



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



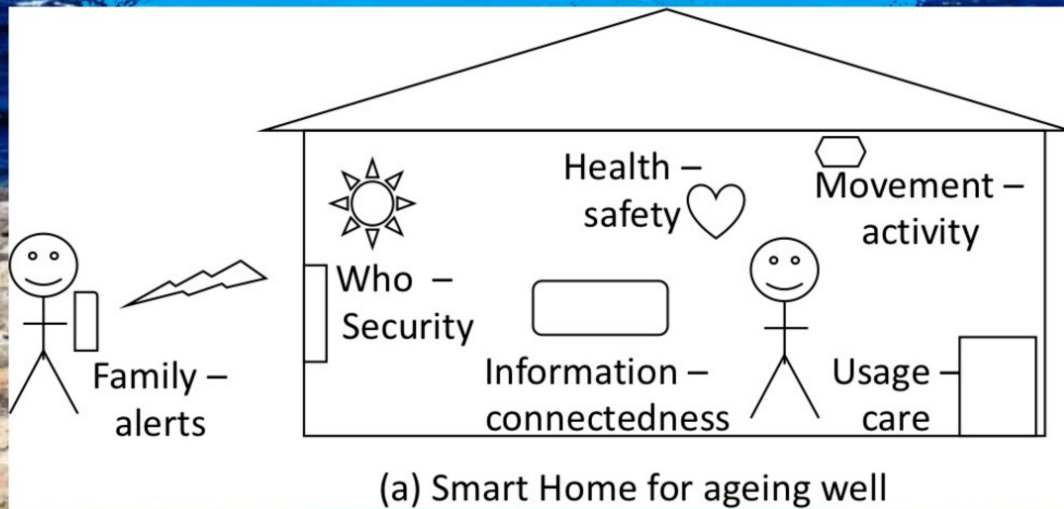
Motivating Example: Smart Home

Key Issues...

Key
Challenges...

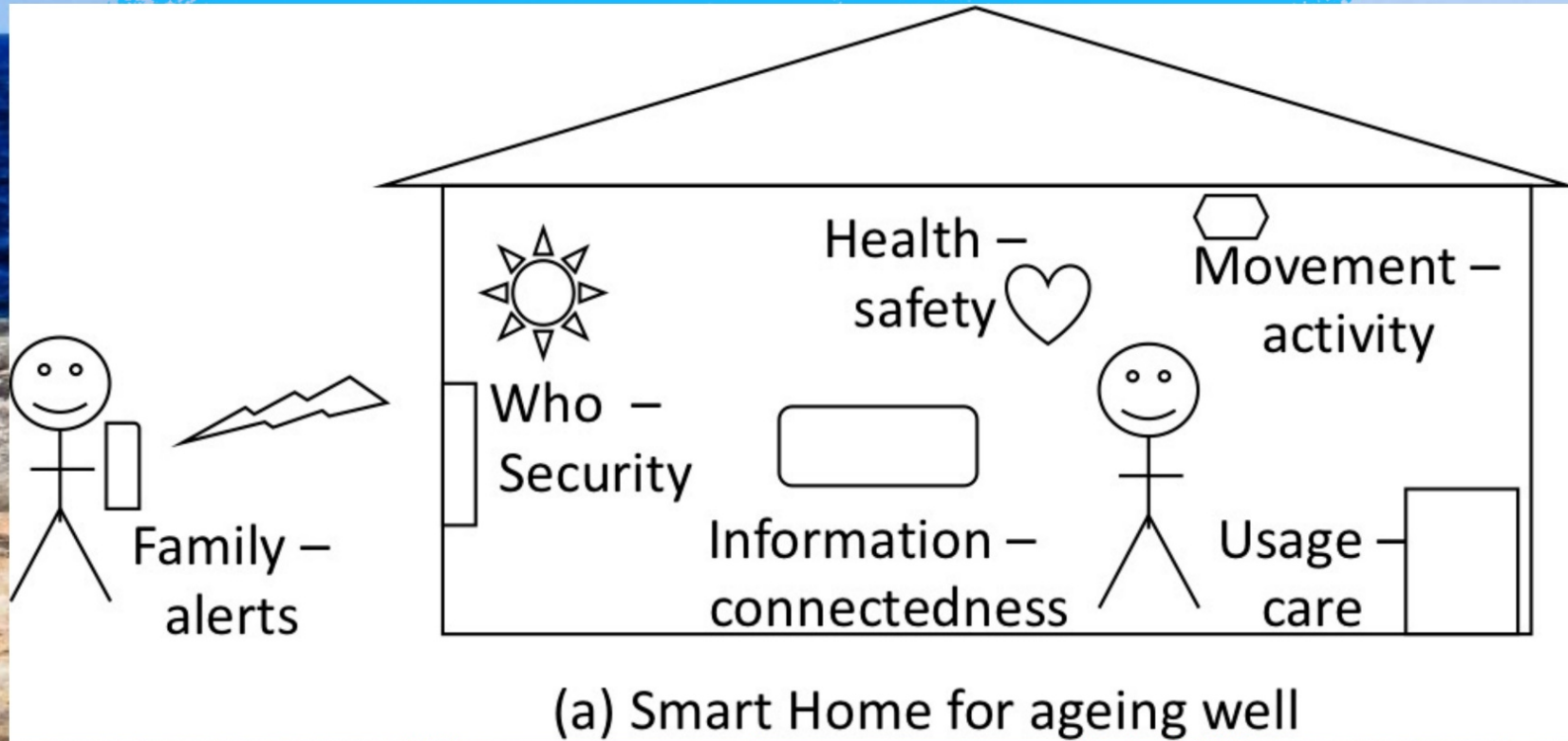
Motivating Example: Smart Home

Key Issues...



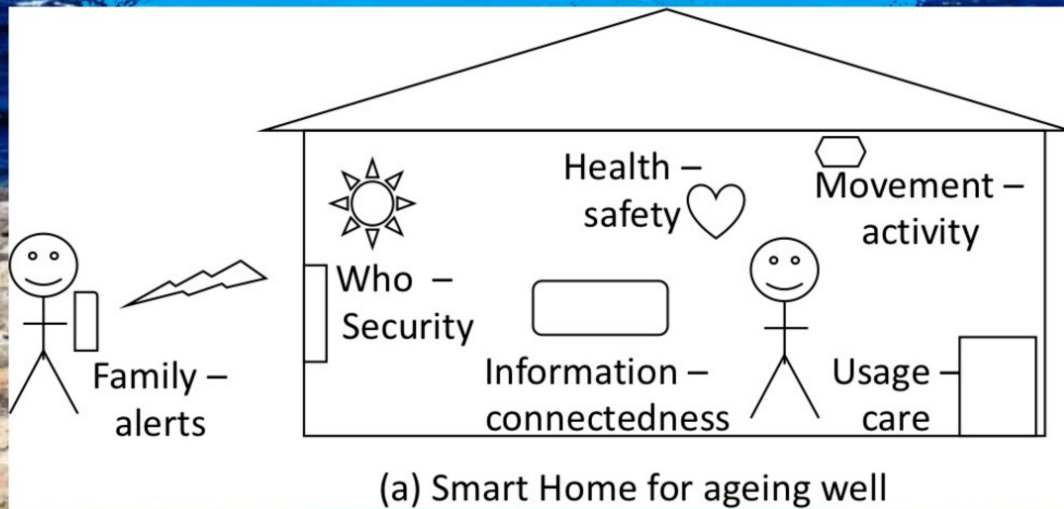
Key Challenges...

Smart Home



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



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

A photograph of a rocky coastline with a blue ocean and a large blue brushstroke graphic. The text "Creating more human-centric software..." is overlaid on the brushstroke.

**Creating more human-
centric software...**



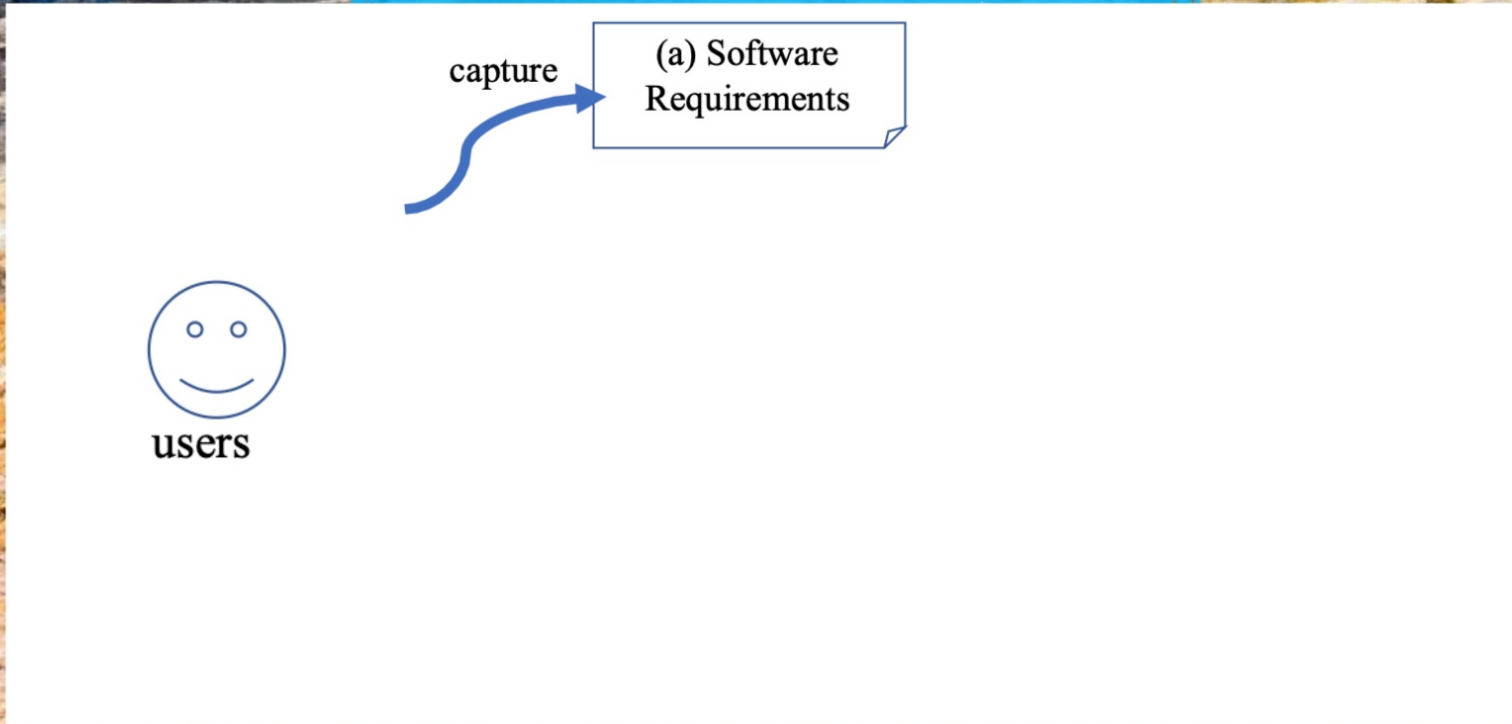
**Creating more human-
centric software...**

Creating more human- centric software...

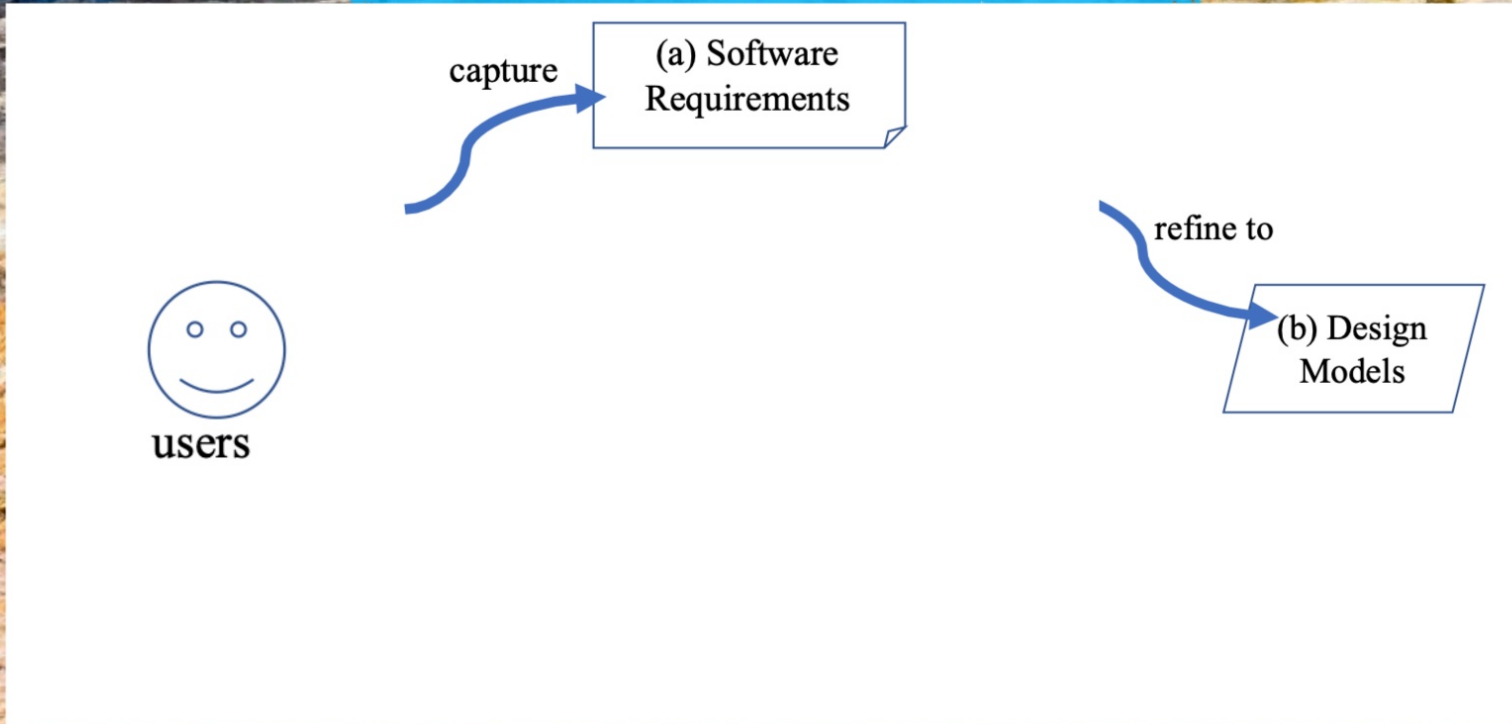


users

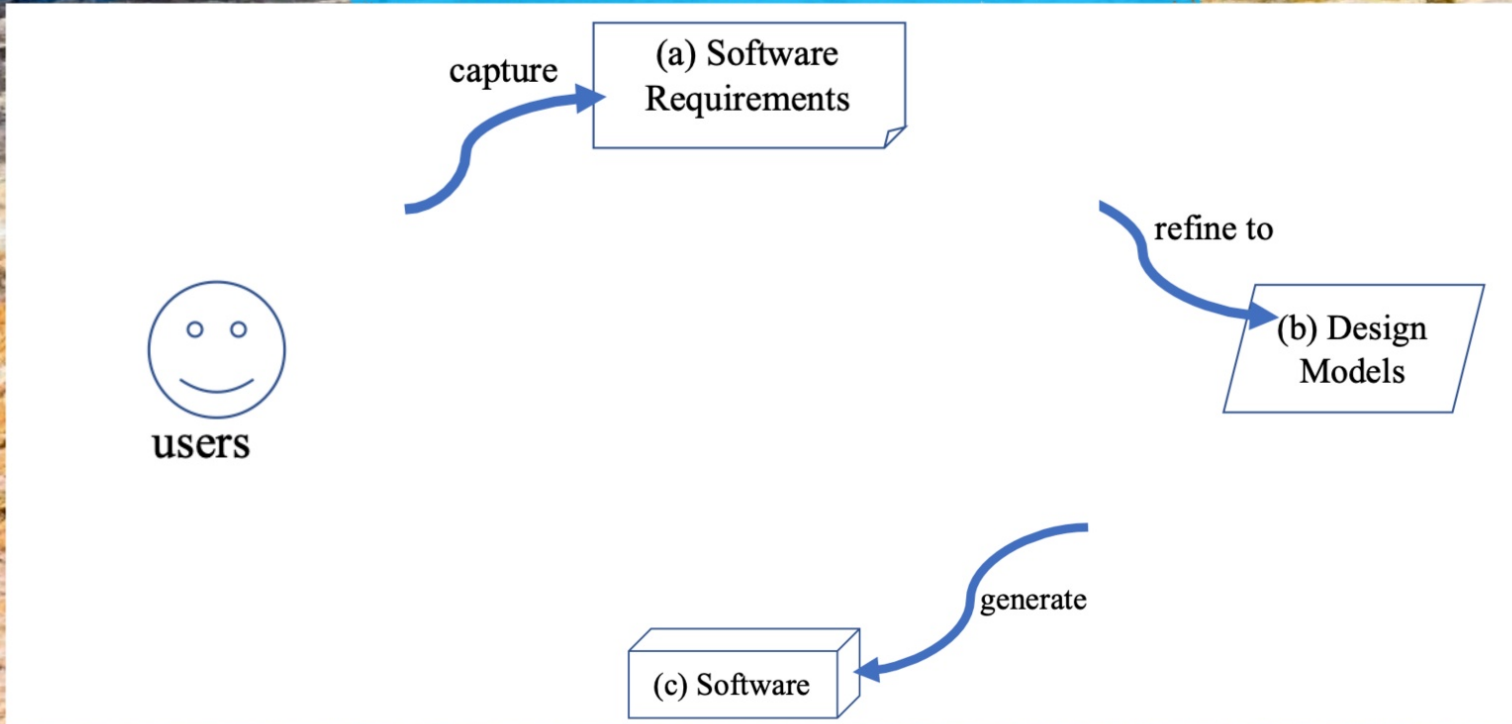
Creating more human-centric software...



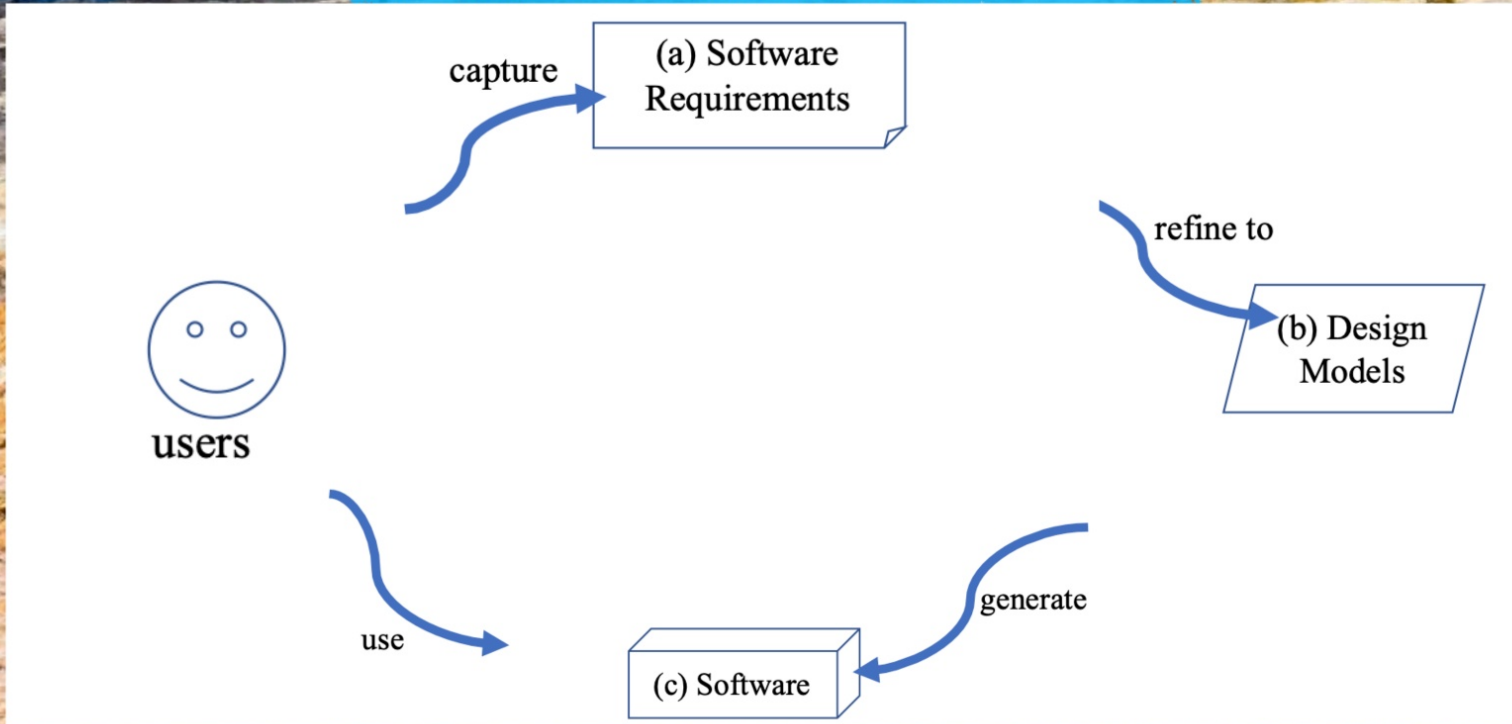
Creating more human-centric software...



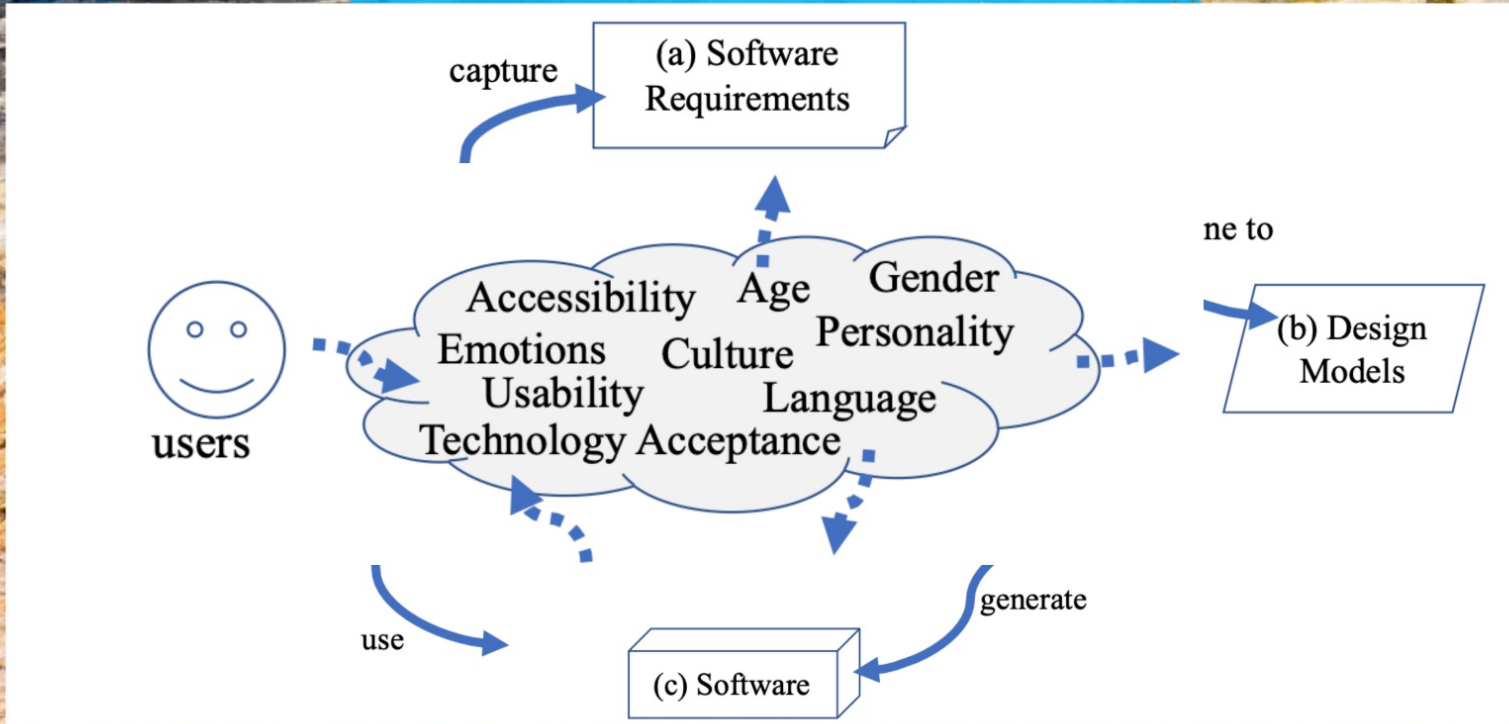
Creating more human-centric software...



Creating more human-centric software...



Creating more human-centric software...





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



Our Approach

Our Approach



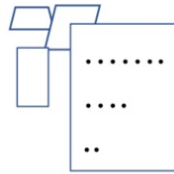
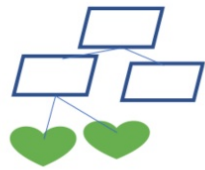


“Living Lab”
Agile, co-creation between
software engineers & users



Users & developers





**Set of DSL-
based
requirements,
extraction &
modelling tools**

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



Users & developers

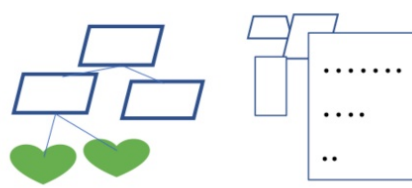




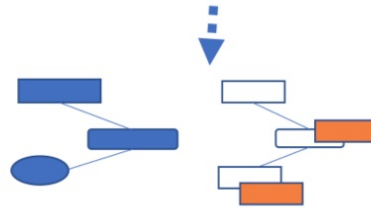
“Living Lab”
Agile, co-creation between
software engineers & users



Users & developers



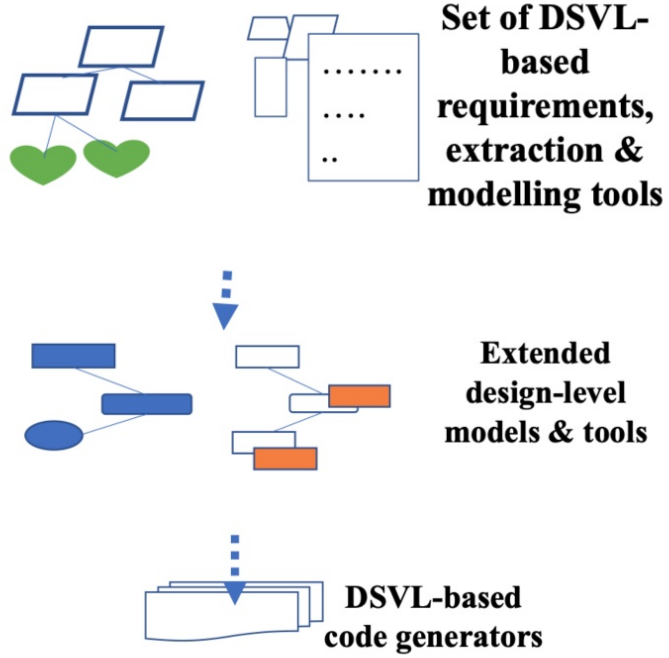
**Set of DSL-
based
requirements,
extraction &
modelling tools**



**Extended
design-level
models & tools**

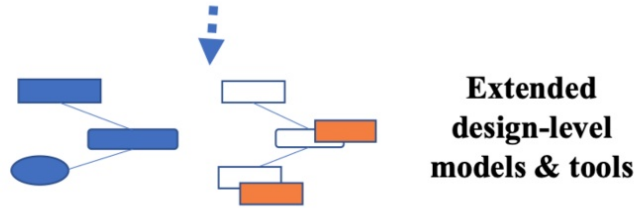
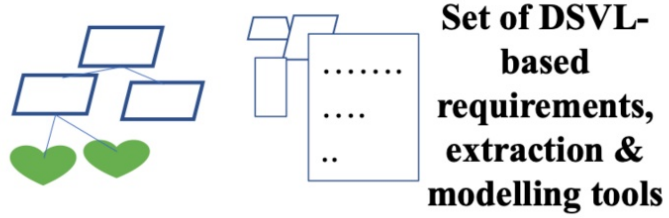


“Living Lab”
Agile, co-creation between
software engineers & users





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

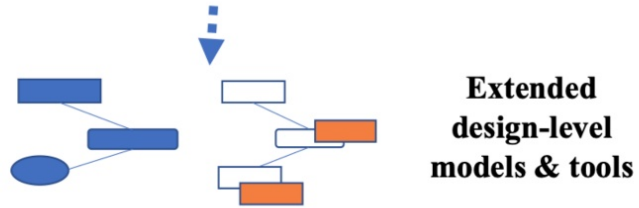
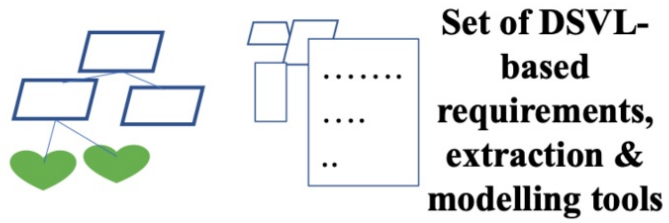




“Living Lab”
Agile, co-creation between
software engineers & users



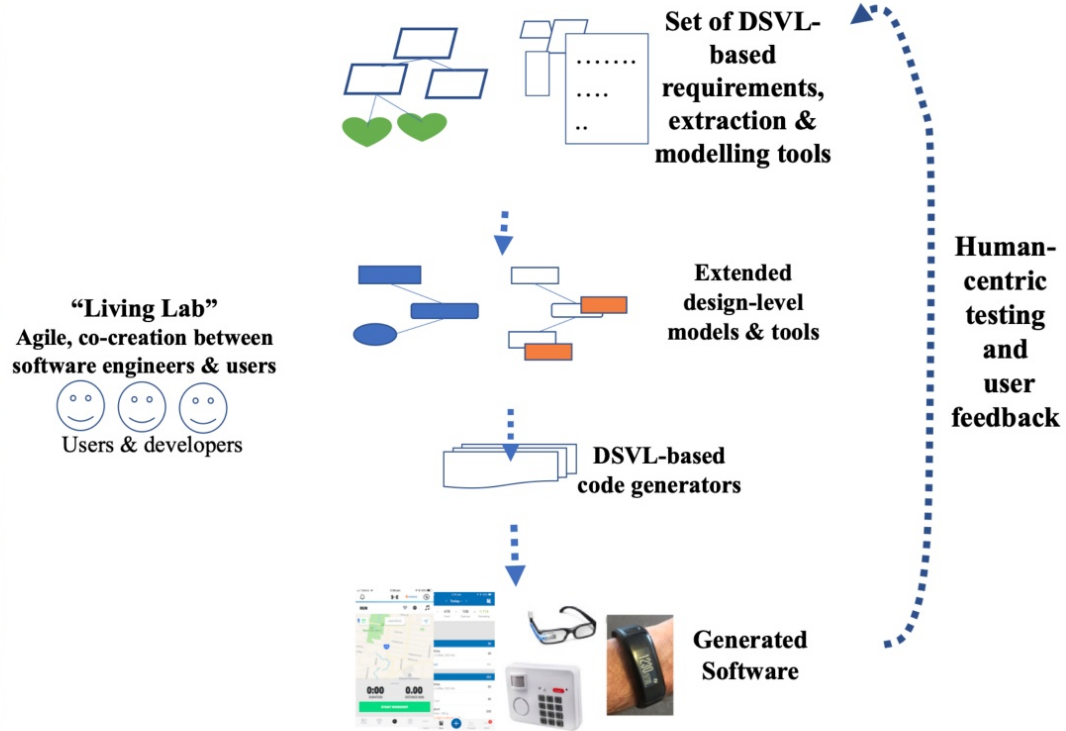
Users & developers



**Human-
centric
testing
and
user
feedback**



Our Approach





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

Progress

- personality & team climate
- tester personalities
- report generation from DSVLs
- run-time adaption of UIs
- aspect-oriented UML models

Human-centric
DSVLs

Emotion-
oriented
Requirements

eHealth App
Generation

Usability Defect
Reporting



Human-centric DSVLs

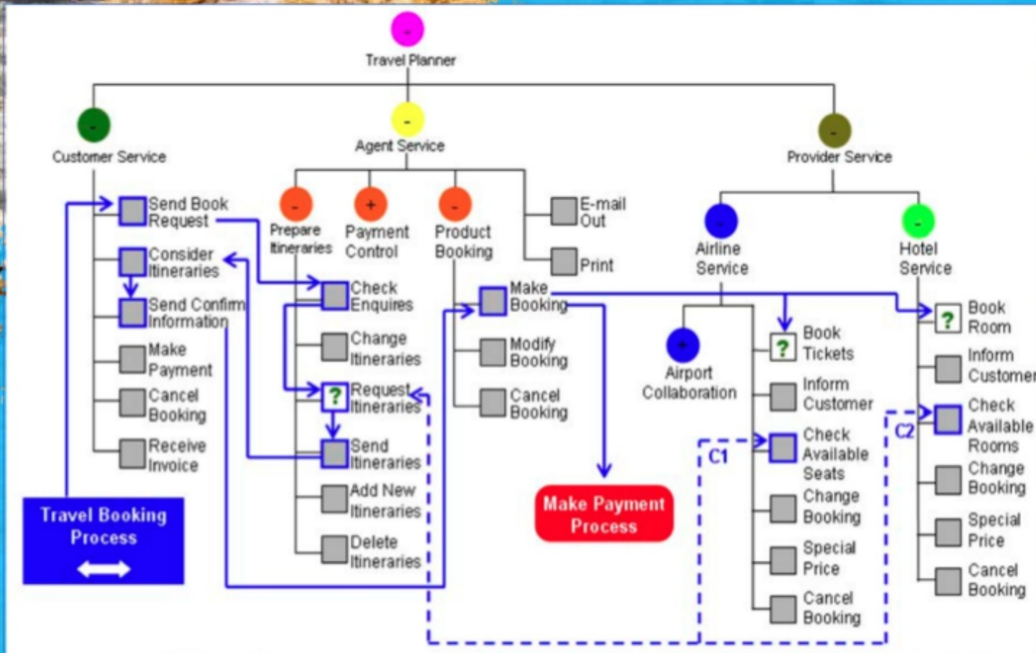
End user business process model

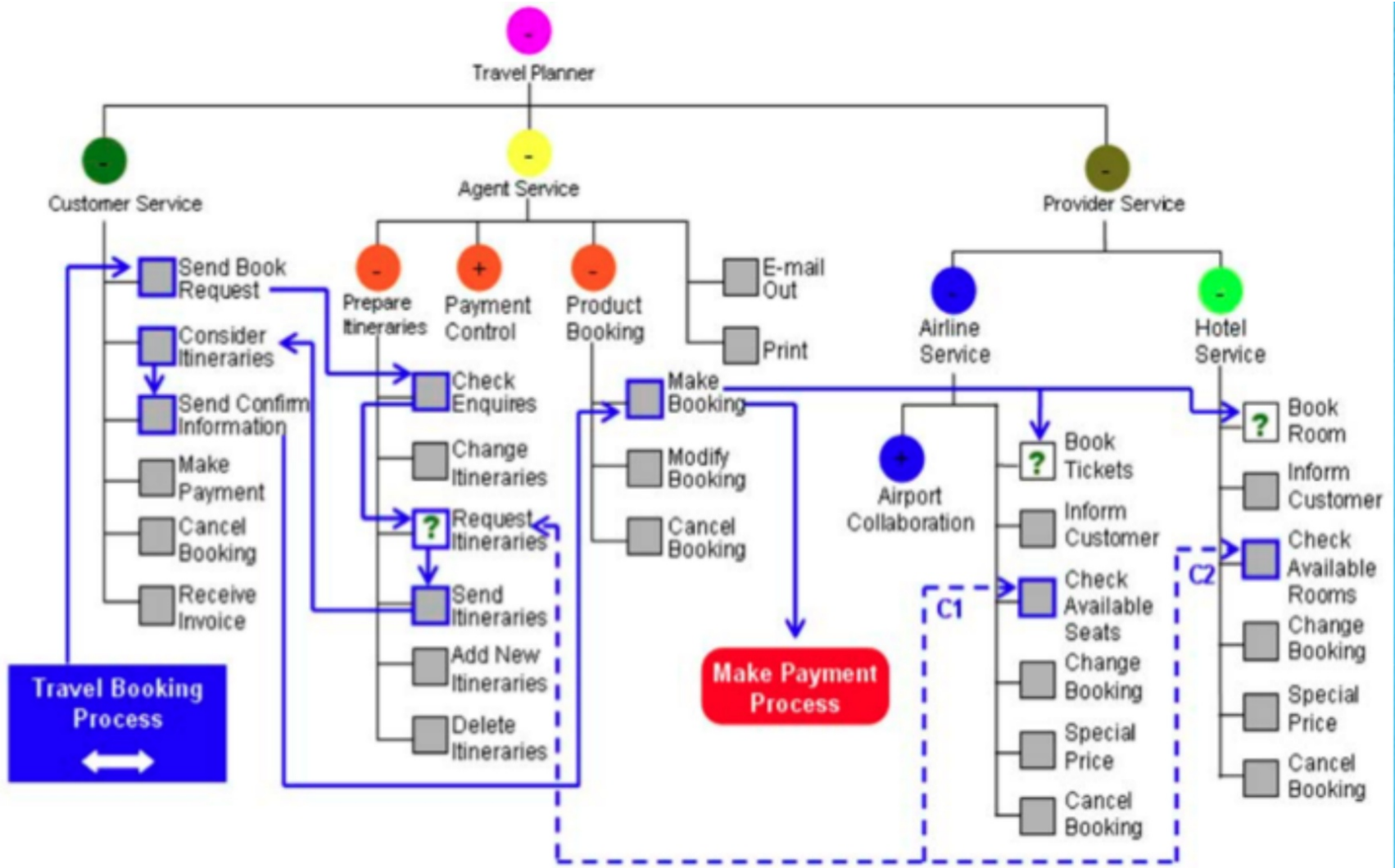
Multi-lingual use cases

Human-centric DSVLs

End user business process model

Multi-lingual use cases

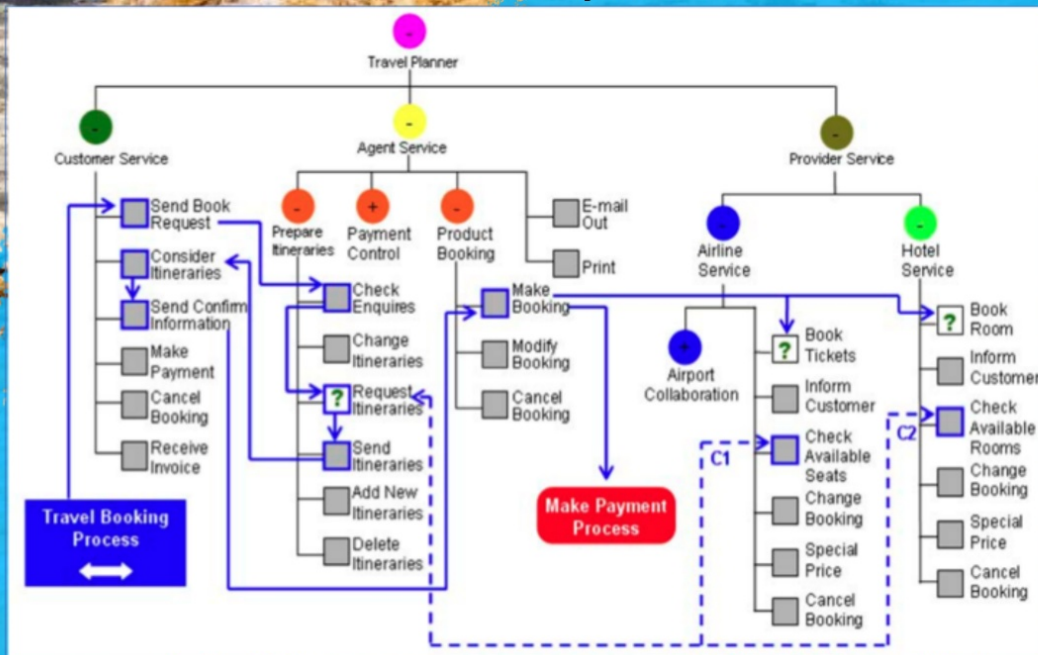




Human-centric DSVLs

End user business process model

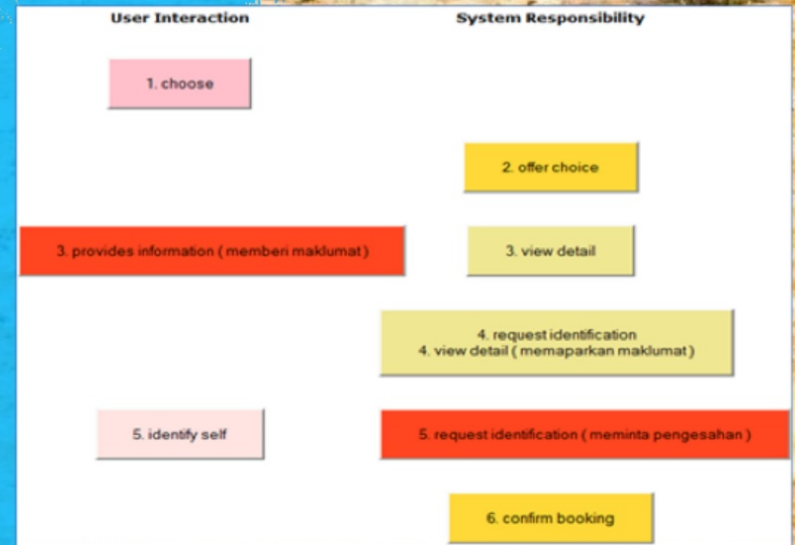
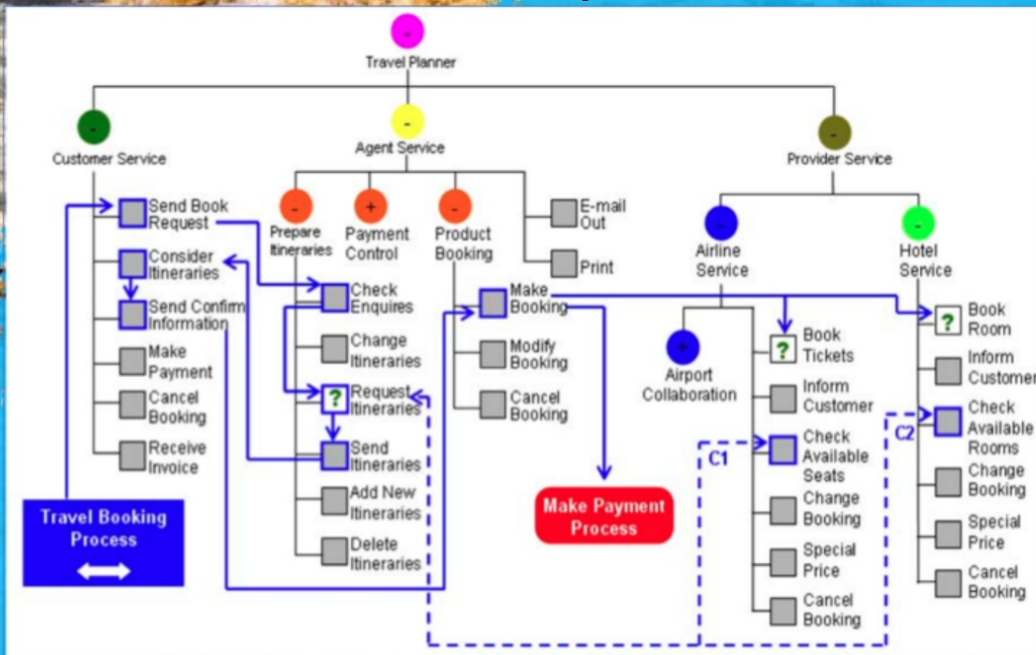
Multi-lingual use cases

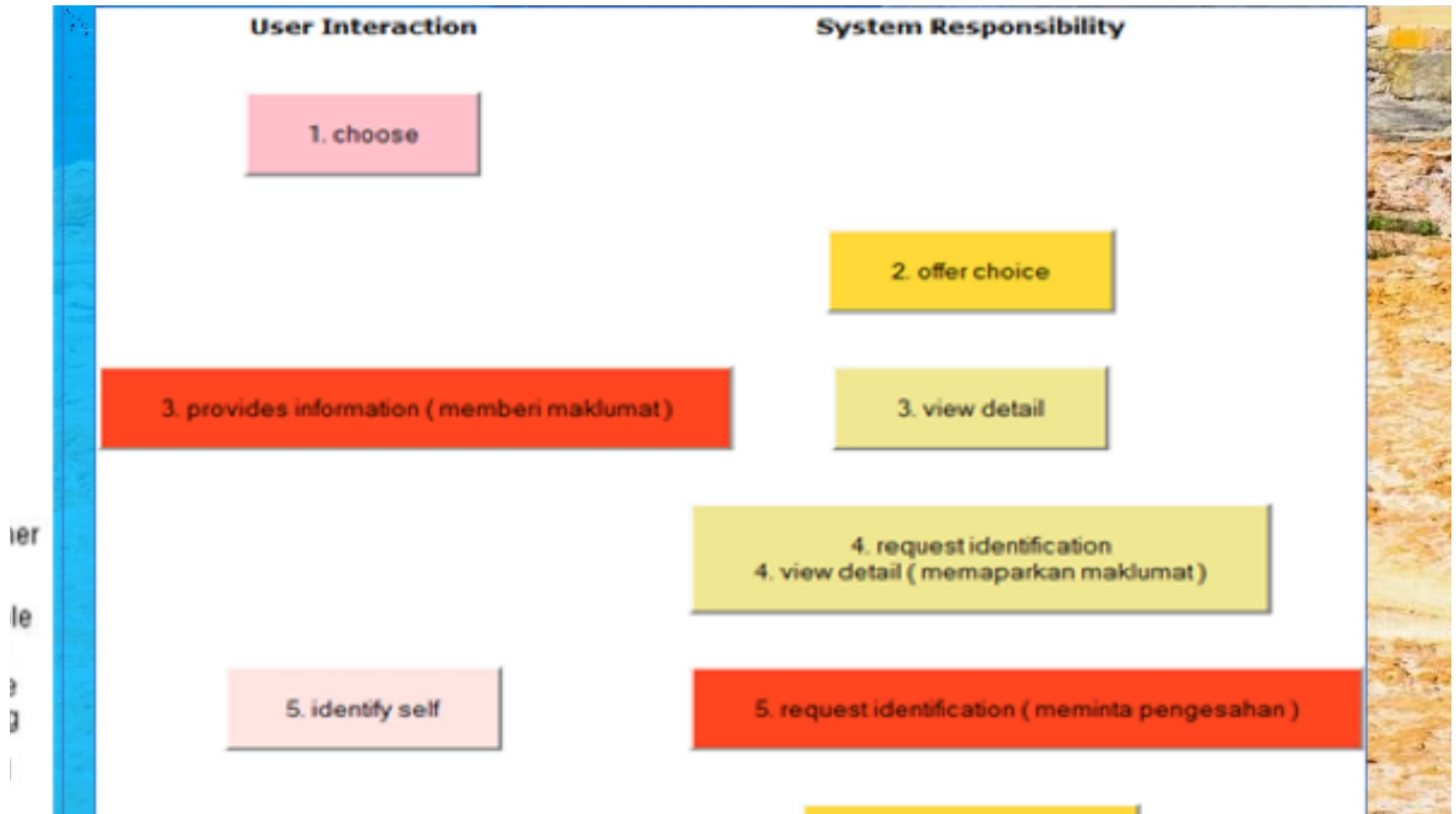


Human-centric DSVLs

End user business process model

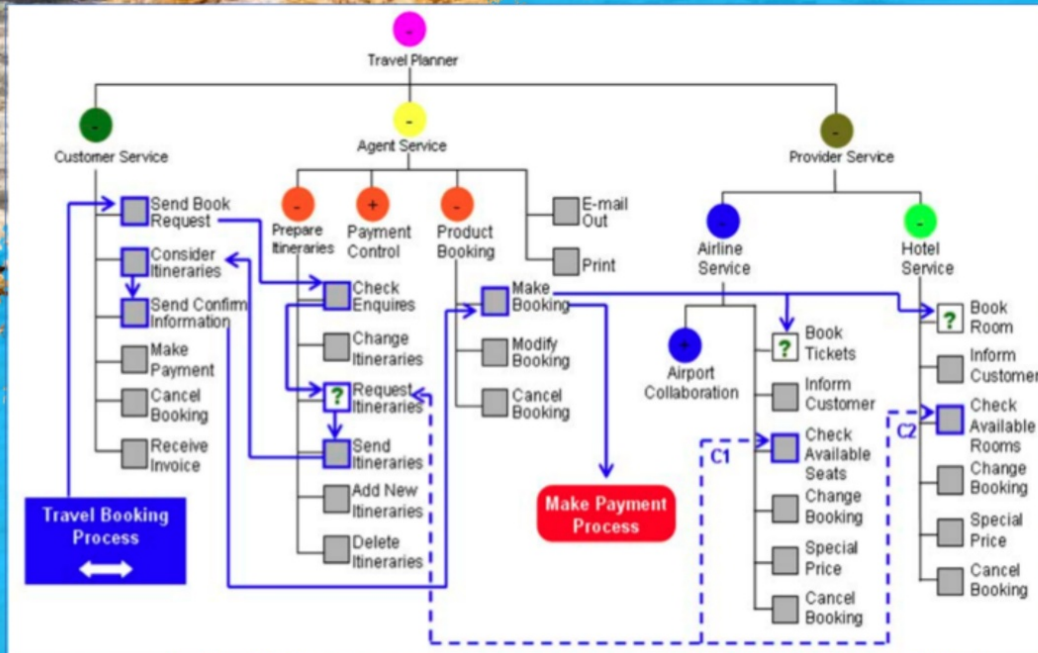
Multi-lingual use cases



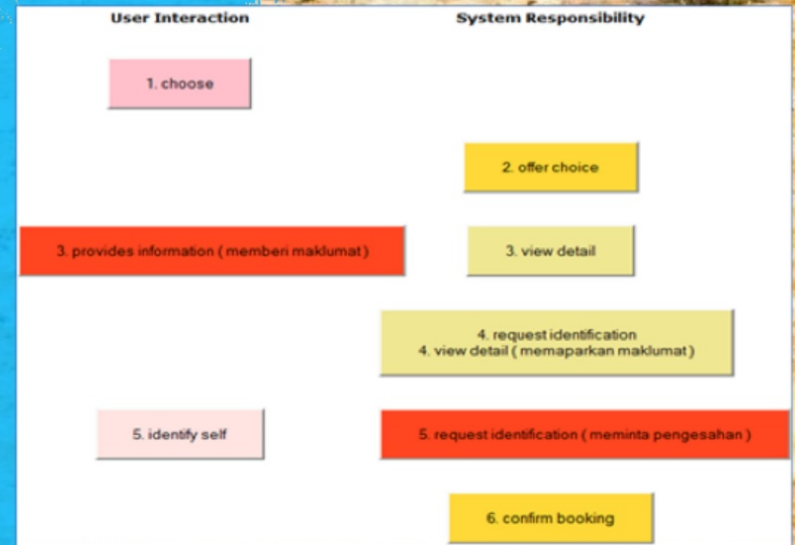


Human-centric DSVLs

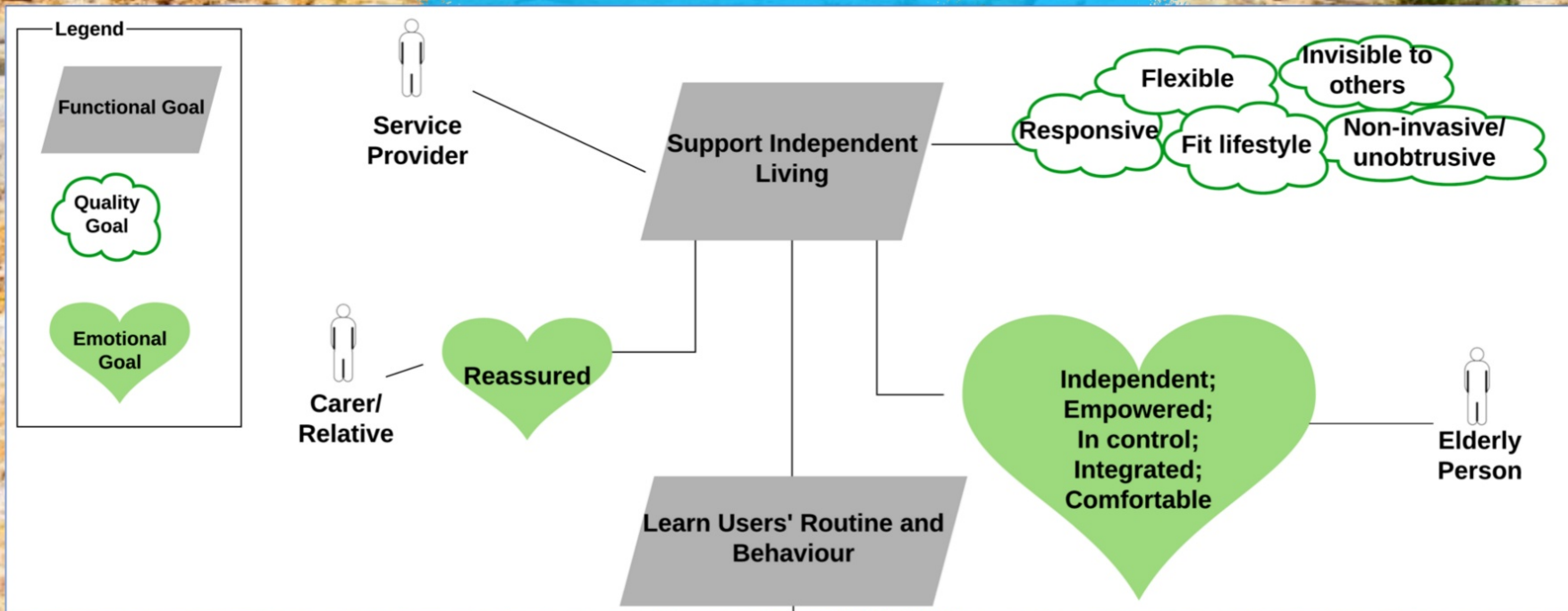
End user business process model



Multi-lingual use cases



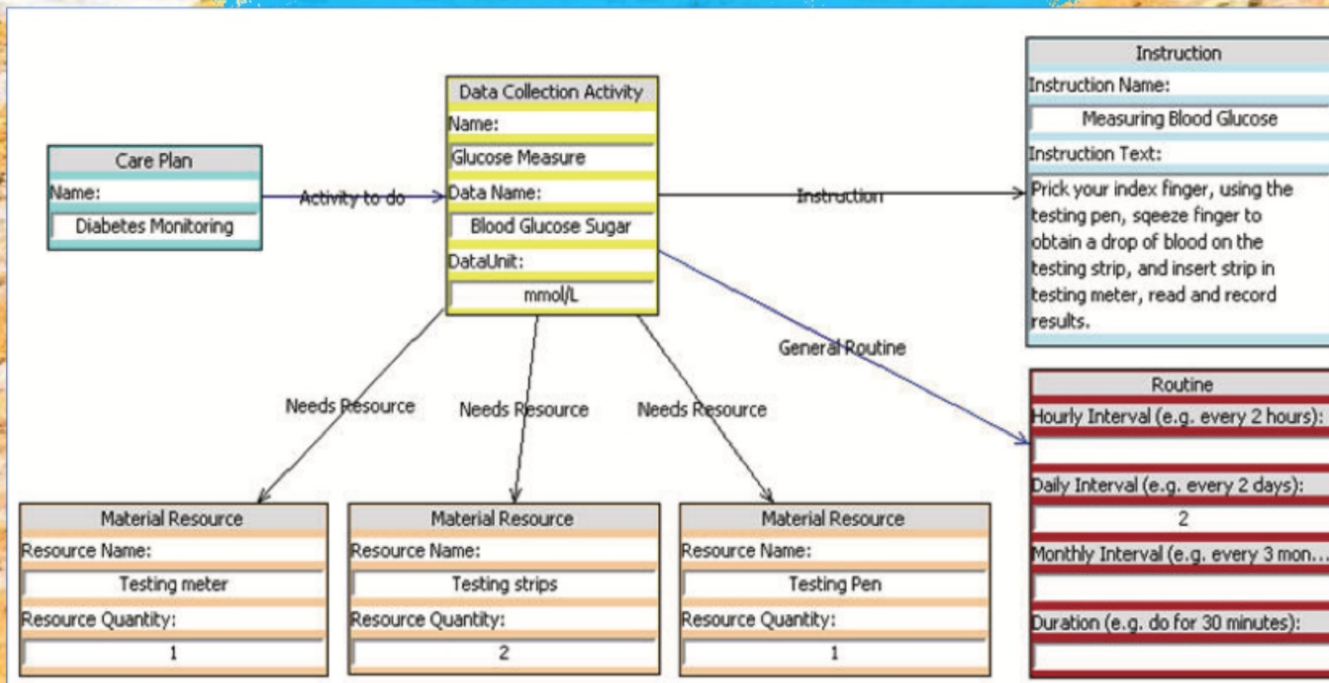
Emotion-oriented Requirements

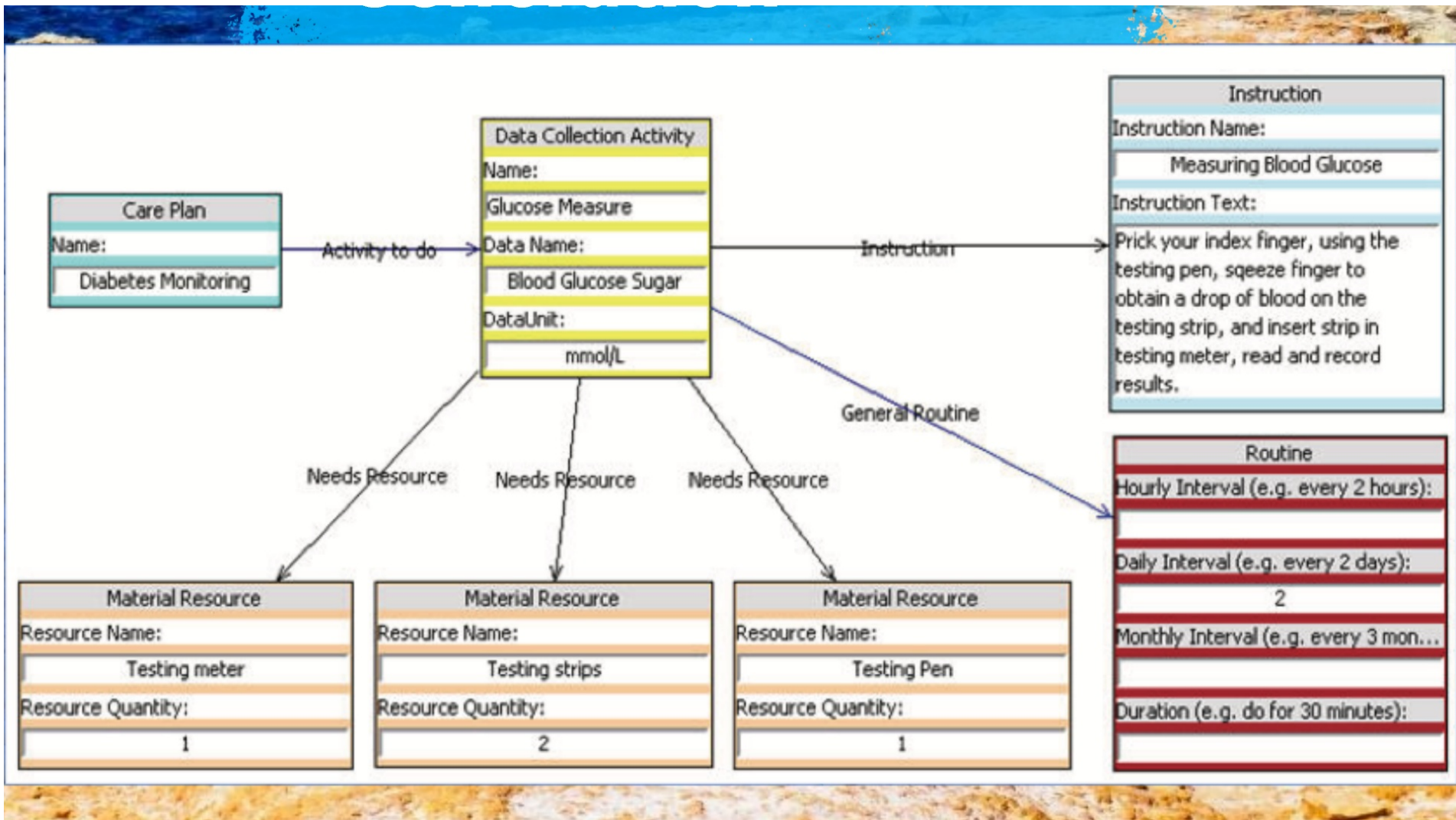


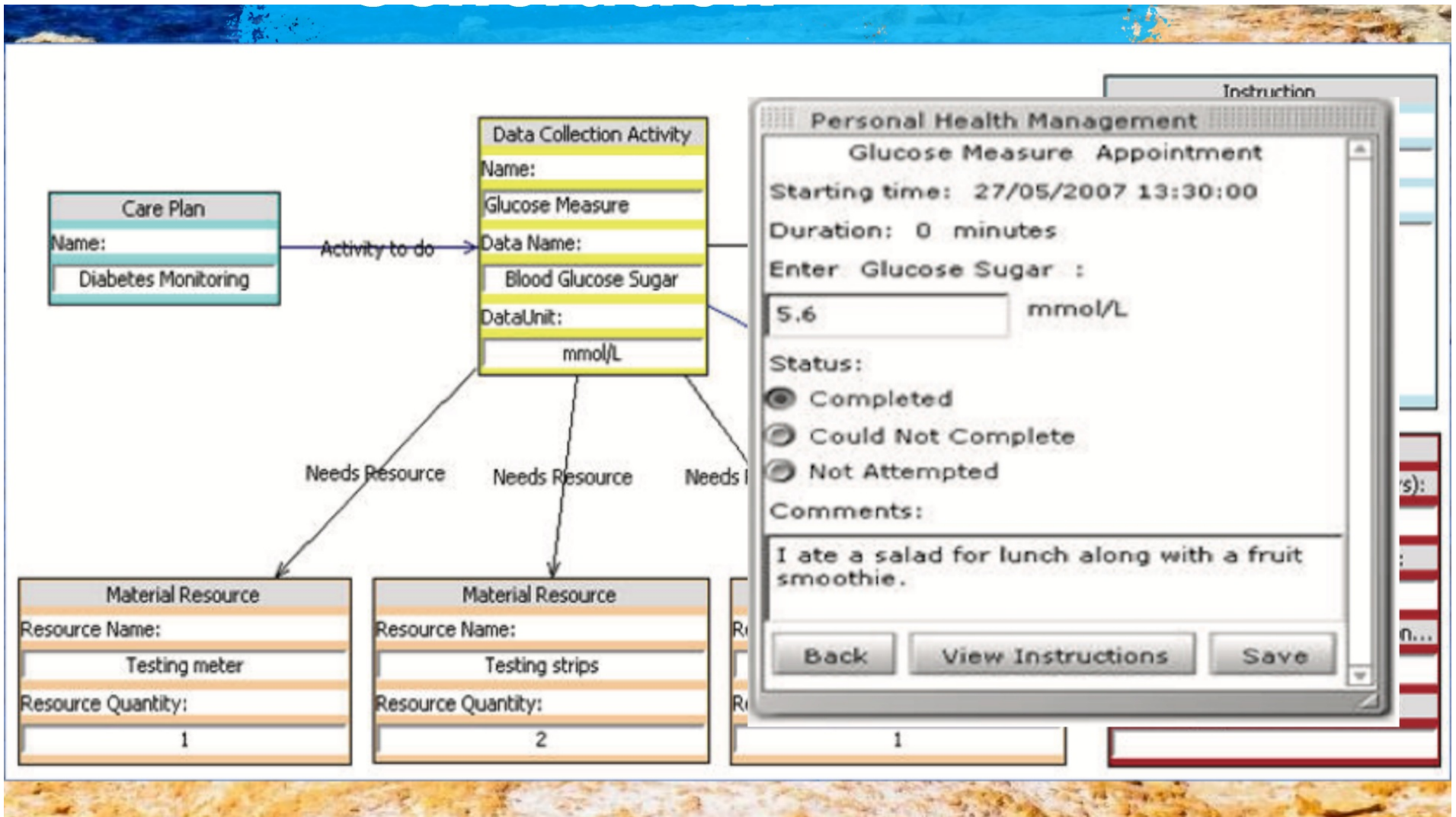
A photograph of a rocky coastline with a blue brushstroke graphic overlaid on the center. The text "eHealth App Generation" is written in white on the blue brushstroke.

eHealth App Generation

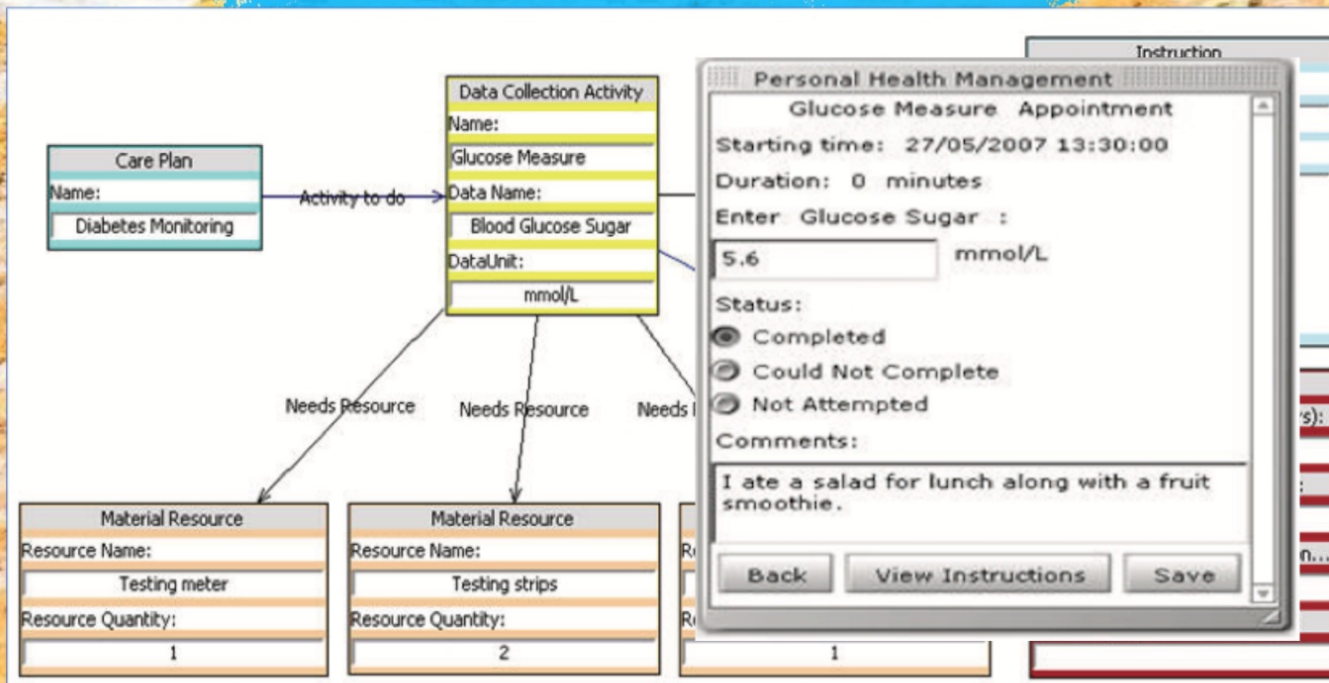
eHealth App Generation







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)

Submit

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)

Submit

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)



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



Summary

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



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