Buskerud University College: Program Systems Engineering

by Gerrit Muller University of South-Eastern Norway-NISE

e-mail: gaudisite@gmail.com

www.gaudisite.nl

Abstract

The focus of the Systems Engineering program of Buskerud University is on multidisciplinary design fitting in the market and application needs and usable in industrial engineering processes. The research agenda focuses on reliability in rough circumstances and on innovation or agile architectures. As application domains the research will focus on system and supply industry as present in Kongsberg, such as sub-sea.

This is a rather preliminary agenda, under discussion with the Buskerud stakeholders.

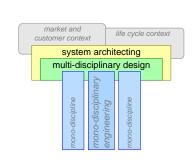
Distribution

This article or presentation is written as part of the Gaudí project. The Gaudí project philosophy is to improve by obtaining frequent feedback. Frequent feedback is pursued by an open creation process. This document is published as intermediate or nearly mature version to get feedback. Further distribution is allowed as long as the document remains complete and unchanged.

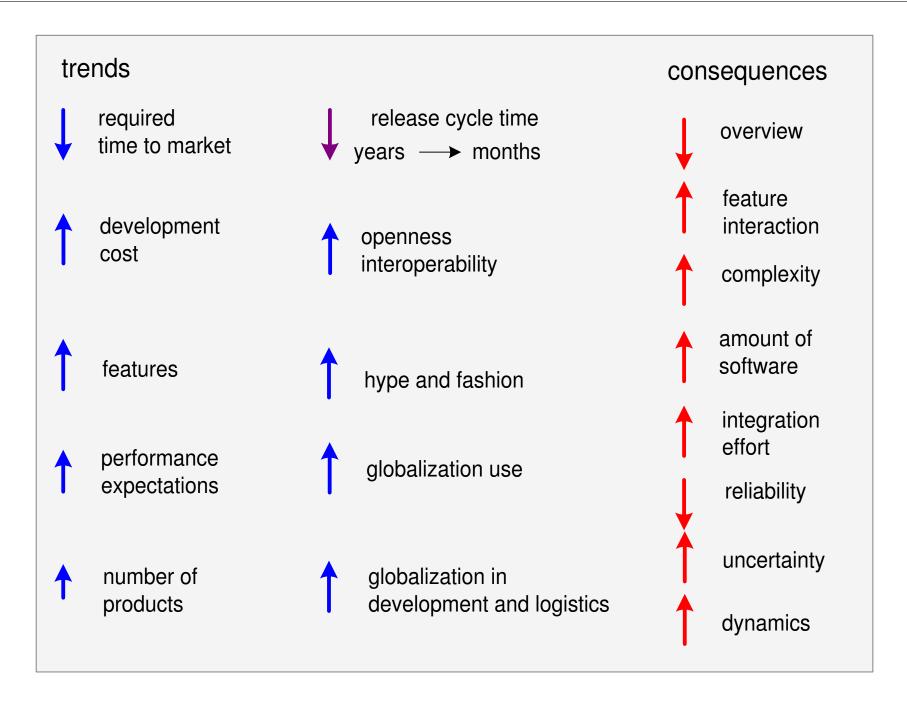
September 9, 2018 status: preliminary

draft

version: 1.4

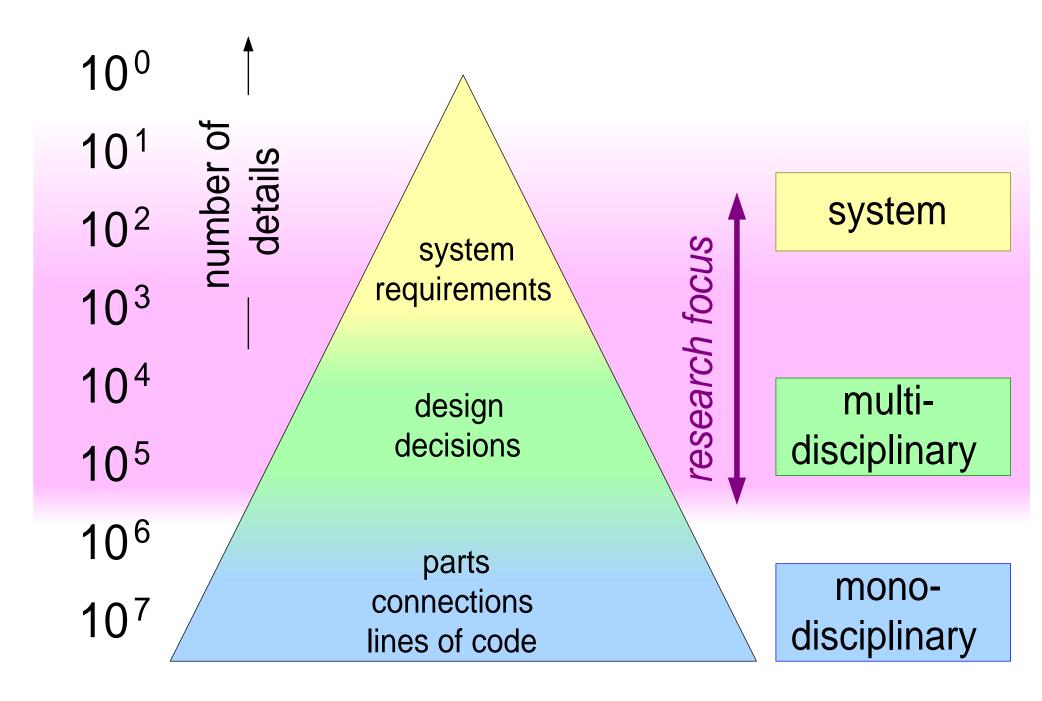


Today's Industrial Trends





SE: address the gap between System and Realization



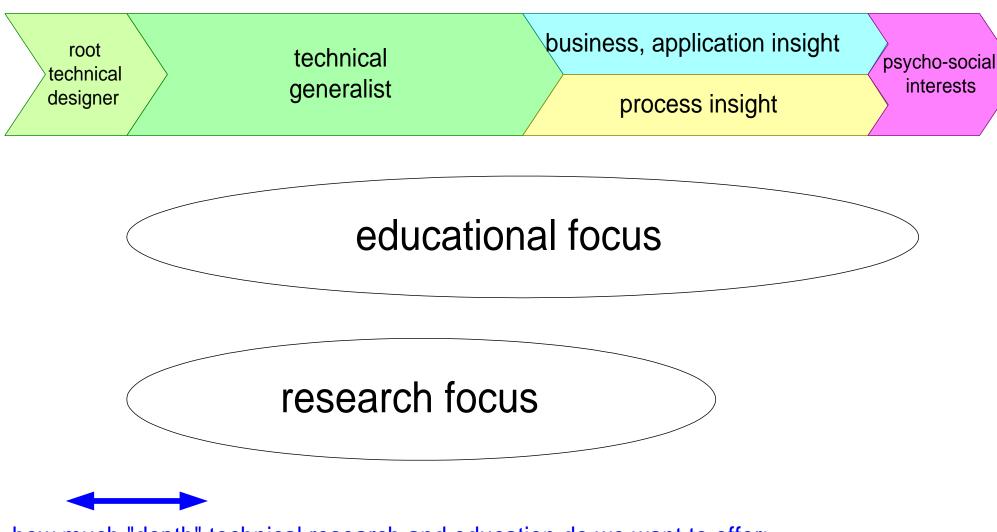


SysEng = SysArch + Multi-Disciplinary design

market and life cycle context customer context system architecting multi-disciplinary design nono-discipline



Focus of Buskerud SE program



how much "depth" technical research and education do we want to offer; How do we want to position *embedded* and *mechanical* engineering?



Educational Focus

root technical designer

technical generalist

business, application insight

process insight

psycho-social interests

Buskerud, ESI course offerings

third party
offerings
for technical
electives

Stevens course offerings

Buskerud technical course offerings (embedded, mechanical engineering) third party
offerings
for leadership
electives



Preliminary Buskerud Research Agenda

intended dissemination and research partners SubSea Defence Manufacturing Maritime

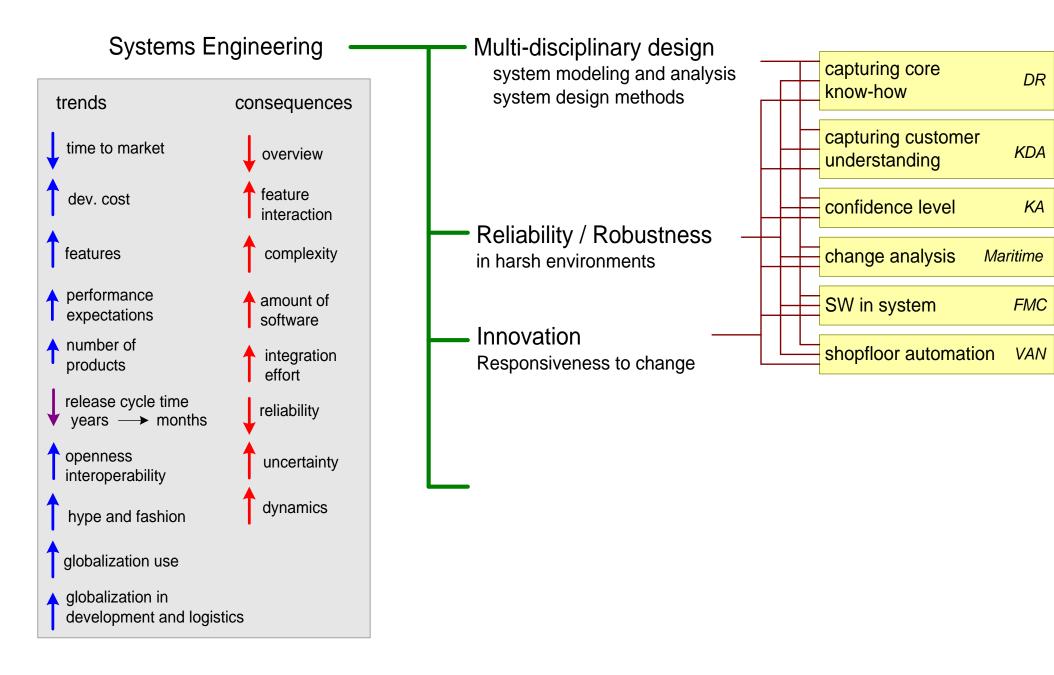
multi-domain research and expertise

Reliability /Robustness in harsh environments

Innovation /
Responsiveness
for change

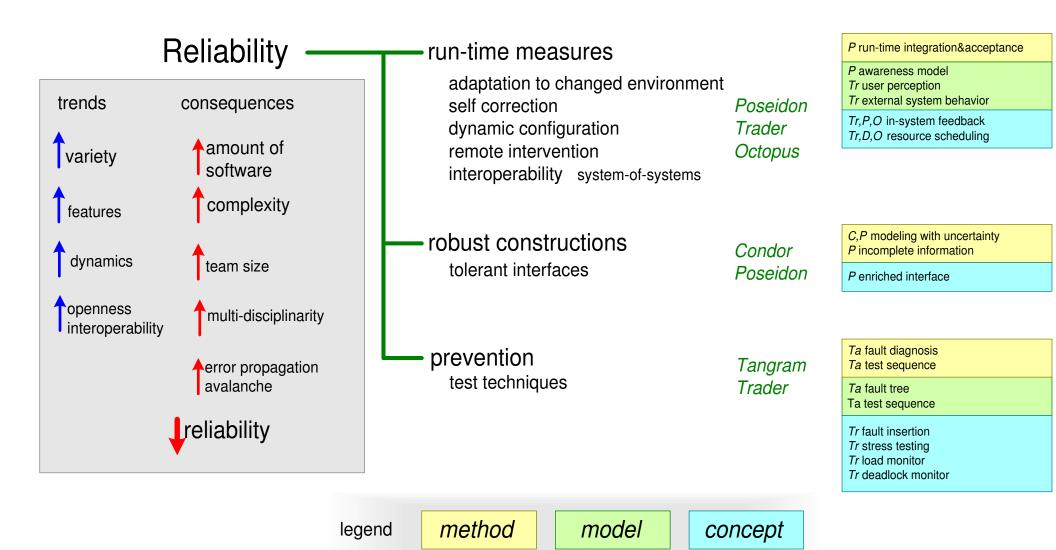


Buskerud research agenda as graph





Example of ESI research agenda





Buskerud Reliability / Robustness

Reliability / Robustness

trends consequences harshness amount of software variety complexity features team size dynamics multi-disciplinarity openness error propagation interoperability avalanche reliability

in harsh environments

potential research subjects

state of practice:

methods, techniques

patterns

life time testing:

shorten duration

confidence level

analysis methods:

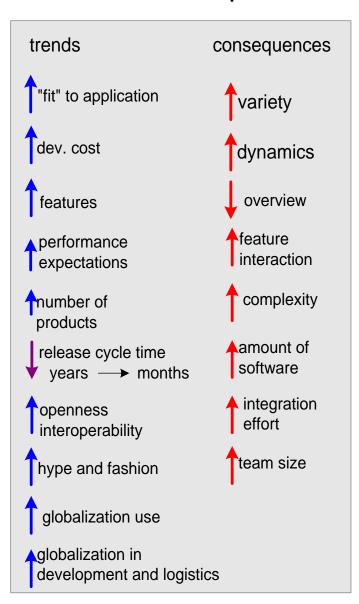
degree of formality

software and firmware in relation to system



Buskerud Innovation / Responsiveness

Innovation / responsiveness to change



potential research subjects

state of practice:

methods, techniques

patterns

roadmapping:

how much to anticipate

reusable assets:

how to create and use resuable assets in projects

impact on duration, cost of solution, and cost of development

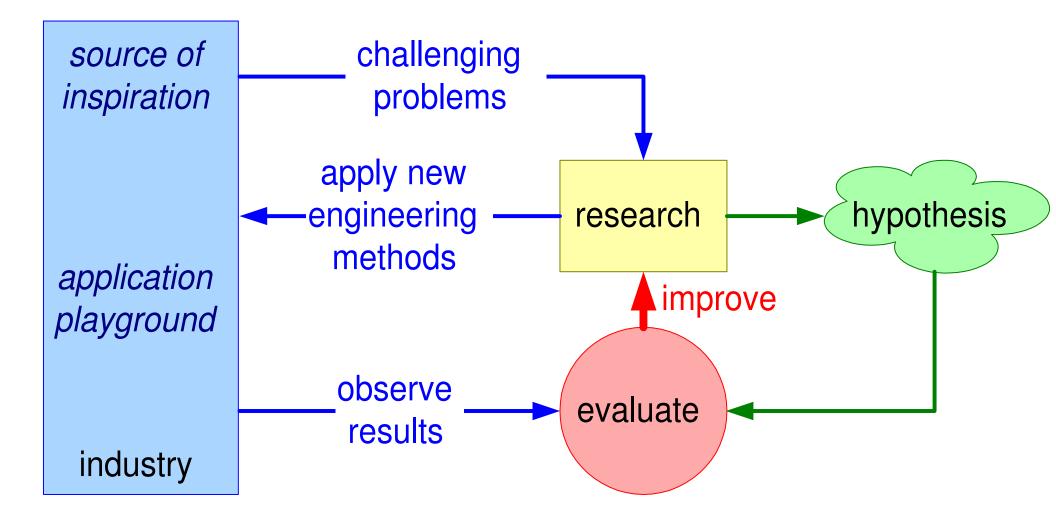
how much to generalize assets

tenders, bidding:

how to improve quality and predictability



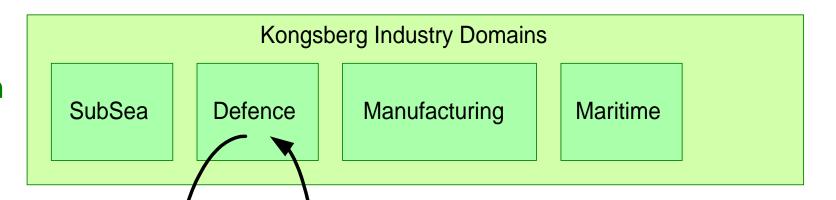
Industry as Laboratory





Industry as Laboratory (2)

intended dissemination and research partners



generalization and consolidation to facilitate use in other domains

single domain research focus on industrial problem

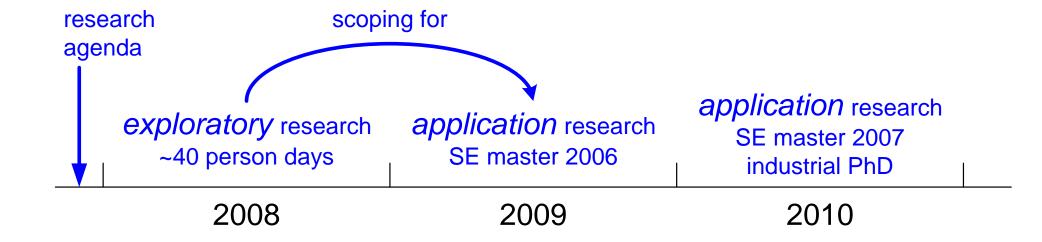
multi-domain research and expertise

Reliability /Robustness in harsh environments

Innovation /
Responsiveness
for change



Master Plan Reseaech





Buskerud SE Educational Options



consultative research

short customized courses

life long company PhD learning students on-demand courses standard courses part-time industry masters standard masters courses

managerial audience

work in industry

study