

Sustainable factor input in product-service operation

by

Katja Gutsche

University of Applied Sciences Ruhr West
Mülheim, Germany

Katja.Gutsche@hs-ruhrwest.de

Sustainable factor input in product-service operation

Content

1. Motivation
2. Human work load in product-service operation
3. SSSM – Service-Strain-Stress-Model
4. Summary

Sustainable factor input in product-service operation - Motivation

Focus on service tasks for the usage phase within the product-lifecycle

→ SMART ASSET / SMART FACTORY

„Increase of product variety and complexity“

„Human-to-machine interaction“

„Demand for zero waste in product operation“

„Greater responsibility for employees“

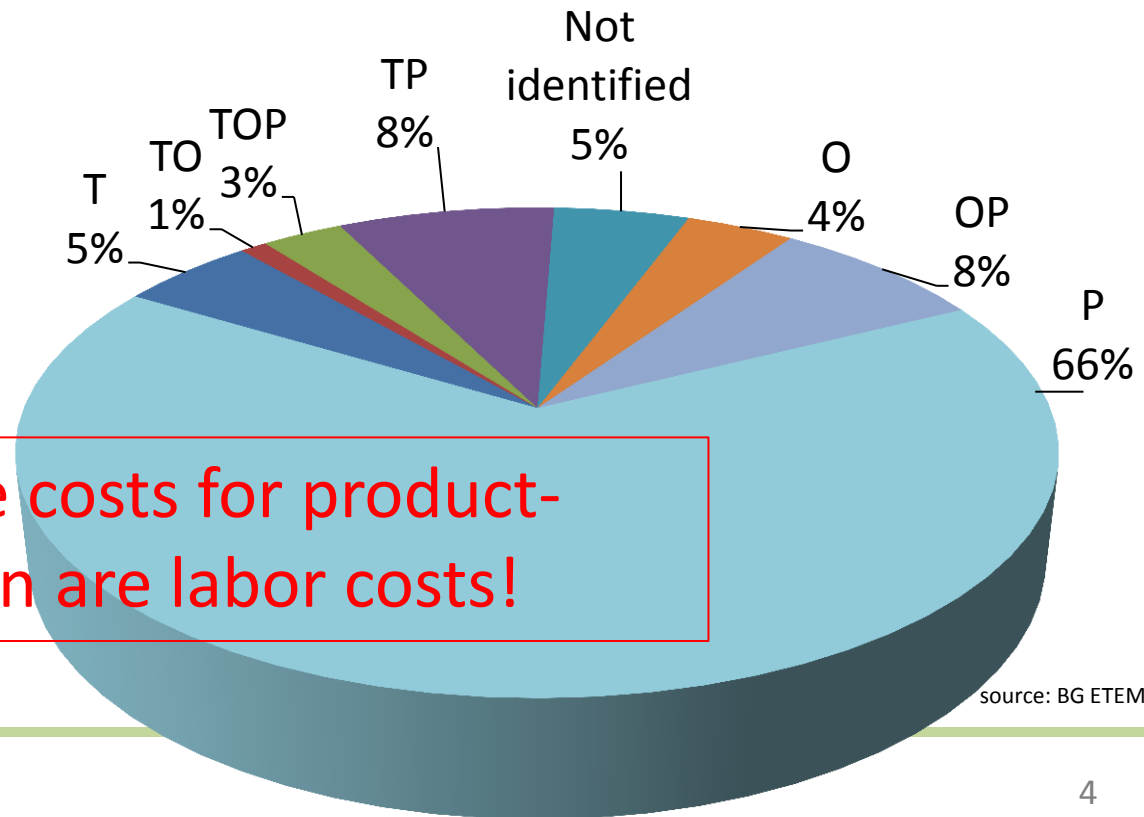
Sustainable factor input in product-service operation - Motivation

Reasons for failures categorized according to the TOP-factors

T – Technical

O – Organisational

P – Personal



Appr. 80% of the costs for product-service-operation are labor costs!

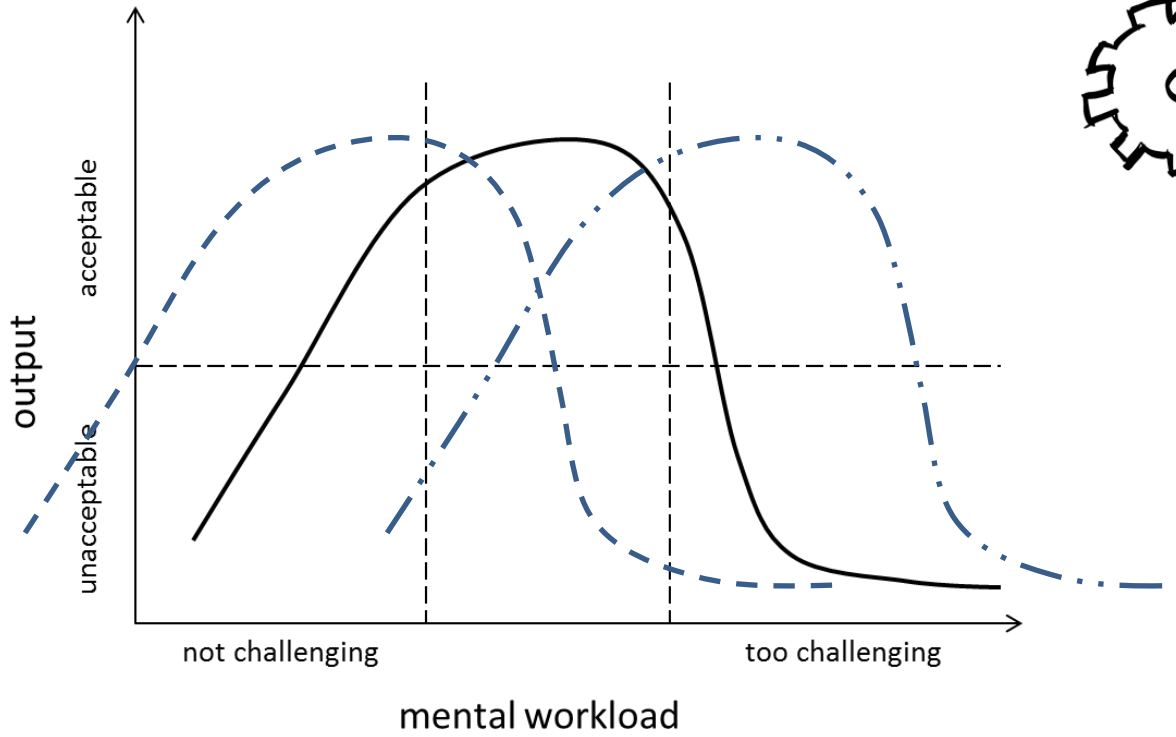
source: BG ETEM, 2012

Sustainable factor input in product-service operation – Human work load

Human



Task



source: referring to Johannsen, G., 1993; Schlick et al., 2010

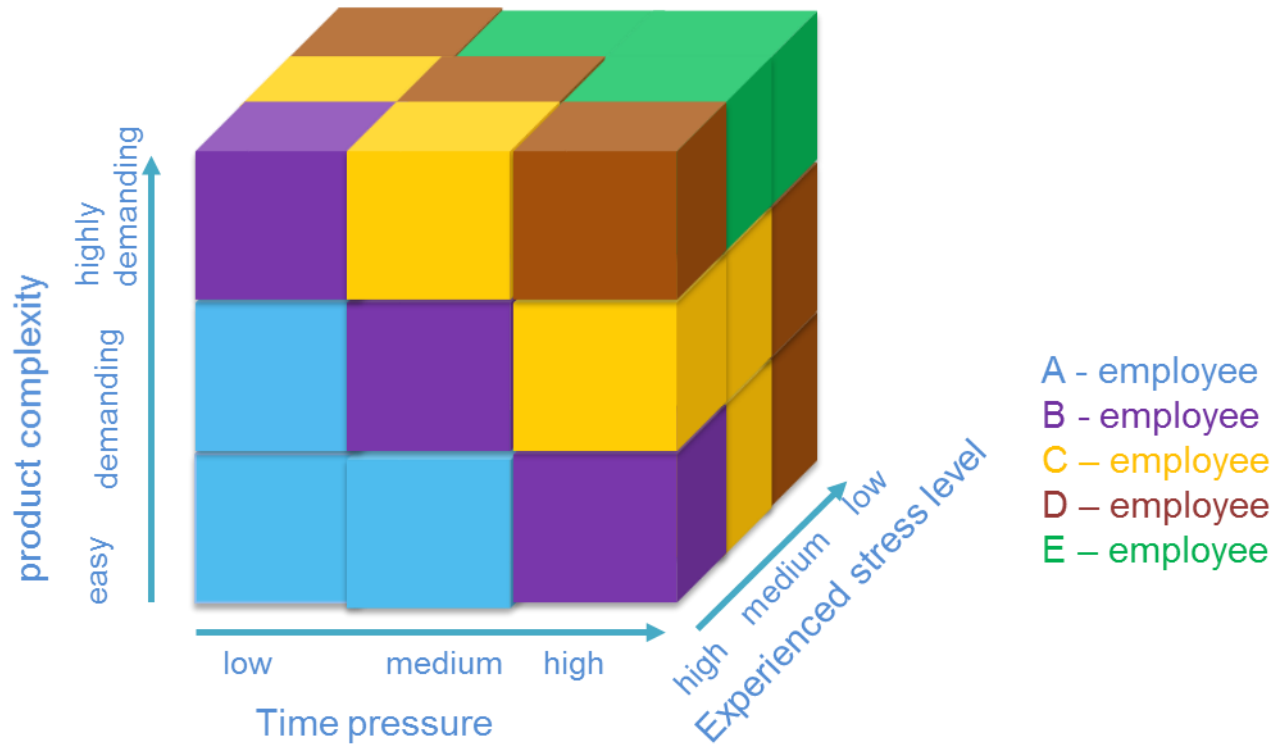
Sustainable factor input in product-service operation – Human work load

Human error probability within product-service-system operation

strain	Average error probability				
	>>	>		<	<<
Simple tasks, high number of repetition, sufficient time available in familiar situation, simple product			1*10E-3		
Complex tasks, high number of repetition, sufficient time available in familiar situation, certain care needed, simple product			1*10E-2		
More complex task, performed regularly, unfamiliar situation, limited time, complex product			1*10E-1		
More complex task, performed rarely, unfamiliar situation, limited time, complex product			3*10E-1		
highly complex task or very rarely performed, unfamiliar situation, limited time, (very) complex product			1*10E-0		
Employee category	A	B	C	D	E

Sustainable factor input in product-service operation – SSSM

SSSM - Service-Strain-Stress-Model



Aim: matching betw. service task complexity and individual competencies

Sustainable factor input in product-service operation - Summary

- SSSM for a sustainable use of human workforce
- SSSM as decision support tool for personnel requirements planning
- SSSM so far a qualitative model
- Currently evaluation process, primarily with chemical industry partners

Sustainable factor input in product-service operation

Thank you for your attention!

Prof. Dr. Katja Gutsche

E-mail: katja.gutsche@hs-ruhrwest.de