

The Selection and Training Framework for Managers in Business Innovation and Transformation Projects

Managerial Recommendations for “The Open Group Architecture Framework” (TOGAF) Integration

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Abstract—The riskiest factor in transforming a traditional business environment (BE) into a lean and automated BE is the role of the profile and the corresponding TOGAF managerial recommendations of the business and (e-)business transformation managers (BTM); the influence they have on the concrete implementation phase of business transformation projects (BTP). The basic profile and “The OpenGroup Architecture Framework” (TOGAF)[66] managerial recommendations of such a business transformation manager has not been sufficiently researched in a holistic manner in order to hammer the BTM’s profile and the corresponding TOGAF managerial recommendations; and that is the main goal of the authors’ research [52][37][38]. In fact, currently there are no TOGAF managerial recommendations and educational curricula for such BTM profiles. This research paper deals with the TOGAF managerial recommendations for the BTM selection and education; who has to manage the technical implementation phase of complex business transformation projects; knowing that the BTPs’ implementation phase is the major cause of very high failure rates [20][21]. The implementations of such business transformation projects require a specific set of enterprise business architecture knowledge. The authors have based their research on the main fact that only around 12% of business organizations successfully terminate innovationrelated business transformations projects [8]. “We know that those organizations that are consistently successful at managing innovation-related changes outperform their peers in terms of growth and financial performance” [7]. Therefore, there is an essential need for more research on the BTMs’ profiles and the TOGAF related managerial recommendations. This research project presents an original set of factors and fulfills the need for an efficient tree reasoning model, in the form of a real world framework and recommendations, which affect the BTM’s selection techniques. BTM selectors, professional analysts, project managers, auditors and advanced computer science students, will benefit from this research project.

Keywords Economical competitive advantage, TOGAF, managerial recommendations, efficient enterprise architecture, business transformation projects, business transformation manager’s profile, managerial recommendations, transformation project implementation.

I. INTRODUCTION

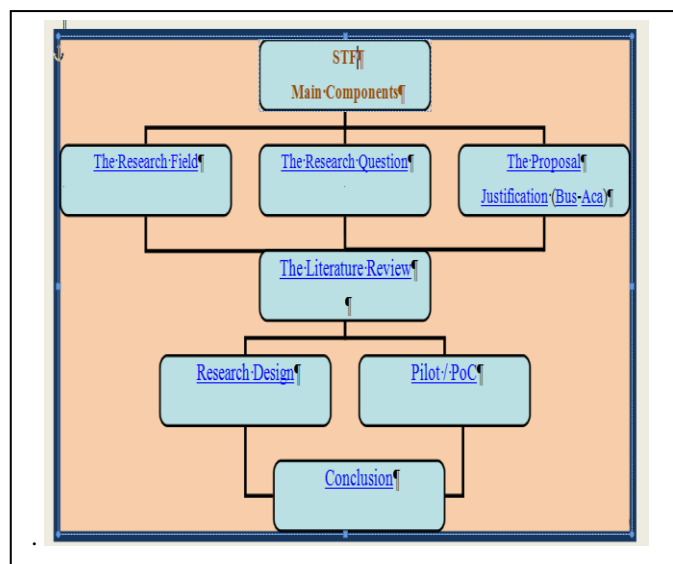


Fig. 1. The pilot Proof of Concept (PoC) development is the current research phase [52].

THE characteristics of a suitable BTM profile and the corresponding TOGAF managerial recommendations are the main goal of the authors’ selection and training framework (STF) research project, which started in year 2010. In this research paper, the authors will try to present the TOGAF based managerial recommendations for such a BTM selection and education process.

This assessment and selection will be corroborated by the evaluation and monitoring of the BTM’s skills [66] to integrate

innovative business processes' model (BPM) technologies into the existing BE [28].

This research's final phase uses a tunable theory based on hyper-heuristics reasoning model [25]. This reasoning model offers the optimal BTM profile and the corresponding TOGAF managerial recommendations that are adapted to complex BTPs [32][35]. These managerial recommendations are fed in the form of factors into the framework's reasoning tree, which will deliver the most important BTM characteristics or most weighted factors [35].

II. RESEARCH QUESTION AND LITERATURE REVIEW

The research project's question is: "Which business transformation managers' characteristic is optimal for the implementation phase of a(n) (e-)business transformation project? – A TOGAF Approach" [44][48][45]. The knowledge gap was acknowledged, mainly due to the fact that the existing literature and various methodologies treating business transformations offer practically no insight into the profile of the BTM as an architect of adaptive business information systems (AofABIS) and proposes the set of corresponding TOGAF managerial recommendations; who can manage the implementation phase of BTPs [1][32].

The literature review has shown that the BTM's optimal characteristic is to be a **"TOGAF based AofABIS"**; and an important part of that phase was dedicated to the finding of factors that influence the BTMs' selection and education [44][59][63].

III. RESEARCH METHODOLOGY AND DESIGN

The authors based their research on the applicative action research (AAR) mixed method, that is mainly based on a hyper-heuristics approach [29][33]. The STF applies the positivist AAR that is designed on a model identical to the hyper-heuristics model. This heuristics model is based on a pseudo beam search tree method and has the elements described in [24][41].

The authors have implemented the STF research methodology, design and prototype [36], to support the selection of the optimal BTM profile. Such selections can be only evaluated with the help of mixed-models [3][27][64]. The STF's qualitative reasoning process model [15] uses the recommendations to give the BTP to tune the details of the BTM's profile [4][23][26].

The collection of case studies from A. Farhoomand and SAP's BTM2 perfectly correspond to the research filtering phase [6][2]. The reasoning engine will not be always perfect and adapted to all possible requirements, but it should be enhanced to make it capable of finding optimal results [33][34].

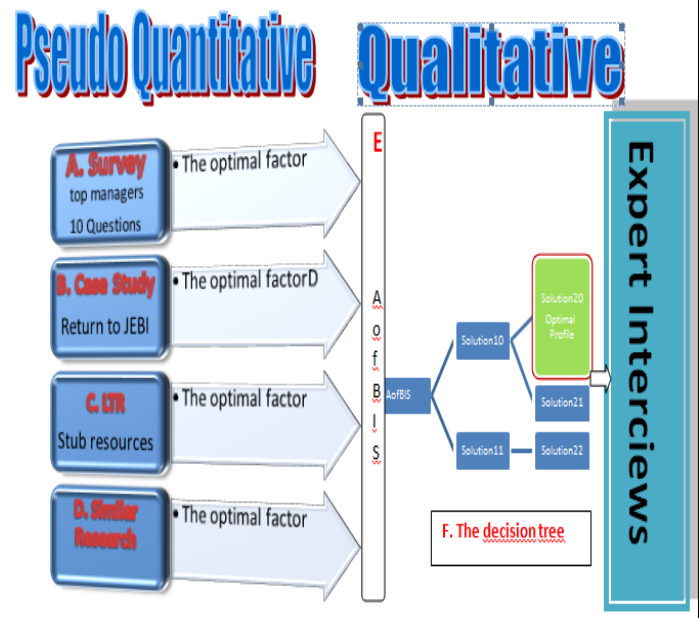


Fig. 2. The mixed method flow diagram [52] Interviews -> Interviews.

The approach to qualitative research offered the possibility to develop a real world framework and pattern [27]; that inherits TOGAF's guidelines.

DSS for TBM - TreeView

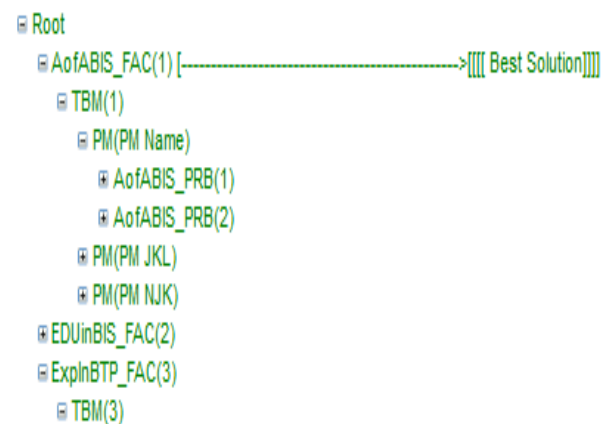


Fig. 3. A view on the STF's tree solution node [35].

IV. THE PILOT

The survey is the quantitative part of the mixed method that is based on the set of resulting factors, which some come from TOGAF; and hence the questions, which resulted from the literature review (Trad, Kalpić, 2013). This research process and the executed survey showed that the BTM is an AofABIS; that is a combination of roles from TOGAF [38][66]. The qualitative hyper-heuristics can be used to tune the STF factors [39]. Therefore, a concrete STF environment

was built; this STF proof of concept (PoC) and the final interviews should deliver the research's final managerial recommendations on how to select and train the right BTM profiles and to define his or her educational curriculum [2]. It will also propose how to use TOGAF as an infrastructure.

V. BTM IS A AofABIS

Understanding the BEs, enterprise architecture and the factors that affect their survival and competitiveness, is only the first step towards a successful BTP. The BTM must have in depth knowledge of: BTP architecture and its development management, business people integration, agile project management and coordination of computer engineers [22]. The BTM acts as solution designer and implementation architect [1][2].

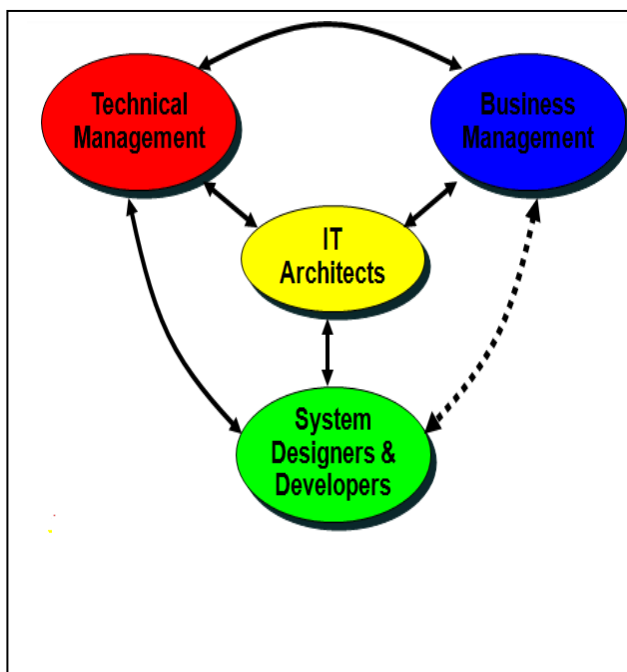


Fig. 4. Enterprise architecture main blocks and components [65].

Accordingly, this research project unifies resources from two distinct but related areas: business processes related information technologies and BTPs, it develops concepts for the BTM's selection and proposes a method to weight and inter-relate his or her various enterprise architecture skills with factors [50][55][66].

Estimating of BTM skills requires a profound knowledge of the enterprise business architecture, business processes (BPs), services technologies and business project management issues. That rounds up the profile of a AofABIS. The BTM is in fact a AofABS, where s/he acts as a coordinator of enterprise architecture(s) teams and coordinates their various activities. The STF will also support him or her in managing problems in real-time [38].

VI. ENTERPRISE ARCHITECTURE

Understanding the BEs and adapting the optimal enterprise architecture, assumes the BTM is capable of optimizing across the enterprise's heterogeneous dislocated processes (both manual and automated); into a holistic integrated environment. Such an environment becomes agile to change and adapted to the enterprise's business strategy.

Executive management knows that the effective management and integration of data-information through information systems related technologies, is a key factor to BTP success, and an indispensable means to achieving *sustainable competitive advantage*. Therefore enterprise architecture addresses this need, by providing a strategic context for the BTP.

In order finalize the BTP effectively within an enterprise, it is necessary to have a BTM who is capable to put in place an appropriate "business capability for architecture", through the: 1) organization structures, 2) roles, 3) responsibilities, 4) skills, and 5) process flows and services (The OpenGroup, TOGAF, 2011). An overview of the TOGAF "Architecture Capability" is shown in Figure 5.

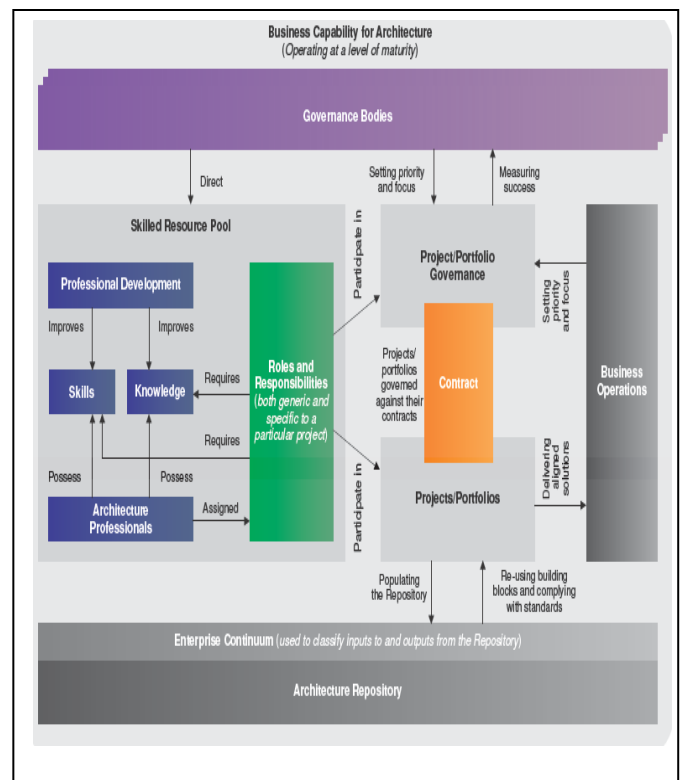


Fig. 5. TOGAF Architecture Capability overview [66].

VII. TOGAF INTEGRATION

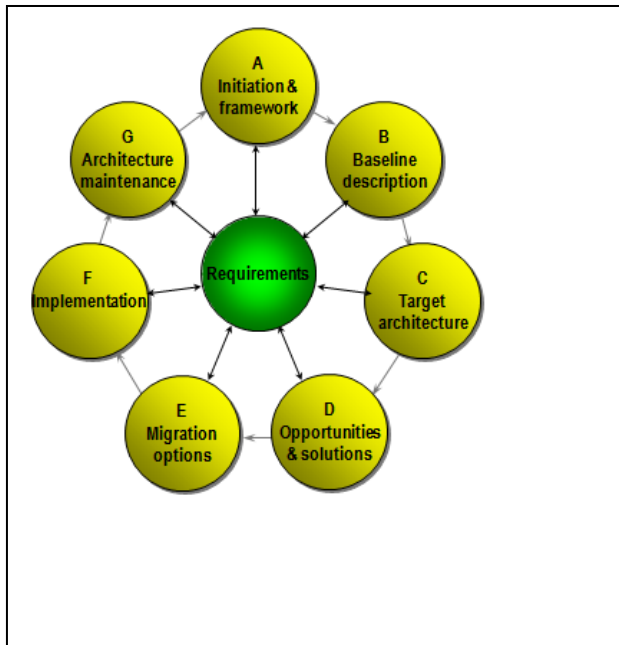


Fig. 6. The diagram shows TOGAF's main components [35].

The research proved the existence of a knowledge gap, as well as the necessity for the STF research project, as a complement to existing enterprise architecture standards [52][57][60][66]. What astonished the authors, during the literature review process was the superficial approach of businesses and managers towards the innovation-related business transformation processes. This research question and topic appear to be undiscovered and under-estimated. The probable reason is the approach of too much scoping of the research question and simplifying the research method to the level of “marketing like” descriptive statistics.

The STF is specialized in BTM's selection and skills definition; it recommends the integration of TOGAF's “Architecture Skills Framework” [66]; which defines the following roles: 1) Architecture Board Members, 2) Architecture Sponsor, 3) Architecture Manager and 4) Enterprise Architecture (which can be considered as a superset of Business, Data, Application and Technology Architecture). STF estimates that BTM is basically a very experienced enterprise architect or AofABIS.

The BTM as a AofABIS must have the following skills: 1) soft-skills (leadership, team-working, inter-personal skills, etc.); 2) Business Skills & Methods (typically comprising business cases, business process, strategic planning, etc.); 3) Enterprise Architecture Skills (typically comprising modelling, building block design, applications and role design, systems integration, etc.); 4) Agile program or Project Management Skills (typically comprising managing business change, project management methods and tools, etc.); 5) IT General Knowledge Skills (typically comprising brokering applications, asset management, migration planning, development of service level agreements, etc.); 6) Technical

IT Skills (typically comprising software engineering, security, data interchange, data management, etc.) and 7) Legal Environment (typically comprising data protection laws, contract law, procurement law, fraud, etc.)

VIII. THE EXPERT INTERVIEW

Two BTP specialists have confirmed in interviews the need for a standardized enterprise architecture framework like TOGAF.

IX. BTP RISK READINESS ASSESSMENT

The BTM must have in-depth knowledge of the TOGAF's “Business Transformation Readiness Assessment”; which means that s/he has the “Capacity to Execute” and the ability to perform all the information technology tasks required by the BTP, including the skills, tools, processes, and management capability for the implementation phase. Lately, there has been successful execution of a similar complex endeavour, and there are appropriate processes, methods, skills, and a heuristics based model for deciding what skills and activities are needed. The BTM must also design the “Enterprise Capacity to Execute”; which is the ability of the enterprise to perform all the tasks required by the endeavour, in areas outside of information technologies (IT), including the ability to make decisions, using the built-in tree reasoning model, within the limited time constraints; that is very typical to BTPs based upon similar complexity of endeavour. There are no non-IT-specific processes, discipline, and skills to deal with this type of endeavour. The BTM has to demonstrate the ability to manage such a type of BTP environment issues and requirements. There is recognition of such a need for knowledge and skills; that reconfirms the research project's detected knowledge gap [66].

The BTM's recommended activities in the assessment process of a BTP's readiness is to address the following business transformation requirements [66]: 1) determine the readiness STF factors that will impact the BTP; 2) to present the readiness factors using STF heuristics models; 3) to assess the readiness factors, including determination of readiness factor ratings & weightings. Assess the risks for each readiness factor and identify improvement actions to mitigate the risk. Work these actions into next iterations of the agile project management plan; 4) to assess the readiness for the BTP. A “Business Transformation Readiness Assessment” can be used to evaluate and to qualify the BTP's readiness to undergo the initiative. This assessment is based upon the determination and analysis/rating of a series of selected factors; that are fed in the tuneable tree. The results of the readiness assessment should be added to the TOGAF's “Capability Assessment”. These solutions are then used to select the BTM and orient him through the BTP's architecture blue-print, to identify the tasks needed for the architecture of BTP, and to identify the risks [66].

X. BTP RISK ACTIVITIES

The BTM has to identify the “Business Transformation Risks and Mitigation Activities”. S/he has to identify the risks related to the “Architecture Vision” and assess the initial level of risk, that is the reasoning tree root node (e.g., catastrophic, critical, marginal, or negligible) and the number of needed iterations. S/he has also to assign a mitigation strategy for each risk that is related to a factor. TOGAF offers a risk management framework [66].

STF that incorporates TOGAF, has two levels of risk that should be managed: 1) the “Initial Level of Risk”: Risk categorization prior to determining and implementing mitigating actions; 2) the “Residual Level of Risk”: Risk categorization after implementation of mitigating actions (if any).

XI. TOGAF MANAGERIAL RECOMMENDATIONS

The STF research offers a set of BTM profile's selection based on the managerial recommendations for TOGAF's integration. The STF research list of TOGAF's related recommendations (sorted by Importance):

1. The BTM must be an AofABIS; who is an enterprise architect. BTMs who are basically technocrats, proactive project architecture managers and advanced knowledge specialists should be capable of supporting and designing the transformation of the (e-)business environment in a proactive manner [22][37]. In fact, BTMs must be an excellent AofABIS [38][66].

2. The TBM must have extensive experience in business transformation projects risks and readiness assessments. The BTP's implementation phase is the main cause of high failure rates in BTPs; that is why BTMs need enterprise architecture empirical hands-on skills. That encompasses the following: 1) knowledge of business architectures (BA) and business process management (BPM), 2) automated business environments [17], 3) agile project management, 4) knowledge management & integration, 5) organizational concepts, 6) management science methodologies 7) enterprise architecture and other concrete BTP implementation artefacts [66]. Therefore the researchers recommend experienced technocrats profile [6] for such BTPs and his or her educational curriculum [64].

3. The TBM must be an avant-garde innovation project manager. The TBM must be an excellent agile project manager, who is capable of implementing a “very light version” of the disciplines TOGAF, Service Oriented

Architecture and BPM. The use of BPM will enhance the management of knowledge and help in the selection of a TBM [62].

4. The TBM must be an avant-garde innovation project manager and a BTP designer. The BTMs' skills and educational curriculum must comprise the knowledge of: business and enterprise architecture, automated real-time business process environments, agile project management, organizational behaviour, management science methodologies and concrete BIS implementation phase know-how [66].

5. The TBM has a holistic profile. This research shows that the BTM is an AofABIS with holistic cross-functional skills [16]; with a business engineering education [67]. The basic profile is a flexible and intelligence-based person that has cross-functional capacities. Transformed organizations and BTMs need more than basic BIS knowledge and educational techniques to exploit the inter-related avant-garde technologies in order to successfully conduct BTPs. Managing the complexity of skills and educational concepts require a mixed method that is mainly based on action research; a hyper-heuristics model [66][9].

6. The STF is an applicable framework for decision support system (STF_DSS). TBM selection depends on the project and company context. The BTM should be supported with a configurable decision making system like the STF [31]. Such BTM's selection and education need holistic just-in-time (JIT) methodologies, similar to BTM2 [9]. The STF is a JIT systems managerial framework or “management 2.0” component for the selection of business transformation managers. The authors' aim is to convert their relevant research outcomes into a managerially useful framework and pattern [13], and its hyper-heuristics tree that is suitable for a wide class of problem instances. The authors regard this as a major business and educational benefit [4]. The STF's decision tree, results in a set of possible solutions that determine BTM's skills. This tree can be also represented as an implementation of business processes modelling (BPM). Such a solution is optimal, because then the STF knowledge is stored in the business information system [1][64].

7. The BTM must be capable of identifying the “Business Transformation Risks and Mitigation Activities” [66]; and must also be capable to identify the risks associated with the “Architecture Vision” and assess the initial level

of risk and the rate of frequency associated with it.

8. The profile and the corresponding TOGAF managerial recommendations curriculum round up the STF's business transformation managers' pattern. Therefore the BTM has to adapt the enterprise architecture method to give priority to the implementation phase; and hence develop a BTP specific architecture pattern that should include [66]:

- Architecture maturity assessment- Architecture governance processes, organization, roles, and responsibilities
- Architecture skills assessment

9. The integration of the STF in the company's business processes and knowledge environment. The use of smart tools, automated workflows, integration and advanced graphical user interfaces are making BPM cheap to use. BPM will enhance the overall business intelligence because the smart use of BPM with STF rules and analytics will help the better decisions for the selection of BTM, with more insights. S/he would be respecting existing choreography standards, enabling to deliver quick return on investment & long-term success.

XII. THE STF PROTOTYPE OF THE EMPIRICAL MODEL

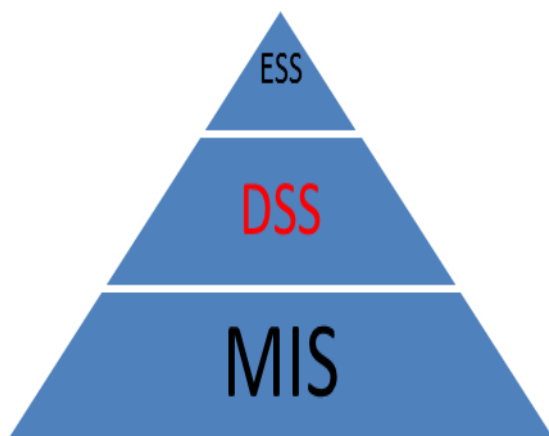


Fig. 7. Decision systems by management level [32].

The STF's empirical model is built to prove the research PoC, which has been developed using the Microsoft Visual Studio 2012 environment [59].

The PoC uses the Model- View- Controller (MVC) architectural pattern that collects the model data. This prototype is a real world decision support system (DSS) that can be used by middle managers [32]; where executive

decision systems (ESS) is used by the executive management and management information system (MIS) by the production management, as shown in Fig. 7. The PoC is a real world system and is considered to be a concrete managerial benefit.

The PoC contains the STF's major components, and what will be primarily tested is the reasoning engine, which is based on the AAR heuristics model. This research PoC will serve to confirm the research's hypothesis and the hyper-heuristic model; that has a goal function, which calculates the best solution (DSSGoalFunction). Added to that, the authors have used interviews with experts to confirm the PoCs outcomes; which means that the STF_MHM is a mixed method based on a real world prototype. The results will be presented in the form of a set of recommendations.

XIII. THE STF'S BTM's PATTERN (STFBTMP)

The authors' aim is to convert their relevant research outcomes into a managerially useful framework [13]; and its hyper-heuristics tree processing model is used as a template that is suitable for a class of problem instances [4].

Therefore, it is planned to create a concrete STF environment that is based on a business process oriented transformation pattern [2]. This STF pattern will be in fact a STF business transformation managers' project pattern (STFBTMPP).

XIV. CONCLUSION

This is another article in a long series of research articles related to the STF research, which is based on the action research mixed method; the STF factors and TOGAF based managerial recommendations are the result of the literature review, surveys outputs, proof of concept and interviews.

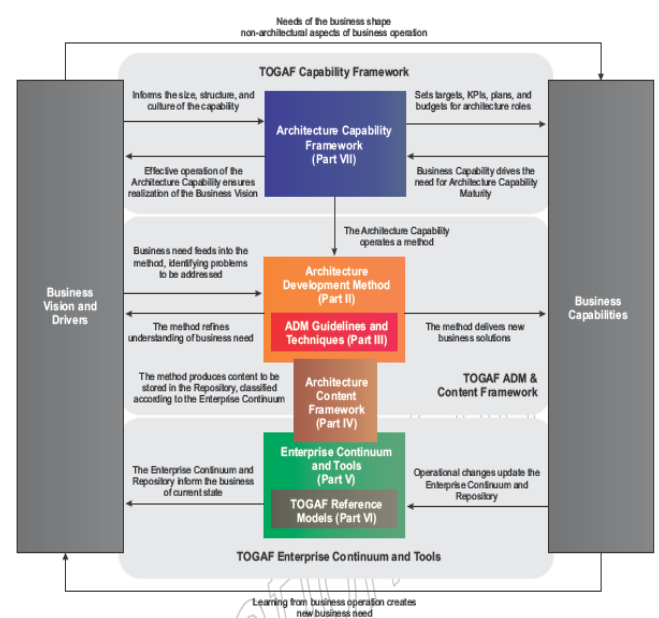


Fig. 8. Linking Business to Business Information Technology [32].

The TOGAF environment permits that a BTM holistically manages the BTP; by linking the business environment and the business information technology.

These factors and TOGAF-based managerial recommendations are the base of the STF's tunable hyper-heuristics research model. In this article, the focus is on the STF's TOGAF based managerial recommendations, which are needed for finding the optimal BTMs' profiles to holistically manage the design and implementation of a BTP and the corresponding enterprise architecture.

There has been a lot developed and written on enabling success in transformation projects, but the authors propose to inspect why BTMs fail in the implementation phase of the BTP. That is mainly due to the BTMs' lack of knowledge in managing business integration and implementation and non-existence of adequate managerial recommendations. This phase's most important findings:

- Knowledge gap: The literature review proved the existence of a knowledge gap between the traditional management skills and the STF's managerial recommendations for BTP [62].
- Evolutionary Mixed Method: This research uses an evolutionary research model in order to create the initial BTM's profile based on the managerial recommendations [62].
- The STF proof of concept The PoC and interviews proved the approach and delivered the research's recommendations on how to select and educate BTMs.
- Managerial recommendations, benefits and framework: The qualitative hyper-heuristics model confirmed the survey's outcomes; and delivered the managerial recommendations and benefits. The STF research project proposes a concrete framework on how to select, train and evaluate a BTM. Hence improves the company's economical competitive advantage.
- BTM profile as an AofABIS: Actual environments produce general profiles that can hardly cope with heterogeneous complexity and fast changes. These high frequency changes are mainly due to the hyper-evolution of technology. The research proposes that the BTM is an AofABIS.
- The STFBTMP pattern: The STF's research defines the BTM profile and managerial recommendations that round up the BTM selection and educational pattern

Acknowledgment

In a work as large as this research project, technical, typographical, grammatical, or other kinds of errors are bound to be missed. In such a series of articles, it was unavoidable to allow for some overlapping. We are aware that it might be irritating to our "devoted" readers. However, this approach should enable access to general and occasional readers as well. Ultimately, all mistakes are the authors' responsibility. The authors encourage feedback from readers identifying errors in addition to comments on the work in general.

It was our great pleasure to prepare this work. Now our greater hopes are for readers to receive some small measure of that pleasure. The authors owe a special debt to Webster University who helped the first author in developing this project.

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