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## **SYSTEM DESIGN, ARCHITECTING AND HEURISTICS**

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*Abstract*

The proper design of systems is a critical aspect of industrial engineering and systems management. This paper focuses upon the fact that, especially for large systems, design has become a distinct two-step process: (1) system architecting, and (2) detailed design. Further, there is still some controversy about these two steps and how they fit together. For example, there are several procedures and ground rules for how to architect a system, three of which are briefly explored here. In addition, the detailed design step is discussed in some detail. A rationale is presented for an overall recommended approach, emphasizing the architecting process. It is further demonstrated as to how heuristics can and should play a significant role in this particular domain.

Keywords: heuristics, design, architecture

### **1. INTRODUCTION**

Industrial engineers have been designing and building systems for themselves and their clients since the profession was founded. These systems addressed such areas as factories, inventory control, time management, process reengineering and project management. Indeed, industrial engineers have led the charge toward achieving efficiencies that have, in turn, resulted in profitable operations to allow businesses to thrive and grow.

So it naturally follows that industrial engineers have had to be at the forefront of designing systems, even as these systems have become larger and more complex. Industrial engineers have had to become, or partner with, “systems” engineers in order to meet this type of challenge. A central aspect of this challenge is the appropriate design of systems of many shapes and sizes.

Design is a process of synthesis whereby the designer takes full account of the requirements for the system as well as the fact that many alternatives are usually under consideration. We tend to apply a “systems approach” which may be described by the following [1]: