

PROJECT PROPOSAL

Team: Standard's Marubozu

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Introduction

Electronic health records (EHRs) have revolutionized the way healthcare professionals store, manage, and share patient information. EHRs not only provide a more efficient and accurate method of record-keeping, but they also facilitate communication between healthcare providers, improve patient safety, and reduce healthcare costs. We will follow the journey of a 65-year male patient who presents to a clinician with symptoms of headache and is subsequently diagnosed with hypertension. The patient's medical and family history, physical examination findings, and prescription details were all updated in the EHR. The next step in the process is generating Surescripts, a digital prescription tool, and sending it to the pharmacy network for dispensing. By examining the use of EHRs in this patient's care, we will gain a better understanding of how technology can improve patient outcomes, streamline healthcare workflows, and enhance the overall quality of care in the healthcare industry (Honavar, 2020).

We started by identifying the clinical concepts, standards, and terminologies of the case. In healthcare, standardization of terminologies is critical for the efficient and effective trading of data and information (González Bernaldo de Quirós et. al., 2018). The development of standardized terminologies helps ensure consistency in vocabularies, rules, and professional documentation, which in turn improves precision, efficiency, productivity, classification, and comparability of healthcare information at various levels (Andrews et. al., 2016). The World Health Organization defines standard terminology as a compilation of terms used in the clinical assessment, management, and care of patients, including agreed definitions that represent the knowledge behind these terms and link with a standardized coding and classification system. This makes it easier for healthcare professionals to communicate and access information across different organizations, leading to better care outcomes for patients. Patient's chief complaints of

headache and hypertension and their ICD 10 codes, CPT codes of Patients, medical examinations, SNOWMED CT codes of gender, smoking, family history etc. and LONIC codes of age and gender were included. We also noted the RXCUI codes of the prescribed drugs.

Unified Modeling Language (UML) diagrams are visual models used to represent the structure and behavior of software systems. They provide a standardized way to depict the various components of a system and how they interact with each other. UML diagrams include various types such as use case diagrams, class diagrams, state diagrams, and activity diagrams, among others. In the healthcare industry, UML diagrams can be used to model interactions between patients and providers, relationships between entities like patients and their medical history, and to visualize business processes (Choi et al., 2015). Business Process Model and Notation (BPMN) diagrams, on the other hand, provide a graphical notation and description for business procedures. They are used to represent the actions and occurrences involved in a process using shapes and symbols, with arrows showing the flow of the process. BPMN diagrams are often used in the healthcare industry to represent workflows involving patient care, such as scheduling visits, ordering tests, monitoring patient data, and corresponding with other healthcare practitioners. They can also be used to depict the management of medical records, including gathering, storing, and retrieving patient data. We made BPMN and UML diagrams of three events linked to our case (Pufahl et al., 2022). one BPMN diagram on appointment decision flow was made, another on the flow of the Physician's office to EHR to pharmacy and one UML was made. For each diagram one type of interoperability was reflected and places where it can be found.

HL7's Clinical Document Architecture (CDA) is a key part of HL7's latest standard, Version 3. It uses a specific grammar/schema set based on XML to create messages that are

interoperable both syntactically and semantically. CDA is currently used as the template for the newest generation of Fast Health Interoperability Resources (FHIR) messages. In our case, we selected three events - Family History, Medications, and Smoking Status - and found the appropriate CDA templates on the website. We then updated these templates with information relevant to our case and included any necessary comments in the appendix.

Our culminating project proposal brings together the numerous organizational mappings conducted over the term, all centered around our chosen use case A. The proposal commences with an in-depth analysis of the use case by delineating an array of terminology and their rationales. Subsequently, we delve into the significance and connections between our BPMN and UML diagrams. In conclusion, we discussed the implications of adopting standards and terminologies for communication and healthcare providers within the medical field.

Use Case & Terminologies

The case we selected describes a 65-year-old man who visited a healthcare provider, primarily complaining of headaches, and was diagnosed with hypertension. The patient has no previous medical or medication history but has been a chronic smoker and has a family history of both diabetes mellitus and hypertension. A physical examination was conducted, revealing no abnormalities, and the patient was prescribed Atenolol 50mg and Telmisartan 40mg. The details were recorded in the electronic health records (EHR), and Surescripts were created and sent to the pharmacy network for dispensation.

Various coding systems such as ICD-10, CPT, SNOMED CT, LOINC, and RXCUI are used to summarize the patient's conditions and characteristics. In the ICD-10 coding system, the

patient's hypertension is coded as I10, Essential (primary) hypertension, while headache is coded as R51. If a patient has both hypertension and headache, both codes should be used to indicate the presence of both conditions. The hypertension code should be listed as the primary diagnosis and the headache code should be listed as a secondary diagnosis. The patient's status as a smoker is coded as F17.21, which represents the concept of an individual who smokes tobacco products. It is a situation that may be determined by a history or physical examination, and it could be used to identify the patient's habits, which could be relevant to their diagnosis, management, or treatment. The family history of diabetes mellitus and hypertension are coded as Z83.3 and Z82.49, respectively.

For the CPT coding system, the patient's physical examination is coded as 99204. This code represents an initial consultation for a new patient, including a detailed examination and review of medical history, diagnosis, treatment plan, and management of any related symptoms or conditions.

In the SNOMED CT coding system, the patient's hypertension is coded as 59621000 and headache as 25064002. The patient's gender (male) is coded as 446151000124109. The codes for smoking, family history of diabetes mellitus, and hypertension are 65568007, 160303001, and 160357008, respectively. Additionally, the prescribed medications, Atenolol 50mg and Telmisartan 40mg, are coded as 318420003 and 318986004.

LOINC codes are used to identify laboratory and clinical observations. In this case, the patient's age is coded as 30525-0, male gender as LA22878-5, smoking status as LA18976-3, and family history of diabetes mellitus and hypertension as LA10552-0 and LA7444-8, respectively.

RXCUI stands for "RxNorm Concept Unique Identifier". RxNorm is a standardized nomenclature system for drugs, provided by the National Library of Medicine (NLM), that provides unique identifiers for clinical drugs and links them to their various brand and generic names, as well as their active ingredients. Each drug in the RxNorm system is assigned a unique RXCUI, which can be used to identify the drug across different systems and databases. The RXCUI is a numeric identifier that is assigned to a drug based on its active ingredients, strength, and dose form. The RXCUI can be used to look up information about a drug, such as its brand and generic names, its active ingredients, and its therapeutic class. The prescribed medications, Atenolol 50mg and Telmisartan 40mg, have RXCUI codes 197381 and 205304, respectively.

The patient's information was coded using these systems to ensure accurate documentation, communication, and management of his condition and treatments. These codes facilitate the exchange of information between healthcare providers, insurers, and other stakeholders in the healthcare system, helping to maintain high-quality care for the patient.

Terms:

| TERMINOLOGY USED | PREFERRED CODING SYSTEM USED FOR THE CASE | NAME OF THE CONCEPT | CODE | LINK | RATIONALES |
|-----------------------------|--|------------------------------------|-----------------|----------------------|---|
| Age | LOINC | Age (65 years) | 30525-0 | LINK | LOINC is used as the preferred code concept for age owing to its association with patient demographics. 30525-0 is used for representing age. The use of such codes to capture demographic information helps improve the accuracy and overall outcomes. |
| Gender | SNOMED-CT | Male Gender | 446151000124109 | LINK | SNOMED-CT is used as the code concept to identify gender. The given numerical code '446151000124109' is |

| | | | | | |
|--------|-------|----------------|-----------|----------------------|--|
| | | | | | <p>specifically meant for the male gender.</p> <p>SNOMED-CT is widely used by many healthcare organizations, thus, ranking high on interoperability.</p> |
| Smoker | LOINC | Chronic Smoker | LA18976-3 | LINK | <p>For smoking, LOINC is used as the preferred concept. As the patient has been a chronic smoker for 10 years,’ LA18976-3’ is used to denote it. The coding concept is used to talk about tobacco history as well as describe the status of the smoker. The use of a standard code concept for smoking will help clinicians assess the patients better and</p> |

| | | | | | |
|----------------|--------|--------------------------------------|--------|----------------------|---|
| | | | | | administer good interventions. |
| Family History | ICD-10 | Family History: Diabetes Mellitus | Z83.3 | LINK | To document this, ICD-10 is used as the preferred code base. The code 'Z83.3' represents a history of family diabetes. It is also used to extract information about the patient's immediate relatives having diabetes. This will help in identifying vulnerable patients who may develop diabetes mellitus and will also serve in population health management. |
| Family History | ICD-10 | Family History: Hypertension | Z82.49 | LINK | For a patient with a family history of hypertension, the code concept used is ICD-10 again. ICD-10 is |

| | | | | | |
|----------------------|-----|-------------------------------|-------|-----------------------|---|
| | | | | | generally used to classify diseases. The numerical code ‘Z82.49’ represents the patient’s family history of hypertension. Documenting a patient’s family history of diseases can help clinicians and providers administer the right medications, diagnoses, and treatments. |
| Physical Examination | CPT | Physical Examination (Normal) | 99204 | LINK. | The CPT code concept is used for physical examination. The code ‘99204’ is used when a patient has a comprehensive in-person meeting with a clinician for more than 45 minutes. The physical examination may have multiple procedures in |

| | | | | | |
|--------------|-------|----------------|--------|----------------------|---|
| | | | | | place. For the given case scenario, a full-fledged test was conducted and the patient's health was found to be normal. This information can be noted and used by clinicians in the future to assess the patient's health. |
| Prescription | RXCUI | Atenolol 50 mg | 197381 | LINK | RXCUI code concept is used for Prescription. The code '197381' is used for Atenolol 50 mg oral tablet. Atenolol is used for patients with hypertension. RXCUI can help promote interoperability between the various stakeholders involved in the healthcare sector. |

| | | | | | |
|--------------|-------|---------------------|--------|----------------------|---|
| Prescription | RXCUI | Telmisartan 40mg | 205304 | LINK | For this prescription, the RXCUI code concept is used. Telmisartan is used to block the receptors and manage hypertension. The code '205304' refers to a 40mg Telmisartan oral tablet in the RXCUI code base. Using RXCUI to document these prescriptions, will lead to establishing a better communication channel between the stakeholders involved for dispensing. |
|--------------|-------|---------------------|--------|----------------------|---|

BPMN Steps/UML Relations

By employing standardized symbols to enhance awareness of the process, BPMN and UML diagrams assist in comprehending the precisely coded workflow of case A. To guarantee that patients receive uniform care, the BPMN drew out an operational flow mapping. The UML diagram made sure that only the minimum amount of patient information was collected in order to reduce errors and enhance information interoperability.

BPMN

Business Process Model and Notation or BPMN allows businesses to comprehend their business procedures in graphical notation and description in a standard manner. According to Benson & Grieve (2021), BPMN enables the representation of trigger events, delays, and messages associated with each activity, and allows the user to examine sub-processes in greater detail. Business Process Execution Language (BPEL), an XML-based language, can be used to execute BPMN's output (pp. 408-410).

Notes

The BPMN diagram depicts the sequence of events that take place after the patient makes an appointment at the Physician's clinic until receiving the prescribed drugs at the Pharmacy. It also emphasizes the connections between the Electronic Health Records system, the Pharmacy Network, and the Pharmacy System. The process begins with the patient booking an appointment at Physician's clinic and attending the appointment. The physician evaluated patients' history and symptoms and makes a diagnosis, updating the patient's electronic health records (EHR) and

prescribing drugs. The electronic health records system (EHR) generates a Surescripts prescription, upon a decision made by the patient about the collection of drugs, the information is sent to the pharmacist. The pharmacist receives the Surescripts prescription in the pharmacy network, the drug is looked up in the system for availability and the drug is made ready for delivery. The Drugs are delivered to the patient upon arriving at the pharmacy.

UML

In the UML diagram that represents Case A, the clinician, and pharmacist are sharing patient information. Medical terminologies and a standardized set of codes are used for patient history, diagnosis, and prescribed medications for simpler comprehension and record-keeping.

Notes-

Patients, clinicians, diagnosis, prescriptions, EHR, and pharmacy are all involved in this Event. The Clinician updates the patient's electronic health records with patient demographic data and prescribes the drugs related to the diagnosis using codes. The newly prescribed medications are added to the patient's previous medication list. A Surescripts prescription with details of the drug name and dosage is generated by the Electronic Health Records system and sent to the pharmacy network. The pharmacy prepares the patient's medication and verifies all the records as soon as the Surescripts' prescription arrives. The prescription drugs are available for patients at the requested pharmacy locations.

Conclusion:

Our team delved into the numerous aspects of organizational mappings associated with patient interactions. We encountered terminologies such as ICD, CPT, LOINC, SNOMED-CT and RXCUI, which provide standardized codes for seamless patient care through semantic and syntactic interoperability (Goljić, n.d.). These medical terminologies can help break down complex case scenarios into sections and help clinicians determine the best possible diagnoses based on the patient's family history, medical conditions and lifestyle. The Business Process Modelling and Notation(BPMN) illustrates a process flow mapping that guarantees consistent care for patients. The Unified Modifying Language(UML) diagram facilitated the acquisition of patient information with constraints to reduce errors and enhance information interoperability. The development of Clinical Document Architecture(CDA) mockups using the HL7 standard framework helped us identify the semantics and specifics for clinical documents using eXtensible Markup Language(XML) (Dolin et al., 2006). These mock-ups and documents can be useful when trying to exchange information between the healthcare stakeholders involved.

Thus, having a regularized standard terminology in place has helped clinicians offer better treatment and medications for their patients globally. Ultimately, we ascertained that HL7 enables the transmission of data in a standardized format, promotes interoperability and improves overall patient care (Noumeir, 2019). We believe we have used all the possible terminologies and standards that fit best for our case i.e., for a 65-year-old male patient who happens to be a chronic smoker diagnosed with hypertension. The development of models, documents and illustrations in frequent sprints allowed us to collaboratively understand how

healthcare standards and terminologies can be used best while trying to treat patients with specific criteria and conditions.

References:

Andrews, J. C., Bogliatto, F., Lawson, H. W., & Bornstein, J. (2016). Speaking the same language: Using standardized terminology. *Journal of lower genital tract disease*, 20(1), 8–10. <https://doi.org/10.1097/LGT.0000000000000157>

Benson, T., & Grieve, G. (2021). UML, XML & JSON. In Benson, T. & Grieve, G. (Eds.), *Principles of health interoperability: SNOMED CT, HL7, and FHIR*. (4th ed., pp. 408-410). Springer

Choi, J., Jansen, K., & Coenen, A. (2015). Modeling a nursing guideline with standard terminology and unified modeling language for a nursing decision support system: A case study. *AMIA ... Annual Symposium proceedings. AMIA Symposium, 2015*, 426–433.

Dolin, R. H., Alschuler, L., Boyer, S., Beebe, C., Behlen, F. M., Biron, P. V., & Shabo Shvo, A. (2006). HL7 Clinical Document Architecture, Release 2. *Journal of the American Medical Informatics Association : JAMIA*, 13(1), 30–39.
<https://doi.org/10.1197/jamia.M1888>

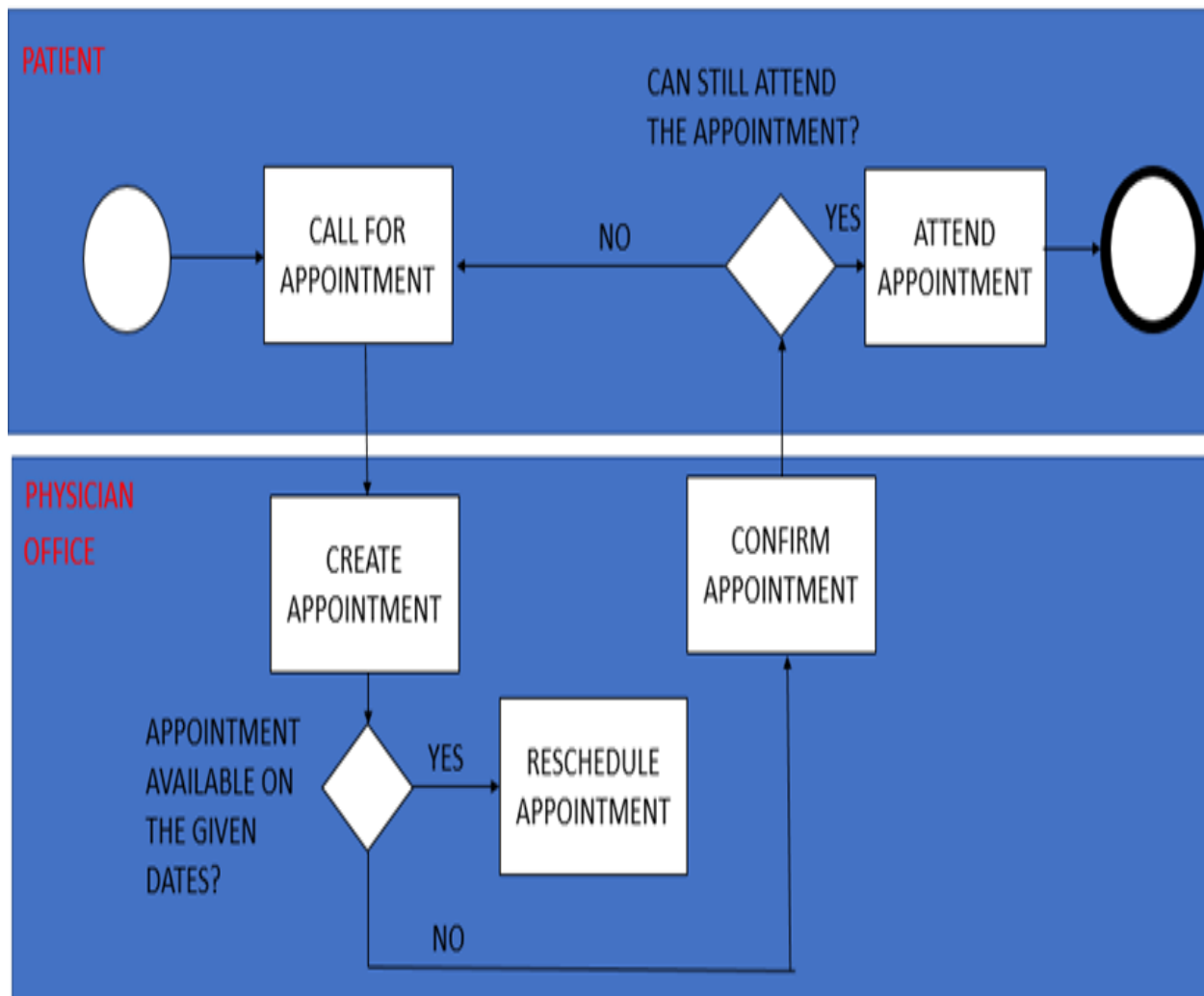
Goljić, D. (n.d.). *SNOMED CT, LOINC, and ICD-10 – The Foundations of Semantic Interoperability*. Wemedoo. <https://wemedoo.com/snomed-ct-loinc-and-icd-10/>

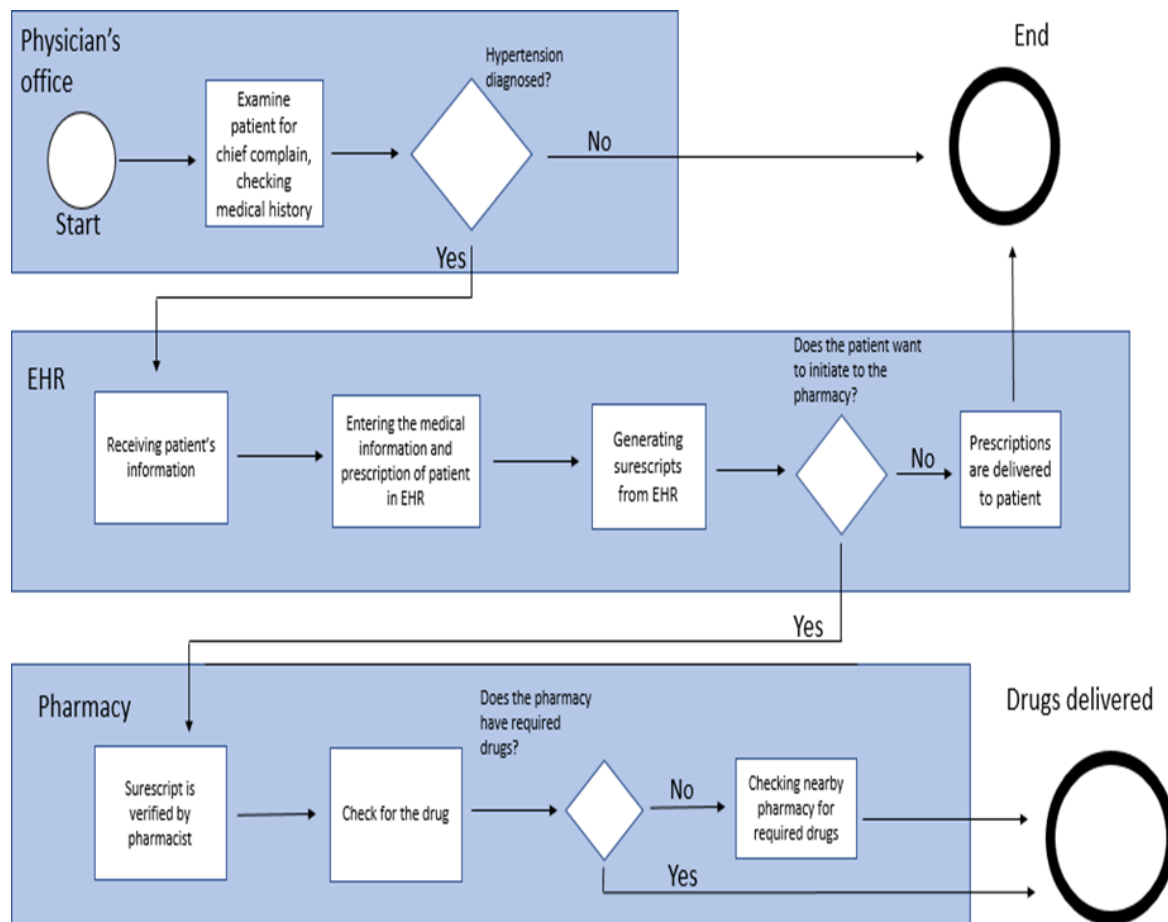
- González Bernaldo de Quirós, F., Otero, C., & Luna, D. (2018). Terminology services: Standard terminologies to control health vocabulary. *Yearbook of medical informatics*, 27(1), 227–233. <https://doi.org/10.1055/s-0038-1641200>
- Honavar S. G. (2020). Electronic medical records - The good, the bad and the ugly. *Indian journal of ophthalmology*, 68(3), 417–418. https://doi.org/10.4103/ijo.IJO_278_20
- Pufahl, L., Zerbato, F., Weber, B., & Weber, I. (2022). BPMN in healthcare: Challenges and best practices. *Information Systems*, 107, 102013. <https://doi.org/10.1016/j.is.2022.102013>
- Noumeir R. (2019). Active Learning of the HL7 Medical Standard. *Journal of digital imaging*, 32(3), 354–361. <https://doi.org/10.1007/s10278-018-0134-3>

Appendix 1

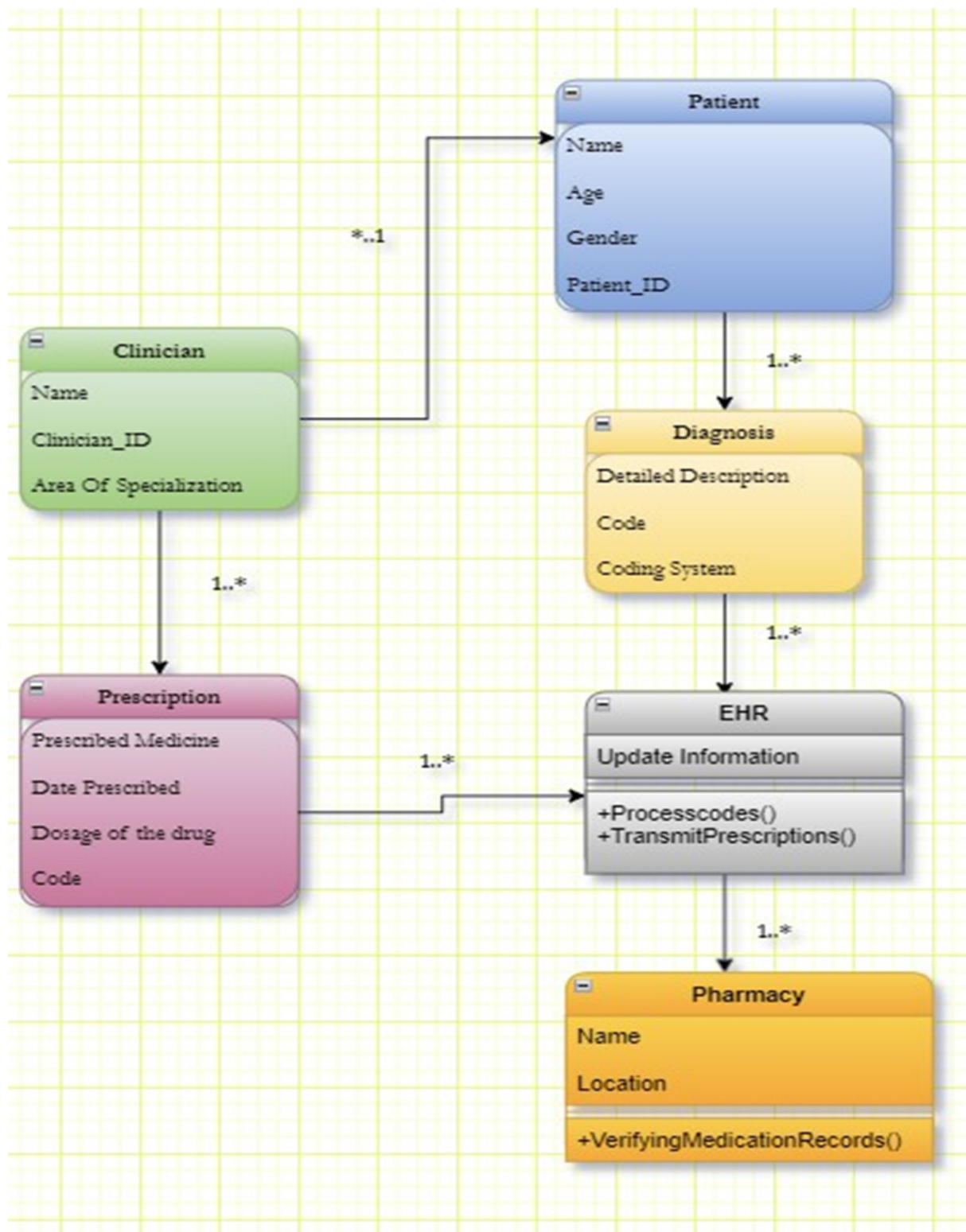
Model 1 (BPMN)

Appointment Decision Flow



Model 2

UML DIAGRAM – CASE A



Appendix 2:

Family History

```

<?xml version="1.0" encoding="UTF-8"?>

<entry>

  <organizer classCode="CLUSTER" moodCode="EVN">

    <templateId root="2.16.840.1.113883.10.20.22.4.45"/>

    <templateId root="2.16.840.1.113883.10.20.22.4.45" extension="2015-08-01"/>

    <!-- Unique ID for the collection of observations about "generic family member" -->

    <id root="01faa204-3333-4610-864f-cb50b650d0fa" />

    <statusCode code="completed"/>

    <subject>

      <relatedSubject classCode="PRS">

        <!-- Identifies this subject as a generic 'Family Member' -->

        <code code="FAMMEMB" codeSystem="2.16.840.1.113883.5.111"

codeSystemName="HL7 RoleCode" displayName="family member" />

        <!-- No additional subject information is necessary, since we are not talking about an
individual person -->

      </relatedSubject>

    </subject>

    <!-- Hypertension observation -->

    <component>

      <observation classCode="OBS" moodCode="EVN">

```

```

<templateId root="2.16.840.1.113883.10.20.22.4.46"/>
<templateId root="2.16.840.1.113883.10.20.22.4.46" extension="2015-08-01"/>
<!-- Unique ID for this individual observation -->
<id root="02faa204-3333-4610-864f-cb50b650d0fa" />
<code code="64572001" codeSystem="2.16.840.1.113883.6.96"
displayName="Disease">
    <translation code="75315-2" codeSystem="2.16.840.1.113883.6.1" displayName="
Condition Family member" />
</code>
<text>
    <reference value="#FH1" />
</text>
<statusCode code="completed"/>
<!-- Since no date is given, effectiveTime is UNKnown -->
<effectiveTime nullFlavor="UNK" />
<!-- SNOMED for Hypertension
Note: explicitly using 161501007 : The clinical
case specifies positive family history of hypertension.
-->
<value xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    xsi:type="CD" code="161501007" codeSystem="2.16.840.1.113883.6.96"
displayName="Hypertension (disorder)">
    <originalText>

```

```

        <reference value="#FHGeneric1prob"/>

    </originalText>

    </value>

</observation>

</component>

<!-- Diabetes observation -->

<component>

    <observation classCode="OBS" moodCode="EVN">

        <templateId root="2.16.840.1.113883.10.20.22.4.44"/>

        <templateId root="2.16.840.1.113883.10.20.22.4.44" extension="2015-08-01"/>

        <!-- Unique ID for this individual observation -->

        <id root="02faa204-3333-4610-864f-cb50b650d0fa"/>

        <code code="64572001" codeSystem="2.16.840.1.113883.6.96"
displayName="Disease" >

            <translation code="75315-2" codeSystem="2.16.840.1.113883.6.1" displayName="
Condition Family member"/>

        </code>

        <text>

            <reference value="#FH1"/>

        </text>

        <statusCode code="completed"/>

        <!-- Since no date is given, effectiveTime is UNKnown -->

        <effectiveTime nullFlavor="UNK"/>

```


<!-- SNOMED for Diabetes Mellitus

Note: explicitly using 430679000: The clinical case specifies positive family history of diabetes mellitus.

-->

```
<value xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  xsi:type="CD" code="430679000" codeSystem="2.16.840.1.113883.6.96"
  displayName="Diabetes mellitus">
  <originalText>
    <reference value="#FHGeneric1prob"/>
  </originalText>
</value>
</observation>
</component>
</organizer>
</entry>
```

<!-- References

Centers for Disease Control and Prevention. (n.d.). Public Health Information Network

Vocabulary Access and Distribution System (PHIN VADS). Centers for Disease Control and Prevention.

<https://phinvads.cdc.gov/vads/http://phinvads.cdc.gov/vads/ViewCodeSystemConcept.action?oid=2.16.840.1.113883.6.96&code=430679000>

Centers for Disease Control and Prevention. (n.d.). Public Health Information Network

Vocabulary Access and Distribution System (PHIN VADS). Centers for Disease Control and

Prevention.

<https://phinivads.cdc.gov/vads/http://phinivads.cdc.gov/vads/ViewCodeSystemConcept.action?oid=2.16.840.1.113883.6.96&code=430679000>

Family history generic. (n.d.). HL7 C-CDA Example Search.

<https://cdasearch.hl7.org/examples/view/Family%20History/Family%20History%20Generic>

SNOMED CT - Family history of diabetes mellitus - Classes | NCBO BioPortal. (n.d.). Welcome to the NCBO BioPortal | NCBO BioPortal.

<https://bioportal.bioontology.org/ontologies/SNOMEDCT?p=classes&conceptid=160303001>

-->

Medications

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<entry>
```

```
  <substanceAdministration classCode="SBADM" moodCode="EVN">
```

```
    <!-- Medication Activity (V2) -->
```

```
    <templateId root="2.16.840.1.113883.10.20.22.4.16" extension="2014-06-09"/>
```

```
    <templateId root="2.16.840.1.113883.10.20.22.4.16"/>
```

```
    <id extension="300035" root="1.3.6.1.4.1.22812.3.99930.3.4.9"/>
```

```
    <id extension="300013" root="1.3.6.1.4.1.22812.3.99930.3.4.9"/>
```

```
    <text>
```

```
      <reference value="#Medication_PRN_222222"/>
```

```
</text>

<observation xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

  <statusCode code="active"/>

  <!-- Effective Time is Unknown -->

  <effectiveTime xsi:type="UNK">

    </effectiveTime>

    <consumable typeCode="CSM">

      <manufacturedProduct classCode="MANU">

        <!-- Medication Information (V1) -->

        <!-- First drug Telmisartan -->

        <templateId root="2.16.840.1.113883.10.20.22.4.23" extension="2014-06-09"/>

        <templateId root="2.16.840.1.113883.10.20.22.4.23"/>

        <manufacturedMaterial>

          <!-- Used Telmisartan code with RxNorm as mentioned in the case study -->

          <code code="205304" codeSystem="2.16.840.1.113883.6.88"
codeSystemName="RxNorm" displayName="Telmisartan 40 MG Oral Tablet">

            <originalText>

              <reference value="#MedicationName_PRN_222222"/>

            </originalText>

            <!-- Used NDC code norm for the given medicine -->

            <translation code="6516229211" codeSystem="2.16.840.1.113883.6.69"
codeSystemName="NDC" displayName="Telmisartan 40 MG Oral Tablet"/>

          </code>
```

```
<name>Telmisartan</name>

</manufacturedMaterial>

</manufacturedProduct>

</consumable>

<precondition typeCode="PRCN">

  <criteria>

    <!-- ** Precondition for substance administration (V1) -->

    <templateId root="2.16.840.1.113883.10.20.22.4.25" extension="2014-06-09"/>

    <templateId root="2.16.840.1.113883.10.20.22.4.25"/>

    <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>

    <!-- Hypertension -->

    <value xsi:type="CD" code="38341003" codeSystem="2.16.840.1.113883.6.96"
displayName="Hypertension" />

  </criteria>

</precondition>

</observation>

</substanceAdministration>

<!-- Medication Information (V2) -->

<!-- Second drug Atenolol -->

<substanceAdministration classCode="SBADM" moodCode="EVN">

  <templateId root="2.16.840.1.113883.10.20.22.4.16" extension="2014-06-09"/>

  <templateId root="2.16.840.1.113883.10.20.22.4.16"/>
```

```
<id extension="200035" root="1.3.6.1.4.1.22812.3.99930.3.4.9"/>
<id extension="200013" root="1.3.6.1.4.1.22812.3.99930.3.4.9"/>
<text>
  <reference value="#Medication_42424242"/>
</text>
<statusCode code="active"/>
<observation xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <!-- Effective time is Unknown -->
  <effectiveTime xsi:type="UNK">
  </effectiveTime>
  <consumable typeCode="CSM">
    <manufacturedProduct classCode="MANU">
      <templateId root="2.16.840.1.113883.10.20.22.4.23" extension="2014-06-09"/>
      <templateId root="2.16.840.1.113883.10.20.22.4.23"/>
      <manufacturedMaterial>
        <!-- Gave the RxNorm Code for Atenolol -->
        <code code="197381" codeSystem="2.16.840.1.113883.6.88"
codeSystemName="RxNorm" displayName="Atenolol 50 MG Oral Tablet">
          <originalText>
            <reference value="#MedicationName_42424242"/>
          </originalText>
          <translation code="6838202301 " codeSystem="2.16.840.1.113883.6.69"
codeSystemName="NDC" displayName="Atenolol 50 MG Oral Tablet"/>
```

```
</code>

<name>Atenolol</name>

</manufacturedMaterial>

</manufacturedProduct>

<precondition typeCode="PRCN">

  <criteria>

    <!-- ** Precondition for substance administration (V2) -->

    <templateId root="2.16.840.1.113883.10.20.22.4.25" extension="2014-06-09"/>

    <templateId root="2.16.840.1.113883.10.20.22.4.25"/>

    <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>

    <!-- Hypertension -->

    <value xsi:type="CD" code="38341003" codeSystem="2.16.840.1.113883.6.96"
displayName="Hypertension" />

  </criteria>

</precondition>

</consumable>

</observation>

</substanceAdministration>

</entry>
```

<!-- References

Atenolol Oral: Uses, Side Effects, Interactions, Pictures, Warnings & Dosing - WebMD. (n.d.).

<https://www.webmd.com/drugs/2/drug-11035/atenolol-oral/details>

Med oral with indications and instructions. (n.d.).

<http://cdasearch.hl7.org/examples/view/Medications/Med%20oral%20with%20indications%20and%20instructions>

Telmisartan Oral: Uses, Side Effects, Interactions, Pictures, Warnings & Dosing - WebMD.

(n.d.). <https://www.webmd.com/drugs/2/drug-16800/telmisartan-oral/details>

-->

Smoking Status

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<entry>
```

```
  <observation classCode="OBS" moodCode="EVN">
```

```
    <!-- ** Tobacco use ** -->
```

```
    <templateId root="2.16.840.1.113883.10.20.22.4.85"/>
```

```
    <templateId root="2.16.840.1.113883.10.20.22.4.85" extension="2014-06-09" />
```

```
    <id root="45efb604-7049-4a2e-ad33-d38556c9636c" />
```

```
    <code code="11367-0" codeSystem="2.16.840.1.113883.6.1" displayName="History of tobacco use" />
```

```
  <observation xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
```

```
    <code code="72166-2" codeSystem="2.16.840.1.113883.6.1" displayName="Tobacco smoking status NHIS"/>
```

```
  <text>
```

```
    <reference value="#SmokingStatus" />
```

```
</text>

<statusCode code="completed"/>

<effectiveTime value="2014-06-06T10:32:00-05:00"/>

<!-- Note: This template represents a "snapshot in time" observation, simply reflecting
what the patient's

current smoking status is at the time of the observation. As a result, the effectiveTime is
constrained

to just a time stamp, and will approximately correspond with the author/time. -->

<value xsi:type="CD" codeSystem="2.16.840.1.113883.6.96"
codeSystemName="SNOMED CT" code="449868002" displayName="Smokes tobacco daily"/>
</observation>

<text>

<reference value="#SmokingStatus" />

</text>

<statusCode code="completed" />

<effectiveTime>

<!-- To record a current smoker, the effectiveTime/low will define the time the patient
started

smoking and will have no effectiveTime/high to indicate that the patient is still smoking. -->

<low value="2013" />

</effectiveTime>

<!-- removed value since smoking frequency was not known-->

<author>
```



```
<templateId root="2.16.840.1.113883.10.20.22.4.119"/>
<time value="201406061032-0500"/>
<assignedAuthor>
  <id root="2.16.840.1.113883.4.6" extension="99999999"/>
  <!--Root means NPI number.-->
  <code code="200000000X" codeSystem="2.16.840.1.113883.6.101"
    displayName="General Physicians"/>
  <!-- Changed to general physician-->
  <telecom use="WP" value="tel:+1(555)555-1002"/>
  <assignedPerson>
    <name>
      <given>Henry</given>
      <family>Seven</family>
      <administrativeGenderCode code="M" codeSystem="2.16.840.1.113883.5.1"
        displayName="Male"/>
      <birthTime value="1958-04-01"/>
    </name>
  </assignedPerson>
</assignedAuthor>
</author>
</observation>
</entry>
<!-- References
```

Current Smoking Status. (n.d.).

<https://cdasearch.hl7.org/examples/view/Social%20History/Current%20Smoking%20Status-->>