Business Transformation Projects-Estimating the Value of Transformation Projects (EVTP)

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Abstract

Evolutive Business (economic, societal, financial, or common) Transformation Projects (BTP) can offer important business advantages and improve enterprises' performances. But BTPs are complex, because of the enterprises' heterogeneous environment, reality in inter-linking various domains, lack of adoption of a Polymathic concept, and inefficient EVTPs mechanisms that are based on quantitative only estimations, which gives importance just to tangible financial values and hence stakeholders' financial ambitions. A robust and EVTP is needed to trace BTP's evolution and in estimating each phase's gap and promoting intangible values that are very important for the businesses employees and surrounding eco-system. Polymathic or holistic concepts privilege interdisciplinary approaches for BTPs' implementations and that makes EVTPs complex. This article uses the Applied Holistic and Poly-Mathematical Model (AHMM) for EVTP (AHMM4EVTP), which is a variant of the Polymathic AHMM. TheAHMM4EVTP supports the Polymathic Enterprise MetaModel (PEMM), where the PEMM supports the EVTP to estimate success or failure. The EVTP interfaces executive management environments like SWOT, Six Sigma, or other, to improve BTP's management. The EVTP, PEMM, and gap analysis can be applied for different fields like: BTP's management and estimations, Organizational engineering, Transformation processes, Enterprise architecture, Artificial intelligence (AI), Mathematical models, and other. This chapter is a new brick in the Research and Development Project (RDP), gap analysis, and framework.

Keywords: BTP's management and estimations, Business Transformation Projects, Ratings/Weightings Concepts, Polymathics, Meta Models, Enterprise Architecture, Enterprise Agile Methods, Organizational engineering, Mathematical Models, Artificial Intelligence, Critical Success Factors, and Performance Indicators.

INTRODUCTION

The author uses an In-House Implemented (IHI) Polymathic Transformation Framework (IHIPTF)

based RDP,which in-turn is based on a semi-automated concept, that can be automated but for human-ethical values the author refuses such an approach. The mentioned concept uses a template artefact-document which contains the basics of the IHIPTF and all its modules;that have a generic approach and are adapted to RDP's focus.In this article the focus is the EVTP and It is strongly recommended to consult the article:"Business, Economic, and Common Transformation Projects-IHIPTF (Trad, & Kalpić, 2024a);before analysing-reading this article. For each new RDPwork (article, experiment, book article, or other…), the artefact-document is adapted, complemented and modified to include new research sub-domain topic, which in this case is the EVTP(and related topics)…It can be considered that the complemented/modifiedpart, contains more than 60% (to 75%)of the new topic(s)…Because the authors' main aim is not just to publish but to offer the IHIPTF that is capable of confronting ITPs complexities, Polymathy, and to avoid eXtremly High Failure Rates (XHFR)…This article has aspecific-proprietarymulti-dimensional approach to the IHIPTF, RDPs and ITPs(simply Project). The IHIPTF supports: 1) The IHI Methodology, Domain, and Technology Common Artefacts Standard (MDTCAS) as a transcendent model; 2)Enterprise Architecture (EA)and othermethodologies; 3)The Factors' Management System (FMS); 4) The Polymathic Rating-Weighting Concept (PRWC)that usesCritical Success Areas (CSA), Critical Success Factors (CSF), Key Performance Indicators (KPI), VARiables (VAR) which areused to interface the Information and Communication Systems (ICS) and Decision-MakingSystem (DMS)/Knowledge Management System (KMS)/Groupware (simply Intelligence); and 5) An IHI EVTP Concept (EVTPC). The FMS and PRWC(simply Evaluation)use sets of CSAs, CSFs, KPIs, and VARs (simply Factors), for Project's evaluation purposes.TheIHIPTFfororganizations (simply Entity)need Intelligence that usesAction Research (AR) is based Learning Processes (ARbLP).

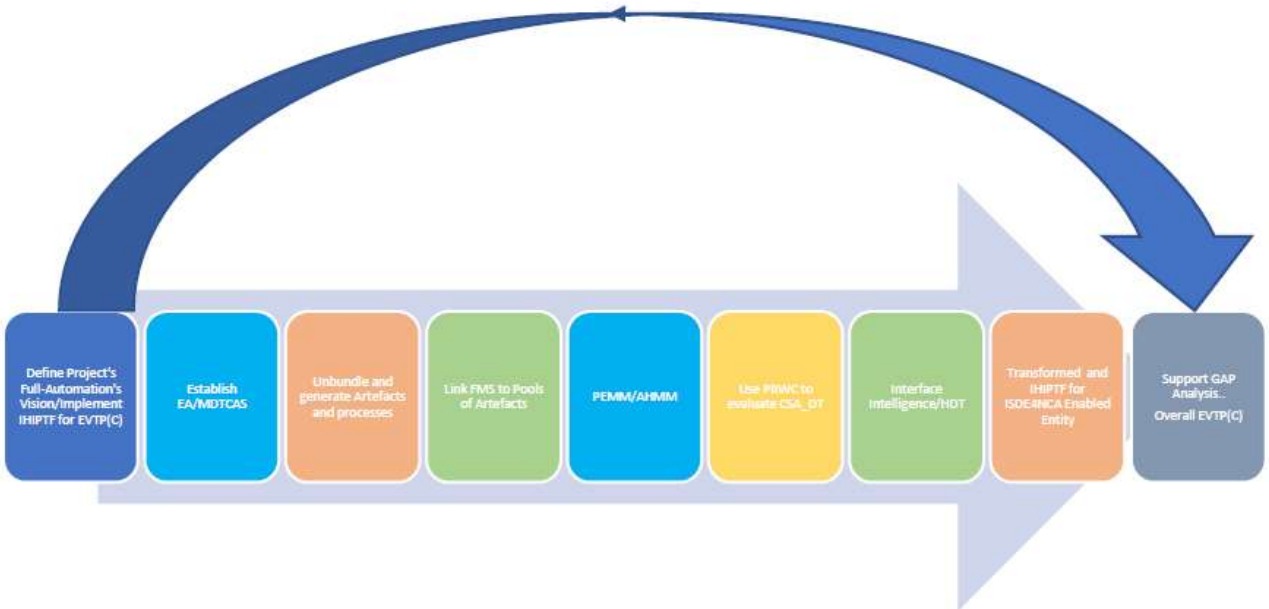

Figure 1. IHIPTF's sequence of phases for the EVTP.

Figure 1 shows IHIPTF's phases for the EVTP module and the Project is a set of CSAs to be analysed and this article starts with its first CSA which is the RDP.

THE RESEARCH DEVELOPMENT PROJECT

An Innovative and Unique Concept

A Projectcan have many Viewpoints, that can include:

- "A" for EA and ICS based transformations.
- "C" for complete transformations that combines all Viewpoints.
- "G" for Generic transformations.
- "W" for the IHIPTF, Project, and the EVTP, which is this article's focus.
- …

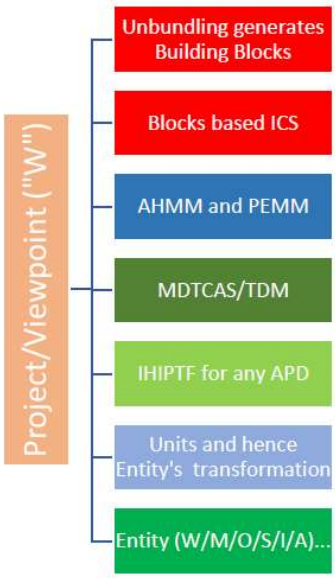

Figure 2. Viewpoint's "W" evolution roadmap.

As shown in Figure 2, the focus is on Viewpoint "W" (because EVTP is a methodology and therefore is a part of IHIPTF) have in view also the rate of 95% of Projects' XHFRs; which forcesthe RDP to be unconventional (Krigsman, 2008), as shown in Figure 3.

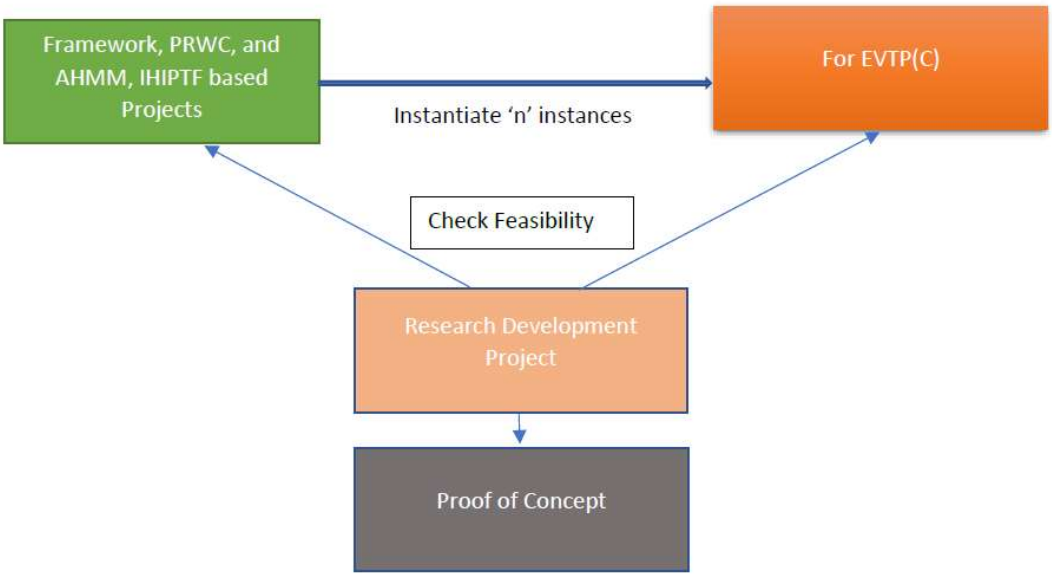

Figure 3. The interaction between the Project (hence IHIPTF4EVTP) and the RDP.

Therefore, this article reuses IHIPTF, RDP, and other authors' research resources. This reuse concept of approaches, resources, and keywords, can be considered by some simplistic automated/robotized tools as some kind of duplication or cases of similarities… By just using directed standards, there isn't any creative innovation, especially in complex domains which desperately need new approaches and renewed methodologies approach to Polymathic research initiatives… Otherwise all academic, business and common domains, will be dictated by the anti-intellectual Google, Amazon, Facebook, Apple, and Microsoft's (GAFAM) stakeholders… Therefore, there is the need to identify an anti-GAFAM (or Anti-Locked-In/ALI) Polymathic Researched Literature Review (RLR) and Gap Analysis (GAPA).

The PRLR and the Research/ProjectGAPA

Project's complexities and their XHFRss are mainly due totheincapacities in the integration of Polymathic/cross-functional domains and GAFAM's monopolistic attitudes.

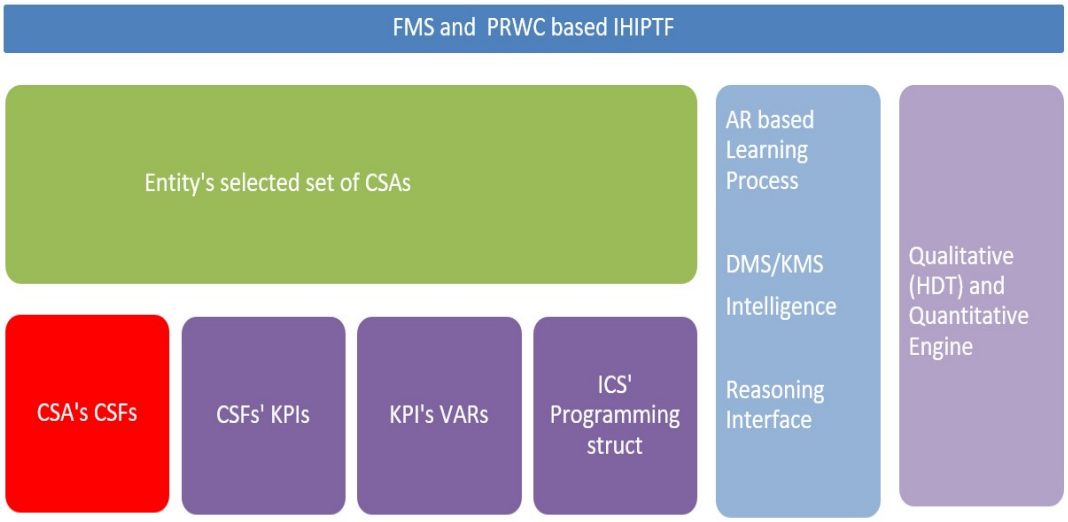

Figure 4. The Evaluations (FMS and PRWC)IHIPTF (for EVTP)that processes CSA_DTs.

The IHIPTF for EVTP (IHIPTF4EVTP) needs the AHMM4EVTP and HDT, to support Intelligence's and Evaluations' operations to offer solutions and credible Factors. This article's Research Question (RQ) is: "Which IHIPTF4EVTP(C) characteristics and capability are needed to support Projects?" The PRLR is mainly based on IHIPTF's knowledge repository and authors' related works, like:

- Organizational and Digital Transformation Projects-A Mathematical Model for Building Blocks based Organizational Unbundling Process (Trad, 2023d). Where The Unbundling Process (UP) that is followed by a Refinement Process (RP) (simply Disassembling) are Project's critical phase.
- The Business Transformation Project's Holistic Agile Management (Trad, & Kalpić, 2022a).
- The Selection, and Training Framework selection and training framework (STF) for Manager's in Business Innovation Transformation Projects–Educational Recommendations (Trad, & Kalpić, 2014a, 2014b, 2014c).
- Enterprise Transformation Projects-The use of the Polymathic Rating and Weighting Concept (Trad, 2024a).
- The Project and the IHIPTF (Trad, & Kalpić, 2024a).

… and many others.

This RDP has identified an important RDP gap that is due to the fact that there isn't: 1) Any identical Polymathic approach to a Project and IHIPTF4EVTP; 2) Projects' XHFRs; 2) No existing mixed-method like the authors' Quantitative-Qualitative Research Mixed Model (QQRMM); 3) The use of Team's profiles; 4) A concept that takes into account long-term intangible objectives; 5) Concrete Evaluations and Factors that link to the ICS and IHIPTF4EVTP; and 6) CSA-DTs processing capabilities, as shown in Figure 4. RDP's related Proof of Concept (PoC) uses the following Applied Case Studies (ACS): 1) The insurance domain (Jonkers, Band, &Quartel, 2012a), which is used for ICS, modelling, basic transformation technics, and EA topics; 2) Presents a paradigm-shift and a translation into a Pool of services (Bernal, García, & Zenón, 2021); and 3)

PoCs from previous works.
An RDP has to setup the PRWC a set(s) of Enumerators (PRWCE), which for this article has the following values: 1) Proven (that is equal to 10); 2) Possible (that is equal to 8 or 9); 3) Feasible (that is equal to 7 or 6); 5) Complex (that is equal to 5); 6) Very_Risky (that is equal to 3 or 4); 7) Very_Complex (that is equal to 1 or 2); and 8) Failure (that is equal to 0). Enumerators are to be used in all article's CSA/CSA_DT processing and resulting findings.

RDP's Pattern

Actually, there are no similar concepts, frameworks, and approaches; and that the IHIPTF/TRADf, has a clear research advantage. The author's RDP concept and IHIPTF have an absolute international lead in research of Polymathical Transformation Projects and initiatives. And if the following keywords are queried (using Google's search engine): Business Transformation Projects, Transformation Manager, AI, EA, Applied Mathematical Models, Holisms, Polymathics, Risk Management, DMS/KMS, Innovation... The results show the author's uniqueness and the absolute lead (Trad, 2024b).This article like all the authors' works use the same pattern which has the following sections (Trad & Kalpić, 2020a):

- An introductory part that explains the overall subject related to the phase's RQ.
- The RDP part that explains the research concept.
- The ACS(s) and PoC related to the final experiment.
- The ICS, ADM, decision making system, represent sections in the work's RQ specific context and integration.
- A specialized part, like in these casesof the PRWC and IHIPTF4EVTP.
- Each part (or CSA) contains a table of selected and weighted Factors.
- An APplication Domain (APD) section.
- The conclusion and recommendations that summarizes and concludes the research work.

The Targeted APD

The APD is a set of topics related to the EVTP(C) and Entity's (and Assets) Valuation Concepts (EAVC) that are used to see if the IHIPTF and Project(s) have delivered values. Where values can be tangible and/or intangible. The EVTPC and EAVC can be applied on one, more than one or all RDP's CSAs, as shown in Figure 5. The EVTP can use existing methodologies and technics like:

- IHIPTF's GAPA for each CSA and the PDP's (and Project's) CSAs.
- Business, Economic, and Common Transformation Projects-The Integration of Six Sigma (ISS) (Trad, & Kalpić, 2024b).
- The Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis (Trad, & Kalpić, 2023b).
- Asset Management Systems (AMS).
- ….

In this article the EVTPC and EAVC tries to focus on intangible values that improve societal conditions and ethics…

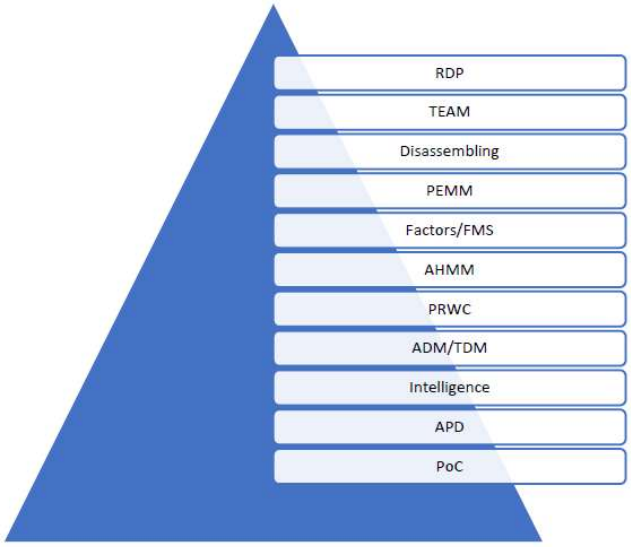

Figure 5. RDP's CSAs.

The GAPA for RDP (GAPA4RDP):

- For a TDM Iteration (ITR) (RDP_1)
- RDPValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (RDP _2)
- GAPA4RDP(ITR)=RDPValue(ITR)-RDPValue (ITR-1) (RDP _3)
- Risk=∑ GAPA4RDP(ITR) (RDP _4)

The RDP CSA/CSA_DTProcessing and Resulting Findings

For this CSA'sresultant Factors and artefactsare:

- The resultant set of CSA's related CSFs are: 1) Innovative_Concept_Feasibility; 2) Gap_Analysis_Defaults; 3) Gap_Analysis_Value; 5) Mixed_Methodology_Basics; 6) Mixed_Methodology_HDT; and 7) IHIPTF4EVTP's integration.
- The resultant set of CSF'srelated KPIs that has the form of an PRWCE.
- The resultant set of KPI's related VARs are: 1) Innovative_Concept_Feasibility_VAR; 2) Gap_Analysis_Defaults_VAR; 3) Gap_Analysis_Value_VAR; 5) Mixed_Methodology_Basics_VAR; 6) Mixed_Methodology_HDT_VAR; and 7) IHIPTF4EVTP_Integration_VAR. All these VARs are concrete ICS application variables, like for example Mixed_Methodology_Basics_VARMicrosoft's C# language structure as shown in Figure 6 which is a concrete programming lang structure (which links Factors to a concrete ICS and APD'smodules):

```
publicstructIHIPTF4EVTP_Integration_VAR
{
  publicIHIPTF4EVTP_Integration_VAR(int APDType,intAPDStat)
  {….}
  publicintcAPDType{ get; }
```

```
        publicintcAPDStat{ get; }
        publicstringToString() =>$"({cAPDType},{cAPDStat})";
        }
```

Figure 6. The IHIPTF4EVTP_Integration_VAR structure.

CSA's CSFs	Related KPIs	Weightings
CSF_RDP_Polymathic_Innovative_Concept	Proven	From 1 to 10. **10 Selected**
CSF_RDP_Gap_Analysis_Defaults	Proven	From 1 to 10. **10 Selected**
CSF_RDP_Gap_Analysis_Values	Complex	From 1 to 10. **08 Selected**
CSF_RDP_QQRMM_Basics_EERM	Feasible	From 1 to 10. **09 Selected**
CSF_RDP_QQRMM_Basics_HDT	Feasible	From 1 to 10. **09 Selected**
CSF_RDP_IHIPTF_EVTPC	Feasible	From 1 to 10. **09 Selected**

valuation

Table 1. The CSA_DT outcome is 9.20.

This CSA's Decision Table (CSA_DT) uses the defined CSFs and KPIs (and relate VARs), as shown in Table 1,the resulting value is 9.20 that corresponds to "Mature". The details on how the CSA_DT was processed can be found in AHMM, FMS, and PRWC CSAs/sections. A Project is made of many Phases and CSAs, and the first analysed CSA is about how to establish the Project's Managers and Team members (simply Team, that includes also other types of specialists).

THEPROJECT'S TEAM AND MANAGER PROFILES

Managing Complexities, and Polymathics

Projects are very challenging and have many types of complexities; andthe most important ones lie in the conversion and transformation of the Legacy ICS'and APD's heterogenous components to offeran agile, secured, and unbundled ICS services, AMS resources, APD resources, and Business Processes (BP) Models (BPM). The IHIPTF4EVTP uses the PRWC to evaluate:1) Project's GAPA (or statuses); 2) Toabstract the usage of EA and other methodologies; and 3) To support Team's integration, capacities and skills. XHFRs are mainly due tothe lack of Polymathic capabilities and skills, especially for the Project's and EVTPrelated parts. Managers (and methodology specialists) need to have theArchitect of Adaptive Business Information System (AofABIS)or Business Transformation Project's Architect's Profile (BTPAP) profile.The BTPAP that super-classes of the AofABIS profile, which should have adequate set of skills which contains skills related to the integrationofIHIPTF4EVTP with Agile Project Management (APM), EAmodels, various methodologies (Trad, & Kalpić, 2021a). The IHIPTFoffers the Architecture Development Method (ADM) based Transformation Development Methodology's (TDM) approach.

Managing the Continuum, Repository, and Reference Models

The Team has the responsibility that includes the integration of the IHIPTF4EVTPartefacts, architectural design, and documentation at a technical reference model level. The IHIPTF4EVTP includes various types of architects' profilelike (The Open Group, 2011d): 1) Leadinga Industry

Architects groups; 2) System Architect has the responsibility for architectural design and documentation; 3) Industry Architect has the responsibility for EA/TDMbased EVTPdesign; and 4) Organization Architect and Team have the responsibility for architectural design of a specific Entity, and interfacing other methodologies like EVTP's integration that is the APD and managing its complexities (Trad, 2023c).

Managing Complexity and Uncertainty

For forging Polymathics it is important to select Team-members who have predispositions for managing Complexity. Complexity is related to cross-functional system's modelling/design, business engineering, and ICS services. Complexity has many variables a Team-member can have the predispositions to successfully finalize their projects. Each Team-member has his intellectual capabilities for cross-functional multitasking and there are cultural-mental constraints; where Team-members can manage tasks from various domains parallelly (Trad, 2023c). Factors related to complexity are (Bryce, 2015): 1) The volume of topics and tasks; 2) The characteristics and relations of each topic and ICS component; and 3) Team-members' abstraction, architecture and modelling capacities. Entitieshave exponential evolution or regression and they specialists to innovate and such expansions are very complex. Therefore, Team-members' projects must emphasize organizational structures transformation technics and how to create value(s) in complex environments. *Entities* must synchronize and manage customers, offered products/services, employees multi-tasking capabilities, targeted countries/regions, regulations, roles/responsibilities, frequency of change, application of new strategies… Succeeding in managing complexities can offer benefits like: 1) Higher returns; 2) Reducing costs; and 3) Improved employees' performances and satisfaction. To detect complexities fatal effects and their wide-spreading, there the need to apply accountability, control processes, and Complexities Management Strategies (CMS) in *Entities* (Heywood, Hillar, & Turnbull, 2010). CMSs can support the continuous rise of BTP's complexities which are difficult to predict and exceed Team-member's cognitive limits. BTPs implement complex systems which it is impossible to predict its future impacts and behaviour. A CMS relates to many different topics, tasks and elements which are autonomous (even siloed), but at the same time interrelated in static nonlinear patterns. CMS must take into account *Entity's* external and internal Factors which can include: 1) It is mandatory and has to be accepted; 2) Reduces stress and makes Team-members motivated, productive, or creative; 3) Skills upgrading and make Team-members qualified; 4) Predicts influences; 5) Improves cognitive abilities and thus to predict opportunities; 6) Improves critical and improvised thinking; 7) Enforces leadership capacities and frees the need for static control; 8) Being factual and accepting partial/temporary facts; 9) Accept failures and unpleasant surprises; 10) Localize islands of simplicity as jumpstarts; 11) Promote diversity; 12) Promote action and reaction and not blocking analysis; and 12) Apply Polymathic/holistic non-linear thinking. CMSs must take account constraints like deadlines, budget, knowledge, or cognitive capacities (Buch-Madsen, 2011). A CMS is IHIPTF's capacity in managing complexity; such a framework can be based on the following Factors: 1) Applying a cohesive strategy and transparency on critical issues; 2) Using complexities analysis, simulation, and optimization tools/framework like the HDT; 3) Understanding what drives complexity like market

volatility, fragmented customer demands, globalization, mergers/acquisitions, using the *Global Simplicity Index,* reducing complexity, and relevance/level of complexity for BTP's success. CMS defines the optimal level of complexity for each BTP domain and uses HDT/Factors to optimize complexity. To successfully use the CMS needs to establish an HDT based problem-solving which also uses Factors and delivers recommendations for change and that can be included in a cross-functional capacities (Wikipedia, 2023).

The Targeted APD

Options for assessing the *product* of group assignments	
Type of mark	This mark may be based on...
Shared group mark	This strategy may apply when a group submits a single product (e.g. oral presentation, written report) as the product of their group assignment. With this strategy, the product is graded as a whole, and individual contributions are not assessed. The strategy may encourage collaboration, but disadvantage strong students and allow for social loafing.
Individual mark	Students receive an individual mark based on their contribution to a group project, OR students produce an individual product as the outcome of their group work. This strategy can be motivating to students if they perceive they are being fairly rewarded for their contributions. However, the strategy can discourage collaboration. If the task has a shared product, it can be difficult to distribute work equally to all students in the group.
Combination of group average and individual mark	The group product is marked, but the marks are adjusted based on individual contributions to the project (as assessed by the instructor, or as reflected in team logs, reflective journals, or peer assessments). The group is awarded a single mark, which is then adjusted for each member based on contributions. This approach can be perceived as equitable by students, but may create conflict if peer assessments are not perceived as fair.
Options for assessing the *process* of group assignments	
Individual mark (adjusted from group average)	This strategy assesses the group process as a whole, then adjusting marks to account for individual contributions (rewarding strong contributors, while lowering grades for weak contributions). This strategy requires the use of evidence from direct observation, group logs, and reflective journals on the team process.
Group average mark	This strategy assigns a single mark to the group for their group process, as reflected in observations, group logs, and reflective journals. This strategy can encourage strong collaboration and commitment to a strong group process, but can disadvantage stronger contributors.
Individual mark	Students are assigned a mark based on a separate assignment (e.g. a reflective paper) on the group process, that includes information on their own contribution and that of their team members.

Figure 7. Assessing Team's groupwork (KPU, 2020; Crebert, Patrick, Cragnolini, Smith, Worsfold, & Webb, 2011).

There are various strategies for evaluating Team's capacities, skills, and intangible values that are in fact Factors (CSFs) (KPU, 2020; Crebert, Patrick, Cragnolini, Smith, Worsfold, & Webb, 2011):

- Capacity to abstract, find consensus, and resolve complex problems/difficulties.
- Adapt to APM and respect timelines, milestones…
- Exchanging in support/advice, groupwork processes…
- Contributing in gathering and researching information, reporting, critical evaluation...
- And other…

The GAPA for TEAM (GAPA4TEAM):

- For a TDM Iteration (ITR) (TEAM_1)
- TeamValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (TEAM_2)
- GAPA4TEAM (ITR)=TeamValue(ITR)- TeamValue (ITR-1) (TEAM_3)
- Risk=∑ GAPA4TEAM (ITR) (TEAM_4)

The TEAM CSA Processing and Findings

The resultant Factors are:

- The structure publicstructUsing_TDM_VAR{ …}
- The CSFs are: 1) Polymathics_Managing_Complexities; 2) Polymathic_Profiles; 3) Managing_Contiuum; 4) Using_TDM; and 5) HumanFactor_Resistance.
- The VARs are: 1) Polymathics_Managing_Complexities_VAR; 2) Polymathic_Profiles_VAR; 3) Managing_Contiuum_VAR; 4) Using_TDM_VAR; 5) HumanFactor_Resistance_VAR; and 5) Interfacing_Existing_Methodologies_Environments. All these VARs are concrete ICS application variables, like for example Using_TDM_VAR Microsoft's C#.

This CSA_DT uses the defined Factors, as shown in Table 2, and the result is 8.5 that corresponds to "Risky".

Critical Success Factors	AHMM4CBB enhances: KPIs	Weightings
CSF_Team_Managing_Complexities	Complex	From 1 to 10. **08 Selected**
CSF_Team_Polymathics	Feasible	From 1 to 10. **09 Selected**
CSF_Team_APM	Complex	From 1 to 10. **08 Selected**
CSF_Team_IHIPTF_TDM_Exisiting_Methodologies	Feasible	From 1 to 10. **09 Selected**

Table 2. The CSA_DT outcome is 8.50.

The Project starts with the complex UP and RP (simply Disassembling), that delivers the needed sets of Building Blocks (BB).

THE DISASSEMBLING PHASE AND BUSINESS PROCESSES

Disassembling Entity's Legacy

Projects and EVTPare complex and have XFHRs because they depend on Composite BBs (CBB)based creation processes. CBBs are created by the Disassembling process and serve for designing diagrams artefacts and environments. Where the Organizational UP (OUP) is a sequential set of Disassembling processes that transforms the Entity's: Legacy ICS structure, ICS'

administration, Assets/Resources, Applications/Services, BPMs, and Internal/external collaboration models. Disassembling processes, as shown in Figure 8, delivers a Pool of heterogenous CBBs that are (re)used to build Architectural BBs (ABB). Disassembling (that is Automated RPs-ARP) can face difficulties in interfacing the various transformation modules like EVTP(C), GAPA, FMS, PRWC... Disassembling process should deliver afeasible Entity's Pool of refined CBBs and a central Entity's Polymathic Dictionary and Glossary (EPDG) (Trad, 2023d). The EPFG offers: 1) Common data and terms vocabulary for IHIPTF and EVTPC; 2) A data catalog; and 3) Collections of related terms, definitions, and other properties.

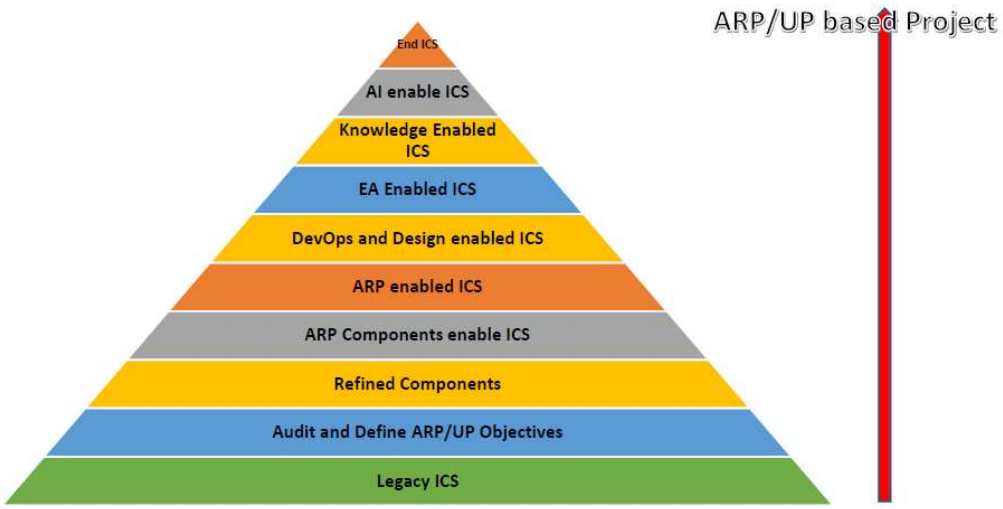

Figure 8. Disassembling based Project's Approach(Trad, 2023d).

The Pool of Refined CBBs, BP(M)s, and Reference Models

Projectsand hence EVTPrefined CBBs and ABBs,use existing services' architecture frameworks and standards; and they are managed by the TDM which synchronizesProject's Disassembling processes. ABBs are existing templates that are used for instantiating Solution BBs(SBB) that is APD'sagnostic. The TDM uses The Open Group's (TOG) Architecture Framework (like TOGAF that includes a generic BBs, CBBs, ABBs, and SBBs guidelines that (The Open Group, 1999). The IHIPTF4EVTPand TDM use the Technical Reference Model (TRM) that offers a generic concept for CBBs, ABBs, BBs… (simply Block) and its services, which makes Blocks interoperable. The The MDTCAS offers the common methodological language the "1:1" mapping concept (The Open Group, 2011c). Disassembling extractsAPD and standard/common resources and models that are included in the MDTCAS that can include (Trad, 2023d): 1) Object Management Group's (OMG)Decision Making Notation (DMN)that can be usedfor modeling operational decisions like in (RedHat, 2022; The Open Group, 2021): 1) Adapting BPMs; 2) CSA_DTs evaluations; 3) Supporting Disassembling to deliver needed artefacts for the EVTP environments; and 4) EVTP specific Blocks concept for a targeted APD.

The Targeted APD

UP, ARP, and Disassembling processes are very complex to be valuated, because they are simply

successful or not… A binary result… The GAPA for UP (GAPA4UP):

- For a TDM Iteration (ITR) (UP_1)
- UPValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (UP_2)
- GAPA4UP (ITR)=UPValue(ITR)- UPValue (ITR-1) (UP_3)
- Risk=∑ GAPA4UP (ITR) (UP_4)

The Disassembling CSA Processing and Findings

This CSA's resultant Factors and artefacts are:

- The structure: public struct IHIPTF4EVTP_Capability_DFSS_VAR…
- The CSFs: 1) Legacy_Transformation; 2) EPDG_Implementation; 3) ARP_Capacities; 5) Reference_Models; and 6) IHIPTF4EVTP_DFSS integration.
- The VARs: 1) Legacy_Transformation_VAR; 2) EPDG_Implementation_VAR; 3) ARP_Capacities_VAR; 5) Reference_Models_VAR; and 6) IHIPTF4EVTP_Capability_DFSS_VAR. And a related structure.

This CSA_DT uses the defined Factors, as shown in Table 3 that is 8.50 that corresponds to "Risky". The details on how the CSA_DT was processed by Evaluations.The Disassemblingprocesses depend on the established PEMM.

Critical Success Factors	AHMM4EVTP: KPIs	Weightings
CSF_Disassembling_Legacy_Transformation	Feasible	From 1 to 10. **09 Selected**
CSF_Disassembling_Pool_Dictionary	Mature	From 1 to 10. **10 Selected**
CSF_Disassembling_BPs_Blocks_Services	VeryComplex	From 1 to 10. **07 Selected**
CSF_Disassembling_Reference_Models	Complex	From 1 to 10. **08 Selected**

valuation

Table 3. The CSA_DT outcome is 8.50.

THE PEMM

Basics and Construct

There are manyways how to buildgeneric Meta-Models likePEMMfor the IHIPTF4EVTP and its modules. PEMM depends on the Entity's heterogenous ICS components and structure, as well as on its organizational transformational capacities. APEMMshould be theEntity's, IHIPTF4EVTP's, ICS',Projects'point of reference and itestablishes a method-relational/modelon how to avoid commercial-onlyvaluations models, ICS/AI products, promotes XHFRs detection, and the synchronization of Project's activities.The PEMM as shown in Figure 9, is the Entity's, IHIPTF4EVTP's, and Projects' ultimate reference model, supports all IHIPTF4EVTP's modules, and targeted APD for PEMM..

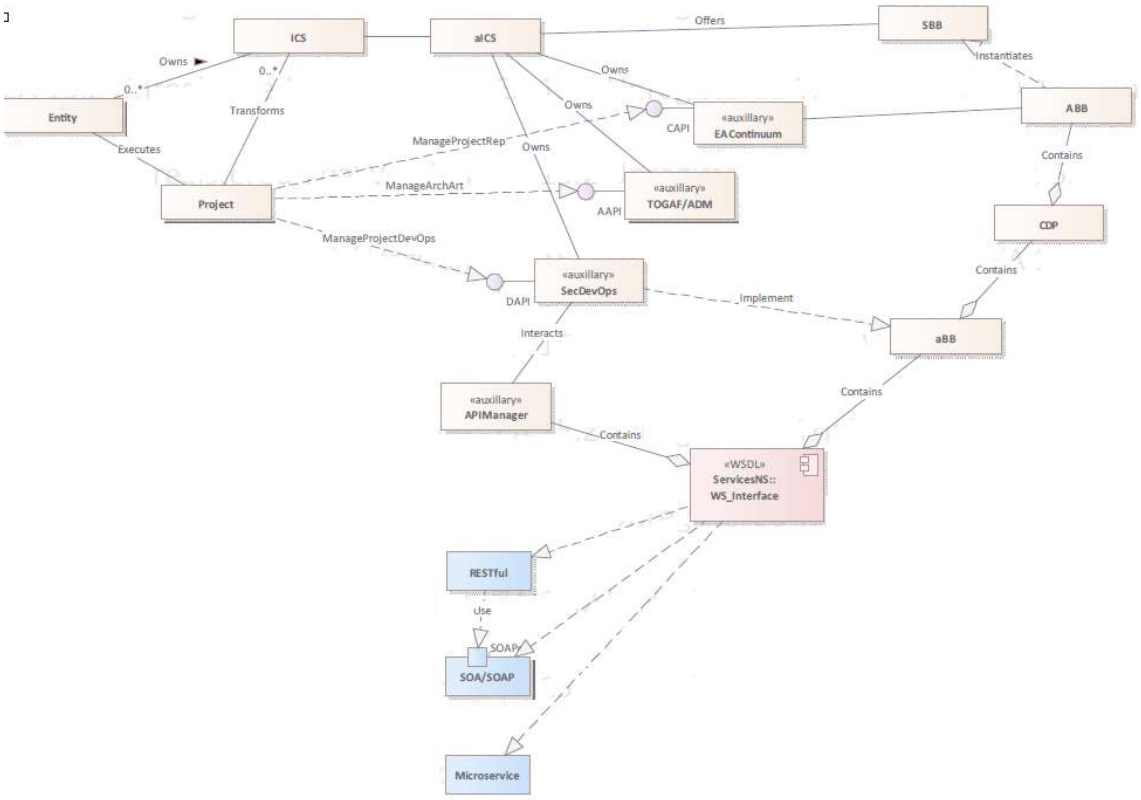

Figure9. A version of aPEMM.

The Targeted APD

The GAPA for PEMM (GAPA4 PEMM):

- For a TDM Iteration (ITR) (PEMM_1).
- PEMMValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (PEMM_2).
- GAPA4PEMM (ITR)=PEMMValue(ITR)-PEMMValue (ITR-1) (PEMM_3).
- Risk=∑ GAPA4PEMM (ITR) (PEMM_4).

Which can be based on comparing two PEMM files and analyzing the gaps.

The PEMM CSA Processing and Findings

The resultant Factors and artefacts are:

- The structure: public struct IHIPTF4EVTP_PEMM_VAR…
- The CSFs: 1) PEMM_Feasibility; 2) Fundements_Conept; 3) Disassembling_Sync; 4) Global_Construct; and 5) IHIPTF4EVTP_PEMM_Integration.
- The VARs: 1) PEMM_Feasibility_VAR; 2) Fundements_Conept_VAR; 3) Disassembling_Sync_VAR; 4) Global_Construct_VAR; and 5) IHIPTF4EVTP_PEMM_VAR.

This CSA_DT uses the defined Factors, as shown in Table 4 that is 8.25 that corresponds to “Risky”. The PEMM depend on the FMS’ integration.

Critical Success Factors	KPIs	Weightings
CSF_PEMM_Basics	Complex	From 1 to 10. **08 Selected**
CSF_PEMM_Generic_Meta_Modelling	Possible	From 1 to 10. **09 Selected**
CSF_PEMM_Relate_Disassembling	VeryComplex	From 1 to 10. **07 Selected**
CSF_PEMM_IHIPTF_PEMM	Possible	From 1 to 10. **09 Selected**

valuation

Table 4. The CSA_DT outcome is 8.25.

THE SET OF FACTORS AND THE FMS' INTEGRATION

Integrating Factors

The FMSis used to integrate various levels of Projects' risks and the FMS is based on CSAs and other categories of Factors, where: 1) Each CSA corresponds to an Entity APD or common functional domain, like for example, logistics, finance,…; 2) Each CSF maps to a set of requirements and problems, like for example, accounting activities; and 3) Each KPI corresponds to a uniqueEntity's ICS item that is linked a VAR. Entity's FMS and ICS' libraries and resources are synchronized by the TDM.

The CSAs and CSFs

IHIPTF4EVTP'srepository contains and maps to Project's selected CSAs (which in turn map to CSFs, and other types of Project'sIntelligence resources, like LSS services, architecture models, requirements) as shown in Figure 10. A CSA maps to CSFs and other Project's resources is supported by the TDM (The Open Group, 2011a).

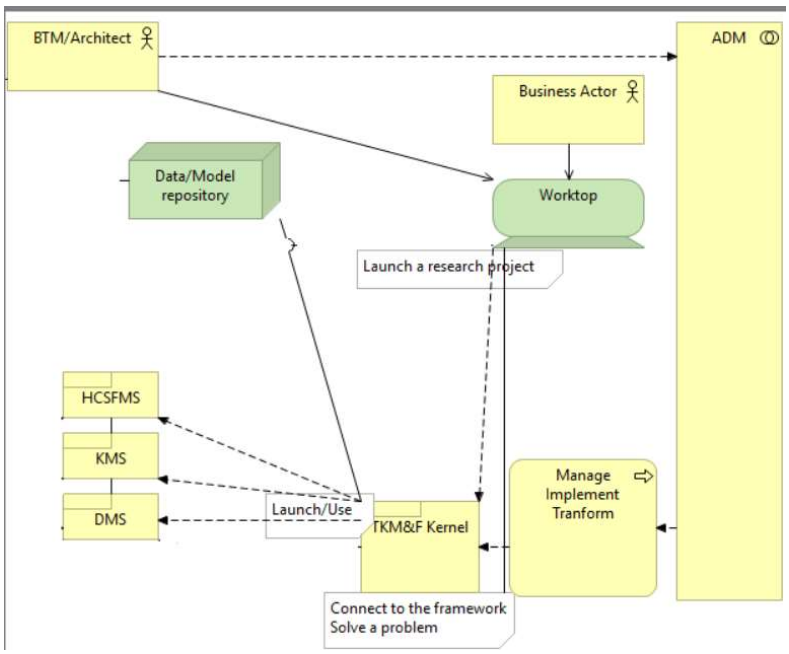

Figure 10. The TDM's architecture method's interaction.

CSF is a set of integrated KPIs, and a KPI related/maps to a unique Project requirement and/or problem type as shown in Figure 10. The Project Team identifies the initial set of Factors to be managed by the FMS (Peterson, 2011). Therefore, CSFs are important for the mapping between Project's and/or IHIPTF4EVTP's problem types (simply Problem), Intelligence constructs, and other Entity's items and resources. A CSFs reflects a Problem with its predefined constraints.

The KPIs and VARs

A CSF is a set of KPIs, and a KPI related/maps to a unique Project requirement and/or problem type(s). FMS' default CSFs/KPIsneed a detailed PRWC interaction, where a KPI is used for the mapping between Project's objectives, business requirements, VARs, organisational structure.A Project establishes and links initial sets of Factorsthat is a complex process and that is based on:

Analysis = ∑ Factors, abstracts the risk and GAPA on the level of a Project.

Factors = ∑ CSAs, abstracts the risk and GAPA on the level of a subsystem or a sub-Project or APD.

CSA = ∑ CSFs, abstracts the risk and GAPA on the level of a APD component or topic.

CSF = ∑ KPIs, abstracts the risk and GAPA on the level of anBlocks or a bundle of services.

KPI = ∑ Variables (VAR), abstracts, and attributes of a ICS service(s).

The symbol ∑ relates to processing of a series of Project of transformational equations, and not to the definition of ***sumof***… Decisions based on GAPA(s) for formulating a Project's strategy and status, are based on the analysis of the external and internal CSAs and hence CSFs and KPIs (and VARs). CSFs and KPIs are key elements in Projects and their planning.

Factors Patterns and Rules

Factors pattern(s)are persisted in IHIPTF4EVTP's repositoryin the form of Blocks, and are (re)used by the Evaluations because they offer: 1) Predefined set(s) Factorsto be usedby Intelligence and GAPA; 2) Defined responsibilities, relationships,best practices, and content; 3) Relationships betweenBlocks and other Project's artefacts; 4) Default Factors' values; and 5) Interfaces to evaluation rules.A Projectstarts with TDM's initial phase which is also the feasibility's checking phase. This phase checksifthe Project is feasible and the possibilities of XHDRs; andFMS offers the following set of rulesto check Factors:

- R1: References' checking which evaluates their credibility and that can be done by the Team.
- R2: Projects result in organisational changes and these changes' success is measured by Factors by using GAPA or similar concepts.
- R3: Applied modelling language which change in the diagrams and artefacts can help the estimation.
- R4: The Meta-Model which change in the diagrams and artefacts can help the estimation.
- R5: The TDM which is matureand the diffs between phases can help the estimation.

- R6: If the aggregations of all Project'sCSA_DTs are positive and exceed the defined minimum, the Projectcontinues to its PoC (or phase 2) where can try to solve problems.

A rule can be defined for this (or targeted) CSA.

The Targeted APD

The GAPA for FMS (GAPA4FMS):

- For a TDM Iteration (ITR) (FMS_1).
- FMSValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (FMS_2).
- GAPA4FMS (ITR)=FMSValue(ITR)- FMSValue (ITR-1) (FMS_3).
- Risk=∑ GAPA4FMS(ITR) (FMS_4).

The Factors and FMS CSA Processing and Findings

The resultant Factors and artefacts are:

- The structure public struct FMS_HDT_Processing_VAR…
- The CSFs: 1) FMS_Feasibility; 2) Factors_Defaults; 3) KPI_VAR_Interface; 4) Patterns_Collection; 6) Rules_Sets; 5) FMS_HDT_Processing; and 6) IHIPTF4EVTP's integration.
- The VARs: 1) FMS_Feasibility_VAR; 2) Factors_Defaults_VAR; 3) KPI_VAR_Interface_VAR; 4) Patterns_Collection_VAR; 6) Rules_Sets_VAR; 5) FMS_HDT_Processing_VAR; and 6) IHIPTF4EVTP'sintegration_VAR; and the related example is FMS_HDT_Processing_VAR structure.

This CSA_DT uses the defined Factors, as shown in Table 5 that is 8.5 that corresponds to "Risky".

Critical Success Factors	KPIs	Weightings
CSF_FMS_PRWC_Integration	Mature	From 1 to 10. **10 Selected**
CSF_FMS_Factors	Possible	From 1 to 10. **09 Selected**
CSF_FMS_IHIPTF_ICS_VARs	Complex	From 1 to 10. **08 Selected**
CSF_FMS_Patterns_Rules	Complex	From 1 to 10. **08 Selected**

valuation

Table 5. The CSA_DT outcome is 8.50.

THE AHMM

The QQRMM

The initial set of Project problem types and their selected/related Factors are initialized in TDM's preliminary phase (or initial iteration). Then, IHIPTF4EVTP's HDT inputs various sets like: Constraints, Factors, Rules, Data-sets, Configurations, and other, which are stored in IHIPTF4EVTP'srepository. The use of simplistic quantitative analysis, is very limited and there is the need for a qualitative method that enriches the Entity's Learning Process (ELP). The QQRMM based HDT evaluatesProjects' problem types and to proactively detects violations to the defined

constraints and applied rules.

The Transformational Model and Structure

The adoption of a holistic, cross-functional, and Polymathic modelling approach, is supported by the AHMM and its AHMM4EVTP variant, which uses a multi-level Disassembling process. The RDP uses the Empirical Engineering Research Model (EERM) (Easterbrook, Singer, Storey, & Damian, 2008) andaPolymathic-Mathematical Model (PMM) that can describe a real-world system's behaviours, capabilities, and possibilities.

AHMM4EVTP's basic element are used in IHIPTF4EVTP, which is a specific model. The AHMM4EVTP nomenclature is presented in Figure 11:

- The symbol ∑ indicates summation of IHIPTF4EVTP's actions, denoting the relative importance of the set members selected as relevant. Ratings and weightings as integers ranging in ascending importance from 1 to 10.
- The symbol$\underline{U}$ indicates sets union.
- The AHMM4EVTP defines the Project and IHIPTF4EVTP as models.

Basic AHMM's Elements and Artefacts

Basic Mathematical Model's (BMM) Nomenclature

Iteration	= An integer variable ***"i"*** that denotes a *Project/ADM iteration*	
microRequirement	= (maps to) KPI	(N1)
CSF	= Σ KPI	(N2)
Requirement	= (maps to) CSF = ⋃ microRequirement	(N3)
CSA	= Σ CSF	(N4)
microMapping microArtefact/Req	= microArtefact + (maps to) microRequirement	(N5)
microKnowledgeArtefact	= ⋃ knowledgeItem(s)	(N6)
neuron	= action->data + microKnowledgeArtefact	(N7)
microArtefact / neural network	= ⋃ neurons	(N8)
microArtefactScenario	= ⋃ microartefact	(N9)
AI/Decision Making	= ⋃ microArtefactScenario	(N10)
microEntity	= ⋃ microArtefact	(N11)
Entity or Enterprise	= ⋃ microEntity	(N12)
EnityIntelligence	= ⋃ AI/Decision Making	(N13)
BMM(*Iteration*) as an instance	= EnityIntelligence(*Iteration*)	(N14)

The Generic AHMM's Formulation

AHMM	= ⋃ ADMs + BMMs	(N15)

AHMM's Application and Instantiation for EVTP

Domain	= EVTP/Evaluations	(N16)
AHMM4(*Domain*)	= ⋃ ADMs + BMMs(*Domain*)	(N17)

Figure 11. AHMM's nomenclature (Trad, & Kalpić, 2020a).

The Applied Transformation Mathematical Model

The AHMM4EVTP is composed of: 1) A static view; 2) A dynamic (or behavioural) view; and 3) A pool of reusable ARbLP based scenarios. The AHMM4EVTP can be modelled using following formula for Entity Transformation Mathematical Model (ETMM) that abstracts the Project:

$$AHMM4EVTP=Weigthing_1*AHMM4EVTP\_Qualitative+Weigthing_2*AHMM4EVTP\_Quantitative \quad (N18).$$

AHMM4EVTP = ∑ AHMM4EVTP for anProject iteration
(N19).
ETMM = ∑ AHMM4EVTP instances
(N20).

The Targeted APD

The GAPA for AHMM (GAPA4AHMM):

- For a TDM Iteration (ITR) (AHMM_1).
- AHMMValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (AHMM_2).
- GAPA4AHMM (ITR)=AHMMValue(ITR)-AHMMValue (ITR-1) (AHMM_3).
- Risk=∑ GAPA4AHMM(ITR) (AHMM_4).

The AHMM CSA Processing and Findings

The resultant Factors and artefacts are:

- public struct QQRMM_Feasibility_VAR…
- The CSFs: 1) QQRMM_Feasibility; 2) Elements_Sets; 3) Transformational_Model; 4) Viewpoints; 5) ETMM; and 6) IHIPTF4EVTP_Integration.
- The VARs: 1) QQRMM_Feasibility_VAR; 2) Elements_Sets_VAR; 3) Transformational_Model_VAR; 4) Viewpoints_VAR; 5) ETMM_VAR; and 6) IHIPTF4EVTP_Capability_VAR, like for example QQRMM_Feasibility_VAR structure.

This CSA_DT uses the defined CSFs and KPIs, as shown in Table 6 that is 9.20 that corresponds to "Mature".

Critical Success Factors	KPIs	Weightings
CSF_AHMM4EVTP_Basics_QQRMM	Proven	From 1 to 10. **10 Selected**
CSF_AHMM4EVTP_Transformational_Model	Possible	From 1 to 10. **09 Selected**
CSF_AHMM4EVTP_Elements_Blocks_Artefacts	Proven	From 1 to 10. **10 Selected**
CSF_AHMM4EVTP_Viewpoints	Possible	From 1 to 10. **09 Selected**
CSF_AHMM4EVTP_ETMM_EVTP	Possible	From 1 to 10. **08 Selected**

valuation

Table 6. The CSA_DT outcome is 9.20.

THE PRWC

The Role of the PEMM,AHMM4EVTP, IHIPTF4EVTP, and PRWC

The PEMM based PRWC (and Evaluations) as shown in Figure 12, has the following characteristics:

- Has a static and dynamic form.
- Is AHMM's (and hence AHMM4EVTP) basic structure and its integrity checker.
- It defines Rules, Constraints, HDT, Intelligence, and other basic structures and their integrity checkers.

- Is FMS' basic structure and its integrity checker. Which ensure that Factors are measurable and mapped to a ratings and weighting.
- It aligns Factors and Project's Unit of Work (UoW) that needs the needed level of granularity and responsibility. There also the need to implement the "1:1" mapping, implementation and classification concept.
- Is IHIPTF4EVTP's structure.
- Is the Project's overall and for a single CSA GAPA enabler.

The ADM based TDM synchronizes MetaModel's (PEMM) implementation and evolution.

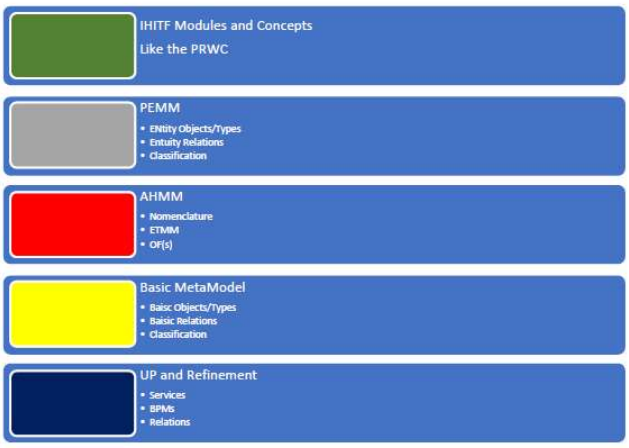

Figure 12. The IHIPTF4EVTP layers of models.

HDT's Actions

For a Project requirement (or problem type), the IHIPTF4EVTP identifies the related Factors, to be processes by the HDT based Intelligence.HDT's actions in the form of scenarios are dynamically evaluated. Factors are important for the mapping between the requirements, CBBs, ICS, and Intelligence (Peterson 2011). A Project can use a standard/commercialPRWC(s) or like in IHIPTF4EVTP, it builds its own one, which functions as follows:

- The weighting for each CSA is CSA_WGT ϵ { 0.00% … 100.00% } which is a floating point value/percentage values, which are derived from CSA_DT as one CSA_DT and a set of CSFs).
- The selected corresponding weightings to CSF ϵ { 1 … 10 } are fixed integer values.
- The selected corresponding ratings to CSF ϵ { 0.00% … 100.00% } are floating point percentage values.
- A weighting is defined for each PRWC CSF, and a rating for each KPI.
- The selected corresponding ratings for a KPI is KPI_RAT ϵ { 0.00% … 100.00% } and is derived from: 1) An ICS application/module variable(s) (simply VAR); 2) Estimated by the IHIPTF4EVTP or a domain specialist; or 3) An external concept.
- CSA_WGT = ∑CSF*CSF_WGT.
- CSF_WGT = ∑KPI*KPI_RAT.
- KPI_RAT = ∑VAR*VAR_RAT.

The Targeted APD

GAPA is used to evaluate Project'sand its modules performances. Where it can be also used for each Entity's CSA, where CSFs can be: 1) A status for a TDM'sresource like a requirement; 2) Mapping levels of UP's BBsand PRWC outcomes; 3) GAPAs storage and comparison; 4) TDM phases'synchronization; and 5) HDT based Intelligence requests calls. KPIs relate to VARs from BBs, so HDT's based evaluation processes can automatically estimate the values of CSAs, and CSFs. The GAPA for PRWC (GAPA4 PRWC):

- For a TDM Iteration (ITR) (PRWC_1).
- PRWCValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (PRWC_2).
- GAPA4PRWC (ITR)=PRWCValue(ITR)- PRWCValue(ITR-1) (PRWC_3).
- Risk=∑ GAPA4PRWC(ITR) (PRWC_4).

The PRWC CSA Processing and Findings

The resultant Factors and artefacts are:

- The structure: public struct GAPA_Exec_VAR…
- The CSFs: 1) PEMM_AHMM_Application; 2) TDM_Usage; 3) HDT_FMS_Usage; 4) Intelligence_Integration; and 5) GAPA_Exec.
- The VARs are: 1) PEMM_AHMM_Application_VAR; 2) TDM_Usage_VAR; 3) HDT_FMS_Usage_VAR; 4) Intelligence_Integration_VAR; and 5) GAPA_Exec_VAR, like for example Mixed_Methodology_Basics_VAR structure.

This CSA_DT uses the defined Factors, as shown in Table 7 that is 9.0 that corresponds to "Feasible".

Critical Success Factors	KPIs	Weightings
CSF_PRWC_PEMM_AHMM	Complex	From 1 to 10. **08 Selected**
CSF_PRWC_TDM	Possible	From 1 to 10. **09 Selected**
CSF_PRWC_HDT_FMS	Proven	From 1 to 10. **10 Selected**
CSF_PRWC_Intelligence	Possible	From 1 to 10. **09 Selected**
CSF_PRWC_IHIPTF_GAPA	Possible	From 1 to 10. **09 Selected**

valuation

Table 7. The CSA_DT outcome is 9.0.

THE ADM BASED TDM

Selecting the Viewpoint for the TDM

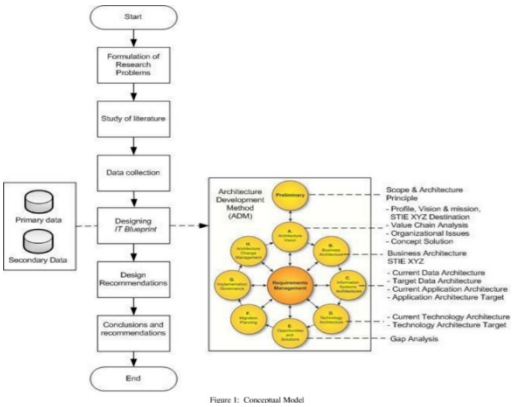

Figure 13. ADM's (TDM) phases (The Open Group, 2011a, 2011b; Holilah, Girsang, &Saragih, 2019).

Projects depend on Entity's structure which needs the application of selected Viewpoint(s) which for this RDP is Viewpoint "R", "C" and "W", where"W"is the main "W". The TDM synchronizes Project's phases and manages RDP, IHIPTF4EVTP, PRWC/Evaluations, and the HDT to solve Problems as shown in Figure 13 (Markides, 2011).

The MDTCAS

TheIHIPTF4EVTPintegrates the MDTCAS and TDM to manageBlockswhich can be used in APD modelling activities and support a Digital Transformation (DT).The MDTCAS supports UPs to integrate standard methodologies, like TOGAF/ADM. TheMDTCAS, as shown in Figure 14,is a mixture ofexisting methodologies like(Trad, 2023d):Structure Analysis and Structured Design (SA/SD), Object Oriented (OO) Methodology (OOM),UML/ArchiMate, The Entity Relationship Diagrams (ERM), DMN, BPM Notation (BPMN)…

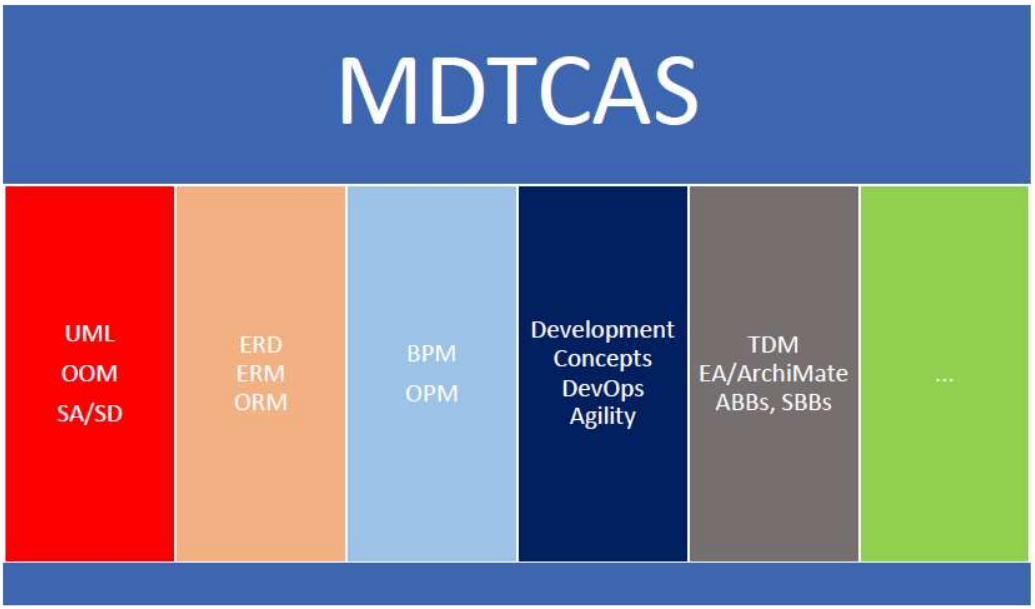

Figure 14. MDTCAS'Layers (Trad, 2023d).

PRWC based Continuous Improvements and GAPA

The Project can use the PRWC for continuous improvements and where ELP based enhancements can include topics like: Evolutive quality, Teams' philosophy, Cross-functional Teams, PEMM as a reference, XHFRs,Governanceand renewal, Transformation technics, Linking PRWC to Project's and IHIPT's modules, Managers' education ICS' evolutions, Societal changes, Project experiences….

Integrating Other Frameworks

To alignment various types of frameworks, there is the need to (The Open Group, 2022):

- Create a catalogue of needed frameworks and their area of focus.
- Include planning and execution (Project Management Institute (PMI), PRINCE2, Six-Sigma).
- Include ICS governance and operation (Lean, COBIT, ITIL).
- Include management and measurement frameworks (Balanced Scorecard and SABSA Enterprise Risk).
- Include industry-specific (SCOR and eTOM).
- Group the frameworks by type like risk, accounting, and planning as shown in Figure 15.
- Define the intersection with EA/TDM capability, because EA provides value in planning, change governance, and realization.
- Adjust the Project's roadmap to either fit the EA Capability or to extend the EA Capability to fill the gap.

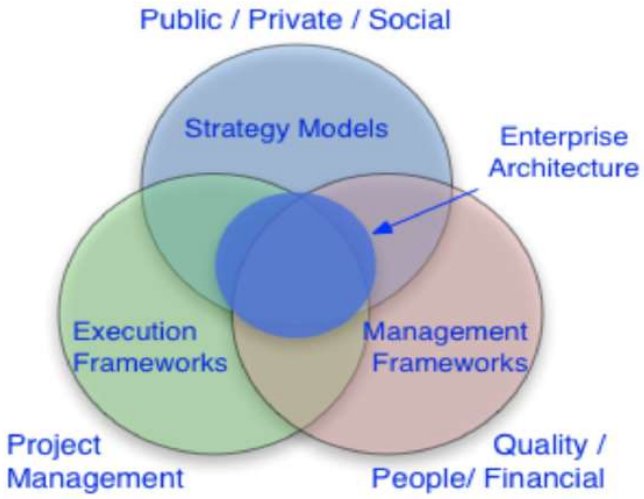

Figure 15. Grouping frameworks.

The Targeted APD

The GAPA for TDM (GAPA4TDM):

- For a TDM Iteration (ITR) (TDM_1).
- TDMValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (TDM_2).
- GAPA4TDM(ITR)=TDMValue(ITR)-TDMValue(ITR-1) (TDM_3).
- Risk=∑ GAPA4TDM(ITR) (TDM_4).

The TDM CSA Processing and Findings

The resultant Factors and artefacts are:

- The public struct PEMM_Integrity_VAR…
- The CSFs are: 1) Viewpoints_Establishement; 2) MDTCAS_Usage; 3) Cartography_Generation; 4) PEMM_Integrity; and 5) IHIPTF4EVTP's integration.
- The VARs are: 1) Viewpoints_Establishement_VAR; 2) MDTCAS_Usage_VAR; 3) Cartography_Generation_VAR; 4) PEMM_Integrity_VAR; and 5) IHIPTF4EVTP'sintegration_VAR.

This CSA_DT uses the defined Factors as shown in Table 8 that is 8.60 that corresponds to "Feasible".

Critical Success Factors	KPIs	Weightings
CSF_TDM_Viewpoints	Complex	From 1 to 10. **08 Selected**
CSF_TDM_MDTCAS	Proven	From 1 to 10. **10 Selected**
CSF_TDM_Cartography	Complex	From 1 to 10. **08 Selected**
CSF_TDM_UP_Blocks	Possible	From 1 to 10. **09 Selected**
CSF_TDM_PEMM	Possible	From 1 to 10. **09 Selected**
CSF_TDM_Interfacing_Frameworks	Complex	From 1 to 10. **08 Selected**
CSF_TDM_LSS_DMAIC_DFSS	Complex	From 1 to 10. **08 Selected**

valuation

Table 8. The CSA_DT outcome is 8.60.

INTELLIGNCE

Basics

The HDT based problem-solving process is supported by the mainly the ELP based Intelligence module; andit uses the: 1) AHMM's instances based on beam-search that is mainly a qualitative-heuristic processing (Della Croce, &T'kindt, 2002); 2) The twins Evaluations; 3) QQRMM (Nijboer, Morin, Carmien, Koene, Leon, & Hoffman, 2009). The ELPmanageEntity and Project's Knowledge Items (EPKI) that are related-linked to Entity's/Project's resources and modules like PRWC, Intelligence...The IHIPTFsupports the Entity's Legay KMSwhich can be transformed to manageEPKIs. The KMSpart of Intelligence, identifies theconcerned Factors their Evaluationprocesses(Rockart, 1979).

Implementing Intelligence's Kernel

The ELP manage Entity and Project's EPKI that are related-linked to Entity's/Project's resources and modules like Evaluations, Intelligence... The IHIPTF supports the Entity's Legay KMS which can be transformed to manage EPKIs that are in turn linked to Evaluations. Intelligence supports Project's enhancements and interfaces all the IHIPTF's modules and uses the PRWC to evaluate Factors. The KMS part of Intelligence, identifies the concerned Factors their PRWC evaluation processes, which also estimates the XHFR (Rockart, 1979). The KMS interfaces the FMS that links a Factor (like a CSF) to one or more EPKI that in turn corresponds to various NLP scenarios. IHI NLP scenarios manage Intelligence's requests and control various IHIPTF's modules activities-actions. The PRWC enables FMS' patterns to enhance-modify the KMS, which delivers information-answers in the form of EPKIs and the needed set of actions. A Project's change request can generate a large set of actions and solutions, whose implementations can generate a new set of problems. A successfully integrated KMS with the FMS can give major advantages in generating automated decision making for dynamic business services' eco-systems (Clark, Fletcher, Hanson, Irani, Waterhouse & Thelin, 2013). Such services are also used by the IHI DMS. For Evaluations based DMS, the Team selects and tunes Factors, which are then orchestrated by the NLP scripts.

The DMS is used in all Project's processes which contain sets of Factors that are mapped to Blocks (or sets of actions/services); like the ones that are presented in this chapter's PoC. Intelligence is the most important module for DTs and Projects in general.

DT's Implementation

As shown in Figure 27, DT's goal is to have a common platform of Blocks, BPMs and other artefacts which improve Entity's Time-to-Market (TtM). DTs are strategic objectives, but Projects' digitizations are complex and have XHFRs (Eira, 2022). The DT uses the IHITF to disassemble legacy systems and enable the use of TDM, MDTCAS, and EA digitized models and to define DT's scope (Bizzdesign, 2022). A successful DT is the base of a successful Project that needs Polymathic skills as shown in Figure 16.

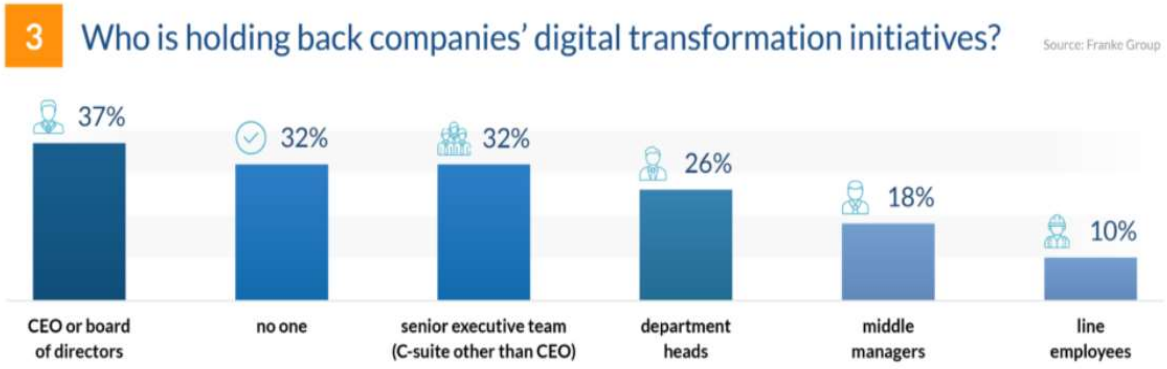

Figure 16. An APD viewpoint on the rejection of DTs (Eira, 2022)

This chapter's section (like this RDP) is a Project CSA, and the PoC is based on Evaluations focused ACSs, which are combined with a common EA based ACS that originates from the Open Group (Jonkers, Band, &Quartel, 2012a). The EA based ACS covers Project ICS, EA, modelling, linking KPIs, and basic transformation scenarios that support cross-functional collaboration as shown in Figure 17.

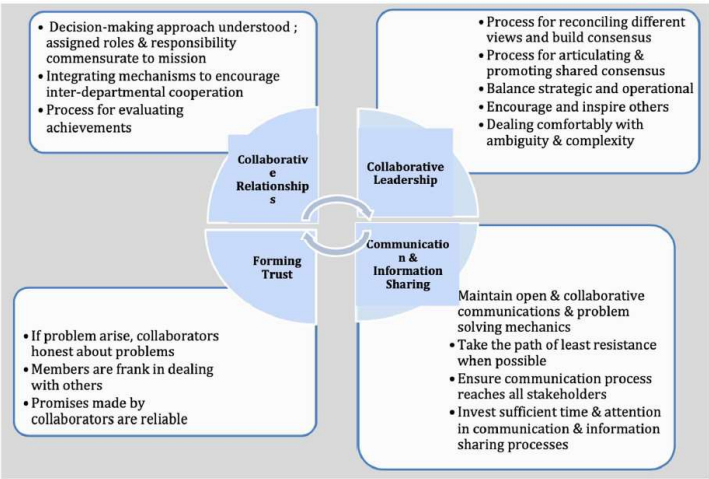

Figure 17. Four dimensions of cross-functional/Polymathic collaboration (Morse, 2020).

The Targeted APD

The GAPA for Intelligence (GAPA4Intelligence):

- For a TDM Iteration (ITR) (Intelligence_1).
- IntelligenceValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (Intelligence_2).
- GAPA4Intelligence(ITR)=IntValue(ITR)-IntValue (ITR-1) (Intelligence_3).
- Risk=∑ GAPA4Intelligence(ITR) (Intelligence_4).

The Intelligence CSA Processing and Findings

The resultant Factors and artefacts are:

- The structure: public struct HDT_Access_VAR…
- The CSFs are: 1) QQRMM_Application; 2) HDT_Access; 3) KMS_DMS_Integration; 3) GAPA_Processing; and 4) IHIPTF4EVTP's integration.
- TheVARs are: 1) QQRMM_Application_VAR; 2) HDT_Access_VAR; 3) KMS_DMS_Integration_VAR; 3) GAPA_Processing_VAR; and 4) IHIPTF4EVTP'sintegration_VAR, like theHDT_Access_VAR structure.

This CSA_DT uses the defined Factors as shown in Table 9 that is 9.20 that corresponds to "Mature".

Critical Success Factors	KPIs	Weightings
CSF_Intelligence_Basics	Proven	From 1 to 10. **10 Selected**
CSF_Intelligence_QQRMM	Proven	From 1 to 10. **10 Selected**
CSF_Intelligence_HDT	Possible	From 1 to 10. **09 Selected**
CSF_Intelligence_DMS_KMS	Possible	From 1 to 10. **09 Selected**
CSF_Intelligence_IHIPTF_CSA_DT_GAPA	Complex	From 1 to 10. **08 Selected**

valuation

Table 9. The CSA_DT outcome is 9.20.

THE APD-EVTP

The GAPA based EVTP

GAPA is done by Intelligence which uses the HDT to narrow the Project's gap(s) by using local GAPAs (a local GAPA is a GAPA for a CSA) for the: AHMM, FMS-Factors, Pool of Blocks, PEMM-MDTCAS, TDM… The PEMM enables GAPA's execution in various Project's levels, phases, and on various ICS components. GAPA can be done on TDM's phases, to show if there were improvements, regressions, and eventual XHFRs. But first the DT must be successful.

DT's Implementation Impact

DT's goal is to have a common platform of Blocks, BPMs and other artefacts which improve Entity's Time-to-Market (TtM). DTs are strategic objectives but Projects' digitization are complex and have XHFRs. The DT uses the IHITF to Disassemble legacy systems and enables the use of TDM, MDTCAS, and EA digitized models and to define DT's scope. A successful DT is the base of

a successful Project that needs Polymathic skills that are needed like in the case of EVTP andProjectcharter has the following elements/components: Name, Business case (or ACS),Scope, Goals, Milestones, and (specific) Requirements. DTs influence Projects and their EVTP(C) and EAVC.

The EAVC

The EAVC is based on the valuation of the Entity's assets that can be integrated by applying:

- The IHIPTF to align ofEnterprise Asset Management (EAM)and EA; where theAssets Alignment Pattern (AAP) offers a solutions in the form of design, technical, and managerial recommendations to be used by the Entity's asset managers. The EAM-based AAP is not influenced by any specific APD and has a holistic approach that uses an AI concept (Trad, 2021b).
- Support for Organizational Asset Management (OAM)which can be applied to any type of asset management concept, in order to support the evolution of organizational, national, or enterprise asset management. It can also usedfor the detection of financial irregularities, assets optimizations and eventual dangers for organizations or national assets (Trad, 2021c).
- Support the Holistic Project Asset Management Concept (HPAMC)to optimize asset/wealth creation/management in transformed Entity's systems (Trad, & Kalpić, 2020b).
- The Intelligence Driven Development for Enterprise Architecture and Asset Management to support the EAM. The AMM offers a set of solutions in the form of patterns, scenarios, and interactive services(Trad,Kalpić, 2018).
- Entity's valuation, also known as business valuation, is the process of assessing the total economic/financial value of Entity's assets that can be used for sale value and tax reporting.One conceptis basedon calculatingEntity's valuation by subtracting liabilities from assets,but other methods exist; like (Misamore, 2017): 1) Book Value: By using information from its balance sheet but it is unreliable; 2) Discounted Cash Flows that is considered as the most important standard of Entity's valuation method, that is formulated as *Discounted Cash Flow=Terminal Cash Flow/(1 + Cost of Capital) # of Years in the Future*; 3) Market Capitalizationmeasures publicly traded Entity's value, that is formulated as *Market Capitalization=Share Price x Total Number of Shares;* 4) Enterprise Valueis calculated by combining Entity's debt and equity and then by subtracting the amount of cash that is not used to fund Entity's business development and operations, that is formulated as *Enterprise Value = Debt + Equity – Cash;* 5) Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) or operating earnings, that doesn't record all transaction's costs at once but uses depreciation over time (or amortization); 6) Present Value of a Growing Perpetuity Formula, where a growing perpetuity is a kind of financial instrument that pays out a certain amount of values money each year, , that is formulated as *Value of a Growing Perpetuity = Cash Flow / (Cost of Capital - Growth Rate).* When this last formula is combined with EBITDA as the cash-flow and enterprise value can deliver the Entity's value. The Entity's value to EBITDA ratio can be formulated as:EVAC ->*Enterprise Value = EBITDA/(1/Ratio).*

And such environments face XHFRs and need adapted environments.

Resulting XHFRs

Various sources show the limitations and emerging trends of transformational methodologies' weakness and the failure of continuous improvement initiatives or XHFRs, which are related to (Antony, Sony, 2020; Albliwi, Antony, Abdul Halim Lim, & van der Wiele, 2014; Chakravorty, 2009):

- transformational initiatives have XHFRs which is similar toany other organizational transformation initiative.
- The first limitation is viewed as a gap in the sense that it addresses XHFRs in many Entitiesthat is more than 60%.
- Because of various types of complexities these XHFRs that happen to Entities across different APDs,transformational initiatives are stopped… Mainly due to massive costs.
- ...

The Targeted APD

The GAPA for APD (GAPA4APD):

- For a TDM Iteration (ITR) (APD_1).
- APDValue (ITR)=CSF(1)*RAT(1)+CSF(2)*RAT(2)+… (APD_2).
- GAPA4APD(ITR)=APDValue(ITR)-APDValue(ITR-1) (APD_3).
- Risk=∑ GAPA4APD(ITR) (APD_4).

The ADP CSA Processing and Findings

The resultant Factors and artefacts are:

- The structure: public struct EVTP_Mechanisms_VAR…
- The CSFs are: 1) DT_Implementation_Impact; 2) Adapted_Environments ; 3) Coordinated_Environments ; 4) Resulting_XHFRs ; 5) EVTP_Mechanisms_VAR ; and 6) Types_of_APD.
- The VARs are: 1) DT_Implementation_Impact_VAR; 2) Adapted_Environments_VAR; 3) Coordinated_Environments_VAR; 4) Resulting_XHFRs_VAR; 5) EVTP_Mechanisms_VAR; and 6) Types_of_APD_VAR.

This CSA_DT uses the defined Factors as shown in Table 10 that is rounded 8.20 that corresponds to "Risky".

Critical Success Factors	KPIs	Weightings
CSF_APD_DT_Implementation_Impact	Complex	From 1 to 10. **08 Selected**
CSF_APD_Adapted_Environments	Possible	From 1 to 10. **09 Selected**
CSF_APD_Coordinated_Environments	Complex	From 1 to 10. **08 Selected**
CSF_APD_Resulting_XHFRs	VeryComplex	From 1 to 10. **07 Selected**
CSF_APD_EVTP_Mechanisms	Possible	From 1 to 10. **09 Selected**

valuation

Table 10. The CSA_DT outcome is 8.20.

THE PROOF OF CONCEPT

Introduction and the used ACSs

Project's Factors are deduced from the selected ACSs and are managed by the FMS, that are used in Projects to evaluate success rates and they are managed by theEvaluations that are used in this PoC, which tries to show how the IHIPTF's modules are used for EVTP and EVAC.The Evaluations, GAPA, HDT, and other are used to estimate Project's success or XHFRs(Lebreton, 1957). The ACSs/PoC select and the related tune Factors with this question in mind: "What are the essential Factors that guaranty EVTP' success?" The first ACS is an insurance management system (ArchiSurance) that used to present basics Project's transformational capacities to convertthe legacy system and then use a specific EVTP CSA. The mentioned ACS explains how to manage, register, accept, valuate, and invoice claims related activities (Jonkers, Band, &Quartel, 2012). The transformed ICS has to improve Blocks' usage, data-quality, and Factors evaluations, as shown in Figure 18.

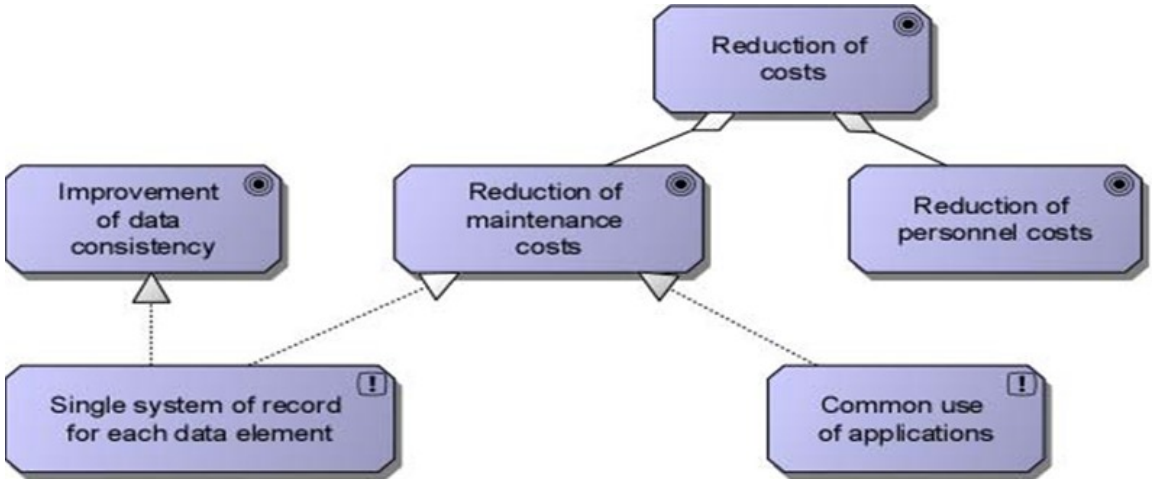

Figure 18. Project's transformation goals (Jonkers, Band, &Quartel, 2012).

EVTP' and TDM's Interactions

The setup of EVTP'and interactions with TDM's phases looks as follows:

- phase A or the Architecture Vision phase, establishes an architecture effort and initiates an iteration of the architecture development cycle by setting its objectives/scope, constraints, and goals, which all are translated into sets of Factors for the EVTP and hence the PoC.
- Phase B or the Business Architecture phase shows how the Project's target architecture implements key requirements and related them to the IHIPTF4EVTP, EVTP, and Evaluations.
- Phase C or the GAPA phase shows and uses the cartography generation, which shows the modelled target application landscape.
- Phase D or the Target Technology Architecture and GAPA phase shows the final Project's infrastructure.

- Phases E and F, Implementation and Migration Planning; the transition architecture proposes possible intermediate situation and evaluates (with the IHIPTF4EVTP and Evaluations) the Project's status using defined Factors.

Evaluating RDP's CSA_DTs

The EVTPinterfaces Intelligence and Evaluations which are presented and evaluated in Table 11, and using the CSA_DT's Tables Weighting and Rating Enumerator (CTWRE) that is shown in Figure 19.

CTWRE Label	Limit's Value	Description	Color
Proven, Mature	9.01-10.00	Success	Green
Possible, Feasible	8.51-9.00	Success	Green
Risky	8.01-8.50	Important Risk	Yellow
Complex	7.01-8.00	Unclear	Red
VeryComplex	5.01-7.00	Will probably fail	Red
Impossible	0.00-5.00	Failure	Red

Figure 19. The CTWRE's values.

The EVTP-required skills have mappings to Project's resources and the PRWC defines relationships between the Project and Factors.

CSA Category of CSFs/KPIs	Transformation Capability	Average Result	Table
The RDP's Integration	Mature	From 1 to 10. **9.20**	1
Team's Setup	Risky	From 1 to 10. **8.50**	2
Disassembling Process	Risky	From 1 to 10. **8.50**	3
PEMM's Implementation	Risky	From 1 to 10. **8.25**	4
FMS' Integration	Risky	From 1 to 10. **8.50**	5
AHMM's Integration	Mature	From 1 to 10. **9.20**	6
PRWC's Integration	Feasible	From 1 to 10. **9.0**	7
TDM' Integration	Feasible	From 1 to 10. **8.60**	8
Intelligence's Integration	Mature	From 1 to 10. **9.20**	9
APD's Integration	Risky	From 1 to 10. **8.20**	10
IHIPTF4EVTP/Phase's 1 Outcome	Risky	From 1 to 10. **8.70**	11
Evaluate First Phase			

Table 11. The RDP's outcome is (rounded) 8.70.

After initializing IHIPTF4EVTP's client, Factors/CSFs were linked to a specific node of the ARbLP/HDT. The programs linked the AHMM4EVTP instance to the set of HDT/Intelligence actions which uses Intelligence actions. Table 11 presents Phase's 1 results that the PRWC and Projects are "Risky". EVTP is not an independent task or component; and is linked to all IHIPTF4EVTP's modules. TheAHMM4EVTP's main constraint to implement the PRWC is that CSAs having an average result below 8.0 will be ignored. This work's conclusion with the result of 8.70 implies that EVTP' integration is "Risky" and due to various types of complexities. As Phase 1 is not a "Failure" the PoC continues to IHIPTF4EVTP's setup and EVTPC's integration.

EVTPC's Integration

IHIPTF4EVTP's GAPA for all CSAs (GAPA4Project) includes and targeted GAPA evaluations:

- The RDP's Integration.
- Team's Setup.
- Disassembling Process.
- PEMM'sImplementation.
- FMS' Integration.

- AHMM'sIntegration.
- PRWC'sIntegration.
- TDM' Integration.
- Intelligence'sIntegration.
- APD'sIntegration.

An GAPA4Project can be estimatedby applying:

- For a TDM Iteration (ITR) (Project_1)
- A Project is done on all CSAs (Project_2)
- Project(ITR)=CSA(1)*RAT(1)+CSA(2)*RAT(2)+… (Project_3)
- GAPA4Project(ITR)=Project(ITR)-Project(ITR-1) (Project_4)
- Risk=∑ GAPA4Project (ITR) (Project_5)

IHIPTF4EVTP's Setup and Configuration

Figure 20. The IHIPTF'sgraphical interface.

The PoC configures the FMS and Factors then these Factors are mapped to Projects resources and artefacts. The Evaluations contains the relationships that link Project's (and EVTP) requirements, Blocks, NLP scripts, Factors, and Global Unique IDentifiers (GUID). IHIPTF(4EVTP)'sclient's interface that is shown in Figure 20 sets up all the Project's operations like NLP scenarios development and linking scripts to Factors and Blocks. NLP scripts are the backbone of Intelligence and contain the define sets of actions to be processed. The AHMM4EVTPensures EVTP's integrity and HDT's tree configuration

Phase 2-Solving a Concrete Problem

Phase 2 relates to a concrete ACS the. Unleashing Synergies: The Intersection of Digital Transformation and EVTP. This ACS is about manufacturing improvements, where a leading manufacturing enterprise implemented a DT to automate production BPs and collect real-time data-sets from integrated sensors. LSS was applied to analyze collected data-sets, resulting in reduced defects, shorter lead-times, and improved overall equipment effectiveness. Phase 2 contains the following TDM's steps and operations:

- TDM's setup and its integration with the FMS, GAPA, and PRWC.

- Sub-phase A establishes the PEMM, Disassembling approach and its goal.
- Sub-phase B establishes IHIPTF4EVTP's target models to support EVTP.
- Sub-phase C shows and uses the cartographyand describesIHIPTF4EVTP's activities.
- Sub-phase D shows the needed IHIPTF4EVTP'sand Project's infrastructural landscape.
- Sub-phases E and Fpresents intermediate Project's situation(s) and evaluates EVTP; and updates the list of Problem (or PRB) to be solved.

PRBs Solving for aconcrete HDT Node:

- Intelligence solves PRBs, where Factors to defined set of actions which are processed in a selected/concrete HDT node. For this aim the action CSF_IHIPTF4EVTP_Capability_Procedure(from the Intelligence CSA) was executed and offers sets of solutions(SOL). Solving PRBs involves the execution of actions and delivering SOLs for multiple Project's activities, where each action can deliver a new PRB and that generates the HDT tree. The HDT uses the QQRMM and contains a dual-OF that contains: 1) In Phase 1 the IHIPTF4EVTPhas implemented NLP scripts to process CSA_DTs, and related PoC's resources to theCSF_IHIPTF4EVTP_Capability_Procedure; 2) Intelligenceis configured and uses the PRWC support the HDT; 3) LinkingHDT's node to data-contents; and 4) The HDT executes the CSF_IHIPTF4EVTP_Capability_Procedure and delivers SOL(s).

SOL Nodes activities:

- NLP scripts are called by the IHIPTF4EVTP's modules like the PRWC.
- These scripts are processed in the background to deliver IHIPTF4EVTP's modules value(s).
- These values are translated into actions, conclusions and recommendations.

CONCLUSION AND RECOMMENDATIONS

This RDP proposes a set of recommendations and technics on how to implement a IHIPTF4EVTP, EVTP, EAVC, and GAPA4Projects for any type of APD. The IHIPTF4EVTPuses Evaluations, GAPA, HDT, and Factors to iteratively assert Project's feasibility and because of the low score of(rounded) 8.70 (Table 11)implies that it is "Risky" Project, and the resultant recommendations are:

- EVTPC is an Entity evaluation concept that can include the EAVC.
- The IHIPTF4EVTP shows how to implement an IHI and Anti-Locked-In (ALI) transformation framework and GAPA for all CSAs.
- The GAPA and Evaluations can estimate Projects' progress.
- This RDP uses a specific QQRMMconcept and ignores statistical/quantitative approach.
- The PRLR proved the existence of an important knowledge gap and XHFRs.
- The AHMM4EVTP and ELP based HDT supportsIntelligence.
- The HDT supports IHIPTF4EVTP's modules reasoning, like in the case of the PRWC.
- Cross-functional/Polymathic skills are needed.
- The IHIPTF4EVTPuses the MDTCAS to interface existing frameworks, standards and methodologies, like TOGAF, SWOT, Six-Sigma's environments...

- The PoC checkedIHIPTF4EVTP's feasibility.
- The IHIPTF4EVTPintegration is complex and "Risky".

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