# Paper n°1 : Artificial Intelligence-Based Methods for Business Processes: A Systematic Literature Review

Data has constantly been growing thanks to the computational era. Nowadays, data comes from mobiles phones, computers, smart home appliances and is constantly growing. Organizations can concentrate on decision-making and business strategies rather than manual operations which in turn improves the organization's performance. As a result, companies are overloaded with data that they may not know how to take advantage of.

The study performed a literature review to identify these techniques and models: they applied their search string in the Scopus Web of Science database and discovered 21 relevant papers relevant to the aforementioned question. The paper identified methods that automated tasks and helped analysts make decisions when designing, extending, or reengineering business processes.

Here, Business Process Management is described as a disciplines that involves models used to design and enact as well as measure and configure business processes, here defined as structured steps to a goal or desired output, hence creating a model. The study emphasized that a successful implementation of an automated process in alignment with work and organizational culture and effort led to efficient systems use and few risks of underutilization and wasted investment.

A research group studied systemic mapping of process mining techniques and their application in different industry segments. They identified 1278 articles spanning from 2002 to 2018, the literature in question chosen for the case study were "process discovery", "conformance checking" and "architecture/tool improvement". Another group analyzed 705 papers from 2005 to 2014.

Looking at the methodology, the study elaborated on the systematic literature review process made to pinpoint AI-based methods tailored for business process automation and decision-making enhancement. The Methodology entailed curation of academic databases with specific search parameters and exclusion criteria. 21 papers were examined and selected revealing insights into their distribution across countries and publication venues made by different research groups. Different methods of AI were found to be relevant methods for Business Process.

Out of all the methods, most of which can be described as modelling, two methods stood out more than the rest: the "Decision Support Method" which can be described as a mechanism to reuse successful patterns from past solutions in order to reduce the time needed for developing new solutions. The decision support methods assist analyst by identifying weakness and reusable patterns. Based on a process repository, the AI is going to analyze patterns and weaknesses which will then be assessed by a business analyst.

On the other hand, the "Process Enhancement" methods focused on resource unavailability which could create bottlenecks and misuses. As such the study focused on different process enhancement methods that took different forms: a group of researchers developed a "bio-inspired" method by injecting a "bio-agent" (computational element inspired by biological system to optimize process flow) with the agent provoking changes in the model structure and allocate resources. After the agent's interaction, the best fit configuration was returned.

Another group improved a method that analyzed resources trends in business by decomposing numerous data sources into business process components. This method could identify workload patterns that appear in multiple sources and identify changes and trends in the resource usage in business processes. Multiple groups created methods to extend a business process, namely one that focused on adding more to a business process without changing the system's code while another group focused on ERP systems by adding flows for monitoring timing and quality. Last but not least, a group combined different processes into one by using patterns and tags.

The article collected and categorized different AI-based methods for business processes which will assist researchers by having one focused string of "source of search" allowing researchers to create more structured models.