

Chapter 14

Decision Making and Decision Support Within New Product Development

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ABSTRACT

There is an extensive literature on new product and process development (NPD). However, the analysis of decision-making and decision support requirements in this area is less well researched. The authors discuss decision making in the context of NPD and identify decision types and decision attributes relevant to the NPD context. They illustrate the approach by analyzing NPD decisions in three industrial cases with a focus on early stage NPD decisions. They create a set of attributes with reference to the decision making literature. They find these attributes can be used to codify decisions in order to characterize them. They find the design decisions in these case studies to be creative and brainstorming-led with a low level of structure. The results provide insights both on decision making in NPD in practice and on the requirements for Group Decision Support Systems (GDSS) in this area. The authors suggest that an argumentation-based GDSS that allows structure to be developed may be suitable for these decisions. The cases are used to illustrate the application of the approach and show an interesting set of example decision types but do not cover the range of NPD decisions that may be evident in a larger set of companies.

INTRODUCTION

A new product development (NPD) process requires decisions to be made about many aspects of the product and related production processes. Decisions are also necessary about the product

development project itself, e.g. deciding whether or not the development project should continue. These decisions are often made by groups that may be co-located in time and space, or not co-located in either dimension. Decisions can be strategic, tactical or operational. Some decisions

DOI: 10.4018/978-1-4666-4478-6.ch014

may be urgent, risky or, both. Decisions can, and frequently do, involve group members in partner organizations. An organization also has to make decisions about the portfolio of NPD projects it manages. In order to facilitate these decisions a Group Decision Support System (GDSS) may be helpful.

Here we consider the types of decisions that may arise in NPD. We present a set of decision attributes that are relevant in this context. Decisions can be characterized using this set of attributes. We illustrate the approach by analyzing early stage NPD decisions in three industrial case studies in which we find that the attributes identified are suitable for research into the process and content of NPD decision-making. The approach provides insights into the nature of NPD decision-making and uncovers aspects of decisions that are relevant to identifying the requirements for, and the design of, GDSS for NPD.

BACKGROUND

Models of the Product Lifecycle and New Product Development

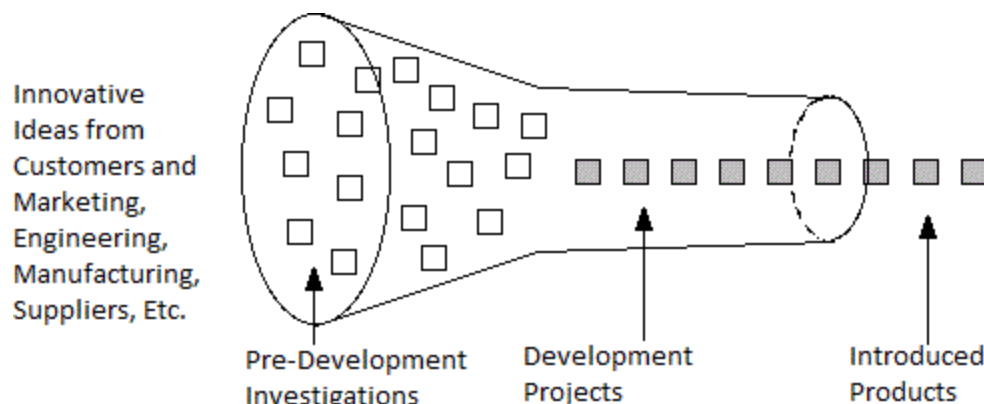
Numerous models exist that either describe or structure the product lifecycle. For example, Saaksvuori and Immonen (2002) discuss typical

product lifecycle phases of: Definition, Design, Sales, Manufacturing and Service. They show these as stages with the product moving from one to the next as it moves through its lifecycle.

Definition involves the early stages where the purpose of the product and the aims of the project to create it are defined and recorded. At the Design stage, the product specification becomes more concrete. The Sales stage is where market interest is generated and Manufacturing is where the product is created and sold. Service relates to the continued modification of the product in order to keep it competitive and the provision of any maintenance or services needed for the product. Not shown in this sequence of phases is the end of the product lifecycle, when the production is gradually reduced and the product eventually drops from the product portfolio. This stage can leave behind demand for products such as spare parts that allow existing customers to continue using previously sold products.

The New Product Development (NPD) process exists within the earlier stages of the product lifecycle, described in detail by authors such as Wheelwright and Clark (1992). It is often modeled as a funnel (see Figure 1), illustrating the expectation that a higher attrition rate occurs across an NPD portfolio at the early stages (Wheelwright & Clark, 1992). New product development and the overall portfolio of development projects be-

Figure 1. New product development funnel (adapted from Wheelwright and Clark (1992))



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