MDE1 Project:

EP content :

- Administrative Patient Information https://build.fhir.org/patient.html
    - Name
    - Date of birth
    - Biological Gender
    - Address
    - Phone number
    - Social Security number
    - Native Language
    - Emergency contacts
- Medical Information
    - height https://build.fhir.org/ig/HL7/cimi-vital-signs/StructureDefinition-height.html
    - weight https://build.fhir.org/ig/HL7/cimi-vital-signs/StructureDefinition-body-weight.html
    - Blood type https://build.fhir.org/observation-example-bloodgroup.json.html
    - Allergies and Intolerances https://build.fhir.org/allergyintolerance.html
    - Chronic illnesses (z.B. diabetes and Other medical specifics (Implants, pacemaker…) https://www.hl7.org/fhir/condition.html
    - Pregnancy status (if female) https://build.fhir.org/ig/HL7/fhir-ips/StructureDefinition-Observation-pregnancy-status-uv-ips.html
    - Regularly taken medications https://build.fhir.org/medication.html
    - Care level https://build.fhir.org/careplan.html
    - DNR (Do not resuscitate) https://www.hl7.org/fhir/consent.html
- Medication list
- Date of last update

Overview of Technologies

Current standing

- Apple emergency ID
- Android emergency information
- European Guideline “Patient Summary”

Electronic Health record standards

- **ELGA (Elektronische Gesundheitsakte):** The Austrian electronic health record system that provides a comprehensive framework for managing and sharing health data, ensuring interoperability and secure data exchange among healthcare providers.
- **MyHealth@EU:** An initiative aimed at enabling cross-border health data exchange across the European Union, enhancing continuity of care for EU citizens.
- **FHIR (Fast Healthcare Interoperability Resources):** Developed by HL7, FHIR facilitates data sharing through RESTful APIs, known for its flexibility and scalability in healthcare information exchange.
- **CDA (Clinical Document Architecture):** Another HL7 standard that specifies the structure and semantics of clinical documents for exchange, known for its robustness in representing complex clinical data.

Data storage solutions

- Cloud databases
    - Google Cloud SQL, and Microsoft Azure SQL offer secure storage for medical data, ensuring high availability and disaster recovery
- Local databases
    - Traditional databases such as MySQL, PostgreSQL, and SQLite provide on-premises data storage, offering full control over data management and security

Web Development Technologies

- Java dynamic Web project
    - A framework for developing web applications using Java, ideal for creating secure, dynamic, and scalable web portals
- Frontend technologies
    - HTML, CSS and JavaScript can be employed to build user-friendly interfaces for the web portal

FHIR vs CDA

Decision criteria:

- Interoperability
    - FHIR offers superior interoperability through RESTful APIs, making it easier to connect with various healthcare systems and applications. It supports real-time data exchange, which is crucial for emergency scenarios where timely access to patient data is critical.
    - CDA provides a comprehensive structure for clinical documents, ensuring all necessary information is included. However, it is less flexible than FHIR and can be more challenging to implement for real-time data exchange.
- Implementation complexity
    - FHIR is known for its ease of implementation. It offers modular resources and uses modern web technologies like JSON.It is particularly suited for systems that require frequent updates and dynamic data interactions.

    - CDA: While robust, CDA's complexity can lead to longer development times and higher implementation costs. It is best suited for static documents and systems that do not require frequent data updates.

Decision (suggested by Seb):
Given the EP project's requirements for real-time data access, ease of implementation, and future-proofing, FHIR emerges as the preferable standard. Its ability to seamlessly integrate with various systems and support dynamic data interactions aligns well with the project's goals of providing timely and accurate emergency medical information

Sources for FHIR vs CDA:

Interoperability FHIR:

- "HL7 FHIR: An Agile and RESTful Approach to Healthcare Information Exchange." Health Level Seven International (HL7)

Bibtex:
@INPROCEEDINGS{6627810,
  author={Bender, Duane and Sartipi, Kamran},
  booktitle={Proceedings of the 26th IEEE International Symposium on Computer-Based Medical Systems},
  title={HL7 FHIR: An Agile and RESTful approach to healthcare information exchange},
  year={2013},
  volume={},
  number={},
  pages={326-331},
  keywords={Interoperability;Object oriented modeling;Software;Hospitals;Standards organizations;eHealth;Interoperability;Healthcare;Standards;FHIR;HL7 v3;Agile;RESTful;Informatics},
  doi={10.1109/CBMS.2013.6627810}}

Interoperability CDA:

Liang, Jun & Xu, Mei & Li, Lan & Yang, Sheng & Li, Bao & Cheng, De & Jin, Ou & Zhang, Li & Yang, Long & Sun, Jun. (2010). Increasing the Meaningful Use of Electronic Medical Records: A Localized Health Level 7 Clinical Document Architecture System. 6441. 491-499. 10.1007/978-3-642-17313-4_49.

Bibtex:
@inproceedings{inproceedings,
author = {Liang, Jun and Xu, Mei and Li, Lan and Yang, Sheng and Li, Bao and Cheng, De and Jin, Ou and Zhang, Li and Yang, Long and Sun, Jun},
year = {2010},
month = {11},
pages = {491-499},

title = {Increasing the Meaningful Use of Electronic Medical Records: A Localized Health Level 7 Clinical Document Architecture System},
volume = {6441},
isbn = {978-3-642-17312-7},
doi = {10.1007/978-3-642-17313-4_49}
}

Implementation Complexity FHIR:
"Introduction to FHIR." SMART Health IT
https://digital.nhs.uk/services/fhir-apis

"Introduction to FHIR." SMART Health IT
https://techno-soft.com/an-introduction-to-fhir-standard-and-smart-on-fhir-platform.html/

Implementation Complexity CDA:
HL7 CDA Implementation Guide, The international Patient Summary
https://international-patient-summary.net/hl7-cda-ig/

HL7 Standards Product Brief, HL7 International
https://www.hl7.org/implement/standards/product_brief.cfm?product_id=7

International Patient summary:
https://international-patient-summary.net/

Feedback MDE1:

Introduction:

Kurze Beschreibung warum , wozu was gibt es , warum neues „produkt“

Aktuelle Methoden und Bezug auf nächstes Semester

Abgekürzt Begriffe zum ersten mal Ausschreiben und ggf kurz (ganz kurz) erklären

Goals und Non goals nicht als Liste!!!

Implementation effort/ affixable skills / knowhow statt complexity

Methoden:

- Requirements engineering (zb non functional resources(time, budget, know how),)
- Measurements (funktioniert /Akzeptiert)
- Rahmen (V modell)
- Prototyping (Messbar machen von

Introduktion:

Unsere Goals -> Requirements -> in Methoden

Zu Goals noch Headlines des Content einfügen

Results:

IDE : versionsbeschreibung, mit GIT und Grund (1 Satz reicht),

Decision in Results, Anzahl der Strukturelemente gegenüberstellen (Stichwort Rim)

Was für Datenbank + ggf Quelle

Was für Benutzeroberfläche + ggf Quelle

Erkenntnisse aus Recherche um Ziele zu erfüllen (ggf implementation guide oder architectural design)

Code aus FHIR Projekt

IFU erwähnen

Sources:

Auf Zitate achten dass vollständig

Sauermann will Ort

SEF-IFU:

- Installation, deinstallation
- ……etc.

Plan für weiteres vorgehen :

To Do Michi Sebastian:

- ☑ ~~Introduction fertig schreiben~~
- ☑ ~~Requirements vervollständigen~~
- ☑ ~~Measurements in Methoden hinzufügen~~
- ☑ ~~V Modell auf unser Projekt anwenden (Prototyping beschreiben) und in Methoden hinzufügen~~
- ☑ ~~Results GIT erklärung ergänzen~~
- ☑ ~~Diskussion schreiben~~
- ☑ ~~Quellen überarbeiten (Orte hinzufügen)~~
- ☑ ~~Abstract schreiben~~
- ☑ ~~Abstract gegebenenfalls ergänzen, korrigieren~~

- ☑ ~~individual working time documentation (61,5 individual mandatory working time for the project)~~
- ☑ ~~wiki vervollständigen~~

Präsentation :
Ideen

- ☑ ~~Logo~~
- ☑ ~~Kurzer Überblick/Intro~~
- ☑ ~~Funktionsweise~~
    - ☑ ~~Bilder ggf. aus IFU~~
- ☑ ~~Proof of concept:~~
    - ☑ ~~Login~~
    - ☑ ~~Datenimport (ELGA und User) (Filearten: CDA/FHIR)~~
    - ☑ ~~Dateninterpretation~~
    - ☑ ~~Datenspeicherung~~
    - ☑ ~~DEPS generierung~~
- ☑ ~~Einblick in Wiki~~
- ☑ ~~paper öffnen~~