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Enterprise Architecture Development and Adoption of TOGAF ADM Iteration Cycles

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ABSTRACT: Researchers and practitioners believed that Enterprise Architecture (EA) plays an essential role in supporting business achievements. An EA guides an organization to be aware of its strengths and weaknesses. Improvement programs follow it through a roadmap. EA needs a comprehensive artifact repository to support EA roadmap implementation and monitoring. An EA repository is a repository of business, data, application, and technology architecture. However, there are many obstacles in developing an EA repository. These obstacles come from stakeholder awareness, data distribution, unclear working processes, and uncontrolled infrastructure development. EA researchers have been responding positively to these challenges, as indicated through the extensive EA researches and publications. This study exercised the Systematic Literature Review (SLR) method to analyze the trends in EA development, especially concerning TOGAF ADM iteration cycles. The study focused on publications on EA implementations in the form of case studies within a specific industry. Data extraction in the literature review was carried out on publication years, iteration cycles, industry types, and EA element types. EA element types are classified based on EA element data from the results of the selection of studies. Publications within the Architecture Development Iteration Cycle area are dominant. The cycle consists of business, data, application, and technology. The EA Model is the element most used in the EA publications.

Keywords: Architecture Development Iterations, EA repository, Enterprise Architecture, Systematic Literature Review, TOGAF.

Abbreviations: EA, enterprise architecture; TOGAF, the open group architecture framework; DoDAF, department of defense architecture framework; SME, small and medium-sized enterprises; FGD, focus group discussions; PCF, process classification framework; APQC, American productivity and quality center; PPDM, public petroleum data model association; MCDM, multi-criteria decision-making.

I. INTRODUCTION

Nowadays, many industry leaders explore and move towards the digital transformation to drive their organizations and businesses forward. In [58], the authors discuss the roles and contributions of Enterprise Architecture (EA) for digital business transformation. EA has many benefits that could help various business challenges to increase flexibility and responsiveness; improve business-IT alignment, risks, integration or interoperability, IT utilization; reduce cost, complexity and resource optimization, and support strategic business initiatives.

However, in many instances, EA documentation was found to be useless with meaningless architecture created for its purpose [31]. Inflexibility, too conceptual, unacceptable degree of detail, obsolescence, and difference with an actual EA stakeholder known difficulties with current an EA repository, which led to its uselessness and un-usability [99]. The survey in [62] with 105 correspondent companies indicates that 67.7% of the organizations have an EA documentation which is moreover technical, and mostly too IT-related, 37.6% have outdated documentation, 33.7% have too complicated documentation and very difficult to practice, and 27.1% find it misses its necessary details.

The TOGAF Architecture Development Method (ADM) [54] is the result of constant discussions and assistance from various EA practitioners around the world. The purpose of this paper is to explore the previous research on an EA development in several industry domains related to the adoption of TOGAF ADM iteration cycles. A Systematic Literature Review (SLR) [80, 103, 160] method was adopted to discover related literature. The previous SLR explored the EA framework without detailed exploration in an iteration cycle. The objective of this paper is to an analysis of the previous exploration of the EA development in several industry domains related to the adoption of TOGAF ADM iteration cycles.

Section II presents background on enterprise architecture and its role in achieving business objectives. Here, TOGAF used as the reference framework along with the Architecture Development Method (ADM) and its iterations. Section III discusses the SLR methodology used, which involved the research identification, selection of studies, study quality assessment, data extraction and monitoring, and data synthesis. Section IV presents the analysis and results

of the literature review, and finally, a conclusion presented in Section V.

II. BACKGROUND

Enterprise Architecture (EA) is a well-known framework for supporting and directing enterprise consideration, design, provision, and implementation. EA is handling a comprehensive and practical approach. Enterprise architecture concerns architecture principles, and organization practices guided across a business layer, information systems layer, and technology layer. The EA layers imply changes necessary to execute the organization strategies. These practices utilize the various aspects of enterprise architecture to identify, motivate, and achieve enterprise changes [83]. An EA delivers a blueprint to define the configuration and the procedure of an organization within three layers: business, information systems, and technology. EA is a structural way of defining how the systems, processes, and people in an organization role as a whole [101].

The TOGAF ADM describes a methodology to develop and manage the EA lifecycle and forms the TOGAF core. It is iterative for the whole EA process, between and within each phase. The ADM is a standard method and can be exploited for a wide variety of enterprise and intended used in different sectors and different industry domains.

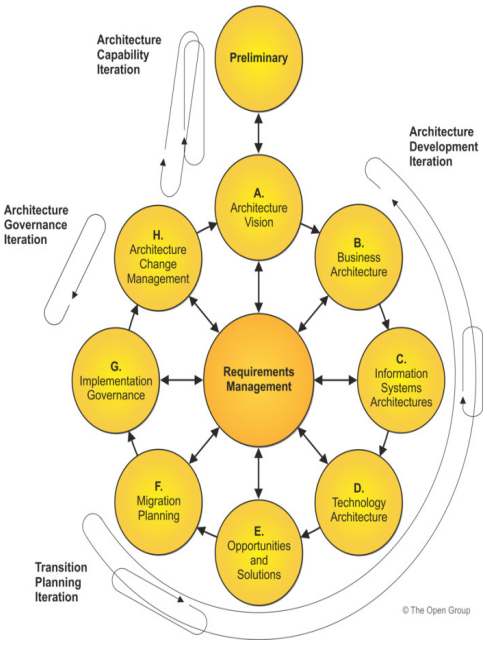

Fig. 1. TOGAF Iteration Cycles [54].

The TOGAF ADM [54] graphical representation, as illustrated in Fig. 1 follows a deterministic waterfall method for quickly describing the basics of EA development and the EA lifecycle. This method supports several concepts that mentioned as iterations. First, the ADM iteration describes an architecture landscape through the ADM cycles that are related to particular individual initiative and bound to the EA requirements. Second, it describes an integrated EA development process where each activity in the different ADM phases is connected to create an integrated architecture. Third, it describes how to manage the change process to the architecture capability.

The required architecture capability is created and evolved in the architecture capability iterations. Architecture Development iterations are the iteration to create architecture content through cycling or integrating business, information systems, and technology. This iteration could be extended into the Opportunities and Solutions phase and Migration Planning phase to ensure the architecture implementation finalized as targeted on the Architecture Vision phase. Transition Planning iterations are creating the defined architecture change roadmaps, and Architecture Governance iterations are supports that govern the change activity progress to achieve a defined target architecture.

III. METHODOLOGY

Systematic literature review (SLR) [80] used as a research methodology to define the EA implementation or development trend based on TOGAF ADM iteration cycles. SLR stages consist of:

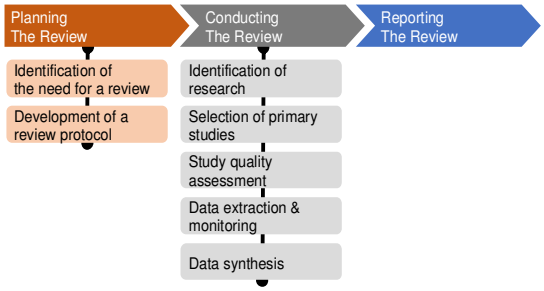

Fig. 2. The SLR stages [80].

A. Planning the Review

The need for a systematic review: Industries are currently facing challenges in developing or implementing a successful EA. These challenges require researchers to continue studies and introducing improvements to the current EA approaches. The systematic review is needed to examine to what extent studies related to EA development have carried out using or based on the TOGAF ADM iteration cycles.

Development of a Review Protocol

This SLR was fact-finding in nature to seek all the research from 2013 to 2018 on EA development in the various industry domains, the usage of TOGAF ADM iteration cycles, and the elements of EA implementation. The search process has done starting from 2013 since the previous researchers have already done the EA review in August 2013 [2]. The search period ended in 2018 since the review conducted in 2018. During the planning stage, the following research questions used for data extractions:

RQ1. What industry domains studied in EA researches carried out between 2013 and 2018?
RQ2. What were TOGAF ADM iteration cycles examined in the EA publications between 2013 and 2018?
RQ3. What EA elements frequently examined within EA development?
RQ4. What are EA elements used in the TOGAF ADM iteration cycle?

B. Conducting the Review

Identification of Research: This review aims to find the studies related to the above research questions. Based on the research questions, search term sclassified as:

1. Topic,
2. Activities,
3. EA Implementation elements.

From the search terms, this review identified the following alternative terms to construct a search string.

Table 1: Search String.

Search String		
Topic	**Activities**	**EA Elements**
Enterprise Architecture	Development	Framework
Business Architecture	Implementation	Methodology
Data Architecture	Adaptation	Artifact
Application Architecture	Adoption	Model
Technology Architecture	Transformation	Meta Model

The search string can concatenate as ("Enterprise Architecture" OR EA OR "IT Architecture" AND Development OR Implementation OR Adaption OR Adoption AND Framework OR Methodology OR Artifact OR Model OR "Metamodel").

The search string is customized on different search databases as its necessity while maintaining the logical sequence of terms. The search string applied to a collection of online search databases to ensure none of any related study is missing. The following search databases and publications had selected:

1. ACM Digital Library (http://dl.acm.org/),
2. IEEE Xplore (http://ieeexplore.ieee.org/),
3. Elsevier (http://www.sciencedirect.com/),
4. SpringerLink (http://www.springerlink.com/),
5. Scopus (http://scopus.com/),
6. AIS (https://aisel.aisnet.org/),
7. Web of Science (https://webofknowledge.com).

Selection of Studies: After implementing the search string on all the selected search databases, selection criteria than used to a particular and group the publications. Two steps of selection used, a primary search and a secondary search. The primary search used the following criteria:

1. IF ('published between 2013-2018) THEN INCLUDE, ELSE DISCARD,
2. IF ('the search result is a general article') THEN DISCARD, ELSE INCLUDE,
3. IF ('duplicate or have multiple publications from the same study") THEN DISCARD, ELSE INCLUDE,
4. IF ('written in English') THEN INCLUDE, ELSE DISCARD.

General articles are consist of totally unrelated papers that recovered properly to insufficient implementation of search string by online search engines [72, 120], Editorials, tutorials, panels, poster sessions, prefaces, and opinions.

Replicated publication citations excluded preceding the above selection filter. If multiple papers described the same results from the same study, or there were several publications from one research or study, it considered as a single study. The secondary search selection used the following criteria:

1. If ('industry domains clearly stated) then include, else discard,
2. If ('using systematic literature review method'), then discard, else include.

Since this research focused on an EA development in a specific industry, the research only considering the specific EA research which discussing or using specific industry cases.

Study Quality Assessment: This review evaluated the results based on a quality assessment. It followed the quality checklist specified by Barbara Kitchenham [81]. Since the checklist is for software engineering, modifications to suit with EA domain were necessary. The final checklist used in this study is as exposed in Table 2.

Table 2: Quality Checklist Table.

Quality Checklist	
Quality Items	**Grade**
Are the aims clearly stated?	YES/NO/PARTIAL
Are the study participants or observational units adequately described?	YES/NO/PARTIAL
Was the study design appropriate concerning the research aim?	YES/NO/PARTIAL
Are the data collection methods adequately described?	YES/NO/PARTIAL
Are all the study questions answered?	YES/NO/PARTIAL
Do the researchers explain future implications?	YES/NO/PARTIAL
Is the EA case study context defined?	YES/NO/PARTIAL
Is the case study based on theory and linked to existing literature?	YES/NO/PARTIAL
Is a transparent Chain of evidence established from observations to conclusions?	YES/NO/PARTIAL
Are the EA components being used clearly stated?	YES/NO/PARTIAL
Is the EA methodology adequately described?	YES/NO/PARTIAL

The quality items graded on YES/NO/PARTIAL. Scores 1, 0, and 0.5 were given accordingly to YES, NO, and PARTIAL, respectively. The total score then used as a study quality assessment. A quality assessment performed in parallel with Data Extraction.

Data Extraction and Monitoring Progress

This research used design data extraction to input the information that was required to answer the research questions. The data extracted consists of publication title, author name, journal or conference, publication year, EA elements, and EA Iteration Cycle. Data extraction produced specific information to answer the research questions.

Data Synthesis

Following the data extraction process, the search findings aggregated for data synthesis. The following patterns looked for from the data synthesis:

1. The frequency of EA studies in a specific industry as a case study,
2. The frequency of EA studies on a specific iteration cycle,
3. The frequency of EA studies on a specific EA element,
4. The frequency of EA studies on the EA element for a specific iteration cycle.

With the selected search database, search string primary, and secondary selection, as illustrated in Fig. 3, this research found 145 relevant publications.

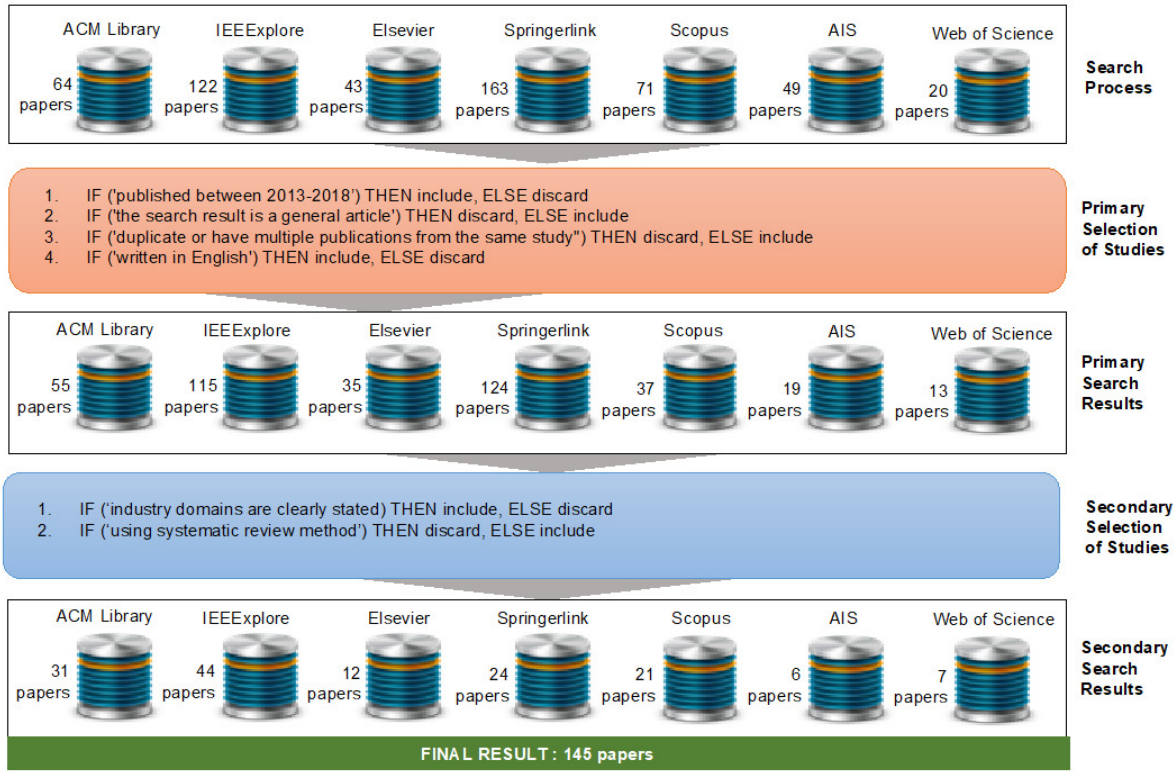

Fig. 3. SLR execution process.

Table 3: Publications from selected search databases.

No.	Search Database	Publications	Total
1.	ACM Library	[94][131][130][82][44][110][119][29][60][6][27][78][149][86][156][70][87][10][144][18][125][111][109][141][127][52][43][112][117][65][142]	31
2.	IEEE xplore	[158][8][61][92][122][153][45][76][107][137][140][143][157][24][40][57][63][98][124][15][147][22][75][85][100][102][128][133][134][5][9][16][38][41][42][64][68][106][123][126][138][139][116][77]	44
3.	Elsevier-Science Direct	[115][135][51][69][46][56][17][30][59][74][145][4]	12
4.	Springer link	[32][55][1][33][35][49][90][97][114][121][3][34][84][20][26][91][39][95][148][150][12][47][105][73]	24
5.	Scopus	[48][71][89][136][96][66][154][53][104][14][118][28][113][88][11][108][93][23][79][19][129]	21
6.	AIS	[37][7][50][155][36][159]	6
7.	Web of Science	[13][21][25][67][132][151][152]	7

IV. RESULT AND DISCUSSION

Based on the data extraction from the 145 publications, the search analyses explained below.

RQ1. What industry domains studied in EA researches carried out between 2013 and 2018?

First, this paper examined the frequency of EA studies in a specific industry as a case study. This process was carried out in three perspectives. First, based on the search database to determine the distribution of publications in the selected search database. Second, based on the publication years, to determine the trend of EA research during the period 2013 to 2018. Third, based on the type of industry in which a case study used in the EA research, where the aim is to answer RQ1.

The distribution of publications referred to on the search database perspective listed in Table 3.

Most publications on EA appeared in the IEEE search database (44 publications), followed by ACM library with 31 publications, Springerlink with 24 publications, Scopus with 21 publications, Elsevier Science Direct with 12 publications, Web of Science with 7 publications and AIS with 6 publications. The distribution of publication frequency in each search database indicates that EA's research has been published and indexed in various search databases.

The dominance of IEEE publications does not mean that researchers are more preferred to publish their research in IEEE. A particular paper can appear in more than one database search. Based on the primary search selection that avoids duplicate entries, the publication indexed in more than one search database counted only once.

From the perspective of the publication year, the distribution of publications is as listed in Table 4.

Table 4 : Distribution of Publications on EA Development in the year 2013-2018.

No.	Publication Year	Publications	Total
1.	2013	[158][8][61][92][122][153][116][115][135][32][55][19][129][66]	15
2.	2014	[94][131][130][82][44][110][60][111][45][76][107][137][140][143][157][57][4][1][33][35][49][90][97][114][121][25]	26
3.	2015	[119][29][24][40][63][98][124][15][147][100][133][51][69][3][34][73][84][79][132][151]	20
4.	2016	[6][27][78][149][112][117][22][75][85][102][128][134][41][77][46][56][20][26][91][28][113][88][11][93][23][37][50][159][152]	29
5.	2017	[86][156][70][87][10][52][43][65][5][9][16][38][42][64][68][106][123][126][138][139][17][30][74][39][95][148][150][53][104][14][118][155][36][13][21]	35
6.	2018	[144][18][125][109][141][127][142][59][145][12][47][105][48][71][89][136][96][66][154][108][7]	21

Table 5: EA Publications in Various Industry Domains.

No.	Industry Type	Publications	Total
1.	Administrative and support service	[142,137, 40, 5, 16, 16, 135, 39, 21]	9
2.	Agriculture, forestry and fishing	[86, 107, 15, 23]	4
3.	Education	[149][144][122][98][138][73][154][28][13]	9
4.	Financial and insurance	[119][61][57][133][1][90][150][89][108][132]	10
5.	Human health	[44][110][10][124][22][128][42][116][69][59][3][95][96][104][14][118][79][50]	18
6.	Information and communication	[94][82][6][27][18][125][141][65][158][153][45][143][24][63][75][85][100][134][9][41][68][123][115][51][56][30][145][4][33][49][97][114][121][84][20][91][12][105][88][11][19][129][159][151][152]	45
7;	Manufacturing	[147][17][74][55][26][47][66]	7
8;	Public administration and defense	[131][130][29][78][156][70][111][109][127][52][112][117][8][92][76][140][157][102][38][64][126][139][32][35][34][148][136][113][93][37][7][155][36]	33
9;	Transportation and storage	[87]	4

It concludes that the trend of research development on EA in the industry is on a positive trend over the past 5 years.

The third perspective is on the type of industry that used as the EA study case. The list of industry sectors refers to the International Standard Industrial Classification of All Economic Activities (ISIC) Revision 4 [146]. The frequency of each industry listed in Table 5.

This analysis answers RQ1 regarding EA development trends in a specific industry. The EA studies in healthcare were the most often from 2013 to 2018, with 12 publications, followed by the government with 11 publications, software development with 10 publications. EA studies in other industry domains such as education, finance, services, and smart cities were also prominent. Based on analysis results, indicates that companies have well received the awareness of the importance of EA in many varieties of industries. There are several industries where EA studies are still at the beginning, such as aerospace, agriculture, manufacturing, and transportation, which need to continuously explored to increase EA awareness and use. Besides, EA is still wide open to be developed in other industries that have not yet appeared in search results. In those industries where EA implementation has already on a positive trend, more in-depth studies required to ensure EA gives significant support to the achievement of business objectives.

RQ2. What were TOGAF ADM iteration cycles examined in the EA publications between 2013 and 2018?

After reviewing EA trends in a variety of industries, we then examined the EA studies that discussed on iteration cycle in the EA development. The iteration cycle refers to TOGAF ADM that supports several concepts known as iteration. Its iteration cycle consists of architecture capability iterations, architecture development iterations, transition planning iterations, and governance iterations architecture. A literature review based on the iteration cycle results is, as shown in Table 6.

Table 6 : Frequency of EA implementation on specific iteration cycle.

No.	Iteration Cycle	Publications	Total
1.	Architecture capability iterations	[82][44][86][156][10][144][92][124][134][16][123][46][121]	13
2.	Architecture development iterations	[131][130][29][60][6][78][70][158][8][116][153][45][76][137][140][143][157][24][40][57][63][98][15][147][22][75][77][85][100][102][128][133][5][9][42][68][126][138][139][115][69][59][32][55][1][33][35][49][90][97][114][3][34][73][26][91][39][95][148][150][47][105]	63
3.	Transition Planning iterations	[94][119][27][87][61][107][135][30][84][20]	10
4.	Architecture governance iterations	[110][149][122][41][64][106][51][56][17][12]	10

Table 7 : EA iteration cycles between 2013-2018.

	2013	2014	2015	2016	2017	2018
Architecture Capability iterations	[92]	[82][44][121]	[124]	[134][46]	[86][156][10][16][123]	[144]
Architecture Development iterations	[158][8] [116][153] [115][32] [55]	[131][130][60][45][76][137][140][143][157][57][1][33][35][49] [90][97][114]	[29][24][40][63][98][15][147][100][133][69] [3][34][73]	[73][78][22][75][7 7][85][102][102][2 6][91]	[70][5][9][38][42][68] [126][138][139][39] [95][148][150]	[59][47][105]
Transition Planning iterations	[61][135]	[94][107]	[119] [84]	[27][20]	[87][30]	-
Architecture Governance iterations	[122]	[110]	[51]	[149][41][56]	[64][106][17]	[12]

Table 8 : EA implementation with specific elements.

No.	EA Elements	Publications	Total
1.	Model	[94][82][44][29][60][6][156][70][87][8][61][92][122][153][45][143][40][63][98][124][147][77][85][133][38][41][42][64][68][106][138][139][115][135][51][69][46][30][55][1][33][35][90][97][3][34][84][150][12] [47][105]	51
2.	Frame work	[131][130][110][78][149][10][144][116][76][107][137][140][75][102][134][16][123][56][59][32][49][114][121][95][148]	25
3.	Meta model	[119][15][100][73][26][91][39]	7
4.	Architecture	[27][86][158][157][24][57][22][128][5][9][126][17][20]	13

The publication of EA implementation with a specific industrial case study mapped on four iterations cycles based on TOGAF ADM answers RQ2. There were 63 publications out of 145 publications that were those examined in the architecture development iterations. Architecture capability iterations mapped to 13 publications, followed by the transition planning iterations and governance architecture iterations with 10 publications each.

EA development layer consists of three architecture layers, namely business, information systems, and technology architecture. Information systems architecture consists of application and data architecture. Architecture development iterations received significant attention from EA researchers. Studies on each layer of architecture increased along with the increase in EA implementation in many industries.

The mapping of EA implementation based on iteration cycles and publication year, shown in Table 7. EA studies showed a positive trend in all TOGAF ADM iteration cycles. It can conclude that the architecture development iterations had the most publication frequency with a positive trend from 2013 to 2018.

RQ3. What EA elements frequently examined within EA development?

From 145 publications, it detected that four EA elements implemented. The EA elements were model, framework, metamodel, and architecture. The model is a detailed scale, simplified, and abstract of the subject matter. The expert is a whole element of an organization and a particular concern to the stakeholders [54]. Framework means a formation for subject or process that can consume as a means to structure judgment, conforming consistency, and inclusiveness [54]. EA artifacts are an architectural creation that defines a product of architecture from a particular angle. The metamodel is a model that defines how and with the architecture defined in an arranged way [54]. It describes EA entities and their relationship as an integrated model, and concerns with interdependency between entities. An architecture itself means a formation of EA components, its interdependency, and guidelines and principles directing EA design, and its progress over time [54]. The EA elements, which classified as models, frameworks, metamodel, and architecture mapped to 145 publications results from selection of studies. Mapping details found in Table 8.

A total of 51 publications were about the EA implementation based on the modeling mechanism. It is modeling interpreted as a model on a business layer, information systems layer, and technology layer. Analysis of the exercise of models in the EA implementation becomes crucial. The framework mapped into 25 publications. Architecture mapped into 13 publications. Metamodel mapped into seven publications. An interesting fact that metamodel is a detailed decomposition and visualization of the model. However, the number of publications that appeared in the range of 2013 to 2018 was inversely numbers. The model gets the most publication frequency, while the metamodel gets the smallest frequency. With this phenomenon, it concluded that the EA study focuses on configuring the EA model but not many studies on the metamodel element. The metamodel is the decomposition of a model. Therefore, the opportunity to improve studies that work on metamodel is very challenging. The metamodel study encourages the birth of some EA metamodel and supports the increasing success rate of EA implementation.

RQ4. What are EA elements used in the TOGAF ADM iteration cycle?

In section IV, it has studied that there are four elements of EA, namely model, framework, metamodel, and architecture, that discussed in the 145 reviewed publications. In this section, further analysis of the pattern and linkages of EA element implementation concerning the TOGAF ADM iteration cycles presented. Table 9 shows the mapping of studies that link TOGAF ADM iteration cycles with EA elements.

Table 9 : Mapping of EA iteration cycles with specific EA elements.

	Model	Framework	Metamodel	Architecture
Architecture Capability iterations	[82][44][156][92][124][46]	[10][144][134][16][123][121]	-	[86]
Architecture Development iterations	[29][60][6][70][8][153][45][143][40][63][98][147][77][85][133] [38][42][68][138][139][115][69][55][1][33][35][90][97][3][34][150] [47][105]	[131][130][78][78][76][137][140][75][102][59][32][49][114][95] [148]	[15][100][73][26][91][39]	[158] [157][24] [57][57] [128][5] [9] [126]
Transition Planning iterations	[94][87][61][135][30][84]	[107]	[119]	[27][20]
Architecture Governance iterations	[122][41][64][106][51][12]	[110][149][56]	-	[17]

Several observations made from Table 9. The most obvious is that the previous EA researches concentrated mostly on Architecture Development Iterations across all the four EA elements, particularly the model. The Metamodel element seemed to receive the lowest attention from researchers in almost alliteration cycles except for Architecture Development iteration.

Current EA development concentrated on how to model the enterprise since EA development is still facing many challenges from various enterprise complexity.

Based on Table 9, it concluded that the use of the EA model in the architecture development iterations is dominant. This conclusion answered the RQ4. The trend suggested that the current development of EA examines many of the models in the architecture development iterations. It consists of a business model, application model, data model, and technology model. However, this does not mean that iteration cycles and other EA elements were not significant. This study also provides information that more researches can be carried out further in the EA implementation domain.

V. RECOMMENDATIONS FOR FUTURE WORK

Based on the above discussion, there have been many opportunities for EA research. More EA researches can research rarely touch industrial domains. Such as aerospace, agriculture, big data, data management, e-commerce, electricity, fire emergency, HR, marketing, military, patent, supply chain, and transportation.

Further research can also focus on architecture capability iterations, transition planning iterations, and governance iterations architecture. It is still possible to do further development in the architecture development iterations since many industries are still facing various problems on how to improve an EA development.

The dominance of publications that studying the model suggests that it has a crucial role in the execution of EA. However, the framework, metamodel, and architecture are EA elements that need further development. Excellent potential improvement exists to analyze a metamodel. Given the metamodel is the decomposition of the model. Some publications that study the model encourage an increase in publications that study metamodel in the future.

VI. CONCLUSION

This paper describes the literature review results on 145 publications that discussed the implementation of EA in specific industries. In this study, it can conclude that there is a positive trend in EA development in specific industries from 2013 to 2018. Since this study uses the SLR method as a research methodology, the results of the research are an analysis of the trends of previous studies. The focus of EA development dominates by the architecture development iterations cycle and studies based on the EA model. The EA model can mean a model on business, information systems, or technology layers.

The contribution of this paper is on providing an understanding of research development trends in enterprise architecture development. This EA trend leads to the next EA development since Architecture Development Iterations had studied intensively. The EA elements must prepare before implementing an EA lifecycle. Creating a clear and accurate EA model is a mandatory step to ensure the success of EA development. This paper offers potential areas for further EA research. For EA practitioners, the results of this study can provide information on current EA developments, to guide and encourage the successful implementation of EA in their respective organizations.

VII. FUTURE SCOPE

In the future, an EA development in healthcare, IT, and government domain proposed various methods as the next EA development good practices. Besides, the evaluation mechanism for the success of EA implementation has become a challenge for many parties. This challenge can be an opportunity for further SLR.

Conflict of Interest. There is no conflict of research in this research article. The manuscript has not been submitted to, nor is under review in another journal or other publishing venue.

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