

Apromore is a collaborative business process analytics platform supporting the full spectrum of process mining functionality.

Available as SaaS and on-premise, Apromore allows you to share and analyse both business process datasets and models throughout the enterprise.

Process Mining in Public Hospitals

Public hospitals face immense pressure to provide patients with efficient treatment and a rapid discharge from hospital.

An effective process structure is essential to systematically ensure appropriate levels of care for patients being discharged across shifts and care providers. These processes benefit both patient and care providers, and gaps in a process can have significant impact on a patient's health outcomes, and lead to future readmissions.

Understanding Acute Coronary Syndrome discharges in a hospital setting

The hospital Apromore worked with is a 600+ bed facility in Melbourne that manages over 28,000 emergency hospitalisations per year. There are over 30 beds in the cardiac medical ward and during the 2016-2017 period, there were over 1,300 admissions for Acute Coronary Syndrome (ACS) to this hospital.

An essential factor in avoiding readmission is modification of a patient's behaviour and providing information on preventative behavioural changes is an important part of the discharge process. The hospital's challenge with the discharge process was to understand how to meet patient needs while extending the routines of hospital care in a systematic way to home care.

Shining a light on the patient process

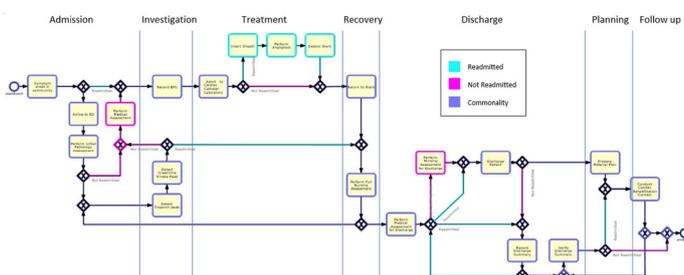
This is where Apromore, an open-source process mining software originating from a spinout of The University of Melbourne came in. Members of the Apromore team and digital health academics from the School of Computing and Information Systems in conjunction with hospital staff, started creating a picture of the processes at work by analysing the experiences of ACS patients along their journey.

The team wanted to help the hospital answer the questions: "What is the typical experience of someone who is discharged unsuccessfully", and "What is the difference between patients who are readmitted & those who are not?"

The team used a three stage approach to bring understanding to the data in a meaningful way. The first two stages involved a review of medical records and interviews with patients at key time points in their hospital journey (from immediately pre-discharge to post discharge) in order to give more context to the medical records.

The third stage was a process mining project. The team was able to match a patient's experience gathered from the interviews, with that person's hospital journey as captured in the patient's digital medical record extracted from the hospital's patient management system.

"The first few days the patient is in shock after the life-threatening event, and it is difficult for them to hear all the information from the nurse in relation to diet and exercise and 'make it stick' with them at home."



Capturing differences and commonalities between the two ACS patient journeys (readmitted and not readmitted) using Apromore's unique variants analysis capabilities, which rely on configurable BPMN models.

From Data to Understanding

Together, the three sources of data provide a rich picture of what factors have an impact on successful discharge. The analysis of the patient journey revealed a highly complex process and a broad range of factors that contribute to patients returning to hospital post-discharge.

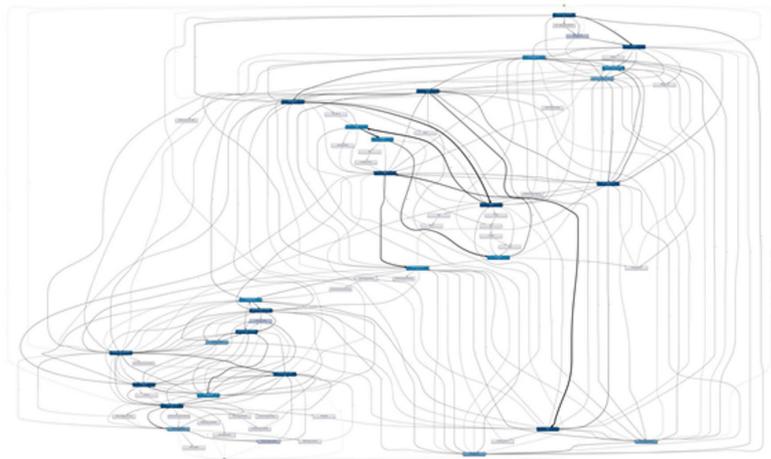
One of the most important observations from the process mining analysis was that non-readmitted patients received a nursing

assessment for discharge just before being discharged, while readmitted patients only received a medical assessment for discharge.

The process mining analysis suggests not just that this nursing assessment should occur, but that it should be focus on individual patient needs and stressors. It also showed that small changes in process which were not evident to the patient or perceived as significant to the hospital staff, can be linked to readmission.

The complete process map for the ACS patient journey.

This map demonstrates that most activities which involved an exchange of information are executed in almost any possible order. This indicates that well-established routines are not in place in this instance.



What next?

The Apromore team verified the findings through a focus group with nursing staff from the ward where the study was conducted. The staff agreed with the findings and put forward process improvement suggestions. Information obtained from process mining projects can support staff on the ground just as much as it can support higher level strategic decision making, clarifying for all parties how a process is operating.

Armed with this data, the next steps towards reducing readmission is a routinisation of the person-centred approach at the hospital. Although tension exists between the requirements of operational efficiency and demands of a person-centred care approach towards discharge, readmission incurs its own costs (human and financial).

Get in touch to start your own journey towards process excellence with Apromore