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Early Phase Telemedicine Requirements Elicitation in Collaboration with Medical Practitioners

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Outline

- Introduction
 - Case
 - Motivation
 - Research Question
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 - Mixed elicitation method
 - Refined method
- Results
- Conclusion and Future work



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Introduction

- Case MobiGuide (MG) project
 - Mobile Patient Guidance System (PGS) for disease management
 - European FP7 Integrated Project: 13 partners
- Motivation
 - PGS supports (new) treatments: Evidence Based Medicine
 - Multidisciplinary design setting: Absence of medical researchers



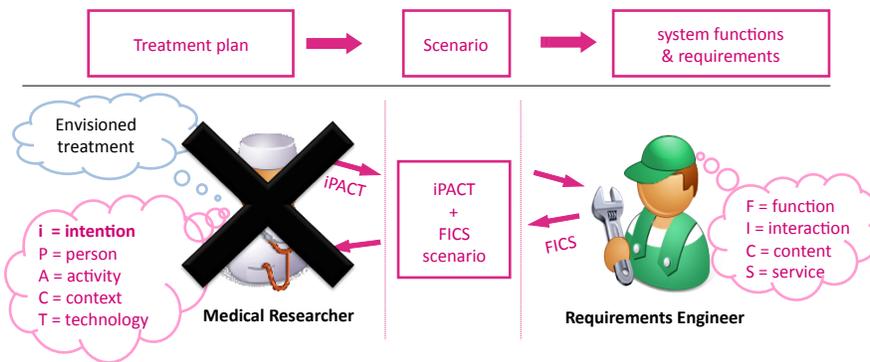
Research Question

How to elicit requirements for a new telemedicine application in collaboration between engineers and medical practitioners with time constraints?



Method – Ideal Case

- Mixed method: scenario + e.g. activity-interaction analysis
- Scenario in terms of:
user activity (iPACT) & user-system interaction (FICS)



[cf. Benyon-MacAulay & Widya et al.]



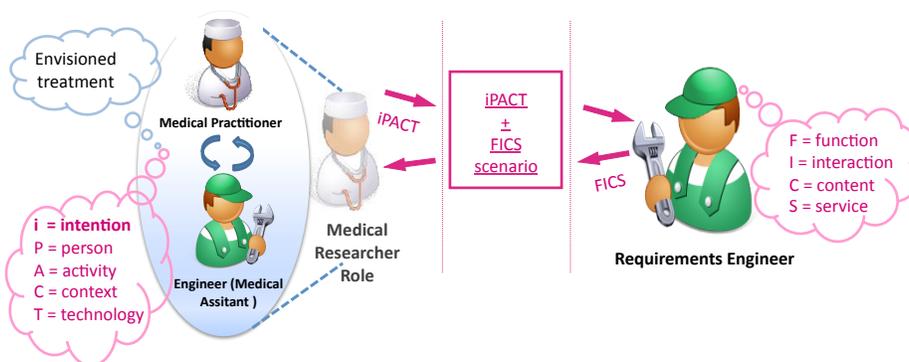
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Method – Adapted Case

- Replace medical researchers role by a team medical practitioners and RE-engineers (medical assistant)
- Iterative approach method



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Techniques I

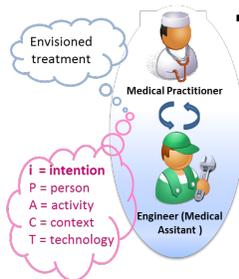
For collaboration between medical practitioners and engineers:

- Cross Disciplinary Study: engineer → medical assistant
- Brainstorm and Team Discussion Sessions

Aim: Initial scenario focused in intention, person and activity

Process:

- Medical practitioner provides idea → intention (i)
- RE-engineer (medical assistant) proposes scenarios
 - Abandon unrealistic scenarios
 - Not worth being investigated
 - Rare clinical situation
 - Choose realistic scenarios
 - Worth being investigated
 - Common clinical situation



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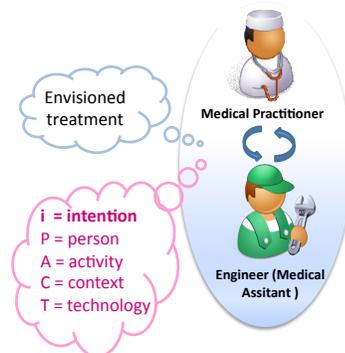
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Techniques II

For collaboration between medical practitioners and engineers:

- Questionnaires
- Semi-Structured Interviews

Aim: Exhaustive scenario detailing also context and technology



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Results: Case I

- Adaptation of an existing therapy

Evidence Clearly Available	Evidence Partly Available
Anticoagulant Therapy	Physical Exercise Training Therapy
<p>Guideline:</p> <ul style="list-style-type: none"> Prescribed medication Inclusion and exclusion criteria Time details ... Adaptation: <ul style="list-style-type: none"> Electronic Reminders 	<p>Randomized Control Trial:</p> <ul style="list-style-type: none"> Physiotherapist supervision Vital signs controlled Time duration ... Adaptation <ul style="list-style-type: none"> Context: outdoors, no-supervisor Technology: role of physiotherapist
✓	✓



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Results: Case II

- Specification of a **new** ICT based therapy
 - Pathophysiological Model** describes
 - disease internal functioning and external effect
 - how to link clinical variables with the disease pathophysiology

Evidence Not Available

High altitude Scenario	Symptoms Avoidance Scenario
<p>Less O₂ - Regular sino atrial impulses (i.e. human natural frequency) get disturbed</p> <p>Context: activity/exercise</p> <p>Hypothesis: prevent shortness of breath by reducing physical activity in high altitude.</p> <p>Symptoms: palpitations, shortness of breath</p>	<p>HR increment</p> <p>Context: activity/rest</p> <p>Hypothesis: prevent symptom and upcoming AF episode by HR increment (or matching with physical activity)</p>
✗	✓



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Conclusions & Future Work

- Refinement of iPACT+FICS scenario based elicitation mixed methodology (advantages)
 - Role of intention (i) becomes more significant
 - Model based approach for new treatment facilitates engineers work as medical assistant and avoids technological push
 - Reduce gap between medical assistants and medical practitioners
 - Result of multiple iPACT+FICS scenarios for several cases (Evidence Clearly/Partly/Not Available)
 - Likely useful in (some) other domain
- Disadvantages
 - Complexity of the process
 - More effort + several (extra) iterations
- Future works
 - Refinement of FICS, ontology and translation to Asbru



END

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