MEDINFO23
8 – 12 JULY 2023 | SYDNEY, AUSTRALIA

Initial user- centred design of an AI- based clinical decision support system for primary care

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Introduction

Why is this subject relevant?

Challenges of General Practitioners (GPs) in Primary Care

- Patients with nonspecific symptoms → Diagnostic range
- Long-term diagnostic process vs. limited time
- Unique role of GPs as 'gatekeeper'
- Rapidly growing knowledge

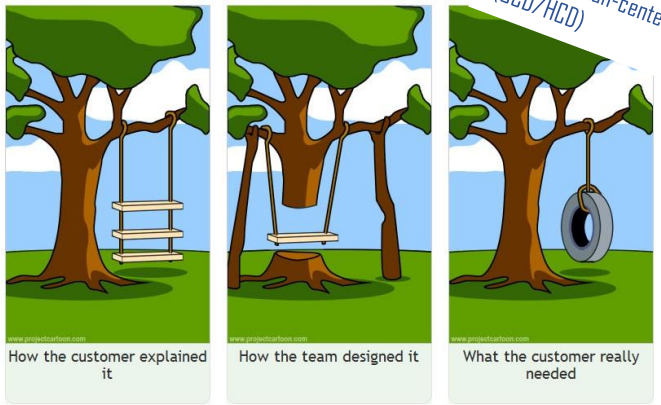
Background

Project aim

- Support the diagnostic process
- CDSS for unclear and rare diseases
- 3 different AI methods

Gefördert durch:
Bundesministerium für Gesundheit

User/ Human-centered Design (UCD/HCD)



The user plays an essential role!

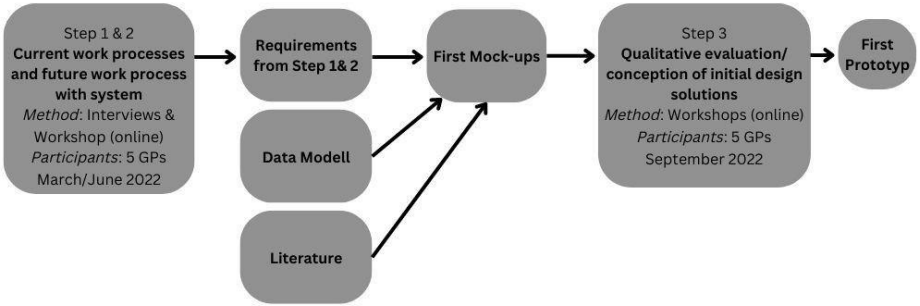
→ **Research question**: How do general practitioners envision the user interface of an AI-based clinical decision support system for primary care?

Methods

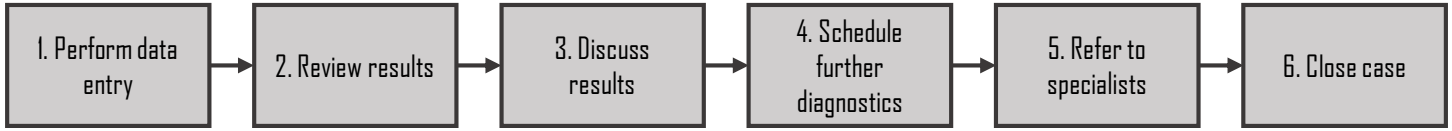
Conception of an initial design

- Mock-up creation balsamiq®

  resulted of the preliminary work



- and the designed task model



Methods

Evaluation workshop

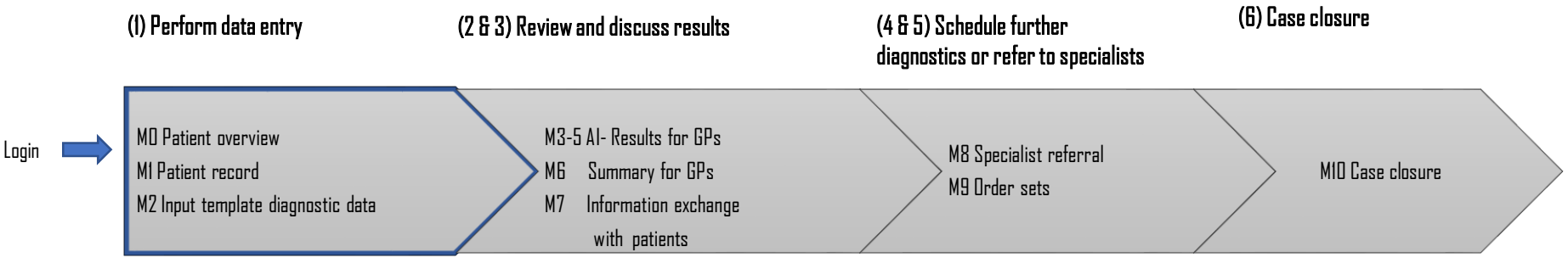
- 2 workshops : discussing the mock-ups
- online video conference tool (with recording)
- discussion guide and protocol

Result analysis

1. **Paraphrasing** answers to the guideline questions
2. **Consolidating** notes and results of the audio analysis
3. **Summarising and categorizing** the key messages

Results

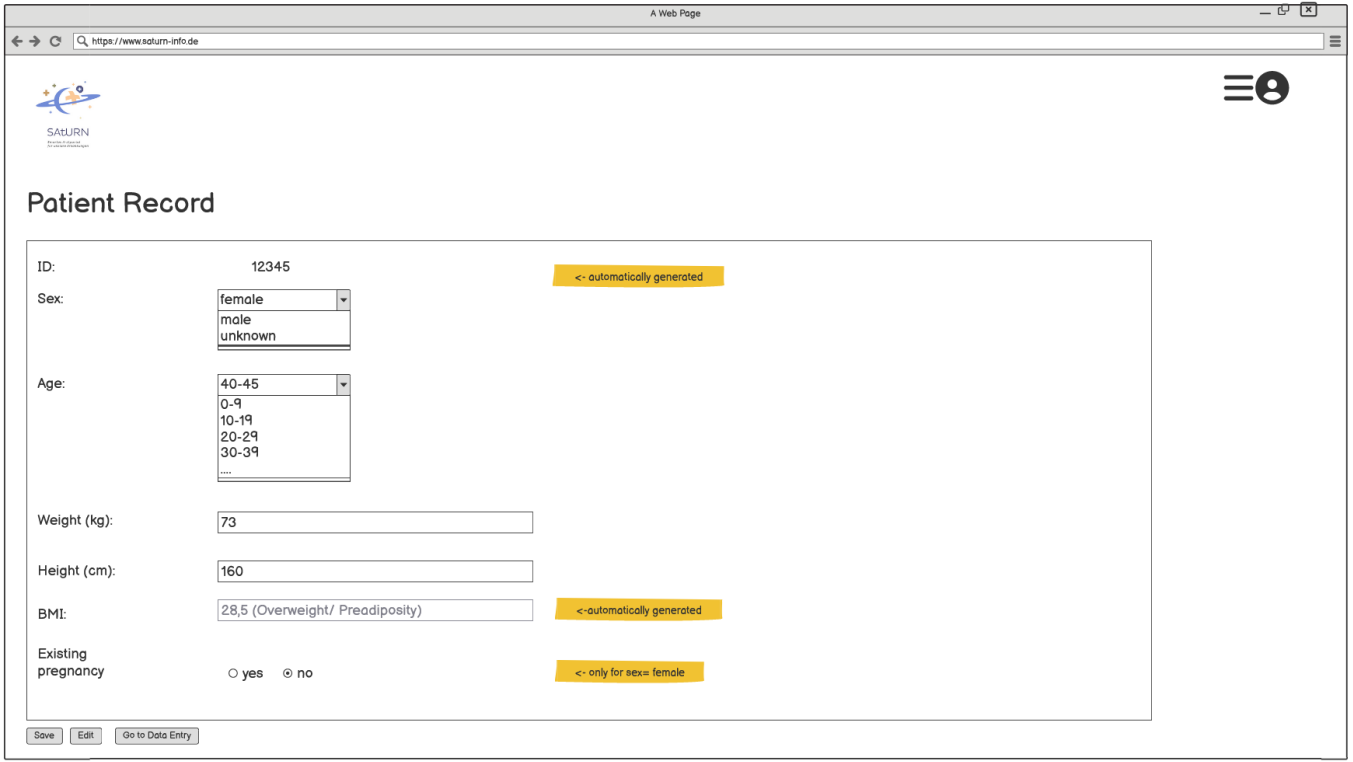
Mock-ups



Results

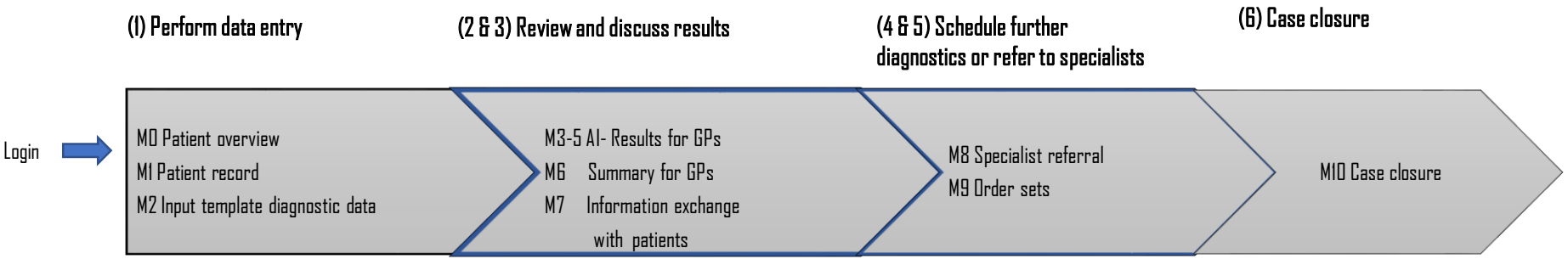
Mock-ups

M1



Results

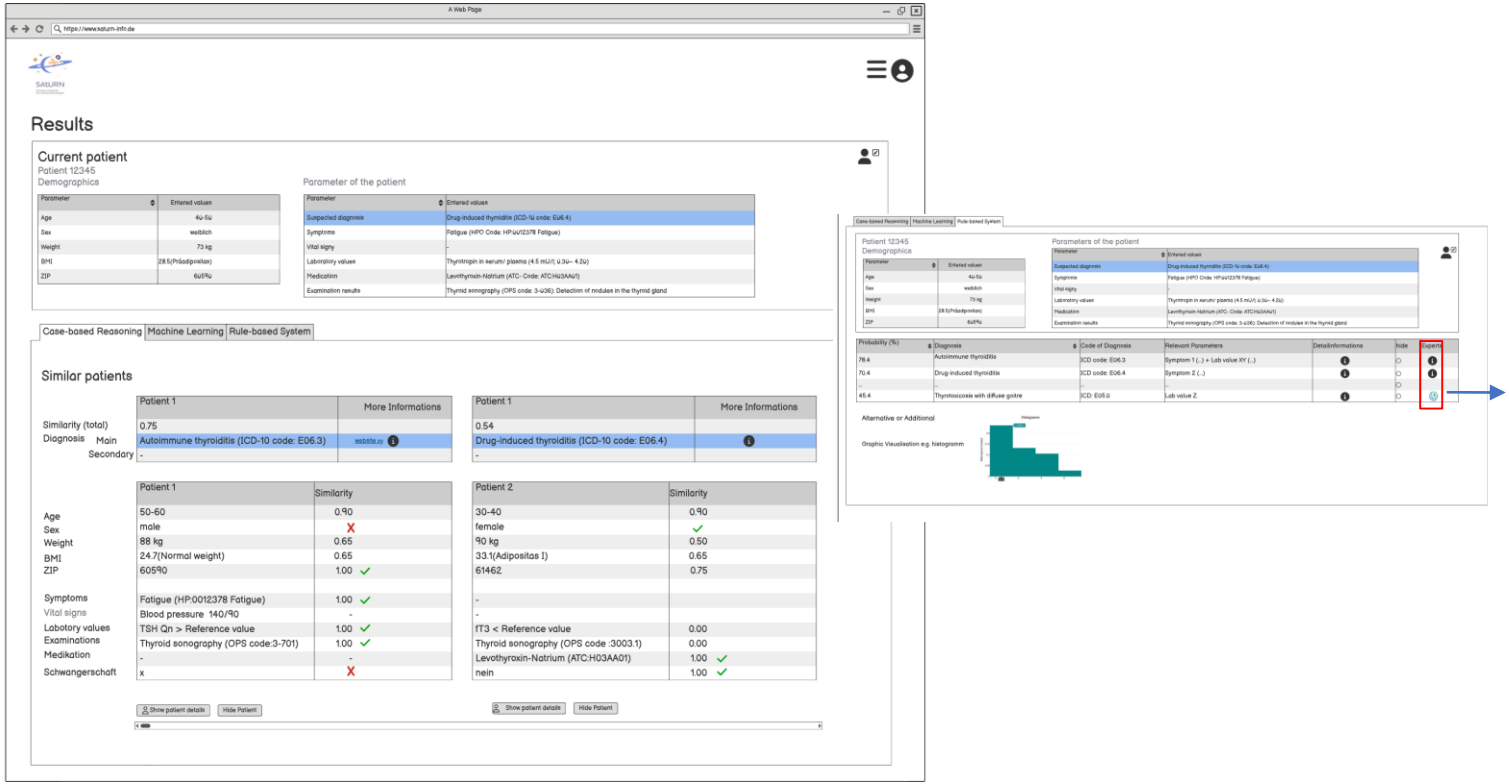
Mock-ups



Results

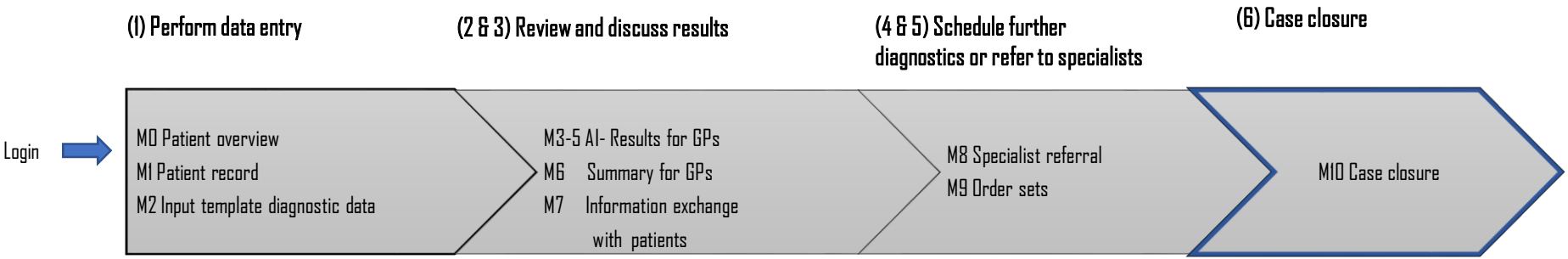
Mock-ups

M3-5



Results

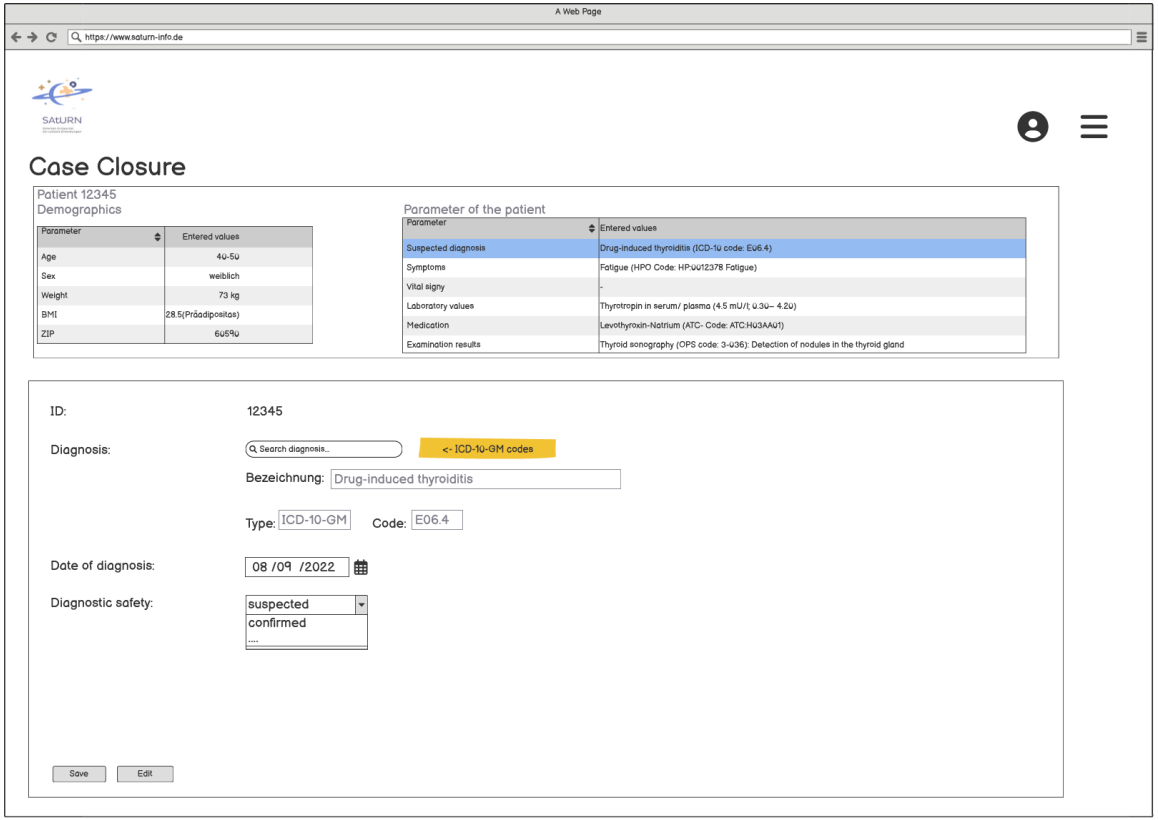
Mock-ups



Results

Mock-ups

M10



Results

Workshop Results

Demographics of participants

- gender: 40% ♀ 60% ♂
- mean age: 40.8 years
- general feedback on mock-ups

  e.g. relevance of clarity

Key messages

for the improvement of the design proposals

No.	Task	Category	Key message
1	1	Entry and processing	Intelligent request of parameters, based on previous inputs.
2	1	Entry and processing	No usage of mandatory fields.
3	1	Entry and processing	Ability to transfer information from other sources.
4	1	New data fields	Provide basic categories for diagnoses and symptoms.
5	2	Visualisation	Aggregation of all AI results in a clear presentation.
6	3	Access authorization	Individual access for patients, controlled by GP.
7	3	Entry and processing	Patient symptom entry function (portal access provided).
8	4	Provided information	Brief information on suspected diagnosis (in case of rare disease).
9	4	Search assistance	Possibility to filter information on specialists according to their proximity to the place of residence.
10	6	New data fields	Possibility to document diagnosis history at case closure.
11	1+ 6	Entry and processing	Possibility to enter and edit file attachments.
12	1- 6	Visualisation	Focus on clarity.

Discussion

Methods

- 5 GPs:

  small group size vs. intensive task-based mock-up discussion

  → Groups of 5-8 people are also described as a good group size by various other sources, e.g. Geis, 2018

- More general presentation of the mock-ups (does not cover the wide range of visualisation methods):

  limitation vs. allowing space for ideas

Discussion

Outcome

- General feedback + key messages for the improvement of a CDSS design proposals for primary care in Germany
- Further course of the project: results -> functional requirements
- Iterative feedback from GPs will be collected regularly
- Feedback reflects findings from other studies

  e.g. Importance of integration of CDSS into the work routine of the individual practitioner

Conclusion and outlook

- Valuable feedback on GPs' expectations of the UI
- Recommendation of further close involvement of GPs

Regular stakeholder involvement in CDSS projects is very valuable!

Thank you!

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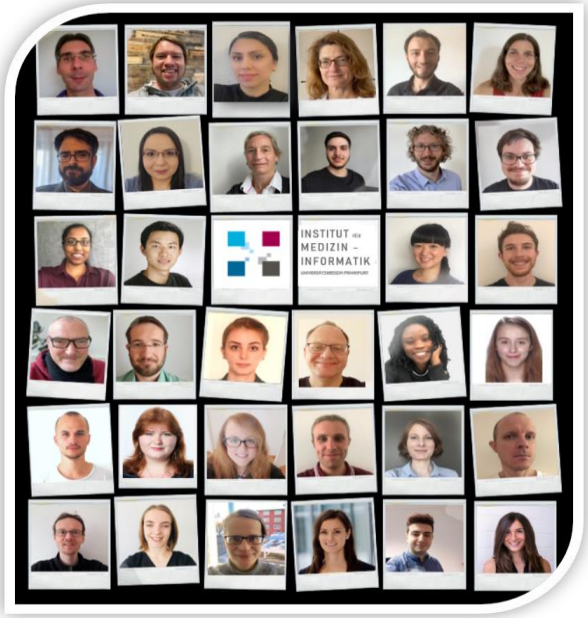
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