Goals in Enterprise Architecture Management – Findings from Literature and Future Research Directions

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Abstract—The Management of Enterprise Architectures (EAM) is an evolving discipline within the information systems community. By taking a holistic point of view on an enterprise, considering its business and Information Technology (IT) elements, EAM aims at a better alignment of business and IT, cost savings and faster response times. In order to achieve those benefits academics as well as industry representatives already provide methods, models and tools. Nevertheless, researchers and practitioners call for means to demonstrate the payoff of EAM initiatives. A common management approach for explicitly tracking an individual’s or team’s performance and success relies on the definition of goals. To the authors’ knowledge such an approach is not yet established within the EAM discipline. To improve this shortfall, this paper gives an overview on the current body of knowledge in the field of goals in EAM by means of an extensive literature study. Based on the analysis’ results we present reoccurring properties of goals in EAM, possible interrelations and an initial classification. The paper concludes by providing topics for future research directions.

I. INTRODUCTION

For more than 20 years the discipline of Enterprise Architecture Management (EAM) has developed methods, models and tools to enable a holistic management of the components forming an enterprise. Thereby, an enterprise is considered to have an architecture similar to other software intense systems. According to the ISO/IEC 42010:2007 standard this architecture is defined as "the fundamental organization of a system embodied in its components, their relationships to each other and to the environment" [1]. Besides the documentation and description of an Enterprise Architecture (EA), EAM also includes an ongoing management of the EA. Among others, the potential benefits of the discipline are better Business-IT alignment, cost savings and faster time-to-market [2], [3]. However, while the reasons for implementing an EAM function within an enterprise [4] and the development of principles [5], [6] are quite well understood by researchers and practitioners today, the discipline lacks a common understanding of its goals and especially their documentation. This is surprising when considering other IT management approaches, e.g. IT governance [7], which strictly align their activities to their respective goals. To the best knowledge of the authors, there is neither a renowned collection of EAM goals available nor commonly agreed techniques of documenting, enforcing and monitoring them. Nevertheless, we deem this vital given the success of the management-by-objectives mindset applied in other management disciplines [8]. Another reason for making goals in EAM explicit, consists in their ability to demonstrate the effectiveness of EAM activities which is urgently demanded in practice and recurrently discussed in academia [9].

In order to provide a conceptual foundation for the term ‘goal’ in EAM this paper addresses the following research questions:

1) How does literature define the term goal in EAM?
2) Which properties does a goal in EAM possess according to related literature?
3) How could a classification of goals in EAM look like?

The remainder of this paper is organized as follows: In Section II, we provide an extensive overview on publications about goals in EAM. Based on our findings, we systemize the different facets of goals within Section III. Lastly, Section IV concludes with a short summary and points towards further fields of research.

II. OVERVIEW ON GOALS FOR EAM IN LITERATURE

To identify relevant books, papers and journal articles on goals in EAM, we applied a structured approach as recommended by Webster and Watson [10]. As visualized in Figure 1, in phase one (lasting from November 2012 to December 2012) we perused IS journals and conference proceedings using the Web of Science and the EBSCO database. Thereby, we carried out electronic full-text searches on the following English keywords: 'enterprise architecture' and 'goal' as well as their German translations. We made sure that the top 20 journals included in the MIS Journal ranking provided by the Association for Information Systems [11] and the WI-Orientierungslisten provided by the Wissenschaftliche Kommission Wirtschaftsinformatik im Verband der Hochschullehrer für Betriebswirtschaft e. V. (commission of German speaking IS scholars) [12] were covered by our search. In order to identify relevant books the mentioned search terms were also used for electronic searches with Google and SpringerLink. Our activities resulted in a total of 82 sources. After a first analysis of these sources (title, abstract, outline) following the method of hermeneutic text comprehension (cf. [13]) 30 articles and books have been identified as relevant.
because they actually study the core construct of goals in EAM. The remaining 52 sources discussed topics tangentially related to the central construct of goals in EAM such as exemplary goals for EAM motivation in general or they used the term goal to describe the target of an article. The results of a subsequent detailed content analysis are presented in the following sections. Based on the various properties different sources attribute to EAM goals a concise definition of the term ‘goal’ in the context of EAM will be provided. Since the detailed analyses revealed several synonyms used for the term ‘goal’, we analyzed the 30 sources again for synonym usage within phase two.

A. Frameworks for EA

One of the most popular frameworks for EAM is The Open Group Architecture Framework (TOGAF), currently available in version 9.1 [14]. Initially released in 1995 as a derivative of the Technical Architecture Framework for Information Management (TAFIM), TOGAF is presently developed and maintained by members of The Open Group working within the Architecture Forum. TOGAF contains a plethora of concepts all brought up by stakeholders while alluding to the term goal. For instance, TOGAF describes business scenarios as a method for deriving business requirements for the architecture and the implied technical requirements. However, the final outcome is not requirements but rather business goals and their more fine-granular constituents, the objectives. TOGAF further advises that objectives ought to be SMART (specific, measurable, actionable, realistic and time-bound) and lists 13 goals as well as several contained objectives as an example. And yet, the framework later defines the term requirement as “a statement of need that must be met by a particular architecture or work package” and makes use of this concept within all phases of its Architecture Development Method (ADM). In the same way, TOGAF calls for SMART requirements, it contains guidelines for defining and establishing interoperability requirements and dedicates a process (not phase) of its ADM to the management of requirements. Unfortunately, no explicit link between objectives and requirements is given.

While COBIT 5.0 defines business goals (also called enterprise goals) as “the translation of the enterprise’s mission from a statement of intention into performance targets and results” it refers to its derivatives, the IT-(related) goals, as statements “describing a desired outcome of enterprise IT in support of enterprise goals. An outcome can be an artifact, a significant change of a state or a significant capability improvement” [7]. IT goals are mapped on process goals being defined by COBIT as a “statement describing the desired outcome of a process. An outcome can be an artifact, a significant change of a state or a significant capability improvement of other processes”. By pointing out several examples for goals in combination with an approach to cascade business needs down to processes, the business framework for the governance and management of enterprise IT is one of the most goal-focused approaches we came across during our studies.

Building Blocks for Enterprise Architecture Management Solutions (BEAMS) is a best-practice based approach for EAM developed by Buckl et al. [15]. Centering on the assembling of re-usable building blocks, BEAMS requires the definition of an organizational context, goals and concerns when launching an EAM initiative. While Buckl explains a goal as “an abstract objective of the EA management function that describes a state or condition of the enterprise to be brought about or sustained through appropriate means. A goal is thereby defined for one or more objects of the EA“ she defines the term concern as “interests which pertain to the system’s [i.e., the enterprise’s] development, its operation or any other aspects that are critical or otherwise important to one or more stakeholders” [4]. Together, goal and objective form a problem which “specifies the objective of the EA management function by defining what to achieve, i.e. the goal, and where the goal should be applied, i.e. the concern”. Neither the structure of a goal nor the term ‘objective’ is closer elaborated on. However, Buckl et al. list typical goals for EAM, e.g. reduce security breaches, increase homogeneity and foster innovation [16].

With the version 3.0 released in 2011, the Zachman framework continues to be a two-dimensional classification system consisting of communication interrogative (What, How, Where, Who, When and Why) and reification transformations. Instead of goals, Zachman speaks of ends which are covered by the framework’s ‘Why’ classification name. Ends can be considered from an executive, business management, architect, engineer, technician and enterprise audience perspective [17]. Even though Zachman’s approach is entitled ‘the enterprise ontology’, the framework refrains from detailing the term goal.

B. Books

Ahlemann et al. [18] emphasize that the EAM’s major benefit is the efficient, [business] goal-directed allocation of time, people, and money. Thereby, business goals, which are sometimes referred to as (business) requirements, are part of the EA strategy as the very top of all EA layers. The authors add that EAM can “become a communication tool to spread strategic visions and goals in the organization” while simultaneously helping to align organizational assets and capability with the strategy. They also introduce the term EA goal (without defining it), distinguish between strategic and tactical EAM objectives (again without a definition or delimitation) and list stakeholder-specific goals in EAM (e.g. provide EA standards and guidelines).

Bente et al. [19] describe an agile and collaborative approach to EA. One of their core EA tasks is to define the
IT strategy by defining goals which should account for the SMART qualities. Furthermore, goals should provide enough details to be actionable, e.g., the geographic location for which a goal should be achieved. The authors argue, that a handful of goals is enough to define an IT strategy. A distinction between goals, objectives, requirements and visions is not necessary, because at the bottom line all of these concepts are used to agree on what is wanted by who. By involving business leaders during goal definition IT goals can be derived and a deeper understanding about a goals rational will be achieved.

For Bernard, goals in the context of EA are changeable components of an enterprise located at the highest level of his EA³ cube framework [20]. Serving either one or several lines of businesses, the author generally considers a goal to be strategic with a sponsor being responsible for achieving it by means of strategic initiatives. Moreover, each goal “should be stated in a form that includes measurable and meaningful outcome”. According to Bernard, the documenting strategy of EA helps to identify and visualize goals. He provides detailed examples how specific goals, initiatives and measures can be made explicit.

Bernus et al. [21] differentiate between business (e.g., branch support) and corporate goals (e.g. optimizing customer support), whereas the former is derived from the latter type. Different goals like profitability, flexibility and information sharing are discussed, and yet, no uniform definition is provided.

According to Dern, the development of an IT-architecture necessitates a previous definition of goals and a scope [22]. Thereby, each goal has to be prioritized (for instance in A, B, C goals) and the moment of achieving it has to be made clear. Well-defined, concrete and prioritized goals serve as a means to derive architectural viewpoints which, according to Dern, represent a main deliverable when managing IT architectures. In his running example, the Fantasia Insurance, the author presents 15 goals ranging from ‘reference software architecture’ to ‘centralized solution’. Each one of them comes with a short textual description, the scope and a method to verify its achievement.

Engels et al. initiate the debate about goals by devising a four-level hierarchy consisting of financial, customer-related, process-related and IT-related goals [23]. Within IT, the authors differentiate between the five distinct design goals correctness, cost-efficiency, effectiveness, agility and innovation. With each one of them being attributed to the application landscape, the individual degree of fulfillment depends on the type of process the applications support. Even though the authors also apply the word ‘requirement’ throughout their book (in particular in association with applications), they neither provide a definition nor they explain how requirements actually relate to goals.

Even though their book centers on EA principles, Greefhorst and Proper also explain related concepts, among others goals & objectives being the main driver for architecture principles [6]). Both terms are defined as "targets that stakeholders within and outside an enterprise seek to meet", can be very high-level as well as specific and may have a strategic or a more tactical characteristic. In line with the business motivation model [24], they define objectives as the specific, measurable, actionable, realistic, time-framed (SMART) version of goals and point emphasize on possible hierarchies among them.

In a subchapter of her book, Hanschke discusses the benefit of EAM and lists three common goals for the discipline, namely "generate transparency", "align business and IT architecture" and "control the development of the IT-landscape and the business architecture" [25]. Although, a comprehensive definition for goals is not provided, some of their properties are named: impact, metrics, contribution to corporate goal and context. Hanschke also argues for SMART goals.

The German-speaking book of Barkow et al. refrains from explicitly defining the term goal in the context of EAM [26]. However, on a textual basis the authors sketch a succinct approach to elicit strategic, tactical and operational EAM goals. The latter type is the most concrete, unambiguous and comprehensive one, its achievement has to be measurable by applying key performance indicators. As a starting point for the goal search process, the authors name the enterprise strategy, the IT measures catalog as well as an EAM maturity check. The book provides 2 strategic, 5 tactical and 10 operational sample EAM goals. The last class contains a temporal dimension expressed by a goal deadline.

In their book, McGovern et al. apply the notion of a goal in several contexts [27]. For instance, the authors speak of goals when it comes to a system’s operation and support discipline, the software development process, the modeling process or data architectures. Neither for goal nor for requirements, which according to the authors pertain to properties of the system, definitions are provided.

Minoli considers the ultimate goals of EA in promoting of alignment, standardization, reuse of existing IT assets and the sharing of common methods for project management and software development across the organization [28]. The discipline creates a "map of IT assets and business processes" driving the discussion on how can a business strategy be expressed through technology. However, the author refrains from providing a more precise definition of the term.

In a dedicated chapter of his book about IT governance and EAM, Niemann classifies EAM goals in IT efficiency ("doing the right things"), effectiveness of IT ("doing things right") and IT reliability ("doing things in a low-risk way") whereas each goal resolves into several subgoals [29]. Niemann alludes to the conflicting character of goals (e.g., cost reduction vs. innovation management) and remarks that the type, priority and character of goals vary according to the particular situation. Drawing on own experience as well as literature, the author discusses the benefit of EAM accompanied by a short description of typical goals in the domain (e.g., make heterogeneity visible, securing strategy and resources conformity).

C. Journals and conference papers

Fischer et al. [30] summarize the main goals of EA as “EA documentation and communication”, "to-be architecture design" and "transformation project support". To achieve these goals EA models providing transparency, measurability and consistency are suggested.

Concentrating on a digital preservation capability in the context of TOGAF, Becker et al. [31] sketch a model contain-
ing a [business] goal and its related entities. In detail, constraints and drivers (both relating to a stakeholder’s concern) have an impact on a goal. The latter can be quantified by a Key Performance Indicator (KPI) which is used to evaluate a capability. Subsequently focusing on a case study from the public sector, the authors refrain from explaining properties and relationships of a goal in detail.

Based on an extended version of Archimate, the British researchers Clark et al. [32] introduce LEAP, a lightweight framework for EA. Opposed to the well-known EA modeling language, the framework is capable of formally modeling business goals using the Object Constraint Language (OCL). Thereby, business goals (or motivators) are defined as high-level decomposable objectives being part of the business layer. While they can be considered as conditions to be satisfied by some aspect of a system or a system modification, business goals can be also in conflict with each other.

Chung et al. consider an EA as a blue print of the organization [33]. The authors claim that a better EA “is likely to result in a better achieved [organizational] goal”. Surprisingly, they do provide a table with business (e.g., faster adaptability, better decision making) and IT-related benefits (e.g., better IT visibility and complexity management) that they call softgoals within their descriptions.

Inline with Schönherr [34] Lange and Mendling conduct a series of semi-structured interviews to identify classes of EA goals, corresponding EA frameworks adoption helping to achieve these goals, as well as approaches to measure a specific goal’s achievement [35]. The authors list seven goals (each backed by perused literature) and further subdivide the set into an internal and external category whereas the latter aims at fulfilling regulatory requirements. In addition, they notice that the identified instances are mainly IT goals, whose priority can alter over time and which support the achievement of enterprise goals.

Quartel et al. present ARMOR, an Archimate based modeling language that serves at modeling the motivation for EA [36]. According to the research group, goals state what to achieve. They are related to more abstract (business) goals, defining the why, as well as to more concrete (IT) goals, detailing on the how. Following the meta-model of ARMOR, a goal contains a name, type, specification, language, priority, period and assumptions. However, no definitions for these attributes are given. Possible subclasses are soft and hard goals, whereas the former is defined as “vaguely defined goal with no clear criteria for its fulfillment” in line with the i* model [37]. Furthermore, there are conflict, (positive/negative) contribute and refinement relations of goals [38].

Based on TOGAF, the Business Motivation Model, i* and KAOS, Engelsman and Wieringa redefine ARMOR to contain only a minimum number of goal-oriented concepts [39]. In the light version of the framework, [business] goals belong to stakeholders, can be decomposed, can have means-end-relations and (for hard goals) can conflict. If a goal is concrete, it turns into a requirement and has to be allocated to one single architectural component. Conversely, architectural components can be linked to several requirements. Subsequent to the execution of two case studies, the authors conclude that only the concepts stakeholder, goal, decomposition, influence and conflict are usable in practice.

Teka et al. [38] extend the meta-model of the existing requirements and goal modeling language TROPOS as well as the NFR by adding semantically reach definitions for goal influence relations that support reasoning on these relations. Furthermore, fuzzy logic is used to provide some kind of measurability.

According to van Steenbergen et al., choices in the management of an EA have to be explicitly linked to business goals in order to unfold the benefits of the discipline [40]. By means of an empirical survey, the researchers define further techniques and examine their relations to different types of benefits. The study is backed by a literature review where the Dutch academics and several other colleagues peruse various related sources before finally concluding with an Enterprise Architecture Benefits Map [41]. Again, the authors emphasize the contribution EA has to make regarding the achievement of business goals.

In 2003, Wegmann published an article on his systemic enterprise architecture methodology (SEAM) [42]. According to the researcher, the goal of any EA project “is to define and implement the strategies that will guide the enterprise in its evolution”. Typically, so Wegmann, business level defines the goal whereas operational and technology levels show how these goals are reached. No further explanations about the structure of a goal are given.

Yu et al. strongly promote the modeling of goals to make them explicit and in consequence increase transparency about the underlying drivers, build up a foundation for the systematic analysis and improve the decision base for or against a certain EA [43]. For the sake of documentation and traceability, the authors additionally recommend relating goals to a specific architecture. Moreover, they sketch how goal modeling (either by means of business motivation model or the i* framework) could be integrated in an enterprise architecture construction process.

Focusing on the role of EA stakeholders van der Raadt et al. distinguish between lower level goals called consequences and highest level goals called values [44]. Their list includes consequences like EA conformance and decision making as well as values like realization of strategy and monitoring of changes. For each goal they also provide a short description. Nevertheless no operational guidance for implementing these goals is presented.

Doumi et al. provide a framework in which goal modeling is separated from enterprise architecture while mutual impacts are modeled additionally by using i* [45]. They state, that goals do never specify how they can be achieved. They distinguish hard goals from soft goals (satisfaction clear/unclear). All in all, only the correspondence of IT systems to goals/tasks is modeled by arrows.

In their article, Cardosa et al. review seven enterprise modeling approaches and enterprise frameworks regarding their support for the goal domain [46]. The researchers state that “goal statements range from high-level concerns in an enterprise (expressing the vision and mission of the organization) to declarations of the values that must be achieved by business process execution on behalf of stakeholders”.

In
conclusion to their literature survey, they summarize their findings by means of a synoptic table, containing the main concepts, relations and related concepts of the approach’s goal domain and state "current approaches for enterprise modeling offer rudimentary support for intentional modeling as well as for the incorporation of intentional aspects in the other viewpoints”.

D. Findings

The analysis of 82 sources revealed that goals are indeed a relevant topic for EAM. In general, the studied literature on goals can be subdivided into two categories. While the first group of authors applies the term in conjunction with a cost/benefit analysis of the discipline (e.g., Hanschke [25]), the second group regards (business as well as EAM) goals as distinct entities that need to be incorporated in a modeling approach (e.g., Yu et al. [43], Teka et al. [38]). In the latter case goals represent the motivation for an EAM endeavor, hence the 'why' dimension.

Our study further confirmed that there is no commonly accepted definition for the term 'goal' in the context of EAM. While several authors consider EAM as an instrument employed to achieve business goals (e.g., Quartel et al. [36]) others define domain-specific goals the management of an EA ought to meet (e.g., Wegmann [42], Lange and Mendling [35], Niemann [29]).

During our research we came across several ambiguous delimitations with regards to related concepts. For instance, Steenbergen et al. [40] mix up the benefits of a goal’s achievement, i.e., the consequences, with the goal itself. Chung et al. [33] list benefits of EAM but refer to them as softgoals.

With the exception of Bernard [20] sketching the role of an EA sponsor in brief, none of the examined work brings an organizational scheme into play that, among others, specifies the roles and responsibilities, saying who is in charge of achieving and tracking goals in EAM. Complementing the well-known but very general 'SMART' properties specific, measurable, actionable, realistic and time-bound (e.g., TOGAF [14]), the sources we perused recommended additional characteristics a goal for EAM should have, namely relationships to other goals (e.g. [39]), stakeholders (e.g. [36]), rational (e.g. [31]) and restrictions (e.g. [4]).

Remarkably, most of the sources highlight the need for decomposing goals, but various authors use a different terminology. For example, general and specific goals are called hard and soft goals (e.g., Engelsmann and Wieringa [39]), high-level goals and objectives (e.g., Clark et al. [32]) or goals and objectives [47]. The deeper a goal is within such goal hierarchy, the more properties are attributed to it.

As indicated by Table I, our search for synonyms revealed that authors referring to goals in the sense of objectives attributed more properties to goals as those who see goals in the light of drivers or benefits. Furthermore, additional types of interdependencies between goals (e.g., Cardoso et al. [46]) are prominently presented, including support and conflict relationships.

III. TOWARDS A UNIFIED CLASSIFICATION OF GOALS IN EAM

This section provides possible domain-specific characteristics for goals in EAM. Our descriptions are based on studied literature in combination with our experience we gained in the field of the role of an academic (e.g. [48]) and practitioner. Regarding the EAM sources, no distinction between business or EAM goals are made. Consequently, meaningful ideas we read in the context of enterprise or business goals are directly adapted to goals in EAM. Within the explanations, we stick to the scheme Greeffhorst and Proper [6] use when describing the attributes of architecture principles. In contrast, we do not differentiate between basic, advised, classifying, potential, meta-data or relational properties.

Table I summarizes the identified goal properties, distinguishing between the three different notions we came across in literature. For each individual property, those sources are specified that back the according goal dimension.

In line with software design patterns [49] or the statement part of architecture principles [14], a goal for EAM should bear an unambiguous and succinct name that can be communicated straight forward while being easy to memorize. The name should denote a desirable or even necessary future state. At best, it embodies the impacted EA elements (e.g., business application) or EAM components (e.g. data gathering method). An example for a goal’s name could be "increasing the business application transparency". Goal names in EAM are suggested by [36] as part of their modeling language ARMOR.

For the ease of use, goals should have a category attribute enabling enterprise architects to cluster and retrieve them more easily. Categories can be chosen based on different criteria, for instance the time horizon of a goal (e.g., strategic, tactical, operational, cf. [26]), the degree of measurability (e.g. hard vs. softgoals, cf. Chung et al. [33]), or the area of origin (e.g. customer-related goals vs. IT-related goals [23]). At best, the devised categories should be mutual exclusive, such that a particular goal can be assigned to one category only. Again, it’s the author group Quartel et al. [36], which introduces the type of a goal without going into details.

Similar to architecture principles (cf. [14]), a goal in EAM should provide information about the underlying rationale, thus business or IT goals, technical/legal/ corporate reasons, requirements and/or values that originally led to the establishment of the goal. Making the motivation for EAM activities more transparent is discussed in several of the studied sources. It is Steenbergen et al. [40] who promote the linking of EA techniques with benefits. Moreover, Becker et al. [31] advise to consider goals always in conjunction with the adjacent drivers. Cardoso et al. [46] additionally provide an ontological foundation for the motivation behind an EAM goal.

A goal for EAM should comprise the different actors who are either benefiting from its achievement or supporting it’s pursue in some way. Literature recommends to bound real persons to goals. For Engelsman and Wieringa [39] a stakeholder has a goal. In TOGAF, stakeholders are ascribed more properties to goals as those who see goals in the light of drivers or benefits. Furthermore, additional types of interdependencies between goals (e.g., Cardoso et al. [46]) are prominently presented, including support and conflict relationships.

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its fundamental intention. Examples are increasing, facilitating, replacing, etc. (e.g. increase transparency, reduce annual costs spent on EAM). Despite of the fact none of the studied sources made this property explicit, several sources (e.g. [18], [22]) embodied the concept of directions in their examples for goals.

Goals should specify a focus area, thus the affected architecture (e.g. business, application, data, technical), or more precisely, the specific EA elements (e.g. business process), management components (e.g. EA standardization method), their attributes as well as relationships the goal pertains to. The idea of such an "area of interest" is spawned in BEAMS [15] where the authors use the term 'concern'. In fact, creating subsets of focus areas enables the formulation of subgoals.

Extending the concept of a focus area, a goal should comprise possible restrictions applying for the instances of EA elements or the management itself. For instance, a goal may only apply for business applications hosted at a certain location. In a different case, the goal uniquely centers on the EAM team working at the organization's headquarter. Restricting goals in its focus area caters to the formulation of subgoals. Such restrictions become sensible if the whole EA is decomposed into domain architectures as, e.g. suggested by The Open Group, 2011.

In line with the SMART attributes (cf. [14]), goals in EAM should have a target value as well as a deadline. While the former represents the qualitatively/quantitatively formulated final value or the absolute/relative change of the actual value, the latter defines a point in time up to which the goal is due to be achieved. Opposed to the three other SMART attributes specific, realistic and actionable, we deem these two goal properties adequately objective. Again, time and value permit the creation of subgoals (goal with a less ambitious value vs. goal with a shorter time horizon).

As a matter of fact, achieving or failing to achieve a certain goal comes along with positive and/or negative implications. Whereas the software design pattern community uses the term consequences [49], EAM literature on principles applies the term implications as well [14]. Caring about subsequent implications already upon a goal's definition is vital from our point of view, e.g. for goal prioritization.

Finally, goals in EAM can have interrelations ranging from generalization/specialization, conflict, or support (sometimes also called realization). Relations among goals are frequently discussed in literature in particular by sources proposing a modeling approach (e.g. [36], [39]).

On purpose we made sure that all of the above attributes exclusively focus on the description of the goal while leaving out the proposition of (parts of) one or more possible solutions. In this vein, no information about the responsible persons, supporting tools, potential risks, causalties, necessary methods, recommended performance indicators, etc. is contained in a goal’s specification. Deliberately, we also skipped on the origin, i.e., if a goal stems from business, legal, or technical reasons.

IV. CONCLUSION

The establishment, pursue and achievement of goals are an integral part of common management disciplines. However, centering on EAM, the role and application of goals have been treated with minor attention, especially when being compared to principles [5], [6] or reasons [4] for EAM. With our literature survey, whose results are presented within this paper, we intend to improve this situation. Despite the various examples literature quotes for representative goals for the domain of EAM, there is no common definition on how such a concept should be defined. The 82 sources we perused abstain from providing a unified and comprehensive definition of goal’s properties and relations. Thereby, enterprise architects would have to struggle less with proving EAM’s added value and benefit for an organization, if they only manage to accomplish the objectives being set by the stakeholders.

Based on the examined body-of-knowledge as well as our industrial EAM experience, we were able to sketch a possible structure serving as a goal definition scheme. The key advantage of such a template lies in the fact that it is now possible to articulate the 'problem' in EAM in a more precise and comprehensive manner. This however, represents a core precondition for picking only those solutions that have the best consequences for the organization. The objective of our future studies will be the evaluation of the proposed structure.

Certainly, we are aware of additional goal attributes, like a goal identifier, context, priority, life-cycle information, known uses & stumbling blocks, possible visualization types, last change date, hypotheses made, etc. as for instance stated in [6] for architecture principles or used by the pattern communities. Future work should examine and ponder the relevance of these additional characteristics in particular from an industry perspective where the management of EA actually takes place.

During our research, we noticed a remarkable difference between goals that either target at the EA (e.g. standardize IT components) or the management thereof (e.g., reduce annual EAM spending). Given that from our knowledge, the boundaries between EA and EAM goals often blur in practice and literature, future work should concentrate on a clear delimitation.
Against the background that target-means relationships are a commonly discussed topic not only in EAM, closer attention should be paid to the formulation of subgoals. As a starting point, we propose to research into the direction of a goal’s focus area, restrictions, deadline and targeted value as already pointed out in Section 3. Additionally, studies should work on an underlying role model (e.g., goal owner vs. maintainer), interrelations with principles, risks, and key performance indicators, but should also include less conceptual tasks like the compilation of an EAM goal catalog. The latter could provide industry with an overview on typical goals in EAM and possible ways to measure their achievement (cf. [50] who focuses on KPIs).

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