

Smart BPM from the Perspective of a Telecom Service Provider for Incident Management

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ABSTRACT

Business Process Management (BPM) is in the throws of an extreme makeover. The traditional focuses of process efficiency and cost reduction have given way to agility and digital automation. For Telecom service providers, BPM place a premium on evaluating and providing leading-edge capabilities. With that, the role of Artificial Intelligence (AI) has come to the forefront as a mean to drive better and deeper customer experiences within a digital process. While BPM drivers are shifting toward digital automation and customers, AI is emerging as a means of better serving customers. AI's ability to take human cost and latency out of processes, as well as provide new interfaces that delight users, mirrors the new goals of BPM. This paper examines the current state of BPM and planned AI improvements among leading telecom business processes.

KEYWORDS-*Business process management, Artificial Intelligence, business process implementation*

I. INTRODUCTION

Business process can be defined as the composition of different activities working together to achieve an organizational goal. Implementing business process management (BPM) should consider several best practices, such as time, quality, cost, and flexibility, in terms of how and when to implement BPM. The main contribution of this research study is to propose a smart BPM framework that possesses the ability to employ a database of best practices, business standards, and business activity history in order to permit a technical team to analyze, rectify and improve the incident management business process during a network failure.

In addition, the other objective of this research is to build an AI based business process or workflow directly from its process design logic in order to enable rapid process development and deployment. This procedure requires some technical improvements of the design, as it is mainly based on building the business process using AI, which, communicates the defined business process and rules to the business process management engine. The results of our research permit a telecommunication service provider to accelerate processes and

increase their efficiency by reducing costs of processes, as well as to increase service quality and dependability.

II. LITERATURE AND RELATED WORK

Processes are considered, a generic factor in all organizations. They are the way things get done. Processes are also viewed as 'strategic assets', which require companies to 'take a business process orientation. Process is not simply the management fad of re-engineering, but a more pervasive issue, requiring serious attention. 'Process thinking has become main stream. BPM in this context considers process as both a business imperative and a means of understanding and explaining business activities - the way customer requirements get transformed into actual goods and services. A number of studies have raised awareness of BPM, and begun the process of characterization.

BPM's roots are in optimizing the core processes that drive consistently predictable, high-quality outcomes while reducing costs. Customer improvement takes center stage, for now. As telcos move toward customer obsession, back-office processes extend to include an increasing number of critical customer touchpoints. As customers interact with processes, the experience must be outstanding or they will vote with their feet and flee to the competition. To drive these initiatives forward, customer experience within BPM becomes a critical requirement.

As processes traverse the customer engagement experience all the way to the back office, the ability to drive end-to-end digital process automation moves from vision to reality. Other emerging trends, like low-code development, lower traditional barriers to automation and allow the long tail of processes to be digitized, furthering the goal of true digital automation.

BPM is not sexy technology, but it is essential technology. Long relegated to the back office, BPM initiatives are increasingly moving toward deeper and more meaningful

customer interactions. AI, on the other hand, is very sexy at the moment, and the focus of many AI efforts falls squarely on serving customers. In this particular work we explore the emerging intersection of BPM and AI.

During a network failure, Business process activity needs to be analyzed, whether in sequence or in parallel, to remove any delays in the process itself. One major thing that technical teams have to consider is the root cause, which should be taken into account before applying any healing action. Technical team, process owners, and analysts should work in collaboration as one team to brainstorm ways to design a incident management workflow. Then, technical person should apply the new workflow to a real-life setting to evaluate it. This has a major impact on the workflow design procedure, but still it depends on the human factors and does not involve real data extracted from activity within the workflow.

The proposed framework includes four layers: incident acquisition, incident evaluation, recovery workflow identification, and improved model generation. Each layer has its own technique, but this paper did not provide the methodology in detail for each layer.

The importance of designing a business process that depends on standardization methodology. Standardization should be involved in the design from the lowest layer, the database level, to a higher level of designing business processes. Standardization can be viewed from two perspectives: Vendors' perspective and customers' perspective. From the vendor's perspective, this will decrease the overall cost of developing and designing systems; from a customer's view, this will meet his good expectations of the product. The process of achieving enterprise integration includes all managerial and technical factors that enable cross functional process integration. The result is a customer-oriented management structure, with information systems, formally related to the processes and integration of procedures required to establish and retain customer satisfaction. Enhanced Telecom Operations Map (eTOM) and Business Process Management Notation (BPMN) are used as the standard representation, and it is suggested that prioritizing the activity to achieve the optimal cost of the process.

AI has become extremely essential to telcos, due to the globalization of the world market and massive advances in information technology through which businesses gather, organizations are able to transform and then analyze data to predict the future of the business to enhance and provide better decision results. In this aspect, AI is utilized to support technical team, to make the decision for healing actions, instead of spending more time cleaning and analyzing log files to solve or optimize the resource assignment for an incident. Thus, the main features of AI are to optimize workflow design and root cause analysis.

III. PROPOSED FRAMEWORK

The purpose of this solution is to find the most suitable way to solve the network failure. To achieve this, proposed intelligent framework will analyze and monitor past activities and "tasks" inside the database to come up with the best healing action. A trigger will be added to notify or alert the user about healing action. To accomplish this operation, it is required to identify accuracy each phase or activity within a process. To do so, a work flow orchestrator and decision making engine act as an enabler for process owners to monitor and trigger the processes and activities, as well as to seek any improvement opportunities.

The proposed framework system can be utilized as a new generation of business process management by identifying and training while users continue to use the system. In accordance with the specified requirements, it is shown to describe how the system components should interact. Figure 1 shows the main system components and how they are linked to one another.

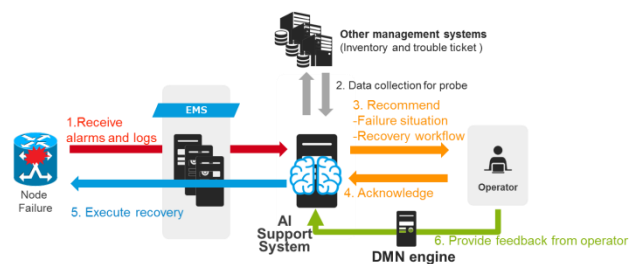


Fig.1: Conceptual Model

At the beginning, it is required to create the workflow design using any tool (Microsoft Visio, IBM Blueworks, Trisotech BPM) with the BPMN standard; then, the system engine will parse the design file and will validate and verify the workflow design. Afterwards, the engine will automatically create the healing workflow process and its related objects. There are two main components of system architecture, which are described below.

- BPM Orchestrator
- AI support system

a. BPM Orchestrator

The suggested orchestrator has used Microsoft Visio and Blueworks Live to draw objects such as the entity, task, and arrow that are based on the BPMN standard. These tools are diagramming tool that can be used to visually communicate technical as well as non-technical representations of ideas, processes, concepts, structures, layouts, software models, blueprints, etc. These files contain the workflow design, which stores object data such as entities and connectors, in

Extensible Markup Language (XML). This will allow developers to manipulate and work with these files programmatically because it is based on XML structured technology.

In addition, the orchestrator is responsible for moving process instances and workflow from one phase to another, and for executing any phase based on its respective type.

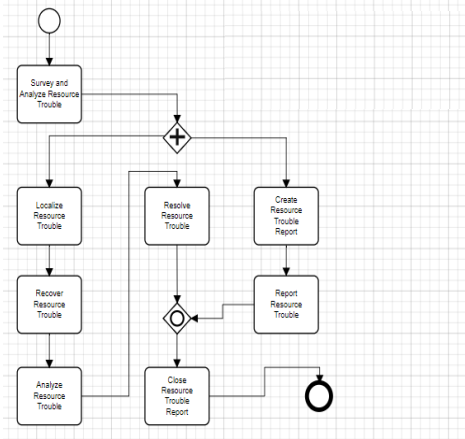


Fig.2: Resource Trouble Management

b. AI support system

AI support system is designated to work as a Secretary for operator/technical team, where it helps to identify the best healing action. During the Incident management, the AI system collects data from other support systems, such as alarm and network management systems, indicating there is a fault. The operator checks this information and manually starts the healing process. Then the user initiates a process to train the AI system so that it can heal the fault automatically if it happens again.

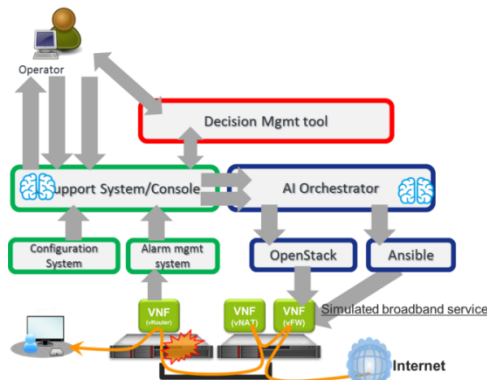


Fig.3 : Environment setup

This process includes looking at whether the repair was successful, the role of the user and their level of skill. Based on this data, an overall score is determined and a recommendation made about whether to include it as training data for the AI system. This way, a telco can demonstrate the steps taken to automatically resolve a performance issue in a way that a human being can understand.

IV. OUTCOME AND CONCLUSION

A simulation model is proposed to validate the proposed framework. Some sample of failures representing different logs evaluated. The simulation model and demonstration environment, representing AI setup, Decision Making Engine are expected to be configured with other stakeholders and developers. Two kinds of use cases are applied to the demo environment. 1st time incident scenario and automated healing scenario are simulated.

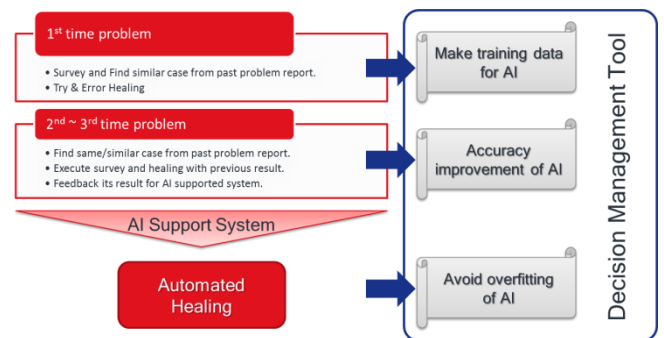


Fig.4: Use case

In order to improve the accuracy feedback is always required, where it is required to define reviewers to review the output results offered by AI (Network expert, AI expert, etc.).

The main objective of this work is to provide an intelligent business process management for incident management that has a positive impact on a telco service assurance processes, and to redefine the traditional approach to solve the incident by a smart business processes in telco organization. The proposed model is expected to improve cost saving, increase the effectiveness and the efficiency, and increase the usability among the business users.

AI and DMN are key factors to sustain automated operation itself in future telco network. BPM is in a state of flux. Old goals of cost savings are giving way to digital transformation and better customer experience. As BPM, once relegated to the enterprise back office, increasingly touches customers, the opportunity to delight becomes a critical success factor. BPM, properly implemented by telcos with the AI, can lead to new opportunities to interact with customers. This

further positions core processes and BPM as important enablers of a digital transformation strategy. The journey will be a long one, and both service providers and customers will make missteps along the way, but it will be worth the effort.

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