FHNW MSc Medical Informatics
CDSS module – Assessment

Group project to develop a mini-CDSS:

Students should work in groups of 3-4 to develop a mini knowledge-based Clinical Decision Support System (CDSS). Assessment will be via a group presentation, scheduled according to the FHNW assessment timetable.

The project:

Identifying a health system need, creating user personas and scenarios, identifying guidelines/evidence as the basis for the CDSS (L1), designing high-level business flows, data elements and decision logic (L2), developing machine-readable code (L3) and the executable CDSS (L4). Quality assurance measures should be taken with desk-based testing, and groups should identify a brief implementation, monitoring and evaluation strategy.

The project **does not** need to build an entire / completely comprehensive CDSS for the use case identified – quality is valued over quantity.

Describe the health / health system need – briefly describe the rationale for the CDSS – what problem will it seek to address?

User Personas and Scenarios – describe the different users that will interact with the CDSS, and provide 2 user scenarios that illustrate examples of how the user will interact with the system

Guidelines and Evidence – identify relevant clinical guidelines and evidence and briefly describe the rationale for selection

Design the 'human readable' algorithm (L2) –

- **High-level workflow:** diagrammatic representation of the workflow using BPMN
- **Data dictionary:** specify data elements that will be included in the CDSS – at a minimum this should include the data element labels, type, response options and conditional logic. Where possible, map to standards.
  - As a guide, the CDSS should include between 30 – 50 data elements, with at least some conditional logic, and some derived data elements.
- **Decision logic:** specify decision logic. This can be done diagrammatically (BPMN), or in a decision table (e.g. as per WHO SMART Guideline DAK), e.g. for diagnoses or treatment / management recommendations (depending on the use case, other types of decisions / recommendations may be more relevant)
- **Identify challenges in translation of the L1 to the L2:** where did decisions have to be taken / gaps filled? What are the potential implications of these decisions

Develop the machine-readable code (L3) – translate the L2 into an L3 – we recommend XIsform for its simplicity but any standard can be used as long it drives the L4 behaviour. Hard coded application will be accepted, but are ideally avoided because they often make changes more complex and time consuming. Consider user experience (e.g. sequence and grouping of your questions), maintainability of your code and data quality (e.g. constrain rules).

Implement the executable (end-user) layer (L4): Choose appropriate technology for implementation compatible with the L3 developed. Think about user interface considerations – what will make the system more or less acceptable and usable to end-users.

Quality Assurance Testing: Design an approach to risk-based testing. Conduct tests to identify L2 – L4 translation issues. Address any bugs or issues identified during testing.

Implementation, monitoring and evaluation strategy:

- Briefly outline the **plan for CDSS implementation** – how will the CDSS be provided to users and maintained? Consider factors such as integration with existing systems and user training.
- Briefly describe an approach to **monitoring and evaluation** – what are the objectives at different stages of maturity? What is the potential impact (positive and negative)? What methods will be used?

Describe expected impact – what is the potential impact (positive and negative) of the CDSS? What benefits and challenges does the group anticipate?

Assessment:

Students will be assessed on their work through a group presentation. All group members should attend and each deliver part of the presentation. Online attendance will only be allowed with prior approval of the FHNW administration.

- **Materials:** Groups should provide the presentation materials by 2nd July, along with L2 (high-level workflow using BPMN, data dictionary, and decision logic), L3 documentation and either a pre-recorded demo or access to the L4.
- **Content:** Briefly present all aspects outlined above, including a short L4 demo. Include a final slide describing individual contributions
- **Duration:** 10 minutes for presentation, 10 minutes for questions.

Evaluation Criteria:

- **Group Work:** 80%
  - Overall quality of the presentation (oral presentation, slides, demo)
  - Quality of, and demonstration of critical thinking about, CDSS development and documentation
- **Individual Assessment:** 20%
  - Individual presentation and ability to articulate responses during Q&A
  - Description of individual contribution