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Commentary

Development of Business Modeling Languages and its Applications

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DESCRIPTION

Since the 1990s, the development of information infrastructure has enabled researchers, industrial partnerships, and manufacturers of enterprise systems to create and standardize widely used notations that are applicable to strategy consultants.

Each modeling language has its application in enterprise modeling; some are particular to modeling a domain in the enterprise, like organizational or technological infrastructure. System architects, software engineers, and other professionals design and implement the internal workings of an enterprise. Therefore, actors with a technological background like system architects and engineers can implement these execution rules on the business side using languages like Business Process Model and Notation (BPMN). The design of corporate workflows requires a higher level of abstraction and is primarily done by people with a business background, strategy consultants at the highest level and business analysts on a lower level [1].

Finally, there are domain-specific modeling standards like HL7 in the health information technology that dominate the description of collaborations in their field. Modeling languages are either developed within standardization organizations with support from the largest enterprise system vendors or have their roots in the academic sphere. The capacity to characterize numerous e-business features, including business-to-business contacts, automatic and human activities, task life cycles, contract modeling, organizational and technological infrastructure of an enterprise, is at the forefront of the conversation from a business perspective [2].

Software engineers demand a fine-grained model where each task or service has its own deployable and runnable software component with a well-defined software interface; the Service Oriented Architecture (SOA) is the meeting point of these two perspectives. In the SOA, each atomic business task such as all services are listed in a catalogue, which allows a compound service to search for a service that can carry out one of its constituent tasks.Defining the temporal ordering of events or business tasks, also known as process modeling, has been extensively researched in academia. Business process modeling languages described a distributed system including the execution constraints, interactions between components, and the control and data flows.

Orchestration and choreography must be able to handle abnormal events, such as if a fau occurs. Modern business modeling languages heavily rely on the experience of enterprise computing vendors, which results in additional software engineering and business modeling requirements [3].

It has been extended to business processes by fault or exception handling and compensation, since several process instances can be active at a time.

The academic community contributed to the development of business modeling languages by defining workflow and message exchange patterns by developing an abstract mathematical representation of actual business scenarios. Formal modeling techniques primarily use sequential, parallel, and alternative execution constraints, which have been shown to be insufficient to capture all data-flow, resource access, and exception handling behaviors.

Though version 2 has already established its connection to execution, (BPMN) was primarily created for modeling purposes. Its intended audience is business analysts and process designers rather than software architects and engineers, and mathematically, (BPMN) supports both the orchestration of a single business process and the description of the collaboration of multiple processes [4].

A Petri Net is a bipartite directed graph with two sets of nodes: places and transitions. Each edge connects one place with onetransition. Control flow is represented by a token moved from place to place when all transitions preceding the destination place are executed synchronously. Petri Nets are ideal forsimulating parallelism and numerous instances of a process; when simulating workflows, a transition is equivalent to a business activity.A state machine describes a single process with a

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directed graph in which the nodes are called states and the edges are calledtransitions. A state machine remains in a state until an event from the environment triggers a transition, at which point the machine generates an output event and moves to a next state. State machines are effective in defining and monitoring the behavior of a single process.

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