In future state of a business process in

Business, Management

Inthe framework of BPM, business process modeling plays an important role and isconsidered as the mechanism for describing current and future state of a businessprocess in an organization. Business process modeling is accountableto produce a graphical representation of events, actions, decisions, flowcontrol, and links in the sequence that supports the administration oforganizational processes and their change decision. The change could be intenseor indirect, but business process models are capable to address it in terms of compliance, efficiency and financial issues. In business or IT area, it considered as atool for process documentation, process automation, simplification of variousstakeholders interdependencies and to end for process execution.

Nowadays, business process modeling has been considered as a fundamental approach towardsprocess management that benefits organization to remain efficient andcompetitive in the dynamic market. Nevertheless, process modeling requires aconsiderable asset in terms of suitable methodology, tool and lastly training guidelinesto model any business processes. It is apparent that for the accomplishment of any process model, employeesare the main reason. Hence, in order to get full benefits of process modeling, the employee should handle processmodeling appropriately. There are many modeling techniques available in themarket, and selection is not easy as the companyneeds to understand which technique is suitable for the business environment and most importantly it can be easilyunderstood by company staffs.

To get overcome the above problem, comparativeanalysis of most usable modeling techniques is required. For SAP PLM or anyother management

application, depending upon modeling objectives, differentprocess perspectives are considered to select best suitable modelingmethodology and a tool that can fulfill current and future business requirements. 1.

1 Purpose of Business ProcessModelingBusiness process modeling is a tool to describe the end-to-end business process and not a performanceoutput. The output of any business process diagram is considered as animprovement opportunity for any organization in the way their operation works. So the focus should be on differentiating value-addedactivities and improve them to reduce cost and time efforts, and ultimately to makecustomer experience and service better. Business processmodels are differentiated into two types;· As-is model – representcurrent state of business process· To-be model – future stateof business processThese process models are used for analysis and improvement and executed for furtheroptimization. Besides the description, process modeling aims to enable company employees for a better understanding of operation workflow amongst each other and tostreamline the process.

Table 3: Outcomes of business process modeling (Snabe 2012) 1.

2 Business Process Modeling TechniquesVarieties of modelinglanguages have long been used for describing processes. Flowchart, UML (Unified Modeling Language) diagram, EPC(Event-driven Process Chain), Petri Net, IDEF (Integration Definition forFunction Modeling), DFD (Data Flow Diagram), RAD (Role Activity Diagram), YAWL(Yet Another Workflow Language), BPMN (Business Process Modeling Notation) arefew commonly used examples of

process-orientedmodeling techniques. But at present few of them are widely used because oftheir expressiveness and functional behavior. These languages are primarilyused to describe operational workflow so many can easily understand, analyzeand do positive changes via improvement in the process. Below discussed types are leading modeling techniques that many organizations havebeen using a process management tool toimprove their business process performance. Aflow chart diagram represents the flow ofcontrol or algorithm during the course of the process, showing step by stepsketch of various activities and their order by simple arrow connection. As amost popular diagramming type, flowcharthas simple symbols that can easily understand by users.

But due to lack ofsupport for the breakdown of activities, the flowcharthas limited usage. Flowcharts mainly used for software engineering but its simple natureattracts many managers and business developers to implement it in someadministrative use as well. UML(Unified Modeling Language) activity diagram represents logic or detailed logicof business rules which applied basicallyin business or software-based systemdomain. In a software system, UML diagramis used for specifications, development, visualization, and documentation. In the businessprofession, UML is considered as a powerful, flexible, and object-oriented technique to describe the detailed logicof business rules.

Regardless of flexibility in modeling, UML is not popularamong business analyst because of its semblance and multiplicity nature. EPC diagram, shortform for Event-driven Process chain diagram, is deliberated as a type

offlowchart. Even though being the type offlowchart, EPC diagram gain ample popularity because of its occurrence in the configurationand implementation of SAP system especially Enterprise Resource Planning (ERP).

Nowadays, EPC diagram is used for resource planning and to identify possibleopportunities for business process improvement. Started from business processworkflow outline generation incorporationwith SAP R/3 solutions, EPC diagram, nowadays, used widely by manyorganizations for modeling, analysis, and process redesigning purpose. EPCdiagram is supported by many elements like events, functions like activity ortask, logical connectors, and responsibility functioning like process owner, organization etc. Business Process Model andNotation (BPMN) is nowmeasured as a standard for the representation of an end-to-end business process in an expressivegraphical way. In the beginning, BPMN technique was developed byBusiness Process Management Initiative (BPMI), an organization to promote thestandardization of software enterprises.

But after the unification of BPMI with OMG (Object Management Group), it is now maintainedby the Object Management Group (OMG). Nowadays, BPMN has received considerableattention from many process managers andbusiness analysts as a convenient modeling technique for documentation andfurther execution of business processes to gain a competitive advantage in this dynamic market. The primary objective of BPMN was to simplify communicationand coordination among various departments inside organizations or company. BPMN varies from business process mapping as it

is used for the representation of current business processesfor purposes such as standardization, employee training activities, and qualityadministration. But now BPMN can likewise support UML, XML (Extensible Markup Language) and HTML documents intended for execution of business processes with visualizationof standard and common notations across any organization. Over the past few years, we have not seen any standardapproach for modeling of business processes. But with the establishment of BPMN technique, BPMI, now OMGgroup has filled out that vacuum with the developmentof royalty-free graphical notation.

Withthe variety of elements, BPMN targeted customer’sranges from higher level business user to lower level implementers. With manyamendments, finally, OMG was able tolaunch BPMN 2. 0 version successfully, which is used as one single specification for all as it defines the graphicalnotation, metadata and interchange diagram layouts.

Everyorganization has sets of methodologies that govern their work towardsdevelopment and improvement. Strategically, the methodology plays an importantrole to provide confidence to stakeholders (customers, employees, managementetc.) that deliver projects profitably. Each methodology signifies a diversemeasure for evaluation. With a clear questionin mind i. e.

for what purpose business process models are used in the organization, it is likely to begin working outwhich approach organization want. Dependingupon the focus of process description, modeling techniques should be capable ofproviding vital information of associated process. We

evaluated most effective modelingtechniques that discussed in previous section (Chapter 4. 2) along two general points;(1) four different lookouts of business processes namely: behavioral, informational, functional and organizational, and (2) basic modeling elementsthat supported by each technique. Abusiness process modeling technique should be capable of representing one ormore following process perspectives, · Behavioral: Signifies when andhow actions are accomplished.· Functional: Signifies whatactivities are being accomplished.· Organizational: Signifies where andby whom activities are executed.

· Informational: Signifies informationalentities (data) produced or manipulated by a process and its interrelationship. Theintention of the evaluation is to gain further insights into the suitability ofthe modeling methods with regard to the visualization of modeling elements insubsequent chapters. A summary of the main results of the comparisons ispresented at the end of the subsections broken down according to the criteria. Theresults are in the tabular format summarized below. A rating can have three appearancesminus 1 (-), zero (o) or plus 1 (+). Table 4 above shows first phaseassessment for suitable modeling techniquesbased on different lookouts of business processes. All three of the modeling techniquesi.

e. EPC, UML activity diagram and BPMN 2. 0 ?? studied here have a freelyavailable meta-model and can, therefore, be extended at any time. They are thereforerated all three with a +.

But BPMN 2. 0 and UML activity diagram is favored bymost of the business analyst and process managers because of theirstandardization prominence

by OMG group. Most notable thing from above evaluationis that process-oriented modeling technique BPMN 2. 0, however, succeeded faraway in terms of all four business processperspective with the highest score of +16. Froman organizational point of view, behavioralperspective plays a central role while selecting any modeling technique becauseit directly relates to organizationalperformance by managing the workflowamong different functional units to optimize and improve their business processes.

But a different modeling technique uses more or less the same graphicalnotations (elements) while modeling any process. There is no way of explainingwhich methods are best suited in terms of notation. In the secondphase of evaluation, we will quantify theresult of the first phase by comparing theavailability of basic elements like events, functions, branches, and control, data and message flow, responsibilities, data and softwaresystems in Flow Chart, EPC, BPMN and UML Activity diagram. Abovementioned modeling methods are used by many organizationsand considered as a standard for gooddocumentation of business processes. They basically include freely accessiblegraphical notations and common terminology. Other modeling methods like RAD, DFD, Petri Net and many more, are out of questions because they do not fulfill therequirements set out here, for example, they are too difficult to learn, have limited regularity, or that theirelements are already controlled in the methods mentioned above. Event element group shows that EPC and Flowchart diagram provides the easiest graphicalnotation with just one symbol.

However, defining only states can be possiblehere. The UML activity diagrams are provided with start and end element withoutany intermediate state i. e. no information carrier in the succession of the process. On the other hand, BPMN 2.

0 diagram provides three notation elements for eventsi. e. start, intermediate and end event. All these symbols can be easilyvisualized and used. Thus, a variety of states in a process can be describedand illustrated.

Functiongroup shows that the graphical notation forEPC, BPMN 2. 0 and UML are the same. But in case of BPMN 2. 0 and EPC, there is apossibility to represent individualprocess steps as well as sub-processes or references to other processes. Butthe scope is limited to representsub-process in UML activity diagram and it depends upon the software vendorswho provide notations for modeling. Gateway group shows that there is the only difference in the semantic understanding of the gateway elements.

Thus, the EPC cannot subsequently use inclusive (OR) or exclusive (XOR) gatewaydue to the state of the event. Otherwise, all modeling methods offer an opportunityto run a process path exclusively or in parallel. In the case of BPMN 2. 0, a variety of gateway elements is used to governthe workflow of the process. These elements represent fundamentallydifferent symbols and a distinction is made based on circumstances of the incomingand/or outgoing workflow for branchingand/or connecting, parallelization and/or synchronization, data conditions and/orfuturistic circumstances. Control, data, and message flowgroup shows that EPC and UML offer the possibility to model control, as well asdata, flows except Flow Chart diagram. However,

only BPMN 2. 0 offers awell-integrated message flow in addition to controllingflow and data flow in its notation.

CommunicationLink group shows that BPMN 2. 0 and UMLoffer the possibility of a visual differentiation by Swimlanes. Processes canthus be demonstrated very clearly within defined company boundaries and responsibilityconversions can be easily pictured. With the EPC, functions can be assigned bya symbol of an organizational unit.

To give a short impression of EPC element incomparison with Swimlanes, each activity would have to be assigned an organizationalunit and quickly creates confusion among process modeling. Allmodeling methods presented here are able to represent data and/or information. In BPMN 2. 0, however, more data is demonstrated thatobjects of any kind. In addition to data objects and storage container, text annotationscan be assigned to an activity, which increases the expressiveness. A software systemcan only symbolically express into the EPC and BPMN 2.

0. The BPMN 2. 0 is morefocused towards workflow and informationflow of the process and strongly geared intothe modeling of the implementing software system.

But in addition, BPMN 2. 0 is enoughadept to represent any software systems that involves any time during process accomplishment. Anevaluation based on four different viewpoints of any business process andsupported modeling elements prove that OMG’s BPMN 2. 0 standard notation iscapable of addressing most substantial characteristics of BPM and it rankedbest among

the widely used process modeling methodologies. As shown above, allthe modeling methods justify behavioral perspective criteria for anorganization by using different graphical notations. However, approachingtowards methodology selection for any organization, it becomes clear that BPMN2.

0 has most powerful and expressive notation for the description of any kindof processes. Describing processes in a standardizedway by using BPMN 2. 0 notation allows organizations to cover business as wellas a technical view of any process on thesame page. Business level modeling isused for demonstrating a high level of business abstraction and technical levelmodeling is used to complement technical details on the abstracted business levelmodel. BPMN 2. 0 graphical notation is simple to understand but complexes for modeling any business process. Towork smart and take the advantage of BPMN2. 0 standard, the organization is needed atool that matching organization requirements, easy to use for all stakeholders andsmarter enough to generate modeling result.

Today, huge numbers of different business process modeling tools are available in themarket that supports complete BPMN 2. 0 standard. A comprehensive study from BPMN modeling reviews suggested that at least 70 software providers haveapplication for the process modeling that uses BPMN 2.

0 as a standard. In the earlier state, many business analyst ordevelopers started using a drawing tool such as Camunda, MS Visio with sameBPMN syntax and notations in their tool palette for documenting differentbusiness processes. But after the introductionof standard notation by OMG, view

towards looking BPMN 2. 0 tool has changed. Nowmany BPM vendors have developed their ownbusiness suit to support BPMN 2. 0 standard and extended modeling scope fromprocess documentation to process analysis, process simulation, processmonitoring, and process automation via workflow management.

Selectionof best suitable BPMN 2. 0 supported tool for any organization can be a complex process and it might have an indirect impact on organizations way of doingbusiness as it requires substantial investment in time, money and employeetraining. However, evaluation for tool selection must be adequate that not onlyfulfill organization current needs but also covers the aspect of furtherprocess improvement and long-term futuregrowth. Consideringmethodological requirements discussed in an earliersection and various other perquisites like already in-house availability of tool, the global market of vendor i. e. market size, maximum customer base etc.

, we have elected six below major BPMN 2. 0 providers forcomparison. The technique used for tool evaluation is divided into two stages thatrange from functional support towards BPM approach to intuitive usage and toolsmartness towards process modeling with BPMN 2.

0 standard. We compared andmeasured those tools in tabular form (see Table 6 and Table 8) with regards to differentuser perspective that covers intuitive, functional and/or technical factors. Arating in below-given table can havethree appearances; (1) minus (-) stand for tool is either not supported orpartially supported to the given features and barely eye-catching for any businessprocess description, (2) zero (0) stand for vendor is still do not

haveeffective tactic to support given features, and (3) plus (+) stand for tool iseffective to support given features. FromTable 6, evaluation outcomeshows that all tools have a greater provisionin terms of established criteria. The results from above table based onfunctional areas and basically referred with respect to the future outlook ofany BPMN 2. 0 software towards BPM concept (see Table 7). But ARIS businesssuits have a much-advanced platform by introducing digital technologies earlier intoprocess modeling that supports functionality like process discovery and processvisualization functionality, handling change request, process models sharing, cloud-based support, different process analysisreporting, an ease of managing process workflow across the organization. MS Visio tool seems to be developed only for diagramming purposethat supports BPMN 2.

0 standard but no other functionalities form givencriteria. However, tools like Signavio, Camunda, and Adonis, Bizagi, MS Visio andalmost all other business suits from the markethave the capability to address thisfunctionality completely in future time. Fromthe primary evaluation result, we can conclude that process modeling tool thatsupports BPMN 2. 0 standard should have thecapability to address further processimprovement measures.

From an organizationalpoint of view, both functional andnon-functional requirements are needed to fulfill as it addresses usability like UI friendliness and performancecharacteristics. So we will further narrow down our approach by considering endusers usability perspective. Defining usability perspective with respect to endusers must need to achieve specified

objective of process description andprocess improvement goals efficiently and effectively. FromTable 8 result it’s now clearthat ARIS Business IT Transformation Suite and Software AG’s Signavio Business TransformationSuite have the highest degree of provision for BPMN 2.

0 process modelingstandard in terms of all above-definedcriteria for usability and further process improvement functionalities. Appliedsecond evaluation result shows ARIS has some restrictions in terms ofimport/export functionality, user interface and stability for learning. Thereason behind such restrictions is becauseof their initial focus towards entity-relationship modeling, diagramsdecomposition, organization charts and later they focused towards process modelingbased on the concept of Event controlled process chains (EPC).

On the otherhand, Signavio has a much-simplified user interfaceand capability to import other vendors supported file formats easily and tosupport many different formats like HTML, XML, BPMN, DMN etc. With multilingualfunctionality, contents are possible to show in a variety of supported languages. Separate modeling conventionsnotation functionality allows any organization to create own templates forprocess modeling. Process model versioning for release management and differentvariant comparison gives organization well insight into process distinction. Withwell-supported collaboration feature, users can easily share process models on the web-basedportal to get any comments and feedbacks on models. Like ARIS, Signavioalso has the capability to addressintegration possibility with SAP enterprise tools.

Signavio tool itself is veryintuitive to learn from available documents to get an overall understanding of the workingenvironment. Inconclusion, of course, Software AG’s ARIShas many capabilities on a larger scale by introducing various advanceddigital platform with respect to future needs. However, to initiate from limitedscope like process modeling and improvement at the departmental level, Signavio shows the best candidature towards intuitive working, organizationsrequirements and user satisfaction