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Application of Enterprise Architecture in Digital Transformation of Insurance Companies

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Abstract: Implementation of enterprise architecture is a major requirement for companies that want to develop business processes according to their needs. Business architecture is the company's initial plan to support the company's operations. An insurance company is a company that provides insurance services. Insurance is a form of contract in which the guaranteed party pays a premium to the insurance company. Insurance companies provide payment guarantees in the event of certain risks that are guaranteed in the insurance contract. Therefore, this company must think about operational forms to provide the best service for its customers. Structuring business processes starting from the sales process, administrative processes, claims processes, to financial processes which are the most vital processes. Insurance companies are different from other financial services companies, such as banking companies, fintech companies and others. The insurance company's unique process is to provide guarantees to its customers in carrying out risk protection. Before starting to implement enterprise architecture, the company already has a business architecture blueprint which is the enterprise architecture of a company. The design begins with running architectural business processes, architectural applications, architectural databases and architectural technology. Enterprise architecture implementation certainly cannot be separated from project management. Because project management is a process that manages the project so that the project becomes more organized in its implementation.

Keywords: Application Architecture, Business Architecture, Enterprise Architecture, Insurance Service, TOGAF Framework.

INTRODUCTION

An insurance company is a business entity that provides insurance services. The goal of insurance companies is to provide financial protection for their customers from unexpected and unwanted risks. In an insurance contract, the customer pays a premium to the insurance company, and in exchange, the insurance company guarantees payment in the event of certain risks guaranteed in the insurance contract. Insurance companies have many different types of insurance products, including life insurance, health insurance, auto insurance, property insurance, and many more. Each type of insurance product is designed to provide specific protection against certain risks. For example, life insurance provides a death benefit to heirs in the event of a policyholder's death, while auto insurance provides a benefit to pay for the cost of repairing the vehicle in the event of an accident or breakdown. Insurance companies also earn income through investment from premiums paid by their customers. The revenue is then used to

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pay claims filed by their customers. Therefore, insurance companies need to have good risk management and smart investment strategies to ensure their business continuity. Because insurance companies provide an important service to society, they are usually regulated by a government regulatory agency. These regulations aim to ensure that insurance companies (Ecer & Pamucar, 2021), (Zhao et al., 2021) meet appropriate financial and business ethical standards and provide adequate protection for their customers.

The service of an insurance company is to provide financial protection for their customers from unexpected and unwanted risks. This service is provided in the form of different insurance products, such as:

1. Life insurance: provides a death benefit to heirs if the policyholder dies during the insurance coverage period. Some life insurance products can also provide benefits such as health insurance, disability insurance, and investment benefits.
2. Health insurance: guarantees payment of health care costs, including hospitalization costs, operating costs, and drug costs. Some health insurance products can also provide benefits for routine health checks or dental care.
3. Vehicle insurance: guarantees payment of vehicle repair costs in case of accident or damage. Some vehicle insurance products can also provide benefits such as third-party liability insurance or driver accident insurance.
4. Property insurance: guarantees payment of the cost of repairing or replacing property damaged or lost due to certain risks, such as fire, flood or theft.

In addition to insurance products, insurance companies can also provide other services, such as risk management consulting, risk assessment, or claim settlement services. Some insurance companies also provide special insurance products for businesses, such as professional liability insurance or work accident insurance. It is important to remember that the insurance products offered by insurance companies may vary depending on country and local regulations. Always make sure to carefully read the terms and conditions of an insurance product before deciding to buy it.

Enterprise Architecture design using the Framework is an approach that is commonly used in the development and management of enterprise architecture. An EA Framework is a guide or framework used to assist with the development and management of an Enterprise Architecture, and assists organizations in understanding and managing their business requirements. TOGAF (The Open Group Architecture Framework) is an enterprise architecture framework that is used to develop and manage a structured and well-integrated enterprise architecture. TOGAF was first introduced by The Open Group in 1995 and since then has become the de facto standard in enterprise architecture. TOGAF includes several main sections, including:

1. Architecture Development Method (Schäffer et al., 2021) (ADM): ADM is a method used to develop an enterprise architecture from start to finish. ADM includes eight phases, namely, preliminary, vision, business, information systems/technology, data, application, technology, and implementation.
2. Architecture Content Framework: This framework maps out all the enterprise architecture elements that must be considered in developing a comprehensive and integrated enterprise architecture.
3. Architecture Capability Framework: This framework maps out the organizational capabilities required to develop and manage the enterprise architecture effectively and efficiently.
4. Reference Models: Reference models provide guidelines and frameworks for developing enterprise architectures that are specific to a particular industry or business domain.
5. Architecture Governance Framework: This framework provides guidelines and principles to ensure that the enterprise architecture is developed and implemented according to the organization's strategy and business objectives.

TOGAF is used by organizations to help develop a comprehensive, integrated and flexible enterprise architecture. By using TOGAF, organizations can ensure that their systems and applications are well structured and well-integrated, and that strategic decision making in terms of enterprise architecture is based on the best principles in the industry.

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This research has explained about enterprise architecture, explained about insurance companies. This raises the following research questions:

1. How to implement enterprise architecture in the insurance business? (RQ 1)
2. Is there a method for implementing enterprise architecture and what is the process? (RQ2)

The use of enterprise architecture framework has become a common thing; therefore, this research will be different from previous studies. The author tries to make a difference in this research where in the Method chapter there will also be a discussion of the differences with research that has discussed enterprise architecture. **State-of-the-art**, this research is designed from the core framework of a sustainable insurance system and increases efficiency in carrying out the needs of insurance companies. So that the goal is that information technology services for insurance companies are maximized with changes in information technology that change rapidly. The development of enterprise architecture in insurance companies has a very urgent urgency, especially in developing services based on cloud technology. So that in serving customers, insurance companies provide maximum service, according to the needs of customers. The application system developed by the insurance company is committed to developing information technology in accordance with the insurance enterprise architecture roadmap (Hindarto et al., 2021).

LITERATURE REVIEW

Previous research that has discussed Information Technology based on Enterprise Architecture has been widely used in various companies. Therefore, research on this topic is still hotly discussed considering that Information Technology is always developing and continuously updating. Likewise, the company's needs are always changing, considering that business is always growing. The era of the industrial revolution and digital transformation is currently experiencing changes in the company's business. The growth of various online businesses has made many changes and influences the company's business. So, companies must quickly adapt to business changes. This research is not looking for weaknesses, but this research is to support previous research, where the weaknesses of previous research are suggestions for improvement in this research, meaning that this research is a complement to previous research (Prawira et al., 2023).

The first discussion is research entitled "Proposal of a sensing model in an Adaptive Enterprise Architecture." The author's goal is to model sensing capabilities in the context of adaptive enterprise architectures to ensure self-awareness and context awareness for enterprises. Proposals regarding sensing-enabled meta-models and integrating them in adaptive enterprise architecture models. The advantages of this research can assess the company's absorption capacity to balance investment. The result ensures a competitive advantage compared to competitors. The weakness of this research is that it does not fully describe the enterprise architecture, only showing parts, such as how to adapt the enterprise architecture (Daoudi et al., 2023).

The second discussion is research entitled “Impact of solvency II on the enterprise architecture of insurances: A qualitative study in Germany”. The discussion in this research is about enterprise architecture in insurance companies. The European Commission suggests a new framework directive for insurance companies. The framework is Solvency II, consisting of minimum capital, governance and risk management, transparency. The challenge is the implementation of Enterprise Architecture (EA) management for insurance companies (Khosroshahi et al., 2014). Its strengths are explaining the impact of implementing an enterprise architecture on the proposed solvency framework. Disadvantages do not address the steps in implementing an enterprise architecture on a solvency framework.

The project model for developing an artificial intelligence service system used is an enterprise architecture approach and consists of elements of the business layer, elements of the application layer, and expansion of motivation (Takeuchi & Yamamoto, 2019). These advantages encourage companies to use enterprise architecture as a framework in developing information technology. The weakness is that there are no enterprise architecture implementation steps.

The approach from the research "Concepts for Modeling Enterprise Architectures" (Jonkers et al., 2004) proposes a concept-based enterprise architecture approach. This research proposes only an idea or ideas in carrying out plans for a company. The weakness is not proposing the concept of implementing enterprise architecture in a company.

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Research entitled "Analyzing Enterprise Models Using Enterprise Architecture-Based Ontology" discusses enterprise architecture by proposing an enterprise model (Sunkle et al., 2013). The contributions to this research are twofold: first, it shows how an existing EA modeling language can be utilized to create an EA ontology and the second shows how two known EA analyzes can be realized using this ontology. The advantage of ontologies facilitates analysis of the basic enterprise architecture in prototyping due to proper mix of representation and inference functions and can be extended for more involved enterprise architecture analysis. The weakness has not been implemented in the enterprise architecture model.

Proposed methods that can combine both qualitative and quantitative risk analysis and combine risk mitigation solutions (Sousa et al., 2013). In information technology security, attack-defense (ADT) is successfully used to represent attacks and countermeasures. The aim of this paper is to leverage the ADT approach to assess risks and opportunities in enterprise architectures. The strengths of this research, outlines a framework for identifying the best way to reduce risk and increase company profitability based on architectural principles. This framework is used as a case study in the insurance business. Weaknesses have not implemented using the project management framework.

From the research that has been described, most of the research explains that enterprise architecture has already planned for the company. However, the research above has not explained much about the application after planning. State-of-the-art research is implementing enterprise architecture in insurance companies. The application of enterprise architecture uses project management, so that later Information Technology planning will be in accordance with and controlled by the project management method. For this reason, the enterprise architecture used in this research uses The Open Group Architecture Framework (TOGAF). Within TOGAF there will be nine domains namely Preliminary, Architecture Vision, Business Architecture, Information Systems Architecture, Technology Architecture, Implementation Governance, Architecture Change Management. This research only discusses Business Architecture, Information Architecture, technology architecture and Implementation Governance.

METHOD

TOGAF, or The Open Group Architecture Framework, is a widely-used approach for enterprise architecture development. It provides a comprehensive method for designing, planning, implementing, and managing enterprise architecture. The framework is divided into several phases, each of which focuses on a specific aspect of architecture development. One of the first phases in the TOGAF framework is the Preliminary phase. This phase involves establishing the scope and objectives of the architecture development effort, identifying stakeholders, and defining the architecture principles and framework. The Architecture Vision phase follows, which focuses on defining the overall vision and objectives for the architecture. This phase involves creating a high-level view of the architecture, identifying key stakeholders, and developing a roadmap for the architecture development effort. The subsequent phases of the TOGAF framework include Business Architecture, Information Systems Architecture, Technology Architecture, Opportunities and Solutions, Migration Planning, Implementation Governance, and Architecture Change Management. Each of these phases focuses on a specific area of architecture development, from defining the business architecture to managing changes to the architecture over time. By following the TOGAF framework, organizations can create a comprehensive, structured approach to enterprise architecture development that aligns with their business goals and objectives.

Architecture Vision Phase, In the Architecture Vision phase of TOGAF, the primary focus is on defining the overall goals and objectives of the architecture effort. This phase is all about creating a shared understanding of the business need that is driving the architecture effort and defining a high-level view of the target architecture that will address that need. The Architecture Vision phase involves a number of key activities, including:

- Developing a statement of the business need that the architecture effort will address
- Identifying stakeholders and their concerns
- Defining the scope of the architecture effort

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- Creating a high-level description of the target architecture
- Defining a set of principles that will guide the development of the architecture

The Architecture Vision phase is critical because it sets the direction for the entire architecture effort. By establishing a clear understanding of the business need and the target architecture, stakeholders can align their efforts and work towards a common goal. Without a well-defined Architecture Vision, the architecture effort is likely to flounder and fail to deliver the desired results.

Business Architecture Phase, In the Business Architecture phase of TOGAF, the focus is on defining the business strategy, governance, organization, and key business processes. This phase involves identifying the key business drivers, goals, and objectives, as well as the business capabilities required to achieve them. One of the key deliverables of this phase is the Business Architecture (Hudha et al., 2019) document, which outlines the business strategy, organization, and key business processes. This document serves as a blueprint for the development of the Information Systems Architecture and Technology Architecture. To develop the Business Architecture document, the following steps are typically taken:

- Identify the key business drivers, goals, and objectives
- Define the business capabilities required to achieve the goals and objectives
- Develop a business reference model that outlines the key business processes and activities
- Identify the key stakeholders and their roles and responsibilities
- Identify the key business risks and develop risk mitigation strategies

The Business Architecture phase is critical for ensuring that the Information Systems Architecture and Technology Architecture are aligned with the business strategy and goals. By defining the key business processes and capabilities, organizations can ensure that their IT systems are designed to support their business objectives and enable them to achieve their goals.

Information Systems Architecture Phase (Irmayanti & Permana, 2018), The Information Systems Architecture phase of TOGAF involves the design and implementation of the technology infrastructure that supports the business architecture. This phase defines the hardware, software, and network infrastructure required to support the business processes and applications identified in the previous phases of TOGAF. During this phase, the enterprise architects work closely with the IT department to design and implement the required technology infrastructure. The following are the key steps involved in the Information Systems Architecture phase:

- Identifying the technology infrastructure requirements based on the business requirements and the existing IT infrastructure
- Developing a technology architecture that meets the identified requirements
- Identifying the technology standards and guidelines that will be used to guide the implementation of the technology infrastructure
- Developing a technology roadmap that outlines the implementation plan for the technology infrastructure

The Information Systems Architecture phase is critical to the success of the overall enterprise architecture effort. A well-designed technology infrastructure can ensure that the business processes and applications are supported in an efficient and effective manner. It can also enable the organization to quickly adapt to changing business requirements and emerging technologies.

Technology Architecture Phase (Meertens et al., 2012), In the Technology Architecture phase of TOGAF, the focus is on defining the technology infrastructure required to support the business and application architecture. This phase ensures that the technology infrastructure is aligned with the overall enterprise architecture and business goals. The Technology Architecture phase consists of three sub-phases: Technology Architecture Development, Technology Architecture Implementation, and Technology Architecture Governance. During the Technology Architecture Development sub-phase, the technology infrastructure required to support the business and application architecture is defined. This includes identifying the hardware, software, network, and security components required to support the enterprise architecture. In the Technology Architecture Implementation sub-phase, the technology infrastructure is implemented according to the defined architecture. This includes procuring and deploying the hardware, software, and network components required to support the enterprise

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architecture. Finally, in the Technology Architecture Governance sub-phase, the ongoing management and maintenance of the technology infrastructure is addressed. This includes defining policies, procedures, and standards for managing the technology infrastructure, as well as monitoring and reporting on the performance of the technology infrastructure. Overall, the Technology Architecture phase is critical to ensuring that the technology infrastructure is aligned with the overall enterprise architecture and business goals. By following the TOGAF methodology for the Technology Architecture phase, organizations can ensure that their technology infrastructure is optimized to support their business objectives.

Implementation Governance Phase, The Implementation Governance phase of TOGAF is a crucial step in ensuring that the architecture is implemented correctly and effectively. This phase focuses on the management and control of the implementation process, ensuring that the architecture is delivered according to the requirements and specifications laid out in the previous phases. The Implementation Governance phase involves the following activities:

- Establishing the implementation team and governance structure
- Defining the implementation plan and schedule
- Monitoring and controlling the implementation process
- Managing risks and issues that arise during implementation
- Ensuring that the architecture is implemented according to the specifications and requirements defined in the previous phases

During the Implementation Governance (Sabtu, 2021) phase, it is important to establish a governance structure that is appropriate for the size and complexity of the implementation. This structure should include roles and responsibilities for all stakeholders involved in the implementation process, as well as clear communication channels and decision-making processes. The implementation plan and schedule should be defined in detail during this phase, taking into account any dependencies and constraints that may impact the implementation process. Regular monitoring and control of the implementation process is also critical to ensure that the implementation stays on track and any issues or risks are addressed in a timely manner. Finally, it is important to ensure that the architecture is implemented according to the specifications and requirements defined in the previous phases. This involves testing and validating the implementation to ensure that it meets the desired outcomes and that any issues or defects are addressed before the implementation is rolled out to production.

RESULT

The results of research from insurance companies can be seen in Figure 1, which describes information architecture. The database in the application system contains five main data blocks, namely Dashboard Database, Vendor Database, Backoffice Database, Employee Database, Customer Database and Claim Database. Database Claims, functions to handle all claims from insurance customers. Vendor database, serves as a database that supplies insurance company needs such as office stationery or insurance company supply needs. The Backoffice database consists of the Finance Database, the Investment Database, the Asset Database and the Policy Database. The Finance Database functions as a storage medium for all of the company's financial transactions. Database Investment functions for the company's investment needs. The Claim Database functions as a database to record all claims made by customers. The Customer Database functions to record all insurance company customers or customers.

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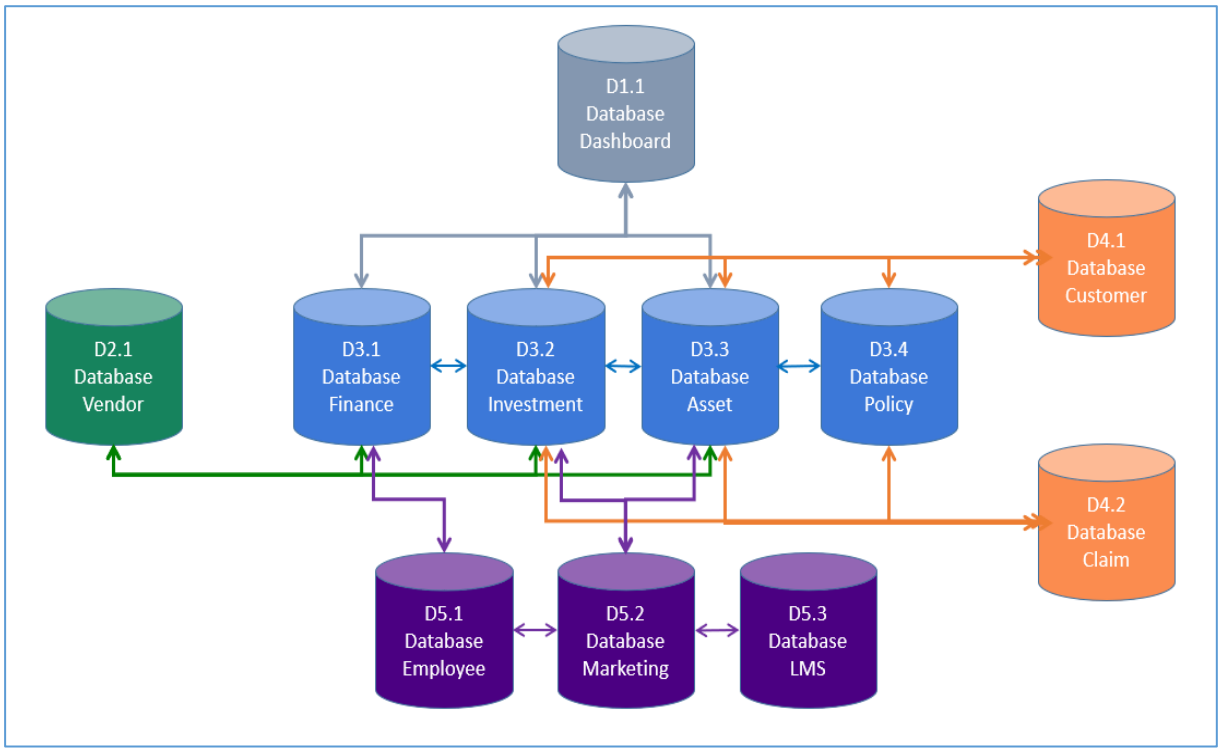

Figure 1. Information Architecture
Source: Researcher Property

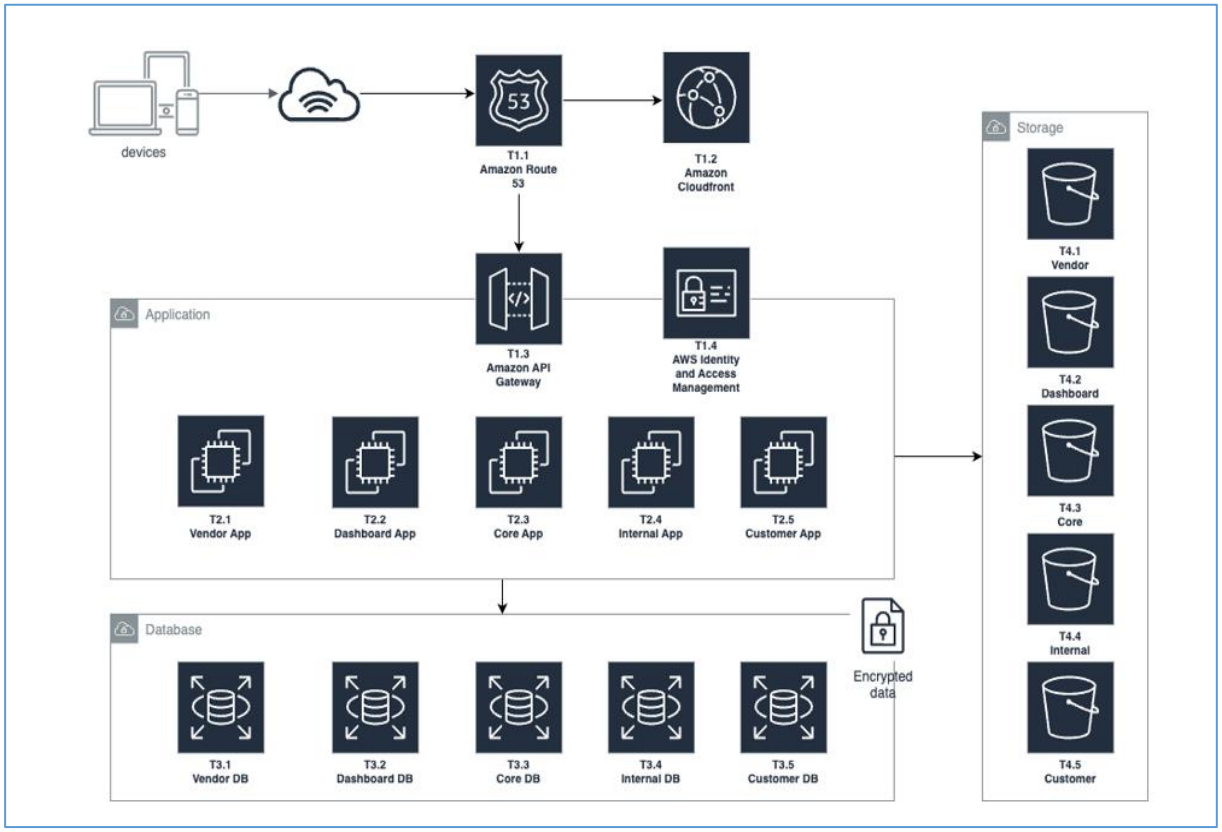

Figure 2. Technology Architecture
Source: Researcher Property

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Figure 2. Describes the Technology used in insurance companies. From the main technology architecture is Database for storage needs. Details of the database have been presented in Figure 1 regarding Information Architecture. Architecture applications aim for corporate information systems, such as claim application systems, financial application systems, vendor application systems and others. Included in architectural technology is an infrastructure system consisting of networks, servers and storage. So the discussion regarding architectural technology includes all infrastructure devices to an enterprise application.

After the Enterprise Architecture is finished, the next step is to implement the Enterprise Architecture. This study uses the project management method as governance in carrying out Information Technology work so that it is in accordance with the system development target. Project Management is always process and result oriented. There are three important elements in completing work based on Project Management. The three important points are Cost, Time and Quality, where all the completion is based on the user requirements that have been planned in the enterprise architecture. For this reason, the application of Information Technology is successful, the details of the application architecture must exist, and all architectures must be carried out with detailed discussion. So that the purpose of developing an enterprise architecture goes well and in accordance with the direction of the company.

DISCUSSIONS

How to implement enterprise architecture in the insurance business? (RQ 1). Topic that has become very important in recent years. Enterprise architecture is a critical component of any business, and its implementation can help organizations achieve their goals efficiently and effectively. In the insurance industry, enterprise architecture can be used to streamline processes, improve customer experience and improve overall performance. Enterprise architecture is a strategic approach to aligning business goals with technology solutions. This involves creating a blueprint for the current and future state of the organization, identifying gaps, and developing a roadmap to bridge those gaps. In the insurance industry, enterprise architecture can be used to optimize business processes, reduce costs and improve the overall customer experience. By implementing an enterprise architecture, insurers can better understand the needs and preferences of their customers, and tailor their products and services accordingly. Implementing enterprise architecture in the insurance industry can be challenging, but the rewards are significant. This requires a deep understanding of an organization's goals, processes, and technology infrastructure. However, with the right approach and expertise, it can improve efficiency, increase customer satisfaction and competitive advantage in the market. In this article, we will explore the application of enterprise architecture in the insurance industry and its impact on business operations. Enterprise architecture is a critical component in the success of any business, including the insurance industry. Implementing enterprise architecture in the insurance business can help organizations achieve their goals and objectives by aligning their business processes, information systems, and technology with their strategic objectives. Enterprise architecture can help insurance companies to develop a clear understanding of their business processes, including the interdependencies between different departments, and how they can be integrated to improve efficiency and productivity. This can be achieved by using tools such as process maps and flowcharts to identify areas of improvement and streamline processes. Another important aspect of enterprise architecture is the development of a robust information system that can support the business processes of the insurance company. This can be achieved by developing a data model that can capture all the relevant information required to support the business processes. The data model should be designed to support data integration, data quality, and data governance. Furthermore, implementing enterprise architecture in the insurance business can help companies to identify and mitigate risks. This can be achieved by developing a risk management framework that can identify potential risks and develop strategies to mitigate them. The risk management framework should be designed to support risk assessment, risk analysis, and risk mitigation. In conclusion, implementing enterprise architecture in the insurance business is critical for achieving success. By aligning business processes, information systems, and technology with strategic objectives, insurance companies can improve efficiency, productivity, and mitigate risks.

Is there a method for implementing enterprise architecture and what is the process? (RQ2). Enterprise architecture implementation is a complex process and requires a lot of preparation. Following

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are some steps that can help an organization in implementing enterprise architecture: Identify business requirements: The first step in implementing enterprise architecture is to identify the business requirements of the organization. This involves evaluating business goals and strategies to ensure that the implemented enterprise architecture can help achieve those goals. Analysis of existing architecture: Once the business requirements are identified, the next step is to analyze the existing architecture in the organization. This helps in determining whether the existing architecture is usable or needs to be changed. Planning a new architecture: If the existing architecture does not meet the business requirements, then the organization will need to plan a new architecture. This involves determining the right technology architecture, data architecture, application architecture, and business architecture. Implementation: Once the planning for the new architecture is complete, the organization can start implementing the enterprise architecture. This involves developing and implementing systems, ensuring proper integration between systems, and ensuring that systems function properly. Monitoring and evaluation: After the enterprise architecture is implemented, the organization needs to monitor and evaluate the performance of the system. This helps in determining whether the implemented enterprise architecture is successful in achieving the business objectives. In the process of implementing enterprise architecture, it is important to ensure that all members of the project team understand the enterprise architecture to be implemented. In addition, organizations also need to ensure that the enterprise architecture is continuously updated and adapted to changing business needs.

CONCLUSION

Enterprise architecture and project management are two critical components of any organization. The former provides a holistic view of the organization's infrastructure, while the latter ensures that projects are completed on time, within budget, and to the required quality standards. When these two disciplines are combined, the result is a powerful framework that can help organizations achieve their strategic goals. In this article, we will explore the key takeaways from the implementation of enterprise architecture using project management. We will look at the benefits of this approach, the challenges that organizations may face, and the best practices for successful implementation. By the end of this article, you will have a clear understanding of how enterprise architecture and project management can work together to drive organizational success. As organizations continue to grow and evolve, it becomes increasingly important to have a clear understanding of the enterprise architecture. This includes the organization's business processes, information systems, and technology infrastructure. By implementing enterprise architecture using project management, organizations can ensure that their infrastructure is aligned with their strategic goals, and that projects are managed effectively to achieve those goals. This approach can help organizations to reduce costs, improve efficiency, and enhance their overall performance.

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