# Functional Approach to Subversion Analysis in New Product Development

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**Abstract.** It is essential when developing a new product to identify and eliminate the most critical potential failures in the product before they occur. These potential failures can be eliminated in advance, making the new product development process faster and less costly. The primary tool currently used for this purpose is Failure Mode and Effect Analysis (FMEA), which identifies potential failures and their causes. However, since FMEA relies on the personal expertise of team members carrying out the FMEA, this tool is subjective and, hence, not very reliable. To make a potential-failure analysis more objective and robust, TRIZ offers a special tool called Anticipatory Failure Determination (AFD), which can improve or even replace FMEA. AFD provides a set of checklists to help detect typical failures and uses another TRIZ tool called Subversion Analysis to identify possible scenarios for these failures. Nevertheless, a brand-new product may have new critical failures that have never been encountered before and were not included in the checklists. Such failures may be missed by both FMEA and AFD methods. The aim of this work is to enhance the AFD and make it more reliable and easier to use to identify the most critical failures that can occur in a brand-new product. This goal is achieved through the combined use of Function and Subversion analyses. A case study is provided to illustrate the proposed approach.

**Keywords:** Anticipatory Failure Determination, AFD, FMEA, Function Analysis, New Product Development, NPD, Subversion Analysis, TRIZ.