Critical Success Factors for Enterprise Architecture: Survey, Taxonomy, and Solutions

Peter Hillmann[a], Lovis Justin Immanuel Zenz, and Andreas Karcher
Universität der Bundeswehr München, Department of Computer Science,
Werner-Heisenberg-Weg 39, 85577 Neubiberg, Germany

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Abstract: Enterprise architecture (EA) is a critical key competence in the organization, adaptation and improvement of companies. The objective of this study is to identify and analyze critical success factors associated with EA projects and EA management. In particular, the interrelationships of critical factors as key components were examined. Therefore, we present the first taxonomy of key factors in EA providing an overview of the major areas to be addressed. The assessment revealed five major challenges: communication problems, limited top management support, insufficient EA expertise, ineffective knowledge management and inadequate requirements management. Based on these findings, a comprehensive compilation of strategies was develop encompassing preventative guidelines and reactive approaches. It provides practical recommendations for overcoming the identified obstacles. The measures developed were integrated along the project life cycle with reference to organizational processes, in particular with a focus on change management and controlling. Practical recommendations were tested in expert interviews and business game for their effectiveness.

1 MOTIVATION FOR ENTERPRISE ARCHITECTURE

In an increasingly digitized and globalized business world, companies are forced to continuously adapt and optimize their structures, processes and technologies to ensure their competitiveness (Aldea et al., 2018; Kesseler and Karcher, 2017). Enterprise Architecture (EA) enables organizations to efficiently utilize their resources, optimize their processes, and leverage their technologies to achieve their business goals. EA is committed to guaranteeing that decision makers are furnished with a full and accurate account of the relevant facts and circumstances at the opportune time. This objective is accomplished by means of a strategic alignment that incorporates the business, technology and data, all of which are aggregated and managed in a systematic fashion. This integration is essential for optimizing case capabilities and resource allocation. Currently, no other management best practice, with the exception of EA, can provide the comprehensive context for enterprise-wide strategic planning and decision-making. Furthermore, EA strengthens the collaboration of Business-IT-Alignment (Hillmann et al., 2024).

In the context of our VUCA world, the capability to think in comprehensive and complex contexts represents a significant challenge for the future (CONSIDEO Gmbh, 2013). *Architectural Thinking* plays a pivotal role in providing the support needed to address this challenge. Nevertheless, the number of successful EA projects is estimated to be only about 25 to 30 % (Voegele, 1997). Given the complexity and dynamics of today's business environment, organizations face a number of challenges when implementing EA projects (Kotusev and Kurnia, 2021). By identifying critical success factors (CSF), analyzing key components, and developing solutions tailored to these, we contribute to overcoming these challenges and supporting organizations in successfully shaping their EA. This study aims to providing practical and effective recommendations for the success of EA approaches. The goal is to assess the prevailing difficulties and influencing factors in EA, EA management (EAM) and EA projects. Based on this, we develop a taxonomy of CSF to capture the complexity and provide an overview for a successful EA application. The solutions developed are presented in form of a catalog of specific measures to support companies in proactively addressing challenges as well as effectively preparing for and reacting to them. Fur-

[a] https://orcid.org/0000-0003-4346-4510

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thermore, our concept facilitates the integration of the resulting catalog of measures into the business processes and life-cycle phases of EA projects. It defines a general framework and can be combined with existing approaches.

The following research questions guide us in the investigation of success factors in EA:

1. What are the CSF in enterprise architecture projects that determine their relative importance and influence?
2. What correlations and interactions exist between these factors and how can they be processed in order to gain a better understanding?
3. How can a early warning system be set up for the factors to apply suitable best practices as preventive and reactive procedures?

In summary, we obtain the following requirements to address the success rate of EA application with a catalog of specific techniques:

- Completeness: Overview to functionally cover all possible areas and stakeholder objectives.
- Resource utilization: Support in the task prioritization and effective allocation of resources for the suitable actions.
- Methodology: Structured catalog of efficient measures and practicable strategies to solve challenges in EA projects.
- Modularity: Flexibility to adapt measures depending on the specific company, EA, and project environment.
- Continuous improvement: Integrated process for dynamic updating of the catalog to integrate new findings and best practices.

2 RELATED WORK ON FLAWS

Table 1 presents a survey of the principal influencing factors and key challenges applying EA. The CSF were identified and validated through a combination of literature review and ten expert interviews. In conclusion, it reveal a multitude of factors that decide over success and failure. Additionally, there is a dearth of analysis concerning interdependencies and mutual influences. In summary, in the context of EA application, we identify key issues, which require attention:

1. EA is seen purely as a service center for ad-hoc demand requests and without integration.
2. EA is only utilised reactively and there is no adaptation to changes in business strategy.
3. Instead of actually applying EA concepts and techniques, there is merely the creation of models with abstract object-oriented representations.
4. The application is carried out without precise objectives and in an inappropriate level of detail without assessment of the required maturity level.
5. There is no consideration of the architecture continuum, which leads to a lack of re-usability.
6. There is no alignment of methodology, with too many EA approaches compete, and the degrees of freedom are unrestricted.

3 TAXONOMY OF CRITICAL SUCCESS FACTORS IN EA

This section presents a comprehensive description of the taxonomy for CSF in EA and EAM, including its constituent components. We are ensure comprehensive coverage of all requisite areas throughout the EA project life cycle. Four principal categories have been identified as significant influencing factors for EA: Organizational, Technological, Human, and Process-related factors. The following factors play a crucial role in creating an environment that influences the success of EA. Figure 1 provides an overview of the taxonomy.

3.1 Organizational Factors

Organizational factors play a crucial role in creating an environment that influences the success of EA. In particular, a clear organizational structure and effective communication are of significant importance in this regard. The organizational factors can be further subdivided into the following areas:

Goal and Strategic Orientation. In the absence of precise objectives and evidence of added value, it is not possible to make effective use of EA in a targeted and profitable way. EA is only likely to be a success if those responsible have the requisite skills and capabilities. The objectives of EA must be aligned with the business strategy, which is of particular importance for motivating employees.

Governance and Management. Empirical evidence suggests that a change in leadership is the most efficacious approach when attempting to effect change. It is therefore evident that the support of top management is of considerable importance. The implementation of appropriate governance structures provides the possibility of controlling EA activities. This coordinating structure is responsible for the successful use of EA, extending from business to EA with direct integration.

Table 1: Critical factors in EA including EA management and EA projects due to the inherent relationship.

ID	**Organizational Factors**	Sources
1	Top management support	(Aleatrati K. et al., 2015; Masuda et al., 2021)
2	EA priority in overall context	(Aleatrati K. et al., 2015; Banaeianjahromi and Smolander, 2019; Aier, 2014)
3	Influence of architects to decision-making committees	(Dale and Scheepers, 2020; Löhe and Legner, 2014; Bente et al., 2012)
4	Autonomy of management and organizational units	(Ajer et al., 2021; Ajer and Olsen, 2019; Ajer and Olsen, 2018)
5	Organizational culture (establishment)	(Iyamu, 2009; Iyamu, 2013; Freeman, 1972)
6	Information strategy	(Iyamu, 2009; Niemietz and de Kinderen, 2013)
7	Stakeholder relationship management	(Iyamu, 2009; Wood et al., 2013; Bente et al., 2012)
8	Alignment of architects and other IT specialists	(Iyamu, 2009; Iyamu, 2013; Aier et al., 2008)
9	Trust of the organizations in the EAM function	(Aleatrati K. et al., 2015)
10	Bureaucracy and responsibilities within EA management	(Aleatrati K. et al., 2015)
11	Awareness of the benefits of information technology	(Dang and Pekkola, 2017; Ajer and Olsen, 2018; Iyamu, 2009) (Winter and Schelp, 2008)
12	Data quality and documentation	(Aleatrati K. et al., 2015; Hillmann et al., 2022)
13	Realisation gap of EA concepts	(Bui and Levy, 2017; Reichstein et al., 2019; Aier et al., 2008)
14	Financing	(Kurnia et al., 2021; Ajer and Olsen, 2019; Ajer and Olsen, 2018; Iyamu, 2009)
15	Performance in implementation and amount resources	(Dang and Pekkola, 2017; Lim et al., 2024)
16	Guiding Governance and clear targets	(Isomäki and Penttinen, 2008; Hauder et al., 2013)
17	Common expectations with regard to EA functionalities	(Dang and Pekkola, 2020)
	Technical Factors	Sources
18	Integration of EA and development	(Aleatrati K. et al., 2015; Brandis et al., 2014; Langermeier and Bauer, 2018) (Zenz et al., 2023)
19	Consideration of technical requirements	(Aleatrati K. et al., 2015; Heiland et al., 2023)
20	Guidelines and architectural principles	(Bui and Levy, 2017; Olsen and Trelsgård, 2016; Hjort-Madsen, 2006)
21	Reuse of existing EA artifacts	(Löhe and Legner, 2014; Ascher et al., 2022; Pöhn and Hillmann, 2021)
22	Alignment of efficient tools and methods	(Dale and Scheepers, 2020; Dang and Pekkola, 2016)
23	Selection, migration and integration of tools	(Brandis et al., 2014; Heiland and Karcher, 2019)
24	Availability and complexity of EA tools	(Olsen and Trelsgård, 2016; Nygård and Olsen, 2016) (Gong and Janssen, 2020; Heiland et al., 2021)
	Human Factors	Sources
25	Communication and collaboration	(Banaeianjahromi and Smolander, 2019; Niemietz and de Kinderen, 2013) (Gong and Janssen, 2020; Banaeianjahromi and Smolander, 2016) (Banaeianjahromi and Hekkala, 2019; Rouvari and Pekkola, 2023)
26	Motivation and commitment of employees	(Kurnia et al., 2021; Löhe and Legner, 2014) (Banaeianjahromi and Smolander, 2016)
27	Stakeholdern Management	(Dale and Scheepers, 2020)
28	Skill and knowledge of enterprise architects	(Gong and Janssen, 2020; Seppänen, 2014; Gellweiler, 2020) (Al-Kharusi et al., 2021; Marabelli and Newell, 2019)
29	Business know-how and leadership skills of architects	(Dale and Scheepers, 2020; Al-Kharusi et al., 2021)
30	Human resources management	(Banaeianjahromi and Smolander, 2019; Iyamu, 2013; Banaeianjahromi and Smolander, 2016; Safari et al., 2016)
	Process-related Factors	Sources
31	Process management with appropriate clarity and control	(Brandis et al., 2014; Brée and Karger, 2022)
32	Participation and communication along processes	(Kurnia et al., 2021; Dale and Scheepers, 2020)
33	Adaptability of the company	(Iyamu, 2009; Hjort-Madsen, 2006; Darvish R. et al., 2013) (Brée and Karger, 2022)
34	Structured identification and analysis of challenges	(Gong and Janssen, 2020; Seppänen, 2014)
35	Time management and consideration of best practices	(Darvish R. et al., 2013; LeanIX GmbH, 2020)
36	Hurdles in consolidating suitable architectures	(Iyamu, 2009; Hjort-Madsen, 2006)
37	Obstacles to the adoption of EA	(Winter and Schelp, 2008; Seppänen, 2014)

In addition to clear responsibilities, the importance of EA in the overall context must be defined by the business. In order for results to have a profitable influence, the information from the EA department must flow into the company's decision-making bodies.

Structure. The absence of structural anchoring in company operations hinders long-term acceptance. This phenomenon is intrinsically related to the domain of business and EA. A contractual agreement on EA activities serves to underscore the importance of these activities, which must be designed in a flexible manner in order to achieve an optimal level of efficiency. By integrating EA into the organizational structures of other departments, end-to-end collaboration is strengthened. This is a CSF in the context of projects and restructuring initiatives, given that otherwise profitable cooperation cannot be achieved.

Organisation Culture and Politics. It is essential that the utilisation of EA skills be culturally established such that proactive planning can take place. The concept of *Architectural Thinking* encapsulates the essence of planning. It entails an understanding of EA and necessitates an EA mindset, which must be cultivated through regular engagement. Presupposed trust facilitates collaborative cooperation, particularly in a federal setting. A continuous improvement by cultural establishment bolsters sustainable use and enhances efficiency, particularly regarding the reuse of EA artifacts.

Framework and Methodology. The existing frameworks must be adapted to align with the specific characteristics of the organization and harmonized with other approaches and established standards. It is crucial for considering appropriate harmonization strategies to mitigate the complexities associated with the integration of multiple systems. Moreover, it is essential to define framework conditions and guidelines for collaboration between the EA and the technical specialists. In particular, the involvement of stakeholders can be facilitated by tailored frameworks, thereby bridging the gap between the EA and specialised departments with regard to implementation.

Profitability and Efficiency. The availability of ad-

equate financing and suitable lead times for EA represents a considerable risk. Furthermore, the introduction of bureaucratic processes has the potential to impede efficiency. In order to guarantee measurability and control within an EA project, it is essential to have precise definitions of purpose, scope, and objectives. This enables effective monitoring and evaluation, and builds the capacity to make necessary adjustments. The scope of the project encompasses data collection and analysis. The governance has the task to guarantee the profitability and the adjusted scheduling of resources.

Information Distribution and Sharing. The objective is to facilitate clear information sharing and cooperation between the various stakeholders, ensure data availability and quality, as well as guarantee the continuous alignment of EA with the corporate strategy. In addition to a communication strategy, a clearly defined information governance policy is required. This should include the handling of data with regard to collaborative working in the sense of a digital thread across the entire life cycle.

3.2 Technological Factors

The potential of new technologies and innovations for further development is also considered. The technological factors are further subdivided in tools and utilization structure, data and quality management, methods, as well as innovation and technology.

Tools and Utilization. The selection of appropriate EA tools and their integration into a comprehensive tool chain, which is deeply interwoven with other adjacent areas of the company, serves as a foundation for the effective implementation of the EA strategy. User-friendliness and simplicity with regard to the intended purpose should be of paramount importance. Moreover, standards for exchange and interoperability at the interfaces are crucial for streamlining the workflow.

Data and Quality Management. It is imperative that the documentation of EA activities adheres to the agreed-upon criteria with regard to quality and scope and is based on established standards. In order to achieve overall standardization, it is possible to declare appropriate maturity levels. The management of EA artifacts represents a pivotal determinant of success, with a centralized repository offering low-threshold access proving an optimal solution for administration. This should be aligned with a Service-oriented Architecture (SOA) approach to facilitate the exchange and linkage of information in accordance with the linked data principle. With respect to the objective of usefulness, EA literacy must be developed, which corresponds to effective communication and collaboration using EA artifacts with regard to application, analysis, and dissemination.

Methods. The success factors in the area of methodology pertain to the technical implementation of EA activities, particularly with regard to the documentation of EA artifacts. The methods should adhere to coordinated guidelines, in particular a system decomposition. In terms of effectiveness, there should be a focus on reusability along a continuum, which also promotes the principle of equality. Subsequently, the EA activities should be streamlined in the form of automated workflows. Low-threshold access to EA artifacts is crucial for their use and long-term anchoring in the company.

Innovation and Technology. It is imperative to consider the technical challenges that may arise when monitoring and adopting new approaches. In such cases, digital solutions in the form of services are to be preferred, with these being managed over the life cycle of a product. In order to facilitate cooperation, especially in a federal context, it is essential to evaluate the approaches across companies.

3.3 Human Factors

The success or failure of an EA project is contingent upon a number of human factors. All include the skills for communication abilities and collaborative tendencies as well as motivation levels or resistance management strategies of the team members involved. It is evident that the commitment and cooperation of all parties involved are crucial for the success of EA.

Stakeholder Management. Without active stakeholder management, it will be challenging to align the results of EA with the preferences of the stakeholders. By facilitating participation in EA activities, it is possible to foster trust and understanding. Close cooperation can contribute to the creation of a common language and uniform expectations regarding the role of EA and its functionality. In particular, the motivation factor based on noticeable added value can be considered a significant criterion.

Interaction and Social Aspects. Transparency of EA activities and awareness of the potential benefits serve to strengthen dealings with EA. It is imperative that cooperation and collaboration be prioritized in order to achieve joint success like a *we-culture*. Interaction and social aspects serve as indicators of the social and emotional skills exhibited by employees. Insufficient bottom-up commitment and human barriers impede implementation, which in turn hinders success. The establishment of a learning and error culture is cru-

cial for long-term success and meaningful further development and improvement in all areas. A lack of adaptability and a low willingness to change represent significant challenges in this regard.

Personnel, Role, and Qualification. Dedication of the personnel and their readiness to embrace change are pivotal to the effective implementation of EA. The human resources management factor is comprised of several elements, including sufficient personnel, stable conditions, consistent quality, and the ability to execute effectively. This encompasses the formation of a suitable team with the requisite skills. The optimal qualification for the role in question is made possible by uniform competence development and comprehensive knowledge transfer. This includes, in particular, the exchange of knowledge and experience between enterprise architects in terms of EA, business, and IT. Furthermore, ongoing training and induction of new employees is a crucial factor in determining success. Additionally, EA is often performed as a secondary task, which means that insufficient space needs to be allocated to EA. The spectrum of skills ranges from familiarity with a subject area to specialization as a subject matter expert. The ability to adapt EA artifacts is a significant determinant of success.

3.4 Process-related Factors

The process-related factors address the design, management, and adaptability of the processes within EA governance, EA management and EA projects. Here, the design and management of the processes, in addition to the communication and participation of the stakeholders involved, play an important role. The ability to adapt to changing requirements is crucial given the dynamic nature of EA projects.

Process Management and Harmonization. The lack of clarity in processes and procedures, coupled with the absence of coordination with the EA department and the presence of erroneous project plans, contribute to delays. The success factor of process management is comprised of three aspects: clear responsibilities, integration of EA into company-wide processes, and alignment of these processes to create value for stakeholders. By harmonizing the processes accordingly, the diversity and thus the complexity of the processes is reduced. This simplifies possible automation and allows batch processing to increase efficiency. Further challenges in the area of process management are frequent changes in requirements on the part of the client as well as delimited innovation projects that are not thought through and disseminated across organizations.

Communication and Reporting. The involvement of roles and communication must be considered at each stage of the process, in order for the workflow to run smoothly; furthermore, appropriate deputies must be appointed for this purpose. Additionally, it is essential to treat the data as a digital thread. Open interfaces and standards facilitate collaboration; however, the interfaces must be coordinated in advance. Finally, the management of time and the implementation of deep work phases are key factors that contribute to productivity as well as the consideration of the adequate best practice.

Maintenance and Continuous Improvement. It is essential that the EA artifacts be documented in a manner that facilitates their utilization by stakeholders and allows for their reuse. Furthermore, any adjustments must be duly recorded in the event of changes to the circumstances or framework conditions, thus preventing the occurrence of repetition errors. This directly correlates with the factors of change management.

Requirements and Information Management. The effective utilisation of EA, particularly within the context of projects, hinges upon the availability of comprehensive and reliable requirements. The accurate acquisition and examination of information assume paramount importance in this regard. To this end, it is imperative to firstly identify the pertinent stakeholders and facilitate the exchange of integrated information.

Knowledge Management and Utilization. The practice of knowledge management entails the aggregation and reuse of designs and reference architectures, the adaptation of good practices, and the acquisition of insights from past experiences. It necessitates the incorporation of the repository of measures into the knowledge base, the facilitation of transparent communication, and the assessment of the efficacy of implemented measures for the purpose of continuous improvement.

Change Management. Effective compliance and risk management is essential for navigating resistance to change and safeguarding the integrity of the change process. It entails prompt identification, constructive resolution, transparent communication, and inclusive involvement to de-escalate conflicts and nurture trust and collaboration. A comprehensive approach fosters acceptance, commitment, and cooperation, which are crucial for the effective integration of the new measures.

Compliance and Risk Management. With respect to EA activities, the harmonization of structure, management, and documentation yields performance benefits and recognition values. Furthermore, the com-

plexity inherent in many modern systems can be effectively managed through the use of EA, enabling the control of known artifact types with coordinated purpose reference and the reduction of potential design inconsistencies.

3.5 Summary of Factors

Overall, considering and addressing these factors will enhance the likelihood of success in EA projects. It should be noted that a multitude of factors could be classified in a variety of subcategories, as they often interact with and are influenced by one another. This complexity underscores the challenges in clearly delineating individual factors and emphasizes the necessity for an integrative approach when analyzing and addressing factors in EA projects. The key CSF, as identified in both the literature and the expert interviews by number and emphasis, have been highlighted.

4 ASSESSMENT OF CSF

Organizational factors exert the greatest influence on the success of EA projects, exhibiting an above-average impact. The governance and structure is of critical importance, as evidenced by numerous studies. A number of research studies have demonstrated that the direct anchoring of EA management via governance structures within a company has a positive influence on EA projects (Hillmann et al., 2024). Furthermore, this is the only way to deliver the comprehensive added value of EA for holistic further development via Top-Down approach. Additionally, it has been shown that limited access of enterprise architects to information from decision-making bodies and organizational measures significantly inhibits success, which in turn influences the results of such initiatives. Added value is contingent upon the implementation of an efficacious communication strategy and the dissemination of pertinent information to the intended recipient at the optimal juncture, in the requisite format.

The motivation and trust of stakeholders in the benefits of EA are of paramount importance. The evidence indicates that the backing of top management and the conviction of non-expert stakeholders regarding the significance of EA are especially crucial to ensuring the success of initiatives (Aleatrati K. et al., 2015; Masuda et al., 2021). However, mistrust of architects, a lack of awareness of the benefits of information technology, and a lack of architectural awareness have been identified as challenges particularly in time of a digital age (Dang and Pekkola, 2017; Ajer and Olsen, 2018; Iyamu, 2009; Winter and Schelp, 2008). The organization of processes and roles within EA initiatives is a crucial aspect that influences success. An excess of roles within EA management leads to inefficient bureaucracy and a negative impact on the process. Furthermore, problems with data quality and a lack of documentation can create bureaucratic hurdles. The implementation of EA concepts is often a challenge due to their abstract nature, which makes it difficult to translate them into practical artifacts using suitable processes.

The autonomy of organizational units and the political and conflict dynamics of the organizational environment are identified as additional challenges (Ajer et al., 2021; Ajer and Olsen, 2019; Ajer and Olsen, 2018). These factors are further exacerbated, by frequent changes in government and a severe lack of resources (Dang and Pekkola, 2017). Cultural and social aspects, such as organizational culture or competition between architects and other IT specialists, have a notable impact on the effectiveness of EA projects (Iyamu, 2009; Iyamu, 2013).

The manner in which resources are budgeted and allocated is a significant determinant of the success of EA projects. Political influences and funding difficulties are identified as critical issues in the literature (Kurnia et al., 2021; Ajer and Olsen, 2018; Ajer and Olsen, 2019; Iyamu, 2009). Furthermore, a dearth of resources and delays in the implementation of EA projects results in setbacks and unwarranted damage to the reputation of EA (Dang and Pekkola, 2017; Lim et al., 2024). Adequate communication is essential for the success of EA projects. A lack of organizational support and communication problems can impede EA's ability to achieve its goals (Iyamu, 2009; Niemietz and de Kinderen, 2013). Effective governance and clearly defined EA objectives are crucial factors (Isomäki and Penttinen, 2008). Similarly, unrealistic expectations on the part of management regarding EA functionality can lead to project failure (Dang and Pekkola, 2020). Therefore, effective management of stakeholder relationships and strategic communication with the company is vital (Iyamu, 2009; Wood et al., 2013). In accordance to our comprehension of a good EA, a stakeholder ideally does not need to have knowledge of EA in order to derive added value.

Figure 2 provides the summary of the most important factors and their relation. The colors of the categories are in accordance with the taxonomic structure. The strength of the connections is contingent upon their importance, as evidenced by their representation in the literature and expert interviews. For

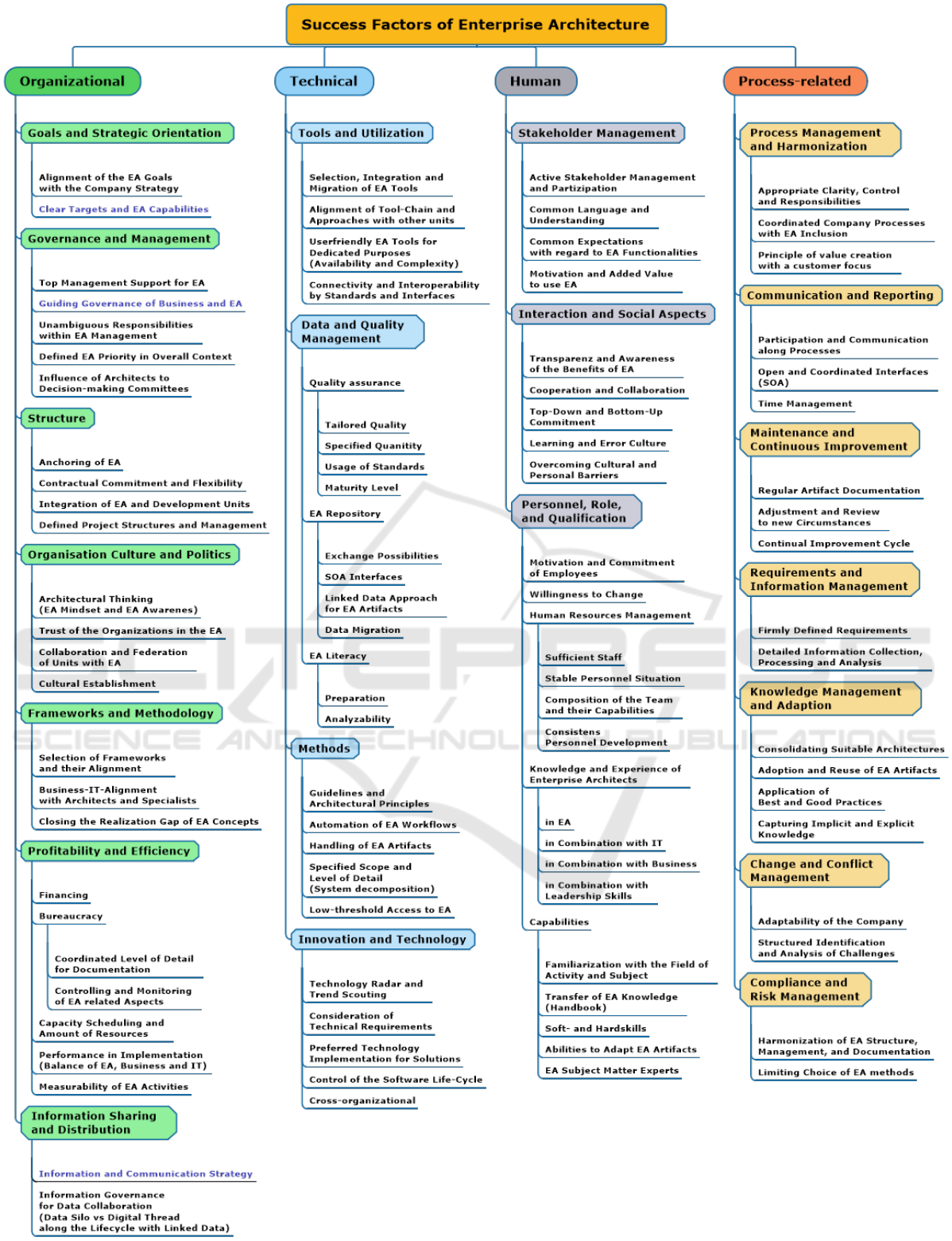

Figure 1: Taxonomy of critical success factors of EA and EAM.

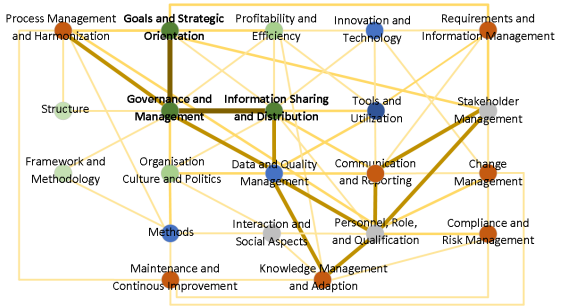

Figure 2: Mutual influence of CSF in the area of EA.

the sake of clarity, weaker connections were excluded from the analysis.

The costs and benefits of EA are contingent upon the equilibrium between strategic and tactical orientation (Hauder et al., 2013; LeanIX GmbH, 2020; Hillmann et al., 2021). Excessive planning and conceptualization result in the dissipation of valuable time and financial resources that could otherwise be utilized for the actual realization. Conversely, the premature and immediate action for ad-hoc solutions may yield inadequate and unsustainable outcomes. Therefore, it is preferable to start with the description of the target architecture such that the scope and required details for the as-is architecture becomes clear.

EA has to be seen as an integral component in the sense of a co-worker. It would be prudent to impose limitations on the diversity of EA applications in order to facilitate alignment with and integration into neighboring disciplines. Multiple case studies have shown that EA is particularly effective when used proactively in contrast to reactively. In general, the following seven recommendations can be made with regard to the introduction and establishment of EA in a company:

1. **EA Awareness.** Cultivation of a comprehensive understanding and defined targets of EA across the entire organization
2. **EA Governance.** Establishment and anchoring of a uniform and harmonized structure for EA
3. **Architectural Thinking.** Facilitation of collaboration and participation, from the initial stages of conceptualization through to the implementation phase, in order to foster cooperation and support the application
4. **EA Workflows.** Strategic planning of active stakeholder management and company-wide communication with focus and value creation
5. **EA Repository and Glossary.** Utilization of established standards and modular reference architectures, in conjunction with the definition and use of terminology.
6. **Interoperability and Re-usability via Linked Data and SOA.** Connections of individual company divisions by employing methodologies to integrate and connect the distributed EA artifacts
7. **Transparency and Dashboard.** Creation of low-threshold and user-friendly access point to EA artifacts, associated documents and relevant information.

5 CSF RELATED PRACTICES ALONG THE LIFE CYCLE

A variety of measures can be employed to address each individual success factor in a targeted manner. A dedicated catalog has been developed that lists potential best practices in a bullet-point format, see Table 2. This is to be expanded upon in future work and tailored to the specific needs of the organization. It is essential to establish appropriate measurement methods for key values with defined threshold values.

6 SUMMARY

In this study, we have developed the first taxonomy for critical success factors for EA and EA management. Among other things, this serves as an overview of what needs to be considered and addressed when managing EA projects. It thus represents a kind of checklist for the successful introduction of EA in a company and enables continuous monitoring to ensure success. In conclusion, three critical success factors were identified from the totality of factors that significantly influence the success of EA and contribute to the positive development of the company. These factors are: Initial is the direct incorporation of EA management into the company through the establishment of governance structures. This demonstrates the endorsement and confidence of top management in EA. Secondly, a precise definition of objectives, tasks and character of EA within the company and in projects is essential. This enables focused work, particularly with regard to implementation and integration. Furthermore, it prevents excessive expectations. The third point is the strategic communication of EA within the company and with external stakeholders. To this end, it is essential to draw up a communication plan and anchor it in processes to foster the culture. The guiding principle of “Architectural Thinking” can be used to motivate employees with the goal of creating a better company.

Table 2: Critical factors along the rough EA cycle with possible key measures for success.

Phase	Factor	Supporting Method
Plan	Goal and Strategic Orientation	Creation of a clear target definition using SMART Organisation of regular strategic workshop and review the strategic direction Create a step-by-step plan with milesontes
Plan	Governance and Management	Convincing leaders and stakeholders about EA benefits Obtain Top-Down-Support Define a precise Business Case Reconsider the allocation of resources
Plan	Structure	Define clear project organisation structures. Develop interdisciplinary collaboration Establishment of interfaces and integration mechanism
Plan	Framework and Methodology	Check the adaptation and alignment of the frameworks used. Describe the methodical procedure for using different approaches.
Plan	Tools and Utilization	Focus on the use of simple tools Development of a tool chain with compatible interfaces Facilitation of seamless data exchange.
Do	Process Management and Harmonization	Review of capacity planning and scaling options Establishment of buffers, in particular for improvements Establishment of priorities for projects Enabling flexibility and adaptability
Do	Stakeholder Management	Analysis and engagement of potential stakeholder Plan communication and establish a proper communication platform Involving Stakeholders in the EA processes Define a methodology to solve conflicts and to create resolution
Do	Requirements and Information Management	Firmly defined requirements from the start Carrying out a thorough analysis phase Organization of workshops to ensure completeness and understanding Countering complexity and scope with tool support
Do	Data and Quality Management	Establish a common database for EA artifacts Introduce quality assurance for EA data via process Enable the cleansing of EA data over long periods of time Focus on Data Integration Technologies
Do	Information Distribution and Sharing	Creating transparency and opportunities for self-exploration Establishing clarity and consistency Establish of a broad distribution of information via plan
Do	Methods	Build a collection of best practices by cases
Do	Organisation Culture and Politics	Promoting a culture of cooperation Enable continuous feedback by defining time periods. Enable critical reflections of EA initiatives through meetings or surveys.
Do	Innovation and Technology	Considering a holistic solution Collection of requirements across all business areas
Do	Personne, Role, and Qualification	Introduction of qualification management with review of staff training Carry out a personnel requirements analysis and surveys Carry out regular employee engagement and motivation measures Enabling prospects, career and talent development for long term
Do	Communication and Reporting	Establishment of a two-way communication with confirmation Establishment of default communication channels Information through regular updates on the processing status
Do	Interaction and Social Aspects	Recognition and appreciation of performance Creation of a motivating working environment Enabling participation and co-determination
Do	Knowledge Management and Utilization	Establishment of knowledge-management-platform Defining a culture of a learning organization Recording experiences and lessons-learned by means of process Announcement that information management is the task of all
Check	Profitability and Efficiency	Definition of clear objectives using SMART and assessment of EA metrics Announcement of Key Performance Indicators Establishment of regular review and reporting in a KPI-related format Review of targeted action and ressource allocation Enabling deep work phases and sprints Checking of the required level of detail for EA artifacts
Check	Compliance and Risk Management	Focus on standardization and integration Create check list for evaluation
Act	Change Management	Consideration of a holistic approach taking into account the environment Definition of a standardized and structured procedure
Act	Maintenance and Continuous Improvement	Establish and trigger a regular cycle of feedback, learning, and improvement Define a cyclic timeframe via validity period for re-examination

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