Process Mining

In the previous videos, we discussed how we can model and analyze processes. But how do we come up with a process models in the first place? One approach is to study the domain of interest and design the process model by hand. This requires a thorough data collection which may involve observation, interviews with different stakeholders, focus groups and other techniques. An entirely different approach is proposed by the process mining community. Process mining techniques allow the automated discovery of processes based on event logs recorded by systems, such as, hospital information systems. This data science approach to process modelling requires considerably less time and effort for designing process models, and given the availability of good quality data may result in process models that are closer to reality than when designing them based on the input from domain experts. So, how does process mining work? We typically start with an event log which consists of events that had been recorded. Each event refers to a particular case. For instance, the patient called Tom, an activity, such as take blood sample and a point in time, as shown here. Based on the event log, we can identify the trace for each case. In other words, the sequence of activities executed for a particular process instance. We can then mine the traces identified, to obtain the general process model, which in this example, is this one here. Of course, this is a very simple example. Real life processes are much messier than this. They are complex and they vary considerably, making the task of process discovery, a challenging one. Nevertheless, there has been great progress in this area, over the last years, and there is an increasing interest from the healthcare community, for process mining initiatives. Discovering, modelling and analyzing processes has great potential for studying healthcare at a population level, for better stratification, and for improving the quality of healthcare services, leading to safer, more efficient, and more effective care, that is tailored to the needs and characteristics of individual patients.