Pedzi (Zee) Makumbe
Research Project

Title: Lean Enterprise Architecture for System Technological Innovation

Motivation: It's no secret that innovation can make or break any technology-based enterprise, now is there a fundamental way to design enterprise architecture so as to holistically foster system technological innovation?
At an abstract, 40,000 feet view, enterprise architecture is the arrangement of enterprise components and the interactions between these different components in a given context.

Key Questions:
The key question is written below and broken down into three sub-questions:
How does one design an enterprise architecture that fosters technological innovation?
   a) How does one capture and quantitatively / analytically analyze complex enterprise interactions?
   b) How does one architecturally assess innovation?
   c) What are the correlations between enterprise interactions and technological innovation?

Research Design:
Using Pratt & Whitney as a case study, the first stage of this research captures interactions within the engine development organization. Coincidentally, a couple of theses were written at MIT detailing enterprise interactions within the development of the PW4000-94' and the PW4000-112' engines. Nevertheless, in order to enable detailed interactions analysis, I am converting the interaction matrix into networks (graphs), and I am using UCINET and general network theory to analyze the interactions.

The second stage of the research seeks to capture innovations associated with each engine. I am getting the first set of innovations based on the literature review associated with each engine. These innovations are often documented as product improvements that make each engine marketable. Since the airline industry is relatively mature, there are more process innovations than product innovations; hence I will conduct interviews to get the process innovation which are not often flaunted in the public literature.

The final stage of the research is to correlate the interactions and innovation. My hypotheses are based on literature review, and I will conduct interviews/analysis to support them.

Staffing: This thesis research is supervised by Prof. Jim Utterback and Dr. Kirk Bozdogan

Timetable: I expect to get done with this SM thesis by the end of this academic (2005) year.

Expected Products: Thesis and published paper.