

# Sustained Participatory Design and Implementation of ITHC

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# Background

- ▶ Participatory Design
- ▶ Effects-driven IT development research program (2004- )
  - ▶ [www. effektdrevetit.dk](http://www. effektdrevetit.dk) - [www.effects-drivenit.dk](http://www.effects-drivenit.dk)
- ▶ Region Zealand; Region South Denmark; CSC Scandihealth; Imatis
- ▶ EPR systems in hospitals; Emergency Departments
- ▶ Morten Hertzum, Anders Barlach, Erling Havn, Jørgen Bansler

# Participatory Design

“The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behaviour. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation” (Schön 1983, p. 68).

- ▶ Collective reflection-in-action
- ▶ Establishment of mutual learning situations
- ▶ Iterative approaches reflecting a hermeneutic circle
- ▶ Small-scale, research-driven, initial design and development

# Learning from implementation

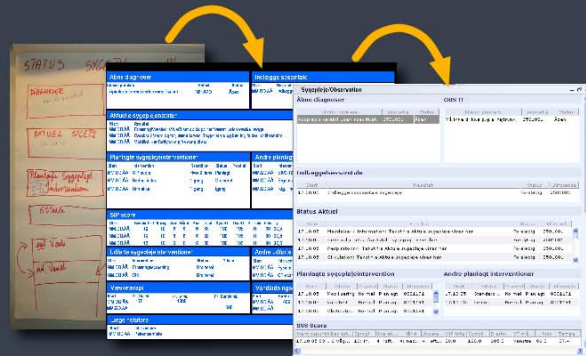
Crossing the chasm between development and implementation

Initiation

Development

Implementation

Operation



?

Formative evaluation

# Learning from imp

A limited implementation of a pilot system [mature, robust prototype] in its intended environment and using real data. It is conducted as part of an ISD project to explore the value of the system, improve the system design accordingly, and thereby reduce implementation risk  
(Hertzum, Bansler, Havn and Simonsen, forthcoming)

Complete EPR  
Workload (↓)  
Coordination (↑)

Pilot  
Implementation

Operation



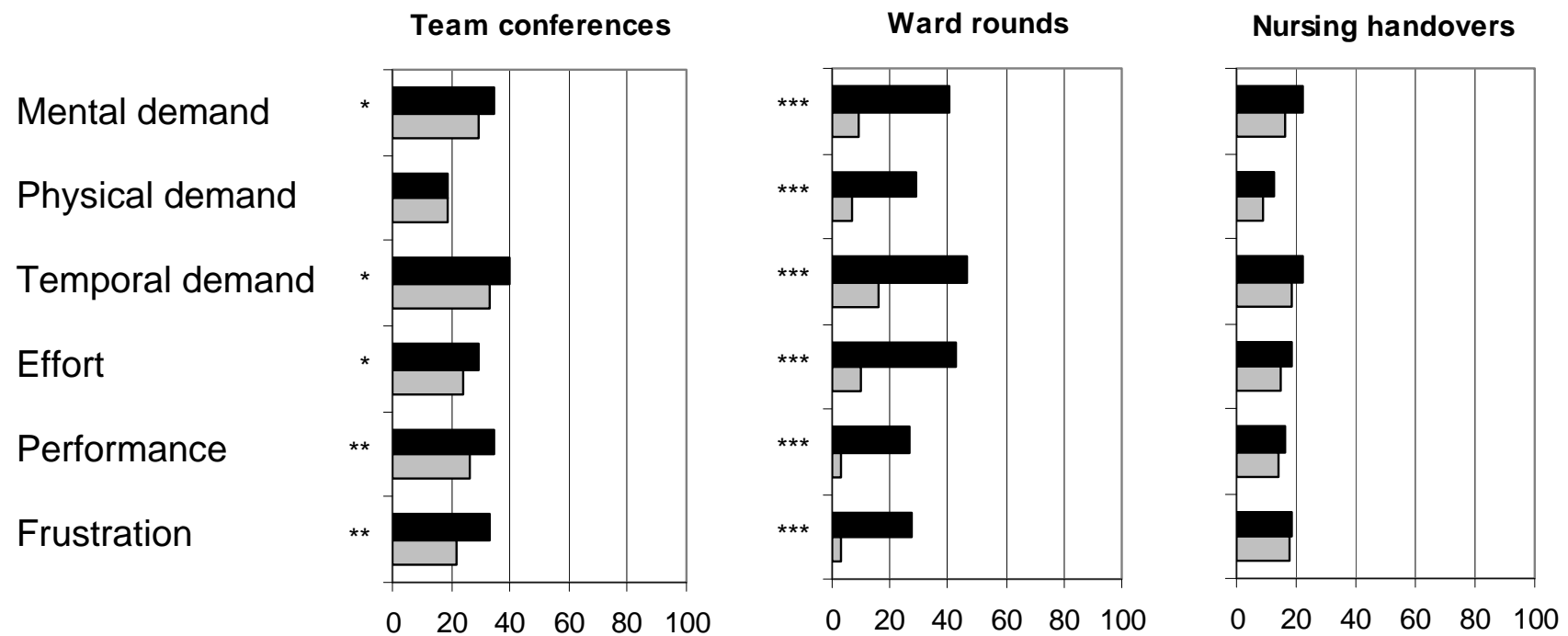
## Pilot Implementation

- ▶ 24/7 in one week
- ▶ No paper records
- ▶ Wizard-of-Oz

?

Formative evaluation

# Learning from implementation



(Hertzum and Simonsen, 2008)

Formative evaluation

# Learning from implementation

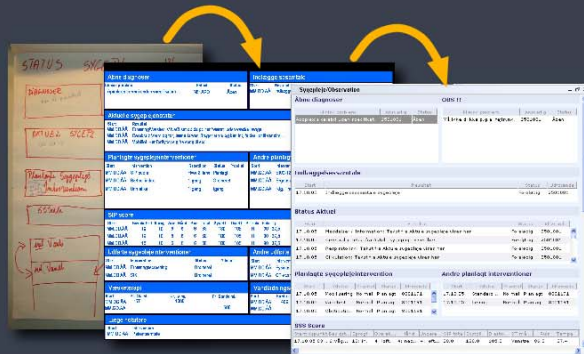
Crossing the chasm between development and implementation

Initiation

Development

Pilot  
Implementation

Operation



?

Formative evaluation

Unanticipated change

- ▶ Emergent
- ▶ Opportunity-based
- ▶ 38% (183/482)





# Learning from implementation

- ▶ Chief physician: “She must be highly prioritized. How do we record that?”  
EPR-unit manager: “We do that in the task-list that we don’t have”
- ▶ Collective investigations of patient records (emergent change)



- ▶ Nurses’ observations became part of the shared agenda during team conferences (opportunity-based change)

14.12.05  
NSA-R

**OBS II (3)**

Klinisk problem	Ansvar	Status
↳ Ind og udgiftmåling	NSA-R	Åben
↳ formodentlig nedsat kraft i høj arm og	NSA-R	Åben
↳ urinretention, kateter	NSA-R	Åben

Resultat	Status	Indsamlet af
er : går til og fra toilette med rollator og 1 pers	Afsluttet	N61APO-RG
a har tolket for pt, det er dog svært at kommunikere med pt d.	Afsluttet	N61APO-RG
ation : pt har gennem de 12 sidste timer haft stigende creat	Afsluttet	N61APO-RG
t mat men vågen og relevant. Følger opfordringer der forstås	Afsluttet	N61APO-RG
er : Gået med følge af 1-2 person til badeværelset (TV)	Afsluttet	N61APO-RG
ædning : Hjulpet med nedre toilette ifm toiletbesøg. Hjælp til i	Afsluttet	N61APO-RG
taler ikke dansk, vanskelig gør kommunikationen. Gør sig fors	Afsluttet	N61APO-RG
else : søn oplyser der den seneste tid har været lidt huske prc	Afsluttet	N61APO-RG
ryk : opleves ikke umiddelbart smerteklager hos pt (TV)	Afsluttet	N61APO-RG
ation : Indl-advis faxet /phj)	Afsluttet	N61APO-RG
ation : sin: forstår vist ikke helt anfordringer, er derfor svær	Afsluttet	N61APO-RG

**Planlagte interventioner (20)**

Indsamle	Start	Intervention	Gentagelse	Status
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00:00:36

### Interventions (I) by physicians recorded in the EPR

- ▶ I-1: Sodium chloride was installed for slow infusion over night
- ▶ I-2: Infusion increased because of increasing creatinine
- ▶ I-3: Attempts catheterization, but without success.
- ▶ I-4: Catheterization made by physicians from the Gynaecological ward
- ▶ I-5: More sodium chloride installed because of possible dehydration

### Issues and hypotheses (H) investigated by the nurses

- ▶ Observe little urine out
- ▶ Discuss catheter problems (H-1)
- ▶ Discuss bladder dysfunction (H-2)
- ▶ Investigates stroke scores (challenges H-2)
- ▶ Doubts H-1 and H-2 and suspect a new H-3 (kidney failure)
- ▶ H-3 presented and confirmed at the following team conference

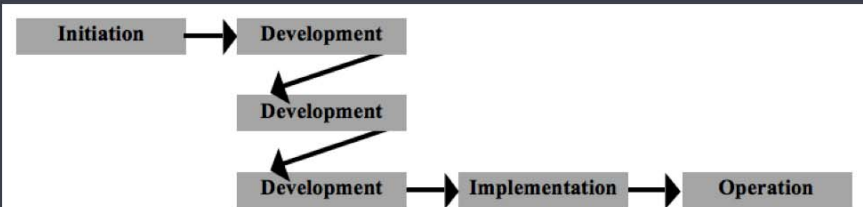
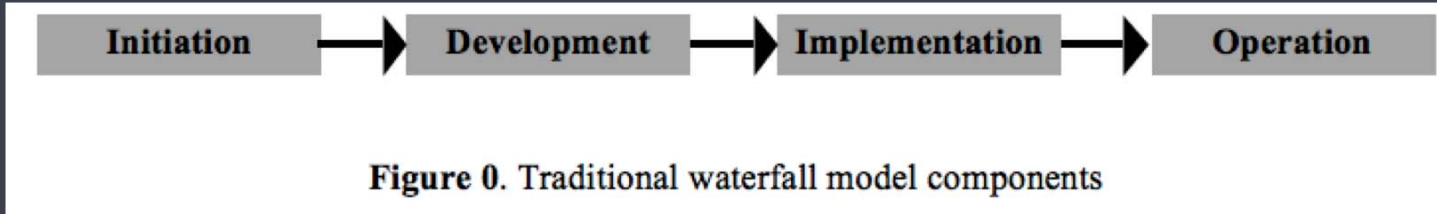
(Simonsen and Hertzum, 2010)

# Implications

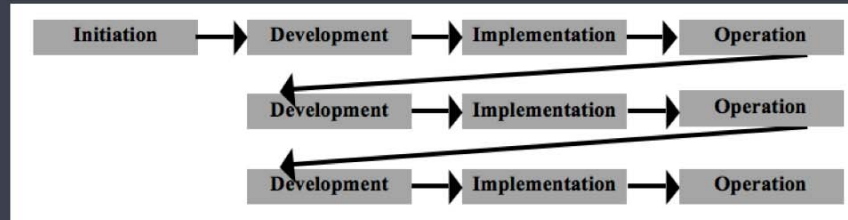
Sustained Participatory Design through Pilot Implementations

- ▶ Development-implementation chasm (research scarcity)
- ▶ Identifying emergent effects and change (a new role for ethnography)
- ▶ Experimentation & learning meets production (a two-sided story)

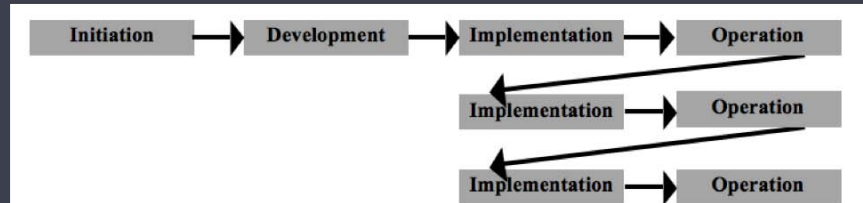
# IT development models



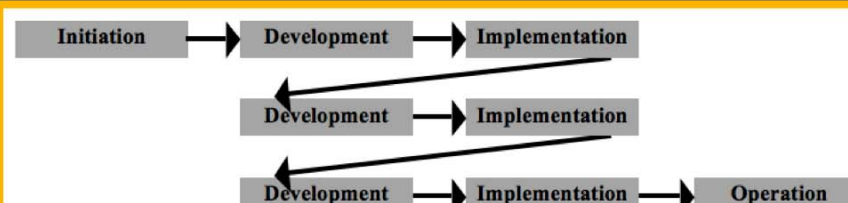
**Figure 1.** ISD project with iterative prototyping.



**Figure 3.** Evolutionary development.



**Figure 2.** ISD project with phased implementation.

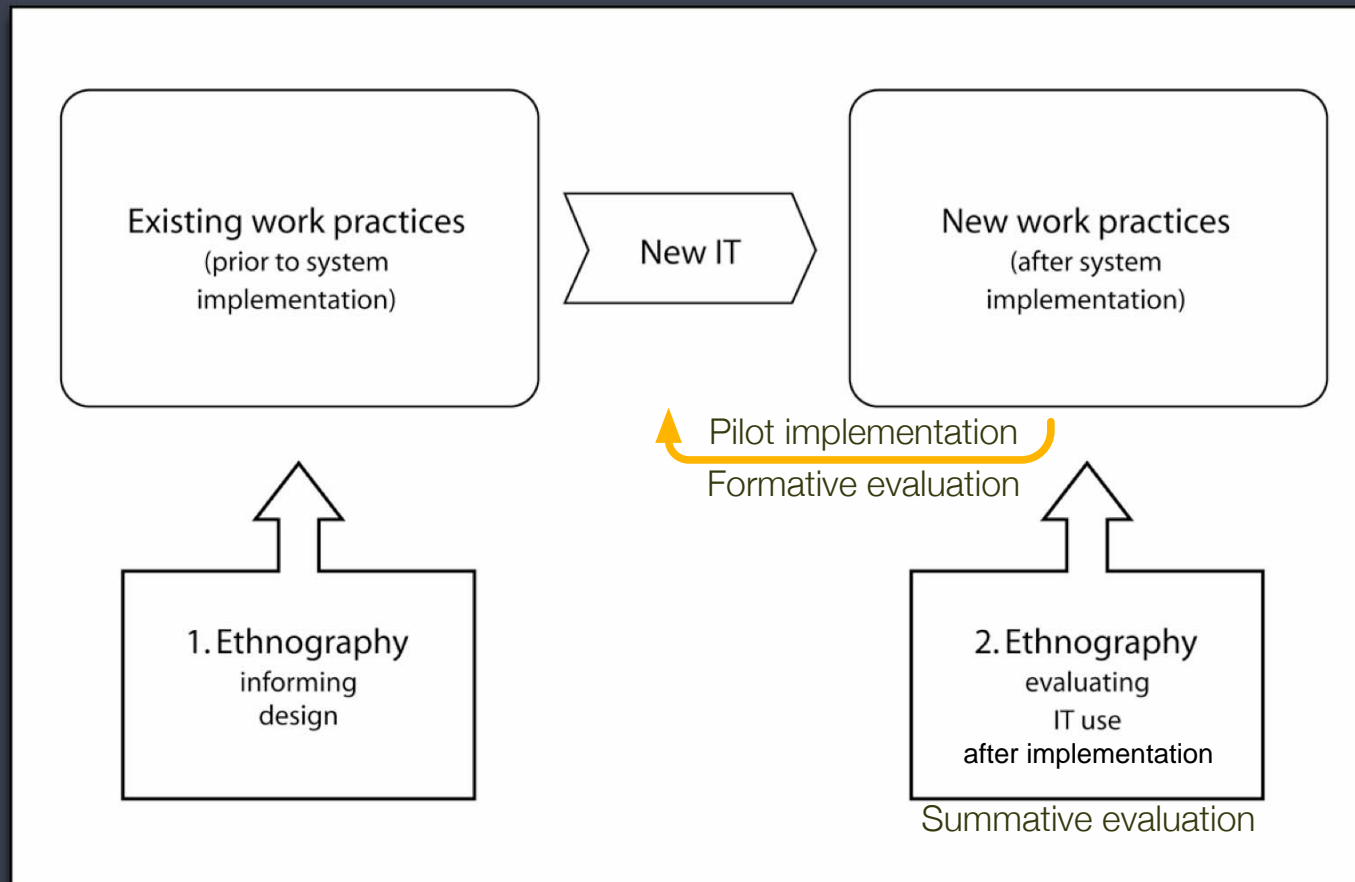


**Figure 4.** ISD project with pilot implementations.

Hertzum, Bansler, Havn and Simonsen, forthcoming

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# A new role for ethnography?



Simonsen, 2009

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# Resource consumption

<b>Activity</b>	<b>CSC (hours)</b>	<b>Region Zealand (hours)</b>	<b>Stroke unit (hours)</b>	<b>Researchers (hours)</b>
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
<b>Total</b>	<b>2791</b>	<b>669</b>	<b>372.5</b>	<b>417</b>

**Table 1.** Person hours spent by the four partners in the EPR evaluation.

Hertzum and Simonsen, 2008

# References

- ▶ Bødker, K., F. Kensing, and J. Simonsen, *Participatory IT Design. Designing for Business and Workplace Realities*, MIT Press, Cambridge, Massachusetts, 2004.
- ▶ Simonsen, J., and M. Hertzum, “Participatory Design and the Challenges of Large-Scale Systems: Extending the Iterative PD Approach,” *Proceedings of the 10th anniversary conference on Participatory Design*, ACM press, 2008, pp. 1-10.
- ▶ Hertzum, M. and J. Simonsen (2008): “Positive effects of electronic patient records on three clinical activities”, *International Journal of Medical Informatics*, Vol. 77, No. 12, pp. 809-817, Selected for the "best paper selection" of the 2009 IMIA Yearbook of Medical Informatics
- ▶ Simonsen, J. (2009): “The Role of Ethnography in the Design and Implementation of IT Systems”, *Design Principles and Practices, an International Journal*, Vol. 3, No. 3, pp. 251-264.
- ▶ Hertzum, M., and J. Simonsen, “Effects-Driven IT Development: A Strategy for Sustained Participatory Design and Implementation,” *Proceedings of the 11th Biennial Participatory Design Conference (PDC 2010)*, ACM Press, 2010.
- ▶ Simonsen and Hertzum, “Iterative Participatory Design,” in J. Simonsen, J. O. Bærenholdt, Monika Büscher, and J. D. Scheuer (Eds.): *Design Research: Synergies from Interdisciplinary Perspectives*, Routledge, Boston, 2010, pp. 16-32.
- ▶ Hertzum, M., J. P. Bansler, E. C. Havn, and J. Simonsen, “Pilot Implementations: Crossing the Chasm between Development and Implementation,” submitted article, Forthcoming.