# Generative Architectures

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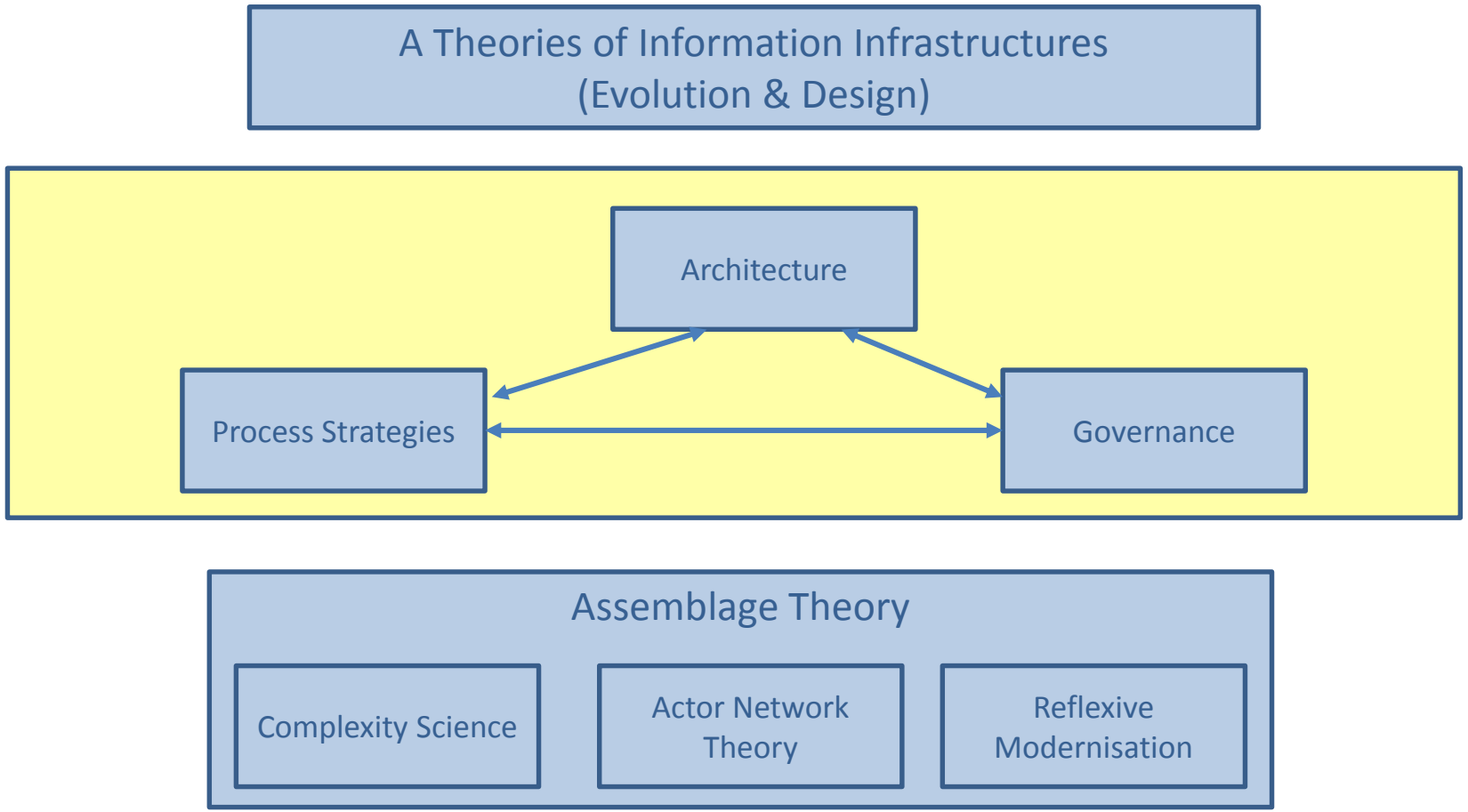
# Towards a Theory of Information Infrastructures



# Infrastructure evolution

- Evolution
  - Bootstrapping
  - Adoption
  - Scaling
  - Innovation
  - Restructuring/harmonization/consolidation
  - Crumbling/fragmentation

# Innovation

- Of, in, on

- W. Brian Arthur
  - The nature of technology. What it is and how it evolves
    - Out of a material
    - (re-)combination
    - Structural deepening
    - Re-domaining

# Generative Technology

- ".. A technology's overall capacity to produce unprompted change driven by large, varied, and uncoordinated audiences."
  - Capacity for leverage
  - Adaptability
  - Ease of mastery
  - Accessibility

  - Computers
  - PC & Internet
  - Opposite: Appliances
    - Telecom: intelligent network + appliances

# Some research results

- Morris and Ferguson: ”Architectures win technology wars!”
- Architectural control points
- Platform  centric ecologies
- Mirroring
  - Product – producer
  - Product – users
- Innovation and generativity

# Generative networks/communities

- Exaptive bootstrapping
- Generative relationships
  - aligned directedness
  - heterogeneity
  - mutual directedness.
  - permissions structures
  - action opportunities

- Design & user communities
- Generative fit

# Generative infrastructure

- Enable the successful evolution of Iis
  - Bootstrapping, adoption, scaling, innovation, restructuring
- Generative architecture
- Generative governance regime
- Generative process strategy
- Generative fit
- Generativity is configurational!!

# The beginning

- 1987: Fürst's lab report transfer solution
- 1988: Telenor (Telemedicine in Northern Norway)
- Lab report transfer solutions
- Standardizing
- Statskonsult's Infrastructure programme: EDI
  - Physicians' invoices
- CEN TC/251, KITH

- **Consensus: EDI**

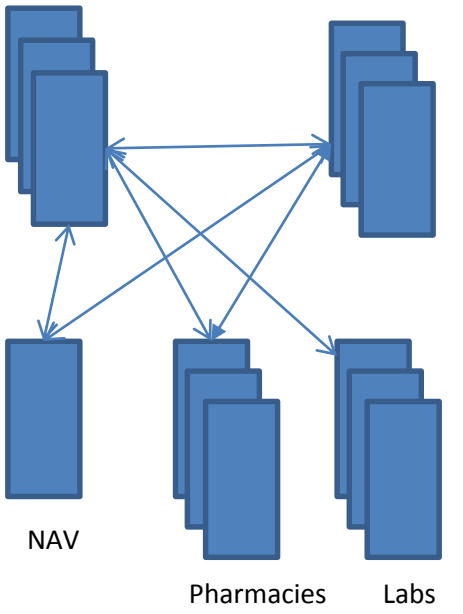
# The continuation

- 90-ies:
  - Lab reports & orders, prescriptions, physicians and out-patient clinics' invoices, admission and discharge letters, ..

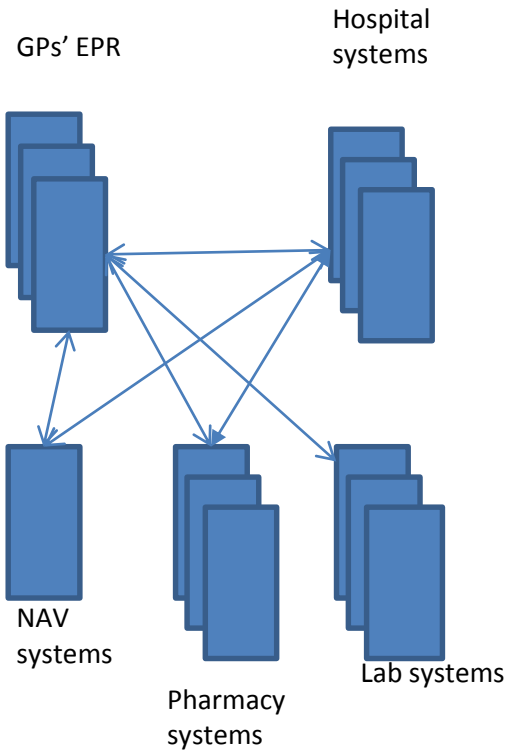
  00-ies:
  - Lab reports & orders, prescriptions, physicians and out-patient clinics' invoices, admission and discharge letters, ..
  - ELIN projects
  - The message effort (meldingsløftet)
  - ePrescription
- Status: Modest successes, coordination problems, always someone not doing as promised

# The EDI Paradigm

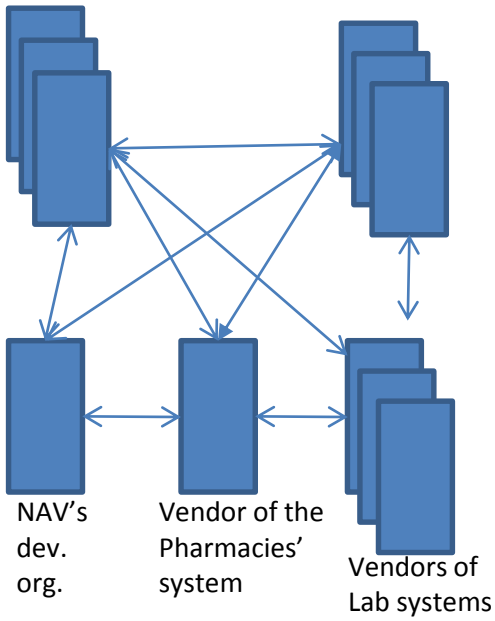
Information flow



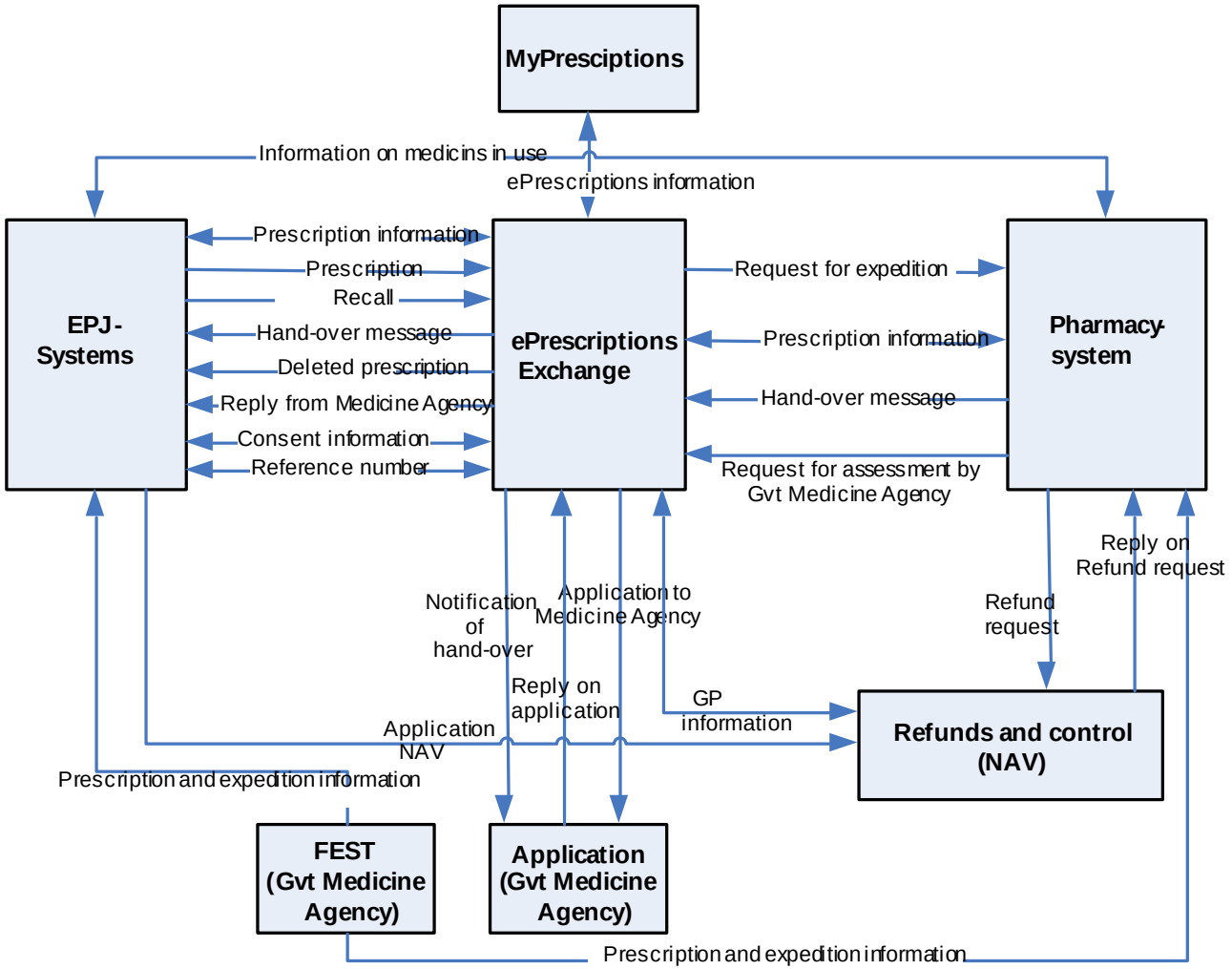

ICT architecture




Project organization



# ePrescription



# Drifting Architecture

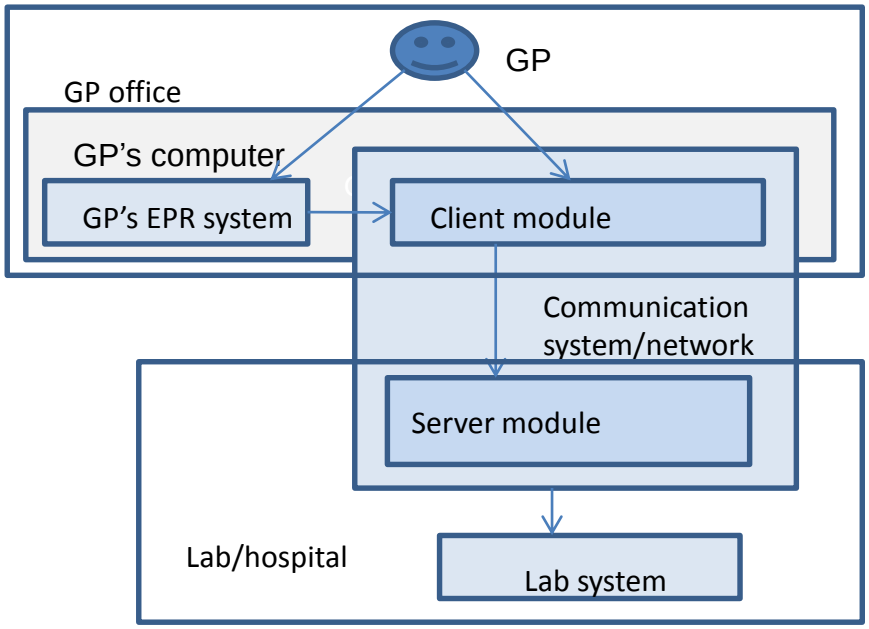
- Delays
- => Generic module for Profdoc users
- => Pharmacies
- => DIPS users

- Disagreements!

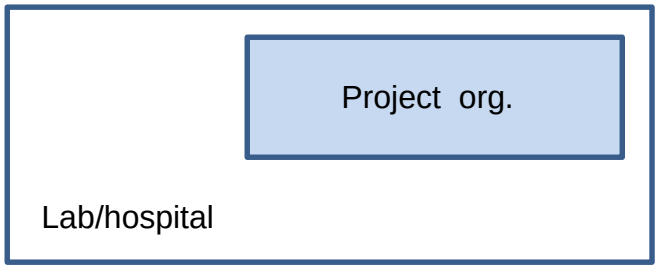
# A few other projects

- Fürst
  - Lab report transfer solution, 1987, 3 man weeks + 1 evening
  - Lab ordering solution
- Edimed, Northern Norwegian Health Network
- Well/Dips Interactor
  - Interactive admission letters
- BlueFox, Prescription register
- MyJournal

# An alternative architecture

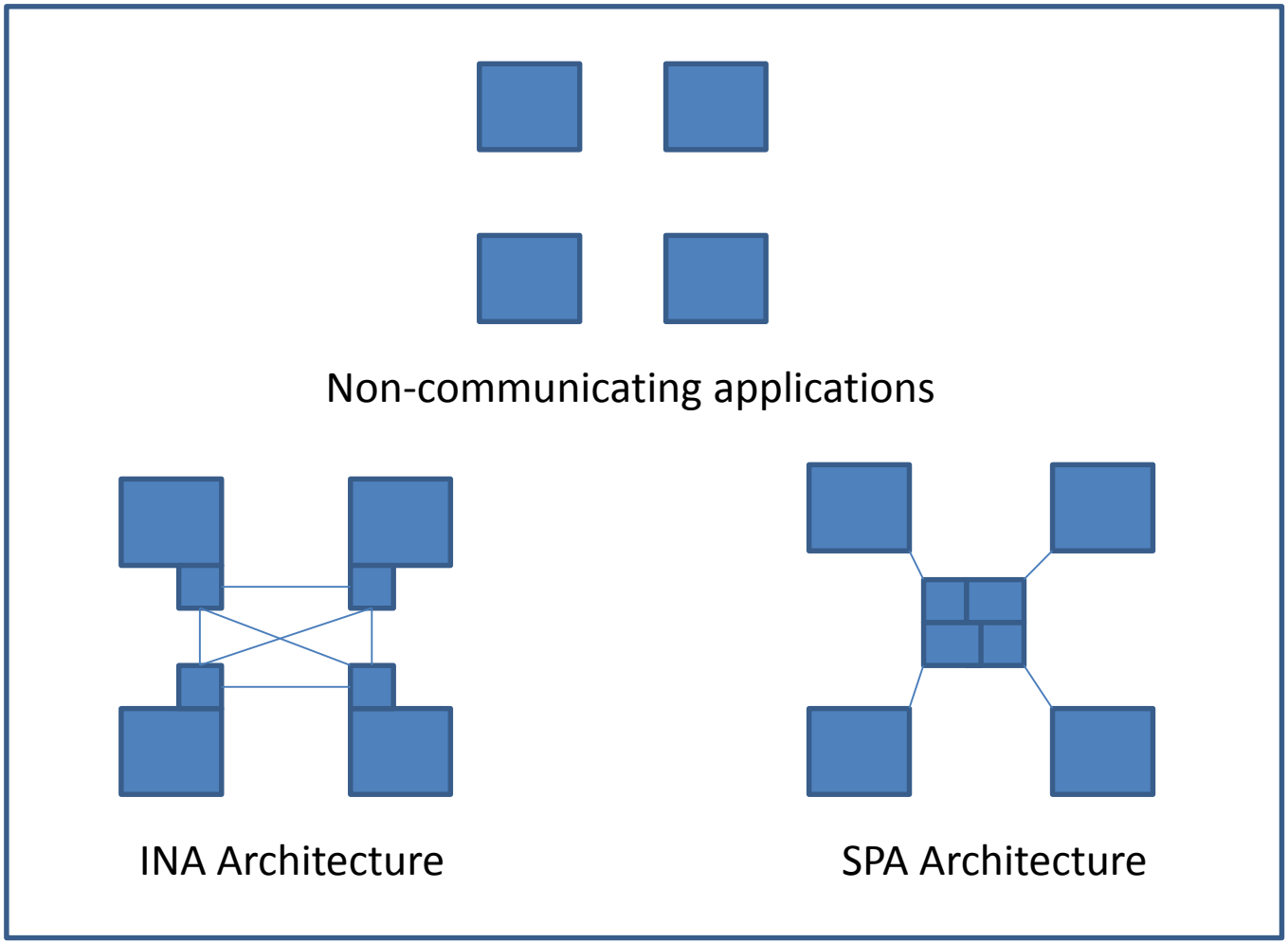



ICT architecture




Project organization

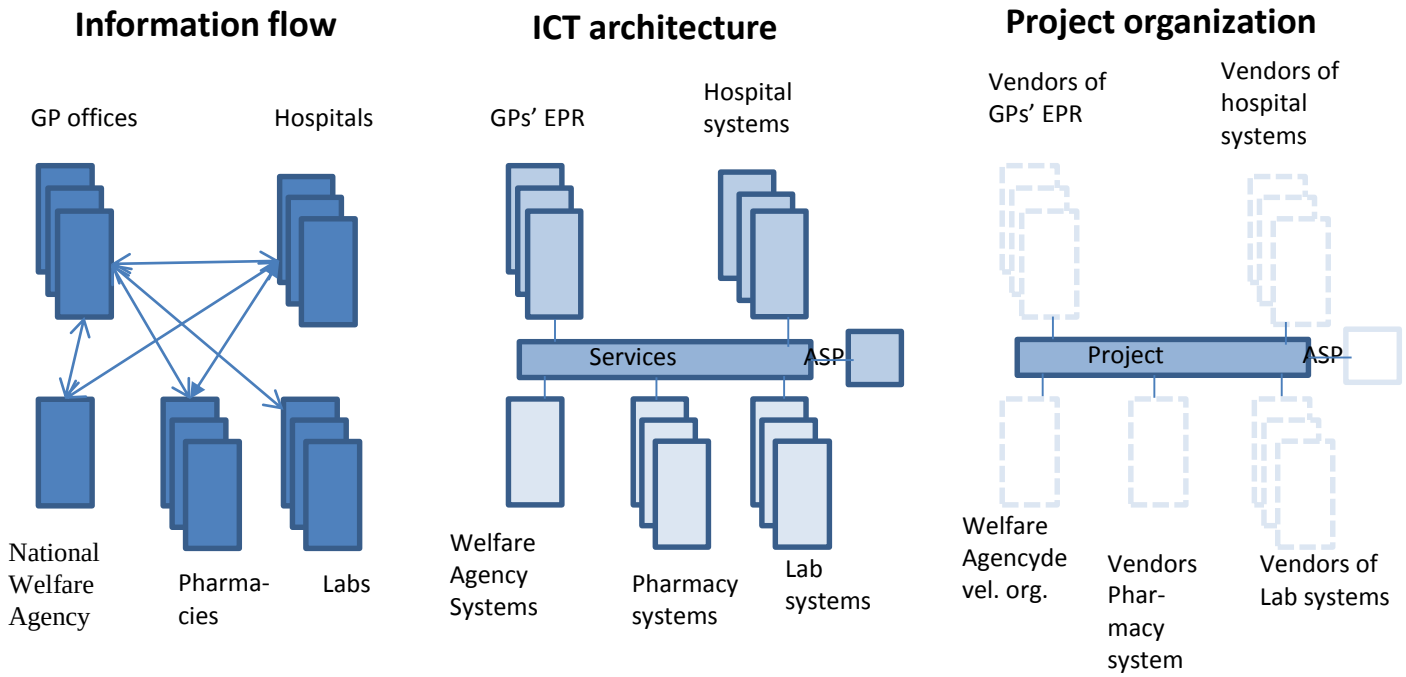
# Two architectures



# Two architectures

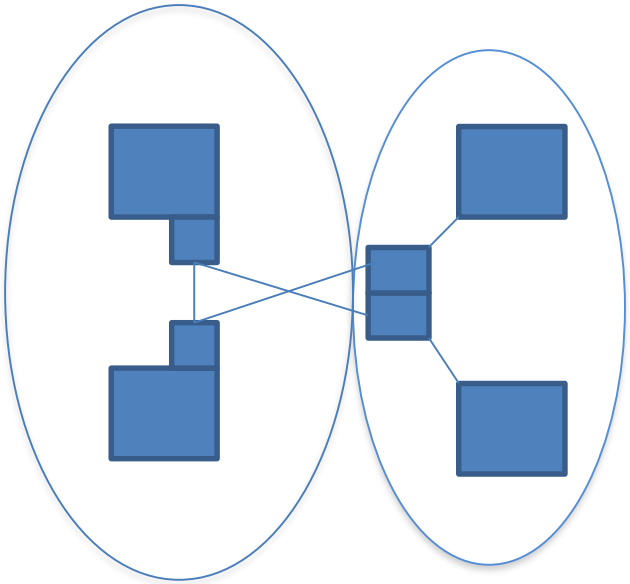
1. Application Centric/Institutional Interface Architecture (AC/INA)
2. Communication System Centric/Service Provider Architecture (CSC/SPA)

# The CSCAParadigm



# Generative architecture

Scaling,
Adoption,
Innovation “on”



Bootstrapping,
Restructuring,
Innovation “in” & “of”

# Summary Care Record Systems

- Scotland:
  - 3 MGBP (4M Euros, 4 M USD)
- Denmark:
  - Official, top-down
    - 10 M Euros,
    - Faded out after about 4 years, officially cancelled after 8
  - Unofficial, bottom-up
    - Great success
- Norway (ePrescription)
  - 500 MNOK, currently piloted in one GP office
- UK
  - Started 2004, early adoption 2007, further deployment is frozen
  - Spent 240 MGBP