CHAPTER 4 RESULT AND DISCUSSION

Result and discussion chapter provides a comprehend result regarding the research. In descriptive result section, overview on research participant and data gathering result are given. In inferential analysis, the model that is used in the research is specified. Identification assesses the model capability to be used in this research, while validity and reliability testing hypothesis testing are delivered in testing and estimation model analysis. Other discussion such as research implication and limitation of study are given to give the reader complete view on the research issue.

4.1 DESCRIPTIVE ANALYSIS

Descriptive analysis gives explanation about the research participants background of research site and. Included in descriptive analysis are the overview of research participants and data gathering result.

4.1.1 Overview of Research Participants

Detail of the research participants is explained in this section. The details are divided into three sections, according to its corresponding research instruments. Those sections are questionnaire, interview, and documentation study.

4.1.1.1 Questionnaire

A total of 140 questionnaires were distributed to employees in Bank X Training Center in early April 2008. The during data collection, 77 questionnaires were able to be gathered and analysed. Thus, the effective response rate is 55 percents. Several tables and figures below show trend in research participants.

Figure 4.1 shows that 44 percents of total valid samples have worked in the bank for more than 15 years. This includes numbers of years that they have spent

working in legacy bank. By this numbers, it is expected that they understand the organisational process very well.

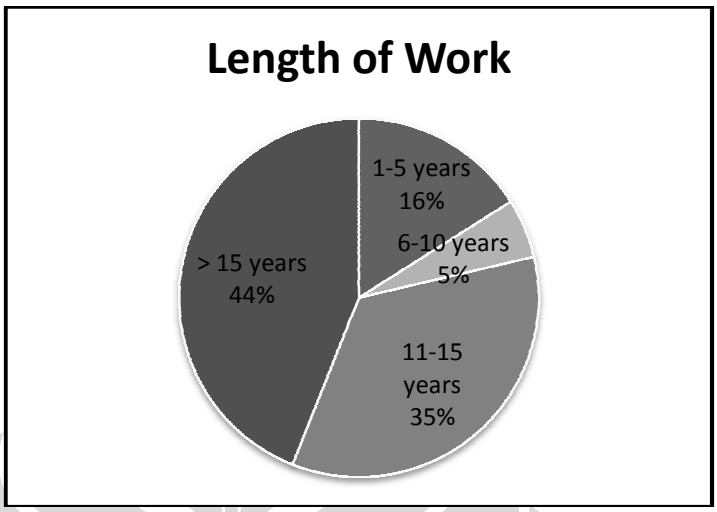

Figure 4.1 Length of Work

Figure 4.2 Positions in Bank X shows that in general, 38 percents from total valid samples, participants act as managers in the organisation. As managers, they accustom to use KM system in their working activities. Beside that they have the also responsibility to encourage others to use the system.

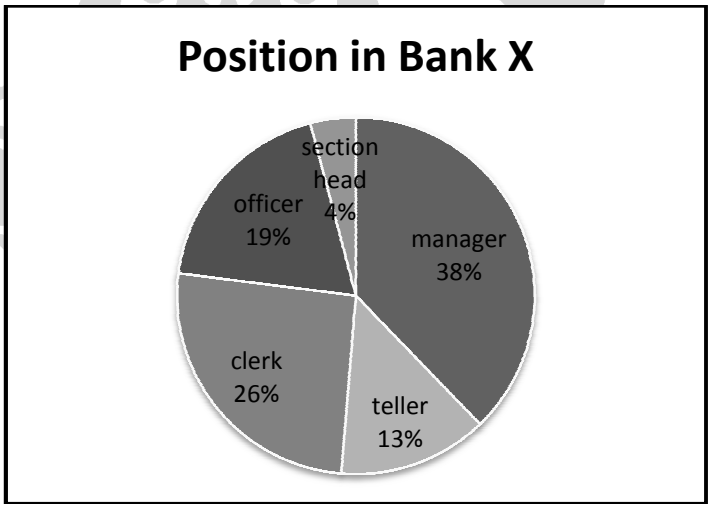

Figure 4.2 Positions in Bank X

In addition, 84 percents from overall valid samples have used Bank X's KM system: Learning Management System for more than 3 years. This implies that for the last three years, they regularly use the system. The system itself had been

implemented in the organisation for about 5 years, since 2003. Detail of the number on KM system usage in Bank X can be seen in Figure 4.3 below.

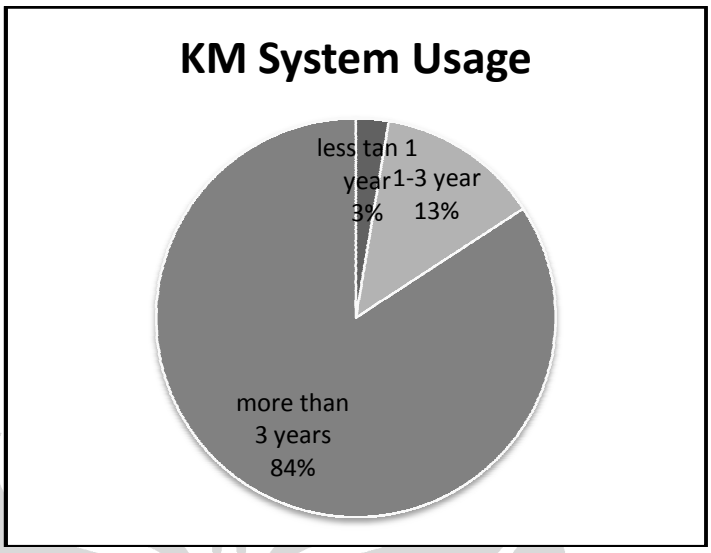

Figure 4.3 KM System Usage

4.1.1.2 Interview

Interviews were held with the CKO, manager, and administrator staffs of Bank X Learning Center Group. Those roles are responsible to lead the execution of KM initiative. Detail of interview log and profile of the interviewees can be seen in Appendix 1.

4.1.1.3 Documentation study

Documentation study was being held against Bank X's KM system implementation reports around mid April 2008. A previous conducted internal research on Bank X's KM system: Learning Management System was also studied. The result then incorporated in literature review.

4.1.2 Overview of Data Gathering Results

General analysis on data gathering results are provided to give a quick preview on the results. From the analysis, general trend on the result of each data gathering technique can be identified. The details are divided into three sections, according to its corresponding research instruments.

4.1.2.1 Questionnaire

After summarising all questionnaire results based on each indicator variables (relevancy, quality, and availability for KM system performance, and efficiency, effectiveness, and innovativeness from organisational process performance), questionnaire results are analysed based on its data dispersion and central tendency. This calculation is done through SPSS 15. The raw questionnaire result can be seen in Appendix 1.

Based on table below, it can be derived that a total of 77 samples are valid and used in the study. For each indicator of KM system performance, the value of std. deviation, variance, minimum and maximum mean are differed. The most dispense data is found in availability, with minimum and maximum value are 8 and 20, and overall location of distribution or mean is 15.56 with scale (variance) 7.38.

Table 4.1 KM System Performance Statistics

		Relevancy	Quality	Availability
N	**Valid**	77	77	77
	Missing	0	0	0
Central Tendency	**Std. Deviation**	2.63611	2.449001	2.716875
	Variance	6.949077	5.997608	7.381408
	Minimum	12	12	8
	Maximum	25	25	20
Dispersion	**Mean**	21.2987	20.36364	15.55844
	Median	21	20	16
	Mode	20	20	16

Based on Table IV.2, it can be derived that a total of 77 valid samples are used in research process. Each indicator of organisational process performance has its own central tendency and dispersion rates. Among those three, data points in innovativeness are the most close to the mean. It is shown with small std. deviation value. The data have mean value of 16.60 with minimum value 10 and maximum value 20. Variance shows that the data are spreading out with scale of

3.80. It can also be noticed for the table that those three indictors have relatively similar mean value, which is around 16.45.

Table 4.2 Organisational Process Performance Statistics

		Efficiency	Effectiveness	Innovativeness
N	**Valid**	77	77	77
	Missing	0	0	0
Central Tendency	**Std. Deviation**	2.458959	2.099784	1.948412
	Variance	6.04648	4.409091	3.796309
	Minimum	8	9	10
	Maximum	20	20	20
Dispersion	**Mean**	16.35065	16.45455	16.5974
	Median	16	16	16
	Mode	16	16	16

4.1.2.2 Interview

During the interviews, information about Bank X's KM initiative and KM system weas gathered. CKO gave in dept insight on the development of KM initiative on Bank X, as well as information about the Learning Center Group as suburbanisation that maintains and executes KM initiative. Manager gave information about how the KM system is involved in the organisational process, while administrators gave information on KM system maintenance. Any additional questions and answers on specific matters were emailed directly to the proper sources after the interview session end or gathered from the Bank X's official web site. Appendix 1 provides the detail of the interview both questions and answers. The overall results of the interviews then were combined in the literature review.

4.1.2.3 Documentation study

From the documentation study, it can be reported that the number of employee who accesses Bank X's Learning Management system is 10,043 people (Bank Mandiri (Persero) Tbk, 2007). The diagram below shows the number of Bank X's Learning Management system users that was fluctuated since it was first

introduced in year 2003. The highest access of the system was 119.553 users in 2005.

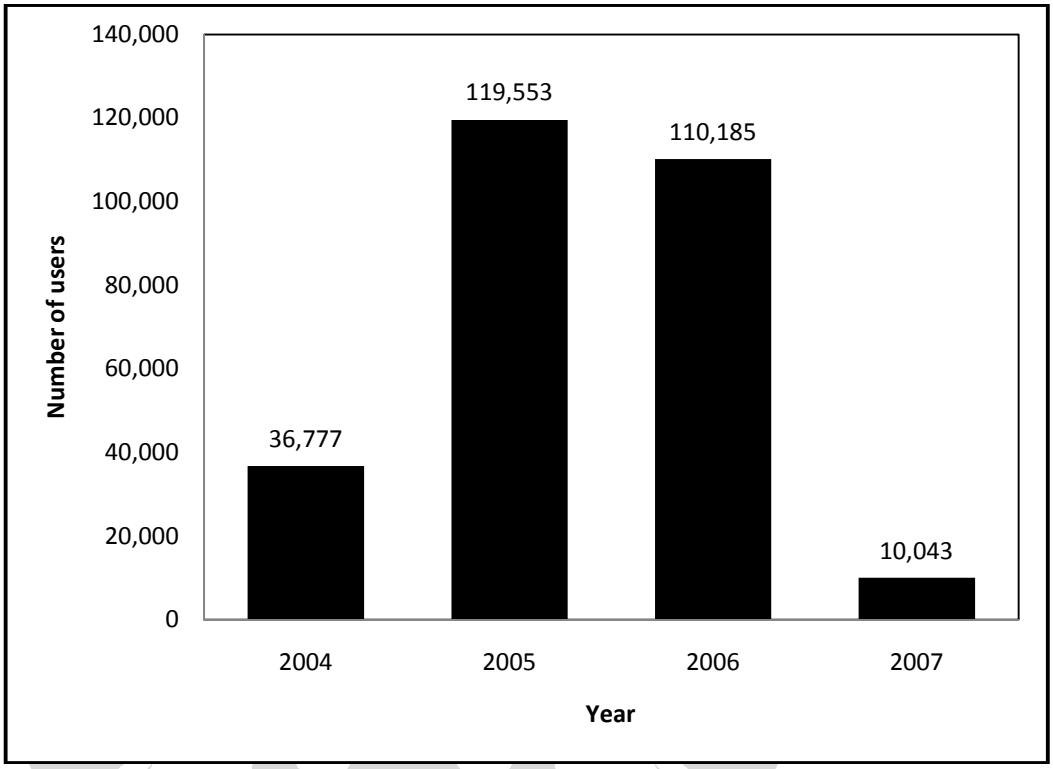

Figure 4.4 Number of Users of Bank X Learning Management System. Adopted from Bank X E-Learning Report (2007).

4.2 INFERENTIAL ANALYSIS

Below is the inferential analysis that is divided into three main sections. Those sections are (1) specification model analysis, (2) identification model analysis, (3) and testing and estimation model analysis.

4.2.1 Specification Model Analysis

AMOS 16 is used to translate the model that is used in this research. It comprises two latent variables, which are KM system performance and organisational performance. For each latent variable there are exists three indicators: relevancy, quality and availability for KM system performance and efficiency, effectiveness,

and innovativeness for organisational process performance. The relation between variables then showed using directional arrows. Figure below shows the research hypothesis that is modelled using AMOS.

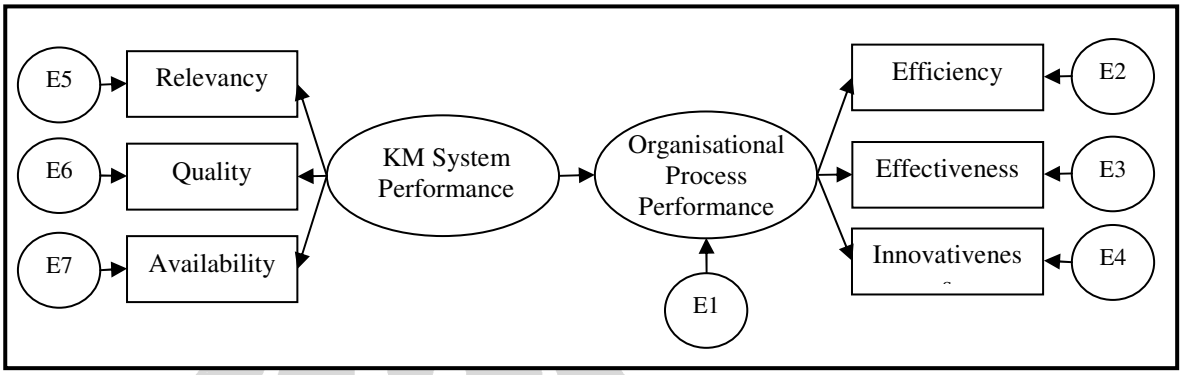

Figure 4.5 Organisational Process Performance Model

4.2.2 Identification Model Analysis

Identification model analysis is measured using degree of freedom, sample size test, outlier observation, and assessment of normality. During the analysis, the model is checked, if it meets the standard or not. Detail of the analysis is explained as follow.

4.2.2.1 Degree of freedom

To compute degree of freedom, AMOS 16 is employed. After analysing Table 4.3 Computation of Degree of Freedom (df), the model has positive df result and can be called as over identified model. Thus, this model has enough information and can be used as research model.

Table 4.3 Computation of Degree of Freedom (df)

Number of distinct sample moments	21
Number of distinct parameters to be estimated	13
Degree of freedom (df)	8

4.2.2.2 Sample size test

It can be seen on Figure IV.5, that the model has six indicators. Thus, minimum sample size that is required for this model is 30 samples. In facts, total samples that have been collected for this research were 77 samples. Therefore, the minimum requirement for sample size is fulfilled.

4.2.2.3 Outliers observation

By analysing the p1 and p2 values in Appendix 4, it can be stated that there are 5 outliers in the research data. The outliers then are removed from the analysis. And the final numbers of sample that are used in the SEM analysis are 72 samples.

4.2.2.4 Assessment of normality

According to Table IV.4 below, it can be observed that the value of skew c.r and kurtosis c.r for all indicators are less than ± 2.58. Thus, the data is normally distributed, and feasible to be used in SEM analysis. For complete Assessment of normality table see Appendix 4.

Table 4.4 Assessment of Normality

Variable	**Skew c.r.**	**Kurtosis c.r.**
Innovativeness	1.133	.239
Effectiveness	.612	-.007
Efficiency	.174	-1.103
Availability	-.280	-.154
Quality	1.136	-.983
Relevancy	-.848	-.056
Multivariate		1.773

4.2.3 Testing and Estimation Model Analysis

The identification model analysis that has been conducted previously indicates that the data and the model are ready for further analysis which is testing and estimation model analysis. In testing and estimation model analysis subsection,

measurement analysis, or also know as fit model analysis, and structural model analysis's results are explained as below.

4.2.3.1 Measurement model analysis

Table 4.5 Model Goodness of Fit

Goodness of Fit Index	Cut-off Value	Calculation result
Chi-Square (X^2)	< X^2 table (15.507)	17.039
Probability	> 0.05	0.030
GFI	> 0.9	0.924
RMR	Close to zero / as small as possible	0.266
NFI	> 0.9	0.935
CFI	> 0.9	0.964
PRatio	0 < PRatio < 1	0.533
AIC	< AIC independent model (275.731)	43.039
ECVI	< ECVI independent model (3.884)	0.606

Based on model goodness of fit tables above, the fact that chi-square and probability are affected by sample size makes this model very unlikely to meet accepted level (Santoso, 2007; Barrett, 2007). Therefore, other tests are used as base to decide the fitness of the model. The GFI, NFI and CFI values are higher than 0.9, and RMR is relatively close to zero. These numbers indicate a good fit. In addition, the PRatio value is between zero and one, and AIC as well as ECVI values are smaller than its independent model's value. These also indicate a close fit. Overall model fit summary can be seen in Appendix 4. Consequently, after judging that the model is fit, structural model analysis can be proceed as next analysis.

4.2.3.2 Structural model analysis

Table below shows relationship between indicators and its corresponding latent variable in regression weights table. The results in this table are used in validity and reliability testing. Moreover, parameter and hypothesis testing is also conducted based on this table.

Table 4.6 Regression Weight

			Standardised Estimate	Probability (P)
Relevancy	<--	KM System_Performance	.763	***
Quality	<--	KM System_Performance	.921	***
Availability	<--	KM System_Performance	.627	***
Efficiency	<--	Organisational Process_Performance	.793	***
Effectiveness	<--	Organisational Process_Performance	.911	***
Innovativeness	<--	Organisational Process_Performance	.790	***

4.2.3.2.1 Validity testing

Table 4.6 shows that P values for all indicators are very significant (less than 0.001). This number is below the cut-off value, which is 0.05. Thus, it shows that each indicator is able to measure what is supposed to measure exactly. By means, the indicator variables used in this research are valid.

4.2.3.2.2 Reliability testing

VE computation is calculated based of standardised regression weight. Each latent variable has their VE values. Values for each variable are as follow:

$$VE\ KM\ system\ performance = {(0.763^2 + 0.921^2 + 0.627^2)}/{3} = 0.6078$$

$$VE\ Org\ process\ performance = {(0.793^2 + 0.911^2 + 0.790^2)}/{3} = 0.6942$$

Result of both calculation is greater than 0.50. By means there exists a sufficient convergence level in the model (Santoso, 2007). Thus, the resulted data is reliable.

4.2.3.2.3 Parameters and hypothesis testing

Generally, based on Table 4.6, it can be stated that all KM system performance's indicators are related to KM system performance. Along with KM system performance, organisational process performance's indicators are also related to organisational process performance. Although, in each relation, the loading factor (estimates) may vary. This decision can be drawn since the estimate values for relation are greater than cut-off value of 0.50.

Based on standardised estimation value, quality (0.921) has the strongest relation to KM system performance. Second to that is relevancy (0.763), and the last is availability with rate 0.627. In the other case, effectiveness (0.911) is the most influential factor in organisational process performance, where efficiency (0.793) and innovativeness (0.790) have slightly the same influence in organisation process performance.

Based on squared multiple correlation table below, 84.9 percents from observe variable quality is able to be explained by latent variable KM system performance, where in organisational process performance, 83.1 percents of observe variable effectiveness is able to be explained by latent variable organisational process performance. More detail can be found on table below.

Table 4.7 Squared Multiple Correlations

		Estimate	**Percentage**
Organisation Process Performance	Innovativeness	.624	62%
	Effectiveness	.831	83%
	Efficiency	.629	63%
KM System Performance	Availability	.394	39%
	Quality	.849	85%
	Relevancy	.582	58%

In hypothesis testing, standardised regression weight and squared multiple between organisational process performance and KM system performance correlations are stated in table below.

Table 4.8 Hypothesis Testing

Standardise Regression Weight	**Estimate**	**Percentage**
Organisational Process_Performance <--- KM System_Performance	.853	
Squared Multiple Correlations		
Organisational Process_Performance	.727	72%

Recall the condition that:

H_0: KM system performance does not relate to organisational process performance.

H_1: KM system performance positively influences organisational process performance.

H_0 is accepted if estimate value (loading factor) between organisational process performance and KM system performance is smaller than 0.5, and vice versa. According to table above, estimated value of standardise regression weight for organisational process performance and KM system performance is 0.853. The number is greater than 0.5, then H_0 is rejected. Therefore, H_1 is accepted: KM system performance positively influences organisational process performance.

In addition, based on squared multiple correlations, it also can be confirmed that 72.7 percents of organisational process performance is able to be explained by KM system performance, while the rest (27.3 percents) is explained by unique values that are not covered in this research.

4.2.3.2.4 Regression equation model

Regression equation model for KM system performance and organisational process performance is constructed based on model's structural coefficient. Table below provide values that are required for the equation.

Table 4.9 Structural Coefficient Model

	Standardised
λ_0	-
KM system performance (X)	.853

Standardised equation model is:

$$\text{Organisational Process\_Performance} = 0.853 * \text{KM System\_Performance}$$

This model means When KM System_Performance (X) goes up by 1, Organisational Process_Performance(Y) goes up by 0.853.

4.3 RESEARCH IMPLICATION

This research tests the impact of KM system performance on particular organisational performance. Derived from analysis result above, it can be concluded that Bank X's KM system: Learning Management System performance positively influence organisational learning process. The model that was proposed at the beginning of the system can be applied in the implementation of KM system in Bank X.

In detail, based on the model, KM system performance in Bank X is influenced by three indicators. Those are (1) system relevancy, (2) system quality, and (3) system availability. In addition, learning process as Bank X's Organisational process that is observed in this research, also relates to three indicators: (1) effectiveness, efficiency, and innovation level. Any improvement that is made in the Bank X's KM system: Learning Management System performance is able to increase the organisational learning process.

By observing the facts, it is true that for KM system to be able to contribute to the organisation, as it stated in the literature review. In order to be able to perform, the system need to be tailored to organisation needs (Folkens & Spiliopoulou, 2004). The sufficient knowledge culture is also necessary to be build around the implementation of KM system. Managements are required to support its employee to be a knowledge worker, by assessing them based on their capability rather than length of work. Therefore, employee is motivated to share knowledge and create a new knowledge on order to be innovated and skilled so he/she is able to achieve high position in the organisation. As for the organisation, highly skilled and knowledgeable employee will result effective and efficient organisation process performance that leads to customer satisfaction.

4.4 RESEARCH LIMITATION

The findings in this research need to be considered together with its limitation. First this research only assesses a single KM system, which is Bank X's KM system: Learning Management System. And its implication is only focused one organisational process which is learning process that is happened in Bank X Learning Center Group.

During the research, data collection might be influenced by participants' bias. Although validity and reliability testing had been done and the results had been incorporated to the final data gathering instruments to reduce any possible errors. The sample size for questionnaire also considered as small. Further research with larger sample size is suggested to improve model fit.

While the research is limited to Bank X's KM system: Learning Management System as the only factors that influence organisation learning process, there might be other factors that influence organisation learning process that was not taken into account. This is due to this particular research only assessing single independence variable which is KM system performance. Any other factor may not be relevant to the research topics.