Intelligent continuous improvement, when BPM meets AI

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CEO and co-founder
BPM IS NOT DEAD.
But we should admit though, BPM has been a bit unsexy lately.
And exactly, what is your job about?

I’m the CEO of a software company. We help companies to automate their processes and to improve their operational efficiency.

I’m an engineer in a research center. I’m developing a project about coordination of collaborative activities in a BPM system.
Strategy is about doing things differently, not simply doing them better than everyone else!

A big majority of BPM projects are related to cost reduction and efficiency improvement. Simply improving operational effectiveness does not provide a robust competitive advantage.
Customer obsessed operating model

Source: Google trends
It’s maybe time to jump on this opportunity.
The “what” of Digital Transformation

“Even though a great many executives consider digital transformation as a top priority, we’ve found very little agreement between executives about what Digital transformation actually means”.

Neil Ward-Dutton – MWD Advisors
How BPM will take a central role in Digital Transformation?

- Make back-office processes accessible to end users
- Improve digital user experiences for customers and employees
- Enable multiple organizations to trust a common set of critical processes

**Enhance human intelligence with AI for continuous improvement**
Make back-office processes accessible to end users
Isn’t that an enterprise app?

Make underlying systems and processes that were once considered “back-office” accessible in order to turn data into insights and respond to customer needs in moments, rather than hours or days.
BMS took the innovative approach of delivering inter-lab process based applications through the use of a BPM platform, integrating them with domain-specific laboratory information management systems (LIMS), whose workflows are not portable to other domains.

"Biopharmaceutical company innovative approach to drug discovery has allowed scientists to focus on science."

Delivery time for a production-ready application was reduced by half. Since the initial implementation in 2014, process based apps have expanded to other organizations: Biologics, Veterinary Sciences, Histology, and High Throughput Screening.

"Over 600 new requests are submitted daily. We are currently working on delivering 4 additional applications and expect to deliver 10-15 more over the next 2-3 years."

Operational requirement, strategic opportunity.

Bristol-Myers Squibb
The value of a model driven, low code platform

Performance Analytics

1. Sharing knowledge / co-ordinating work across teams, departments, entities
2. Making it easy to change behaviour, policy etc
3. Tracking and managing business performance over time

Source: MWD Advisors
Improve digital user experiences for customers and employees
CALLING THE BEST & BRIGHTEST

OUR USERS DESERVE A BETTER EXPERIENCE

IT'S TIME THE WORLD KNOWS THE POWER OF UX

* Source: Flightforux.com
Tasklist, todolist or worklist views, really?
UI’s development freedom

Out-of-the-box, generic and configurable interfaces
Graphical studio to create standalone web/mobile apps
Comprehensible REST APIs for teams that prefer to build

A mix of all three approaches
UX \neq UI

UX is the take away feeling of a user after an experience in a digital environment.
Seamless experiences

Personalized user interfaces
Reliable business processes and operations
Relevant business data
EnerNOC has delivered more than $1 billion in customer savings to date with a cross-organizational digital transformation initiative

“On a hot summer day when everybody is going to crank their air conditioners, utilities will expect high energy use and contact us and say, At 11:00 AM we want you to start giving us back a gigawatt of savings and keep doing that until 4:00 PM.”

… we turn to our “providers”, say a grocery store or a big sawmill [more than 6,000]. We have meters on their buildings and have created a baseline of their energy usage, so we can ask them to curtail usage compared to those baselines.

Energy intelligence software
BPM is used to handle the automation throughout the entire demand response dispatch process. The percentage of manual vs. automatic depends largely on what kind of facility is participating.
Allow multiple organizations to trust a common set of critical processes
Blockchain – in a nutshell

1. A wants to send money to B
2. The transaction is represented online as a “block”
3. The block is broadcast to every party in the network
4. Those in the network approve the transaction (valid)
5. The block then can be added to the chain, which provides an immutable and transparent record of transactions
6. The money moves from A to B

* Source: Financial Times
Benefits

Virtual continuity
Transparency
Resilience
Immutability
Independency
Self trusted

Challenges

Young technology
Regulation
Energy consumption
Privacy
Integration
Adoption
Private blockchains

Transaction speed is considerably improved
Data is not publicly available to anyone with a net connection.
Public auditability can be implemented (consortium blockchains and regulations)
Unified platform to build critical applications involving multiple organizations.

- Ability to encompass processes between different companies
- Increased productivity when creating dedicated apps
- Provide end-to-end traceability and real time audit trail
- Increase blockchain adoption and provide better UXs

* Source: Stratumn - blockchain technology
Car order management example

1. Customer orders a new car at the local retailer.

2. Local retailer checks if the car is in store.

2A-4. Retailer delivers the car to the customer and gets the payment.

2B. New car is ordered from the production site if there is no availability.

3. Production site built the new car and deliver it to the retailer.

3b. Car company request the Controller to issue a new car Asset on the blockchain.

The process involves:
- Customer
- Local retailer
- Production site
- Controller
- Car store
Payment transaction
Without a BPM platform

Car store sells a car for $10,000 to John Doe
Payment transaction
Without a BPM platform

Car store sells a car for $10,000 to John Doe

Account: Car Store
Spend 1 White Car
Receive $10,000

Return a partial transaction

Accounts
Car Store
Car Production

Car company core

Accounts
John Doe
Jan Ripley

Customer account core

Blockchain network
Payment transaction
Without a BPM platform

Car store sells a car for $10,000 to John Doe

Account: Car Store
Spend 1 White Car
Receive $10,000

Multi-assets trade between cores

Partial transaction

Build and sign new transaction T1

Accounts
Car Store
Car Production

Car company core

T1

Blockchain network

Accounts
John Doe
Jan Ripley

Customer account core

T1

Base transaction: Partial transaction
Account: John Doe
Spend $10,000
Receive 1 White Car
Payment transaction
With a BPM platform

Prepared payment
- Accounts
  - Car Store
  - Car Production
- Blockchain network: T1

Confirm payment
- Accounts
  - John Doe
  - Jan Ripley
- Customer account core: T1

Partial transaction
- Blockchain network: T1
Enhance human intelligence with AI for continuous improvement
Common use cases for AI in the context of BPM are related to using machine learning during the process execution.

Trigger a new process based on a ML intuition
Route processes in motion depending on ML predictions
Render recommendations (ie next best action)
Intelligent Robotic Process Automation (RPA).

Robots that can observe and learn of what people are actually doing, that can highlight and automate those patterns so people don’t have to do redundant work.

* Source: Deloitte - Intelligent automation entering the business world
Intelligent continuous improvement of process based apps

**Predictions** based on a specific goal

**Measure** Impact of corrective actions

**Recommend** improvement actions

**Act**
- *Short loop*: Task reallocation, form update, connector replacement, next best action
- *Long loop*: Process or UI redesign, UI performance analysis
Guided approach to AI in the context of BPM

1. Know the data
2. Prepare the data
3. Choose a model
4. Tune the model
Choosing the right model

Dual objective: Allow predictions (duration, path, data, …) and recommendations of improvements on any process-based application.
Linear regression advantages

- Easy to model and use
- Provide overall good results
- Easy to interpret
Linear regression drawbacks

It requires to well know the data to test and define the best model.

Unable to apply a generic linear regression on any process-based application.
Neural network advantages

Neural network algorithms inspired by biological neurons to learn from observation.

Excellent to do classification and prediction. The results (prediction) are often very accurate.
Neural network drawbacks

- It is like a “black box”
- Hard to retrain when data changes
- Unable to interpret the results
  (hard to make recommendations)
Process Mining

• Traditional Process mining
  – Discover: Previous *(a priori)* models do not exist. Based on an event log, a new model is constructed or discovered based on low-level events.
  – Enhance conformity: Used when there is an *a priori* model. The existing model is compared with the process event log; discrepancies between the log and the model are analyzed.

• Extended to predict
  – Used when there is an *a priori* model. The model is extended with a new aspect or perspective, so that the goal is not to check conformance, but rather to improve the existing model.
  – ⇒ predict process duration, behavior of the process, …

*Source: Wikipedia - Process Mining*
Process mining algorithm for prediction

Apply to any process model
Storage of all event logs corresponding to a process
Conversion of the model into a transition system
  Annotated with time information (ie entering time)
  Collection of results per state (ie remaining time)
  Compute functions (ie average)

* Source: W.M.P. van der Aalst, M.H. Schonenberg, and M. Song - Time prediction based on process mining
Service Level Agreement Monitoring app - sample

Predict when a SLA may not be fulfilled
Get alerts when a case duration is late
Recommend corrective actions
Technical architecture
Process mining extension - advantages

- No need to know the data
- Easy to understand/interpret
- Same algorithm can be used for prediction and recommendation
- Can be extended for further prediction use cases
Perspectives for further predictions

Integrate contextual and business data to refine predictions

Team efficiency (combined with resource management)

Probability to encounter technical errors or outages

Applicability to user interfaces in connection with processes
Why is a manual step in the process taking so long?

There are some situations in which UI analysis data would be handy to improve predictions and recommendations.
User experience analysis across a whole process based application.

* Source: BPJ - Brazos CX Insights product
Intelligent continuous improvement of user interfaces and their connection with business processes.

Extended process mining based on user interactions and browser usages
UI pageflows analysis in connection to processes as a way to improve UX’s.
Bright future ahead

BPM platforms will enable innovative teams to create apps that support better digital user experiences.

Apps with tailored UI’s that seamlessly connect with back-office operations

AI as a powerful technology that empowers human intelligence to continuously improve user interactions and processes execution
“BPM isn’t gonna solve it all, but is a damm good place to start”.

Inspirational source: Macklemore
Thank you for your attention.