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ENTERPRISE ARCHITECTURE



Present three industry and three academia view-points about EA, justify and conclude your findings?

Enterprise Architecture (EA) has many definitions, school of thoughts and perspectives. According to Buchanan (2010) EA is a strategic planning process that translates the business vision of an enterprise and its strategy into enterprise change. EA is a collaborative and shared planning process that define a future state vision in terms of models, principles and requirements (Buchanan, 2010). EA team tend to find the future state vision and compare it with the current state for investing into the gap in order to eliminate the differences if any (Oracle, 2009). An effective enterprise architecture program helps in aligning IT investments with long term strategies while reducing risk and helps in delivering high quality information through engineering adaptive solutions and technical services. Oracle (2009) defines EA as the method of organizing that helps in aligning the functional strategies with IT strategies and helps in executing a plan. EA has been considered as crucial in providing the blueprint of organization's current and future environment in addition with process for maintenance and development (Jonkers, et al., 2006). It also helps in optimizing an organization's IT investments and translates the aims and strategies of businesses into attainable technological solutions (Jonkers, et al., 2006).

There exists several different industry standard enterprise architecture framework like Zachman, DoDAF, MODAF and TOGAF. MIT group uses enterprise administrative systems in order to administer the operational aspects that also includes enterprise resource planning, health and safety management and facilities management (Sapient, 2004). The use of Enterprise Architecture is highly used by educational industry in which student's management is also taken care of. The main aim of MIT to use enterprise architecture (EA) for managing students records are to take care of graduate admissions, registrations, alumni systems and enrollment. Zachman (1997) described EA as the set of descriptive representations that are relevant and important in describing an enterprise in such a way that it can efficiently produce an output based on management's requirements and that can be maintained over the period of its useful life (Zachman, 1997).

The Hartford Financial Group also utilizes enterprise architecture to manage insurance, investments, business coverage and employee coverage. The aim of Hartford Financial Group is to maintain an effective enterprise architecture to achieve go-forward strategy. The goal is to maintain an effective and efficient transaction processing system along with timely reporting

procedures. The EA system helps Hartford Financial Group to invest into a centralized shared service model in order to re-invest into value added and forward looking capabilities for driving growth in business. The objective was to move from isolated work streams to coherent architecture for aligning with enterprise data. Hartford Financial Group specially utilizes EA systems for aligning and establishing single source of accountability of the finance data and reporting (Oracle, 2011). EA system for finance data helps in minimizing translation and reducing points of failure through streamlined transformation and data integration. Hartford Financial Group also uses the EA systems in finance department for establishing end to end transparency, auditability and promotion of data sharing (Oracle, 2011).

PHH Corporation build its core IT strength on the basis of EA and consider it to be the right business focus. EA helps PHH Corporation to lead the development of a single holistic enterprise architecture model for the organization as a whole. The EA system of PHH Corporation is closely related and aligned to the business strategy, IT strategy and business operating model. It helps in applying the architectural procedures and techniques all around the enterprise (Oracle, 2011).

On the basis of literature, it can be considered that Enterprise Architecture helps in capturing the essentials of business environment. It presents a whole picture of principles, models and methods that can be used in design and realization of the enterprise organizational structure. It is, hence a valuable asset as it aids in connecting the wealth of interconnections of an organization with its customers, suppliers and partners.

Bernard (2012) presented his view point about Enterprise Architecture. Critique his view point and justify your conclusion.

Bernard (2012) described enterprise architecture as the “analysis and documentation of an enterprise in its current and future states from a strategy, business and technological perspective”. Bernard (2012) specifies that an EA methodology can help in reducing the risk of creating an ineffective EA program or inaccuracy in EA documentation. EA is the think tank of an organization which is being practiced in an ever increasing variety of different circumstances. These circumstances vary from tactical to the strategic, from technical to political and with governance that ranges from sell to tell (Bernard, 2012).

Bernard’s enterprise architecture concept is based upon the framework and seminal article by John Zachman two decades ago (Bernard, 2012). All the attributes of EA systems ranging from tools, methods, procedures, statements, frameworks, usage, values and rules seem to be orderly and definable procedures and approach of an organization (Bernard, 2012). EA works as the foundation of building a better enterprise based on enterprise designing and management approach. According to Bernard (2012) EA results in better information technology planning, decision making and project performance. It also supports or contribute in achieving the strategic and business outcomes.

Bernard (2012) also emphasized on three value add of enterprise architecture. Firstly it supports better resource utilization and planning procedure through enabling top down and bottom up planning approach leading to better resource utilization within the enterprise (Bernard, 2012). Secondly it facilitate into better decision making as it leads to informed decision making and communication amongst all levels of workers/managers in an organization and individual levels (Bernard, 2012). Thirdly, it facilitate consistent communication because of its standard communication and visual models that help in making centralized repository of up to date information at all levels of an organization (Bernard, 2012). However, Berneard (2012) explained that this value added approach of EA systems is dependent upon size and complexity of enterprise, type of performance capacity, degree of duplication in current environment and stakeholders’ acceptance.

Process efficiency and effectiveness is delivered through EA systems in number of ways. For example it may help in facilitating shorter planning cycles, reducing duplicative resources,

reducing cycle times, reducing re-work, improving resource integration and performance, making decision cycles much shorter and improving reference information (Bernard, 2012). It may also help in more effective planning of meetings as well as reduce number of people involved in a process. EA systems do not come without risks and shortfalls. As according to Bernard (2012) there are several risks associated with EA process and systems. These can be financial risks due to cuts during EA execution programs and inadequate initial funding, lack of EA acceptance from all stakeholders and some personnel risks that involves inability to recruit EA specialists on time while retaining them to full level. Other risks includes compliance risks which occurs when projects do not comply fully with EA blueprints. However, EA governance and risk management can help in reducing the risks associated with EA implementation (Bernard, 2012).

EA governance helps an organization to maintain IT investment and closely aligns it with the business and strategic goals. IT resources are allocated to the areas in which the impact on organizational performance is high. EA governance system can be set up in few steps starting with identification of EA program lifecycle phase, identification of EA activities requiring governance, identification of stakeholders involved in EA governance, defining government roles and authorities, mapping governance roles and authorities and finally developing EA metrics (Bernard, 2012). In order to develop an integrative perspective of an enterprise, there are several technologies and techniques used for describing architectures in a coherent manner and communicating with stakeholders at all levels (Goethals, Snoeck, Lemahieu, & Vandembulcke, 2006). According to Goethals et al. (2006) enterprise architecture should be a part of an organization for conducting business in its normal course. It should also be embedded into the classic management processes which the organizations know. EA has played its major role in helping the organization to comply with regulations and acts like Sarbanes Oxley act which was set up as an aftermath of Enron Corporate Scandal. Following this scandal, all the U.S. based companies were required to follow rules to ensure corporate governance and ethical practices at all levels of an organization. These accountability regulations made it extremely important for the organizations to provide necessary accounting information to the auditors as per required by the act. EA has been of great help in designing a system which enables the organizations to conform to Sarbanes Oxley's regulations and provides assistance for necessary insight in an organization (Goethals, Snoeck, Lemahieu, & Vandembulcke, 2006).

CASE STUDY: DELL

Discuss the business problems of the DELL that lead to starting up an EA program?

Dell is a world's largest manufacturers of the personal computers which is outgrown to provide multi-national hardware and infrastructure solutions while expanding country to country. This rapid growth is triggered by the company's large orders involving shipment of 10,000 systems every day to customers in 180 countries produced by 100,000 workers employed worldwide. Recently the vice president of Dell's IT Strategy has found Enterprise Architecture to be useful and mapped out a three year journey road for implementing ten major programs including global service delivery, global quote to cash, solution selling etc. The need was felt due to many issues discussed below.

Dell began its transformation journey from hardware infrastructure provider to software solutions and service provider. This abrupt shift of 27 year old Dell involved embracement of several other countries and products. In order to meet increasing demand of both hardware and software customers, Dell managed to acquire several large companies around the globe during 2010 followed up by acquisition of three new companies in 2011. According to Rhonda Gass, the vice president of Dell's IT Strategy, acquiring new companies only added several layers of new capabilities on the existing systems of IT in Dell which was of no use. This only made things worse as duplication and excessive burden strengthened day by day. In order to grow effortlessly and effectively the need of the hour was to remove inefficient layers and develop a strong solid IT base. This is where need for enterprise architecture was felt as EA can make the company more agile due to excessive cost savings. These cost savings could then be used up by the Dell's management to invest further into other areas for transforming the business.

Enterprise Architecture system was called into action in Dell when the company drifted towards implementing a common electronic payment system for both of its online and offline sales all around the world. This meant for Dell to produce a system which can be deployed globally within 18 to 24 months after establishing 12 different order management systems and 27 different interfaces. This proved out to be a major hurdle in the Dell's journey road as maintenance of customers' and products' data resulted into duplication of data in the data warehouse of Dell. These inefficiencies proved out to be major push back in order management systems of Dell in which

costs were soaring due to maintenance, recording and storing of duplicate products' and customers' data.

Consolidation, standardization and globalization were the key to success which could help the company in moving forward without worrying about the inefficiencies in IT and other systems (Sessions, 2007). Due to multiple acquisitions of different companies around the globe, Dell found itself in the middle of different IT structures pursued by acquired companies initially. In order to rationalize its IT structure, there was a dire need of consolidation of multi-national systems that could lead towards efficiency and effectively managed system (Sessions, 2007)s. The main motive of Dell was to embrace a unified IT structure that could be efficient as well as cost effective by enforcing common standards. In order to take advantage of further opportunities, Dell needed a system which could include a routine planning exercise stemming from thorough understanding of how the company operates. This is where the Enterprise Architecture came into its existence in Dell. EA helped Dell in identifying the capabilities and directed specific IT projects for realizing these capabilities. These projects are then steered further in a most consistent and effective way (Sessions, 2007).

Governance and alignment were the major attractions for Dell to opt for Enterprise Architecture. In order to reduce the time taken for decision making and for eliminating excessive costs, Dell transformed its business operations from that of multiple to unified systems. EA, undoubtedly helped Dell to create principles, roadmaps and reference architectures in order to enforce the best practices. It also aided in the identification of overall need of the enterprise as Dell moved from one tactical project to another. Governance and monitoring are key aspects of EA which helps in defining how one core process relates to other core processes through the organization.

Having involved into software and hardware business in a short term, Dell acquired multiple companies which not only added up the duplication of processes but also made data management a difficult task. In order to minimize the risks and costs associated with data management, EA system was adapted. However, while EA was adapted into the systems of Dell several external and internal factors like compliance and operational business requirement were considered. Overall, EA helped Dell in ensuring compliance with corporate strategies, policies and statutory regulations.

Recommend an EA methodology and describe how DELL would use it.

Many enterprise architectural techniques have come and gone by in last 20 years. However the most important of these are four methodologies namely *Zachman Framework*, *Open Group Architectural Framework*, *Federal Enterprise Architecture* and *The Gartner Methodology*. As the IT systems have become more and more complex, unmanageable and costly to maintain, so enterprise architecture have been emerged as a solution to these problems.

Zachman has defined the enterprise architecture as a set of descriptive element that can be relevant in describing the enterprise in such a way that it can help in managing requirements maintained over its useful life period (Zachman J. , 2006). Enterprise architect provides a long term common view of the resources of enterprise and the way these can be integrated for responding to enterprise drivers. It also helps in elimination of redundancy in business processes while reducing the information complexity.

Dell can utilize the Zachman Framework which is a two dimensional classification scheme of descriptive representations of an enterprise (Zachman J. , 2006). The vertical dimension of the system describes the viewpoints of those who utilizes the models or descriptions and the top row describes the generic perspective of an organization while the lower row is more concrete. It helps the organization to document the systems, processes and people. Dell can use Zachman Framework for developing an integrated IT system throughout the organization. The first column will describe the list of things that are important to the organization followed up by a model specification and data designing. The second column will be based on function of the processes in Dell while the third column will list the locations in which the business operates. The fourth column will list the list of people who are important to the organization and produce a flow chart of an organization. The fifth column will set out the list of event cycles that are significant to the businesses. Based on these event cycles, a master schedule will be developed. The last column is based on motivation in which a list of business goals and strategies will be discussed. A business plan and business rule model will be developed at the last stage which will also include role specification and rule designs (Zachman J. , 2006).

Since Dell is much concerned with the integration and organization of the software assets. The Model Driven Architect (MDA) will help Dell in creating, integrating and maintaining software assets. The main goal of MDA is to help the enterprise architecture in describing the business and

software assets of Dell. By creating the architecture with the software tools, Dell will be able to generate a specific application to implement the architecture and modify them to the organizational needs (Zachman J. , 2006).

The top down and bottom up approach that can be used by Dell is through implementing the architecture in the hierarchy of

- Business architect designing
- Data architect designing
- Application architect designing
- Technical architect designing
- Technical architect implementation
- Application architect implementation
- Data architect implementation
- Business architect implementation

If Dell will use a bottom-up approach it will begin from a very specific aspect and then move to generalized aspects in common. For example the first step will be to obtain all the available data and information and then study it thorough i.e. obtaining information about data of customers and products. The second step would be to develop the use cases (Frankel, et al., 2003). In this stage Dell will analyze the previously developed systems and define the functions newly required of them i.e. previous data management system will be studied and analyzed. The third step will include creation of a Meta model in which customization and specialized modelling languages will be detailed out. The fourth step will be to cartridge the construction. In this stage the working, compilation and packaging of the model applied will be directed. In the last step, unification of Meta models will be done (Frankel, et al., 2003).

Through utilizing the methodology prescribed above, Dell will be able to develop a comprehensive model of transformation from previous data systems to new data storing system. This process can be duplicated for solving all the other problems as well.

Discuss the business benefits expected.

By using Model Driven Architecture (MDA), Dell can expect several benefits. In order to implement the MDA approach, management of Dell needs to educate the management about the risks and benefits attached to it.

MDA is a collaborated approach to design targeted, agile and cost effective IT solutions to business problems and future value added systems capabilities. MDA provides the organizations with several advantages one of them which is, portability and interoperability. Many of the organizations find MDA to be less time consuming as it now takes only four months to complete a project which previously used to take up to seven months (Estévez, et al., 2006).

Dell can enjoy the advantages produced by MDA as it not only generate complete applications from diagrams but also generate all the linkages to integrate the applications from unified modeling language diagrams. MDA process and procedures are ready to produce the codes more quickly than the manual hand coding (Estévez, et al., 2006).

MDA will help Dell in aligning IT systems with the reference architecture and help in identification of the capabilities with the highest returns on investment. As Dell's management understands well the benefits driven by aligned IT systems to be based on retaining the programs (Estévez, et al., 2006). Enterprise architects do not only optimize business processes but also are needed to be equipped with the knowledge that helps in ensuring that each business department conforms to consistent business practices.

The good enterprise architecture will help Dell with the management and oversight of the functions that provides a governance structure which oversees all business transformation activities. It will also help Dell to see that projects it is involved in are carried out and achieve desired results. A well-defined MDA and EA framework also enables Dell to define and model the enterprise as an entire system in all its complexity and dimensions on a continuous basis (Estévez, et al., 2006).

It also enables Dell to collaborate on creation of the future state vision and helps in defining the path forward for managing change of process from current to future vision. It will also focus on key points of integration that are needed by Dell to horizontally integrate business procedures and systems. A good EA system promotes the decisions of enterprise and helps in standardizing the whole IT system across the enterprise while creating economies of scale.

For Dell, implementing an EA system will provide the opportunities to consolidate the environment. These actions will help in simplifying the environment and drive increased value from the investments in IT. Dell will realize the benefits in shape of integration, alignment, investment decisions and collaboration. It will also comprehend the greater responsiveness to the ongoing needs for transforming and improving execution of business vision, mission and goal (Estévez, et al., 2006).

Is there a specific EA framework that DELL has used in the case study? Explain.

Dell is using technology reference model (TRM). It is a component driven approach which is used to identify the standard, technologies and specifications that enable and support the delivery of service components and capabilities. It provides the foundation to describe the standards, technologies and specifications that support the secure exchange, delivery and development of business components (Federal Enterprise Architecture Office, 2003). Gass and her team in Dell utilizes the technology reference model system and provide an architecture review board to govern the long process of transformation. The EA team of Dell, led by Gass and her team, periodically assess the timeline of each project and analyze the transition state of the project with reference to three-year road map.

The technical reference model includes four components i.e. Service Access and Delivery, Service Platform and Infrastructure, Component Framework and Service Interface and Integration. Each component of technical reference model has been taken care of by Gass and her team. The first component i.e. Service Access and Delivery refers to the collection of specifications and standards that support external access and delivery of service capabilities (Federal Enterprise Architecture Office, 2003). The second component of TRM is service platform and infrastructure which refers to the collection and delivery of the infrastructure capabilities and hardware requirements needed to support the transformation system. The third component of TRM is the component framework which refers to the underlying concepts, foundations, standards, technologies and specifications through which components are built and deployed (Federal Enterprise Architecture Office, 2003). The fourth component of TRM is Service Interface and Integration refers to the collection of all technologies, standards and specifications that govern how agencies will interface with a service component (Federal Enterprise Architecture Office, 2003).

Dell has also made it clear to its managers and business process owners that they do not focus on owning the organization instead capability area was more important for Dell. Moreover, the enterprise architects are not expected to define the business processes, instead they are expected to understand the processes and be able to relate it to organizational overall business strategy. This also helps in making each department to conform to consistent business practices, standards and processes.

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