
Building Digital Platform for Property Marketing Sales with an Enterprise Architecture Approach

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ABSTRACT

Constructing a digital platform is an essential priority in an era where technology is the cornerstone of success in the real estate marketing and sales sector. Nevertheless, the advancement of these platforms is frequently impeded by obstacles pertaining to integration, security, and scalability, which stem from their inadequate establishment. Existing platforms' incapability to rapidly adapt to shifting market dynamics frequently impedes the development of innovative digital solutions for the real estate industry, which provided the impetus for this study. The fundamental objective of this study is to create a framework capable of accommodating scalable business expansion, enhancing data security, and overcoming integration obstacles. Utilizing Enterprise Architecture principles in the design and implementation of the platform, as well as conducting a comprehensive examination of the current IT infrastructure, stakeholder requirements, and mapping of pertinent business processes, will comprise the research methods. The results of this study are expected to contribute to a wholehearted comprehension of how the Enterprise Architecture approach can function as a resilient framework for the development of effective digital platforms. In the contemporary digital age, this platform is expected to furnish solutions capable of swiftly adjusting and reacting to evolving market dynamics and changes, thereby facilitating the marketing and sales requirements of real estate. Finally, this research endeavors to offer a comprehensive and practical perspective on constructing a robust and flexible digital infrastructure that can effectively cater to the demands of the real estate sector in the current era of digitalization.

Keywords: Business Processes; Digital Platform; Enterprise Architecture; IT Infrastructure; Real Estate Industry

INTRODUCTION

Technology has become an essential component in gaining a competitive edge in the property marketing and sales sector. Nevertheless, the process of constructing efficient digital platforms frequently needs to improve in the areas of system integration, data security, and scalability. The increasing demand for cutting-edge digital solutions in the real estate sector underscores the shortcomings of current platforms in effectively adapting to swift market fluctuations. Technology plays a crucial role in the property industry by serving as the basis for improving operational efficiency, accelerating response times to market demands, and enhancing the overall customer experience. Nevertheless, the difficulties associated with intricate integration among current systems, along with the need for sufficient data security, have emerged as significant obstacles in the advancement of platforms that can effectively adjust to evolving trends and the dynamic demands of the market. The real estate industry is experiencing a growing need for cutting-edge solutions that can enhance the efficiency of marketing, optimize customer interactions, and deliver more tailored service.

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Nevertheless, current platforms frequently need help to adjust to the swiftly evolving market dynamics promptly. Hence, the demand for responsive and adaptive digital platforms (Titi et al., 2023), (Hindarto, 2023b) is growing more pressing in this sector. Conducting research that tackles the difficulties of combining different systems, ensuring the protection of data, and meeting the requirement for expansion in the creation of digital property platforms will be a crucial measure to meet the swiftly changing market requirements of the present real estate sector.

The industry has encountered a critical issue in the form of digital platforms' incapability to adjust to evolving market demands. Accelerated adaptation to ever-more-complex market dynamics is now severely impeded by the absence of a solid foundation in platform development. Consequently, the organization is unable to fulfil the requirements for enhanced security measures, scalability that is vital for sustaining business expansion, and more intricate integration specifications. As the real estate industry evolves, there is a growing urgency for a platform capable of accommodating diverse consumer needs, shifting trends, and rapid industry dynamics, among other market demands. Failure to swiftly adjust to these changes exposes platforms to rigidity, compromised system integration, and increased security vulnerabilities.

Additionally, shift-response limitations of platforms impede the sustainable expansion of businesses. Real estate enterprises require technological solutions that enable them to expand in tandem with market trends and enhance operational efficacy. A company's capacity to adapt to changing market demands will be impeded by a platform that fails to satisfy the requirements for scalability. To support sustainable business growth in the real estate industry, which is undergoing rapid change, an urgent requirement emerges for a platform that possesses the following characteristics: adaptability, effective system integration capabilities, robust security measures, and scalability.

Even with the substantial investment made in the advancement of digital platforms for the real estate industry, many current solutions continue to need more capability to respond fully and adapt to the ever-changing dynamics of the market. These platforms frequently encounter challenges in keeping pace with the dynamic nature of market trends and the evolving demands of consumers. A lack of deep integration capabilities between disparate systems, an inability to adapt to rapid change, and inconsistent security provision are significant obstacles. Nevertheless, recent advancements in the implementation of Enterprise Architecture (EA) (Afarini & Hindarto, 2023), (Prawira et al., 2023) exhibit considerable promise in rectifying these deficiencies. Enterprise Architecture (Hindarto, 2023a) methodology provides a comprehensive framework for creating, implementing, and overseeing intricate information technology systems. This entails adopting a methodical approach to system integration, which facilitates prompt adjustment to market fluctuations and enhancing security measures through the enforcement of rigorous standards. In the real estate industry, the implementation of Enterprise Architecture (Hindarto, 2023c), (Amanda et al., 2023) principles can provide a more robust foundation for the creation of responsive and adaptable digital platforms. Enterprise Architecture contributes a more resilient integration concept, which enables the platform to manage diverse data from a variety of sources with greater fluidity and efficacy. By adopting this strategy, platforms can enhance their responsiveness to evolving market demands, deliver more reliable solutions, and mitigate the likelihood of data security vulnerabilities or incompatibilities. Therefore, by incorporating Enterprise Architecture into the development of digital platforms, significant potential exists to surmount current constraints, thereby creating novel prospects for enhancing the platform's agility and responsiveness to the swiftly evolving market dynamics within the real estate sector.

The primary goal of this research is to create a digital platform that can handle scalable business growth in the real estate industry, improve data security, and overcome integration challenges. This research will use an EA approach to investigate how to build platforms that can adapt quickly to changing market dynamics and how to make them more resilient to disruptions. The goal of this research is to offer practical recommendations for building platforms that can adapt to changing market conditions and consumer demands. System integration, data security, and the ability to build a framework that can adapt to changing

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business needs are all areas that this platform is expected to enhance. The property industry will be able to adjust and react faster to shifts in the market, encourage new ideas, and undergo digital transformation if EA principles are put into practice. He has made great strides in enhancing operational efficiency, offering practical guidance, making the industry more responsive to technological change, and improving service quality.

LITERATURE REVIEW

Environmental performance and sustainable development are both enhanced by prefabrication construction. However, consumer buying intention needs to be improved for China's incentive programs. With growing reputational, monetary, and consumer incentives improving ESS, an evolutionary game model exposes four ESS scenarios (Wang et al., 2021). By mandating that half of all new buildings in the country be environmentally friendly by 2020, the Chinese government hopes to encourage energy efficiency in the rapidly expanding urban construction sector. Nevertheless, the adoption of green housing practices is hindered by institutional constraints, which poses a dilemma for Chinese real estate enterprises. The non-Western and non-liberal contexts of the housing market and environmental governance are the focus of this research (Jiang & Payne, 2019). Using innovative technology, the research suggests a Spatial Neural Network (SNN) model named Property Appraisal 4.0 to predict property values and unearth previously unknown neighborhood characteristics in satellite embedding vectors. The model beats popular models such as the Hedonic Pricing Model and Support Vector Machines by using deep learning techniques like incremental learning, Deep Automated Optical Inspection, and knowledge distillation (Lin et al., 2021). Businesses that have implemented enterprise architecture (EA) have an improved probability of enduring the COVID-19 pandemic, according to the article. According to a poll of 414 executives, managers, and senior practitioners, EA-driven dynamic capabilities improve digital competencies, digital ambidexterity in operations, and digital capabilities; this has a significant influence on company value and identifies critical areas to invest in (Wetering, 2022). The monetary effects of real estate companies' efforts to incorporate environmental sustainability into their overall business plans are the focus of this article. It finds crucial things that affect sustainability and suggests green ways to have strong economic growth. In order to stay competitive and grow through various economic cycles, entrepreneurs should embrace technological, environmental, and financial innovation (Vanags & Butane, 2013). A primary reason why financial crises happen is because of the mortgage industry's financialization and the originate-to-distribute cycles. Players in Europe's real estate market skillfully navigate relationships between different organizations to profit from rising asset prices by refinancing. Accounting and valuation are fundamental to financialized business models, but the way these practices are structured strategically causes companies to focus on the short term and engage in unsustainable practices (Botzem & Dobusch, 2017).

Institutional limitations in China are preventing the widespread use of green property. The use of SNN technology to forecast real estate prices is exceptional. Companies become more resilient with EA, but they must pay attention to the financial details. There should be an emphasis on eco-friendly building practices. There are many holes in the provided summary or areas that could be used for more investigation. While it is true that EA can make businesses more resilient, there is still room for improvement in the place of financial analysis, particularly regarding the incorporation of environmental sustainability into company plans. An important area to research is the monetary impact of environmentally responsible real estate practices and how they affect GDP growth. The budgetary considerations of Enterprise Architecture Implementation are the primary subject of the proposal under consideration.

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METHOD

The Real Estate Industry's Information Technology Planning, Design, and Management Can Be Organized Using TOGAF, a Popular Enterprise Architecture Management Framework. For real estate companies, TOGAF lays the groundwork for coordinating their IT strategy with the systems that run their day-to-day operations and oversee their properties. TOGAF facilitates an in-depth comprehension of company structure and technology requirements. Finding the right technical resources, operational necessities, and business goals to back up property management in the real estate sector is what this entails. The Open Group Architecture Framework (TOGAF) integrates these findings to pave the way for more efficient architecture development.

TOGAF gives an organized approach to developing integrated architecture. Building the necessary infrastructure to support property management, creating detailed designs for applications, and so on all fall under this category. Using meticulous modeling and documentation, TOGAF allows for the discovery of IT optimization opportunities and weaknesses. An organized implementation stage is also a part of TOGAF implementation. Making sure that technology solutions are implemented efficiently, meet business needs, and support property management processes to their fullest potential is what this means in the real estate context. TOGAF's framework can also facilitate continuous monitoring and evaluation. In this way, the real estate sector can track how well its technologies are doing, adjust to new company needs, and keep its IT infrastructure current and responsive to shifting market conditions. Companies in the real estate industry can benefit from TOGAF's methodical and organized approach to managing IT architecture. This framework helps with planning, designing, and implementing solutions that support business operations and property management effectively.

Application Architecture

Application Architecture (Yang et al., 2023), (Lira et al., 2023), (Yingjie et al., 2023) serves as the fundamental framework in the real estate sector, providing essential support for crucial operations such as property management and customer experience. The applications within the Application Architecture incorporate technology to streamline transactions and property management and enhance customer service efficiency. Property management applications enable real estate agents and property managers to monitor and record property details, such as rental and sales information, maintenance records, and updates on ownership status. Collaboration and communication applications are crucial in this industry. Collaboration platforms facilitate efficient interaction among agents, clients, and internal teams, enabling seamless communication and the exchange of critical transaction information.

Furthermore, analytical applications and data processing are employed to scrutinize market trends, perform property assessments, and forecast prices and demand in the real estate market. The real estate industry is being transformed by technology, which is also impacting the customer experience. Users can take part in virtual tours of properties using VR and AR applications, thereby eliminating the need for physical visits and reducing both time and travel expenses. Digital marketing platforms and mobile apps offer convenient access to property information, allowing clients to search, receive updates, and communicate with agents instantly. Furthermore, transaction and financial management applications aid in optimizing the property transaction process. They enable and oversee payments, manage contractual paperwork, and track the progress of transactions from beginning to end. By incorporating these applications into an Application Architecture, the real estate sector can enhance operational efficiency, bolster customer service, and promptly adapt to market dynamics. The incorporation of these technologies is crucial for enhancing business processes, improving the availability of information, and enhancing customer experience, all of which are essential for achieving success in the fiercely competitive real estate sector.

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Infrastructure Architecture

Infrastructure architecture (Naderi & Shojaei, 2023), (Caraglia, 2023), (Hustad & Olsen, 2021) is the backbone of the real estate industry, ensuring all the necessary connectivity and operations run smoothly. The many technical parts that make up this infrastructure include things like data storage, servers, networks, and security systems. Before anything else, a solid computer network is required to guarantee that clients, property managers, and real estate agents have consistent and quick access to all relevant data. Streamlined internal communications, efficient data transfer, and access to real-time property information are all made possible by this network. Infrastructure Architecture also includes a safe and organized method of storing data. It contains databases that keep track of important documents, such as property records, contracts, and client information. While guaranteeing stringent information security and safety, these systems must be capable of providing fast and guaranteed access to ever-expanding data.

Given the frequent handling of confidential information and large sums of money in the real estate sector, robust security measures are an absolute must. Cyber-attack defense systems, data encryption, and a security infrastructure keep private data out of the hands of people who shouldn't see it. This infrastructure includes access authorization technology. Not to be outdone, Infrastructure Architecture also provides backup and disaster recovery systems. This infrastructure guarantees the rapid recovery of critical information in the event of an emergency or disaster, allowing businesses to continue operating with minimal disruption during the need for data reliability. When it comes to the real estate industry, Infrastructure Architecture is the backbone that ensures vital data is available, secure, and efficiently run. To guarantee that their technological systems contribute to long-term company growth and an improved customer and agent experience, real estate companies should build dependable and interconnected infrastructure.

RESULT

Application Architecture



Figure 1. Proposed Application Architecture Real Estate

Source: Researcher Property

Figure 1 depicts the proposed Application Architecture for Real Estate, which consists of interconnected components that are crucial for efficient operations and improved customer service in the industry. Firstly, Sales and Marketing applications act as the primary components, enabling the administration of sales processes and customer interactions. In the real estate business, these apps make it easier to keep an eye on leads, keep track of client relationships, and use targeted marketing plans to bring in potential buyers or renters. The Website component serves as a crucial tool that functions as the virtual representation of the real estate company. It functions as a platform for displaying properties, offering

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information to clients, and facilitating online interactions like inquiries and appointments. This component is integrated with CRM (Customer Relationship Management) to ensure a smooth user experience and collect valuable customer data for customized interactions. Project Management and System Dashboard applications are essential for overseeing property development projects. Project management tools facilitate the process of planning, scheduling, and monitoring the progress of real estate projects, thereby ensuring their timely completion. The System Dashboard provides a thorough summary of different operational metrics, enabling managers and stakeholders to make well-informed decisions. The inclusion of Vendor Management and Inventory components is crucial for effective supply chain and inventory control. These applications optimize vendor interactions, oversee contracts, and facilitate efficient procurement processes. Inventory systems oversee and control the inventory of assets, optimizing their availability and ensuring prompt updates on their availability and condition. The utilization of design and product applications plays a crucial role in the development and customization of real estate properties. These tools facilitate architectural design, visualization, and customization according to client preferences, thereby enhancing the competitive advantage in property offerings. The Finance, Accounting, Human Resources, and Legal systems are integral components of operational support. These applications are responsible for processing financial transactions, overseeing payroll and employee information, ensuring adherence to legal regulations, and managing contractual and legal aspects related to property transactions. The integrated applications in the proposed Application Architecture for Real Estate collectively optimize operations, improve customer experiences, and facilitate efficient management across different aspects of the real estate industry, including property development, client interactions, and operational support.

Information Architecture

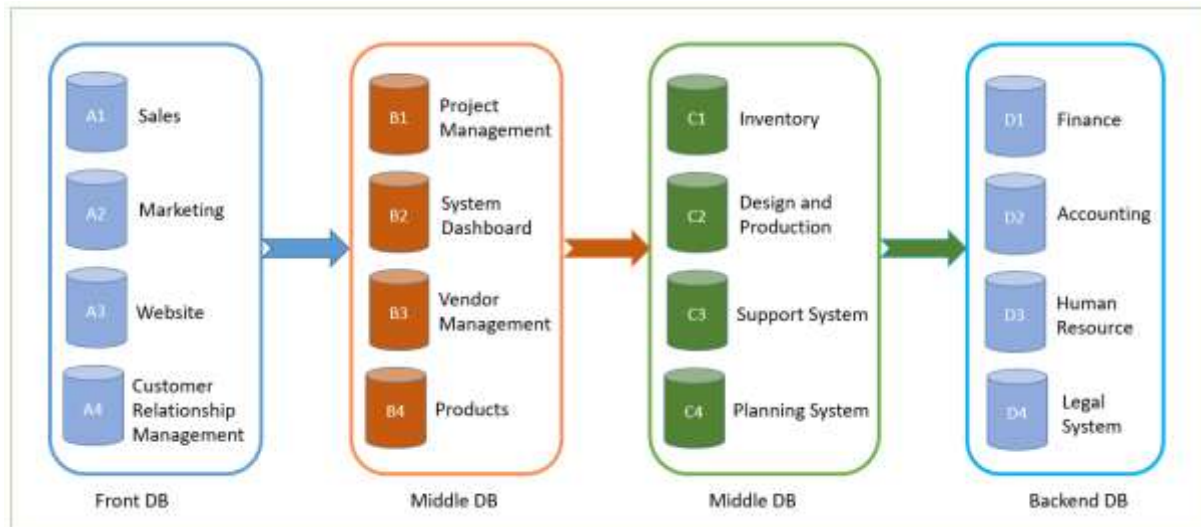


Figure 2. Proposed Information Architecture Real Estate

Source: Researcher Property

Figure 2 represents the suggested Data or Information Architecture for Real Estate, delineating the database framework for different elements within the industry. Every component of the architecture corresponds to distinct databases that store and oversee essential data for the functioning and administration of real estate procedures. The Sales and Marketing databases collect data pertaining to prospects, customer engagements, and promotional initiatives. These databases contain information on prospective purchasers or renters, sales transactions, and marketing tactics employed to attract customers. The website database stores data pertaining to websites, encompassing content, visitor interactions, inquiries, and appointments made via the online platform. It functions as a storage facility for analytics pertaining to websites and

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metrics related to customer engagement. The CRM (Customer Relationship Management) database contains significant customer information, including data, interactions, preferences, and purchase history. By integrating with other databases, CRM establishes a centralized repository for client-related information, which promotes personalized interactions and facilitates well-informed decision-making. The Project Management and System Dashboard databases house project-related data, progress reports, and key performance indicators. These databases provide valuable information on project progress, streamline monitoring processes, and assist in making managerial decisions. The Vendor Management and Inventory databases oversee supplier data, procurement documentation, inventory quantities, and stock particulars pertaining to real estate assets.

The Design and Product databases contain data pertaining to property design, customization, architectural plans, and customization preferences obtained from clients. The databases for Finance, Accounting, Human Resources, and Legal systems manage financial transactions, payroll, employee records, legal contracts, and compliance data. The Data Architecture serves as a systematic framework that consolidates and centralizes essential data from different aspects of real estate operations. It guarantees the accuracy and consistency of data, the ability to access and connect different parts, enabling well-informed decision-making, effective administration, and enhanced customer service in the real estate sector.

Technology Architecture

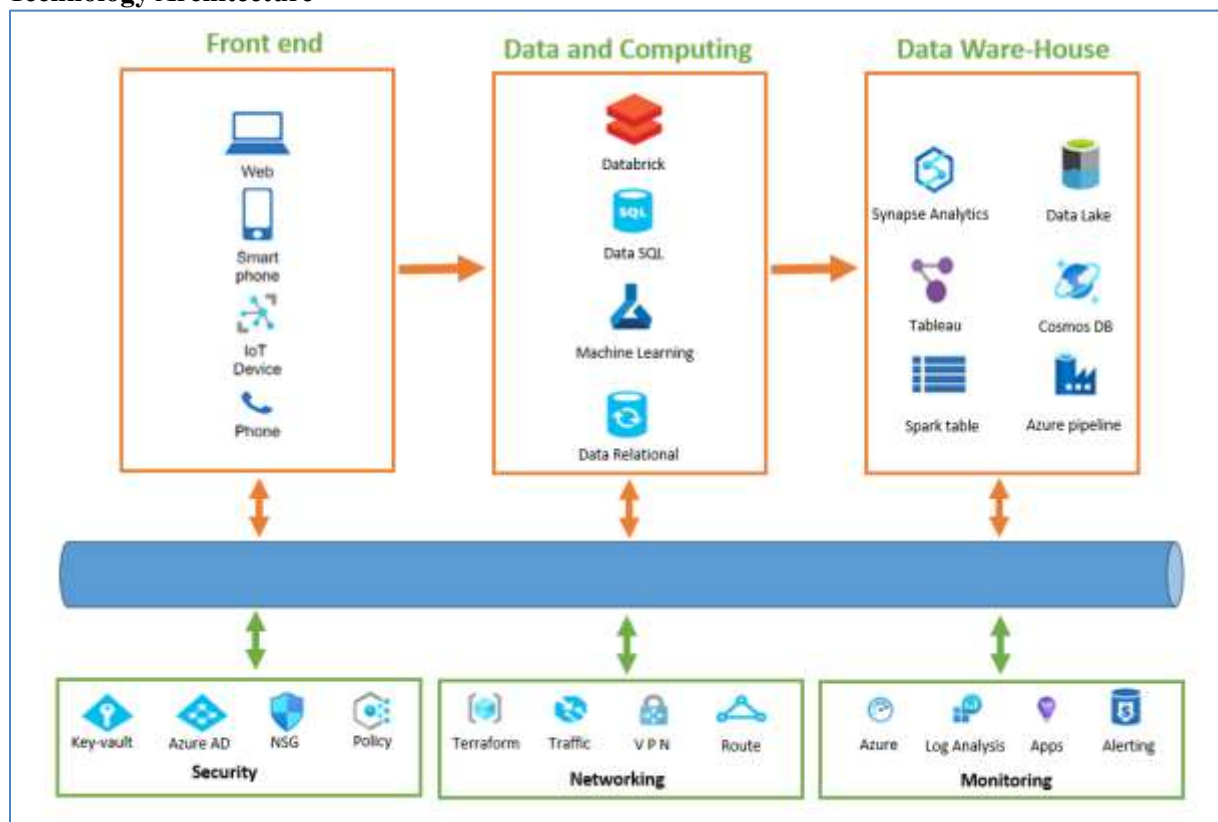


Figure 3 Technology Architecture Real Estate

Source: Researcher Property

Figure 3 represents the all-encompassing Technology Architecture for Real Estate, which includes various essential components for data management, computing, security, and networking in the industry. The Front-end segment consists of a variety of input devices, including smartphones, laptops, IoT (Internet of Things) devices, and phones. These devices function as interfaces for data and interactions, enabling

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users to input and retrieve real-time information, such as property details and client interactions, or monitor property conditions using IoT sensors. In the Data and Computing section, this segment describes the tools and platforms used for processing and analyzing data. Databricks, Data SQL, Machine Learning, and relational databases are essential components for managing and analyzing extensive volumes of real estate data. Databricks offers a consolidated analytics platform. Data SQL and relational databases arrange structured data, and Machine Learning algorithms derive insights and patterns from this data for predictive analytics and decision-making purposes. The Data Warehouse component comprises Synapse Analytics, Data Lake, Tableau, Cosmos DB, Spark Table, and Azure Pipelines. Synapse Analytics serves as a repository for structured data, while Data Lake serves as a repository for unstructured data. Tableau and Spark Table enable users to perform data visualization and analysis, enabling the creation of user-friendly reports and dashboards. Cosmos DB provides the capability to store and access databases across multiple locations worldwide, ensuring global distribution. On the other hand, Azure Pipelines simplify the process of deploying and managing applications.

Finally, Security, Networking, and Monitoring are essential components that guarantee the integrity, safety, and effectiveness of the real estate technology infrastructure. Security measures include encryption protocols, firewalls, access controls, and identity management to safeguard data and systems from cyber threats. Networking infrastructure facilitates uninterrupted connectivity among devices, applications, and databases. Concurrently, monitoring tools supervise system performance, data transmission, and possible vulnerabilities, allowing for proactive measures against any abnormalities or security breaches. The Technology Architecture for Real Estate combines various tools, databases, and security measures to create a solid and flexible technological framework. The system facilitates the effective handling of data, analysis, and visualization while also guaranteeing the necessary security and dependability for efficient real estate management. This allows for enhanced decision-making, improved client satisfaction, and streamlined property administration.

DISCUSSIONS

How can Enterprise Architecture improve real estate system integration, operational efficiency, and market responsiveness?

Enterprise Architecture (EA) is crucial in revolutionizing the real estate sector by improving the integration of systems, operational efficiency, and responsiveness to market demands. EA offers a comprehensive plan that integrates different technological elements, databases, and applications in the real estate ecosystem. By standardizing processes and creating a unified framework, EA facilitates seamless integration between disparate systems used for property management, customer relations, financial transactions, and market analysis. This integration eliminates isolated repositories of data, enabling a more extensive and interconnected dissemination of information throughout various departments and functions.

In addition, EA enhances operational efficiency by optimizing workflows and processes. EA conducts a comprehensive examination of existing systems and practices to identify instances of duplication, inefficiency, and congestion. By restructuring and aligning these processes according to best practices and industry standards, EA helps automate routine tasks, reduce manual intervention, and enhance the speed and accuracy of operations. For instance, it allows for automated input of data, standardized generation of reports, and efficient communication channels between stakeholders, thereby expediting decision-making processes. The role of EA in enhancing market responsiveness is vital. EA empowers real estate professionals to swiftly adjust to market fluctuations and evolving consumer preferences by utilizing data analytics and up-to-date information. By using integrated systems that offer extensive analysis of market trends, customer behaviors, and property performance metrics, companies can efficiently make well-informed decisions. EA's capacity to develop flexible and nimble systems guarantees that real estate firms can promptly change strategies, modify offerings, or adapt operational tactics in accordance with market demands.

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In summary, the strategic application of Enterprise Architecture in the real estate industry not only enables smooth integration of systems but also improves operational efficiency and adaptability to market changes. EA enables real estate companies to enhance their operations, service delivery, and maintain flexibility in a dynamic market landscape by integrating technology, processes, and data.

How can Enterprise Architecture in industrial real estate help adapt to new technologies like IoT and AI to improve customer experience and property management?

Industrial real estate relies heavily on Enterprise Architecture (EA) to facilitate the adoption and utilization of new technology, like intelligent machines and the Internet of Things (IoT). This is being done to improve customer experiences and property management. EA offers a systematic framework for the smooth incorporation of IoT devices into industrial properties. EA facilitates the real-time monitoring of equipment, environmental conditions, and security systems by strategically deploying sensors and IoT-enabled devices across the infrastructure. This implementation not only guarantees efficient management of properties by enabling the anticipation of maintenance needs and optimization of energy usage but also improves safety measures within these areas.

In addition, EA enables the integration of AI-powered solutions into property management procedures. EA empowers industrial real estate to utilize predictive analytics for facility management by incorporating AI algorithms and machine learning models. AI-driven predictive maintenance systems can forecast equipment malfunctions, allowing for proactive repairs and reducing the amount of time that the equipment is out of service. Furthermore, AI-powered analytics can enhance space utilization within industrial properties, resulting in more streamlined layouts and workflows. EA enables the creation and utilization of AI-driven tools to improve tenant satisfaction, thereby enhancing the overall customer experience. AI-driven chatbots and virtual assistants can promptly address tenant inquiries, provide tailored suggestions, and improve communication efficiency between tenants and property managers.

Furthermore, AI algorithms can examine the preferences and behaviors of tenants to provide personalized services, predict their requirements, and generate individualized experiences within industrial properties. Enterprise Architecture serves as a strategic framework that allows industrial real estate to leverage the capabilities of IoT and AI technologies efficiently. By incorporating these cutting-edge technologies into property management procedures, EA improves both operational effectiveness and enhances customer experiences within industrial properties. This creates a more responsive, efficient, and technologically advanced setting for tenants and property managers.

CONCLUSION

The proposed Application Architecture for Real Estate comprises interconnected components aimed at enhancing operational efficiency and elevating customer service. The main constituents comprise Sales and Marketing applications, which are responsible for overseeing sales procedures and customer engagements; the Website component, which is responsible for showcasing properties and enabling online interactions; and the Project Management and System Dashboard applications, which are used for property development projects. The Vendor Management and Inventory components enhance vendor interactions and streamline procurement processes. The Design and Product applications enable architectural design and customization, while the Finance, Accounting, Human Resources, and Legal systems oversee financial transactions and legal matters. The Data Architecture integrates and centralizes crucial data from different facets of real estate operations, facilitating informed decision-making and improved customer service. The Technology Architecture for Real Estate encompasses various components such as data management, computing, security, and networking. These components include input devices, data processing tools, and security measures. The system guarantees the reliability, security, and efficiency of the real estate technology infrastructure, facilitating better decision-making, increased client satisfaction, and more efficient property administration.

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