

Process Mining - a special type of Data Mining - to discover, check and improve your business processes

Facilitated by Arthur Valle



Arthur Valle, PhD

- PhD in Production and System Engineering
- Lean Six Sigma Black Belt (since 2006)
- 22+ years of experience in IT Management: Lean Six Sigma, CMMI, Data Science, Agile/Scrum, ITIL etc
- Currently teaching (and researching) at Wintec-Waikato Institute of Technology, NZ
- CEO of trendsetconsulting.com (since 2000)
- In my Process Mining research, I use upflux from upflux.net, a Brazilian startup.



Process Mining Efficiency

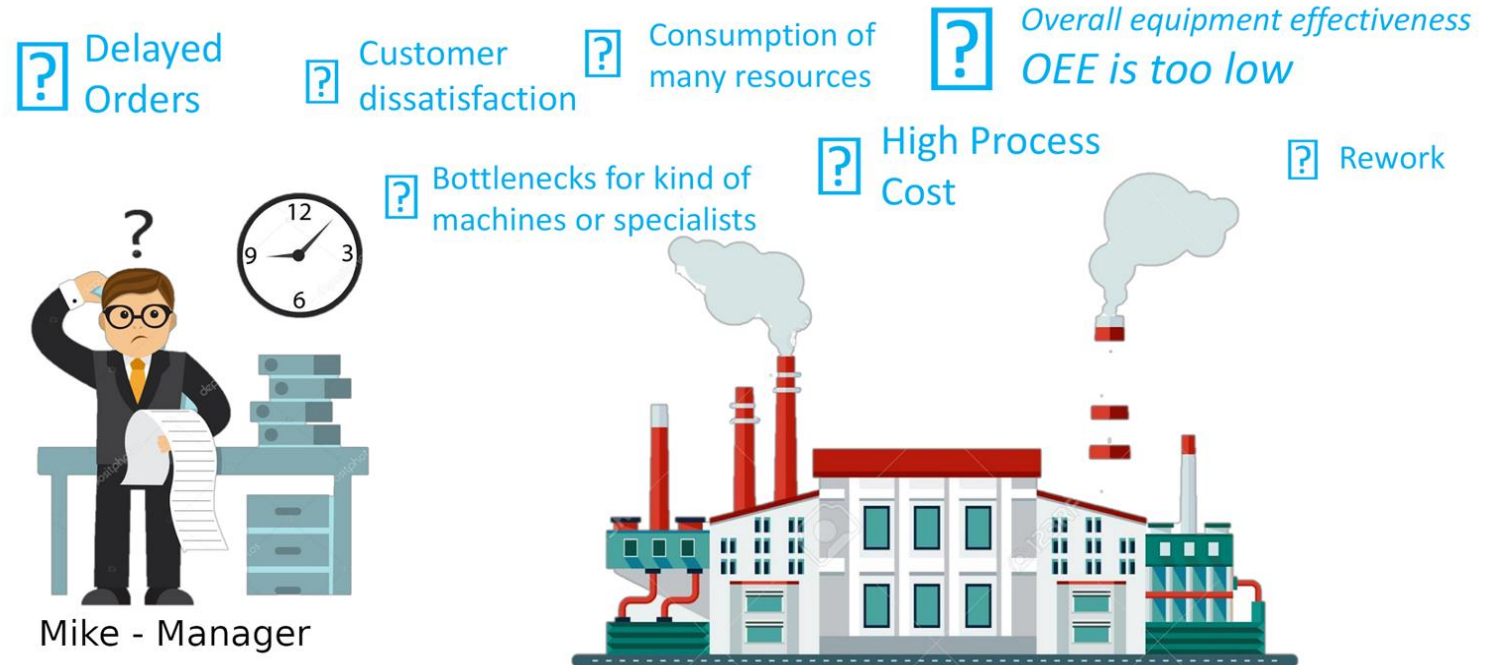


Content

- Introduction
- Process Mining
- Demo



Everyday, problems arise in organizations...



- Are our processes efficient?
- Where are the waste, deviations and overutilization of resources?



Process improvement

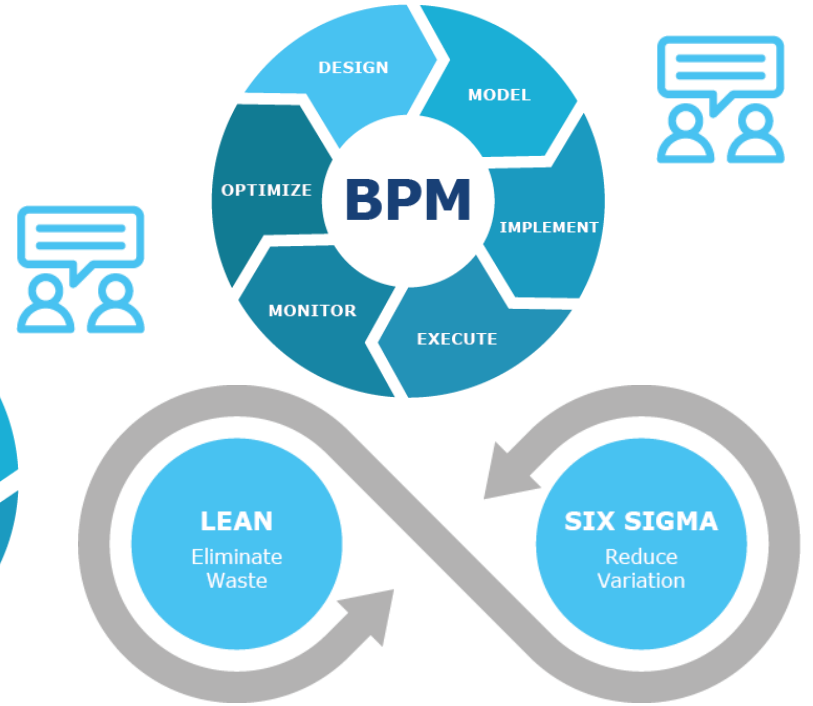
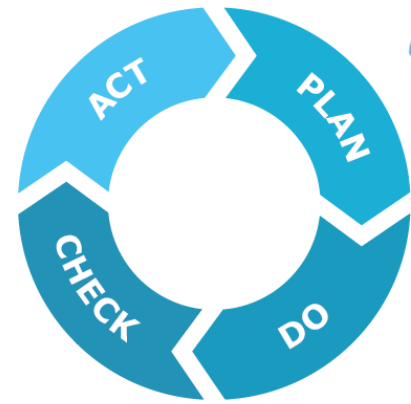
- Aiming to answer such questions...traditional process management techniques are performed.



(So) many process improvement methods



TQM

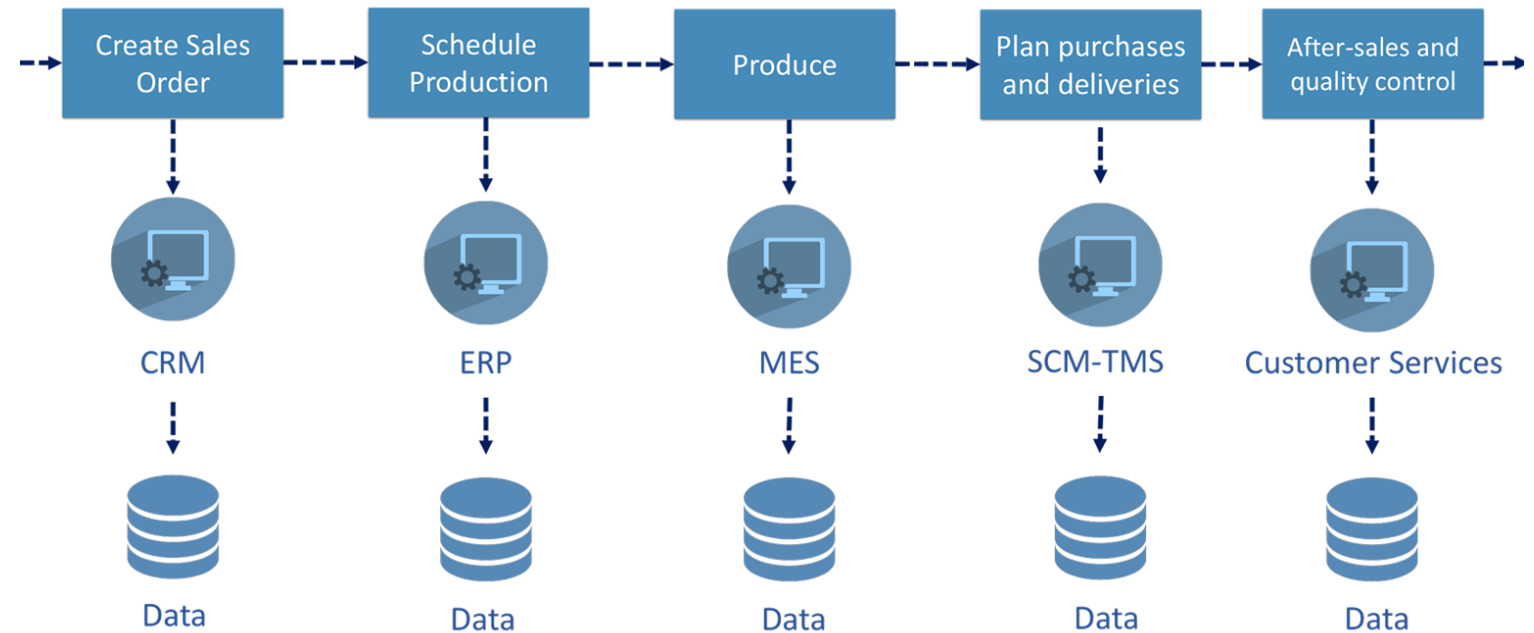


The problem is...

- In all of them, you need to manually “discover” the processes...
 - via interviews,
 - questionnaires or
 - even reading procedures (that nobody follows).



However...in the Information Age, tons of data are stored...



**So, what if we could discover the
actual processes in a matter of
seconds?**



Process Mining

Process Mining - a special type of Data Mining - that:

- captures the reality of processes as reflected in data
- identifies inefficiencies, overutilized resources or bottlenecks;
- detects nonconformities, deviations / frauds; and
- supports Continuous Improvement.

We need to have *Event logs* data:

Who

Case ID

Sales Order Number,
Production Order
Number...

Who

Performer

Who performed the
activity

What

Activity

Activities names

When

Time-stamp

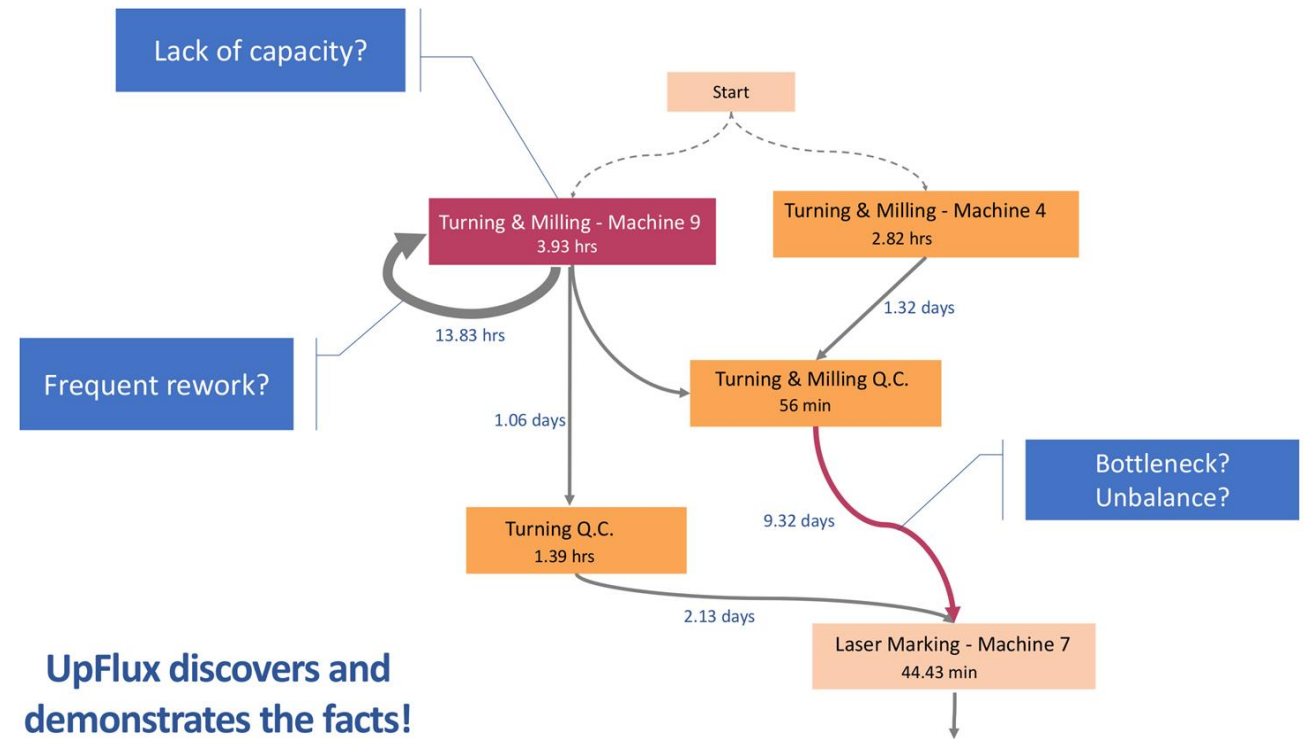
Date/time of event



Example of an *Event log*

Case	Activity	Related dates	
Production Order	Activity	Start Timestamp	Complete Timestamp
20000	Turning & Milling - Machine 4	2012/01/29 23:24:00.000	2012/01/30 05:43:00.000
20000	Turning & Milling - Machine 4	2012/01/30 05:44:00.000	2012/01/30 06:42:00.000
20000	Turning & Milling - Machine 4	2012/01/30 06:59:00.000	2012/01/30 07:21:00.000
20000	Turning & Milling - Machine 4	2012/01/30 07:21:00.000	2012/01/30 10:58:00.000
20000	Turning & Milling Q.C.	2012/01/31 13:20:00.000	2012/01/31 14:50:00.000
20000	Laser Marking - Machine 7	2012/02/01 08:18:00.000	2012/02/01 08:27:00.000
20000	Final Inspection Q.C.	2012/02/16 12:43:00.000	2012/02/16 13:58:00.000
20000	Packing	2012/02/17 00:00:00.000	2012/02/17 01:00:00.000
30000	Turning & Milling - Machine 9	2012/01/17 07:01:00.000	2012/01/17 11:05:00.000
30000	Turning Q.C.	2012/01/17 11:00:00.000	2012/01/17 11:15:00.000
30000	Turning & Milling - Machine 9	2012/01/17 19:24:00.000	2012/01/17 20:01:00.000
30000	Turning & Milling - Machine 9	2012/01/17 20:01:00.000	2012/01/17 23:43:00.000
30000	Turning & Milling - Machine 9	2012/01/17 23:49:00.000	2012/01/18 06:32:00.000
30000	Turning & Milling - Machine 9	2012/01/18 06:59:00.000	2012/01/18 07:24:00.000
30000	Turning & Milling - Machine 9	2012/01/18 16:33:00.000	2012/01/18 17:55:00.000

So we can discover the process, and then, to ask the right questions



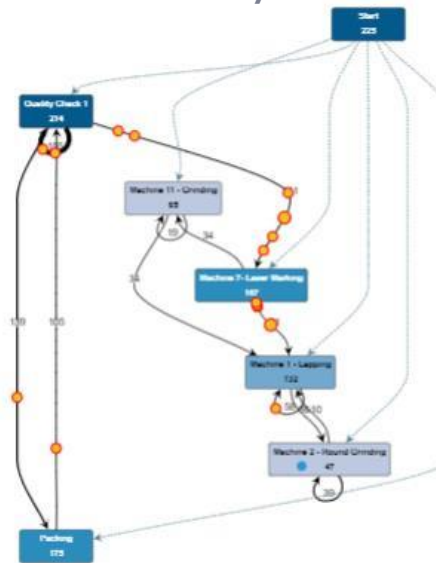
UpFlux discovers and demonstrates the facts!

How Process Mining works

Process data



Process Discovery,
visualization and
analysis



Continuous
improvement

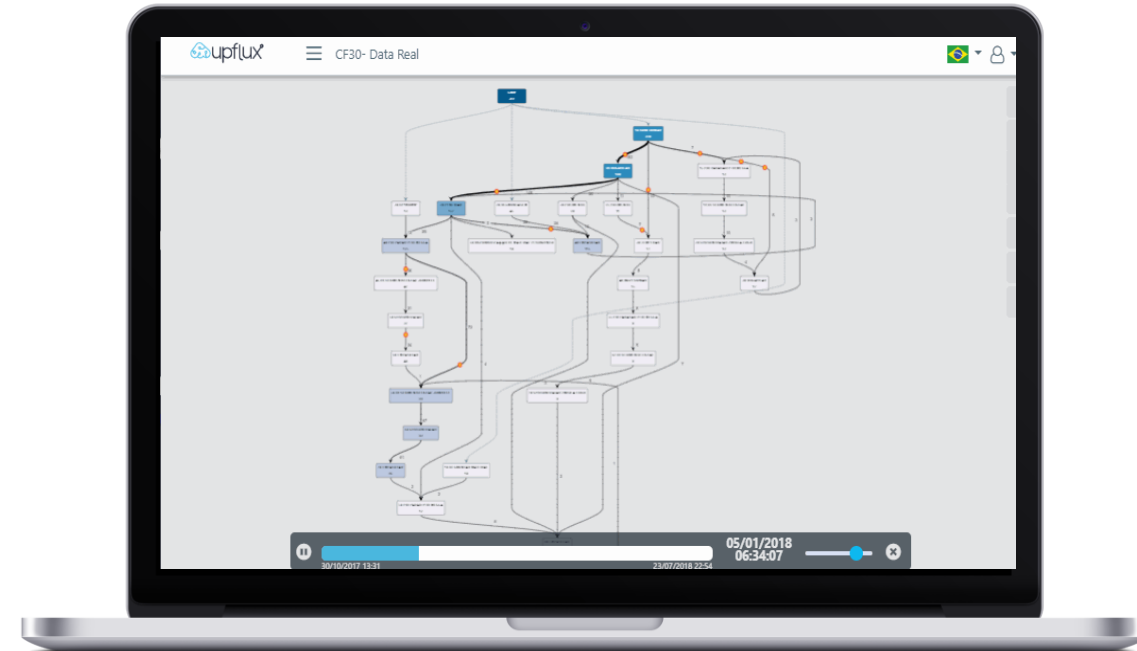
Operational Efficiency
Increase your process performance

Smart audits
Detect nonconformities and frauds

Real-time monitoring
Analyze the reliability of your
process

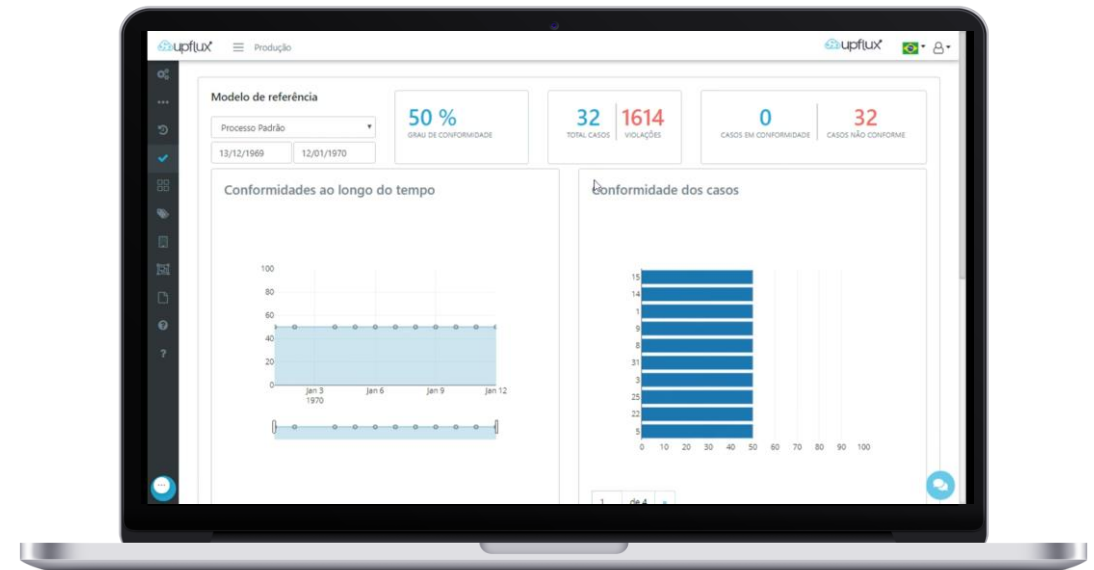
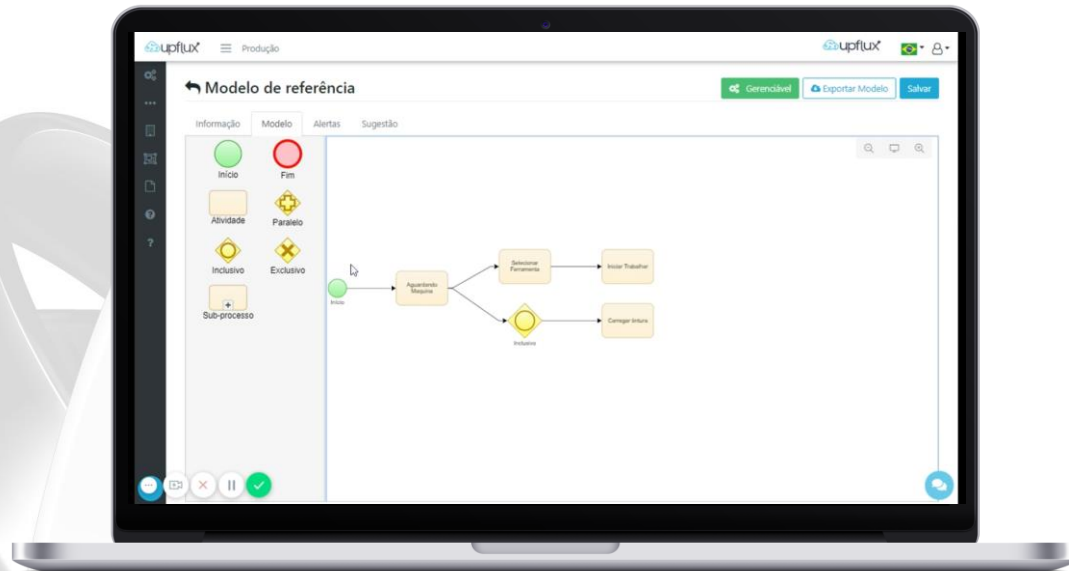
Process discovery, visualization and analysis

- What are the alternative flows of your process?
- What are the most frequent activities and paths?
- Where are the deviations and bottlenecks?
- Do the processes of different units occur in the same way?

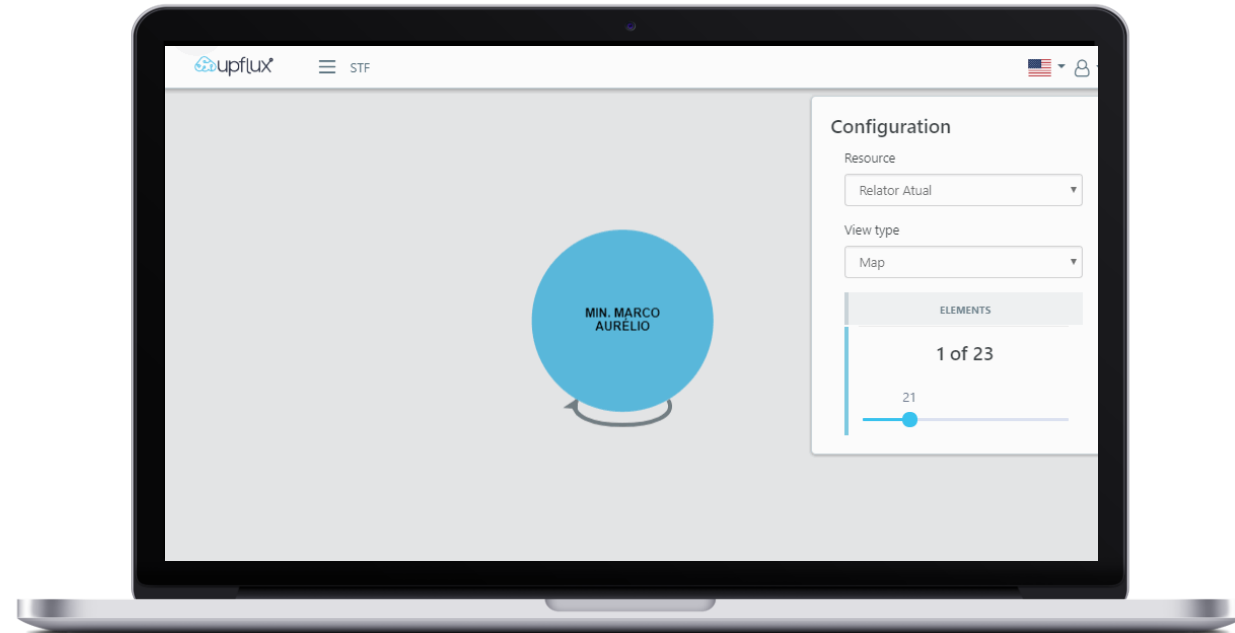


Smart audits

- Audit the entire process, not just a sample.
- In real time, not after 30 days.
- Conformance checking: identify violations, deviations and frauds.
- Discover and refine your “expected” process.



Social or Organizational Mining



From the hierarchical analysis
to an organic analysis in social
networks

Demo



Demo

- Dataset:
<https://data.4tu.nl/search?q=:keyword:%20Collection%3A%20BPI%20Challenge%202014>
- Tool: www.upflux.net
- Backup (datasets and dataset generators):
 - <https://www.tf-pm.org/resources/logs>
 - <https://www.mockaroo.com/>
 - <https://www.generatedata.com/>

Thanks a lot!

Arthur Valle, PhD

Principal Academic Staff Member

arthur.valle@wintec.ac.nz



The image shows a dark-themed footer for the upflux website. On the left is the upflux logo, which consists of a stylized brain icon with a gear and a lightbulb inside, followed by the text 'upflux'. To the right of the logo are three main sections: 'Contact', 'Social networks', and 'Language'. The 'Contact' section includes a telephone icon and three phone numbers: +55 47 3842-0153, +55 47 99609-1191, and +55 47 98856-8584. Below the contact information is a location pin icon and the address: 'Novale Hub, R. Cesare Valentini, 200, Três Rios do Sul, Jaraguá do Sul, SC, 89254-193'. The 'Social networks' section features icons for Facebook, YouTube, LinkedIn, and Twitter. The 'Language' section shows 'English' with a checkmark and 'Português' with a right-pointing arrow.

 **Contact**

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 **Novale Hub**
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Social networks

Language

✓ English
→ Português

Jobs - hiring now

If you want to join our team, check our opportunities.

Additional slide(s)

