



Designing Enterprise Architecture Using TOGAF Architecture Development Model (Case Study: BLC Course Institutions)

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Abstract

Business development must be in line with the development of information and communication technologies to accomplish organizational goals effectively and efficiently. For the educational sector, stakeholders must create and construct information systems that are quick, exact, and accurate regarding business operations in achieving organizational objectives. Information system development must be created in accordance with the organization's strategy to fulfill the organization's information system requirements. BLC Course Institutions recognizes the need of developing an information system that can fulfill the requirements of the organization. The institutions planned to develop enterprise architecture to harmonize the current business strategy in BLC. As the course institute does not have a thorough enterprise architectural design, information system management and business practices are not aligned and lack maturity. So, it has an impact on the service that will be provided to customers. The Open Group Architecture Framework (TOGAF) Architecture Development Method was utilized to create this Enterprise Architecture. Data architecture, application architecture, technology architecture, and creating an implementation plan roadmap are included in enterprise architectural planning in BLC. The process of information architecture determining that was constructed refers to the procedures that had taken place in the educational system administration. The definition process covered in this study includes infrastructure, marketing, academic funding, learning planning, and learning execution. This research produced a blueprint that was utilized to enable integrated business processes. The enterprise architecture created during this stage will be used to assist business operations and accomplish their strategic objectives. The research conclusions indicated that the TOGAF method can be utilized as a tool to design the enterprise architecture of this information system and resulted in a general design architecture model in line with the vision and mission of the BLC and can be used to apply to other tutoring institutions that employ comparable business practices.

Keywords: Course Institutions, Enterprise Architecture, TOGAF, Business Process

1. Introduction

The rapid development of information technology (IT) presents businesses with new operational challenges that must be overcome in order to run more profitably, efficiently and cost-effectively to provide better, and faster services (Puspitasari & Kamisutara, 2021). The development of this information system needs to be in line with the organization's goals. Many organizations do not focus on information systems and business processes as they operate. Enterprise architecture (EA) is the process of developing an abstract perspective of an enterprise that enables those within the enterprise to make better plans and decisions. Enterprise Architecture goes beyond technology by adding strategic planning as the main driver of the enterprise, and business planning as a resource most programs and resources needed (Kotusev, 2020).

There were many alternative frameworks that were used, such as the Zachman Framework, EAP, EAS, BEAM, TOGAF ADM, and GEAF (Hasibuan et al., 2020). The open Group Architecture Framework (TOGAF) is a framework for enterprise architecture that offers a method for designing, planning, implementing, and managing enterprise information technology architecture (Hermawan & Sumitra, 2019). TOGAF provides a detailed method of how to build and manage and implement enterprise architecture and information systems called the Architecture Development Method (ADM). In addition, TOGAF provides an overview of a complete method of how to build and manage and implement frameworks and information systems used to describe an enterprise architecture development model for organizations so that it can be used as a recommendation in the development of integrated systems (Ulmi et al., 2020).

The brilliant learning center (BLC) is a course institution that offers learning services outside of the classroom to all kindergarten, elementary, junior high, and high school students as well as graduates who want to gain knowledge their education outside of the classroom. aimed at achieving objectives, such is focusing on getting high school kids into a particular college. The BLC course institution has seen an increase in enrollment during the past five years. Every year, the number of pupils increases by more than 100% from the year before. Even this year, it opened 4 branches, giving it a wider geographic reach. The influence of strategic planning in the areas of marketing and customer service can obviously be seen in the increase in the number of pupils. The growth and progress of the BLC course Institution are positively impacted by providing excellent service, being attentive to customer needs, and engaging in structured and effective marketing.

The BLC course Institution was pushed to change its business processes as a result of a number of factors, including the number of students that needed to be managed, the number of teachers who needed to be prepared, the volume of financial transactions, the number of facilities and infrastructure that needed to be ready, the number of expert staff positions in specific fields, the volume of communication between institutions and parents, and many others. In other words, strategic planning in the area of information systems is required in order to be able to offer the greatest service while also continuing to build its business branches.

The BLC course Institute did not yet have a mature enterprise architecture design, as revealed by the researchers' observations and interactions with the company. A lack of careful enterprise planning will affect the less-than-ideal service offered to clients. As a result, strategic planning is required to fit the BLC course Institution's current business strategy. Using the primary architecture of the BLC course Institute, this strategic plan is utilized to develop an information system strategic plan. The main architectures include data architecture, business architecture, application architecture, and technology architecture. The main objective of this research is therefore to analyze the information system necessary in BLC course institutions using the TOGAF framework, design the enterprise architecture of BLC course institutions in business processes that enable information systems and information technology to be developed while considering the level of importance of existing business processes, and propose a long-term information system development roadmap within the BLC course institution.

2. Literature Review

2.1 Enterprise Architecture

Enterprise architecture (EA) can help create alignment between the business and information technology requirements of the company to help infrastructure design (Rusli & Bandung, 2017). Planning for enterprise architecture is conducted to provide proposals or an overview of information system architecture and technologies (Negara & Emanuel, 2020), Enterprise architecture is primarily used by enterprises to inform, guide, and set limits on decisions, particularly those involving investments in information technology. When business innovation is produced, enterprise architecture can be utilized as a means of enhancing information technology efficiency (Saluky, 2017). It is expected that this may hasten the adoption and transition to new information systems and technologies (Negara & Emanuel, 2020). Establishing baselines and goals for the business as well as defining and clarifying the key components of the enterprise are all done through architecture planning (Cabrera et al., 2016). Organizations must choose a framework or approach that can be used in the creation of enterprise architecture if they want to implement enterprise architecture. Therefore, it is anticipated that using the current enterprise architecture methodologies, it would be possible to manage complex systems and coordinate the investment of business and information technology.

2.2 TOGAF

TOGAF is an industry standard architectural framework for developing information system architectures within companies that use the TOGAF (ADM) architectural development method (WIRANTI et al., 2020). It is an enterprise architecture framework that offers a thorough method for designing, planning, implementing, and exercising authority over business information architecture (Nama et al., 2017). This makes TOGAF different from other EA (Enterprise Architecture) Frameworks like the Zachman Framework in that it is used to design Enterprise Architecture and where there are specific methodologies and tools for applying it (Saluky, 2017). Utilizing the TOGAF Framework has several benefits, including the fact that it is open source and flexible. The Architecture Development Method is a comprehensive approach provided by TOGAF for creating, managing, and implementing enterprise architecture and information systems (ADM) (Yasirandi & Utomo, 2022). ADM is a general methodology that includes several modeling activities for enterprise architecture development. The planning, designing, developing, and implementation of information system architectures for organizations can also be done using this approach as a guide or tool (Hasibuan et al., 2020).

3. Methods

The TOGAF ADM framework steps, which begin with architecture vision, business architecture, information system architecture, technology architecture, and opportunities and solutions, are the foundation of the research methodology used in integrated architectural planning at the Brilliant Learning Center (BLC) course Institute.

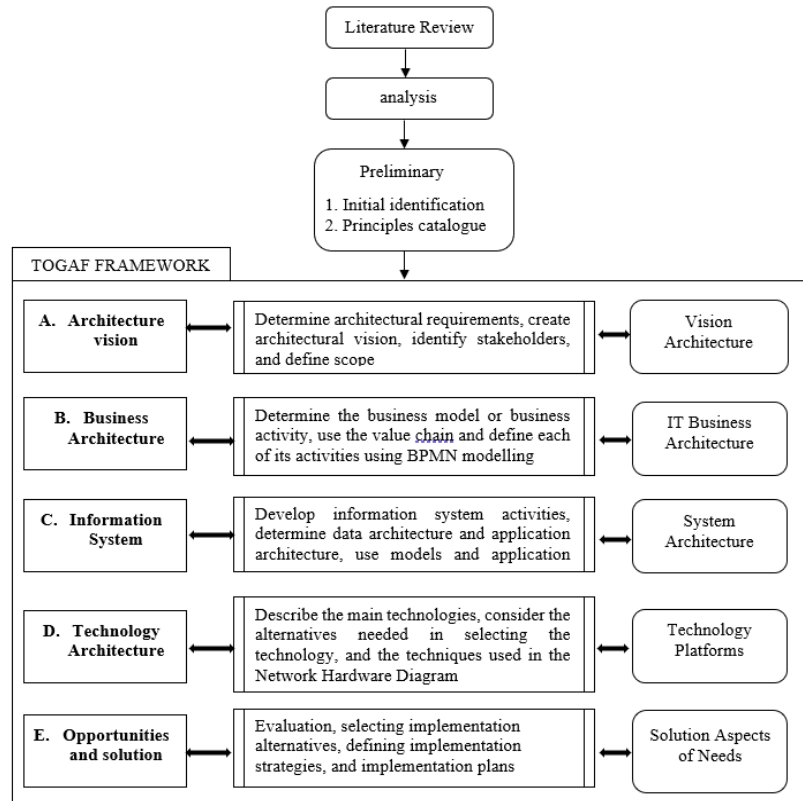


Figure 1: Research Methodology

1. Preliminary Phase

This phase consists of the planning and starting processes required to carry out the business requirements for a new enterprise architecture, including the definition of the organizational architecture framework. The purpose of this phase is to identify the architectural capabilities that are desired by the organization, which serves to review the organization's state, determine the design of the enterprise architecture, identify the scope of the company's organizational components that are impacted by architectural capabilities, identify frameworks that are built, methods, and processes that are in line with architectural capabilities, as well as building maturity targets.

2. Architecture Vision

To achieve corporate goals expressed in the form of a strategy and to establish the scope of the architecture that needs to be developed, it is important to have a shared understanding of the significance of enterprise architecture. At this phase contains the questions asked to get the ideal architecture.

3. Business Architecture

Establishing the fundamental parameters for business architecture and selecting the preferred business activity or model based on business scenarios. (Business Process Model and Notation) BPMN is currently the primary modeling language and tool used to construct the needed model.

4. Information System Architecture

At this phase, more focus is being placed on the process of developing the information system architecture. The organization's data architecture and application architecture are defined in this step when defining the information system architecture. Data architecture is mainly concerned with how data is applied to meet the requirements of business operations, processes, and services. There are several methods that can be applied with: ER-Diagrams, Class Diagrams, and Object Diagrams.

5. Technology Architecture

Create the desired technology architecture by first identifying the kind of technology candidate needed by referring to the Technology Portfolio Catalog, which covers both hardware and software. Choosing the technology at this point also considers the available alternatives. Network Hardware Diagrams are just one of the strategies employed.

6. Opportunities and Solution

At this phase, more emphasis is being placed on the advantages of enterprise architecture, which includes business architecture, data architecture, application architecture, and technology architecture, in order to serve as a foundation for stakeholders in selecting and deciding on the architecture to be implemented. The Project Context Diagram and Benefit Diagram modeling tools can be used to represent this design phase.

4. Result and Discussion

The BLC course Institute's enterprise architecture planning approach is as follows:

4.1 Data Collection

The BLC course Institute does not yet have a mature enterprise architectural design, according to the findings of interviews, document studies, and observations with the BLC course Institute. A lack of careful enterprise planning will affect the less-than-ideal service offered to clients.

4.2 Preliminary Phase

In this phase there is Architectural planning, which serves as a tool to aid in the governance architecture of change initiation, is also included in this phase and is found in the catalog of principles Table 1.

Table 1: catalog of principles

No	Principles
Business Principle	
1	The objectives, operations, and primary duties and responsibilities of the BLC course Institution are all reflected in the business architecture that was developed.
Application Principle	
2	Applications must be user friendly or easy to use by users, so they can focus on their tasks.
Data Principle	
3	Data is effectively managed to guarantee storage, accuracy, and access to data whenever and wherever it is required.
Technology Principle	
4	Plans for utilizing technology that include standardized platforms, software, hardware, and other components.

4.3 Architecture Vision

The BLC course institution maps its current activities using value chain analysis. The following figure describes the primary activities and support activities in Figure 2.

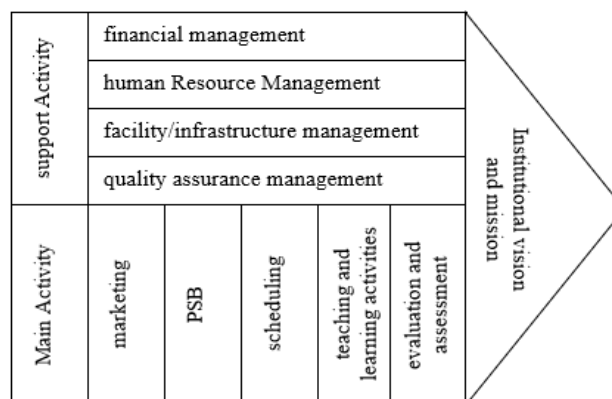


Figure 2: BLC value chain

4.4 Business Architecture

The following is a description of the activities that take place within the BLC course institution, including both the primary activities and the supporting activities of the researchers:

1. Marketing Business Process

In this marketing procedure, the branch manager develops plans and carries out market research before approving the marketing manager to run promotions for course items. The marketing manager asks the course director for permission to execute the promotion.

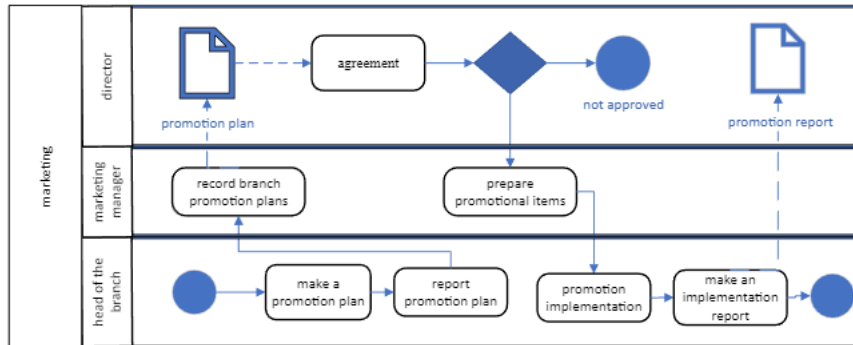


Figure 3: Marketing Business Process

2. The administrative procedure for accepting new students

Customer service personnel are involved in this business process. The customer support department offers details on the course products. Customer service asks to complete student data and process payments if clients who are students or parents of students elect to register and make payments.

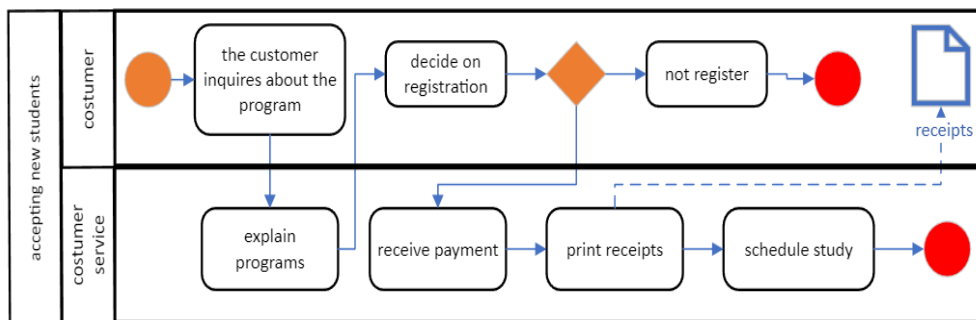


Figure 4: The administrative procedure for accepting new students

3. Scheduling business processes

In this business process, the customer service has opened classes and given information to the scheduling staff on students who have signed up for tutoring, and the teachers have created and reported their availability to teach. Schedules are created by staff and distributed to instructors and customer service.

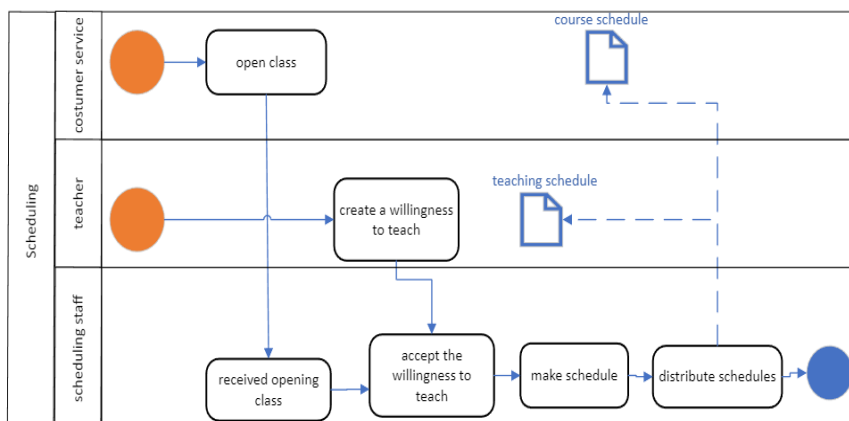


Figure 5: Scheduling business processes

4. Processes for managing finances in businesses

Customer service reports daily receipts for registration, monthly payments, private registrations, and re-registrations in this business process. The financial manager receives the report after the financial team has reviewed and summarized the receipts. The director will get financial reports from the financial manager.

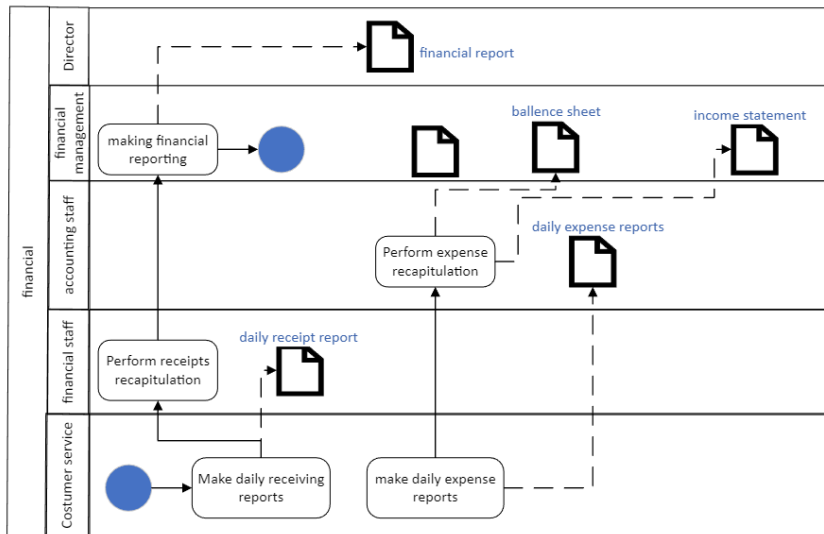


Figure 6: Processes for managing finances in businesses

5. Business procedures for managing human resources

In this business procedure, applicants send a curriculum vitae to human resource development (HRD), who then reviews the file and does additional processing if there is promise for food. If the procedure is finished and the applicant is approved, HRD will give the director the information, and the director will issue an appointment letter.

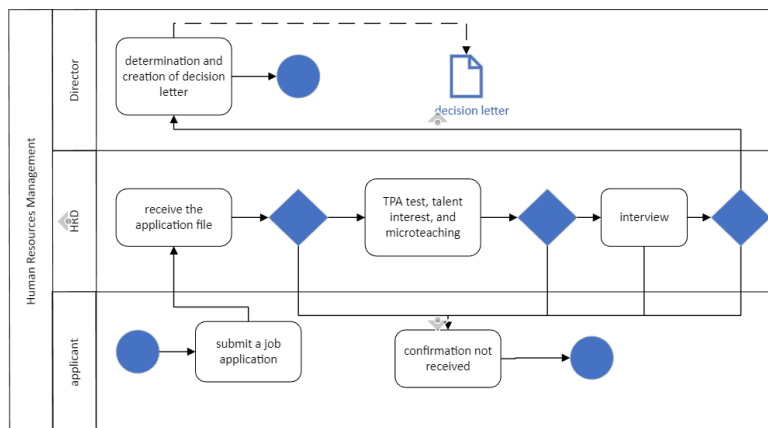


Figure 7: Business procedures for managing human resources

4.5 Information system Architecture

Application architecture planning, which establishes the information system or key applications required to manage data and business operations in business processes at course institutions, is carried out during this stage. These applications have to do with the data architecture that has been created and the business processes that have been examined. It is envisaged that the information system architecture planning would be able to offer options for resolving the issues identified in the information system gap analysis. Table 2 provides a study of the connections between business processes, data entities, and application requirements.

4.6 Technology Architecture

The BLC course Institute's network architecture will be based on TCP-IP during the design stage. It is apparent that there have been many changes made from the original architecture in order to provide better, quicker, and error-free computer network services. Figure 8 depicts the computer network architecture of the future BLC course institution.

4.7 Opportunities and Solution

The purpose of this phase is to produce an information system that is in line with the goals of this architectural planning by solving and implementing the intended architectural modeling. Planning, creating applications, and supplying the needed infrastructure are the solutions and execution offered at this phase. Several strategies are required to support the implementation process after planning in several earlier phases, and these strategies must be considered when making decisions about the implementation of a new system. These are the chosen strategies:

1. Consideration of implementation costs.

Economic considerations must be made when developing IT infrastructure and information systems. This component is crucial because the institution will use it to determine the gains and losses from a system's implementation. Institutional economic aspects are required in the case of this information system because it costs a lot of money to implement. These expenses relate to the system's purchasing as well as the previously mentioned supporting infrastructure. This economic worth can also be observed in the company's benefits and competitive advantages, in addition to the development investment.

2. Development of human resources is necessary both during and after implementation.

The BLC course Institute's information technology sector is in charge of the IT division. The BLC course Institute's information technology is handled by this field. This department is crucial to the success of the system's implementation in terms of the application of the newly developed architecture. As a result, this section has to be strengthened by qualified human resources. The sections involved in implementing the proposed information system and the involvement of human resources in the field of information technology will have a favorable impact on the implementation of this system. As a result, it is necessary to grow the human resources engaged, both directly and indirectly, in terms of expertise and business process understanding (operations). In addition, leaders who have direct control over this system must exercise such control, particularly when it comes to the application of IT management guidelines.

3. project management-based creation of the ideal implementation strategy. If the requirements for the information system are planned properly, it is certain that they will be completed within the target and budget.

5. Conclusion

The BLC Guidance course Institution uses TOGAF-ADM as a tool to plan its enterprise architecture, and this tool creates an architectural model design that is in line with the institution's vision and mission, which leads to a process of raising the performance of the institution's information system services as a whole (integrated in all fields). An integrated enterprise architecture can help with the issue of incomplete information systems for specific units by enabling quick, accurate, and reliable access to the necessary data and information. The management commitment to support the Institution's goals in operating its business to provide the best quality service has supported the design of this enterprise architecture model, which makes BLC course institutions ready to build and implement integrated information systems that support all current business activities. Even though the BLC course institution currently lacks suitable IT infrastructure facilities, future technology development must be carried out so that information technology becomes the primary supporting component in achieving the business objectives of the Institution.

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