Analysing GORE on BPMS Development

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***Abstract*—Business Processes Management (BPM) is one that supports an organization having a competitive advantage. Effectively managing the business processes is more workable than developing a new information system. This research explored the application of Goals Oriented Requirements Engineering (GORE) on BPM based information system in designing optimized business processes. Key Performance Indicators (KPIs) idea in GORE was used to improve information system process according to redesigned (value-added) business processes from As-Is become To-Be in BPM. Bizagi as one tools of Business processes Management System (BPMS) was used to implement the prototype for case studies on business processes of Loan Submission. The possibility of policy changing related to the process sequence of a Submission Agreement was needed an information technology as a solution to facilitate the ease of changes. The results showed that the application of GORE analysis on BPMS development is more easily sustained the correlation between process, data, and user interface. Thus, it is recommended that future continuously improvement business processes should involve value-added indicators by applying GORE with KPIs requirements elicitation process then simplify the implementation by using BPMS, proposes Bizagi software in this research.**

Keywords—BPM, GORE, KPIs, Bizagi

I. INTRODUCTION

The three main things that must be evaluated to make an organization has competitive advantage than other organizations are the organization's business, the product or service, and the business processes in running the organization [1]. One of solution is Business processes Management (BPM) used to improve constantly business processes [1]. BPM defines business processes into two groups activities, namely As-Is and To-Be. The business processes itself are viewed as strategic assets to enhance business agility by applying value-added to control the operational performance. So, existing information technology must be able to support the business processes were applied at that time. In reality, changing an existing information system takes a long time and lots of cost [2]. This often becomes an obstacle for organizations to redefine their business processes.

On [3] proposes a Key Performance Indicators (KPIs) in requirements engineering phase process of information system enhancement project to fulfill operational and managerial requirements. KPIs provides controlled over business processes by reducing unproper user operational routines, but implementing IT goals (the expected role in supporting the organization goals achievement) as a basis in goal-oriented requirements elicitation process. Other studies on [4 and 5] discusses GORE and UML class diagram correlation by providing detailed guidelines in analyzing the requirements while building the model.

In this research, KPIs concept is applied to conduct value-added analysis from BPM of As-Is business processes. Where the value-added is the basis for modelling the business process of To-Be, namely redesigned business processes as non-functional requirements, while Goals Oriented Requirements Engineering (GORE) applied as modeling notations and presents functional requirements.

Furthermore, the business processes design by Business Process Modelling Notation (BPMN) approach, as discussed in [6], implements the business processes using Bizagi with some development stages, i.e., (1) Model the Process; (2) Model the Data; (3) Forms Creation; (4) Define Business Rules, and (5) Assign Performers. The position of this research as shown in Fig. 1.

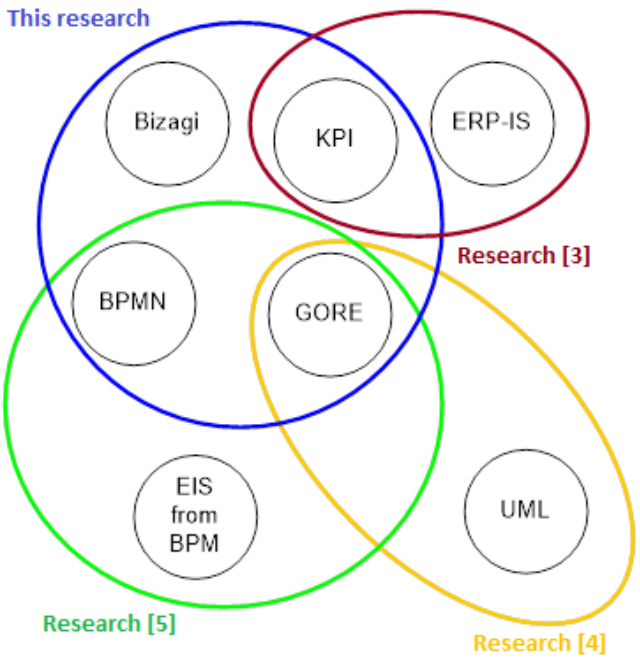

Fig. 1. Research objective.

The objective of this research (as illustrated in a blue circle) explored how to design business processes of BPM-based information system using goal-oriented requirements elicitation of GORE as functional requirements and using value-added analysis of Key Performance Indicators (KPIs) as non-functional requirements then implemented in Bizagi which uses the BPMN approach to model business processes.

II. METHODOLOGY

This research adapted BP*Trends Business processes Redesign Methodology* (BPRM) as depicted in Fig. 2. This approach consists of five stages, the two main stages of this methodology are Analysis Business Process and Redesign Business Process which includes value-added analysis as business processes improvement [1]. In this model, value-added analysis from KPIs idea supports on redesign business processes improvement, are examined.

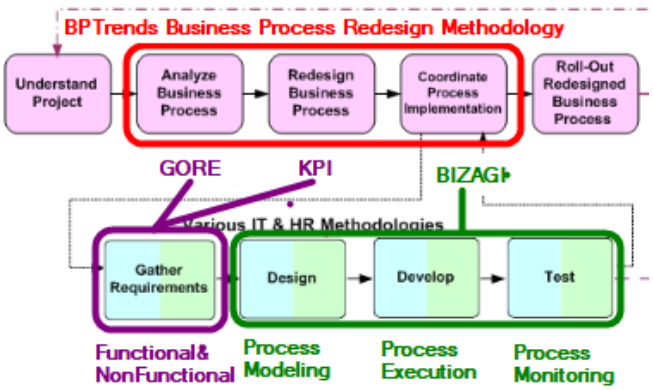

Fig. 2. Research methodology.

This research used GORE as analysis approach with the following steps [8]: (a) strategic dependency system As-Is by identifying stakeholder goals based on ongoing business processes; (b) strategic performance goals of stakeholder by classifying the objectives of each stakeholder in more detail as KPIs candidates; (c) strategic dependency system To-Be by defining goals that can be achieved with a system information development; (d) initials specification by detailing the application requirements to be built in Bizagi.

III. RESULTS AND DISCUSSION

A. Strategic Dependency System As-Is

This research study of Loan Assessment [9] consists of Loan Proposal, Submission Approval, and Loan Report. The Submission Approval is prioritized for improvement. Loan data comes from various branch offices. Loan Proposal itself is carried out in one particular branch office with data sources that already owned. This shows that there are various processes from each hierarchy in the Submission Approval, as shown in Fig. 3, related to the information needed and the approval status granted.

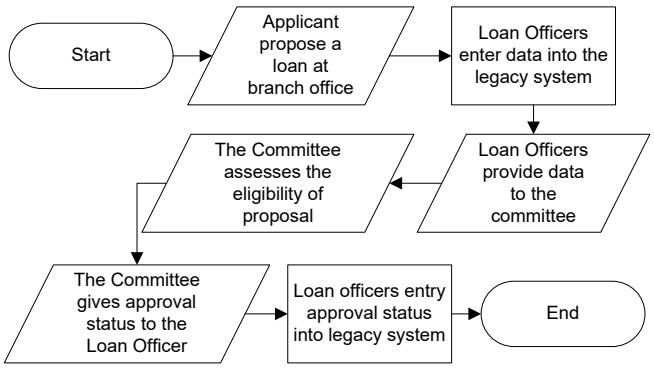

Fig. 3. Business process of submission approval.

Goals of each stakeholder involved in submission approval as described in Table I.

TABLE I. LIST OF GOALS FOR EACH STAKEHOLDER

Goal	Stakeholder	
	Applicant	***Committee***
Input	Ease of loan application	Ease in accessing information related to applicable loan regulations
Process	Clarity of information in completing submission data	Ease in assessing loan application
Output	Easy to find out status of the loan application	Ease in managing of submission status

B. Strategic Performance Goals of Stakeholder

Elements of GORE in this research includes the main goal (**goal**) as implicit requirements, (task) as initial specification to meet the requirements, supporting objectives (soft goal) as a KPIs of the goal.

The results shows features of To-Be obtained from Task and Soft Goal. In Bizagi, Task implemented as Forms Creation and Soft Goal implemented as Business Rules. All requirements of To-Be obtained from Goal, as shown in Fig. 4.

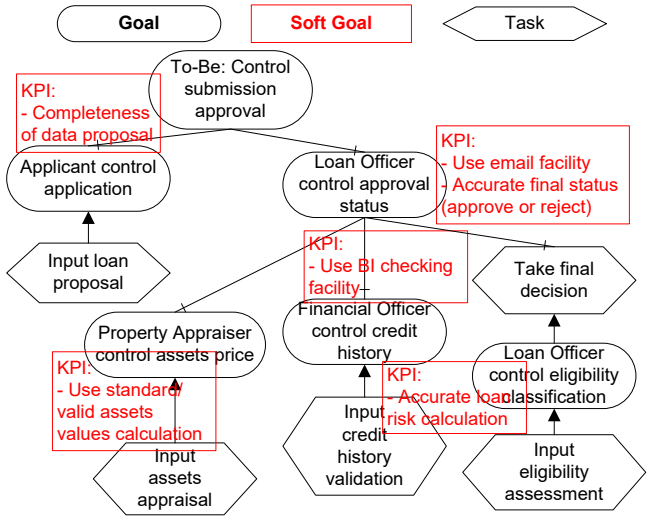

Fig. 4. Initial goal model with KPIs implementation.

C. Initials Specification

Database design and entity parameters are obtained from Transition Conditions of Business Rules in Table I (for example, status consists of Incomplete, Complete, and Canceled). Values of parameter entities defined in the work portal (Bizagi's server will open in web browser) so that these is used in creating Forms and Rules [9].

TABLE II. MAPPING OF REQUIREMENTS WITH BIZAGI MODEL

Requirements	Bizagi Model			
	Performer	***Model Data***	***Forms Creation***	***Business Rules***
Input loan proposal	Applicant	-ProposalNumber -SubmissionDate -ApplicantName -BankName -AccountNumber -Status	Input loan proposal	-ActivityActions: CheckFormCompleteness -TransitionConditions: (Status: Incomplete, Complete, Canceled) -Events Actions: LoanApplicationCanceled
Input assets appraisal	Property Appraiser	-PropertyAppraiserID -PropertyName -PropertyAddress -PurchasingPrice -InterestType	Input assets appraisal	-ActivityActions: RequestStandardAssetValue -TransitionConditions: (InterestType: Variable, Fixed) -Events Actions: -
Input credit history validation	Financial Officer	-FinancialOfficerID -LoanAmount -LoanDuration -StartDate -CreditCardProvider -RiskWeight	Input credit history validation	-ActivityActions: RequestBIChecking, SetRiskWeight -TransitionConditions: (CreditAssessment: “D=25”,”C=50”,”B=75”,”A=100”) -Events Actions: -
Input eligibility assessment	Loan Officer	-LoanOfficerID -MonthlyRepaymentAccount -RepaymentAgreed	-Input eligibility assessment - TakeFinalDecision	-ActivityActions: ClassifyLoanRisk -TransitionConditions: (RepaymentAgreed: Approved, Rejected) -Events Actions: ApprovalNotifiedtoApplicant, RejectionNotifiedtoApplicant

Based on Table I, then design the business processes To-Be as Model the Proces**s** in Bizagi with user interface type activities are obtained from Forms Creation and scripts type activities are obtained from Business Rules in Table I.

At the beginning, applicant input the loan proposal data then Financial Officer will approve the loan proposal. Furthermore, Property Appraiser will provide an assessment of the loan proposal. Finally, Loan Officer will decide whether the loan proposal is accepted or rejected. If accepted, the application will send an Approve Application activity, whereas if rejected, the Applicant will receive a rejection notification as Reject Application activity.

Once a business processes changing occurred from Submission Approval, for example there is an addition or subtraction of the approval order, it can be done on the Model the Process, Business rules and Performers in Bizagi stages. Tests for the steps above will be carried out on business processes by removing the approval hierarchy from the Property Appraiser. Where is the previous business process, after the Applicant submits the loan application, approval is done in parallel by the Financial Officer and Property Appraiser. In the new business process, after the Applicant submits a loan, approval will be made by the Financial Officer, finally by the Loan Officer, as shown in Fig. 5.

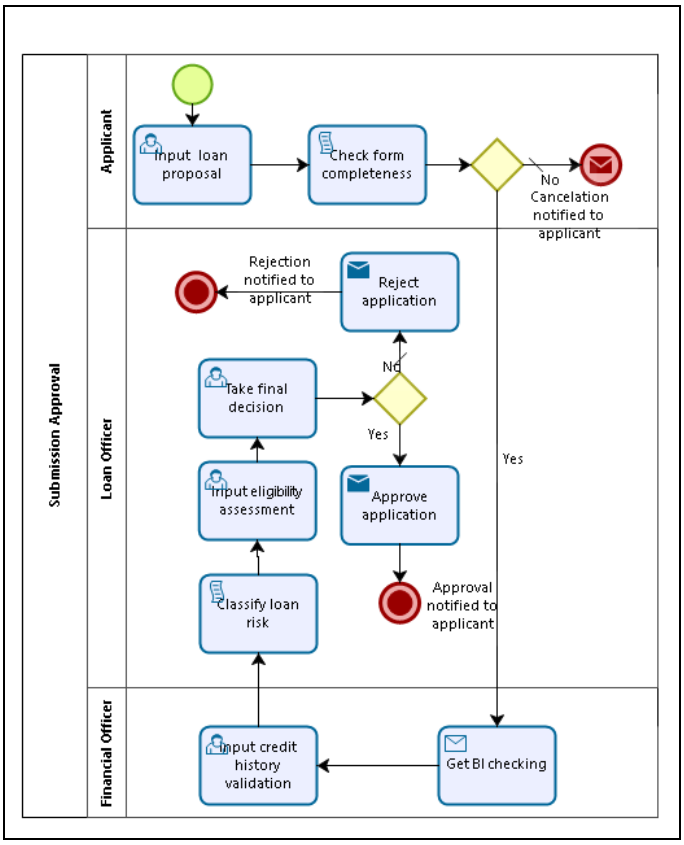

Fig. 5. Removal of approval hierarchy by property appraiser.

After Model the Process has changed, next step is to redefine the Business Rules on Check Credit History activity by Financial Officer and Assess Eligibility activity by Loan Officer. Usually the changes in Business Rules will be carried out by conducting Define Expressions and Activity Actions,

but for the case study in this research, by removing the gateway. Then the existing business rules were deleted automatically. Finally, deploy the new business process of To-Be on the Bizagi's server.

IV. CONCLUSION

Bizagi as BPMS in this research can be seen as a tool for business processes mapping software in modelling and prototyping. GORE with KPIs implementation has been able to control various level stakeholder requirements and facilitate more easily identified the value-added based on a list of business processes As-Is problems or can be elicited from goals to be fulfilled as business processes improvement. However, a good software is also required an entity of Process, Data, and User Interface sustainable correlation. All entities influence each other, as a Process changing held then it will be affected the model of Data and User Interface. A suggestion for further research is the requirements elicitation includes all activities and gateways type implementation that it will be in accordance with more comprehensive business processes mapping framework [10].

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REFERENCES

[1] H. Paul, Business Process Change: A Guide for Business Mangers and BPM and Six Sigma Professional. Burlington, USA: Morgan Kaufmann Publishers, 2007.

[2] P, Roger, Software Engineering: A Practitioner's Approach. 5th Edition. Minnesota, 2005.

[3] A, Fransiskus, H. Bayu, and S. Benhard, "Organization goal-oriented requirements elicitation process to enhance information system," International Journal of Electrical and Computer Engineering (IJECE). vol. 6, no. 6, pp. 3188 - 3195, 2016

[4] R. Darimont, C. Ponsard, and M. Lemoine, "Goal-Driven elaboration of OCL enriched UML class diagrams," CEUR-WS.org, vol. 2245, 2018.

[5] M. Silva, et al., "Requirements engineering at a glance: Comparing GORE and UML methods in the design of automated systems," Conference: XXII Congresso Brasileiro de Automatica, 2018.

[6] A. Unger, M. Spinola, and M. Pesoa, "Requirements engineering approaches to derive enterprise information system from business process management: A systematic literature review," CEUR-WS.org, vol. 2060, 2018.

[7] "Bizagi Digital Process Automation and BPM," downloaded from https://www.bizagi.com.

[8] F. Adikara, B. Sihotang, and B. Hendradjaya, "Goal-Oriented requirements engineering: State of the art and beyond," 2nd International Conference on Information Technology and Business Application, 2013.