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VISUALIZING THE DOMAINS OF EDUCATIONAL SYSTEM
USING ZACHMAN’S FRAMEWORK

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Introduction

Educational system is a system consisting of people, process, information and technology working within socio cultural boundaries to achieve the defined educational goals. It has its own set of descriptions, models, methods and an information structure classified around a given framework enabling the stakeholders to (those who have invested their money, mind or materials in field of education) use it as a strategic tool for decision making and management support. If we use an analogy from architecture it has base line architecture, target architecture and a transition plan to reach the target from the baseline. The baseline architecture includes the basic outline regarding vision, mission, goals, objectives, strategies, underlying tactics etc associated with the role and functions involved in a institution of education. The target architecture visualizes the future outcomes of the institution once the planned activities are carried out. The transition plan to reach the target from the baseline can also be determined in a conceptual form.

The foremost of expectations and targets we have regarding education is that it is able :

- to increase the quality of learning.
- to achieve the goal along with decreased time taken to achieve them.
- to teach more number of students without reducing the quality of learning.

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- to reduce the cost without sacrificing quality.
- to increase the independence of the learners.
- to bring more flexibility in the educational programmes

In short deliver more with less energy.

Quality in education

Quality in education can be increased by conceptualizing, implementing or using effective methodologies. Educational field has been inundated with methods methodologies and techniques which were supposed to improve the outcomes of each ones work. In order to deal with some of the challenges we face like inefficient processes, redundant systems, obsolete information, lack of integration we need to look at various options available in the field itself or from other fields in the society and see if any implications can be drawn in our area of work.

The system model

One such is the system model which has a system development life cycle. In a system development cycle there are certain steps followed to develop that system. It may be viewed in the following way

- o Strategy
- o Analysis
- o Design
- o Construction
- o Documentation
- o Transition
- o Evaluation

Strategy - it is about the overall plan covering the entire organization. What kind of effort that has to go into making a workable plan for the organization

Analysis - the definition of requirements for a particular area of work

Design - it is application of specific technology specific to the requirement

Construction- it is the actual construction of the system

Documentation -there needs to be certain guidelines or manuals for using such a system

Transition- once the system is implemented it becomes a part of the infrastructure of the organization

Evaluation - the system implemented ought to be monitored so that it continues to meet the needs of the organization

The Zachman's Framework

In 1987,John Zachman published a different approach to the elements of system development. John Zachman is one of world's leading experts and the author of the book "Framework for Enterprise Architecture" which has set standard on how an organization should develop, implement and maintain the enterprise architecture. The Zachman's Framework is a logical structure for classifying and organizing the descriptive representations of the enterprise

In Zachman's approach the elements of system remained the same but instead of representing the process as a series of steps he organized it around the points of view taken by the various 'players'. Each player had a role and functions to perform and required specific information to accomplish the institution's mission. One needs to think of application of these information in achieving the task. One needs to think of the technology services needed to support the application. These players included (1) someone who has undertaken to do business in a particular industry, (2) the business people who run the organization, (3) the systems analyst who wants to represent the business in a disciplined form, (4) the designer, who applies specific technologies to solve the problems of the business, (5) the builder of the system, and finally (6) the system itself. Mr. Zachman represents each of these perspectives as a row in his matrix and the columns specified the focus of each player. It exhibits a reflection of the quote from 'The Elephant's Child' by Rudyard Kipling).

"I keep six honest serving men (they taught me all I know):their names are what and why and when and how and where and who"

Each player is looking at the same categories of information. If the roles played by the players are represented by rows the different aspects of the process examined can be

represented by columns. His entire idea was based on enterprise architecture and business processes.

Educational system and Zachman's Framework

The author wants to suggest that this framework can be very well employed in the field of education also. It can be applied to the study of educational system of a society as a whole or as individual institution entrusted with the objective of imparting education.

	Data (What)	Function (How)	Network (Where)	People (Who)	Time (When)	Motivation (Why)
Contextual	List of things important to the enterprise	List of processes the enterprise performs	List of locations where the enterprise operates	List of organizational units	List of business events / cycles	List of business goals / strategies
Conceptual	Entity relationship diagram (including machinery, attributed relationships)	Business process model (physical data flow diagram)	Logistics network (nodes and links)	Organization chart, with roles; skill sets; security issues.	Business master schedule	Business plan
Logical	Data model (converged entities, fully normalized)	Essential Data flow diagram; application architecture	Distributed system architecture	Human interface architecture (roles, data, access)	Dependency diagram, entity life history (process structure)	Business rule model
Physical	Data architecture (tables and columns); map to legacy data	System design: structure chart, pseudo-code	System architecture (hardware, software types)	User interface (how the system will behave); security design	"Control flow" diagram (control structure)	Business rule design
Out of context	Data design, physical storage design	Detailed Program Design	Network architecture	Screens, security architecture (who can see what?)	Timing definitions	Rule specification in program logic
	(Working systems)					
Functioning	Converted data	Executable programs	Communications facilities	Trained people	Business events	Enforced rules

There are people in education who play the role of Planner, Owner, Designer, Builder, Deployer and User.

Planner's view - In educational field also we have planners who give the contextual perspective to the entire system of education. As a planner we have to define the nature and purpose of education it will not only give a purpose to the activity but also the direction it should take. It paves the way to establish the context for system development effort. If the 'why' of the planner lists the goals like creating a equal society, creating a prosperous country and so on, the 'what' in his list will enumerate the requirements, the ideas , personnel profile and so on.

Owner's view - Their point of view is related to overall structure, functions, organization and so forth this is conceptual perspective where the attributes and attribute values are assigned. If the 'how' of the owner talks about the processes involved in education , the 'who' will be the roles and assigned responsibilities of these roles.

Designer's view - This defines the institutional processes described in step 2, but in more rigorous information terms. Where row two described the responsibilities as perceived by the people performing them, row three describes them specifically as transformations of data. Where row two described all the things of interest to the institution , row three describes those information an institution has to collect and maintain.

Builders view - This describes how interface of men materials technology may be actually used to address the information processing needs identified in the previous rows. It has a more physical or reality perspective. Builders are those who actually implement the targets conceptualized by the planners

Deployer's view - it is a kind of 'out of context' perspective someone who is related to but not the main player of the institution.

User's view - It is someone who actually makes use of the built in system. The impact of implementation is mapped in this phase.

Implications

This approach has several immediate effects on our understanding of education as a system .

First of all, the analysis phase typically takes on two different perspectives: one is to describe the situation in purely workable terms, while the second describes the situation in information processing terms. One is able to navigate the information quickly and efficiently

Second, Mr. Zachman specifically addresses more than the data and functions we usually concern ourselves with. His matrix encompasses data, function, location, people, time, and motivation.

Third, he doesn't call them "phases" or "steps." Each row in his matrix represents the perspective of one of the set of players in the development process. It is more important, he asserts, to recognize that systems are developed by distinct groups with different points of view, than that it is to see the movement of systems from one step to another.

Finally, he does not address either documentation or transition explicitly. The matrix itself provides an organization for system documentation. And transition is the process of moving from the "as is" matrix to the "to be" matrix.

What does it mean to view the development process in these terms?

The major contribution of the Framework is its explicit recognition that there is more at work here than functions and data. From the beginning, we should be recognizing the organizational issues; from the beginning, we should be dealing with multiple locations; from the beginning we should be explicitly concerned with timing - triggers, schedules, and so forth.

We do not have models, or even well developed methods for dealing with many of the cells. Mr. Zachman does not advocate the use of any particular modeling style for those cells where multiple techniques are available, and he is the first to recognize that in some

cells no good techniques exist. It is difficult, for example, to model the logic (row three) of a distributed information network - at least in a way that links to our models for functions and data.

This represents an assignment for us all. He has pointed out things that we should be capturing and accounting for in our systems. It is for us to figure out how to do so.

References

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