DigiBP Group Project
Pre-defined project cases

1 Patient Transferal Management

Recent statistical findings released by Eurostat (2017), which are also valid for 2018 (OECD/EU, 2018), revealed that healthcare is still a main expenditure in developed countries

Governments are reacting by imposing pressure on healthcare providers, especially on hospitals to lower costs. However, hospitals should still able to provide a high quality of service (Lenz, Peleg and Reichert, 2012), which require processes and activities to be as optimal as possible. This results in a huge challenge due to the complexity of the domain.

Many structured and ad-hoc processes that involve a broad range of crucial decisions typically can take place across organizations and among actors with different expertise. One process that reflects such a complex environment is the so-called *patient transferal management* process, which is also called transitional care or hospital discharge management/planning.

Parry et al. (2008) defined transferal management as "*a set of actions designed to ensure the coordination and continuity of care received by patients as the transfer between different locations or levels of care*".

This set of actions forms administrative pathways and include medical information but excludes the treatment of the patient, which rather refer to clinical pathways (Lenz and Reichert, 2007).

The process that is to be modeled shall enable intersectoral collaboration between **acute hospitals** and **rehabilitation clinics**, where (a) rehabilitative expertise is brought early into the acute somatic treatment loop, and (b) demand for rehabilitation treatment is considered as early as possible.

The process to be modeled can represent an entry case or emergency case and shall include:

- Organizational units such as acute hospitals, rehabilitation clinics, and health insurances for cost reimbursements.
- Administrative pathways of acute hospitals and rehabilitation clinics, and their combination.
- Decisions about the patient transferal from hospital to rehabilitation clinic. Decisions can be modeled according to the healthcare standards DefReha©: https://www.hplus.ch/fileadmin/hplus.ch/public/Politik/DefReha_c_/20181214_DefReha_Version_2.0_d_definitiv_.pdf.

2 Clinical Pathways

Extracted from (Braun *et al.*, 2016).

In the healthcare sector, conceptual modeling becomes increasingly important for process optimization and standardization efforts in the context of Clinical Pathways (CP). CPs are specific, standardized descriptions of clinical processes for defined combinations of symptoms, which are adapted to

clinical conditions. They are geared to the whole multidisciplinary care process of a certain patient type. CPs are more than only the structure of a care process and a part of the electronic patient records. A CP is understood as a "patient-focused concept, a tool to model the care, a quality and efficiency improvement process and a product in the patient record".

The treatment processes of CPs have to be described in their essential steps. The major impact of CPs is to foster the organization of complex medical treatment processes for similar patient types. This supports clinics in terms of economic processes and quality orientation. It also facilitates control and coordination of the treatment chain, and ensures the straightforward treatment for the patient based on treatment standards.

The process to be modeled shall include:

- Organisational units and roles
- Activities within the Clinical Pathways
- Decisions within the Clinical Pathways

3   Clinical Trials in Pharma

Clinical trials are a research conducted on human volunteers to study how the patient responds to a new drug or treatment by observing its benefits, side-effects and safety. Clinical trials are usually carried out in three phases. Phase 1 is conducted on small number of participants to study the tolerance and safety of the drug. The next phase is carried out on a larger group to study appropriate dosage of the drug. Phase 3 is carried out in an even larger group of patients suffering from the disease being researched and confirms how the drug works compared to the other available treatments before rolling out the drug to the market.

Each phase conducts a strictly monitored and highly regulated process involving recruitment of human volunteers, capturing detailed patient data and analysis of the data. Every phase has high costs and is liable to failure. Optimize and digitalize this process such that costs are reduced, and failure risks are mitigated as early in the process as possible by -

1. Recruiting the right people for the treatment

2. Leverage patient's history and past trial results

3. Reducing the manual work involved in the data collection and analysis

4. Improve data quality control by using digital data

4   Health Insurance Application

The health insurance business model was significantly disrupted by the digital transformation. The health insurance paradigms shifted to a health coverage shopping for the customer, where the application process may change depending on the company. However, most of the common steps that health insurance companies embed are as follows:

- Receive and check whether information is missing
- If the application is complete, the case must be assessed

- According to the outcome of the assessment the case is accepted, rejected, or alternative offers should be proposed
- Alternatives may imply human interaction where the consultant gets in touch with the customer to negotiate a new offer
- In case the case is accepted by the insurance or the new offer is accepted by customer, the contract is signed

Every step requires activities or further sub-processes as well as decisions:

- Activities can follow a structured flow or like in the case of the offer negotiation can be adhoc.
- Decisions can take place on both process level (e.g. respectively, what to do after the application has been evaluated as complete) and activity level (e.g. all the rules that need to be applied in the application assessment activity).

5   Clinical Laboratories

A typical laboratory process starts with an order entry, for example a blood sample. The order requests that an examination be performed on the sample. The examination results in a diagnostic interpretation, which needs to be validated by a physician. The process ends with accounting of and billing of the order. The details and complexities of the process depend upon several factors like interdependencies between the examinations, the safety and security regulations to be followed as well as the country-specific laws to be adhered to.

Clinical laboratories are a primary source of healthcare data. With the growing complexities in the clinical industry, there is a constant urge for striking a balance between a range of competing operational and financial priorities. With the rising bio-specimen volumes, these laboratories experience a shortage of skilled technicians and are burdened with increasing cost pressures. The shrinking technologist labor pool demands the training of new human resource, which further adds to the overall operational cost of the laboratory. Meeting the increasingly rigorous regulatory requirements place additional demands of both time and expertise. Data inaccessibility further aggravates the problem faced by clinical laboratories by hindering their understanding of the full scope of their resource needs. Consequently, the generation of accurate, reliable and timely results gets compromised.

In order to improve the efficiency of clinical laboratories and transition towards the laboratory of future, seamless and collaborative workflow management including the process of specimen collection, storage, labeling, payments, invoice generation and reporting of the clinical results is needed. Identify the digitalization possibilities in clinical laboratories in terms of

- Reducing paperwork and generating digital data
- Better and secure management of patient data
- Improved visualization and analysis of data
- Enhanced and automated decision-making for interdependent tests and approvals
- Added safety and hygiene through hands-free automation

Extracted and adapted from:

Vom Brocke, J., & Mendling, J. (2018). Business process management cases. Digital in-novation and business transformation in practice.

https://cloudlims.com/blog/clinical-laboratory-workflows-improvement.html

6   Digital Pharmacy

The swiss pharmacy and drug system is similar to systems in other countries, however, there are some differences. In Switzerland, drugs defined as products having medicinal promise (e.g. «helps against headache»), can exclusively be purchased in pharmacies, rarely in «Drogerien». In Switzerland, drugs are classified in several categories. The classification determines whether a product is available over-the-counter (OTC) or if a prescription is needed: most drugs against mi-nor illnesses or aches, for example, headaches or cough, can be purchased without a prescription. Several drugs such as antibiotics, drugs against cancer or high dosage pain relievers can only be purchased with a prescription from a medical doctor.

A typical pharmacy workflow follows the steps where a prescription is received by the pharmacy personnel and ends with correct medication being handed over to the customer. Besides the prescription filling process, a pharmacy may offer several additional services like allergy checks, vaccinations, consultation, door-step delivery of products etc. Efficient pharmacy processes can improve the way their customers are served, especially to senior members of the society as well as in pandemic situations.

Identify digitalization possibilities that would lead to a digital and smart pharmacy by focusing on:

- Reduced prescription filling time
- Partially or fully automated service offerings through intelligent processes
- Efficient check of regulatory measures
- Improved integration with partners like hospitals and insurance companies

Source:

http://www.apotheke-thalwil.ch/english/the-swiss-pharmacy-and-drug-system.html

https://pans.ns.ca/public/pharmacy-services/filling-prescription-dispensing