# BI NORWEGIAN BUSINESS SCHOOL

# The role of deals and business networks in innovation processes

# Implications for public procurement?
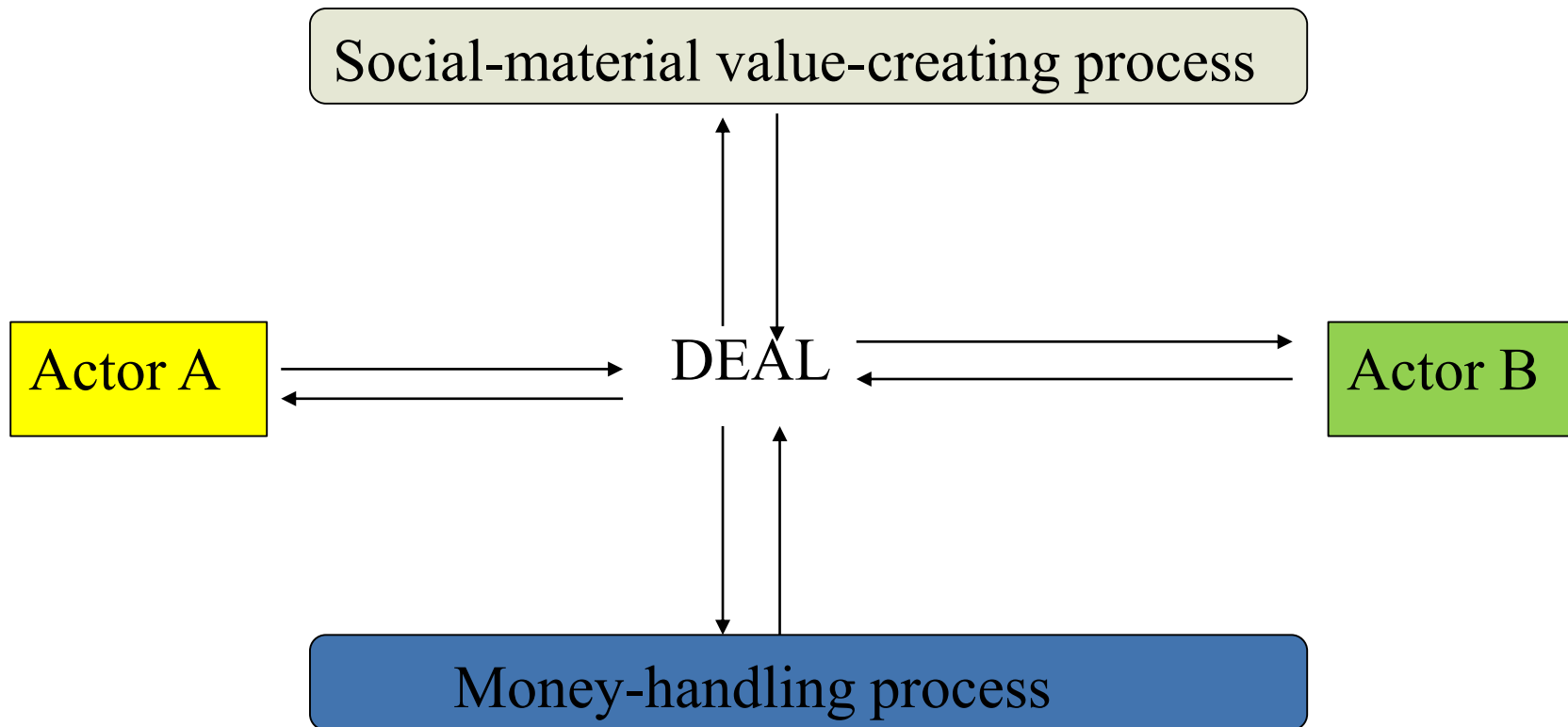
Professor Per Ingvar Olsen

# The study

- The adoption of Transchateter Aortic Valve Implants (TAVI) at 9 different hospitals in Scandinavia (2008 – 2016)
  - Within Oslo University Hospital, Intervention Center
  - Interviews at 8 other hosptials (heart clinics)
  - Two global suppliers of TAVI valves (Edwards Lifesciences and Corevalve/Medtronic)
  - The need to understand the roles of the suppliers in adoption processes
  - The TAVI innovation journey (1989 – 2014)

  - 2 Phd candidates and senior researchers
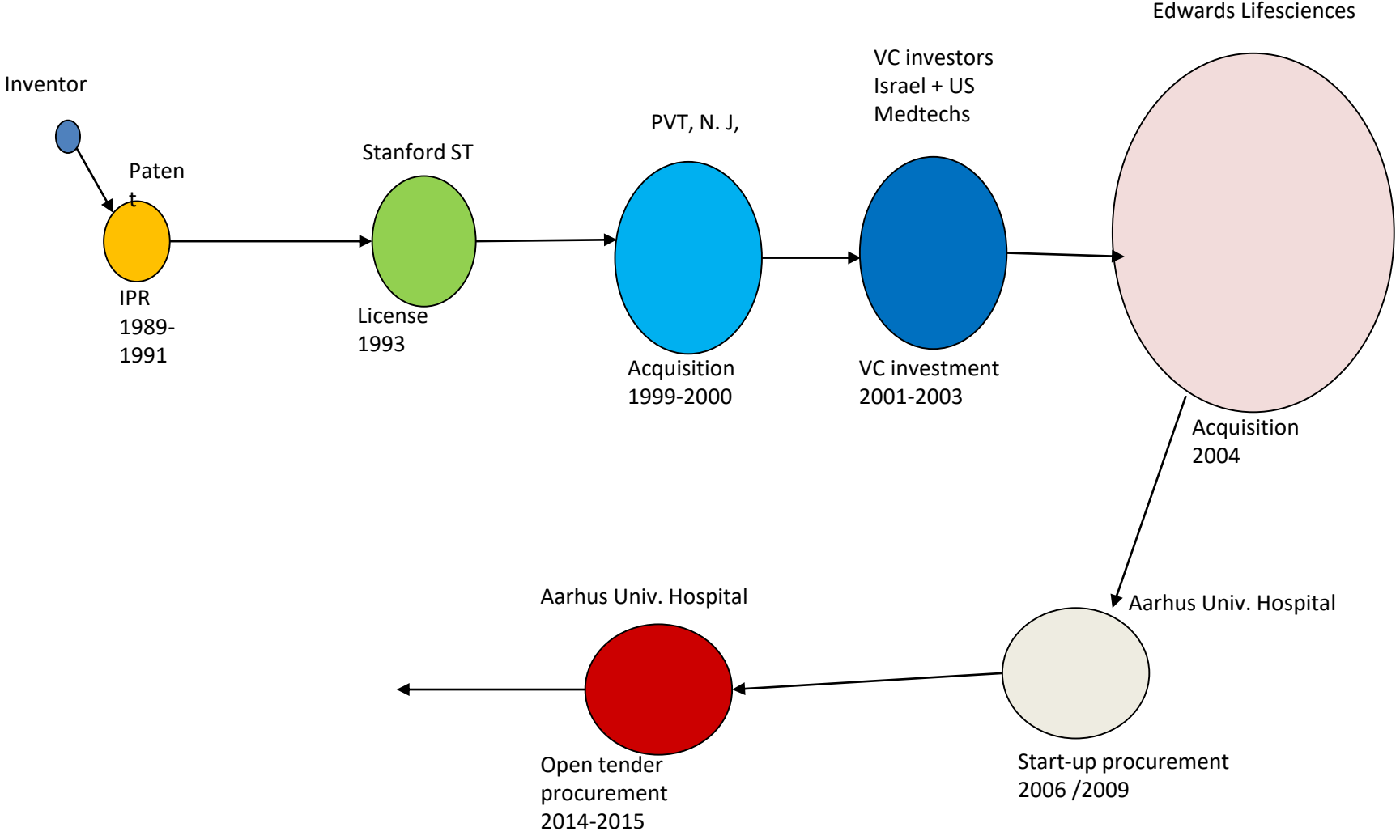- Presentation based on two published articles – so far…

# The roles of money and financing in Industrial marketing and purchasing theory?

- How can we integrate these more «productively» into IMP studies?
  - How does money and financing relate to, say, the ARA-model of business networks and network interaction?

- What would be a distinct IMP approach to studying the roles of money and financing?

- First attempt: Håkansson & Olsen (2015): «The roles of money and business deals in network structures», *Industrial Marketing Management, 46: 207-217*

- This study: Application of analytical model to empirical case study of international innovation process: The case of TAVI
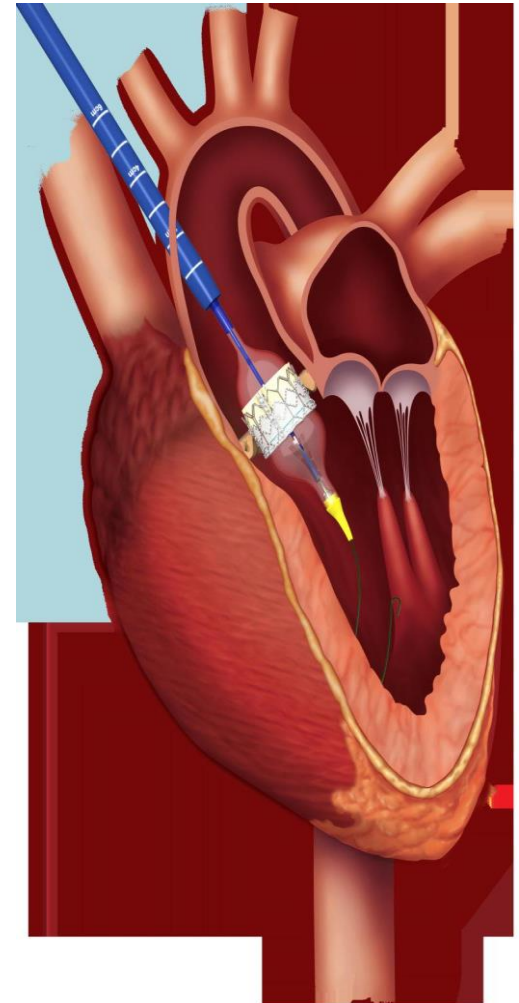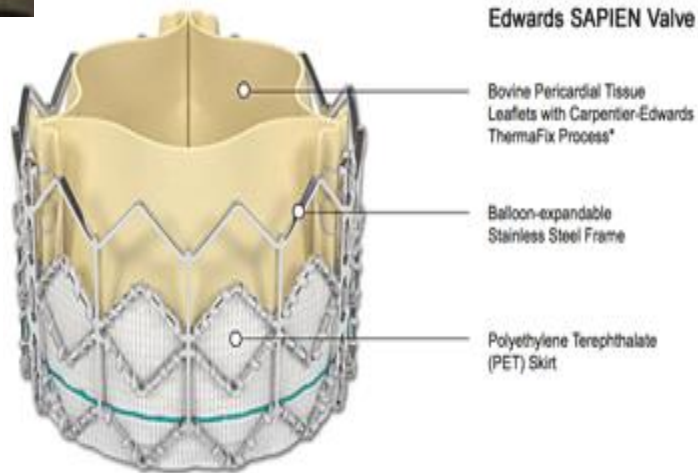
# What is a deal?

Social-material value-creating process

Actor A → DEAL → Actor B

Money-handling process

Håkansson & Olsen, 2015

# 7 major deals:

Inventor

Paten
t

IPR
1989-
1991

Stanford ST

License
1993

PVT, N. J,

Acquisition
1999-2000

VC investors
Israel + US
Medtechs

VC investment
2001-2003

Edwards Lifesciences

Acquisition
2004

Aarhus Univ. Hospital

Start-up procurement
2006 /2009

Aarhus Univ. Hospital

Open tender
procurement
2014-2015

# TAVI: Trans-Aortic Valve Implantation



Edwards SAPIEN Valve

Bovine Pericardial Tissue
Leaflets with Carpentier-Edwards
ThermaFix Process*

Balloon-expandable
Stainless Steel Frame

Polyethylene Terephthalate
(PET) Skirt

# The TAVI innovation process:

- Invention: Dr. Med Henning Rud Andersen, Århus University, 1988-89

- First European CE: 2007, First US FDA: 2011

- 2014: More than 100 000 procedures world wide (aggregated)

- Dominant market players: Edwards Lifesciences and Medtronic Corevalve (Both HQ in Irvine, CA). Now 7-8 competitors

- Our study: The Edwards case: Follows the innovation from invention through Edwards' acquisition of TAVI to mature practice: 1989 – 2014
  - Identifying and analyzing 7 major deals

# Research questions

- How did «TAVI» move from Århus to Edwards/Irvine California?

- Which deals can be identified along the process?

- What were the particular roles of these deals in the process?

- What can we say about the general characteristics of innovation processes if we have a better understanding of the roles of deals?

- What are the roles of the relatively stable business networks we observe in numerous IMP studies, in relation to global innovation processes?

# Analyzing deals

- Who were involved in the deal?

- Who was taking the initiative?

- What was the deal about? (What were the specific challenges faced by the project?)

- What characterized the money-handling process?

- Were there clear relationaships to other deals?

- Were there particular consequences for the involved actors with respect to future participation in the project?

# «Kinds» of deals:

- Deal 1: Patenting/establishing of IPR as a tradeable commodity (1989-1991)

- Deal 2: World exclusive lisence agreement by SST (1993)

- Deal 3: Coordinated acquitions of lisence by PVT and of SST by J&J (2000)

- Deal 4: Staged financing by VC funds and industrial investors (2001-2003)

- Deal 5: Acquisiton of PVT by Edwards (2004)

- Deal 6: Industrial mearketing-purchasing of practice start-up package by Århus UH (2006/2009)

- Deal 7: Public tender procurement by Århus UH (2014-2015)

# TAVI Innovation Journey

- From idea to global business: the expansion of an international new medical technology venture through successive science-business networks *(Mikhailova and Olsen, Journal of International Entrepreneurship)*


- Medical innovations in public healthcare: the problem of adoption and implementation *(Mikhailova and Olsen, book chapter, forthcoming)*

# The adoption process

- CE approval and role of the European market
- National regulations
- FDA regulations
- Marketing and sales, early phase
- The expansion and scaling problem
- From novice to expertice in new area of practice
- The content of supplier products and services
- The local resource mobilization and invetment process

# The dynamics of supplier – user interaction

- The controvercy: Interventional cardiology enter area of cardiac surgery
  - The Team approach (uniting cardiology and cardiac surgery approach)
  - The Lean approach (Cardiology approach (Corevalve 2007 – 2010)
- Supplier strategies and network effects
  - FDA process and FDA requirements for doing TAVI
  - Education, training, technology, support services, international network, research, etc.
- Heart clinic strategies and network effects
  - Entry strategy
  - «being in the game» and/or scaling the activity?

# Timing and adoption profiles
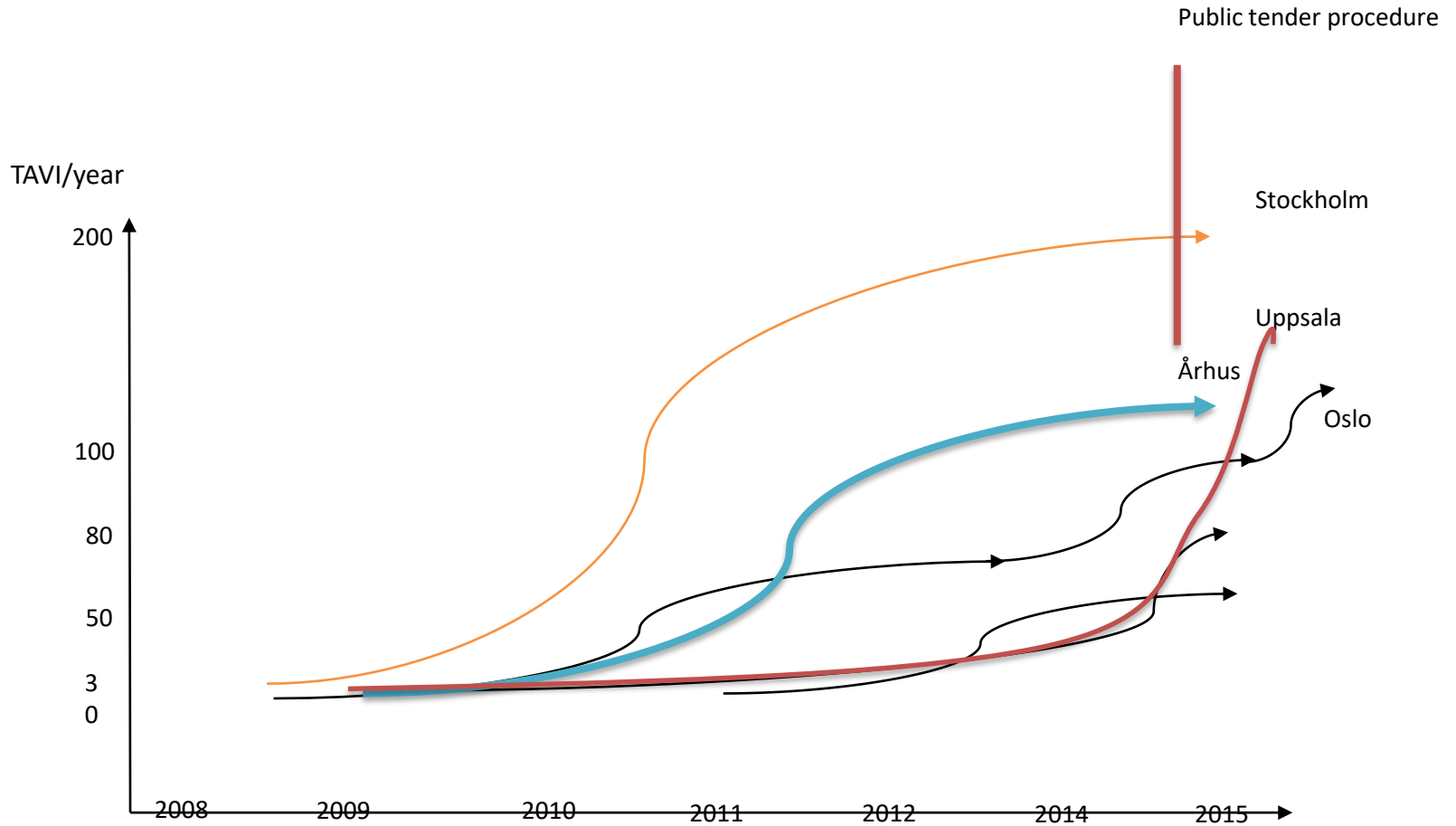
# Collaboration agreements and procurement practices

- Initial collaboration agreement: 2008-2009…
  - Formative phase
- Adoption periode: 5-6 years
- Scaling
  - Based on lean organizing model (cardiology)
  - Team organization model for special og complex cases
- Different scaling profiles
  - Lean cardiology approach
  - Complex technology exploration appraoch
  - Team (cardiology-surgery) approach

# Open tender procurement?

- Collaboration agreement: Euro 20.000 per valve. >100 a year
- Open tender procurement: Stochholm and Århus, 2014
  - After 6 years of procurement practices (> 2 mill Euro/year)
  - At level of proficient expertise and routine based practice
    - When scaling to <100 TAVI/year

- Outcomes of tender process:
  - Lower prices from established supplier(s), high volume, limited support
  - Additional competitive supplier (low volume)
  - Additional complementary supplier (low volume)

# Discussion

- Procurement of innovation challenges
    - Selecting the «right» first supplier?
    - Dependency on supplier for support, learning, etc.?
    - Lock-in effects?
    - Short term adoption politics (controvercies) vs. long term efficiency?

- How to regulate procurement in demanding adoption and learning processes?

- When to introduce open tender procurement?

- Procurement strategies through the entire process?