Effektdrevet it-udvikling

En ramme for "Gentænkning af partnerskaber"

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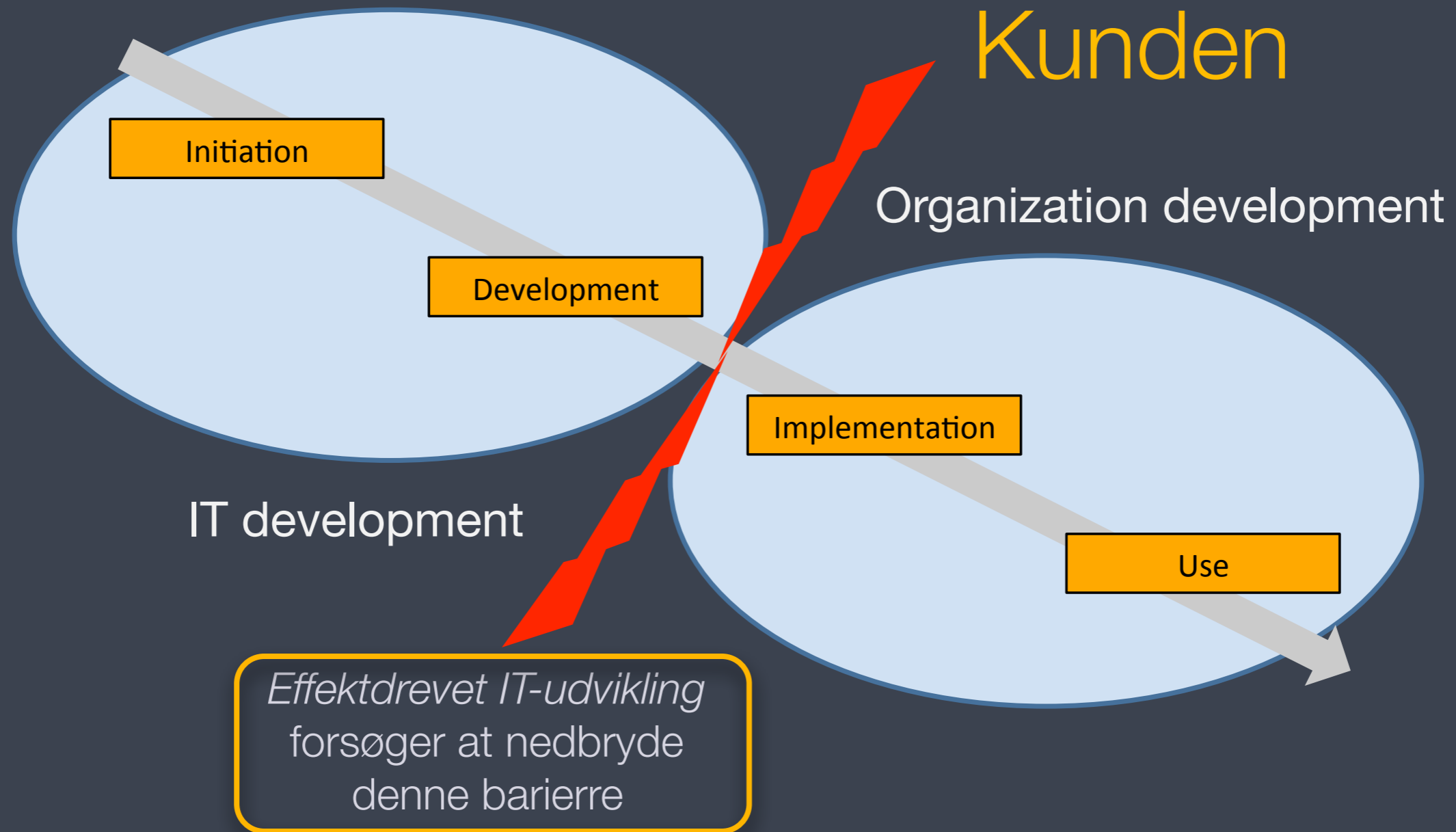
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Hvordan bør it-systemer der forandrer organisation og arbejdsprocesser udvikles og implementeres?

▶ **Ideal**: Agil, iterativ trinvis udvikling; "respekt" for det uforudsigelige ('udvikling'); eksperimenter med systematisk erfaringsopsamling; gensidig læring; styret af nytteværdi og ønskede effekter af it-anvendelsen

▶ **Praksis**: Ingen/få iterationer, ringe participation/læringsproces, få gensidige/fælles mål, ingen/mangelfuld dokumentation af effekt ("gevinst"), manglende sammenhæng: it-system ⇔ nytteværdi af anvendelsen

IT-leverandøren

Kunden

Initiation

Organization development

Development

IT development

Implementation

Use

*Effektdrevet IT-udvikling* forsøger at nedbryde denne barierre

Initiation-development-implementation-use is the general conceptual perception of the developement 'cycle': See Alter (2001): Which life cycle - work system, information system, or software? *Communications of the Association for Information Systems*, 7(17), pp. 1-54

Effektdrevet it-udvikling

▶ Leverandør: *Fra* "produkt til kunde" *til* "løsning for kunde"

▶ Kunde: *Fra* "IT-system" *til* "effekt af IT-anvendelser

▶ Mål: Gentænkning af partnerskaber og nye kontraktformer

▶ Mange projekter – men *ingen* med nye kontraktformer

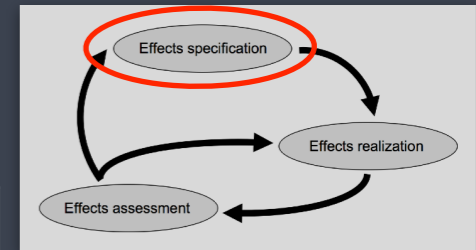Effects specification

Effects realization

Effects assessment
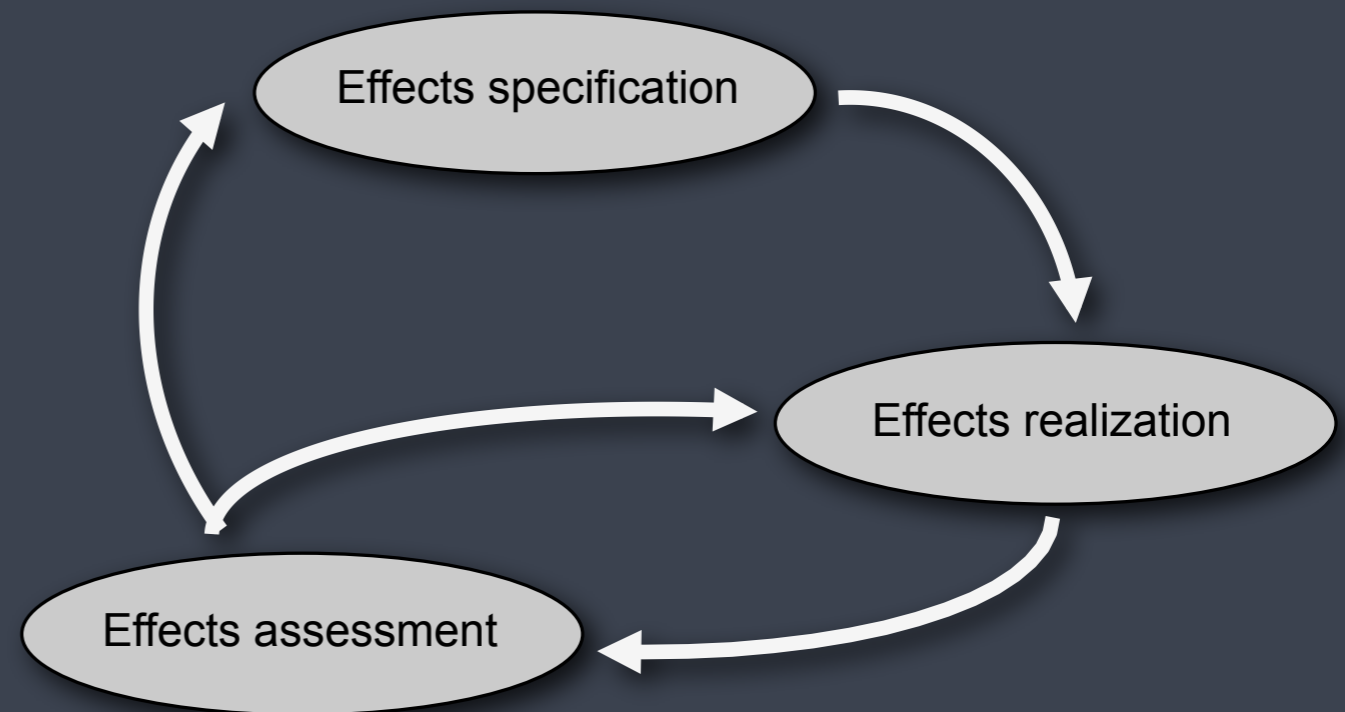
Effects-driven IT development
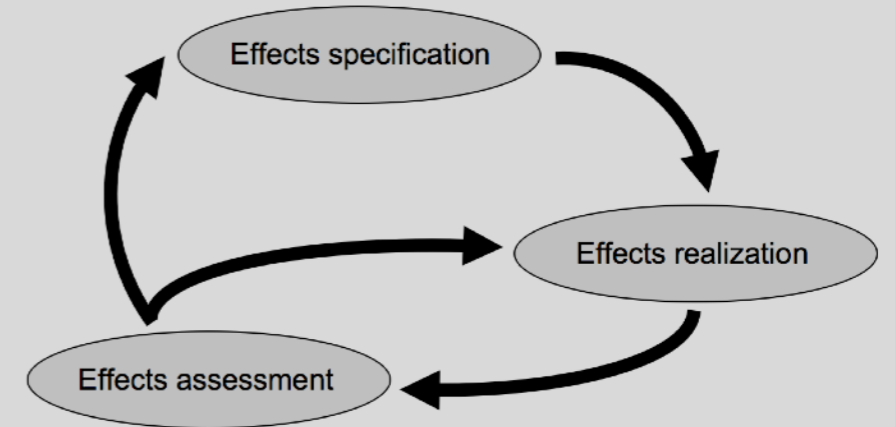
▶ Result- and user-driven *instrument* for technology supported improvement of (clinical) work practices [1]

▶ Developed through action research projects since 2004 [2, 3]

▶ Effects are *specified locally* by clinicians — can be related to hierarchies [4]

▶ Effects are *realized* through local experiments and interventions [5, 8, 9, 11]

▶ Effects are *assessed* from available data (formative vs. summative) [7, 8, 15]

Effects specification hierarchies

| Hierarchi	St. plans [8]	Emergency Dept. [15]	Warm hands [7]
Environment (Political demands, organizational culture, national standards, legislation, etc.)	Shared care Knowledge sharing	Emergency department as central entrance to new "Super" hospital structure	Centralized healthcare with higher specialization. More 'warm hands'
Business Strategy (Relation/function/response to environment)	Standard plans	Increasing the citizens sense of security when reducing # of emergency departments	Optimized patient flow and logistics in and between wards
Business Processes (Recurrent, familiar input-output relationships)	Well documented patient trajectories	Safe phase transition between primary and secondary sector (moving the ED to patient)	Improved resource coordination and prioritizing related to patient flow
Work Process (Critical with regard to IT support)	Emergency department with patient in need of an acute operation	Communication between paramedic and emergency department	Improved overview of incoming and current patients
Technology support (Functions, information, categories, computations, GUI, standards, etc.)	Templates with checklists	Ambulance system reports to emergency departments - e.g. ECG (apoplexy)	List of all incoming and current patients, resource allocation, plan, status, etc.

Given (stable) national-regional quality goals and KPI's

Local (agile) quality goals obtained by interventions & experiments

Hierarchy inspired by Rasmussen et al., (1994): Cognitive Systems Engineering, Whiley, Vicente (1999): Cognitive Work Analysis, Lawrence Erlbaum, and the strategic analysis phase from the MUST method (Samfundslitteratur 2008)

Lessons: Initiation
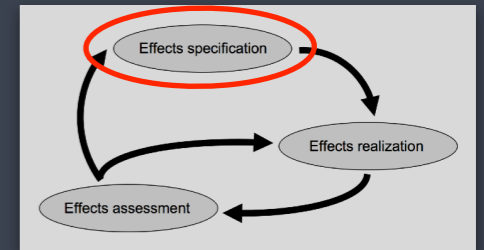
| Initiation & specification | Development | Implementation | Use |

▶ Effects from using IT can be specified, related to, and agreed upon by different stakeholders [4]

▶ Effects can be aligned and comply to national, strategic, and organizational goals [4]

▶ Used as management instrument in both local and large projects [10, 13, 17]

▶ Contracts may be based on measurable effects - this needs more research [2]

Development and implementation
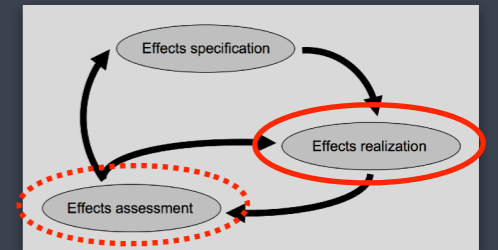
Initiation & specification	Development	Implementation	Use

Effects specification

Effect types [1]:

▶ Planned/realized
▶ Planned/curtailed
▶ Emergent
▶ Opportunity-based

Case: EPR - large scale pilot implementation [16]

KLINISK PROCES-EKSPERIMENT PÅ ROSKILDE AMTS SYGEHUS

CSC Clinical Suite på N61 Akut Apopleksiafsnit. Brugerdeltagelse og evidensbaseret udvikling

Roskilde Amts Sygehus — Datalogi — CSC Scandihealth

▶ Fully integrated EPR (243 screens, 300K patients, 26M records) configured in workshops with clinicians

▶ EPR in real use 24 hours a day in one week

▶ All Clinicians used EPR (no paper records used)

▶ 'Back-office' using Wizard-of-Oz techniques

▶ 38% (183 out of 482) design ideas from users during 5 days of real use

Published in [5, 8, 12, 13, 14]
Documentary movie (youtube):
- In Danish
- In English

Activity	CSC	Region Zealand	Stroke unit	Researchers
Preparations	1996	527.4	237.5	240
Training and paper-record measurements	64	0	65	71
Trial period	534	141.6	70	58
Other	197	0	0	48
Total	2791	669	372.5	417

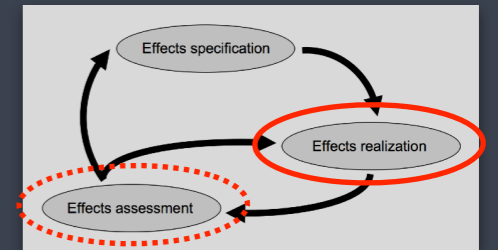|	Effect	Evaluation method
Planned/ realized[8]	Better overview of patients	Mental workload/TLX
Planned/ curtailed[8]		...es of ...on ... EPR)
Emergent[14]		
Opportunity -based[14]		...group
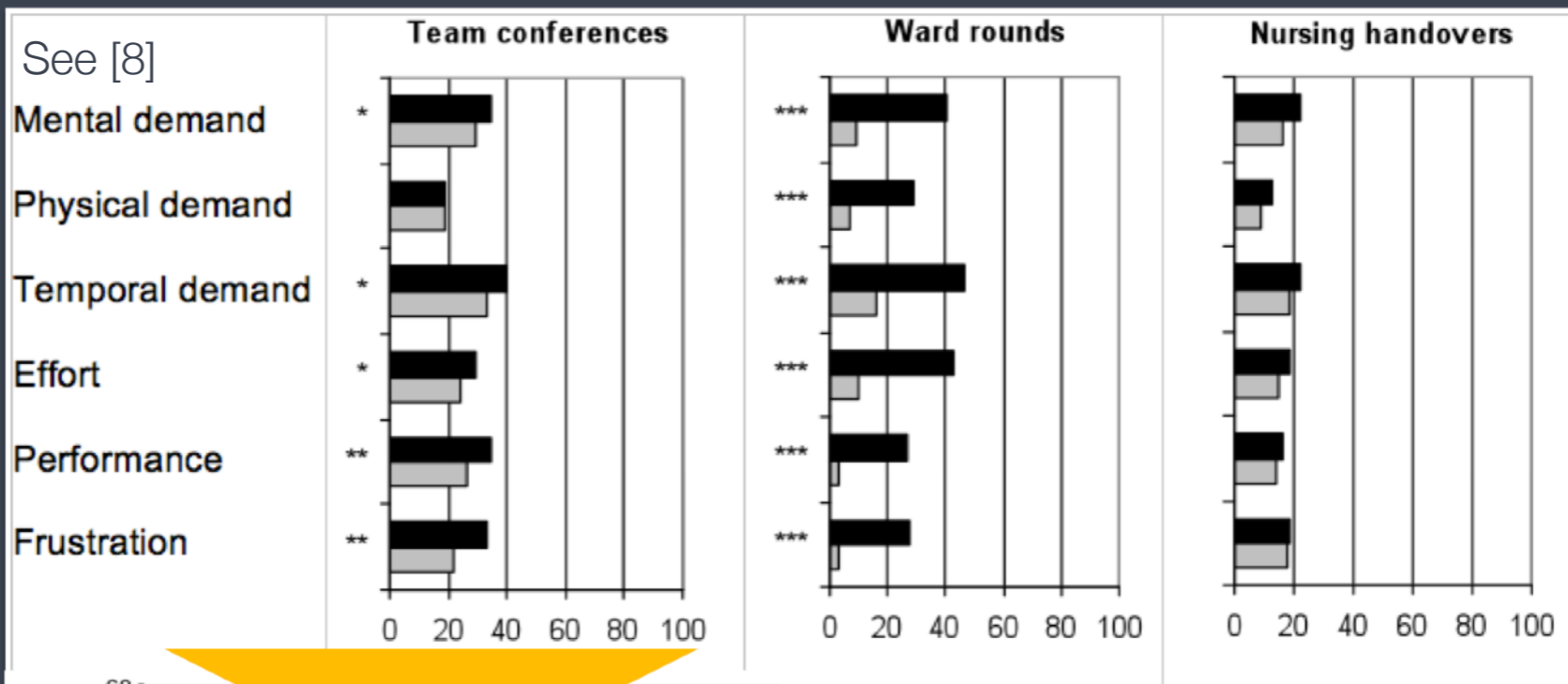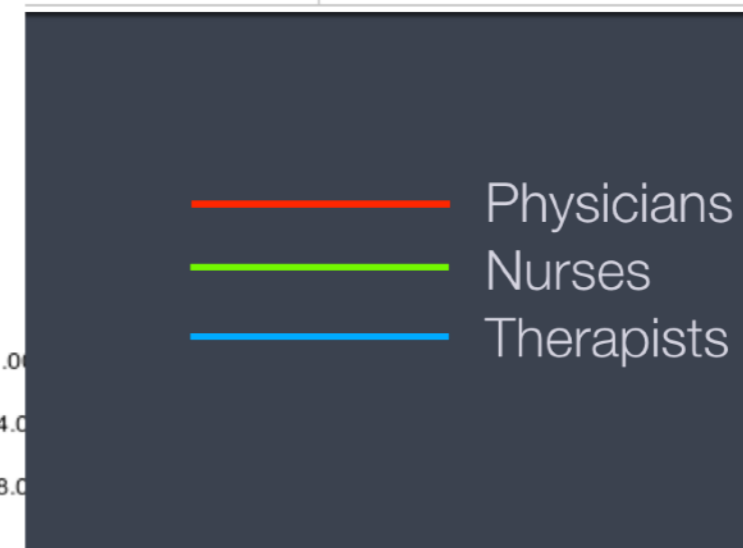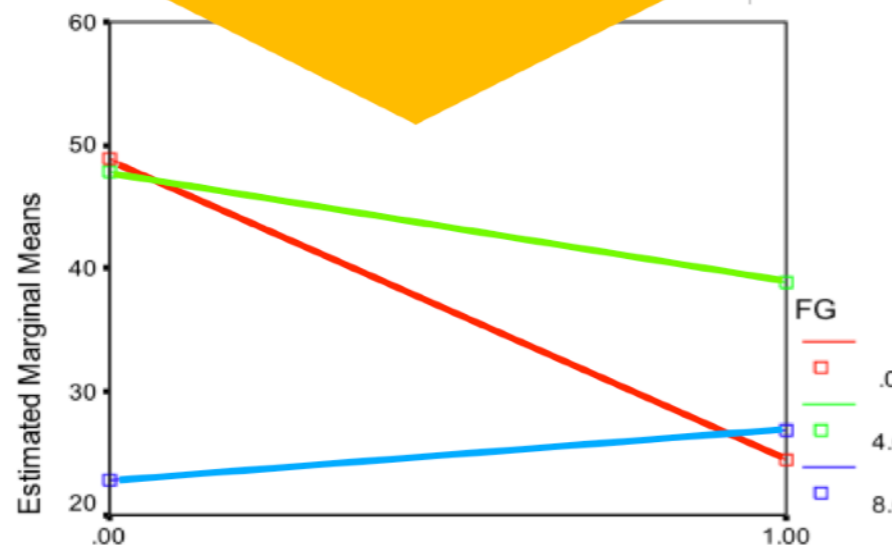
Lessons: Development and implementation

▶ Effects are instrumental for early design activities, and during development and configuration – can replace for example use cases [17]

▶ Effects can be measured and assessed in pilot implementations – before roll-out [12, 16]

▶ Effects may be anticipated, emergent, and opportunity-based [2, 5, 12]

▶ Many innovative effects are unanticipated & enabled after implementation – during on-going use [14]

Use (ongoing improvement)
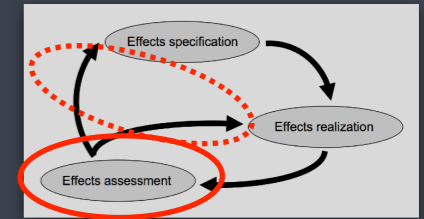
Initiation & specification	Development	Implementation	Use

Warm hands [7]

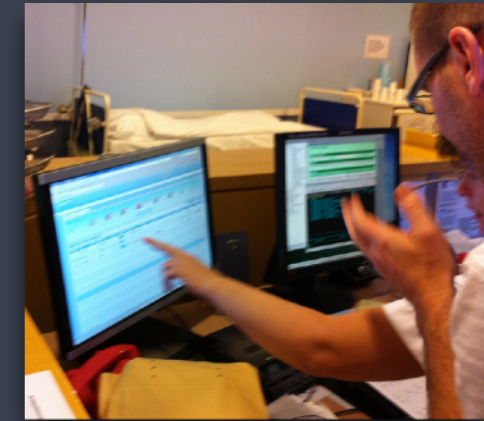Centralized healthcare with higher specialization. More 'warm hands'
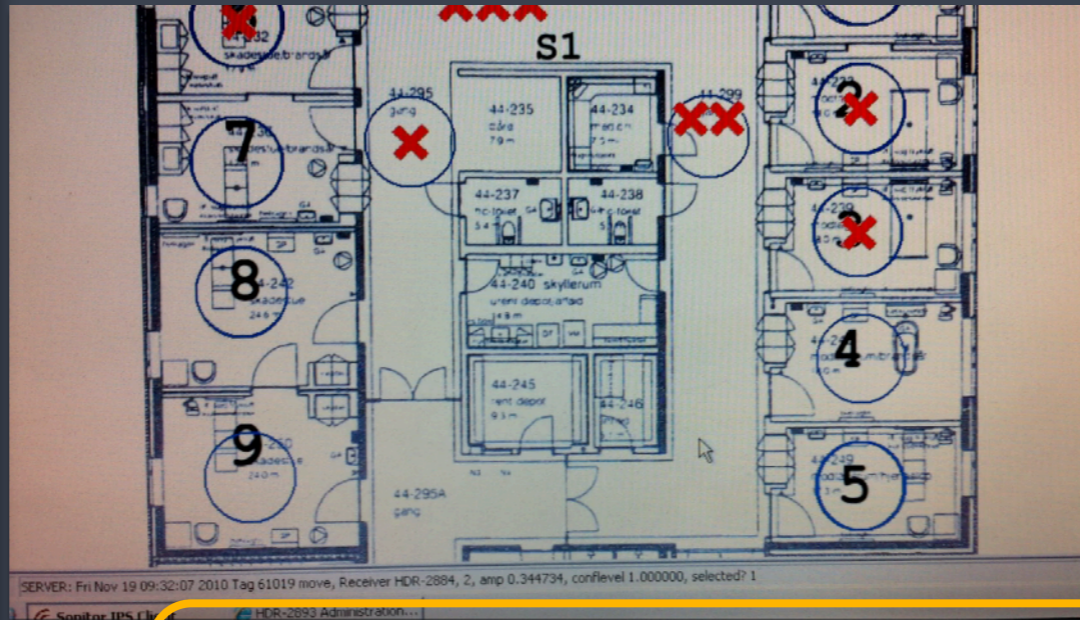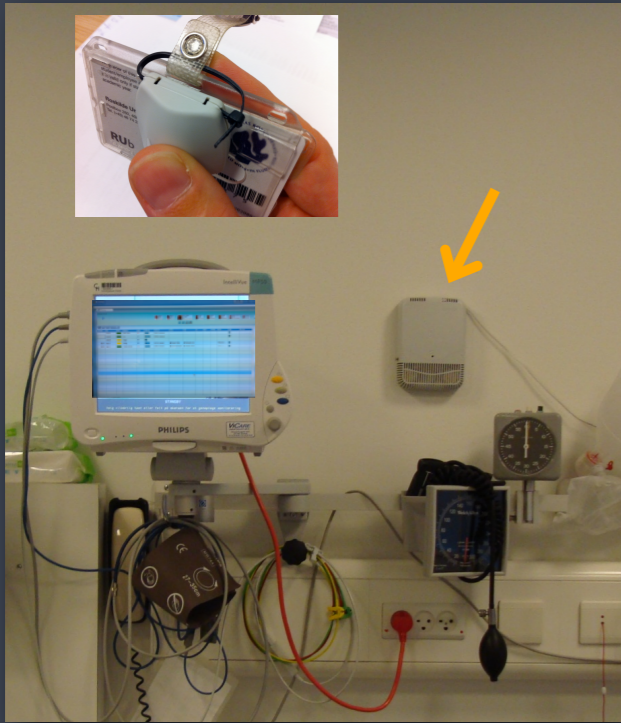
Optimized patient flow and logistics in and between wards

Improved resource coordination and prioritizing related to patient flow

Improved overview of incoming and current patients

List of all incoming and current patients, resource allocation, plan, status, etc.

Effects assessment

More "Warm Hands": 44 min/nurse/shift

N = 663 shifts	Physicians				Nurses		
See [7, 15]		Before	After			Before	After
Patient room		19	20	***		17	28
Coord. Center	**	52	59	**		55	44
Other	***	29	20			27	28

Dansk Projektledelse 7. nov. 2018

Data and visualizations for effects assessment

Lessons: Use (ongoing improvement)

▶ Support mutual investigation, learning, and experimentation with local interventions – based on assessments from on-line data [9, 11]

▶ Require local competencies [6]

  ▶ and governance/support for dissemination, scaling and standardization

▶ Suggested as complementary quality development/assurance model [10]

Characteristic	Accreditation with PDCA phases	Effects-driven IT development
Aim and concern	• National quality goals achieved through evidence-based or 'best practice' process standardisation	• Local quality goals achieved through realising effects aligned with national quality goals
Strategy	• Behaviour control • Standardisation of processes by indicators of the plan-do-check-act (PDCA) phases • Documenting and complying with standardised processes • Top-down control approach by external auditors	• Outcome control • Standardisation of output by specifying, realising and assessing effects • Local experimentation to realise effects • Bottom-up participatory learning approach by local clinicians
Gets people to act (Weick 2000)	• By directing attention toward documenting and learning the accreditation standards and by auditor visits every third year	• Through involving people in specifying and prioritising measurable, wished-for effects on an on-going basis
Gives people a direction (through values or whatever) (Weick 2000)	• People should learn and comply with the standards.	• People should systematically pursue the wished-for effects.
Supplies legitimate explanations that are energising and enable actions to become 'routine' (Weick 2000)	• Legitimate explanations from the 'outside' • approval/accreditation to enable actions to become routine	• Effects specified from the 'inside' • legitimate explanations that have the potential to become routine.
Skill acquisition	• Novices, advanced beginners and competent clinicians	• Novices, advanced beginners, competent, proficient and expert clinicians
Challenge	• To implement general standards in specific and concrete work contexts • Lack of motivation and engagement from local clinicians	• To generalise and distribute local processes that succeed in obtaining wished-for effects • Lack of top management attention and resource allocation
Meeting point	• Global aims, goals and standard clinical guidelines that need to be obtained/implemented locally	• Local experimentation to obtain effects as an implementation strategy to align global aims, goals and standard clinical guidelines

[10]: Simonsen, Hertzum, and Scheuer (2018): Quality Development in Health Care: Participation vs. Accreditation, *Nordic Journal of Working Life Studies*, Vol. 8, No. S3, April 2018

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