PROCESS OPTIMIZATION – HELPING THE KNOWLEDGE WORKER AND CONSUMER

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ABSTRACT

Business processes for health care insurance applications typically execute in a case management design pattern, with the conclusion of one process leading to a contiguous or ancillary process as applicant information is ingested, evaluated, and remediated. Knowledge workers handling applications are under stress to perform within quality of service (QoS) constraints, and are subject to resource constraints on staff levels, while consumers endure uncertainty surrounding the complicated procedures regarding eligibility for coverage and exemptions. Process models developed for analysis using the Business Process Model & Notation (*BPMN*) standard from the Object Management Group (OMG) can be used in discrete event simulation to determine the optimal distribution of work and resources to achieve business goals. Using a case study drawn from work done under the Affordable Care Act (ACA) on behalf of the Center for Medicare & Medicaid Services (CMS), we will demonstrate how process optimization can be realized through the parameterized simulation of reusable process models.

1   SIMULATING BUSINESS PROCESSES BY PARAMETERIZING THE MODEL

Designing the experiment for simulation does not have to mean programming the simulation each time the simulation parameters are changed (Dugan & Gagne 2014). *BPMN* provides a standardized basis for richly describing the business processes that support determining the eligibility for health care insurance coverage and exemptions from bearing the full cost of coverage. However, it does mean developing models that are both semantically correct and consistent with the intended operational behaviors, such that they can be baselined for analysis and parameterized for simulation. Models created using *BPMN* means the simulation parameters and engine must be aligned with the semantics of *BPMN*, which is realized through the use of the adjunct Business Process Simulation standard, *BPSim* (see http://bpsim.org) created by the Business Process Simulation Working Group of the Workflow Management Coalition (see http://wfmc.org). To fully embrace the end-to-end processing perspective, individual models must be combined in a way that appropriately mimics the actual work being done, covering all relevant work.

2   CASE STUDY: ELIGIBILITY PROCESSING OF CMS COVERAGE AND EXEMPTIONS

Serco, Inc. is responsible for the processing of ACA coverage eligibility applications received electronically through the federal site (http://www.healthcare.gov) or by mail at Serco's Mailroom Facility, and for the processing of ACA exemption eligibility also received at the Mailroom Facility. Knowledge workers at the Mailroom Facility help prepare the received mail for scanning and the processing of the rendered images as well as the received electronic records at this site and other call centers. Different processes and tasks are performed to ingest, evaluate, and remediate the received applications and supporting documents, which include dealing with returned mail, appeals, consumer calls, and ad hoc case work. Processes are triggered by externally occurring events (e.g., arrival of mail, audit records, and inbound calls), or internally occurring events (e.g., generation or escalation of tasks, and scheduling of outbound calls). Staff resources are drawn from general and specialized pools to support work matching worker skill sets.

2.1 Process Modeling Challenges

Contiguous or ancillary processes present numerous semantic challenges when combined to assess the comprehensive and integrated behaviors of the collective end-to-end activities. The case management design pattern means that chunky work proceeds in a state-machine order, where events trigger the work.
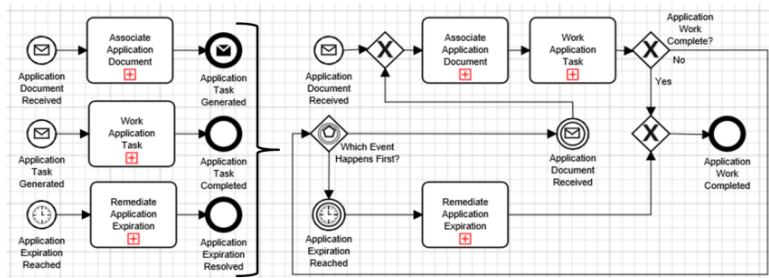

Figure 1: Converting Contiguous Processes To Continuous Process

A combined model must integrate these behaviors in a *BPMN* semantically consistent way, and in a way that reflects the movement of the work through its states that can be parameterized for simulation. These challenges were solved by appropriately connecting process sequences to match the granularity of work, the inter-trigger patterns of events, and the collective assignment of worker resources (see Figure 1).

2.2 Process Simulation Challenges

Token-based discrete event simulation requires that the granularity of the work being done be consistent throughout the model, which can become complicated when the work for a single application can move through multiple ingestion, evaluation, and remediation cycles (see Figure 1), and when the cycles are attached to the scheduling of calls and the issuing of correspondence to prevent date-driven expirations of the applications due to disqualifying issues. The handling of calls to minimize wait times and abandonment rates also present a simulation challenge because they draw from the same resource pool. These challenges were solved by making the simulation behavior mimic the way work arrived and was done.

2.3 Operational Data Challenges

A rich body of operational information is used to provide reports and dashboard presentations of the workload at the call centers, much of it generated by the Business Process Management System (BPMS) Platform automating the processes. However, prior system design considerations had led to restrictions on the connectedness of the audit data from the running processes, which made it difficult to crosswalk the operational data to the simulation parameters. This consequence also made the evaluation of process redesign projects and design alternatives more difficult because the data had to be "massaged" to support the simulation. These challenges were solved by providing a rational basis for this massaging that still validated the experiment designs, and led to new processes with better granularity of audit data.

2.4 Case Study Results

Use of the process models and their simulation led to the optimal assignment of worker resources over the enrollment and follow-up periods, building in scalability of the operations without increasing resource costs (cost avoidance). It facilitated the identification and pursuit of processes with the most payoff for being redesigned, including the use of a Decision Engine (DE) with the BPMS Platform to automate straight-through-processing, and the triage and dynamic assignment of work based on backlog, application data, and matching worker profiles. The benefit to the consumer was more proactive engagement.

REFERENCES

"Exploring Different Simulation Perspectives Using Parameterized Reusable Business Process Models," by Lloyd Dugan (BPM, Inc.) and Denis Gagne (Trisotech, Inc.) – 2014 Submission to ACM Conf