

The Requirements Management Framework as a support tool for designing sustainable product-systems

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New Product Development (NPD) is a process that goes beyond the organizational boundaries, impacting suppliers, costumers, the environment and the society. Companies committed with sustainable development need mechanisms to spread the company principles to the staff and to partners.

This paper aims to demonstrate the application of a Requirements Management Framework (RMF) focused on sustainability in the project of a diaper system. This framework was theoretically described in previous papers but its application in a case was not detailed.

The framework includes the activities of related to requirements of NPD models, and a strategic stage. The latest was included to align the NPD process to the company sustainability goals, ensuring that the new products reflect the organization commitment with the environmental, economic and social dimensions of sustainability. The case was conducted within two projects supported by CNPq, the Brazilian Research Council: the Inclusion Factory project, which gave the strategic directions, and the subproject of the diaper system.

The RMF proposed fills the gaps concerning requirements left by NPD models, especially the inclusion of demands of diverse stakeholders, consideration of requirements for the various subsystems related to the product production and consumption and the consideration of business requirements in NPD as a way to align product development to sustainability business strategies.

The RMF is composed by three stages and eighteen tasks to ensure that new products reflect the organization commitment with environmental, economic and social sustainability dimensions. Stages one and two are of strategic nature and the purpose is to define the business sustainability requirements from the business goals.

The business requirements identified in stages 1 and 2 are generic for all Inclusion Factory products, not only for the diaper system. These requirements were graphically organized in a tree diagram representing the roots of the new products – in this case the roots of the diaper system. These business requirements are non-functional, but necessary to keep the business sustainability goals in mind during the design process.

Stage three consists in a set of activities concerned with the requirements of the diaper system. In this stage, all information about the project was analyzed and many demands for different elements of the system were identified. The mapping of the system elements during this activity is part of the process because not all the demands are directly related to the diaper.

This clarification is important because it helps the developers to properly design the product-system. The elicited demands were converted into requirements following the requirements management theory and allocated to the suitable element of the system (product, materials, technology and process). After, the elements identified for the diaper system were inserted into the tree diagram and the dependencies between the elements and business requirements were marked.

This initial diagram works as a roadmap for the development team, growing as the project progresses. The RMF helps to deal with the complexity of the sustainable projects, setting a light on the relations between the different system elements and stakeholders demands.