



## Really Explore the Space: Automated Process Discovery

Twenty-first century governments and businesses run on data and processes. These data reside on numerous systems. Whether these systems are new and cutting edge or in need of replacement, our platform-agnostic cutting-edge AI lives on top of these systems, analyzes everything, and drives quantitative continuous improvement. Our data-driven process discovery SaaS solution helps organizations effectively utilize scarce resources, re-engineer processes with workflow automation, adopt predictive maintenance, simulate labor modifications, and Robotic Process Automation (RPA).

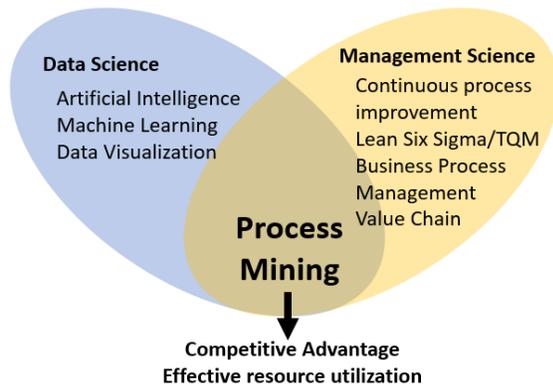


Figure 1

Process Mining is a highly extensible emerging technique situated at the intersection of Data Science and Management Science, Figure 1. Data science and management science are vast and ever-changing interdisciplinary fields which help organizations make better decisions and better use of their scarce resources while simultaneously producing additional value. Process Mining combines artificial intelligence, machine learning, and stunning visualizations to help organizations derive insights from their data. The technique applies human-thought-like processing to system-generated log data, and it learns latent processes from

these data. Depending upon organizational structure and management styles, process mining may serve to either complement existing business process management efforts or, perhaps, substitute for these efforts.

Organizations pay a lot of money for information technology (IT) management systems, and they expect these systems to provide significant value. However, most organizations do not realize that there is next-level strategic advantage hidden in these systems. All IT systems create “data exhaust” – activity trails reflecting the actions of system users or machines while navigating the system. Every time a user enters data into an online form, presses the <Enter> button, adds an item to an online shopping cart, or sends an action-item to the next step in a process, the IT system writes an event to the system log. These log data are a gold mine of business intelligence; process mining is the key which unlocks this treasure.

Process Mining is a foundational enabler for Industry 4.0 analytics. It is the embodiment of continuous data-driven process improvement. Any business or government agency reliant on IT systems to manage operations might benefit from process mining. The use cases are tremendous. It all starts with a vivid problem or question:

**Health:** Can we develop new KPIs, decrease patient wait times, and better use clinic staff?

### Market Research

Most companies have little to no knowledge of where hidden process weaknesses are wreaking havoc on their profit potential. 20% to 30% of revenue in most companies is lost due to that reason alone. (IDC Research)



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- Maintenance:** Servicing our equipment is great and necessary, but we need to predict breakages.
- Sales:** Which activities are associated with ideal outcomes?
- IT Trouble Tickets:** Will changing our escalation rules help resolution time and employee productivity?
- Human Resources:** What are the choke points in our recruiting and hiring process?
- Regulatory Compliance & Audit:** It is vital for us to know when certain processes are circumvented.
- Accounts Payable:** Can we improve three-way matching and enforce segregation of duties?
- Simulate Assumptions:** Are we ready for a surge? What happens if we double throughput?

At a minimum, there are three pieces of information needed to analyze processes in a data-driven fashion; additional information enriches the analysis.

“Everywhere that human-programmed software is being used, businesses should consider using machine learning in addition or instead of it, to reduce costs, to do things that programmers don’t know how to program, to discover things we didn’t even suspect, or all of the above.” Pedro Domingos, PhD

- **Case ID:** This is an instance identifier that represents a specific execution of the process. Depending on the process, this might be an identifier for a patient, job applicant, or a purchasing order. (Required)
- **Event or Activity Name:** This represents one of several steps performed within a process. It could also represent a status change or a transaction step. For example, in a web-based eCommerce process, activities might include “Add Item to Cart” or “Initiate Checkout.” (Required)
- **Time Stamp:** This orders the activities within each case. If start and complete timestamps are available, then performance calculations are possible, such as wait time between activities. (Required)
- **Person or Department Attribute:** When the person or department responsible for process steps are known, social nets of interactivity between process activities may be displayed in order to reveal important insights and troubleshoot bottle necks. (Optional)

- **Cost Attribute:** If event costs are known, then business expenses associated with processes may be understood. (Optional)

Figure 2 contains a simple example of how a process is discovered. We observe that Cases 1 through 3 all contain the same activities, labeled “A” through “E.” In Case 1, the activities happen in natural order. In Case 2, we observe that Activity “C” precedes “B.” Finally, in Case 3, Activity “D” is repeated before

CASE ID	ACTIVITY
1	A
2	A
1	B
1	C
3	A
2	C
3	B
2	B
1	D
2	D
2	E
3	C
3	D
1	E
3	D
3	E

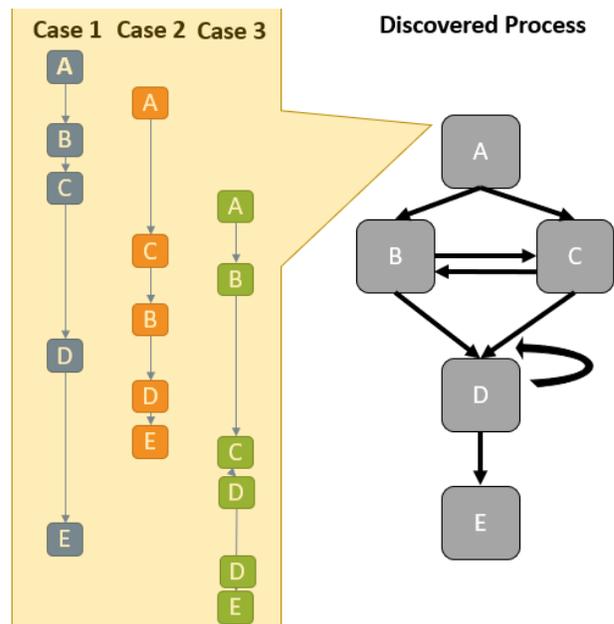


Figure 2



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concluding with Activity “E.” The discovered process accounts for these different process variations.

Real world processes tend to be significantly more complicated. Process Mining is like an Xray machine for your organization. Our Cloud SaaS process mining tool enables stunning visualizations, which help leaders and process owners understand quickly where challenges reside, Figure 3.

Businesses and government agencies are under intense pressure to innovate and gain competitive advantage. Yet, most organizations are not leveraging data which are readily available. More Cowbell Unlimited’s Automated Process Discovery (APD) cloud and desktop software creates a disciplined platform-agnostic system of intelligence, Figure 4. It accepts system log “data exhaust” from any management information technology system, and it helps organizations make effective use of their scarce resources. We are pursuing GSA IT Schedule 70, FedRAMP certification, and AWS GovCloud with goals to work with highly sensitive corporate and government data.

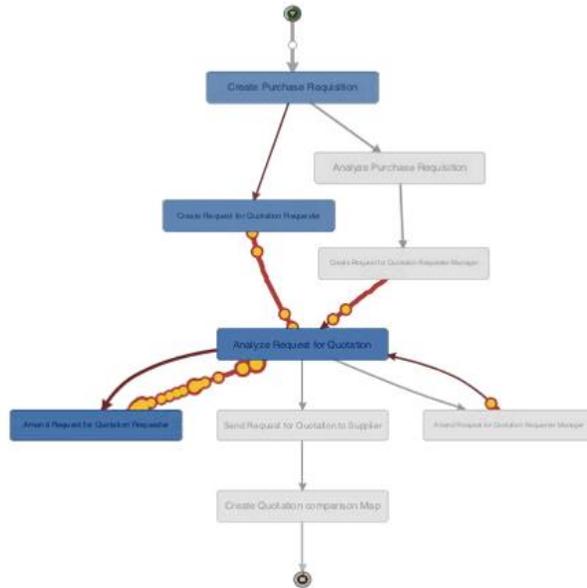


Figure 3

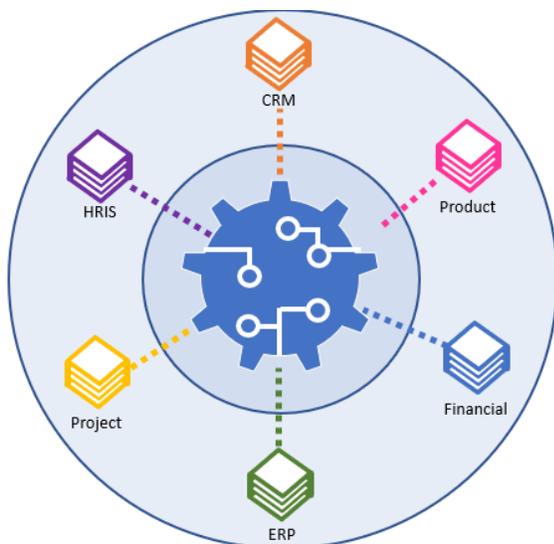


Figure 4

Our data science know-how helps organizations transform and monitor their processes according to strategic and operational needs.

We recommend organizations start with a limited scope investigation of a single process.

Follow-on projects might advance to:

- Analyze and optimize additional critical processes, in a serial manner,
- Monitor processes continually and create alerts according to pre-set rules,
- Integrate enterprise processes optimally, and
- Embark on a full-blown Digital Transformation effort.

Contact [More Cowbell Unlimited](#) today for a free consult and capability demonstration.



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