

Towards Human-centric Model-driven Software Engineering

Prof John Grundy

Dr Hourieh Khalajzadeh

Dr Jennifer McIntosh



Motivating
Example:
Smart Home

Our Approach

Summary

Creating more
human-centric
software...

Progress

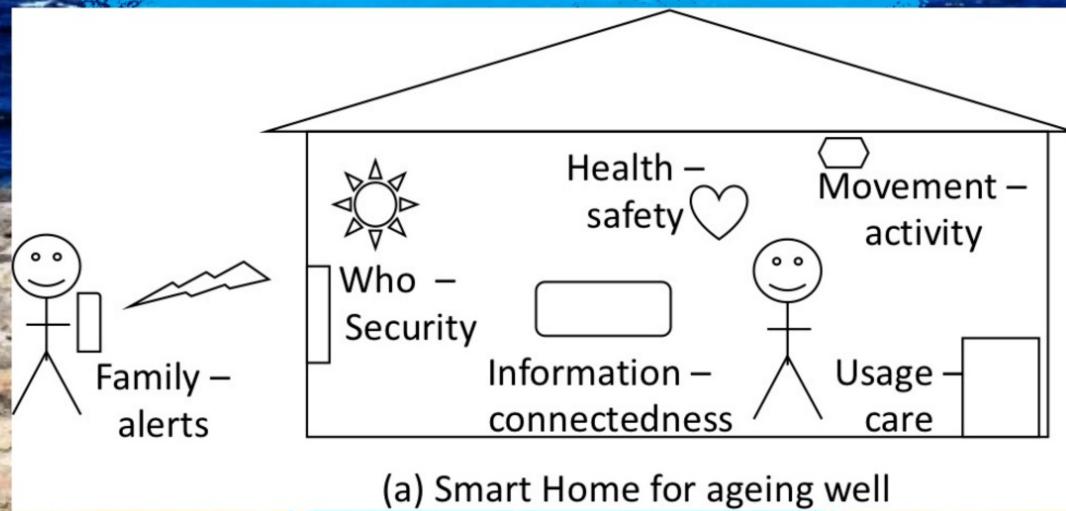


Motivating Example: Smart Home

Key Issues...

Key
Challenges...

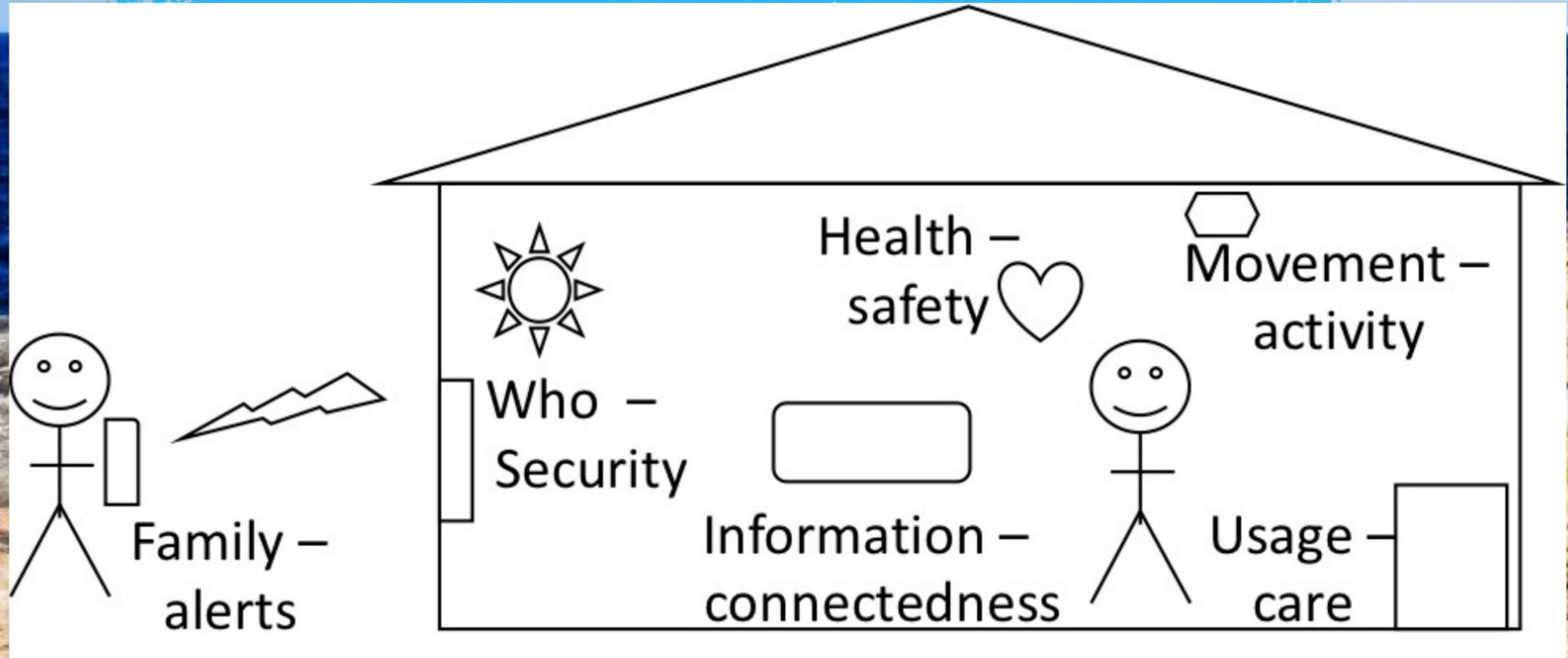
Motivating Example: Smart Home



Key Issues...

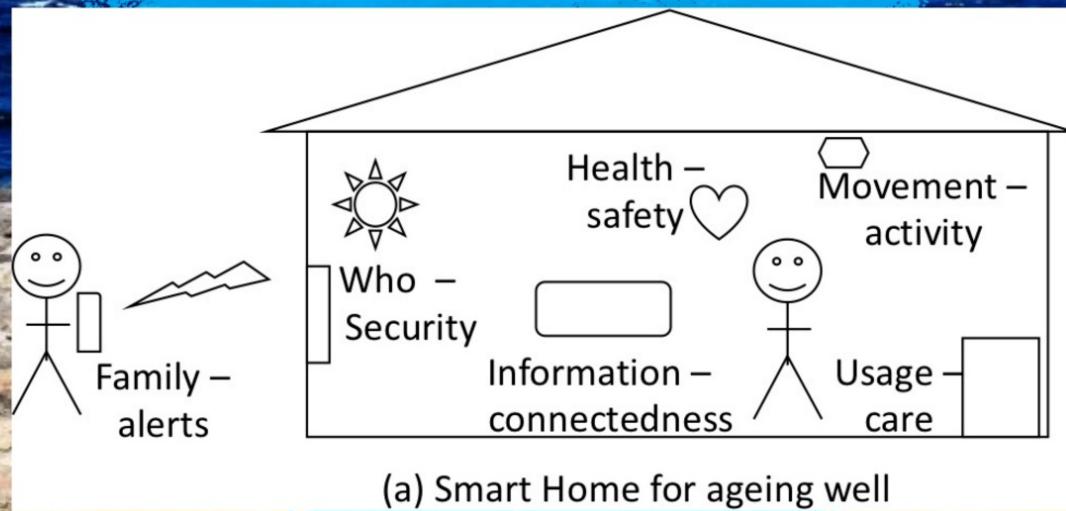
Key Challenges...

Smart Home



(a) Smart Home for ageing well

Motivating Example: Smart Home



Key Issues...

Key Challenges...



Key Issues...

Users have different

- emotion reactions
- personality
- age
- language
- culture
- gender
- socio-economic status
- ...



Key Challenges...

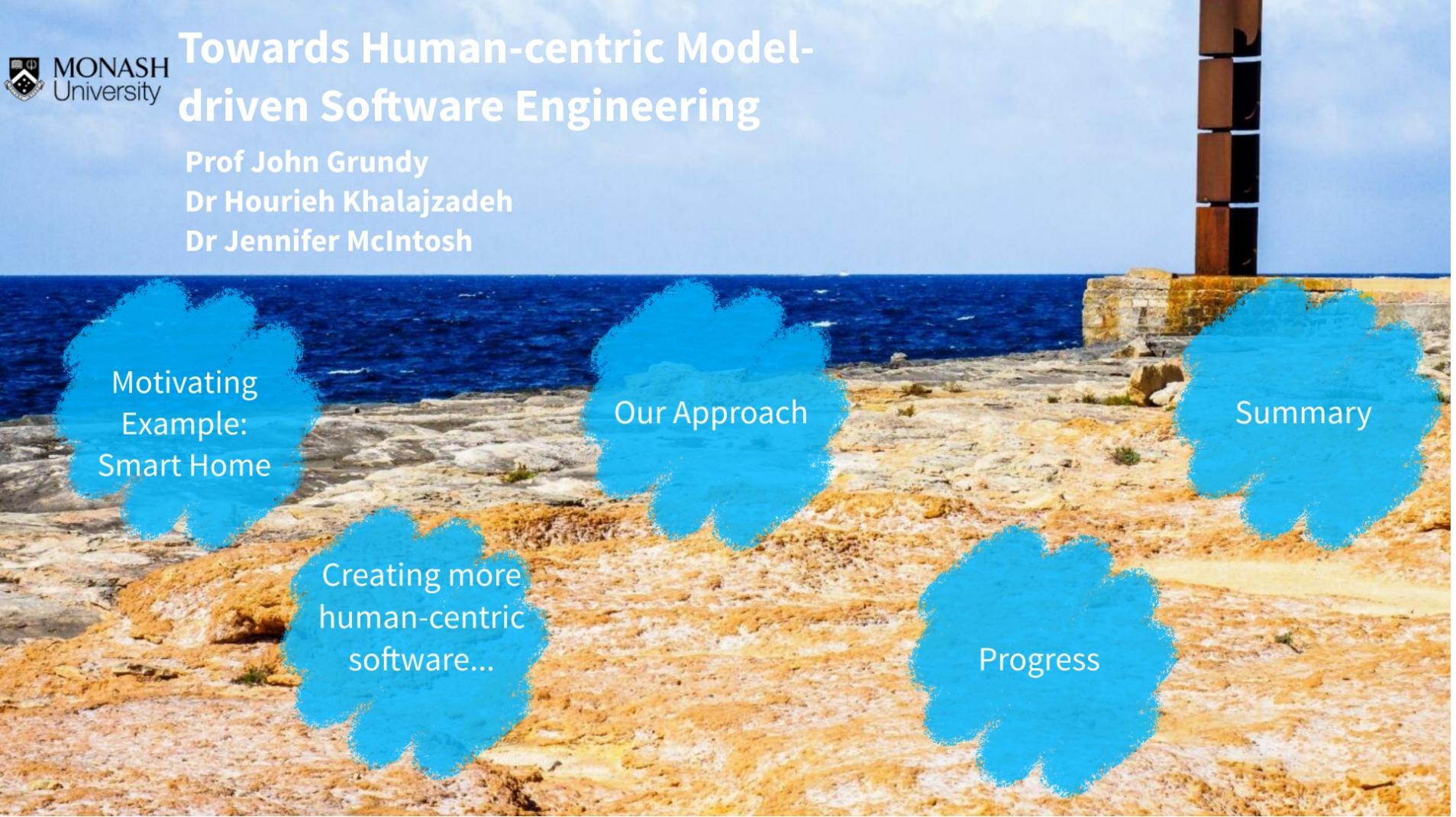
- current MDSE approaches ignore human-centric issues
- developers usually very different to users
- no ways to model human-centric issues, use in MDSE
- lack of feedback to developers when in use
- lack of fast feedback to fix

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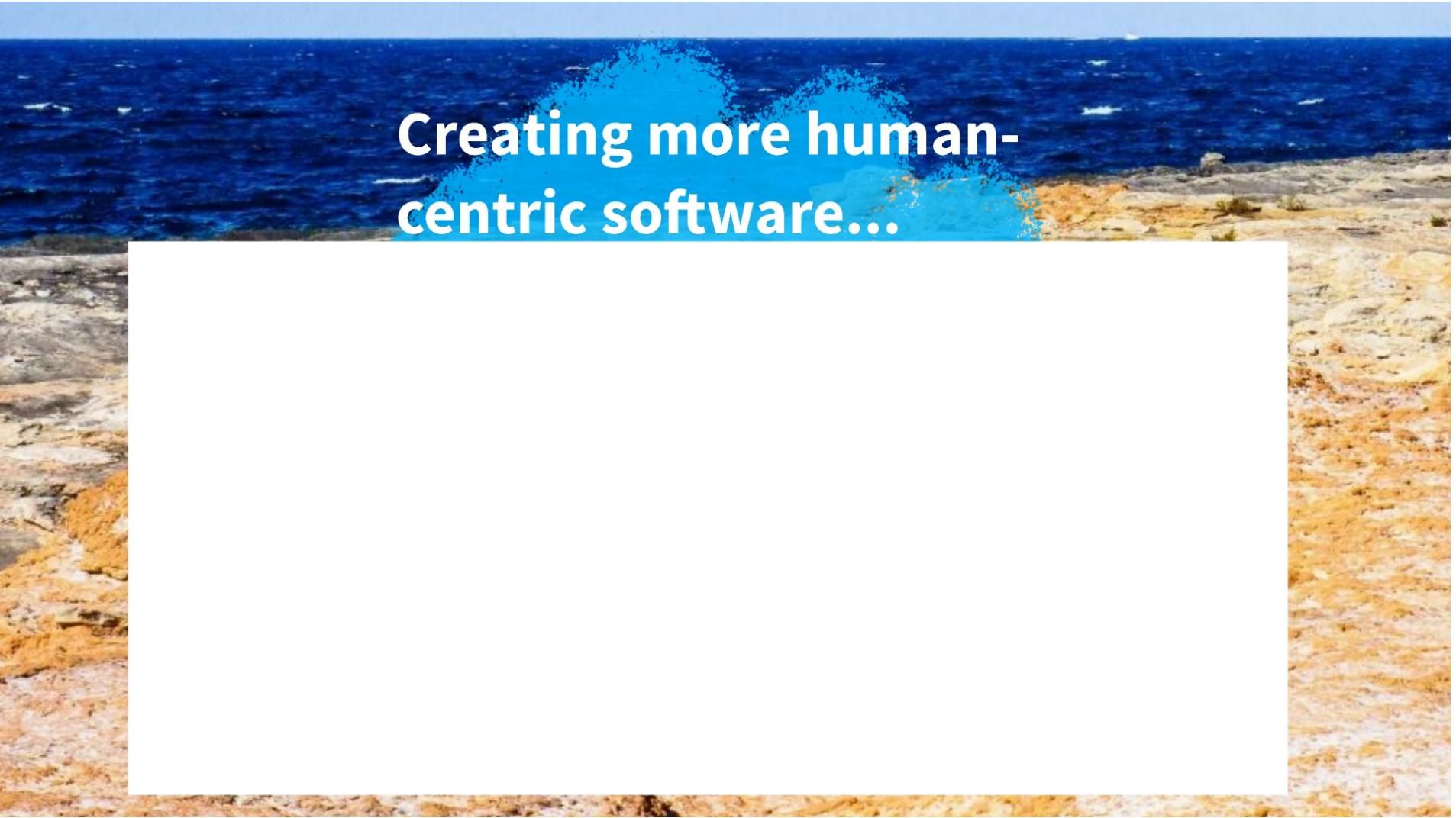
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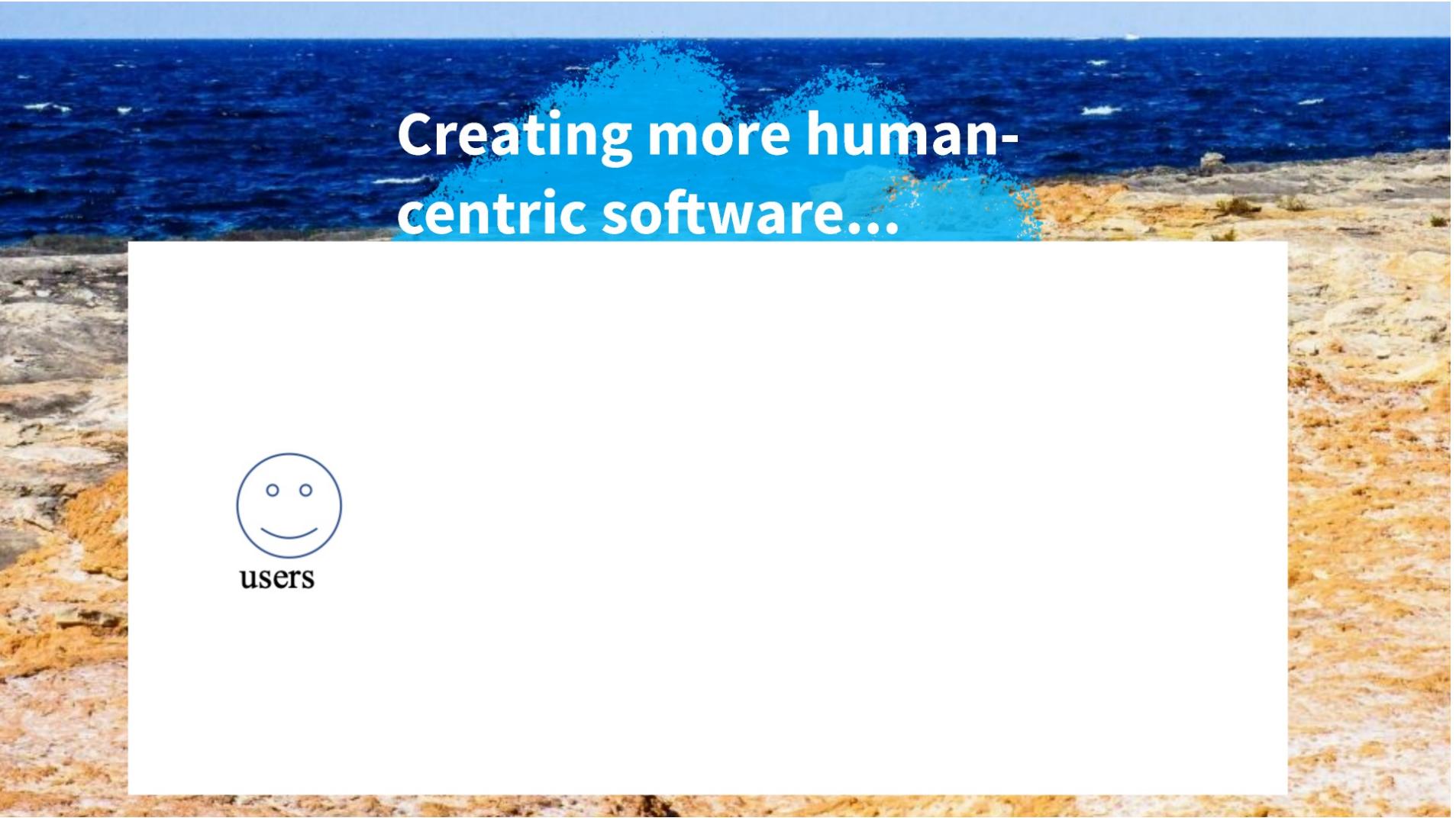
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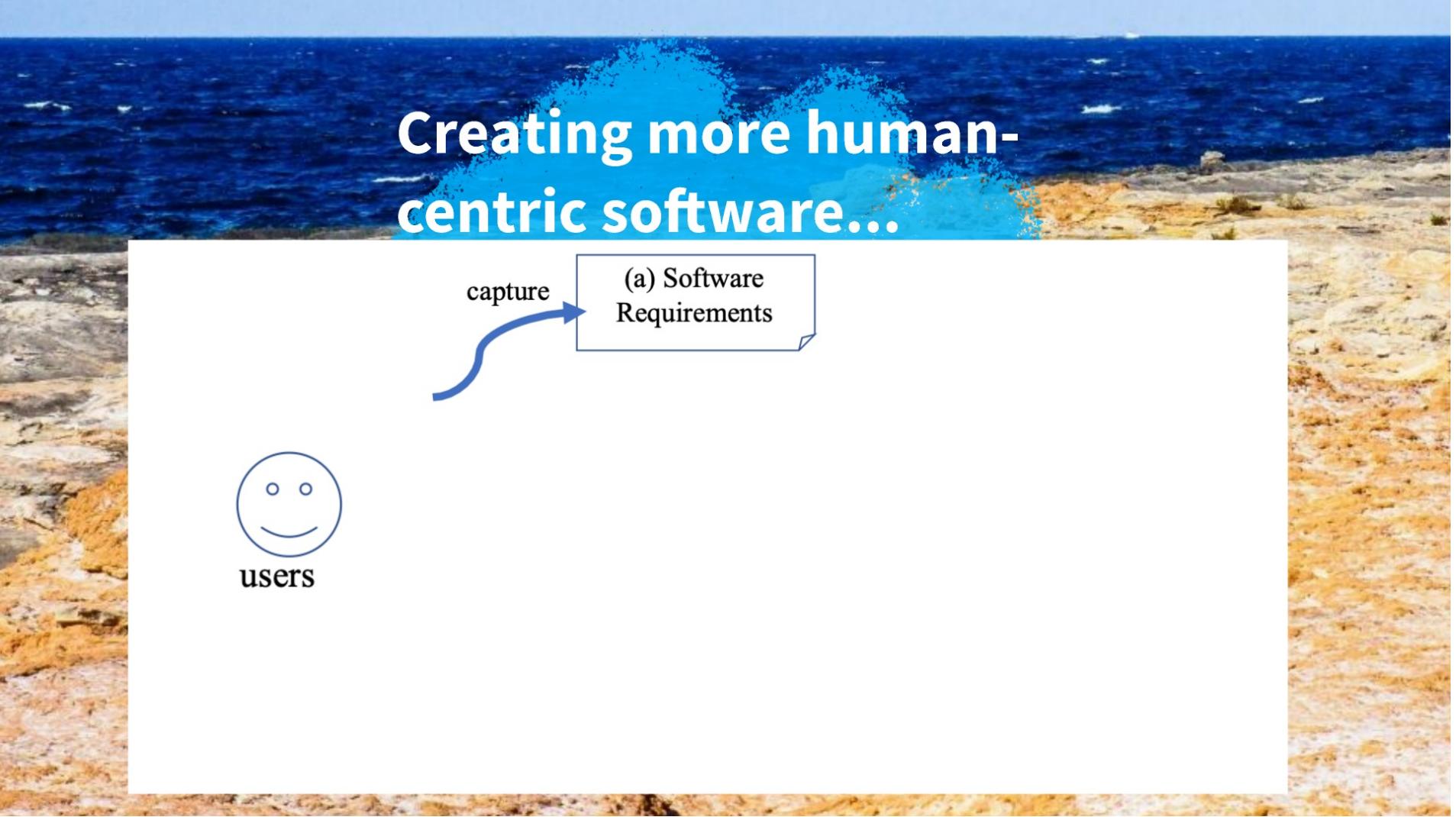


Creating more human-centric software...

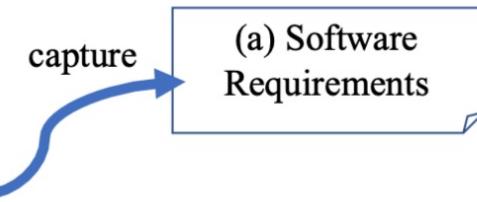


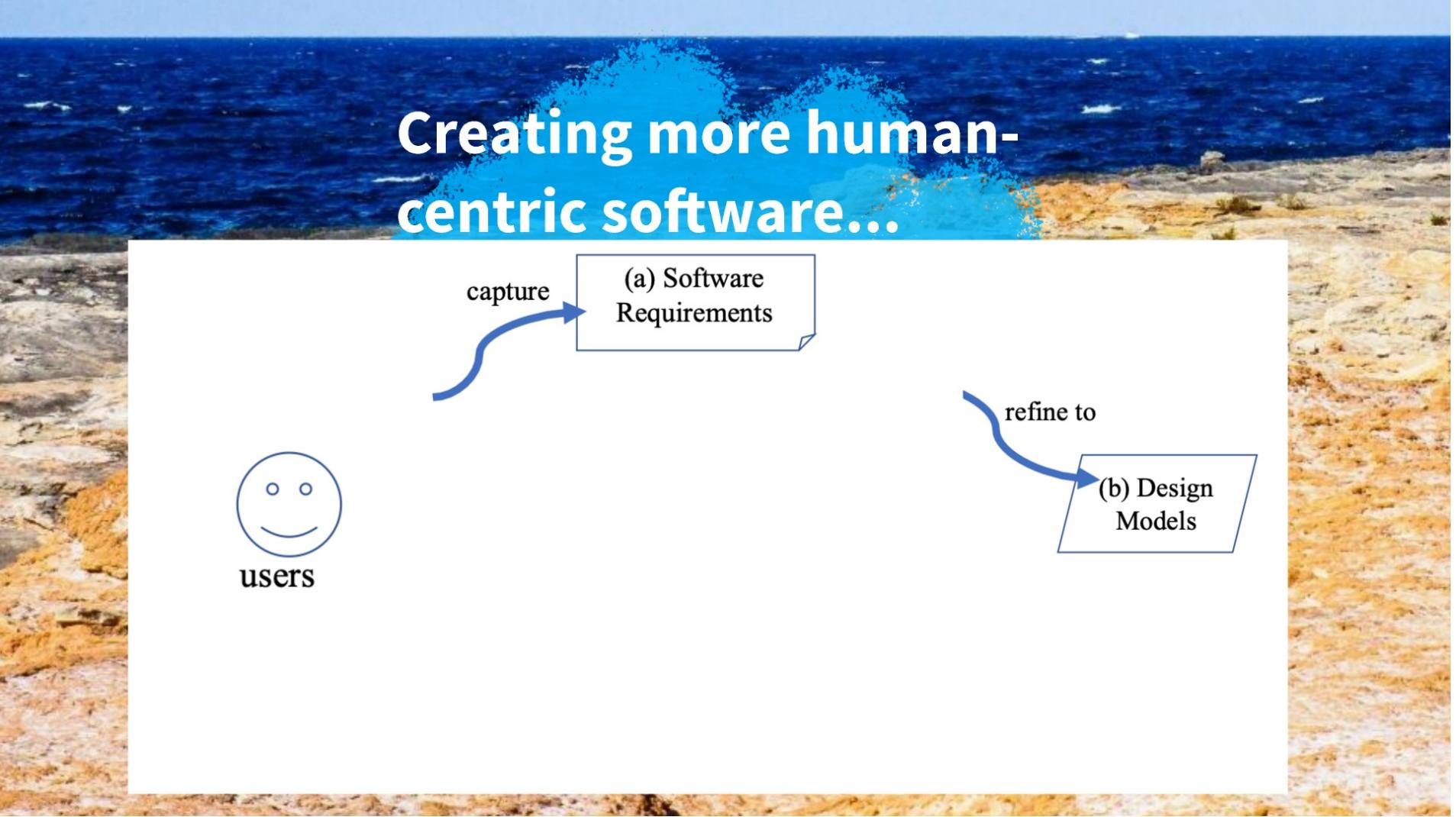
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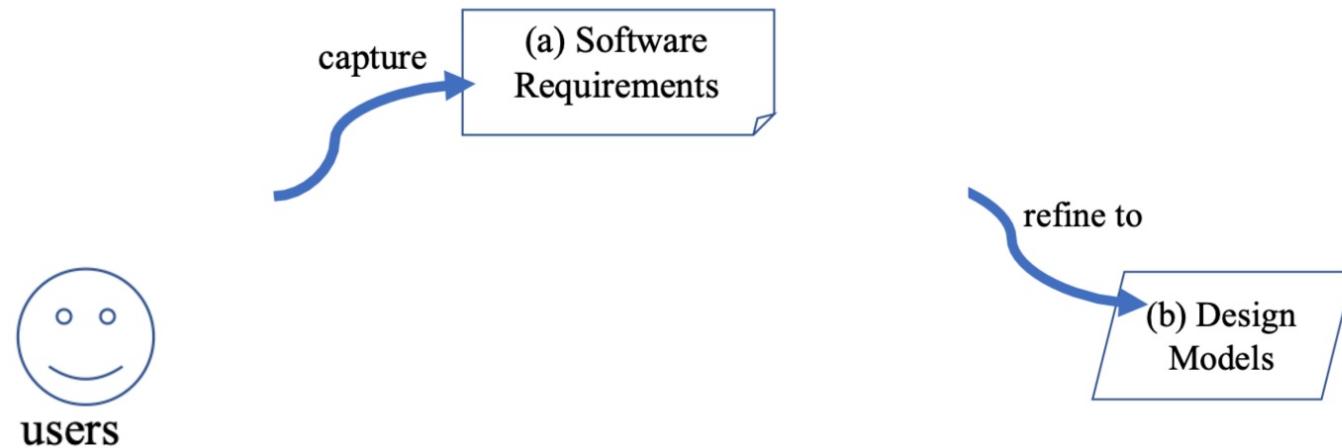


Creating more human-centric software...

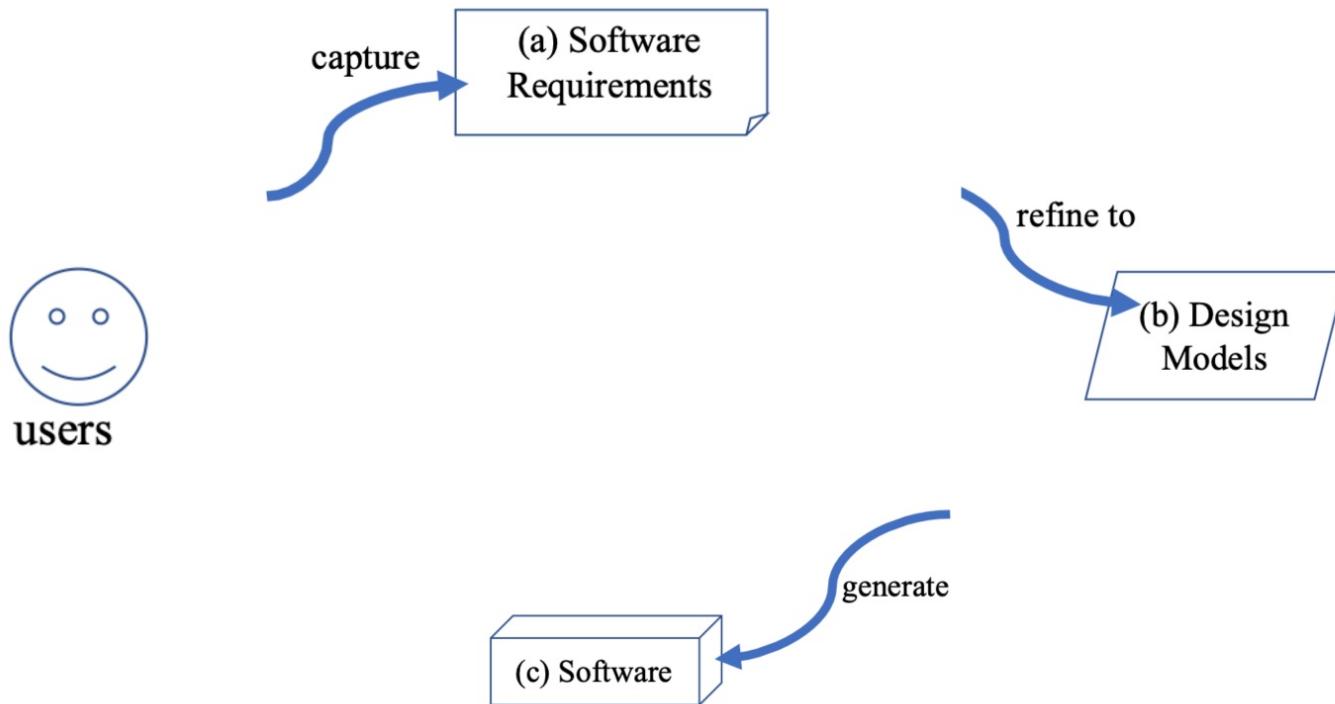




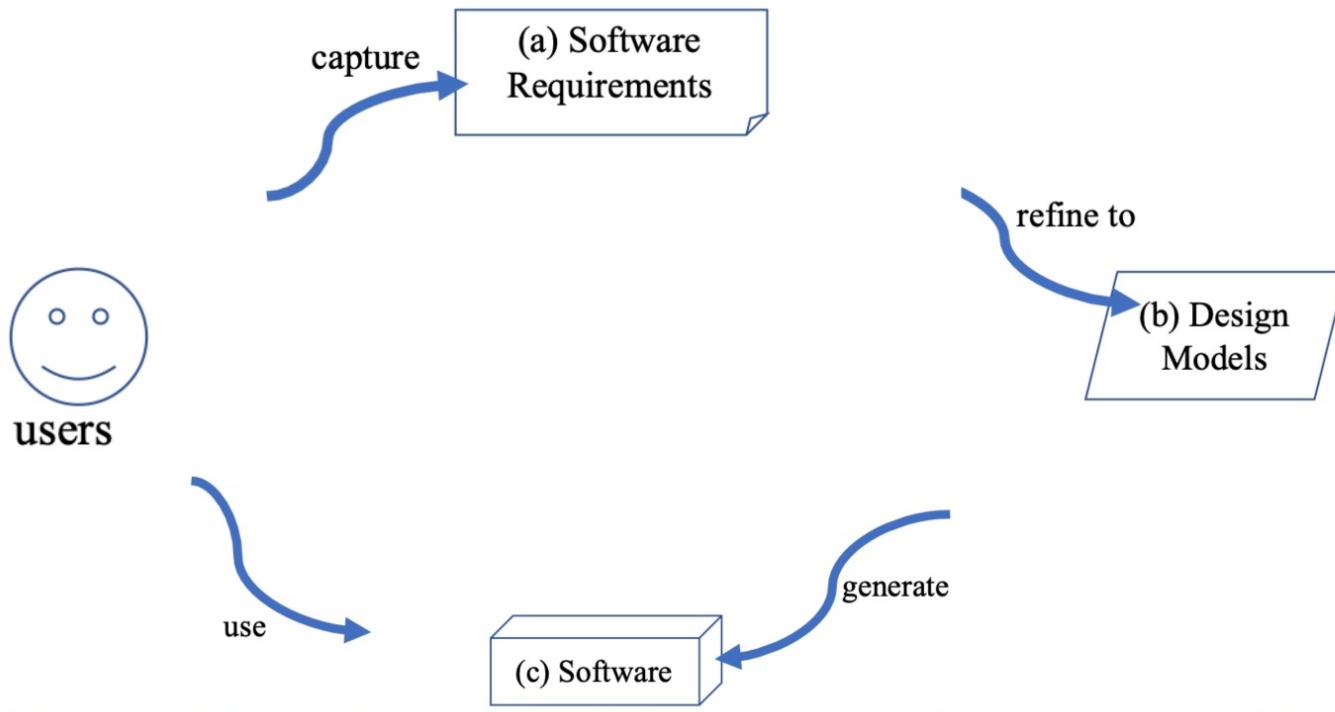
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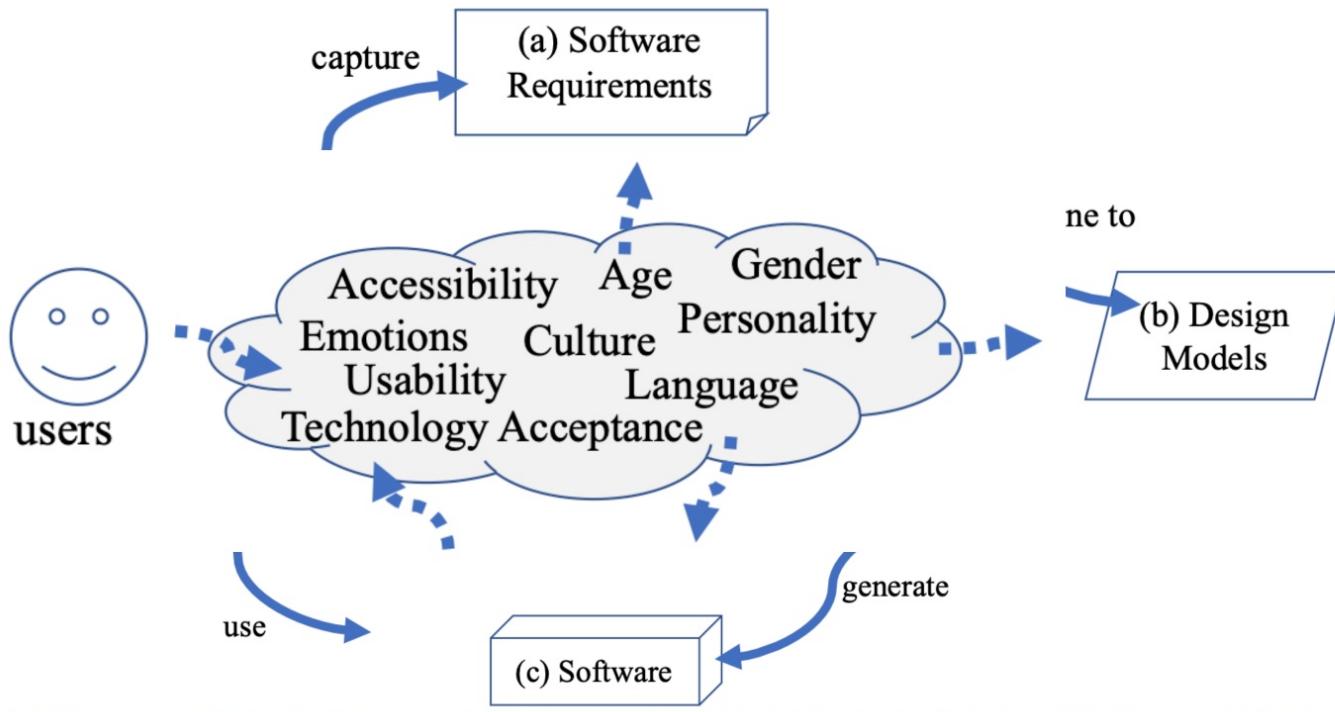
Creating more human-centric software...



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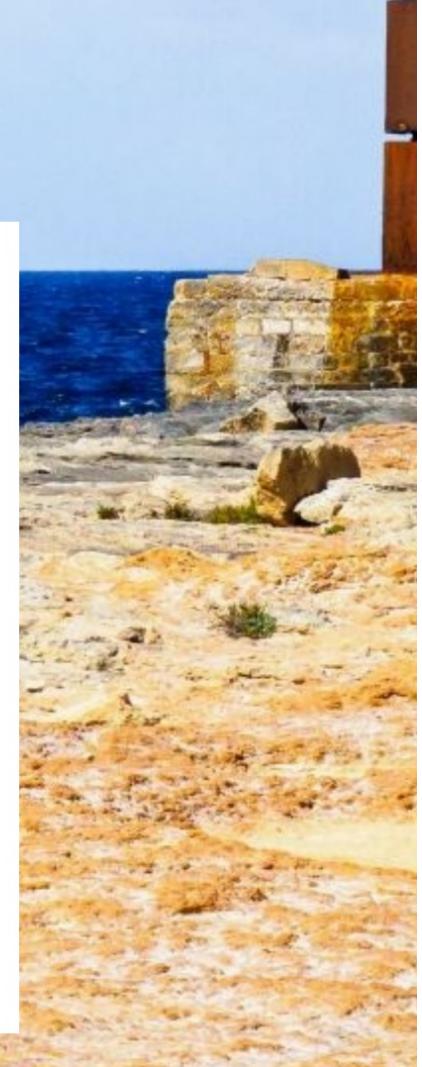
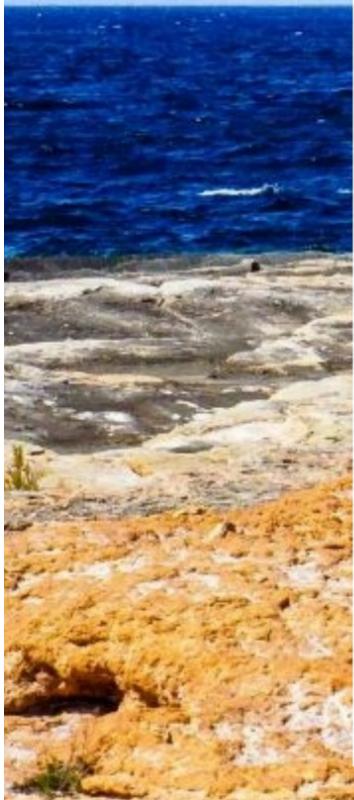
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Our Approach



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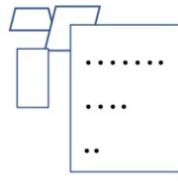
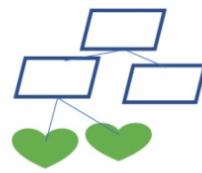


“Living Lab”
Agile, co-creation between
software engineers & users



Users & developers





Set of DSVL-based requirements, extraction & modelling tools

“Living Lab”
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Users & developers

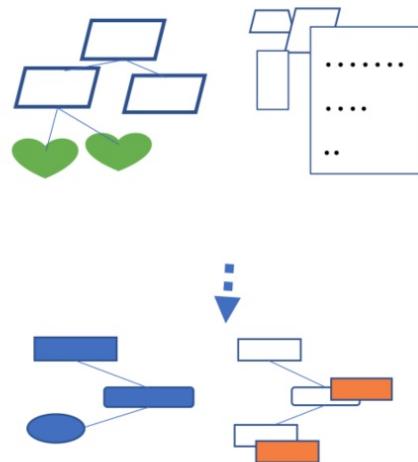




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Set of DSVL-based requirements, extraction & modelling tools

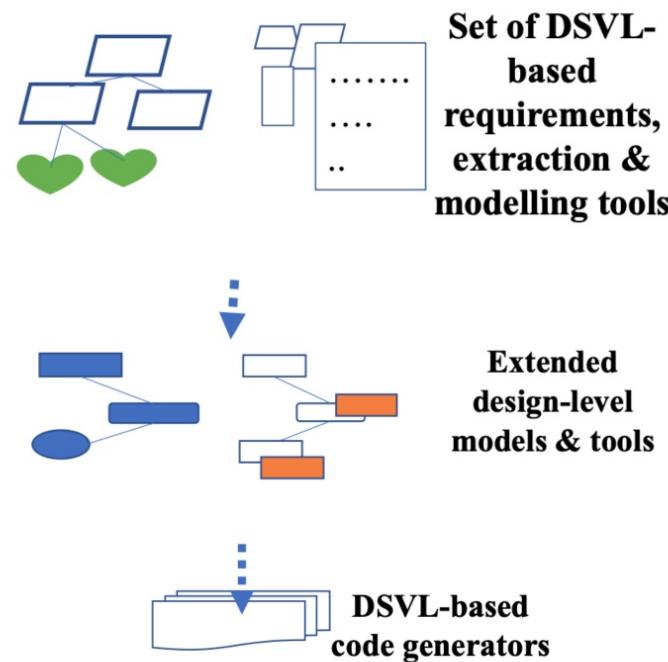
Extended design-level models & tools



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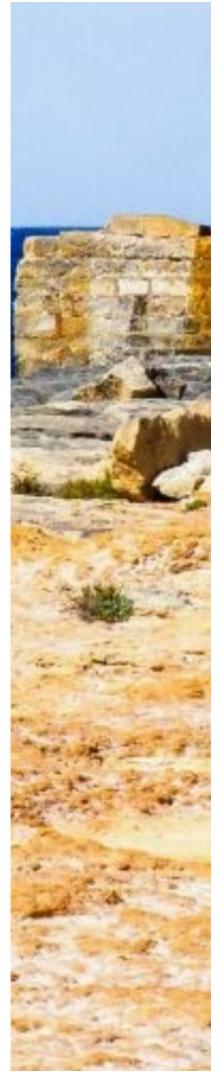
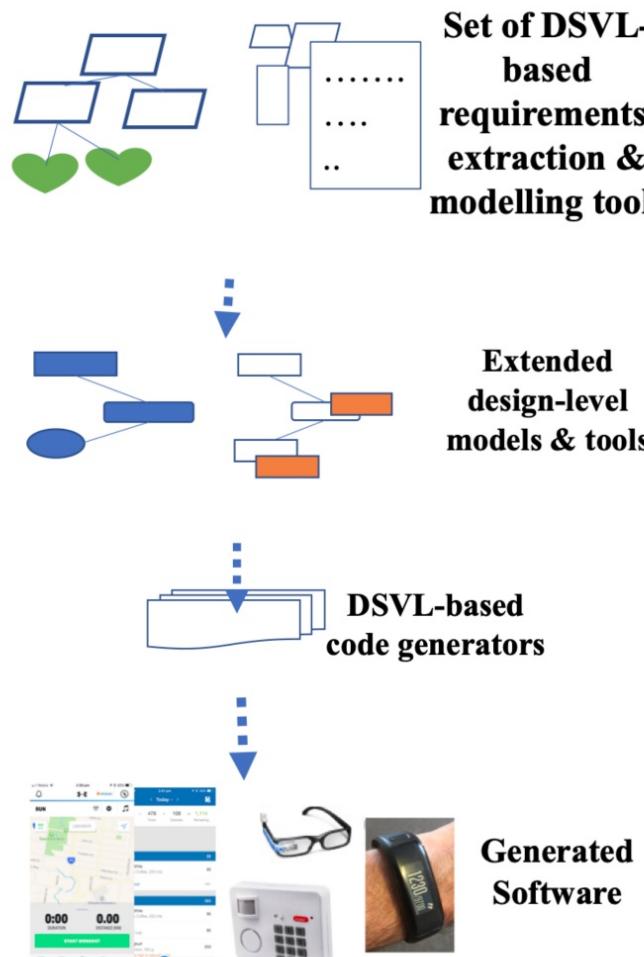




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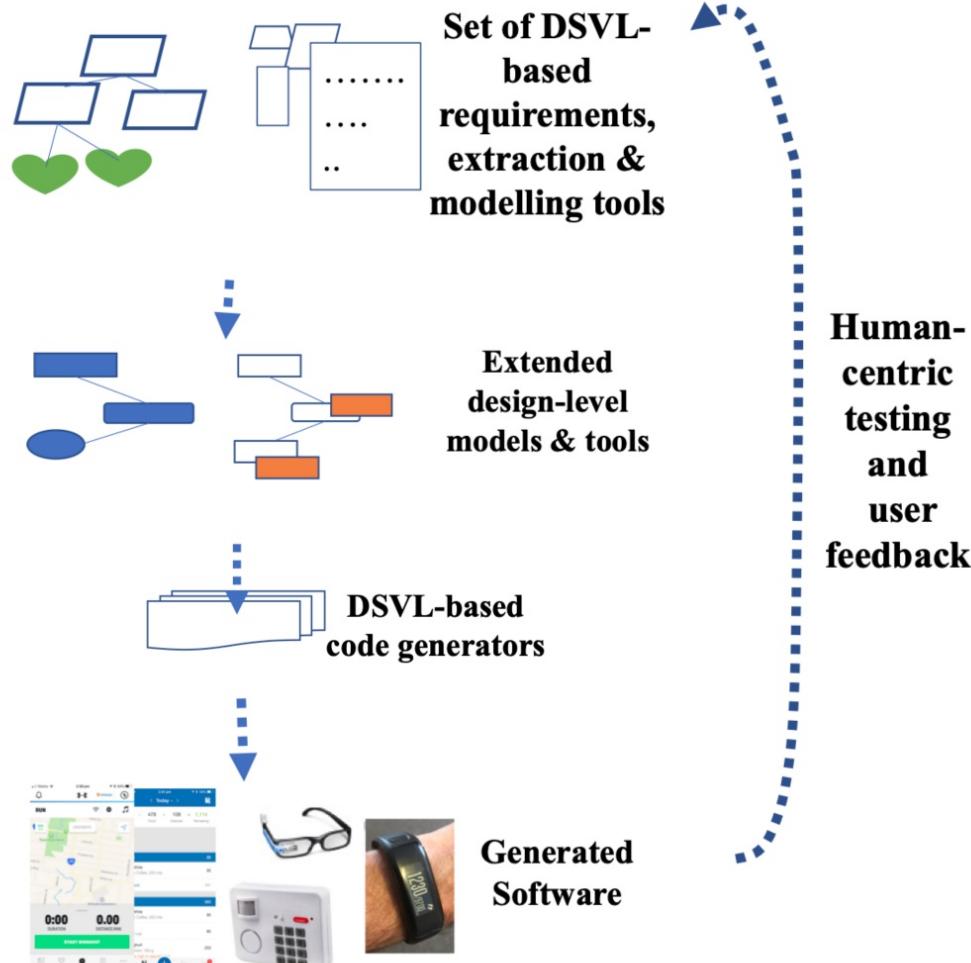
Users & developers



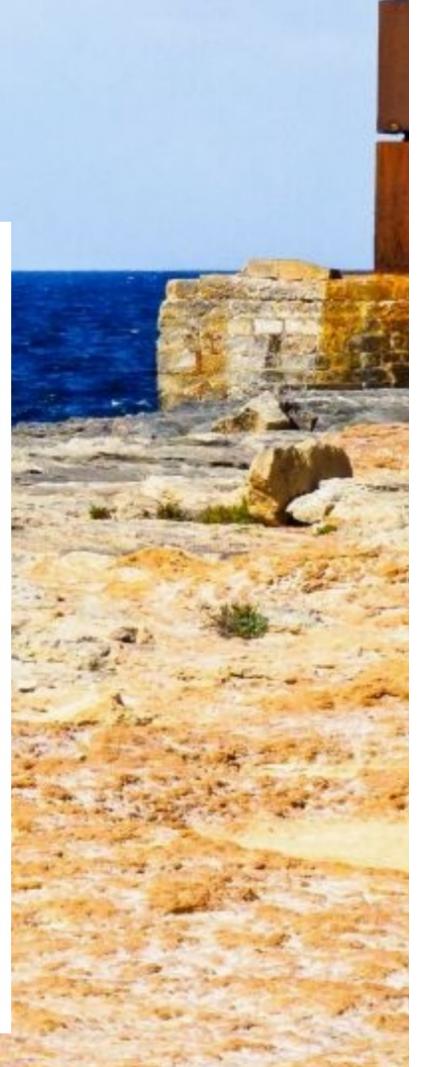
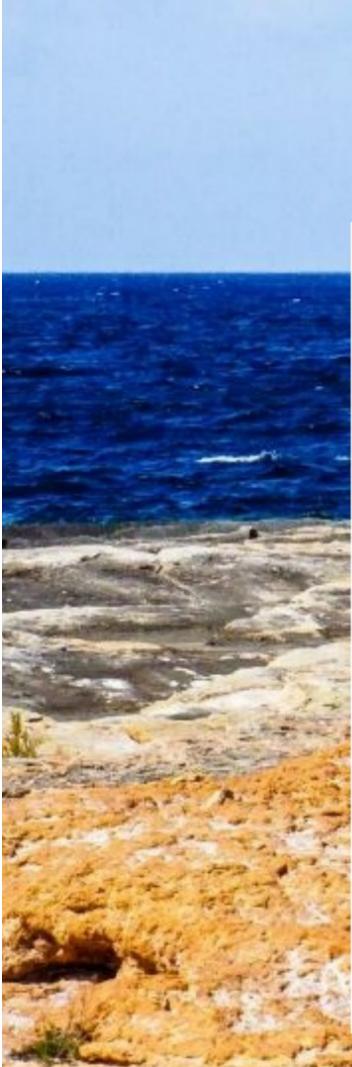
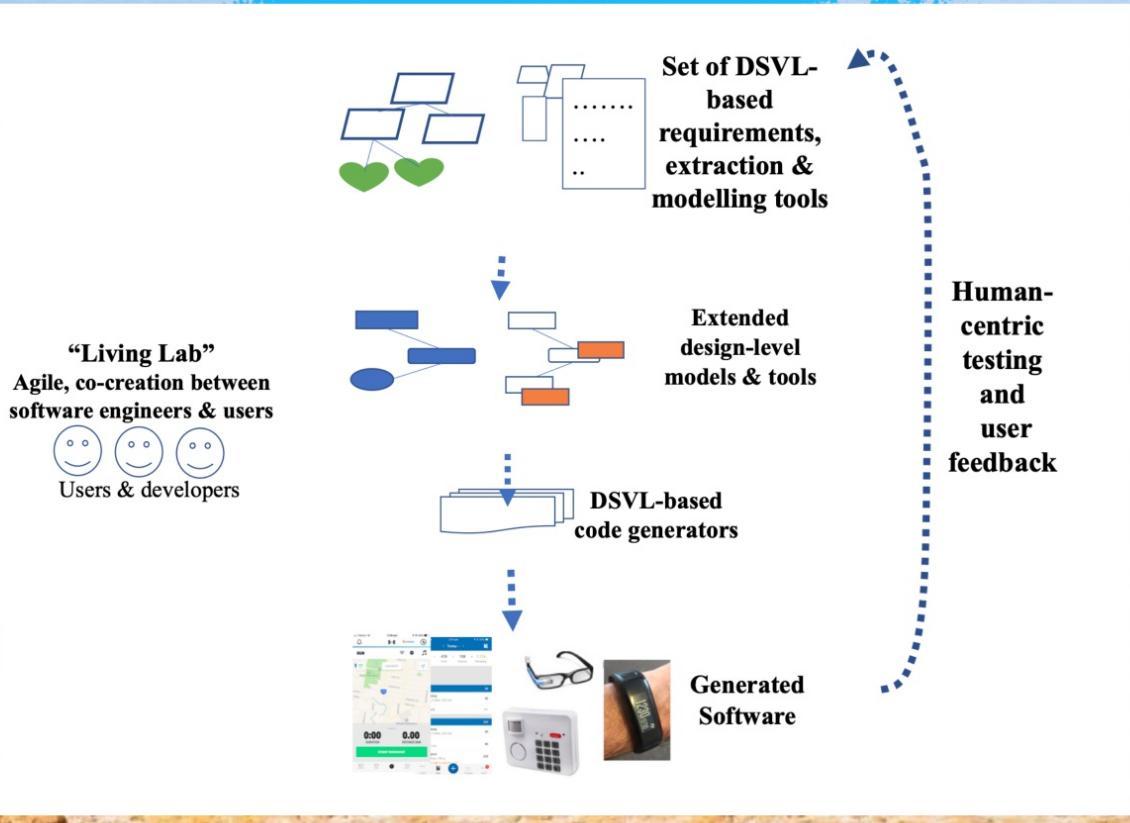


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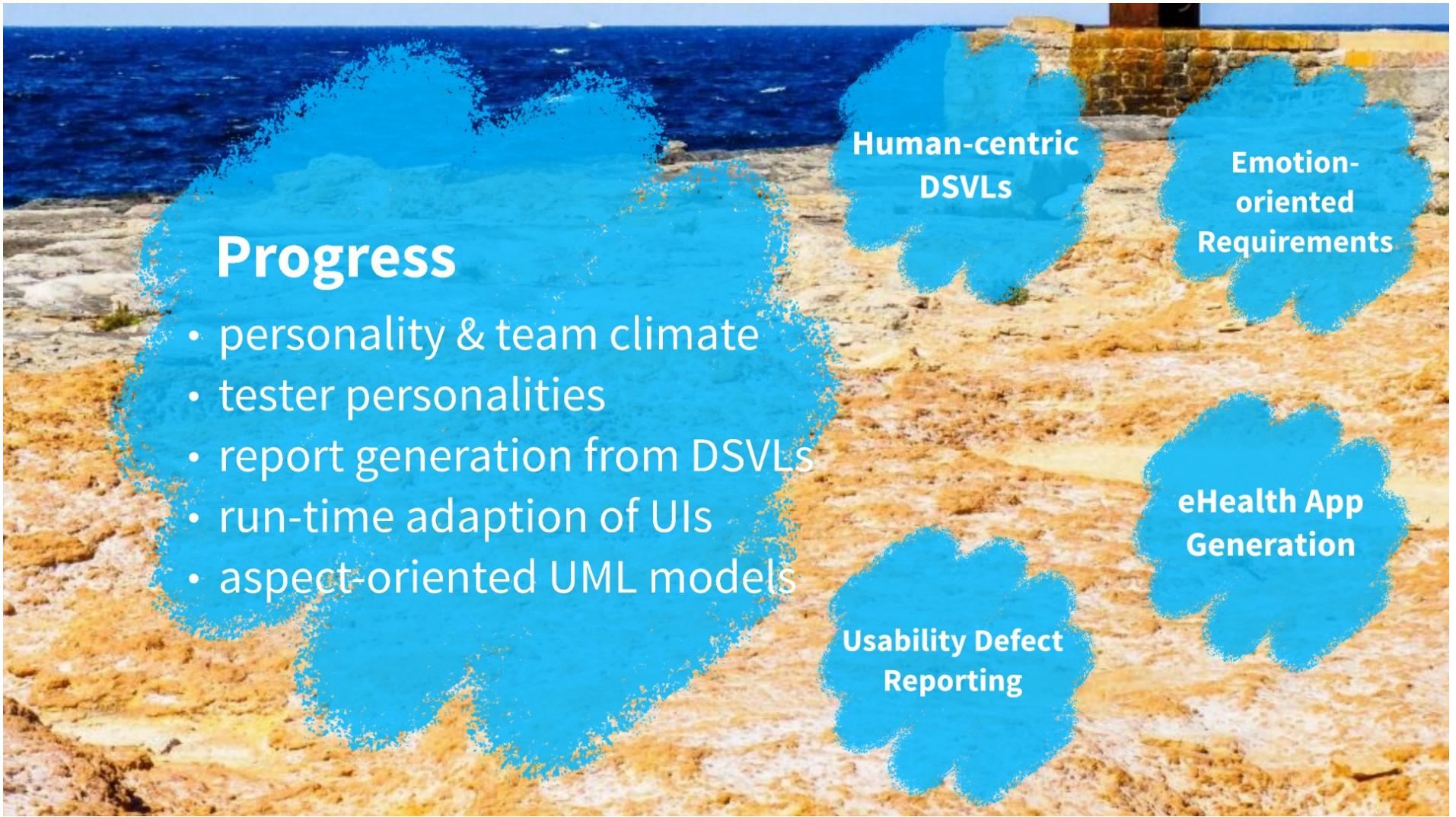
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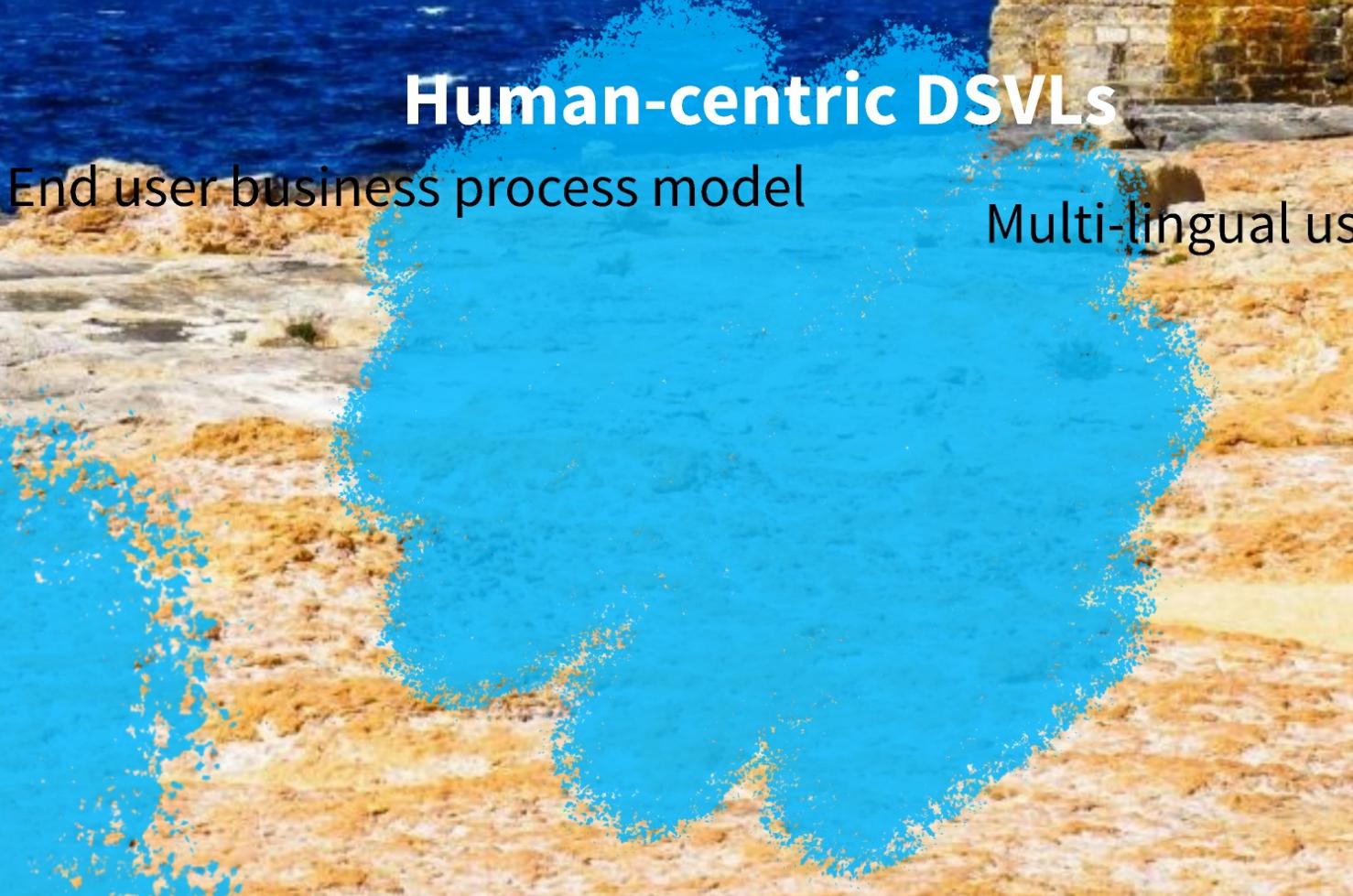
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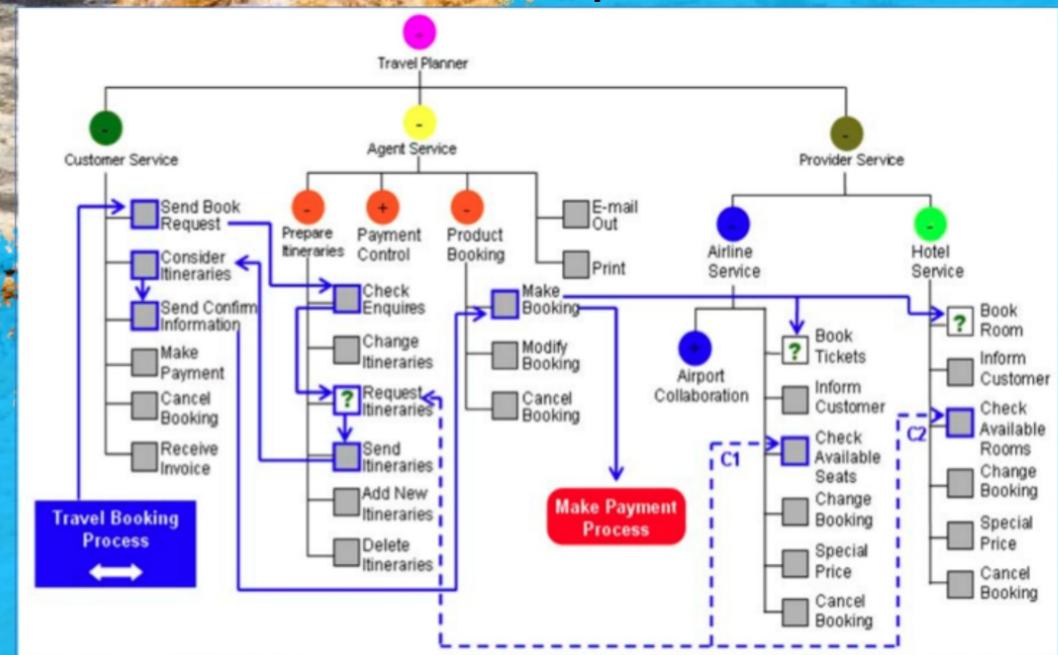
Human-centric DSVLs

End user business process model

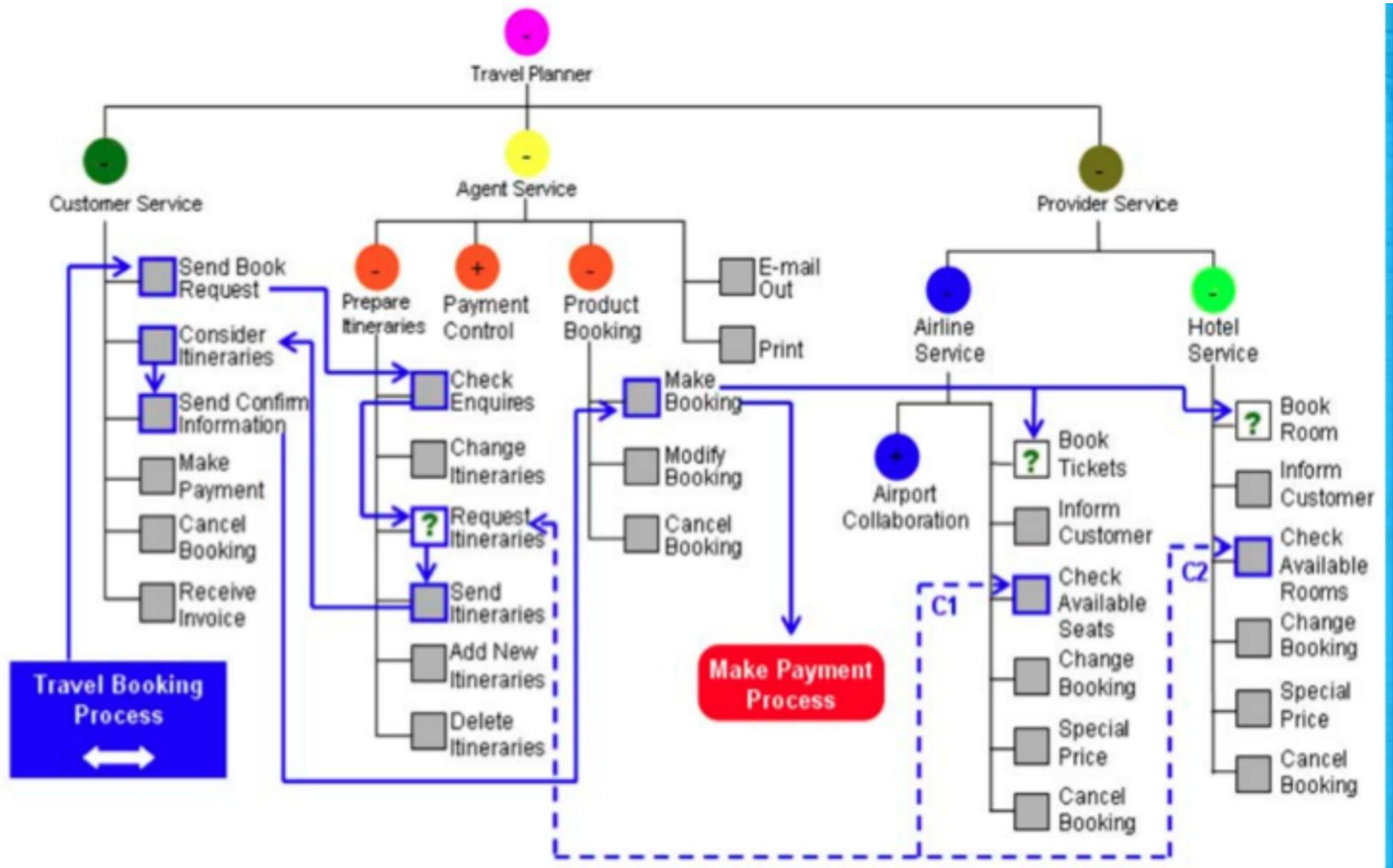
Multi-lingual use cases

Human-centric DSVLs

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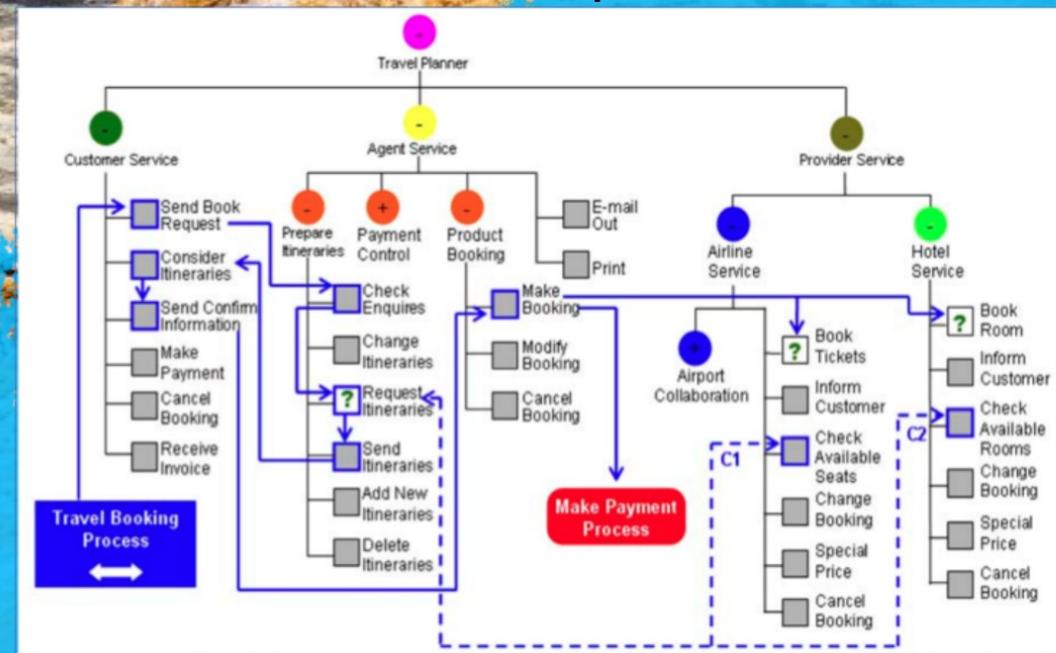


Multi-lingual use cases



Human-centric DSVLs

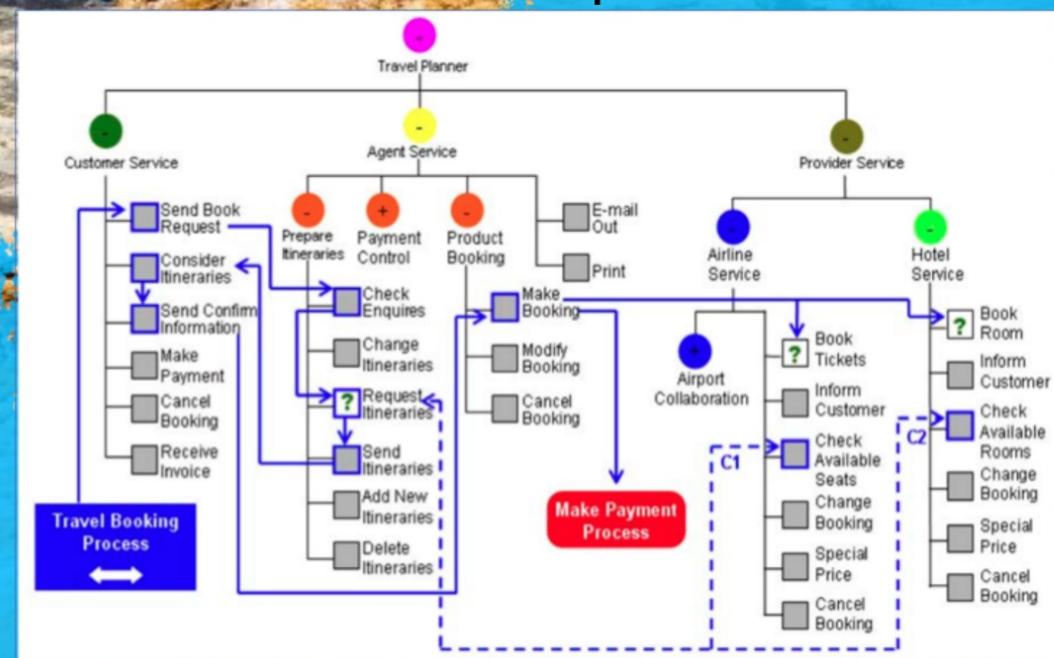
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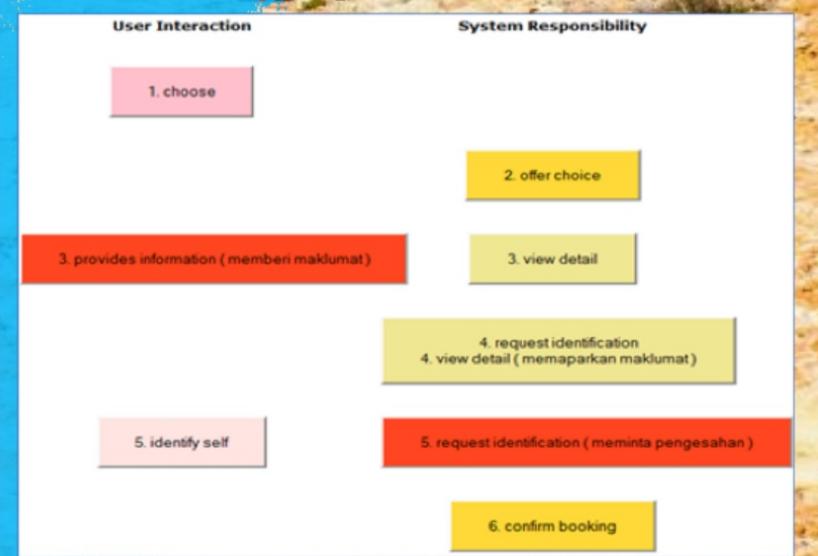
Multi-lingual use cases

Human-centric DSVLs

End user business process model



Multi-lingual use cases



User Interaction

System Responsibility

1. choose

2. offer choice

3. provides information (memberi maklumat)

3. view detail

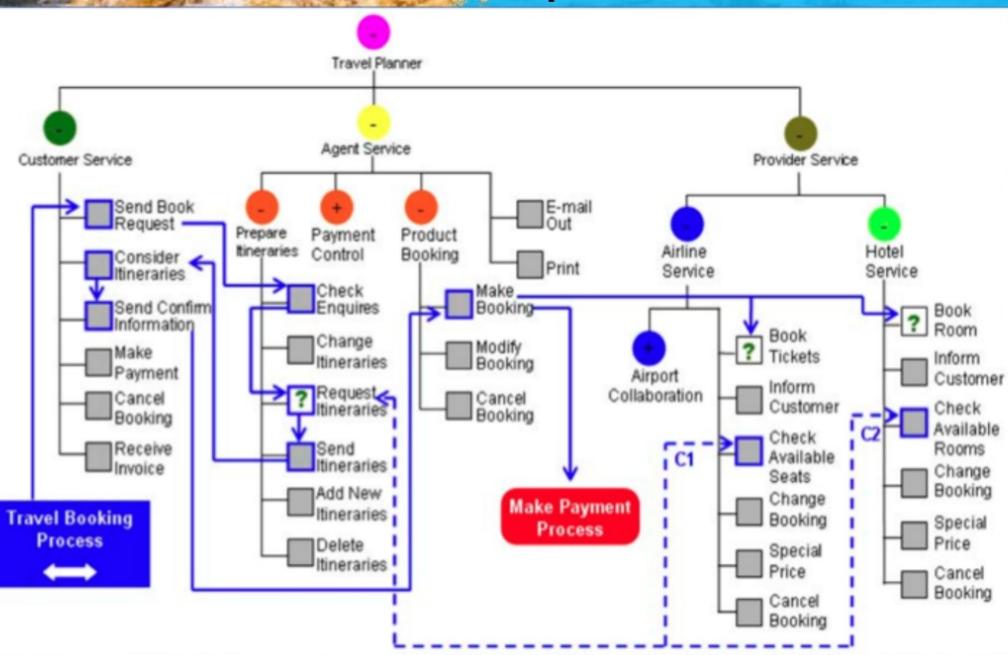
4. request identification
4. view detail (memaparkan maklumat)

5. identify self

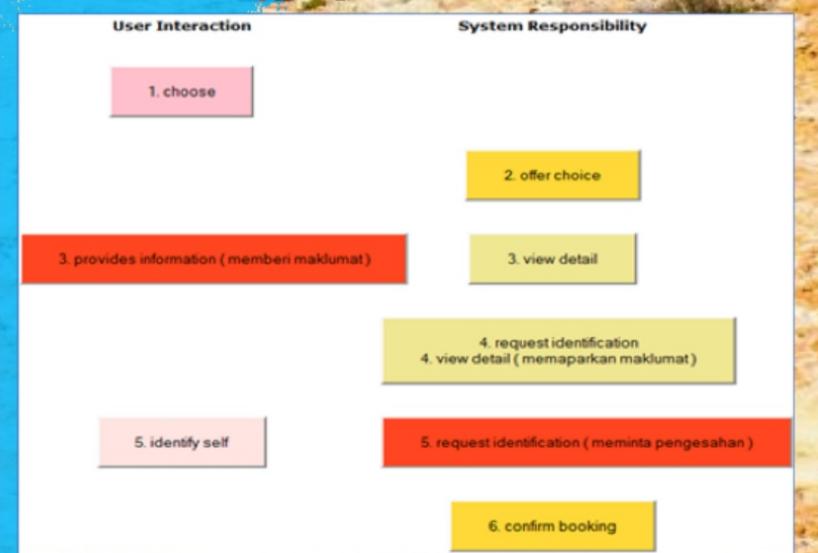
5. request identification (meminta pengesahan)

Human-centric DSVLs

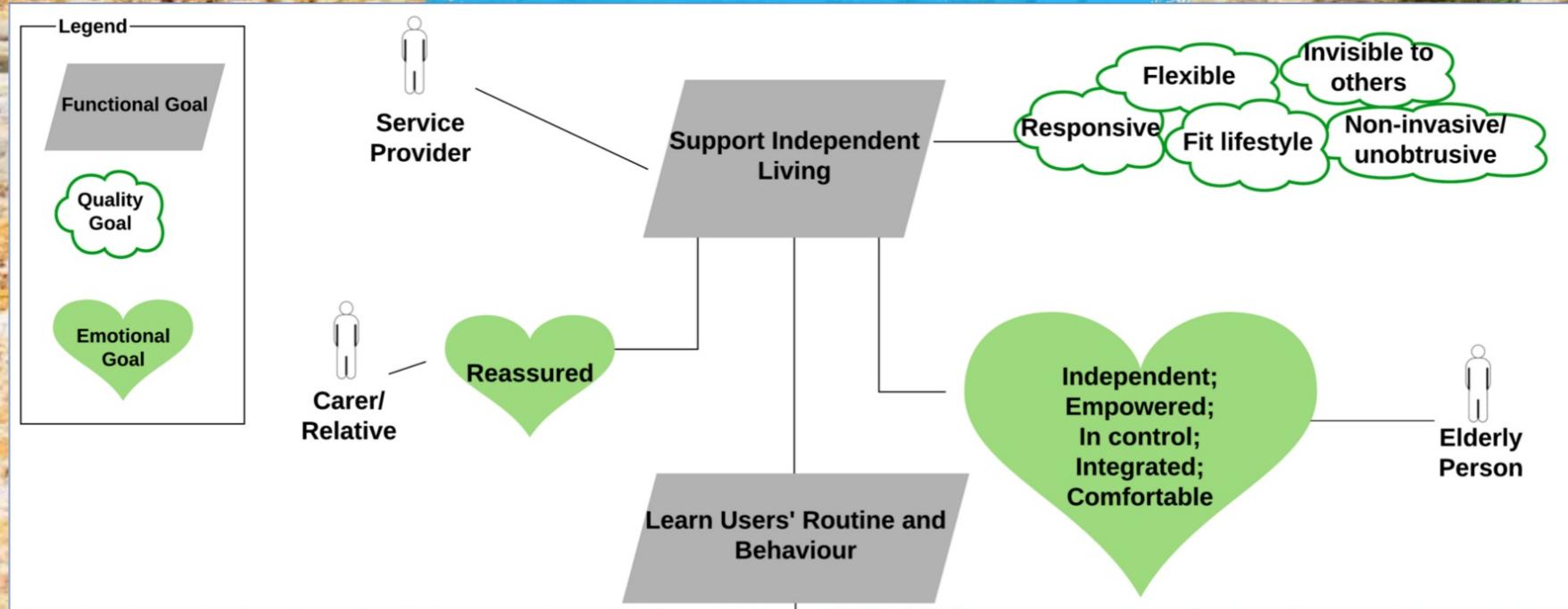
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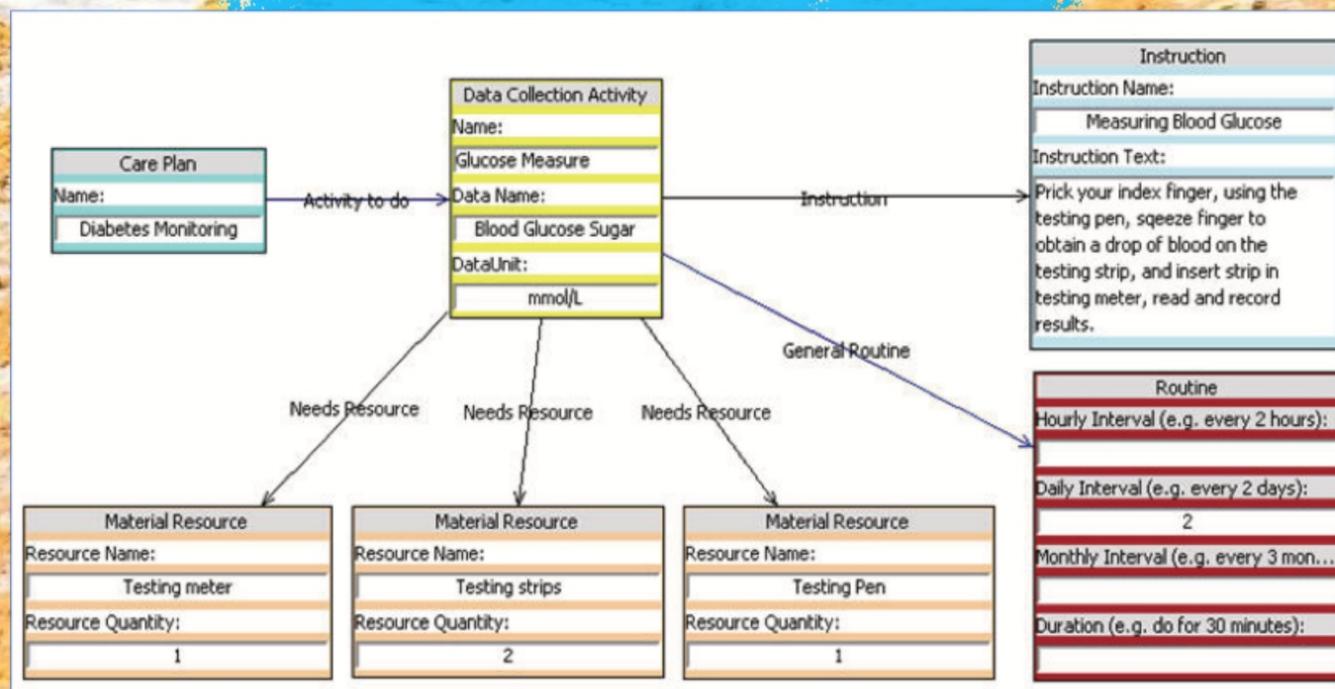
Emotion-oriented Requirements

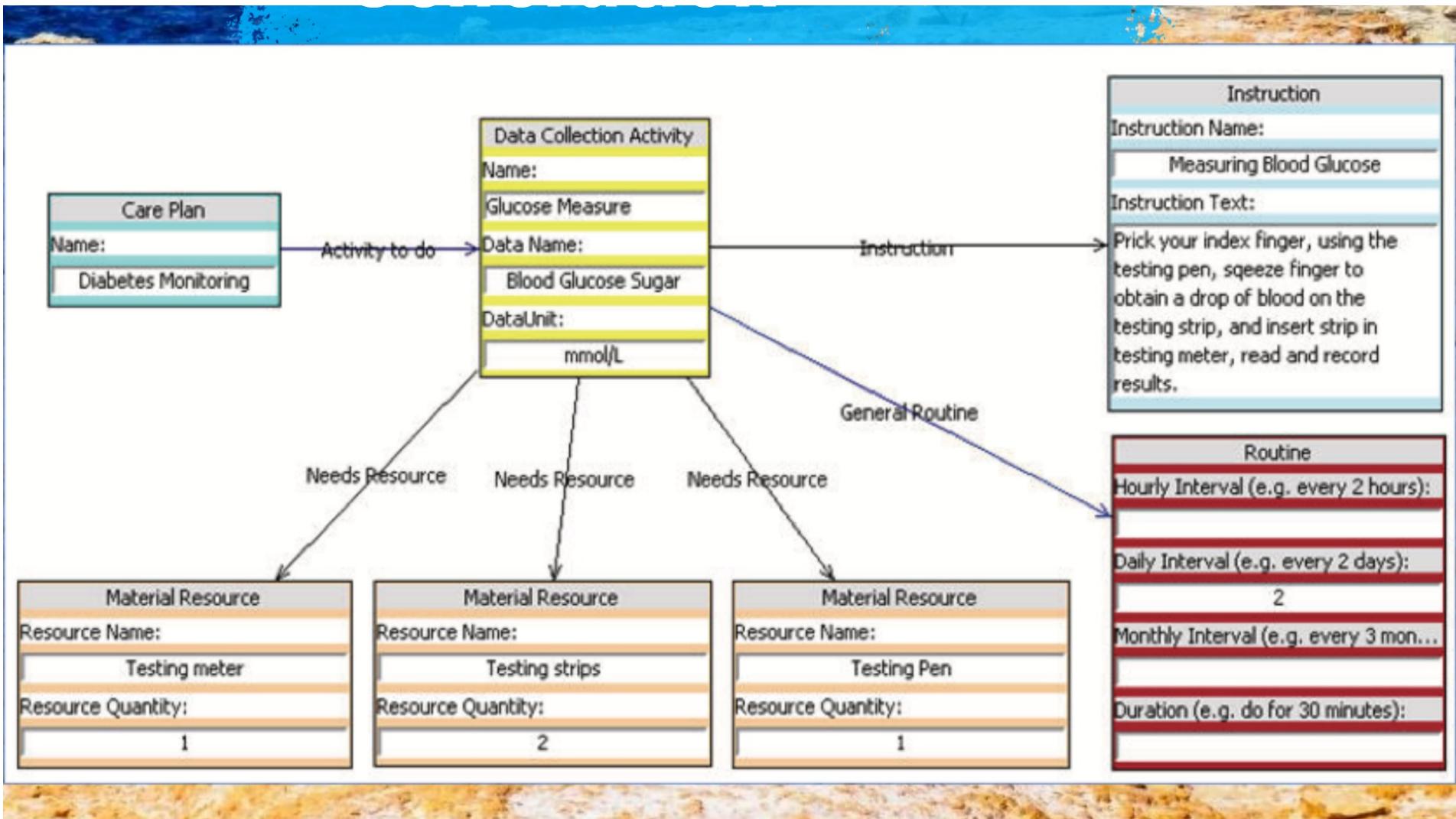


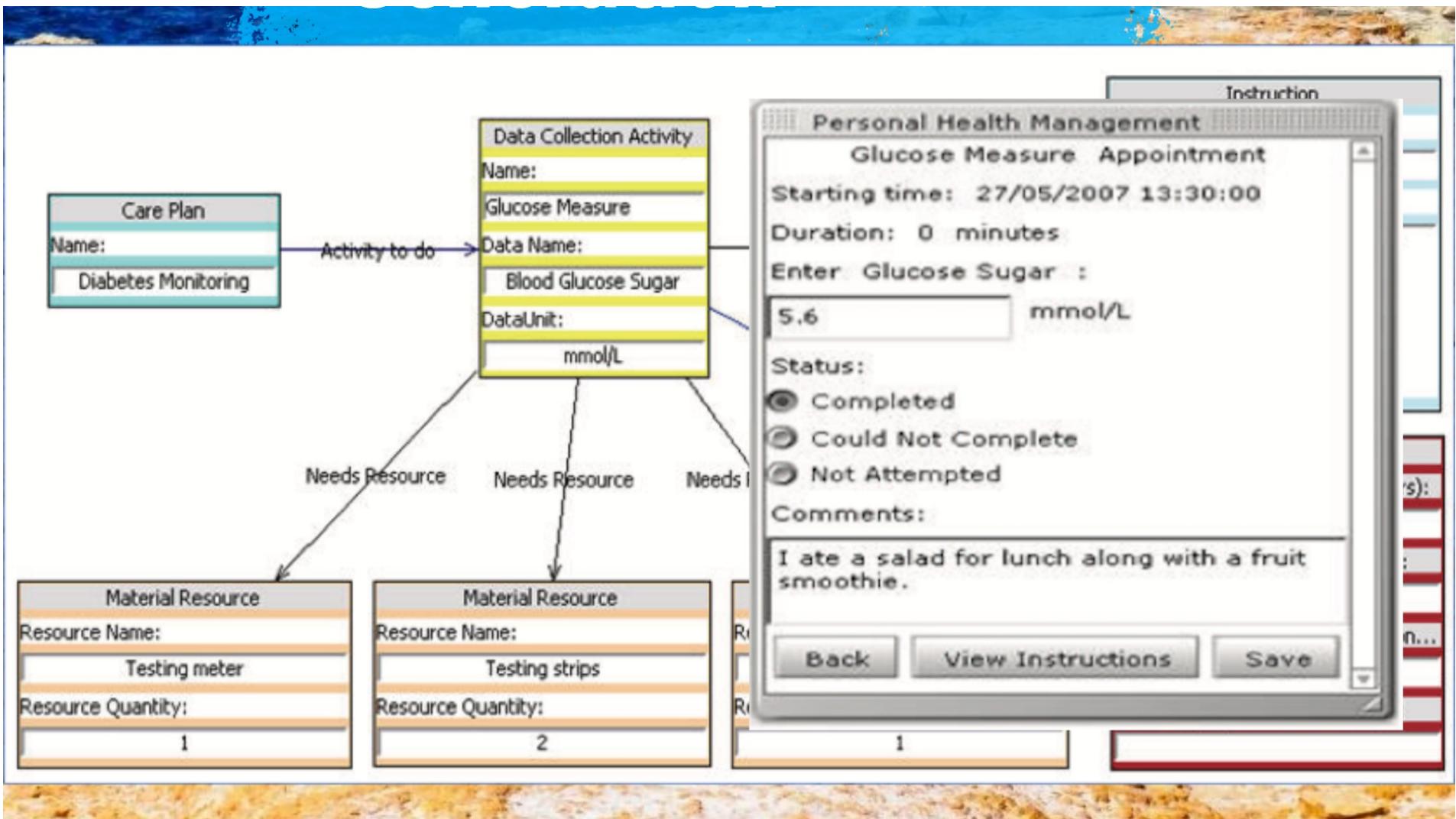


eHealth App Generation

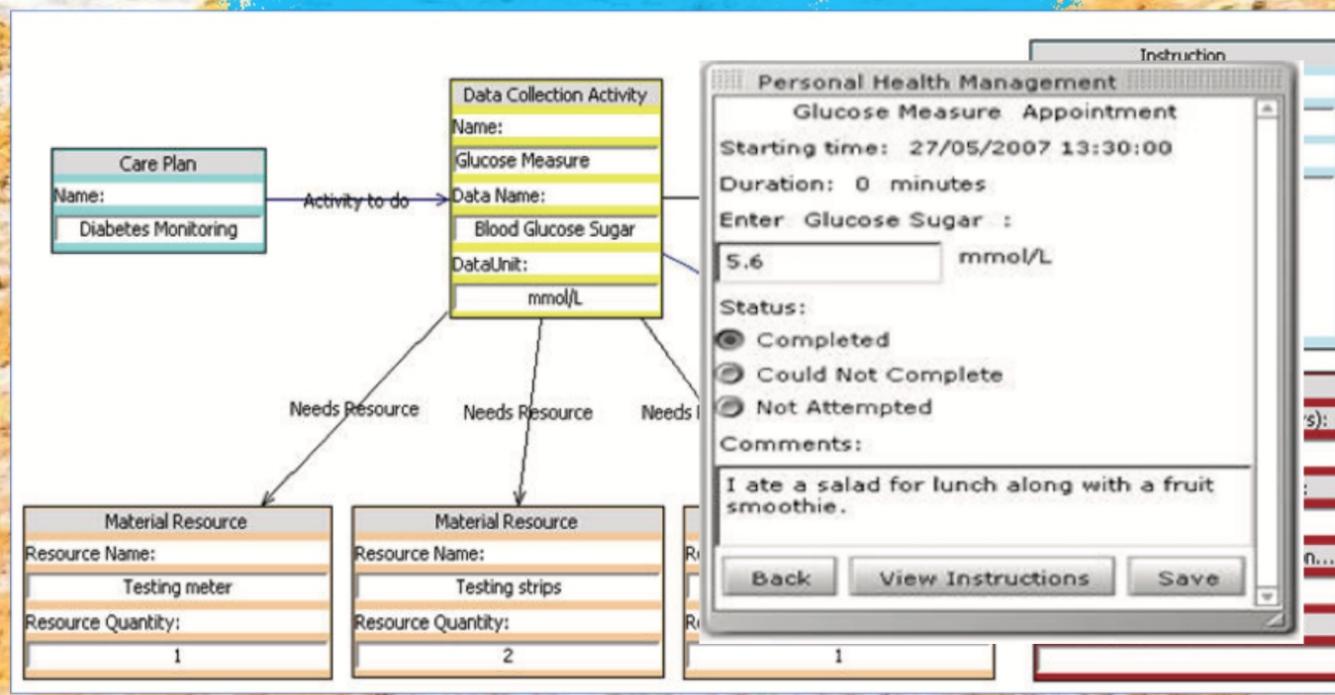
eHealth App Generation







eHealth App Generation





Usability Defect Reporting



Usability Defect Reporting

Guided Wizard Defect Report Form

REPORTER	SOFTWARE INFORMATION	DESCRIPTION
ACTUAL RESULTS	EXPECTED RESULTS	

Expected Results:
There is an informative indicator other than the updated number of open tabs.

How do you think this feature is supposed to work?
At least a message to indicate that new tab is added.

Attach supporting material(s):
 no file selected
(Please attach supporting information such as sketch, ASCII art, code, patch)

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Summary

- Human-centric issues increasingly critical in software
- current approaches poor at incorporating
 - using living lab to co-create
 - using augmented requirements, design DSVLs to model
 - using compile-time generation & run-time adaptation to support
 - using enhanced defect reporting to evolve

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