

Technical University of Denmark



## Healthcare Engineering @ DTU?

**Kledal, Thomas N**

*Published in:*  
Book of Abstracts. DTU's Sustain Conference 2015

*Publication date:*  
2015

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Kledal, T. N. (2015). Healthcare Engineering @ DTU? In Book of Abstracts. DTU's Sustain Conference 2015 [Q-2] Lyngby: Technical University of Denmark (DTU).

## DTU Library

Technical Information Center of Denmark

---

### 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.

## Healthcare Engineering @ DTU?

Thomas N. Kledal, PhD & eMBA  
Head of section for Virology, DTU Vet

The healthcare system is under immense pressure to deliver more cost effective solutions with improved health outcomes. In developed societies healthcare is managed and operated by highly complex systems assembled by several more or less interconnected stakeholders. By exploring the healthcare system, outlining its stakeholders and investigating its most eminent challenges it is clear, that the biggest healthcare challenges are not select diseases or technologies, nor positioned within the individual stakeholders, but actually associated with the healthcare system itself.

While there has been tremendous progress within the art of medicine and technology during the last century, there has been relatively little progress in optimizing operations or measuring the quality and productivity of healthcare; and engineers has contributed only marginally to improvements in the operations of healthcare delivery. However, by embracing different engineering methods, healthcare engineers can work on healthcare challenges at several levels spanning product engineering to engineering systems. Thus, a focused approach to meet the needs of the whole healthcare system is mandated; one such approach could be a strategic investment Healthcare Engineering.

Healthcare Engineering could contribute to the development of a more cost effective healthcare sector with improved health outcome. This goal can be accomplished by embracing a cross disciplinary corporation between stakeholders in the healthcare system and engineers; the healthcare professionals can bring their needs and challenges to the engineering community, which then in turn can provide valuable solutions to the problems. Interestingly, the center can build on a wide range of different engineering strongholds, and the center can facilitate an active and valuable interaction between the technical sciences, the natural sciences and medicine; between basic and applied research; between researchers and students, and between the university and the society.

The concept of Healthcare Engineering ensures an efficient linking of research and innovation, taking both market aspects as well as technological perspectives into consideration. The key driver for the concept design is the value generating process - bringing solutions to challenges in the healthcare system. What are unique to the value chain described here, are the needs/challenge evaluation and selection steps; supported by the health/cost effect assessment capability, and the business development step; supported by the target product profiling capability. The evaluation process should be a three-step process, first dealing with the potential value creation opportunity, secondly with the technical mission and thirdly evaluating the solution business opportunity. The outlined process will at the same time serve as a 'portal' for healthcare professionals to the engineering community, thereby facilitating the interaction between the healthcare system and relevant scientists and infrastructure.

The proposed organizational center design takes advantage of different stakeholder resources, cultural differences, strategic priorities and incentives. Furthermore, the suggested organizational setup aims at strengthening management's attention to the value creation process. In order to anchor responsibility close to operations and help emphasizing the unique purpose of each group; being needs finding, product development or research, the individual groups are designed to work as autonomously as possible.