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Designing loss event database using evolutionary prototyping model to perform bank operational risk management identification process

N A Hamdani¹, E Yulianto^{2,*} and G A F Maulani¹

¹Universitas Garut, Garut, Indonesia

²Langlangbuana University, Department of Informatics, Bandung, Indonesia

*rwinyulianto@yahoo.com

Abstract. Many banks in Indonesia have failed in the process of transformation towards their vision, due to a lack of awareness in managing risk and not growing a risk-based culture. The external and internal environment of the banking system is experiencing rapid development which will be followed by increasingly complex risks for banking business activities. Loss Event Database is a solution to perform the function of identifying and measuring Operational Risk Self-Assessment. The research method used to design and build a Loss Event Database refers to the Evolutionary Prototyping model where at each stage, the involvement of developers and users is intensely carried out. The implementation of Operational Risk Self-Assessment through the development of a Loss Event Database using the Evolutionary Prototyping model is able to reduce the operational risk rating from the Moderate to Low to Moderate level, meeting the requirements of good corporate governance in accordance with applicable regulations and best practices in the banking world.

1. Introduction

Designing Loss Event Database is believed to increase performance of bank operational risk management identification process. Many banks in Indonesia fail in the process of transformation towards their vision because it reduces awareness in overcoming risks and does not foster a risk-based culture [1]. The external and internal environment of the banking system is experiencing rapid development which will be followed by increasingly complex risks for banking business activities [2]. The increasing complexity of risks for banking business activities will increase the need for good governance practices and the identification, measurement, monitoring and, risk management functions of banks. The improvement of the functions of identification, measurement, monitoring, and risk control is intended so that the business activities carried out by banks do not cause losses that exceed the ability of banks or that can interfere with the continuity of bank business [3]. The management of each functional bank activity must be integrated into a system and process of risk management that is accurate and comprehensive as far as possible [4]. One significant risk that has a big problem is operational risk. Operational risk is a risk inherent in all banking activities and work units of the Bank, so awareness of operational risks by work units is a must [5].

The trend of operational risk exposures at the Bank experienced a significant increase in all work units. This is due to the lack of adequate methodology and Operational Risk Self-Assessment tools and



HR competencies. Adequacy of a proper Operational Risk Self-Assessment will enhance the strength of the Bank's risk governance structure [6].

The implementation carried out in managing operational risk is the availability of an operational risk loss database. Without an adequate loss database, banks will experience difficulties in the process of preparing an operational risk loss measurement model [7,8].

The operational risk loss database is a way for companies to find out historical operational risk events that cause losses to the company, the recording is useful for knowing the strength of bank capital and as an experience for banks to mitigate future risks [9].

Each bank must conduct an Operational Risk Self-Assessment, which aims to continuously develop and maintain a management plan and the application of risk management as an integral part of the corporate governance framework in achieving company performance targets [10].

2. Methods

The research model used is an implementation of the Evolutionary Prototyping Model [11]. The following is an illustration.

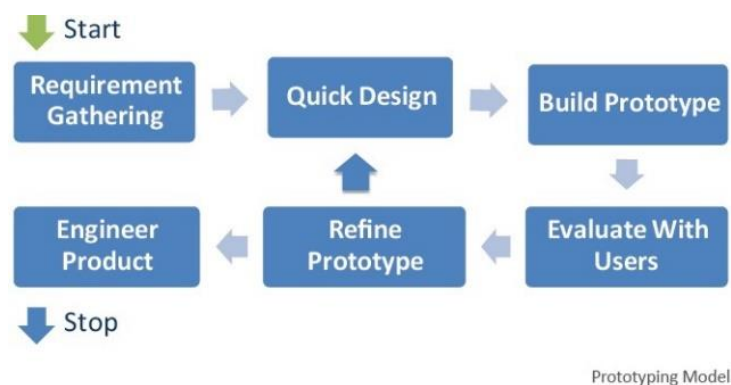


Figure 1. Evolutionary prototyping model [11,12].

This study also uses a qualitative approach that will be used in the design of the Loss Event Database using the Evolutionary Prototyping model as a Software Development Life Cycle with the steps as shown below.

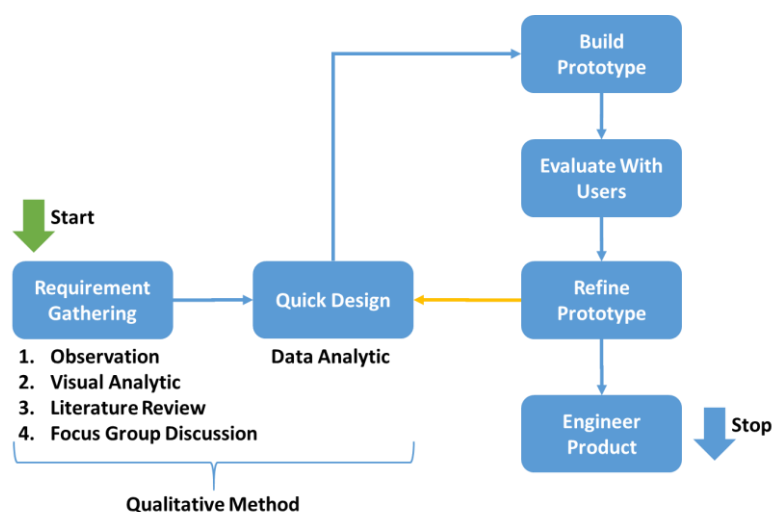


Figure 2. Stages of qualitative methods with evolutionary prototyping model.

3. Result and discussion

3.1. Business process

Based on the requirements gathering results, Figure 3 shows the business process of implementing the Risk Management Information System that will be developed.

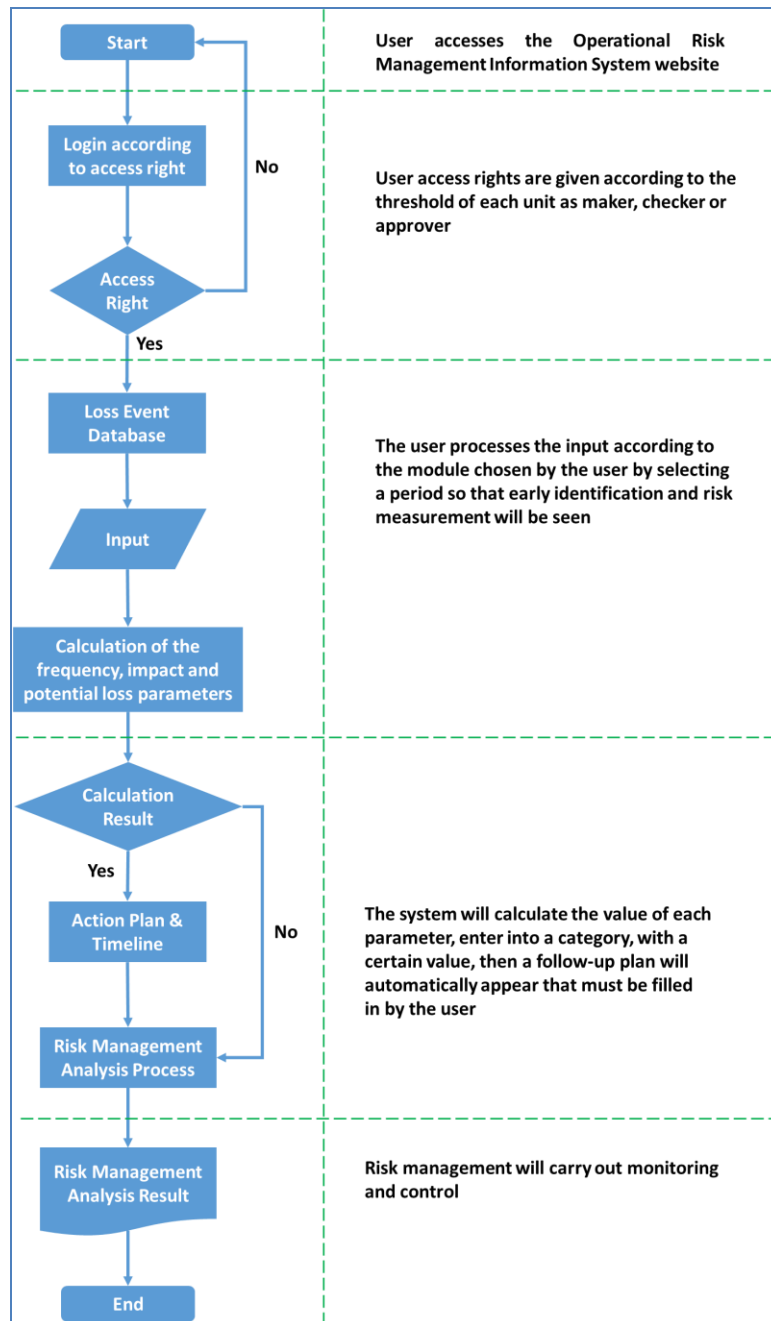


Figure 3. Business process of risk management information system.

The Loss Event Database business process that is part of the Risk Management Information System can be seen in Figure 4 below. The business process of implementing the Loss Event Database is in accordance with the regulations in force in national banks [13].

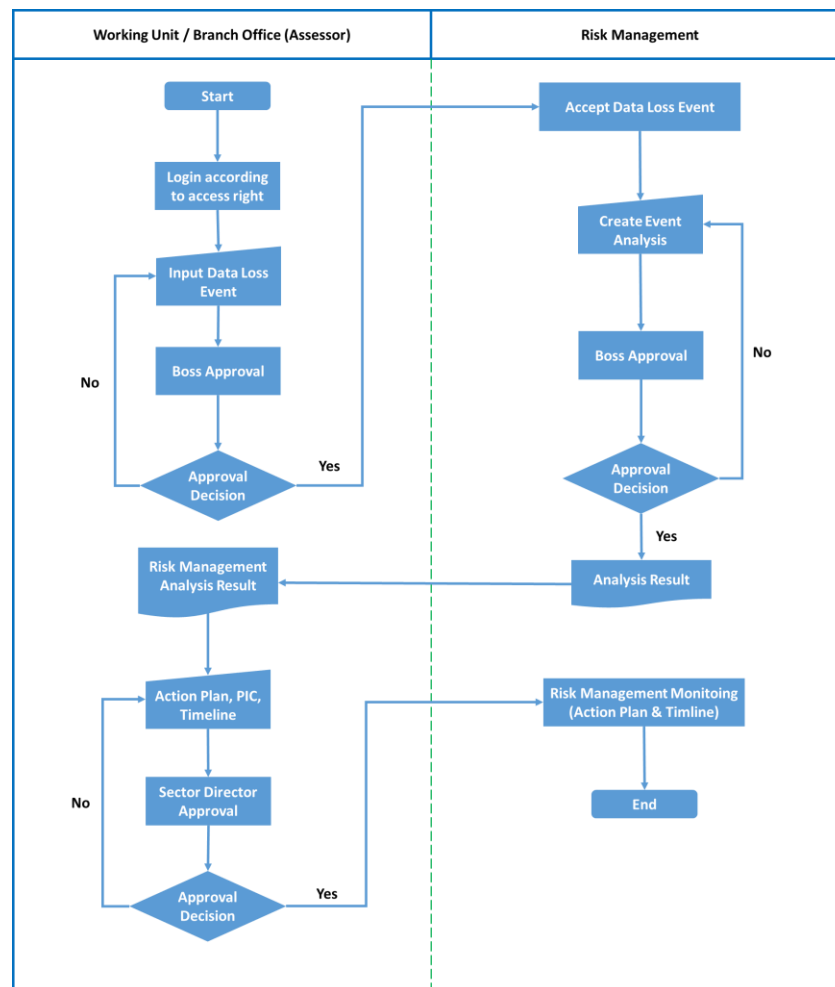


Figure 4. Business process of loss event database.

The Loss Event Database developed starts from the input of the main parameters. After the parameters are well defined, proceed with filling in the Risk Event, Risk Assessment, and Action Plan.

3.2. User requirement analysis

Mapping user needs related to the design of the Loss Event Database to be developed can be seen in Table 1.

Table 1. User requirement analysis.

Role	Risk Management	Head Office	Branch Office
Approver	Division Head	Division Head	Branch Manager
Checker	Group Head	Group Head	Manager
Maker	Officer	Officer	Supervisor
Administrator	Staff	-	-

3.3. Sitemap design

The Loss Event Database that will be developed consists of several primary modules, namely Dashboard that can be accessed by all User Categories, Master Parameters that can only be accessed by Administrators in the Risk Management Working Unit, Maker-based LED Working Paper,

checkers, approvers that can be accessed by Risk Management Working Unit and Risk-Taking Unit and Report. Next Figure 9 is a Sitemap of the menu management developed.

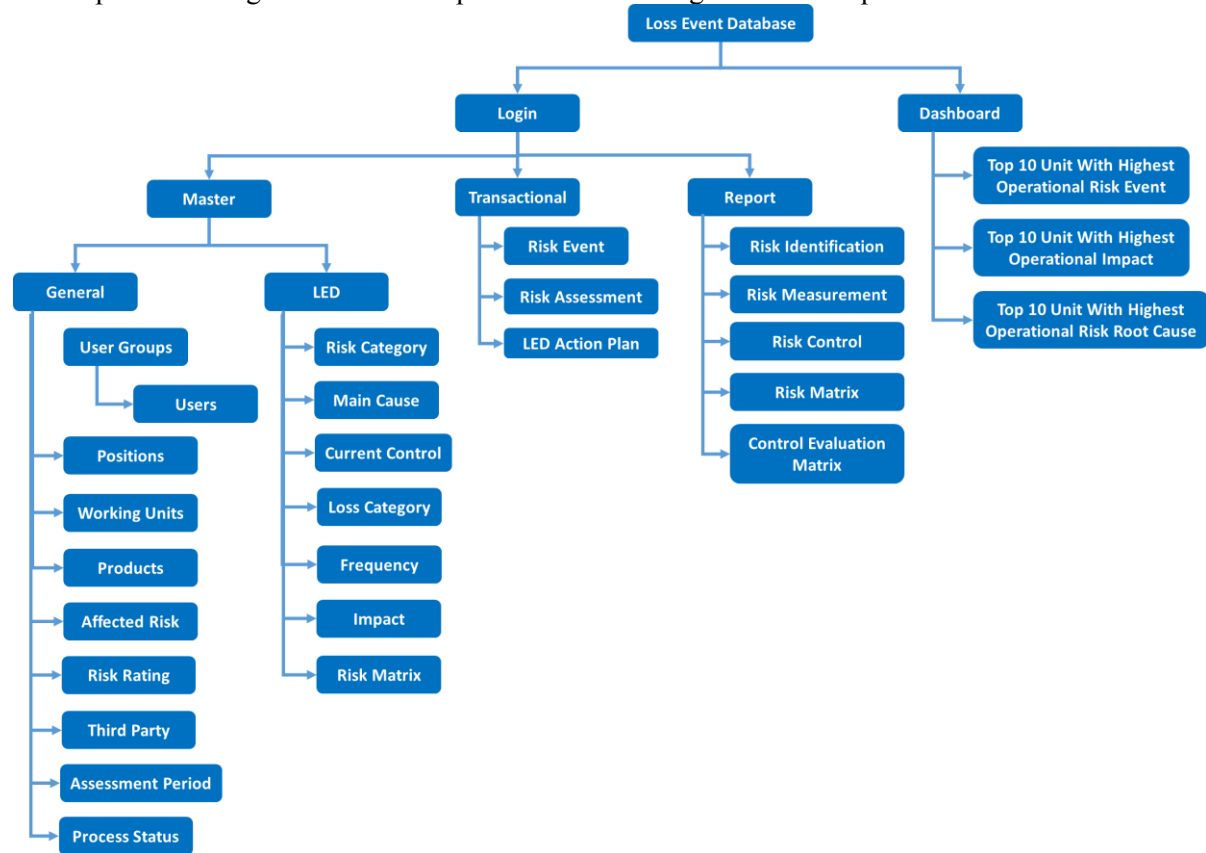


Figure 5. Loss event database sitemap.

3.4. Database design

Database design that will be applied to the implementation of Loss Event Database can be seen in Table 2 below.

Table 2. LED database design.

Table Name	Fields
TUser	User_ID (PK), UserName, ID_User_Group (FK), Pass, ID_WorkingUnit, Status
TUserGroup	UserGroup_ID (PK), UserGroup, Desc, Status
TPosition	Position_ID (PK), PositionName, Desc, Status
TWorkingUnit	WorkingUnit_ID (PK), Parent_ID (FK), 3LoD, WorkingUnitName, Desc, Status
TProduct	Produk_ID (PK), ProductCode, ProductName, Desc, Status
TAffectedRisk	Aff_Risk_ID (PK), AffRiskName, Desc, Status
TRiskRating	RiskRating_ID (PK), TriggerActPlan, RiskRatingName, Desc, Status
TThirsParty	ThirdParty_ID (PK), ThirdPartyName, Desc, Status
TProcessStatus	ProcessStatus_ID (PK), NextProcessStatus_ID (FK), ProcessStatusName, Cond, Stat
TAssessmentPeriod	AssessmentPeriod_ID (PK), AssPeriodeName, Desc, Status
TRiskCategory	RiskCat_ID (PK), RiskCatName, Desc, Status
TMainCause	MainCause_ID (PK), OpRiskCat, MainCauseName, Desc, Status

Table 2. Cont.

TCurrent Control	CurrCtrl_ID (PK), CurrCtrlName, Desc, Status
TLossCategory	LossCat_ID (PK), LossCatName, Desc, Status
TFrequency	Frequency_ID (PK), FrequencyName, Desc, Stat
TImpact	Impact_ID (PK), ImpactName, Desc, Stat
TRiskMatrix	RiskMatrixID (PK), FrequencyID (FK), ImpactID (FK), RiskRatingWeight, ColorCode, Status
TRiskEvent	RiskEvent_ID (PK), UserID (FK), WorkingUnitID (FK), ReportDate, EventDate, ProductID (FK), RiskCatID (FK), RiskEvent, Desc, ThirdPartyID (FK), MainCauseID (FK), LossCatID (FK), Nominal_Loss, Aff_Risk_ID (FK), ActionTaken, SupportDoc, ProcessStatusID (FK)
TAssessment	Assessment_ID (PK), RiskEventID (FK), UserID (FK), CurrCtrlID (FK), EventImpact, RiskRatingID (FK), Recomendation, SupportDoc, ProcessStatusID (FK)
TActionPlanLED	ActionPlanLED_ID (PK), RiskEvent (FK), Assessment_ID (FK), ActionToBeTaken, UserID (FK), StartDate, EndDate, Recovery, RecoverySource, SupportDoc, ProcessStatus (FK)

3.5. Database design

The hardware and network design used in this study can be seen in Figure 10 as follows.

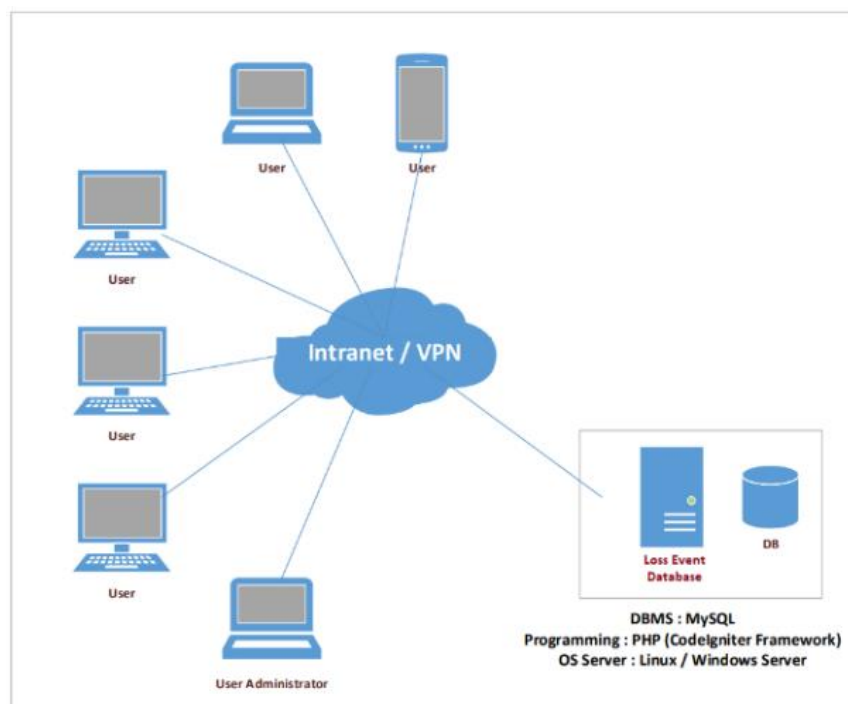


Figure 6. Hardware and network design.

4. Interface design

User Interface Design is a design for software applications that focus on user experience and interaction between users and application. Following some interfaces design of the Loss Event Database (LED) application and the explanation can be seen as follows:

- Input Risk Event Menu, is a menu intended for the Risk-Taking Unit to manage Risk Events. This menu can be seen in Figure 7 below.

Figure 7. Input risk event.

- Loss Frequently Trend Menu. This menu can be seen in Figure 8 below.

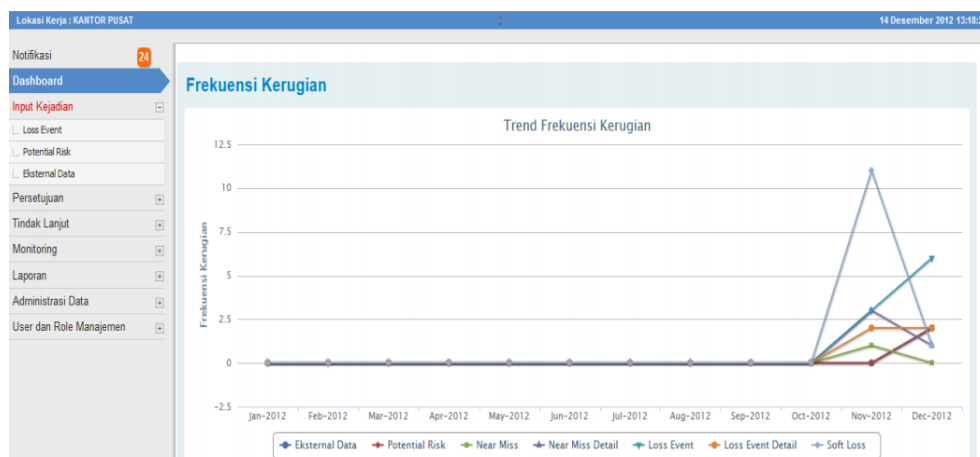


Figure 8. Loss frequently trend.

- Risk Matrix Menu, an operational risk measurement menu, which shows the level of risk ranking based on risk events viewed from the frequency and impact caused. This menu can be seen in Figure 9 below.

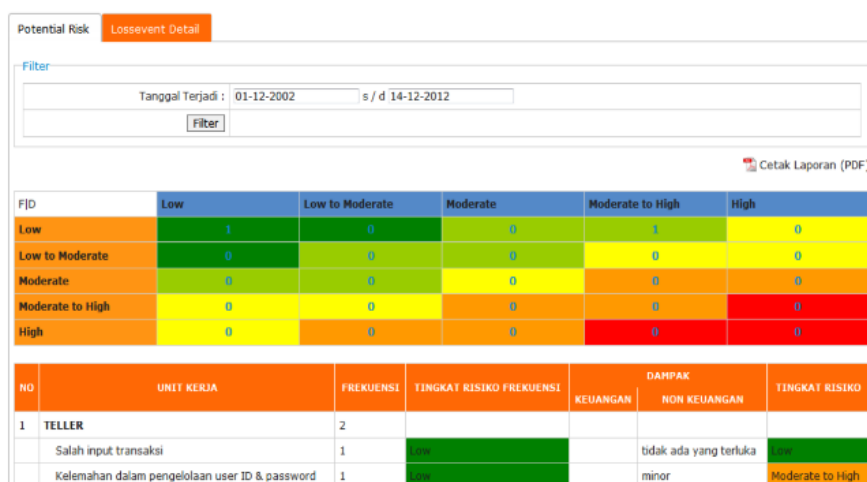


Figure 9. Risk matrix.

5. Conclusion

Based on the results of the research conducted, the design of the Loss Event Database was able to answer all the hypotheses above. Conclusions obtained in the research include Loss Event Database has the ability to collect various types of operational risk events that are integrated between internal events based on POJK and external risk events originating from other banking industries, data loss consortia, and media coverage, including mapping the frequency and impact of their occurrence. In addition, the Loss Event Database is able to make a model of measuring operational risk loss and is a validation tool for each risk assessment or prediction process so as to ensure that the internal operational risk control process is sufficient.

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