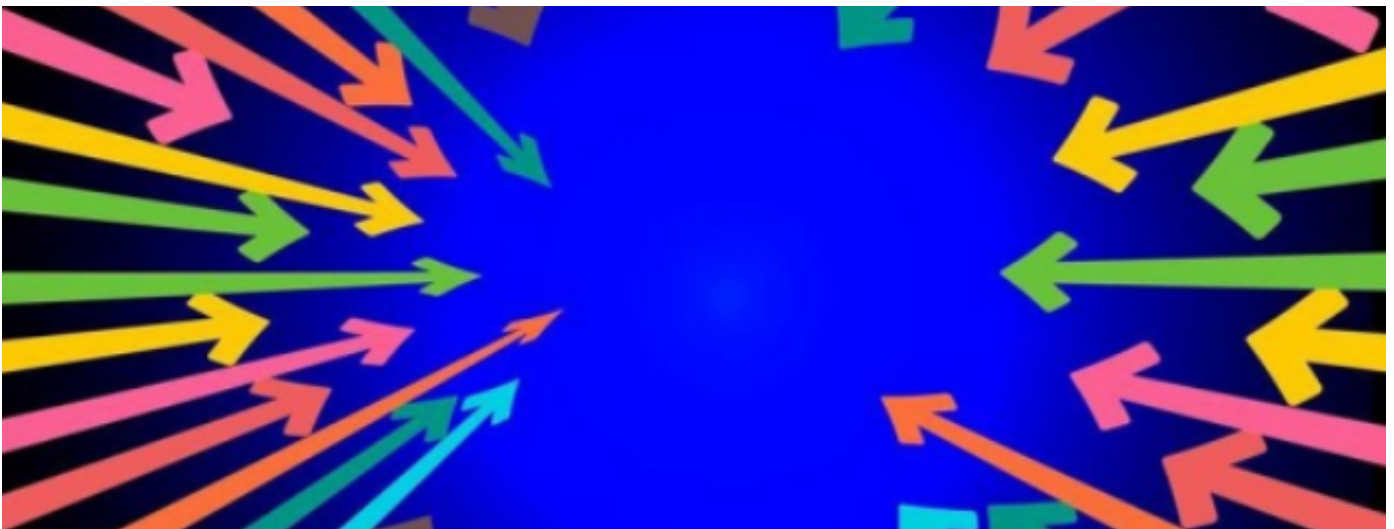


Goal-oriented product development

Successful innovation starts with structured requirements management

It is crucial for the success of product development that it is consistently oriented towards the potential needs of users - because "overengineering" leads to the development of functions that do not generate revenues despite innovative new features. The implementation of requirements management can provide a remedy.



overengineering is a common problem in product development - how can it be avoided and what methods can be used to achieve this? You can find tips here.

Let's start with a phenomenon that occurs in this or a similar way in many companies: A committed development manager in a successful medium-sized mechanical engineering company has every reason to be proud of his work - together with his team and external specialists, he implemented multi-project management three years ago and thus significantly reduced the product development time from four to three years. Today, development, product management and sales work successfully in cross-functional teams. And product management is also pleased that the shorter development times have enabled innovations to be launched on the market before the competition, thus significantly increasing turnover.

The only downer is the fact that of all things, the high-end variant with many innovative new parts fails to sell.

In focus: user requirements and needs

In fact, this problem not infrequently occurs in particularly innovative companies - often because requirements management is lacking. It leads to ambitious and highly specialised engineers developing high-tech products in which customers show surprisingly little interest despite outstanding new features.

The real challenge therefore lies in the correct, i.e. targeted use of the "technology push", i.e. the development of new products from the company's own innovative strength. The decisive factor for success, even with such in-house developments, is that they are consistently oriented towards the potential requirements and needs of customers.

Keeping the solution space open

However, identifying these is often not that easy. This is because the problems in product development usually begin precisely when a customer says what he or she supposedly wants. In the capital goods sector, for example, it is common practice for customers to express their product wishes in conversations or e-mails to the customer advisors in sales or product management. The problem here is that customers unconsciously formulate their ideas for solutions instead of really only describing the concrete application or the challenge to be solved. This narrows the scope for solutions at an early stage and increases the risk of a wrong development.

"While this is perfectly understandable, it is unfortunately not goal-oriented, because it often leads to the actual requirements being recorded neither precisely, nor completely, let alone systematically."

Gunther Reibe, Principal at CO Improve

Structured requirements management begins in the customer consultation

For example, a customer might ask for a new, higher forklift truck to serve a planned high rack. Reibe: "At first glance, this seems to make everything clear. But be careful! The desired forklift may not even be the optimal solution for the requirement that actually exists."

If such solutions are passed on unfiltered to the development department, as a rule no one will check whether there are perhaps other, more suitable solutions for the customer's needs.

„Another striking example is the definition of buttons for a mobile phone. If physical buttons had actually been named as requirements, today's smartphone with a touch screen might not have been developed.“

Systematically capture all aspects of requirements

Things are different in a structured process in which the customer advisor is aware of his crucial role in the product development process and records the customer's requirements in a central system and thus passes them on unfiltered.

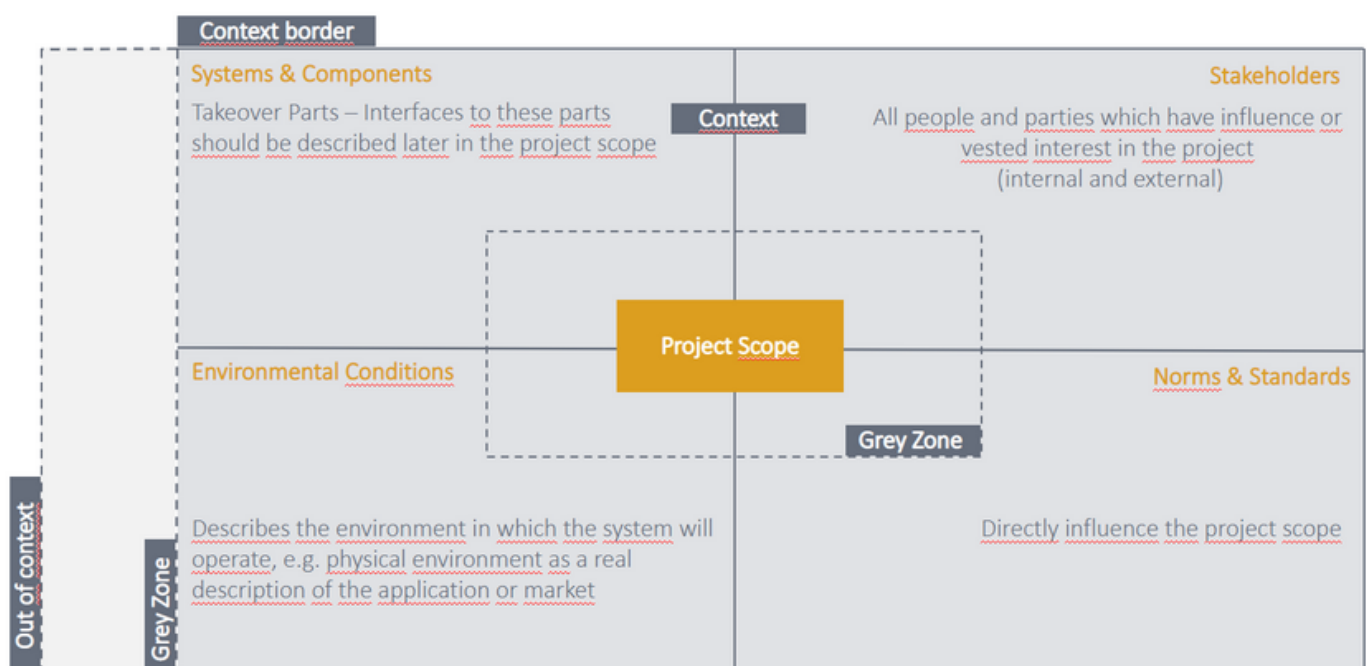
„In this way, it opens up the opportunity for the developers to develop their own, perhaps much more suitable approaches to the customer's problems. Perhaps in the case described, for example, a robot integrated into the shelf would be the better and cheaper solution for the customer's use case?“

Misunderstandings, ambiguities or missing information can also be reduced to a minimum in a structured process when passing on the information, because a transparent process with appropriate tools and structured exchange between all those involved actually systematically records all aspects of requirements.

Customer consultants and developers play in the same team

In successfully implemented requirements management, all information about the use of the product to be developed, i.e. its use cases, as well as requirements for the product (functional and non-functional) are documented centrally in a software with a uniform language (syntax).

A structured process is used to record, evaluate, prioritise and further develop the requirements. All changes in the requirements are also documented in a structured way via a corresponding versioning system. "In this way, they remain traceable at all times. In this way, customer advisors and developers can cooperate optimally," adds Reibe.



Professional requirements management enables companies to optimally utilise all available resources, for example, also the market knowledge of customer advisors. (Image: CO Improve)

Distinguish clearly between requirements and specifications

In practice, one can repeatedly identify different reasons for unsuccessful developments. Frequently mentioned are

- Lack of user involvement in the development process,
 - continuous or uncontrolled growth in project scope after the start of the project,
 - too few resources,
 - unrealistic expectations,
 - incomplete or constantly changing requirements, or a lack of differentiation of burdens and duties.
- Requirements specifications describe the requirements, which are recorded on the basis of the situation at the customer.

In the requirements specifications, on the other hand, the developers' responses are described as a technical obligation or specification. It is important to clearly delineate both categories. Only in this way can it be clearly understood whether a selected requirement is also implemented in the product.

At the same time, it can be ruled out that the developers add features that are not needed, because there is a clear link between requirements and technical specifications.

Eliminate sources of error in the early phase

Requirements management is a process that sets the course for a successful project. "It does mean that there is more effort than usual at the beginning of the project" explains Reibe. "The advantage is that intensive discussions by the project team to evaluate and prioritise the diverse requirements can eliminate mistakes that can lead to significant delays and additional costs in later phases of the product development process."

Although structured and systematic requirements management can be implemented technically and procedurally in the fairly short term, until it is successfully implemented, i.e. properly applied, companies must be prepared for a longer-term change in awareness and culture as well as a thoroughly demanding learning process.

„It is important to first create an awareness of the necessity of the introduction at all levels of the company involved. Even if the decision to introduce the system is made by the management, it is crucial that it is supported by the employees. In this way, considerable efficiency gains and above-average customer satisfaction can be generated in the medium and long term.“

Structure needs method

In order to implement structured requirements management, not every company has to reinvent the wheel. Rather, a variety of models, methods and tools already exist that support process structuring. Here are some examples:

- **Overview charts of the roles in requirements management**, such as
Requirements Engineer - Process Owner, responsible for the correct implementation of requirements management.
Key User - main user of the requirements management software, supports trainers and internal adaptations of the software to company specifics
Project Manager - content-related and monetary responsibility for a product project
Product Management / Sales Account Manager - central interface to customers, for identification, collection and documentation of use cases and requirements;
- **Context diagram** supports the description of the environment (system, product, company environment); this shows
which elements have already been developed and need to be integrated into the product/system (such as modules, components), which external factors cannot be influenced (such as laws or standards),
which environmental influences have to be taken into account (e.g. extreme cold, heat, certain ground conditions, etc.)
which stakeholders are involved and
which factors outside the context are relevant.
- **Lifecycle Tree Structure**: Structure of the essential functions of the product to be developed in the lifecycle; this helps to record the requirements of the product and to assign the requirements to the functions.
- Powerful **documentation software**, for example Polarion, PTC Integrity, Doors, or others - to document the requirements, including versioning.
- **Basic type matrix**: Efficient tool to create initial basic types of complex products from the requirements and to give an indication of scope, budget and manufacturing costs.

Structure needs individual design

Which of the diverse models and methods are used should be carefully coordinated and developed with the employees involved. "This is all the more important because the necessary cultural change and learning effort can only be achieved with the corresponding enthusiasm and commitment in the company," Reibe sums up. A consultant and implementation partner should therefore not only have professional competence, but also sound experience in the field of change management.

Realising developments in a targeted manner

The ability to innovate is one of the core competencies of modern companies. However, it is not only the volume and speed of innovation that is decisive for success, but above all how efficiently and purposefully developments are realised. Professional requirements management enables companies to optimally utilise all available resources, for example, also the market knowledge of customer advisors. For the introduction of a structured requirements management, it is advisable to use the support of professionally competent consultants who are versed in change management. This ensures that the new structure and culture is actually lived and internalised by all employees.