# SBM4303 Enterprise Architecture

Assessment-3 Details

Assessment 3: Portfolio
Due date:  Final date: Week 10.
Group/individual:  Individual
Word count / Time provided:  2000 words
Weighting:  40%
Unit Learning Outcomes:  ULO-1, ULO-2, ULO-3, ULO-4, ULO-5, ULO-6
Course Learning Outcomes:  CLO-1, CLO-2, CLO-4, CLO-7, CLO-9
Graduate Attributes:  GA-2, GA-3, GA-12

Portfolio 1.1 (Case Study)
Read the case study for the medical clinic or the Johnson and Johnson case study (See the Case Study on the resource folder) and answer the following questions:
  What are the main problems for the organisation?
  What solutions do you propose to help solve these problems?
  Examine the Zachman Framework.  How would you apply this to the case study?

Portfolio 1.2 (Frameworks for Enterprise Architecture)
  See the ppt on EA for University of Newcastle from the resource folder and answer the following question:
What processes were proposed for EA?
  Compare the frameworks for EA- Zachman, TOGAF, FEA, and Gartner
  Read the journal article by Kistasamy, C and Alta Van Der Merwe…. To examine the relationship between EA and SOA.

Portfolio 1.3 (ERD diagram)
Entity relationship diagrams provide a visual starting point for database design that can also be used to help determine information system requirements throughout an organization.
Prepare detailed ERD diagram for the given i) Milk dairy and ii) Quikfix Electronics case studies (See the case study from the resource folder).

Portfolio 1.4 (Tutorial Questions)
You should write answers for the Week 3, 4 and 7 tutorial questions. Answer should be concise and to the point.
Please answer the following questions:
Week-3:
1. What are some of the areas of value that are generated by an EA program?
2. What are some of the risks associated with implementing an EA program?
3. How does EA help an enterprise to view its strategic direction/goals?
4. How does EA help an enterprise to view its business services?
5. How does EA help an enterprise to view technology resources?
6. What is meant by managing risk? Provide two methods to manage risk.

7. How does EA link to strategy, business, and technology?
8. Select a real-world medium-or large-sized business and identify the following:
a. Areas of potential value that an EA program would provide.
b. Areas of potential risk to the implementation and acceptance of an EA program, and
strategies to mitigate those risks.
c. How EA can help develop views of this business’ strategic direction and goals; business
services; and supporting resources.
Week-4:
1. What is an EA implementation methodology?
2. What is the role of an EA framework within the EA methodology?
3. What is the purpose of Phase I activities in the EA methodology?
4. Why are Phase III activities dependent on the completion of Phase II?

5. Compare and contrast the purpose of Phase II and Phase IV activities.

6. Can the steps of the EA methodology be changed for different enterprises?
7. Who is responsible for execution of the EA program and EA methodology?
8. How often should an EA be updated? Why?
9. Select a real-world medium or large size enterprise and provide:
a. The phases and steps of an appropriate EA implementation methodology.
b. The way that EA stakeholder support will be obtained.
c. The recommended schedule for updating the EA.
Week-7:
1. What is the purpose of current views of EA components?
2. How do artifacts relate to EA components?
3. Provide some examples of artifacts at the Goals & Initiatives level of the EA3 Cube Framework.

4. What is IDEF-0 modelling and how can it be used to document EA components at the Products & Services level of the EA3 Cube Framework?
5. What are the differences between traditional (ERD and DFD) data modelling techniques and object-oriented data modelling techniques (UML)?
6. Provide some examples of artifacts at the Applications & Services level of the EA3 Cube Framework.
7. Is vendor-supplied documentation on software and hardware products important to retain as EA artifacts? Why?
8. What are some of the EA artifacts that would be desired at the Network & Infrastructure level of the EA3 Cube Framework?
9. Find a public or private sector enterprise and identify the following current EA components/artifacts at each level of the EA3 Cube Framework:
a. Identify current strategic goals, initiatives, and outcome measures.

b. Identify current LOBs, business services, and associated activity/flow diagrams.
c. Identify current information flows and data documentation in each LOB.
d. Identify the current IT systems and applications that support information flows for each
LOB.
e. Identify the current IT infrastructure and networks that host IT systems and applications.
Portfolio 1.5 (Journal articles review)

Reasons behind big data project failure
Successful implementation of big data projects using enterprise architecture
Recommendations for application security and encryption

## Answer

# INTRODUCTION

Enterprise architecture (EA) may be termed as a conceptual framework defining the operation and structure of an organisation while determining the effective ways of achieving the organisation’s long term objectives as well as present goals. It is a scientific practice to conduct implementation, planning, design and enterprise analysis using a well defined comprehensive outlook for strategic execution of organisational policies to attain sustainable development of the organisation. With the help of EA, crucial business decisions may be implemented successfully.

# PORTFOLIO 1.1 (CASE STUDY)

## MAIN PROBLEMS FOR THE ORGANISATION

In the year 1995, the multinational company Johnson and Johnson (J&J) having around 150 subsidiary companies under it, decided to offer a single point of contact to its customers because the customers had to deal with multiple sales calls, multiple invoices, and contracts with the multiple subsidiary companies. Offering a single point of contact to the customers required a huge shift in IT systems of the company. This paradigm shift in IT systems required a huge investment which created a complex problem for the organisation.

## PROPOSED SOLUTIONS TO THE PROBLEMS

The J&J should immediately train its IT staffs according to the industry needs so that the desired IT framework may be built. All other staffs also need training regarding the operation of the new system. The company should follow a well-defined fundraising policy where the cost of capital would be at a minimum and the funds should be well utilised. While implementing the new IT system, the operation of the subsidiary companies should not be hampered as it may affect customer loyalty. The4 implementation of IT system should be aligned with the corporate level and operational level.

## EXAMINATION AND APPLICATION OF THE ZACHMAN FRAMEWORK

Zachman framework is termed as the fundamental structure and the enterprise ontology providing a strategic and formal view of an enterprise while defining it. The ontology may be defined as a schema of two-dimensional categorisation reflecting the intersection of two historical categorisations. The J&J should apply the change in IT system after considering the 6 by 6 matrix presented by Zachman theory where every intersecting cells of transformations and interrogatives should be checked properly. The answers to “what, when, where, how, why, and who” should be well defined before the installation of the new IT system. If these questions are clearly answered then the change would not be effective as much as expected.

# PORTFOLIO 1.2 (FRAMEWORKS FOR ENTERPRISE ARCHITECTURE)

## PROPOSED PROCESSES FOR ENTERPRISE ARCHITECTURE

The architecture should be aligned with the business priorities and needs with the help of IT and business strategies. The principles of enterprise architecture should give the highest level of directions ensuring strategic decision making. The link between technical architectures and the business models is provided by the layers of architecture such as business, application, technical, and information. While the high level context illustration provides a broader picture, the subject matter at a project level is described by the detailed model. The relation between the global contexts and projects are provided by the subject area models. The transition maps deliver the implementation road maps including current model, T1, T2, and target model. The specific directions to the implementation of architectures are provided by the technological guidelines and standards.

## COMPARISON OF ENTERPRISE ARCHITECTURE FRAMEWORK (ZACHMAN, TOGAF, FEA, AND GARTNER)

The leading enterprise architecture frameworks are compared on the basis of SDLC phases and comparisons are also based on fundamental factors like goals, outcomes and inputs. The Zachman framework provides a diagram of the organisation with the help of a 6 by 6 matrix. The intersection of the transformations and interrogatives forms the core of the enterprise’s description. While TOGAF being the most acceptable EA framework in today’s world, it involves four main domains such as business, technology, data, and applications. TOGAF also involves eight phases containing planning, defining, governing and implementing the present architecture and having a suitable migration plan to achieve future targeted architecture. To seamlessly integrate the present available disparate architectures is the main purpose of FEA. Due to FEA, there will be better customer service while enabling people to access information in a more cost-effective way. Gartner views enterprise architecture as a continuous procedure involving the assessment of the present architectural state and management of the whole portfolio while d4efinign goals to create a future state. TOGAF elements are used for building the technology layer while in taxonomy Zachman elements are used and Gartner is suitable for business architecture. FEA is suitable for segment architecture and reference models.

## RELATIONSHIP BETWEEN ENTERPRISE ARCHITECTURE (EA) AND SERVICE-ORIENTED ARCHITECTURE (SOA)

The process of adoption of enterprise architecture within organisations is demanding interest in the support and methods of technologies available. In many ways, the service-oriented architecture encourages the process of EA. Major problems may arise due to the non-acceptance of the relationship between EA and SOA during the implementation of EA. EA and SOA are important disciplines providing tangible means of alignment of business and IT. However, because of the misunderstanding of the relationship between EA and SOA, it is very difficult to achieve the combined benefits. While all the dimension of IT is covered by EA, the architectural strategy using the service concept along with aligning IT is provided by SOA. Both the concepts support the fact business practices should be supported by investment in IT infrastructures. While implementing large projects, EA and SOA should be dealt with together and not in an isolated way. When in the 21st century, the banks are moving towards creating an internet based business model in order to give better customer service. This process of internet based convenience banking model is the perfect example of the benefits of a healthy integration between EA and SOA (Safari, 2016).

# PORTFOLIO 1.3 (ENTITY RELATIONSHIP DIAGRAMS)

****Figure 1****: ERD of Milk Dairy

(Source: Dijkman *et al.,*2016)

****Figure 2****: ERD of Quickfix electronics

(Source: Alonso *et al.,*2016)

# PORTFOLIO 1.4 (TUTORIAL QUESTIONS)

## VALUABLE AREAS DELIVERED BY ENTERPRISE ARCHITECTURE PROGRAM

There are different application aspects dependent on enterprise architecture. The business problems should be identified at first before thinking about the solutions to the problems. The applications that are needed for an organisation to successfully implement enterprise architecture should be based on the business problems. It is the business problems which will decide the requirement of the architecture along with the impact of replacement of the servers. The policies should be formulated as to the way of implementation of the EA. The prior assumptions and rules of business are necessary for the process. Certain business regulations such as any industry rules or government regulations should be taken into consideration before starting the process. The EA framework should also be identified as it will provide guidance for implementation.

## RISKS INVOLVED IN ENTERPRISE ARCHITECTURE PROGRAM IMPLEMENTATION

The risk of data loss is one of the major risks involved in the implementation of EA program. Proper care should be taken while uploading confidential data into the system server. Enterprise security should be assured properly. Performing enterprise architects should be aware of the latest technologies and security experts. Introduction of SOA should align with security compliance. Since meetings, training and document verification is involved in the process, this can reduce the concentration of critical staffs from their desired job duties. With the lack of focus, the EA can be a huge wastage of company resources. Increase in solution costs and less adoption rates are other risks involved along with low user acceptance and project delays.

## ROLE OF ENTERPRISE ARCHITECTURE IN STRATEGIC DIRECTIONS AND BUSINESS SERVICES

EA is responsible more return on IT investments by aligning with business needs while identifying the areas of improvement and reducing costs. Crucial decisions may easy to make based on enterprise architecture as it will provide all the important data required to make strategic decisions. Sector wise information may be gathered at a very short span of time to take an urgent decision. It is easy to evaluate the effectivity of innovation due to readily available information. There may be an improvement of the customer services as customer information will be available within a very short time.

## ROLE OF EA IN VIEWING TECHNOLOGY RESOURCES

Technology resources are analyzed in a brief way by enterprise architecture. Enterprise architecture requires more in-depth technology to get implemented. However, there may be not many technical resources available to the company planning for the technical change in its systems. Enterprise architecture may suggest possible improvements in current IT systems where there will more investments required.

## METHODS OF MANAGING RISKS

A proper search for the solution should be conducted before implementing any solution to get the most reasonably priced solution with great effectivity. Highly trained enterprise architects should be hired with prior experience. All the security issues should be addressed with technology.

## RELATIONSHIP OF EA WITH BUSINESS, STRATEGY, AND TECHNOLOGY

EA is impossible without the help of technology. EA is useful for making business decisions which are crucial for the operations. Strategic steps should be taken only after reviewing the data collected from EA (Farwick *et al.,*2016).

## CASE STUDY

* ****The potential value of an EA program-**** In the case of Google, proper implementation of EA will enable the company to get all the relevant information for its business operations. Also, the implementation of EA will secure the servers of the company while protecting data.
* ****Strategies and risks involved in the implementation of the EA program-****The cost of the solution should exceed the assumed price of the benefits as it will lead to a loss. A well trained expert should be hired to perform the desired task while ensuring maximum security.
* ****Role of EA in strategy, services, goals, and resources-****Important business strategy may be formed using the data available from the EA framework. Every step towards achieving organisational goals may be evaluated in terms of usage of the resources along with being customer friendly.

## METHODOLOGY OF EA IMPLEMENTATION

According to the business needs the methodology may be decided among Zachman, TOGAF, FEA and Gartner.

## ROLE OF EA FRAMEWORK IN EA METHODOLOGY

EA framework is the backbone of EA methodology as it contains all the necessary blueprint regarding the methods of application.

## ROLE OF PHASE I ACTIVITIES IN THE METHODOLOGY OF EA

Phase I activities identify the business needs of the organisation before implementing EA which forms the basis of EA.

## DEPENDENCE OF PHASE III ACTIVITIES ON COMPLETION OF PHASE II

Unless the phase II activities are completed after proper evaluation of the technical resources, the phase III activities are very difficult to conduct.

## COMPARISON OF THE PURPOSES OF PHASE II AND PHASE IV ACTIVITIES

Until and unless phase II analysis is done properly, the final implementation of the proposed plan is impossible for phase IV to conduct.

## POSSIBILITY OF CHANGE IN THE STEPS OF EA METHODOLOGY

The methods should be changed as per the business needs as it is always better to be dynamic while formulating EA since technology and data both changes.

## WAY OF OBTAINING EA STAKEHOLDER SUPPORT

A proper plan should be submitted to stakeholders mentioning the problem solved and along with the investment needed and the consequences of that change in order to take approval.

## RECOMMENDATION FOR EA UPDATING

After proper analysis of the EA system, effective suggestions should be given so that it can be implemented very quickly.

## CURRENT VIEWS OF EA COMPONENTS

Current views include contexts, frameworks, processes, inter relationships, models, and architects.

## RELATION OF ARTIFACTS WITH EA COMPONENTS

Artifacts are documentation done on the EA components which are signed by the stakeholders.

## EXAMPLES OF ARTIFACTS AT THE GOALS AND INITIATIVES LEVEL OF THE EA3 CUBE FRAMEWORK

Documentation regarding the goals and initiatives stated in EA3 Cube.

## DIFFERENCE BETWEEN OBJECT-ORIENTED DATA MODELING TECHNIQUES (UML) AND TRADITIONAL DATA MODELING TECHNIQUES (ERD AND DFD)

Traditional data modeling uses traditional projects while developing whereas object-oriented uses object oriented projects using programming like C++ and Java.

## EXAMPLES OF ARTIFACTS AT THE APPLICATION AND SERVICES LEVEL OF EA3 CUBE FRAMEWORK

Documentation regarding the results of the application is the artifacts here.

## IMPORTANCE OF VENDOR SUPPLIED DOCUMENTATION ON SOFTWARE AND HARDWARE PRODUCTS

It is very important because a vendor may be held responsible for any serious security breach in the system after installation (Lee, 2016).

## EA ARTIFACTS DESIRED AT THE NETWORK AND INFRASTRUCTURE LEVEL OF EA3 CUBE FRAMEWORK

Documentation containing all networking details of the servers, all the vendors' information providing the infrastructures should be recorded for future reference.

# PORTFOLIO 1.5 (JOURNAL ARTICLES REVIEW)

## REASONS BEHIND BIG DATA PROJECT FAILURE

The reason that it is very difficult to find cost-effective solutions to big data projects as a lot of technicalities are involved here. The hiring of a talented expert is very crucial for project success. Also, security is an issue that needs to be addressed.

## SUCCESSFUL IMPLEMENTATION OF BIG DATA PROJECTS USING ENTERPRISE ARCHITECTURE

EA may be very helpful in implementing big data projects as there will security ensured and all the relevant data will be readily available to be uploaded.

## RECOMMENDATIONS FOR APPLICATION SECURITY AND ENCRYPTION

Proper security checks should be done before application and encryption as it may result huge financial loss as well as data loss. Customer service may be hampered affecting the long aspect of good business. A proper study of the frameworks of EA should be conducted to design the best policy while hiring an expert team (Gill, 2015).