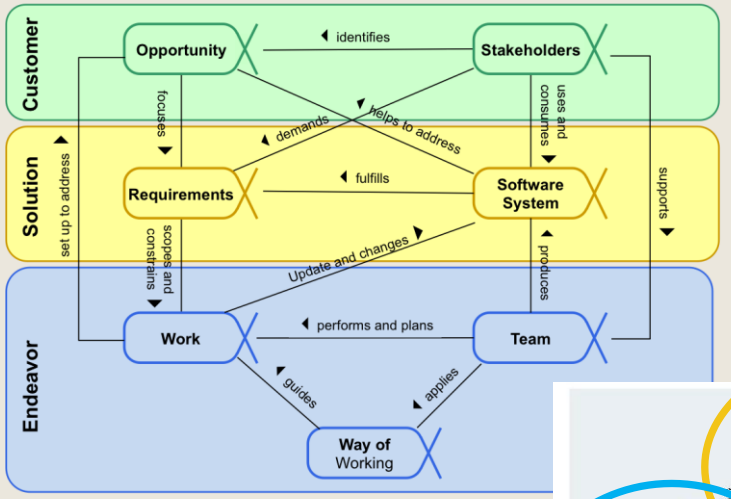
BTM BOK Metamodel – Present and Upcoming

Present Iteration 1

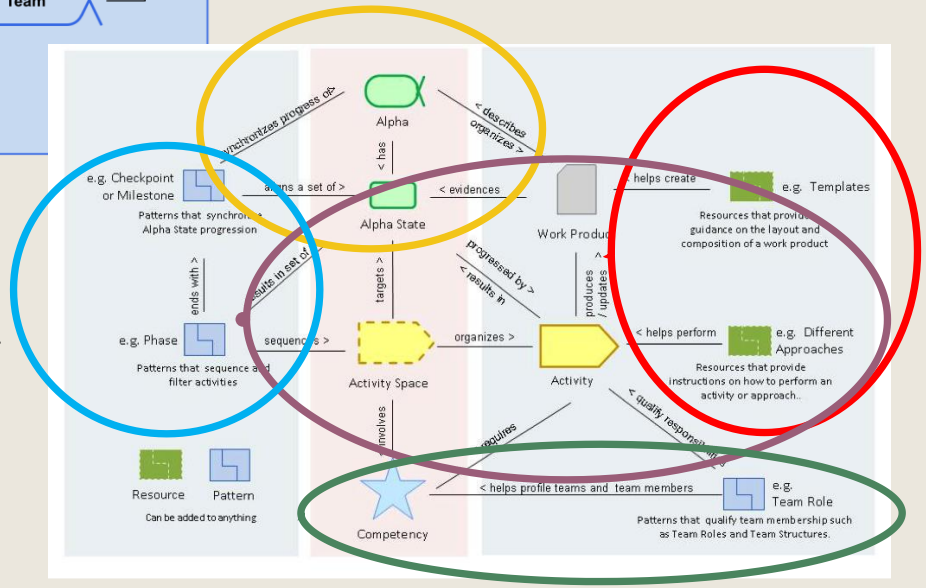


Derived from SPEM 2.0
https://www.omg.org/spec/SPEM

Upcoming Iterations 2 or 3

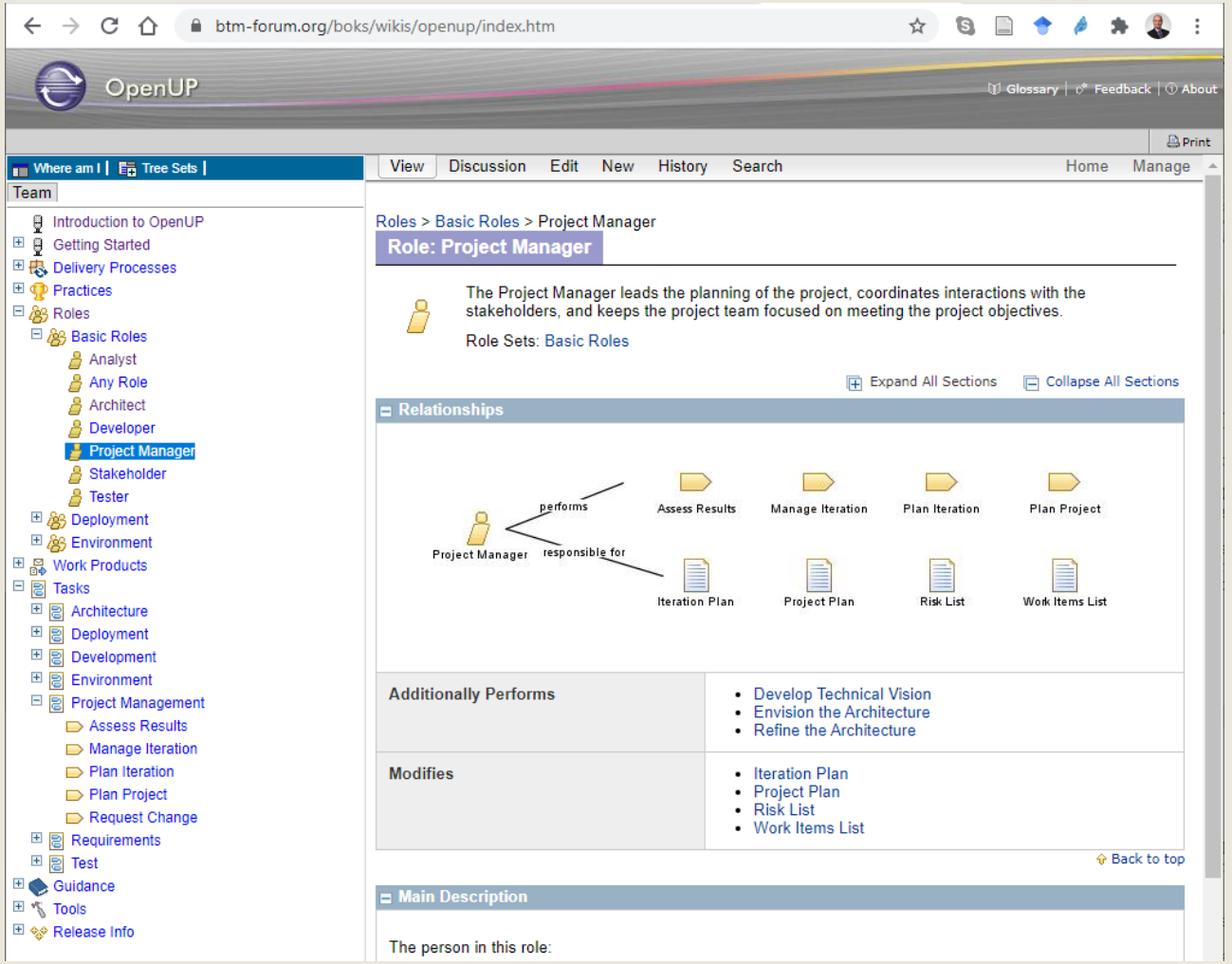


SEMAT Essence 1.8
https://www.omg.org/spec/Essence



Source: Fig.1, p.44, Jacobson, I., Ng, P. W., McMahon, P. E., Spence, I., Lidman, S. 2012. "The essence of software engineering: the SEMAT kernel," *Communications of the ACM* (55:12), pp. 42-49; and Essence Plus, SEMAT Guide, http://semat.org/view-3-essence-plus

BTM BOK Wiki with Open Unified Process



Source: https://gitlab.com/BTMprof/btmbok/-/tree/master/doc

New Talent Management for Digital Projects

- Designing a BTM BOK helped identify new TM methods for digital project leadership, focused on **competency framework** redesign
- Iteration 1 results provide **scaffolding** of upcoming iterations
- DevOps methods and infrastructure ready for **community-led phase**
- Evolution from SPEM to Essence standards requires **new tooling**
- Assets “uploading” is a first phase focusing on “**harvesting**” open-source contents, assets “alignment” should follow rapidly
- Should link BTM BOK assets to IS-IT **program accreditation**

Study Limitations

- Validity can be **limited and possibly disproven** by further iterations
- Reliability of digital project leadership practices cannot be ensured if there are **too few crowdsourcing participants**
- Literature review focused on TM and broadly IS-IT practices, but must refocus on recent findings in **leading Digital Transformation**
- BOK contents justified mostly by literature conceptual frameworks, but need a more a "**BTM-as-Practice**" perspective of digital leaders
- Limiting their **replication potential**, unless TM-related incentives are developed, specific to application contexts
- Assets to be converted to **ontology standards** for more reusability

9. CONCLUSION

Outcomes of BTM

- IT Talent Management (TM) is evolving toward more integration
- Research must focus on TM and broadly IS-IT practices, but must refocus on recent findings in leading Digital Transformation
- BTM BOK contents justified by literature conceptual frameworks, but need a more a “BTM-as-Practice” perspective of digital leaders
- Limiting their replication potential, unless TM-related incentives are developed, specific to application contexts
- Assets to be converted to ontology standards for more reusability

Implications for Practice

- IS-IT professionals are called upon to take leadership of Digital Projects, they must learn new skills, more hybrid profiles
- Use TM methods to guide IS-IT professionals and renew the ranks of digital leadership at various levels within organizations
- Refocus on and better define leadership competencies around IT and Digital strategy outcomes

Research Opportunities

- Integrate theories: business-technology alignment, Digital Transformation, as well as Strategy-as-Practice, Project-as-Practice
- Renewal of the alignment literature to become more coherent with practice, and research the enactment processes, micro-foundations, and performance impact of alignment practices
- Develop new TM methods through an empirical research program in the “as-practice” perspective, integrate strategy and projects
- Studying how digital leadership competencies are enacted by teams and their managers
- Anticipate the ongoing changes throughout the IS-IT profession

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Additional Readings

- BTM as a concept and initiative has not been extensively studied yet. A few papers exist with online presentations available in open access format. More will be published soon in ***BTM Journal*** by a more diverse array of authors from business, computing, and engineering disciplines.

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Q&A ?

Thank You! Questions?

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https://github.com/Digital-Innovation-Foundation/btmbok

BTM Forum
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