Solutions for effective project-based manufacturing

SMARTLOG seminar 21.5.2014

Welcome by Jan Ola Strandhagen

Production Management Research Group;

Department of Production and Quality Engineering;

Faculty of Engineering Science and Technology;

Norwegian University of Science and Technology

Welcome to NTNU and SMARTLOG seminar

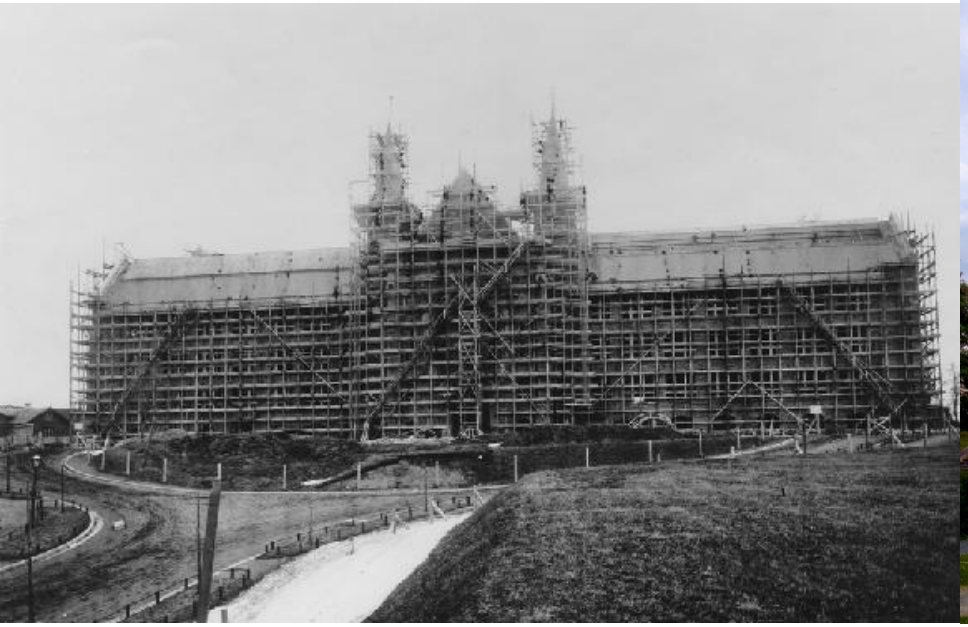
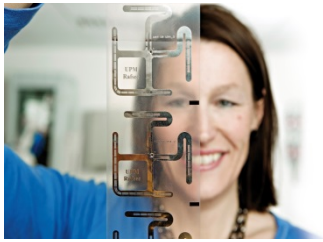


Photo: Schrøder, Trondhjem

Photo: Mentz Indergaard, NTNU Info

Production management

- Manufacturing logistics
- Supply chain management (SCM)
- Manufacturing strategy
- ICT technology and applications in logistics and SCM
- Systems engineering and applications of systems methods



Vision:
An internationally renowned & recognised research group in production management

Mission:
To educate MSc & PhD, and carry out fundamental, innovation-based research in production management in close cooperation with industrial and international partners

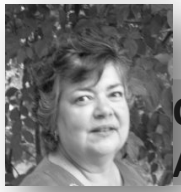
Heidi C. Dreyer
Professor

Jan Ola Strandhagen
Professor

Erlend Alfnes
Associate Professor

Hans Henrik Hvolby
Professor

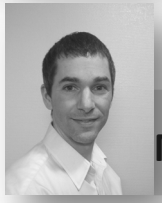
Peter Falster
Professor



Cecilia Haskins
Associate Professor

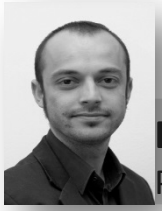
Anita Romsdal, PhD

Daryl Powell, PhD
Post.doc

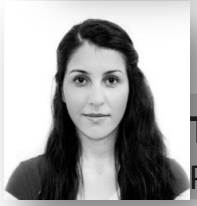


Marco Semini, PhD

Pavan Sriram
PhD Candidate



Emrah Arica
PhD Candidate



Taravatsadat Nehzati
PhD Candidate

Lukas Chabada
PhD Candidate

Philipp Spenhoff
PhD Candidate

Solutions for effective project-based manufacturing

Introduction by Marco Semini

Project-based manufacturing in Norway

- Maritime cluster central part of Norway's industrial future (Reve and Sasson 2012)
- World-wide leading in offshore and subsea equipment

"Important for the country and functions as a good indicator of the general labour market situation."

Which requirements and challenges do project-based manufacturers face in today's dynamic markets?

How can they effectively organize and plan their manufacturing supply chains?

Examples of products produced as projects

Characteristics

Product

- Customized
- Often uncertain demand with frequent changes
- Complex
- Long product life
- Often large in size

Process

- Integrated design/engineering, procurement, construction
- "Engineer-to-order" production
- High-variety, low volume production
- Long lead times
- Requirements to flexibility and responsiveness
- Variety of processes types

Challenges

- **Manage a diverse supplier network** (in terms of relationships, structure and interface)
- **Integrate various departments** (in terms of coordination, planning and control activities)
- **Reduce variable processing time** (accurately predict order-to-fulfillment lead times and meet commitment dates)
- **Reduce the customization** (in order to decrease costs and time)
- **Manage efficiently planning, monitoring, and exception-handling** (including efficient handling of change orders throughout the supply chain)
- **Respond to variability in demand** (both in terms of volume and variety)

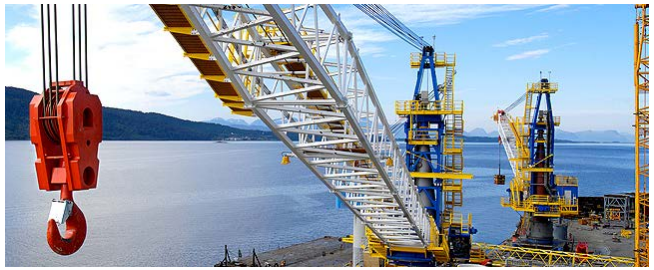
Research at IPK

- Manufacturing strategies in shipbuilding
- Flow manuf. and lean in engineer-to-order production
- Design, planning and control of global fabrication networks
- Integrated product development for rapid introduction
- Lean and ERP in engineer-to-order manufacturing
- Coordination in shipbuilding supply chains
- Automation of low-volume manufacturing
- Capability maturity models for ship design and construction
- Production planning and control in engineer-to-order

IMPACT: Vision and goal

The vision of IMPACT *is to make Norwegian industry a world-leader in manufacturing of advanced, high-value products and services through excellence in technology and innovation.*

The goal of IMPACT *is to develop knowledge, theories, tools and methods for innovations in product development, manufacturing processes and supply chains - in order to provide high value, world-class quality, and shortest lead times at competitive prices.*



IMPACT: Industrial consortium

Senter for forskningsdrevet innovasjon

Brunvoll	Maritime thrusters systems
GKN Aerospace Norway	Aerospace components
Hydro	Aluminium and aluminium products
Kongsberg Maritime	Subsea maritime equipment
Kværner	Engineering, fabrication and project management, oil & gas
Sandvik Teeness	Machine tools
Siemens	Subsea control units
Pipelife	Plastic pipe systems
Ulstein	Shipbuilding, offshore vessels