

# Continuous product improvement through design feedback or: how designers can effectively learn from design flaws

## Background

- **Design flaws** in finished products happen – even though state-of-the-art product development methodology has ways to detect and prevent such flaws (e.g. FMEA, prototype testing, etc.) before a product reaches the market.
- Such flaws, which can be defined as any design features that lead to an unexpected decrease of **product quality**, may reach from poor ergonomics to the total failure of the product.
- On the other hand, we all have experienced how products can **improve** – not only in terms of performance and functionality but also by not featuring the same design flaws as their predecessors. As trivial as this observation may seem, it raises the question what design-related processes lie beneath this phenomenon.
- As far as discovering a design flaw is concerned, it can be assumed that the **feedback** of those who interact with the physical products in practice – the individuals who maintain, repair, recycle but essentially use the products – plays an important role.

## Product example

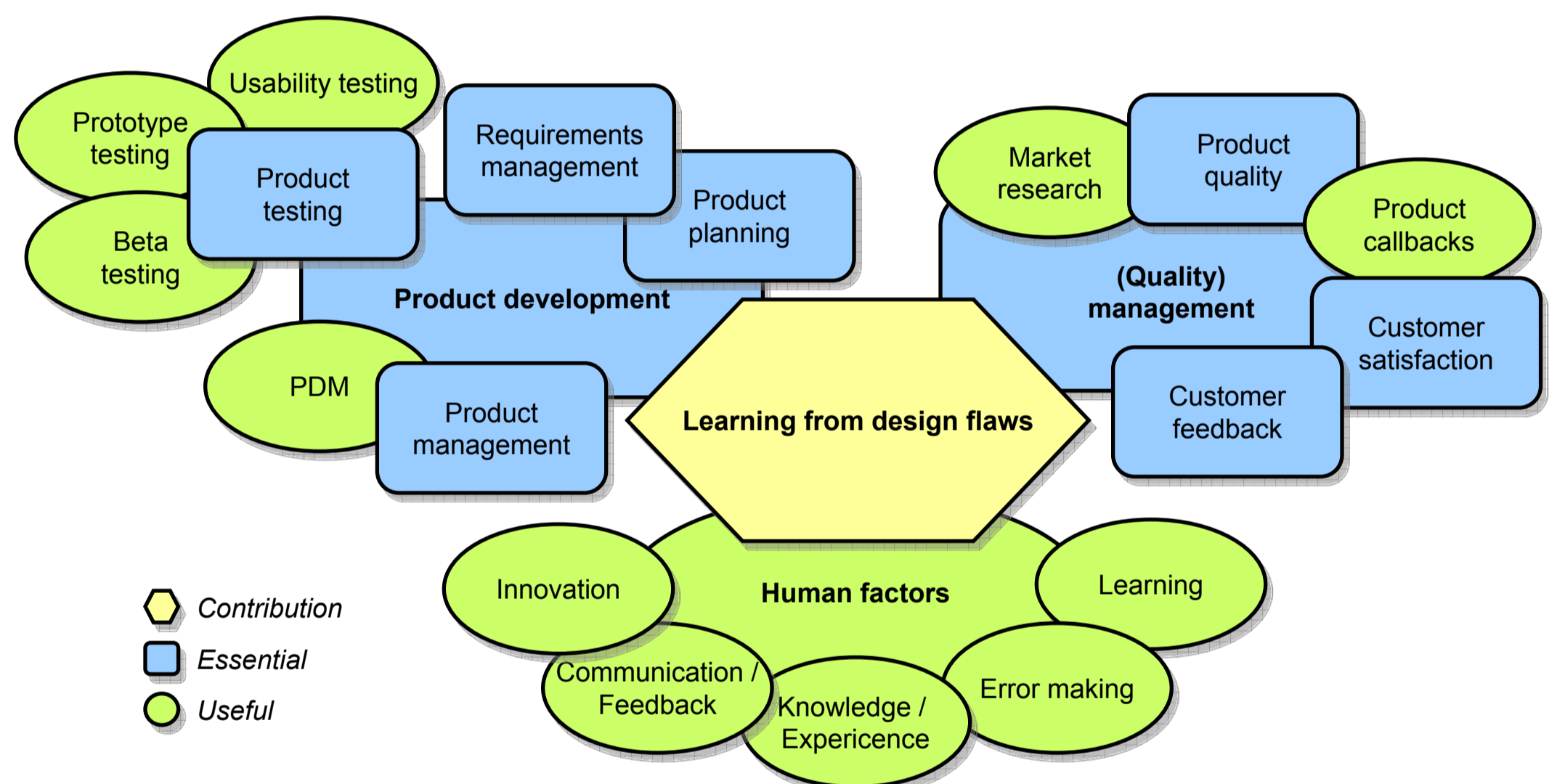
The centre of the controller key of the Nokia 6230 mobile phone (left) turned out to be difficult to press. The successor model 6230i (right) featured a modified controller.



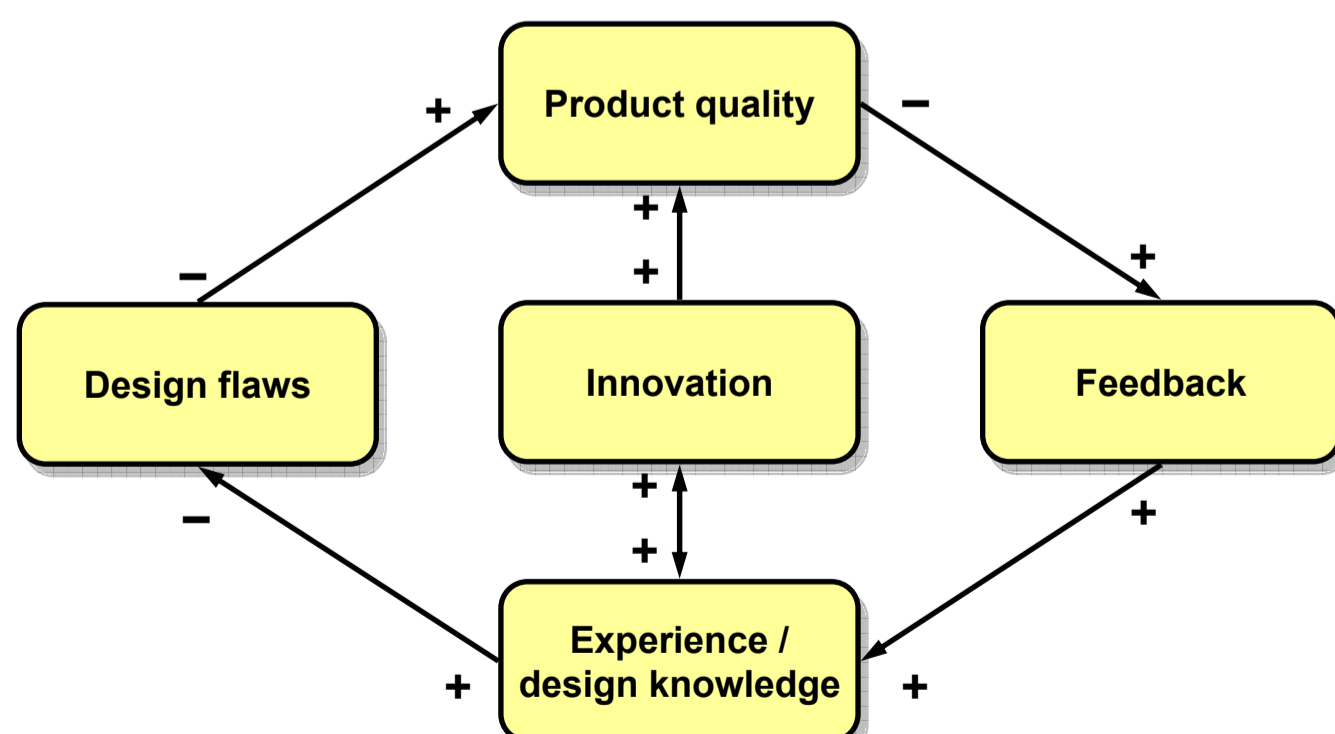
## Research questions

- What is the nature of design flaws and how do they relate to specific product characteristics, e.g. complexity, batch size and life-span?
- (How) do the designers of a company become aware of design flaws of their products?
- Depending on the severity of a known design flaw, what are common strategies for dealing with it?
- What are successful strategies for preventing design flaws from being repeated?

## Theoretical foundation model



## Reference model



## Research approach

1. Criteria formulation: the degree to which product quality improves as a result of correcting a design flaw is taken as success criterion.
2. Detailed descriptive study (until recently): empirical study to obtain a better understanding of how designers learn from design flaws by identifying the various factors of this phenomenon and to collect data on the measurable criterion of how successful designers they corrected a specific design flaw. Method: mail and internet survey of N≈1000 companies. Perhaps case studies.
3. Initial prescriptive study: strategy/methodology development

## Goal

To lay the foundations for a strategy/methodology for the continuous improvement of product quality through design feedback

Dipl.-Ing. Bruno Gries  
Technical University Berlin  
Engineering Design and  
Methodology Group

E-mail: gries@ktem.tu-berlin.de  
Web: www.ktem.tu-berlin.de

