A ROBUST DESIGN METHODOLOGY PROCESS

Why?
The need to identify Robust Design Methodology (RDM) practices suitable
for all parts of product development (PD). The company studied wanted
to develop a RDM sub-process in their PD process.

What?
The purpose of this paper is to describe and evaluate a process for RDM practices
throughout PD.

How?
An empirical study by two researchers
together with a practitioner, based on an
action research approach.

Where?
A study at a Swedish medium-sized (250 employees) manufacturing company,
aiming to develop a Product Robustness Process (PRP) as a sub-process in their
product development. The company is
developing, producing and selling their
own patented high-tech product.

Key Characteristics
Three crucial characteristics of the PRP:
1) Focus on practices rather than tools.
2) The PRP is fully integrated with the PD
process, and follow-up of RDM practices
are included at the gate reviews.
3) The PRP is followed up on RDM related
outcomes.

The Product Robustness Process

One approach: P-diagram

Noise factors (examples)
- Manufacturing imperfections – variation in hole diameter
- Wear out – extraction force affected by customized
  accessories
- Customer behavior – variations in how accessories are
  attached/taken out
- External environment – moisture
- Internal environment – variation in diameter of
  accessories’ pins

Mitigating actions
- Examples: Control methods for assuring
  extraction force
- Evaluate welding alternatives to protect from
  moisture
- Test suppliers’ process
capabilities

Control factors (examples)
- Manufacturing imperfections – tolerance chain analysis
- Wear out – design dynamic holes
- Customer behavior – new connector robust to ways of
  attaching/taking out add-ons
- External environment – new welding procedure
- Internal environment – design dynamic holes

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