



MAPPING INNOVATION FACILITATING INNOVATION IN THE DANISH CONSTRUCTION INDUSTRY

Thuesen, Christian; Koch, Christian

Published in:

Proceedings of the 6th Nordic Conference on Construction Economics and Organisation

Publication date:

2011

Document Version

Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Thuesen, C. L., & Koch, C. (2011). MAPPING INNOVATION: FACILITATING INNOVATION IN THE DANISH CONSTRUCTION INDUSTRY. In Proceedings of the 6th Nordic Conference on Construction Economics and Organisation (pp. 111-112). Hørsholm: Danish Building Research Institute, Aalborg University.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

6th Nordic Conference on Construction Economics and Organisation

– Shaping the Construction/Society Nexus

Executive Summaries



Danish Building Research Institute
AALBORG UNIVERSITY



EDITED BY:
Kim Haugbølle, Stefan Christoffer Gottlieb, Kalle E. Kähkönen,
Ole Jonny Klakegg, Göran A. Lindahl & Kristian Widén

MAPPING INNOVATION – FACILITATING INNOVATION IN THE DANISH CONSTRUCTION INDUSTRY

Christian Thuesen, DTU Management, Lyngby, Denmark, (chth@man.dtu.dk)
 Christian Koch, Institute for Business and Technology, Århus University, Herning (christian@hih.aau.dk)

By adopting a theoretical framework from strategic niche management research (SNM) this paper presents an analysis of the innovation system of the Danish Construction industry. The analysis shows a multifaceted landscape of innovation around an existing regime, built around existing ways of working and developed over generations. The regime is challenged from various niches and the socio-technical landscape through trends as globalization. Three niches (Lean Construction, BIM and System Deliveries) are subject to a detailed analysis showing partly incompatible rationales and various degrees of innovation potential. The paper further discusses how existing policymaking operates in a number of tensions one being between government and governance. Based on the concepts from SNM the paper introduces an innovation map in order to support the development of meta-governance policymaking. By mapping some of the most influential trends and promising niche innovations and relate these to the existing regime, the innovation map can act as a medium in which policymakers, interest organization and companies can develop and coordinate future innovation activities.

KEYWORDS: Innovation, policymaking, niches, SNM, sector development

INTRODUCTION

Based on strategic niche management research (SNM) the paper presents an analysis of the innovation system in the Danish construction industry (Thuesen et al 2011) and discuss strategies by which innovation activities can be stimulated and coordinated.

THEORETICAL FRAMEWORK

Theories within SNM look upon innovation in a sector as a socio-technical phenomenon and identifies three levels of socio-technical interaction within which sectorial innovation can be explained (Schot and Geels 2008) as illustrated in the following figure (p. 546).

Niches form the micro-level where radical novelties emerge. The socio-technical regime forms the meso-level, which accounts for the dominating stabilized socio-technical pattern of interaction which is reproduced by institutionalised learning processes. The macro-level is formed by the socio-technical landscape, an exogenous environment beyond the direct influence of niche and regime actors (e.g. macro-economics, deep cultural patterns, macro-political developments).

METHOD

The collection of empirical material for analysing the innovation system draws on multiple sources like qualitative workshops, semistructured interviews, existing analysis and analysis of central texts.

FINDINGS

The analysis shows a multifaceted landscape of innovation around an existing regime, built around the existing ways of working and developed through generations. The regime is challenged from various niches and the socio-technical landscape through trends as globalization. Three niches (Lean Construction, BIM and System Deliveries) are subject to a detailed analysis.

Niches represent different rationalities

In line with Jensen et al (forthcoming) the niches are found to have partly incompatible rationales as illustrated in the following figure.

Figure 1: Innovation explained in three levels

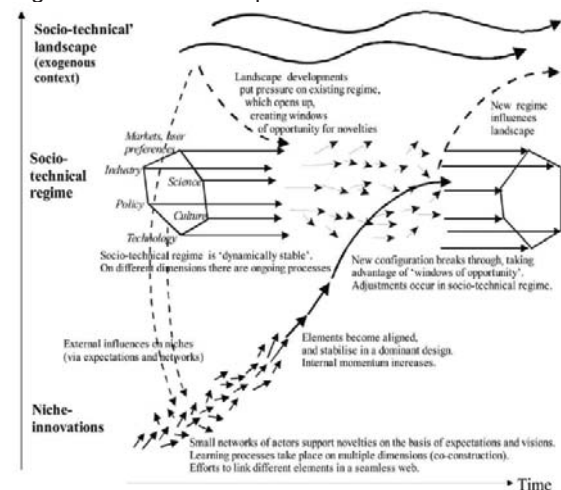
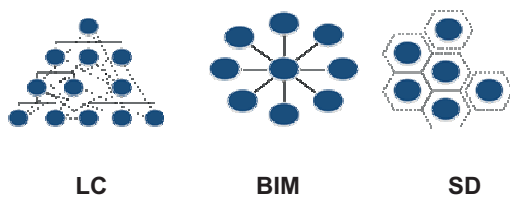


Figure 2: Different rationalities of the niches



...radicality...

While the niches have different rationalities, they are also major differences in terms of radicalism. This is supported by a combination of the various dimensions of compatibility between the niches and the overall regime as illustrated below.

Table 1: Different radicality of the niches

| Dimension | LC | BIM | SD |
|---|--------|--------|--------|
| <i>Technology</i> | | | |
| Production | Green | Green | Red |
| Optimization of design-production | Yellow | Yellow | Red |
| Application of IT | Green | Red | Yellow |
| <i>Industry</i> | | | |
| Value chain | Green | Green | Red |
| Design and production | Green | Green | Red |
| Driver of development | Yellow | Yellow | Red |
| Focus | Green | Green | Red |
| Variance | Green | Green | Red |
| Design-production | Green | Green | Red |
| <i>Policy</i> | | | |
| Political focus | Red | Green | Red |
| Use of standards | Red | Green | Red |
| Participation of Interest organisations | Yellow | Green | Red |
| <i>Culture</i> | | | |
| View of buildings | Green | Green | Red |
| Perception of the building process | Green | Yellow | Red |
| Collaboration | Red | Yellow | Red |
| Learning vehicle | Green | Green | Red |
| Development culture | Red | Green | Red |
| <i>R&D</i> | | | |
| National research activities | Red | Yellow | Green |
| Development horizon | Green | Green | Red |
| Origin of research | Green | Green | Red |
| Educational anchoring | Green | Yellow | Red |

...and innovation potential

The differences in compatibility offers different potential for sectorial innovation, while Lean Construction tries to change the regime from within reproducing the existing building practices (*reproduction*) system deliverances fundamentally tries to reorganize the regime from outside (*transition*). In between these BIM is trying to digitalize the existing regime while not fundamentally changing the organisation of the industry (*transformation*).

New policy practices - mapping innovation

The conflicting rationalities among the niches internally and towards the regime put emphasis on development of policy practices and tools, which will be able to handle these differences.

Such practices should be based on analytical skills to identify, conceptualize and organize existing and new niches' rationalities, focus on developing strategies and allocate resources to informed experimental activity and anchor community formation around the niches.

A central premise for the facilitation of innovation through in this perspective is the development of a "language" through which the industry can understand and articulate innovation and strategies. Here it is appropriate to draw on the theories presented in the paper. Through concepts as niches, regimes, etc. these theories offers a typology which can be ordered in a map. Such a map could provide an overview and orientation points for navigating in the innovation system. Moreover, the map could clarify the interfaces of key players such as the different interest organizations and governmental institutions. Consistency and transparency in the innovation activities can be developed internally among government agencies and between public and private players including construction companies. This will enable the construction industry quickly to respond to new innovation opportunities locally as well as globally.

REFERENCES

Jensen, J., Gottlieb, S. and Thuesen, C. (forthcoming), Governing the sectorial code: Theorizing Danish construction sector dynamics, working paper

Schot J. and Geels FW. (2008) Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy, Technology Analysis & Strategic Management, Vol. 20, No. 5, September 2008, 537–554

Thuesen, C., Koch, C. Monrad, D., Henriks, M. (2011) Styrkelse af dansk byggeris innovationssystem, DTU report