

Enable personal health device interoperability with HL7 FHIR® // BPMN2 // DMN

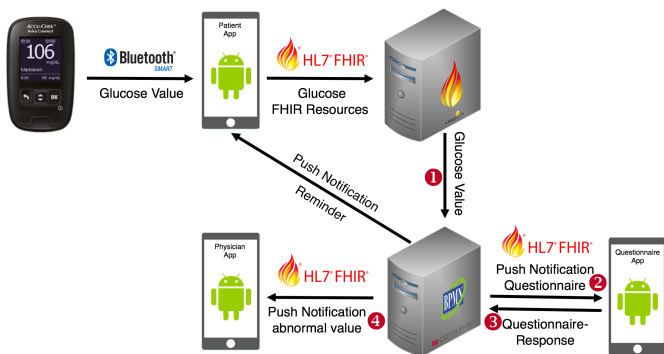
Motivation

- Data is commonly being captured in non-standardized formats, accessible only by the vendors proprietary (cloud) storage and app solutions. Interoperability consists (if ever) of one vendor implementing another vendor's API.
- Using FHIR, there are several advantages over proprietary solutions: patients (e.g. diabetes) a) are empowered to control their health data, b) can be monitored in outpatient care and c) physicians are enabled to access glucose measurements and patient reported outcomes of their patients in real time.

Methods & Materials

- Roche Accu-Chek Aviva Connect® transfers the blood glucose levels (BGL) via Bluetooth Low Energy to the Patient App.
- HAPI-FHIR is an open-source FHIR Java Library and is used within the Android App to create and send the BGL related - and questionnaire resources to the HAPI-FHIR server.
- camunda is an open source platform for workflow and business process management. It supports the execution of BPMN2 and DMN and therefore supports process automatization and decision models.

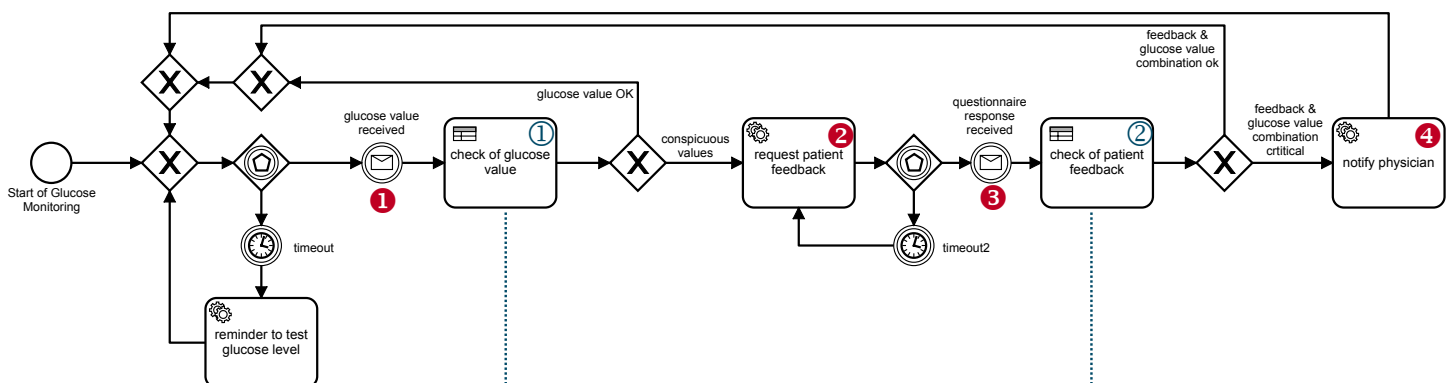
Communication Schema



Process Description

- The glucose value, which was translated to a FHIR resource by the mobile app, is sent to the process engine and evaluated by the GlucoseTable (1).
- If needed patient feedback is requested via a FHIR questionnaire.
- The questionnaire response is sent back to the process engine, response and glucose value are evaluated in combination (2).
- If necessary the physician is notified via a push notification to his app.

BPMN2 & DMN Process



GlucoseTable			
U	Input +	Output +	
	Glucose Value	Glucose Value Result	
	glucose	glucose	string
1	>180	"very high"	
2	[160, 180]	"high"	
3	(80, 160]	"ok"	
4	(40, 80]	"low"	
5	<40	"very low"	

QuestionnaireTable				
F	Input +	essen	Sport	Output +
	Glucose Value Result	essen	Sport	Questionnaire result
	string	string	string	string
1	"low"	"zu wenig gegessen"	-	"ok"
2	"low"	-	"Viel Sport", "Übermäßig viel Sport"	"ok"
3	"high"	"ich habe gestündigt"	-	"ok"
4	-	-	-	"crit"