AI Integration in Business Processes Management

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***Abstract*—IT processes are the key set of activities that centrally coordinate management of events, incidents, routine operations and reports on the status of performance of technological components. Using new methods and Artificial Intelligence is the way to optimize processes management structure.**

***Keywords*—IT processes, AI, function, data**

Abbreviations and Acronyms

ML- Machine learning

BPM- Business process management

AI-Artificial intelligence

API-Application

SOA-Service-oriented architecture

I. Introduction

Each organization tries to increase its competitiveness on the basis of internal factors [14]. One of these factors is AI Integration in Business Processes Management. This is related to various business process management (BPM) measures [6, 7]. Monitoring and observation of business' IT infrastructure is often from centralized console to which all system events are routed. Just few years ago processes were monitored by one or two mainframes, but these days this monitoring is done by server farms, specialized storage devices, power racks, virtualized environment, large clusters with security infrastructures, all controlled from a single location. But as we know larger the number of processes, the more time and resources it takes to be aggregated. What about all data which needed to be handled? How to improve this data management and ease the processes nodes? In this article we are going to present how the specialized process management software and the integration of artificial intelligence will help optimizing business processes. The implementation of information and communication technologies and their Impact on Organizational Change are discussed in [8].

Business Process Management and Machine Learning

The usage of business process management (BPM) software will reduce significantly paperwork. BPM software optimize the usage of resources and significantly improve business outcomes. Process optimization and modification, access to metrics and user usability also benefits of using such architecture.

On figure 1 we will introduce a SOA architecture of a BPM software used with traditional approach.

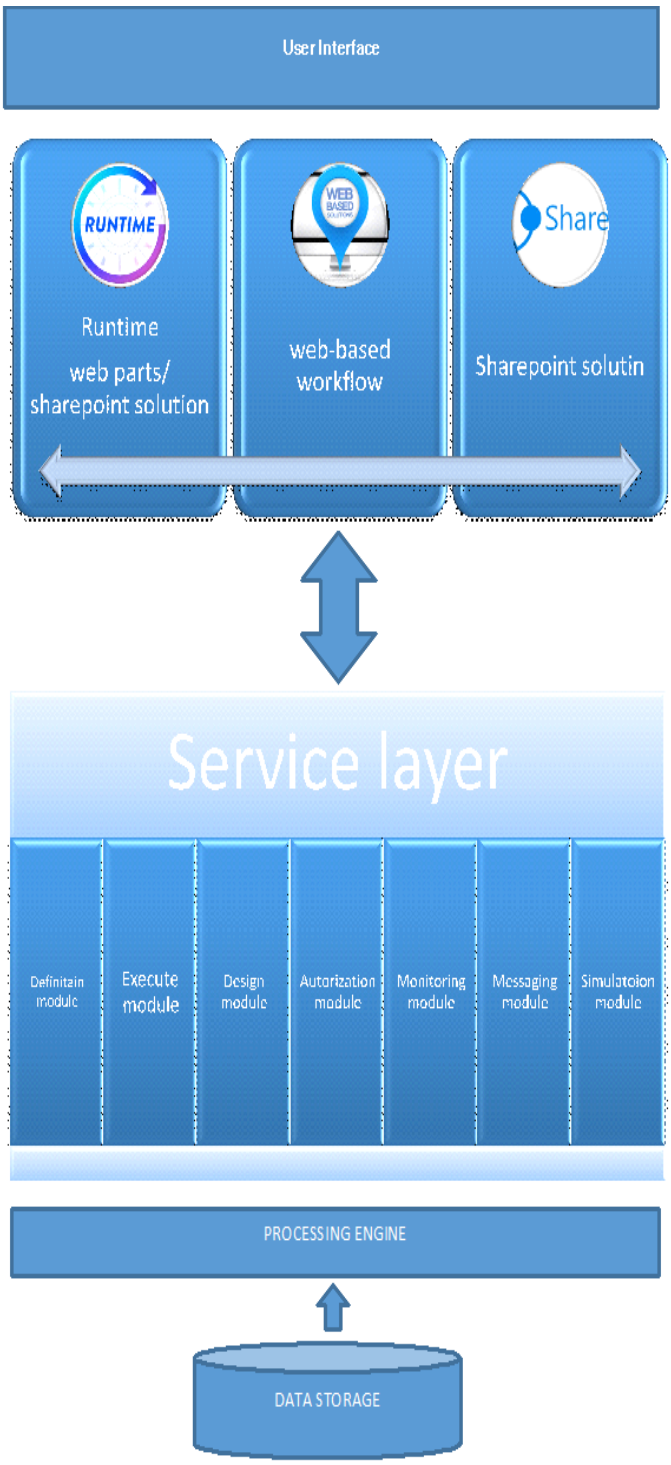

Fig.1. SOA architecture of a BPM software used with traditional approach

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The following diagram illustrates how the processes are integrated with companies existing system.

SOA Architecture

Here we can see that this service oriented architecture has a multi-tiered, service oriented approach. It eases system integration and expandability. The process engine is formed from Service and Business Layers interacting with a set of self-describing services. All this data is located and stored in MS SQL tables, therefore easy for making reports and integration with BI systems. API is able to support all kinds of customised integration capabilities.

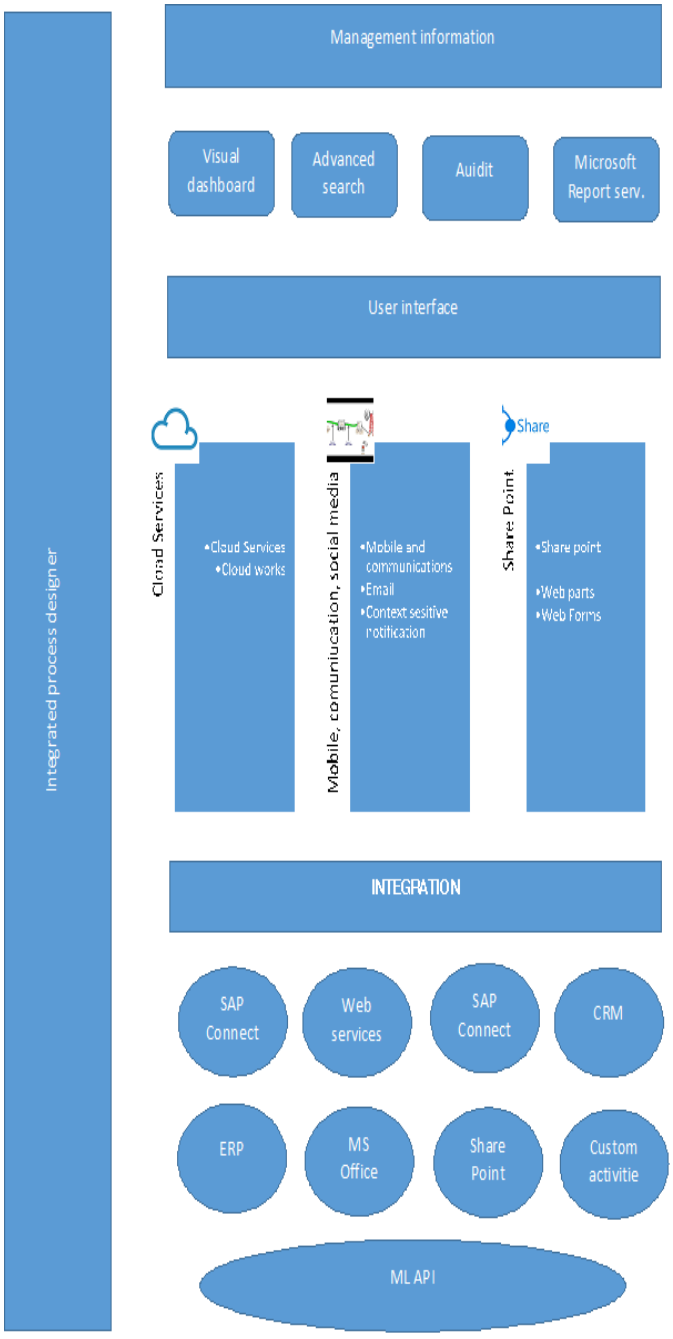

Fig.2 Modules of BPM with ML API

Modules allow process modelers and developers to quickly develop and collaborate on process templates in a workflow canvas. Features include:

-Codeless workflow implementation in a 100% web environment.

-Workflow integrity validation prior to execution.

-Source Control mechanism for multiple developers.

-Extensible design supporting custom activity creation.

-Rich modelling functionality.

- .NET editor featured with Ajax support, client and server-side code.

- A model-first mode enabling a creating of forms in just a few clicks.

- A variety of different form views creation (mobile, read-only, etc.)

- Auto-generated views from a data model, reducing time-to-solution.

- Enriched set of controls and pre-built components.

Now lets imagine a process become more powerful with each case that you execute. What if you could automatically optimize processes using technological advances that combine process data and increasingly accurate decision making. Pairing BPM software with machine learning can do just this.

Machine Learning

Machine learning has matured in recent years. It consists of algorithms that use machine data to calculate improvements and patterns, creating an ongoing positive feedback loop of process optimization. Existing machine learning tools already have libraries ready to implement in combination with BPM applications to start improving processes immediately.

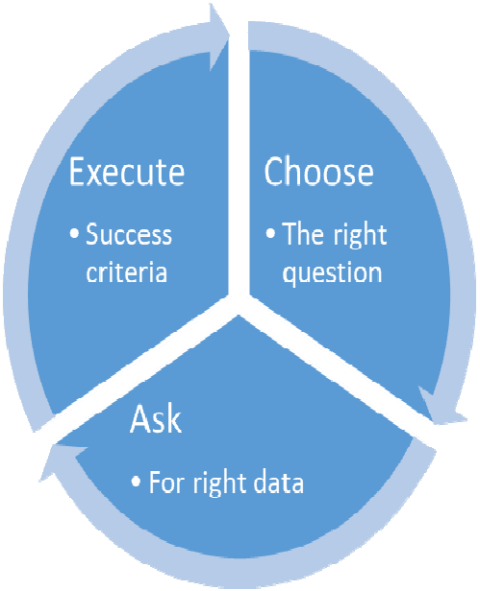

Fig.3 Machine learning process loop optimization.

Why Machine Learning and BPM

BPM software already collects and stores detailed process information generated with each case. With the help of machine learning usage, process data is going to improve decision making by identifying patterns as the process passes through the workflow. Processes powered by machine learning detect patterns and make selections that humans would either not find or take a long time to calculate. Sales forecasts, consumer demand, and fraud detection are just a few ways to apply machine learning to processes automated with BPM software. On figure 4 we are going to present an abstract model that will help us show how AI will be integrated.

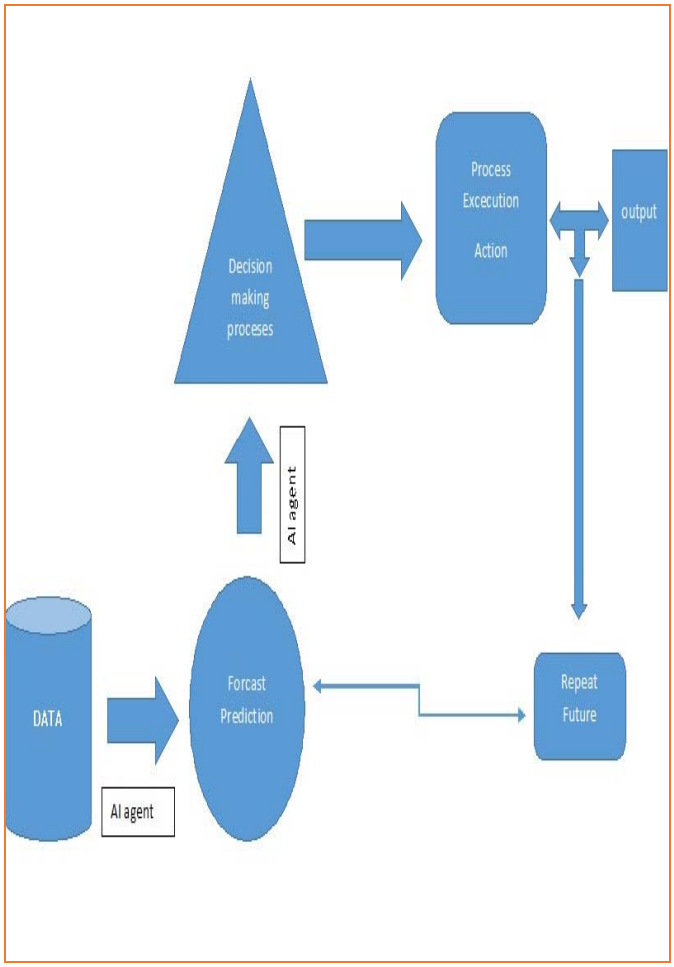

Fig.4 An abstract model for AI integration.

We believe that our designed model will benefit business processes and will be widely accepted and applied by engineers. It also shows how these transitions are building on each other. Given data is taken by a process to predict the future in the form of a prediction. This prediction then is taken by the artificial agent to conduct decision making process and determines how it will behave and act.

Business process and its underlying decision-making changes are also anticipated by our model. Action can influence the future in a way that makes a prediction obsolete, but also the same action can lead to a well known phenomenon of the self-fulfilled prophecy. It means that the future is looping back as the same process repeats itself and the new enriched data is gathered.

The main goal of modern business process management is focused on the improvement of business processes. This involves implementation of more efficient process, flexibility and responsiveness to the everyday changing needs of business users. This shows why the main trends of business processes support are process optimization, responsiveness and flexibility.

If BPM platform supports newer version of PHP 7 and above, it is possible to use the PHP-ML library to implement machine learning in business processes. This library features association rule learning, neural networks, classification, regression, clusters, metrics, feature extraction, pre-processing, and cross validation. Implement these features through a build in custom plugin we will be able to analyze process data in BPM. A line of code is enough to start analyzing workflows. Each time a case is run and process data is generated, patterns and improvements become more accurate. Besides, the other intersection of AI that affects BPM revolves around machine learning. Machine learning gives AI engines ability to assess the efficiencies of the automated processes in businesses processes and where possible to offer recommendations. Based on these recommendations, businesses can modify processes, logic and as a result, escalating process efficiency.

For example, google offers some of the most powerful application endpoints that use machine learning.

Here is the list of already available machine learning APIs offered by Google:

Google Natural Language API

Google Speech-to-Text API

Google Translation API

Google Vision API

Image, speech, and language recognition are being already used in a lot of applications and if we use these endpoints to detect individual objects and faces within images, make automatic translations, and parse speech into text. Furthermore, integrate these API endpoints into processes to leverage these capabilities in automated workflows.

With these options, the ability to enhance automated processes is a lot more agile. Integrating machine learning into your processes via the PHP-ML library or even google API can help companies and business go far toward process optimization.

CONCLUSION

IT operation processes transformation, and all of its associated goals and technologies are no easy task. It will be easy for small company to integrate these new methods and try different approach, but it will be a challenge for big enterprises. Business and IT need to align a number of elements in order for this AI-driven process management revolution to work. We believe that this revolution will be an essential part of next generation process management systems.

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