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Artifacts in Systems Archeology

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ABSTRACT

Post-Structuralist methods are meant to be used to analyze and criticize structural results. Because of this, these methods could be a useful tool for analyzing and making improvements to systems which were designed using structured methods. Discourse analysis and archeology are good examples of such post-structuralist methods. The first step to developing these methods is to recognize the layers of discourse in the system project. Artifacts of the system such as variable names and transition processes are used to identify the layers and understand the relationships between these layers. This approach can lead to a better understanding of present problems with structure in any system.

INTRODUCTION

When I first came across the concepts of post-structuralism, I was repulsed. Much of what was advanced seemed to be a threat to all, well, structure. After being a bit angry, I began to realize that these folks had a point. I hadn't appreciated the extensive literature on how Einstein's theory challenged or even, perhaps, disproved Newton's theory. I always sensed a fear of science as the reason for such logic. But, the post-structuralists are not saying the flaws in the fringes of science actually disprove science. They are only saying that the fringes are frayed enough to require we search deeper for truth and meaning, if we can achieve either.

Nuclear physics was a shock to me. I think I had been thoroughly convinced that Newton's theory was a complete explanation for all truth. I had similar difficulties with entropy, but everyone said that it really was not a problem. Now that I understand entropy better I know it is a real problem to some of the basic tenets of the Newtonian approach. Both entropy and quantum mechanics wipe out determinism which was a part of my Newtonian philosophy. Of course entropy ends any conception of reversibility and quantum mechanics demonstrates that our view of the universe is always limited by the limits of how we view that universe (or can possibly view it).

The goal, for much of post-structuralist thought, is deconstruction. There are some who see an attempt at destruction or total destruction of the structural viewpoint. But, without the structured viewpoint, post-structuralists would be out of a job. They need something to deconstruct.

Post-structuralist method involves finding weaknesses in the fringes of structuralist thought. Presently, nobody who wants to be regarded as intellectual would dare think or write structuralist thoughts. I still believe that the structuralist formulations do have some relevance when each part of the structure is centered in its own territory. On a warm, sunny day we feel warm; on a cold, rainy day we feel cold. No problem here. When we apply Newton's theories to measuring the trajectory of a bullet we can get excellent results. When the meanings of clearly defined nouns are compared with their real counterpart, we all understand perfectly. There are huge segments of the structuralist structure that do match the reality that was meant to be matched. There are also areas in which we logically extend these absolute relationships between theory (or language) and reality and find useful understanding. And when we successfully make these extensions we find ourselves being committed to the structure more deeply; almost religiously.

The problem with the structuralist approach is that no language or theory can match reality. We find this, often to our surprise, whenever we extend formulations beyond their territory and this time find the results wanting. We were encouraged to make these extensions because we were successful at finding useful results from extending relationships at earlier times.

Even with these problems of over-extension, there is nothing wrong with structure as it does and can serve a purpose. But here, post-structuralism can play the hero by warning us when we have extended our structure too far. Of course, post-structuralism depends on the structure to have something to analyze and criticize.

POST-STRUCTURALIST METHODS IN SYSTEMS ANALYSIS

These limits, also, should be the basis for the use of the methods of post-structuralism in such a mundane and pragmatic field as system analysis. In structuring an information system we make a number of assumptions. The best structuring of such a system results from a structuring that anticipates the most common ways the system will be used. But there are always changes in requirements and of use that leads to problems and difficulties with the structure. This can and will happen no matter how well the system was initially designed. These problems are the fringes. My contention is, the methods of post-structuralism, particularly discourse analysis and archeology, are meant to find the fringes of a structured approach. And there, in the fringes of a good structure, is exactly where our information systems problems lie.

In the territory that the design has well under control we should not need post-structural methods. In fact if we designed well, and followed that design, we should find no problems here. Issues that the design was not meant to solve will crop up where ever the design is weak. This is exactly the philosophic territory of the post-structuralist methods. For information systems the most useful methods of post-structuralism are discourse analysis and archeology.

LEGACY SYSTEMS

In legacy information systems we have a landscape that looks much like the landscape of an archeological site. Much of what is at the site is worthless unless we begin from the beginning and carefully distinguish the layers. Breaking down the layers reveals the changes in the system over time that built up into this mound.

With legacy information systems we also need to determine the discourse that went into the system. The discourse is the process of communication that both formed and is part of the system. In the old hermeneutic systems we separated the text and the context, but said they informed each other. With discourse analysis we use some of the same methods as hermeneutics but the context is part of the discourse and thus part of the total that we are analyzing.

The post-structuralist approach is distinct from the older concepts of structured systems analysis. In the structural method, the emphasis is on dividing the system into parts or functional units while examining the system context, first in wider and then in narrower circles. In a post-structuralist approach we view the discourse as a whole and divide the system into parts or layers of discourse as we examine wider and wider circles in the analysis of the whole discourse. Then we are able to concentrate on individual layers and the changes needed, since we have arrived at an understanding of the relationships between those layers.

SYSTEMS ARCHEOLOGY

The most natural layers in archeology are time dependent. A legacy system has a very similar time dimension. An important characteristics of layers in archeology are the changes in methods from time to time as the culture and people change. These are also relevant to information system archeology and one of the clearest characteristics that can lead

to understanding of computer systems is to distinguish the use of different methods in code, in the user interface, and in other documentation. These differences are brought about by the changes in time, people and the goals of the project.

The layers are not easily recognized in an archeological dig and even more so in a legacy system. In both cases we are looking for artifacts that show the similarity or relationship between this layer over here and that layer over there. An artifact is any information that can help to identify a layer, or clarify or identify the association between two layers. Certain artifacts are extremely easy to identify in an archeological dig such as patterns on the potsherds. A similar artifact for legacy systems is the definitions and methods of data structures and connectivity. These also have changed over time and can demonstrate a definite dating system to our process. Another clear indication of a similar layer is the methods of defining and using variables. Another artifact is the processes and order of programming housekeeping chores.

DISCOURSE ANALYSIS

All of these are enhanced by the understanding that this is a discourse and clues from the discourse, such as indications of changes in data handling and reporting that have been required, are used to further date and evaluate the layers of the overall systems project. For example, when we find certain names on a screen we then look into the code to find the code that puts those names on the screen. This is the type of association we need between one part of the discourse and the other parts.

In the post-structuralist approach we are looking at the fringes of the structure. The structure itself, if the project was designed well enough, will handle the needs related to that structure. That is good, but does not get us to a solution for some new problem that the structure was not primed for. The issues in this system that structure can handle have been hammered out long ago. To solve new issues in our system we can redesign and thus restructure the system or we can look somewhere else for a solution. The methods of post-structuralism provide the right balance to look at the fringes of the project structure and recognize solutions to new problems without rewriting the whole project with a new design and a whole new structure.

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