Achieving long-term modularization benefits: A small- and medium-sized enterprise study

Long-term commonalities and experiences with modularization in comparable small- and medium-sized enterprises have been identified as a research gap. This article contributes by describing a unique collection of experiences from companies that received a similar introduction to the same core modularization topics through a series of introductory initiatives. This shared introduction makes the projects and processes of the companies comparable. The study reveals three main aspects of achieving significant long-term benefits from modularization initiatives: the company must (1) aim big and be willing to change its foundation accordingly, (2) draw on the right positional strength and have broad organizational inputs, and (3) properly coordinate work and then actively seek to preserve the focus and results over a long period of time. Interviews were conducted with representatives from 12 of these companies. Qualitative and quantitative data obtained from the interviews were used to draw parallels between the definition, execution, and impact of modularization. The stated results and project circumstances show commonalities for the successful implementation of modularization. They indicate which actions lead to the desired changes and secure the results persistently. The participants have achieved various results, such as strategic changes, new architectures, fewer variants, higher product earnings, and new development processes. Some have also introduced maintenance plans to secure the results, such as establishing configurators, performing weekly analyses, recruiting dedicated personnel, and so on. The interviews revealed several influencing factors, such as management support, internal communication, organizational drive, proper facilitation, and prioritized project management. They also indicated that significantly more improvement can be achieved with proper goal setting and commitment to specific goals. These are the factors that can help future small- and medium-sized enterprises in the proper incorporation of modularization and in maximizing their exploitation of modularization theory.