ISSN 1816-6075 (Print), 1818-0523 (Online)
Journal of System and Management Sciences
Vol. 13 (2023) No. 5, pp. 351-370
DOI:10.33168/JSMS.2023.0523

A Case Study on the Readiness of Customer Relationship Management Development

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Abstract. This study aims to determine the aspects that need to be prepared for the CRM development program at Jenderal Soedirman University. The problem that arises is the lack of CRM implementation, so it is necessary to develop CRM. The measurement method used is the Technology Readiness Index (TRI) with indexing analysis and the inner model to analyze the effect of TRI variables on CRM readiness. TRI is used to find out, from the perspective of the contributors, optimism and innovativeness, and from the perspective of the inhibitors, discomfort and insecurity, how to categorize university readiness based on existing reality. An analysis of the influence between variables is used for the inner model in this study and hypothesis testing is conducted. The impacts of the variables optimism, innovativeness, discomfort, and insecurity are analyzed to prove that the TRI perspective is relevant and has an effect on CRM readiness. Basically, previous studies have never conducted CRM readiness research using TRI. The results of this study prove that the TRI variable has a significant effect, with contributory variables having a positive effect and inhibitory variables having a negative effect on CRM readiness. Another output from this study is the role of TRI in analyzing CRM readiness, namely that CRM readiness at Jenderal Soedirman University falls into the ready category, but with the note that several indicators of discomfort and insecurity variables need to be evaluated. It can be concluded from these outputs that discomfort and insecurity, as proven by the inner model, hinder CRM readiness and are relevant. The results of this study can be applied in other studies because the hypotheses are acceptable, and the relevance of TRI to CRM readiness can be applied in other tertiary institutions.

Keywords: Customer Relationship Management, Technology Readiness Index, Readiness, Inner Model, Outer Model

1. Introduction

Customer relationship management (CRM), according to Buttle in Ningsih et al. (2016), is a corporate strategy that combines internal processes and functions with all external networks to generate and realize value for target consumers profitably. CRM is made possible by information technology and supported by high-quality customer data.

CRM at Unsoed emerged along with the rapid use of electronic business (e-commerce and e-business) as a result of the shift from a product-centric to a customer-centric approach. At Unsoed, CRM is implemented by administering lecturer assessment questionnaires to students. However, there are problems in the current CRM application, particularly at the Faculty of Cultural Sciences, such as the lack of informative questionnaires based on the Student Satisfaction Survey (SKM) results. Therefore, it is necessary to develop the existing CRM system.

The SKM results serve as the foundation for the improvement process, aiming to enhance the quality of learning in future semesters. Challenges arise when the output generated is only an index lacking detailed information, and data processing is still carried out manually using Excel. Another issue is that student satisfaction data has not been utilized as a benchmark for budget planning.

In general, the 2021 Business Plan and Budget of Universitas Jenderal Soedirman outline the target performance indicators, programs, and activities to support the achievement of these indicators. It also includes the university's operational plan, evaluation of the results and impact of various development programs, including those funded through competition programs from Kemristek Dikti. Additionally, the document provides analysis of progress, problems, and the performance of the BLU work unit.

1.1. Research Gap

Then, there is a CRM development plan from campus management that requires recommendations on what needs to be prepared. Based on this context, it is necessary to conduct research on the readiness of Unsoed's human resources in order to provide recommendations for CRM development preparations. This research will utilize Technology Readiness Index (TRI) analysis to measure the level of technology readiness for CRM system development in the college academic system, particularly in SKM activities. The purpose of this plan is to enhance information services related to academic activities, with the expectation that the research findings will improve Unsoed's SKM results.

This research is expected to make a contribution to educational institutions, specifically Unsoed, in preparing for the development of a CRM system for their operations. Additionally, the research aims to identify the key aspects that need to be emphasized based on the results of the Technology Readiness Index (TRI) analysis for CRM development.

1.2. Research Question

Based on the background provided, a research question can be formulated to clarify the problem and visualize the research objectives. The research question is as follows:

- How is the CRM readiness index at UNSOED determined based on the perspective of the Technology Readiness Index (TRI)?
- What is the impact of the TRI variables on CRM readiness?

2. Literature Review

Previous research that serves as the theoretical foundation for each research variable is as follows:

2.1. Customer Relationship Management (CRM)

Hanaysha and coworkers (2021) stated that customer relationship management (CRM) has garnered significant attention as a critical strategy for gathering, understanding, and utilizing essential customer data to enhance marketing decisions. In essence, CRM serves as an effective strategic objective in maintaining customer relationships by collecting vital data and utilizing it to inform agile actions. An

organization equipped with the appropriate CRM application and software will be better positioned to address emerging challenges.

2.2. Customer Relationship Management Readiness

Kolpin and colleagues (2015) defined readiness as the capability of prospective partners to:

- Identify the essential traits and characteristics of their institutions.
- Determine areas of alignment and discrepancies.
- Highlight the positive aspects of their similarities.
- Analyze the differences between them.

2.3. Customer Loyalty

Customer loyalty refers to a customer's dedication to a brand, store, or supplier, which stems from a positive attitude and is manifested through consistent repeat purchases (Tjiptono, 2012). It signifies a customer's strong commitment to consistently re-subscribe to or repurchase selected products or services in the future.

2.4. Customer Satisfaction

Based on Hamzah et al. (2022), customer satisfaction is achieved when the needs, wants, and expectations of users are met, leading to continued use or user loyalty. User satisfaction is attained when the product or service provided fulfills or even surpasses the users' desires. Feedback serves as a valuable tool for assessing consumer satisfaction within an organization, enabling improvements in product quality and serving as a reference for future development and implementation. Furthermore, this feedback aids in evaluating organizational performance. Customer satisfaction plays a crucial role in repurchases. In the context of higher education, customers are students, and therefore, the goal of CRM development is to enhance prospective students' interest through positive word-of-mouth, such as reviews or a reputation for customer satisfaction. The relationship between customer satisfaction and repurchase is supported by research conducted by Yang and Choi (2020), who found that customer satisfaction has a significant impact on repurchase intention.

2.5. Technology Readiness Index (TRI)

Parasuraman (2000) provides a definition of technology readiness (TR) as "people's inclination to accept and use new technology to accomplish goals in their personal and professional lives." The Technology Readiness Index (TRI) is an index used to measure users' readiness to adopt new technology. The utilization of the Technology Readiness Index (TRI) is appropriate as it is a commonly used model for assessing individuals' readiness to adopt information technology. The dimensions derived from the TRI analysis are also relevant to the CRM system at Unsoed, as it involves technological innovation and requires a sense of optimism from users. Technology readiness encompasses both positive and negative beliefs about technology, and these beliefs can vary among individuals. Collectively, these shared beliefs influence a person's inclination to engage with new technologies. The conceptual model of the TRI analysis, as explained by Parasuraman et al. (2000), is presented below:

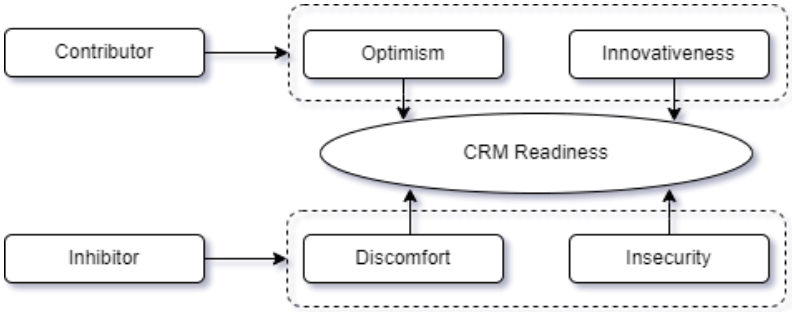

Fig.1: Technology Readiness Index Framework

The Technology Readiness Index has been developed into three categories, namely:

- High Technology Readiness: TRI can be categorized as high if the TRI value is above 3.51 (TRI>3.51).
- Medium Technology Readiness: TRI is categorized as medium if 2.90 =< TRI =< 3.51.
- Low Technology Readiness: TRI is categorized as low if TRI = < 2.89.

According to the initial conceptualization of the Technology Readiness Index by Blut and Wang (2020), innovativeness and optimism are considered "motivators" that positively contribute to technology readiness (TR), while insecurity and discomfort are viewed as "inhibitors" that negatively affect it. Due to the multifaceted nature of TR, it is still uncertain whether it should be understood as a four-dimensional construct (consisting of innovativeness, optimism, insecurity, and discomfort), a two-dimensional construct (comprising motivators and inhibitors), or a one-dimensional construct (representing an overall composite measure). The following provides a description of each of these variables based on the previous explanation:

- Optimism

Innovativeness refers to a positive perception of technology and a belief that it provides individuals with enhanced control, flexibility, and efficiency in their lives. It encompasses overall positive attitudes and emotions towards technology.

- Innovativeness

Optimism is defined as "the inclination to be a technology pioneer and thought leader." This dimension assesses the degree to which individuals perceive themselves as being at the forefront of technological advancements.

- Discomfort

Insecurity is defined as "a lack of control over technology and a feeling of being overwhelmed by it." This dimension typically captures the fear and apprehension individuals experience when faced with technology.

- Insecurity

Discomfort is defined as "distrust of technology and skepticism regarding its functionality." This dimension typically reflects individuals' unease and skepticism towards the reliability and effectiveness of technology.

2.6. Related Works

Research by Chiranjeevi et al. (2019), titled "Evaluating the satisfaction index using automated interaction services and customer knowledgebase: a big data approach to CRM," concludes that customer satisfaction is a key parameter that businesses should prioritize in order to establish and standardize their presence in the market. The proposed system assists organizations in understanding customer needs, expectations, desires, and concerns, ultimately leading to improved customer satisfaction.

According to Abbad et al.'s (2021) research titled "User Antecedents, CRM Implementation, and Impact on Customer Outcomes in the Jordanian Service Industry," CRM implementation can foster potential customer relationships, loyalty, and satisfaction. Additionally, employees, as end-users of CRM, are expected to contribute significantly to the system's development and utilization, emphasizing the importance of proper training to efficiently address consumer needs and enhance customer happiness, retention, and loyalty.

Hanaysha et al.'s (2021) research, "An Exploration of the Effect of Customer Relationship Management on Organizational Performance in the Banking Sector," demonstrates through statistical hypothesis testing that technology-based CRM plays a crucial role as the primary factor in organizational performance.

Shah et al.'s (2021) study, "Role of social media technologies and customer relationship management capabilities 2.0 in creating customer loyalty and university reputation," focuses on CRM

in universities. The study concludes that the role of technology in online-based CRM can enhance academic engagement.

In their research titled "Assessing the Company's E-Readiness for implementing Mobile-CRM System: Case A Nationwide Distribution Company," Kamanghad et al. (2019) assess CRM readiness. The findings indicate that the studied organizations are generally ready to implement Mobile-CRM, with the four main factors of Management, Information Technology, People, and Process playing a significant role. However, the People factor received the lowest overall score, highlighting the need for prioritizing attention, investment, and improvement in this area.

Based on these studies, a research gap can be identified, forming the theoretical foundation of this research. Considering the conclusions drawn from previous studies on CRM at universities, CRM readiness, and CRM implementation, investigating CRM readiness at universities is relevant and worthy of further research.

3. Research Methodology

This study follows a framework that guides the flow of the research, starting from the topic of CRM Readiness and leading to the research conclusion. The following outlines the flow of the framework in this study.

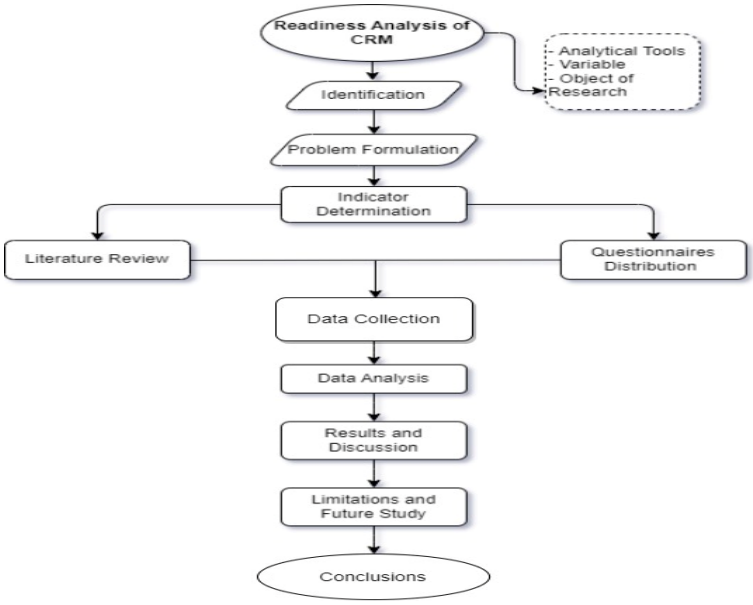

Fig.2: Research Framework

This research is a quantitative study that utilizes statistical data in the form of numbers. The data collection methods employed include questionnaires and literature review. The research participants in this study were students, staff, and lecturers from various faculties at Jenderal Soedirman University. The data was collected through the distribution of questionnaires and analysis of relevant articles.

3.1. Research Model

The framework of this research, as based on Section 2, presents a conceptual model that illustrates the relationship between theory and various identified aspects that are considered significant.

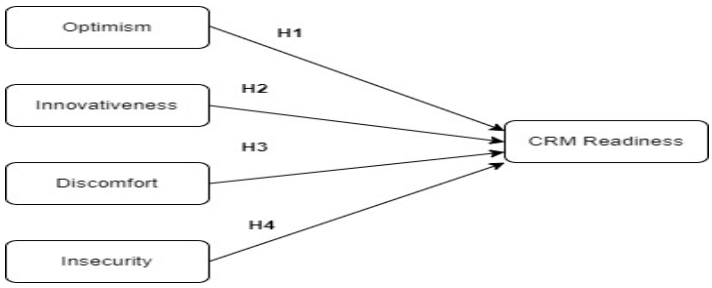

Fig.3: Research Model

Based on the research model in Figure 1, the following are the hypotheses made in this study:

H1: Optimism has a positive effect on customer relationship management readiness

H2: Innovativeness has a positive effect on customer relationship management readiness

H3: Discomfort has a negative effect on customer relationship management readiness

H4: Insecurity has a negative effect on customer relationship management readiness

3.2. Variables Measurement

The measurement variables in this study are categorized into two groups: variables from the Technology Readiness Index (TRI) and the CRM variable itself. These variables will be assessed using questionnaires that will be distributed among campus agencies. The questionnaire is developed based on indicators derived from previous research, which are then formulated into questionnaire statements.

3.2.1. Variables Indicators

The TRI indicators, which are used in this study as a basis for measurement according to Cahyani (2020), are as follows:

a. Indicators of Optimism:
   - The ease of controlling something
   - Use of computer programs
   - Efficiency in doing work
   - Confidence in using a computer
   - Freedom of activity

b. Indicators of Innovativeness:
   - Knowledge of own technology
   - Pioneers in terms of technology
   - Independent in knowledge of technology
   - Application of the latest technology in the field of work
   - Ability to use technological products

c. Indicators of Discomfort:
   - Technology complicates work
   - Difficulty reading IT instructions
   - The inconvenience of using IT
   - Troubled technology when needed
   - Discomfort using technology poses health and safety risks

d. Indicators of Insecurity:
   - The insecurity of the information sent can be seen
   - Insecurity in data delivery

- There must be a double check of the automatic process
- Insecurity in providing passwords

e. According to Safitri et al. (2021) indicators in CRM as follows:
- Technology
- People
- Process
- Knowledge and Insight

3.2.2. Indicator Measurement

Because each question item was given a summated rating and to reduce bias, the indicators of this study were examined using a questionnaire constructed using a five-point Likert scale for potential responses from respondents. The evaluation result is as follows:

1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

3.3. Samples and Population

The distribution of questionnaires was carried out with a total of 395 respondents, as calculated using Slovin's method. The details of these calculations are described in the following table:

Table 1. Respondent data

Total of Students	25.370
Total of Staffs and Managements	2.476

Source: https://uda.unsoed.ac.id/

Depends on table above, it can be processed based on Slovin's Formula, as follows:

$$\frac{27.846}{1 + (27.846 \times 0.0025)} = 394$$

The number of obtained respondents was 395, indicating that they met the requirements of Slovin's Formula for data processing. The data processing was performed using Smart PLS with indexing from TRI.

3.4. Technology Readiness Index (TRI) Measurement

The TRI measurement is conducted through a descriptive analysis of each variable. Subsequently, the mean of each statement in the distributed questionnaire was determined. The Technology Readiness Index has been developed into three categories, which are as follows:

- High Technology Readiness: TRI can be categorized as high if the TRI value is above 3.51 (TRI>3.51).
- Medium Technology Readiness: TRI is categorized as medium if 2.90 =< TRI =< 3.51.
- Low Technology Readiness: TRI is categorized as low if TRI = < 2.89.

3.5. Outer Model Analysis

The measurement model is the initial stage carried out in a study to ensure the feasibility and validity of the variables and indicators used in the study for further testing. According to Ghozali & Latan (2015), the outer model, also known as the outer relation or measurement model, describes how each indicator block relates to its latent variables. The testing of the outer model includes the following criteria:

3.5.1. Convergent Validity

The convergent validity of the measurement model with reflexive indicators can be observed through the correlation between the item score/indicator and the construct score. Individual reflective measures are considered high if they correlate more than 0.70 with the construct being measured. (Ghozali & Latan, 2015).

3.5.2. Discriminant Validity

The discriminant validity of the tested indicators can be observed in the cross-loading values between the indicators and their constructs. If the correlation between constructs and indicators is higher than the correlation between indicators and other constructs, it indicates that the latent constructs predict indicators in their respective blocks better than indicators in other blocks. (Ghozali & Latan, 2015).

3.5.3. Average Variance Extracted (AVE)

This validity test aims to assess the validity of the question items by examining the average variance extracted (AVE) value. AVE represents the average percentage of variance shared among question items or indicators of a variable, serving as a summary of convergent indicators. The AVE value is considered acceptable if each question item has a value greater than 0.5. (Ghozali & Latan, 2015).

3.5.4. Reliability Test

The reliability test is conducted to measure the consistency of the questionnaire for the research variables. When testing the outer model, the reliability is assessed using Cronbach's alpha and composite reliability values. The minimum value required for the reliability test is 0.70.

3.6. Inner Model Analysis

The inner model, also known as the linear relation, substantive theory, or structural model, describes the relationship between latent variables based on substantive theory (Ghozali & Latan, 2015). The structural model testing is conducted to analyze the R-square value and test the hypotheses of the study. The tests performed on the inner model are as follows:

3.6.1. R-Square (R2)

R-Square is used to measure the extent to which endogenous variables are influenced by other variables. In the structural model, R-square results of 0.67 and above for endogenous latent variables indicate a strong influence of exogenous variables (those that influence) on endogenous variables (those that are influenced) and are categorized as "Good." Meanwhile, if the R-square test result falls between 0.33 and 0.67, it is considered "Medium" category, and if it falls between 0.19 and 0.33, it is considered "Weak" category.

3.6.2. Q-Square (Q2)

The Q-square value indicates the predictive relevance of a model. A Q2 value greater than 0 provides evidence that the observed values have been accurately reconstructed, indicating the model's predictive relevance. On the other hand, a Q2 value less than 0 indicates a lack of predictive relevance. The Q2 value is used to assess the relative effect of the structural model on observational measurements for latent dependent variables (endogenous latent variables).

3.6.3. Hypothesis Testing

The research model depicted in Figure 1 can be translated into a mathematical model. The following formula represents the measurement of the relationship between the variables to be observed, denoted as P-value:

$$CRM = a + b1.Opt + b2.Inn + b3.Dis + b4.Ins$$

Notes:

CRM: CRM Readiness
Opt: Optimism
Inn: Innovativeness
Dis: Discomfort
Ins: Insecurity

Testing the inner model generates output in the form of a coefficient of determination, which indicates the direction of influence between variables, as well as the p-value and t-statistics, which demonstrate the significance of the influence among the tested research variables. A positive coefficient of determination signifies a positive direction of the relationship, and vice versa. The p-value is considered significant if it is less than 0.05. In this study, a one-tailed test was conducted, expecting the t-statistics value to be greater than 1.64.

4. Result and Discussion

Based on the distributed questionnaires, the data collected amounted to 395 respondents. This number meets the requirements of Slovin's formula, which calculates the minimum number of respondents as 394. Among the respondents studied, the participant group included both students and lecturers.

4.1. Respondents Demographic

The number of participants in this study amounted to 395, including both students and lecturers. These respondents were selected from 12 faculties at Jenderal Soedirman University. The total number of respondents exceeds the minimum number required based on the Slovin formula, which is 394. The demographic information of the research participants is presented in the following table:

Table 2. Respondents Demographic

Variable	Indicators	Total	Percentage
Gender	Male	247	62,5%
	Female	148	37,5%
	Total	**395**	**100%**
Status	Lecturer	192	48,6%
	Student	203	51,4%
	Total	**395**	**100%**
Faculty	Faculty of Agriculture	27	6,8%
	Faculty of Biology	32	8,1%
	Faculty of Economics and Business	28	7,1%
	Faculty of Animal Husbandry	16	4,1%
	Faculty of Law	23	5,8%
	Faculty of Social and Political Sciences	51	12,9%
	Faculty of Medical	22	5,6%
	Faculty of Engineering	63	15,9%
	Faculty of Medical Sciences	21	5,3%
	Faculty of Humanities	38	9,6%
	Faculty of Mathematics and Sciences	25	6,3%
	Faculty of Fisheries	49	12,4%
	Total	**395**	**100%**

- Characteristics of Respondents Based on Gender

Based on the questionnaires distributed to 395 respondents, it can be observed that the majority of respondents in this study were male, with a total of 247 individuals contributing to the study, accounting for 62.5%.

- Characteristics of Respondents Based on Occupation

Based on the questionnaires distributed to 395 respondents, it can be observed that the majority of respondents in this study were students, with a total of 203 individuals contributing to the research, accounting for 51.4%.

- Characteristics of Respondents Based on Faculties

Based on the questionnaires distributed to 395 respondents, it can be observed that the majority of respondents in this study belonged to the engineering faculty, with a total of 63 individuals contributing to the research, accounting for 15.9%.

4.2. Descriptive Analysis of Variables

The classification of the technology readiness index used in this study is as follows:

Table 3. Classification Table of TRI

Classification	TRI Value
High Technology Readiness	> 3,51
Medium Technology Readiness	2,90 – 3,51
Low Technology Readiness	< 2,89

Mean values used to calculate the indicators and variables to describe their responses. The mean value obtained is then grouped into 5 data categorizations. The following is an interval calculation to determine the limit of the categorization:

$$\text{Interval: } \frac{\textbf{\textit{Maximum Values} - \textit{Minimum Values}}}{\textbf{\textit{Total of Class}}}$$

$$= \frac{5-1}{5} = 0.8$$

Through the interval calculation above, the following is the categorization of the variables used in this study:

Table 4. Descriptive Analysis of Variables

Range	*Optimism*	*Innovativeness*	*Discomfort*	*Insecurity*	*CRM Readiness*
1,00–1,79	Very Low	Very Low	Very Low	Very Low	Very Low
1,80–2,59	Low	Low	Low	Low	Low
2,60–3,39	Neutral	Neutral	Neutral	Neutral	Neutral
3,40–4,19	High	High	High	High	High
4,20–5,00	Very High	Very High	Very High	Very High	Very High

- Optimism (X1)

Table 5. Descriptive Analysis of Optimism

Indicators	Statements	Mean	Category
Ease of controlling things	The Academic Information System at UNSOED makes my work/study process easier	4,02	High
Use of computer programs	I like to use customizable computer programs	4,12	High
Efficiency in doing work	The system at UNSOED makes my work/studies more efficient	3,99	High
Confidence in using a computer	I feel confident that the operation of	3,94	High

	the computer for using the system in UNSOED is correct		
Freedom of activity	Using technology will give me more freedom in my activities	4,05	High
Average of Optimism (X1)		4,02	High

Based on the results of the descriptive analysis of Optimism, the highest mean is obtained from the indicator of using a computer program of 4.12. The optimism variable has an average of 4.02 which is in the high category. This means that the average respondent in this study considered that their optimism was high.

- Innovativeness (X2)

Table 6. Descriptive Analysis of Innovativeness

Indicators	Statements	Mean	Category
Knowledge of own technology	When there is a new technology I will find out more details about the technology	3,97	High
Pioneers in terms of technology	I always use technology to help my work/studies.	4,10	High
Independent in knowledge of technology	Users in my office/campus already know how to operate the system and what to enter	3,89	High
Application of latest technology in works	The Information System at UNSOED encourages its users to achieve their work goals	3,95	High
Able to use technology products	I can easily master or study Information Systems at UNSOED	3,91	High
Average of Innovativeness (X2)		3,96	High

Based on the results of the descriptive analysis above, the highest mean is obtained from the indicator of self-knowledge of technology of 3.97. The innovativeness variable has an average of 3.96 which is in the high category. This means that the average respondent in this study rated their perceived innovativeness as high.

- Discomfort (X3)

Table 7. Descriptive Analysis of Innovativeness

Indicators	Statements	Mean	Category
Technology complicates work	I feel that Information Systems complicates work/study because here it's because of signal delays or server errors	2,44	High
Difficulty reading IT instructions	I find it difficult to implement instructions for operating Information Systems in my office/campus	2,26	High
Inconvenience using IT	I'm afraid to use the Information System for fear of wrong input or a system that isn't free to use	2,25	High
Troubled technology when needed	The Information System always experiences version updates and when installing it because errors often occur	2,24	High
Discomfort using technology has health and safety risks	Using technology too often can lead to occupational health and safety risks	2,28	High
Average of Discomfort (X3)		2,29	High

Based on the results of the descriptive analysis above, the lowest mean is obtained from the indicator of discomfort using IT of 2.25. The discomfort variable has an average of 2.29 which is in the high category (because the direction of the influence of the Discomfort variable is negative). This means that the average respondent in this study considered that the discomfort they felt was low.

- Insecurity (X4)

Table 8. Descriptive Analysis of Insecurity

Indicators	Statements	Mean	Category
The insecurity of the information sent can be seen	I feel that Information Systems complicates work/study because here it's because of signal delays or server errors	2,33	High
Insecurity in data delivery	I'm not sure that data or information sent online will be fully conveyed	2,36	High
There should be a double check of the automated process	Every time I enter data I check again to make sure there are no errors	2,39	High
	I'm afraid that when running the system on UNSOED, the laptop/pc will experience an error and the data won't be backed up.	2,52	High
Insecurity in providing passwords	I feel insecure if I have to give the System password at work to other people	2,42	High
Average of Insecurity (X4)		2,40	High

Based on the results of the descriptive analysis above, the lowest mean obtained from the information insecurity indicator sent can be seen at 2.33. The insecurity variable has an average of 2.40 which is in the high category (because the direction of the influence of the Insecurity variable is negative). This means that the average respondent in this study rated their insecurity as low.

- CRM Readiness (Y)

Table 9. Descriptive Analysis of Insecurity

Indicators	Statements	Mean	Category
Identification	I know what CRM is and how it is implemented	4,07	High
Technology	Technology at my workplace/campus supports CRM	4,14	High
People	Human Resources at my workplace/campus have supported the implementation of CRM	4,01	High
Process	The CRM process at my workplace/campus is well controlled, judging by the smooth communication between the students and the campus	4,05	High
Knowledge and Insight	CRM knowledge in my workplace/campus has been socialized well	3,93	High
Average of CRM Readiness (Y)		4,04	High

Based on the results of the descriptive analysis above, the highest mean is obtained from the technology indicator of 4.14. The CRM Readiness variable has an average of 4.04 which is in the ready

category. This means that the average respondent in this study has a high readiness to implement CRM.

4.3. Outer Model

The outer model test is a test used to measure the level of validity and reliability of each indicator on the latent variable. The following is the outer model testing stage in this study:

4.3.1. Validity Test

An indicator can be said to be valid through a convergent validity test with a loading factor value of > 0.7 and an AVE value of > 0.5. The following is a loading factor and AVE testing table:

Table 10. Table of Validity Test

	***Optimism* (X1)**	***Innovativeness* (X2)**	***Discomfort* (X3)**	***Insecurity* (X4)**	***CRM Readiness* (Y)**
X1.1	0,870				
X1.2	0,843				
X1.3	0,883				
X1.4	0,847				
X1.5	0,820				
X2.1		0,767			
X2.2		0,794			
X2.3		0,816			
X2.4		0,769			
X2.5		0,791			
X3.1			0,814		
X3.2			0,908		
X3.3			0,895		
X3.4			0,888		
X3.5			0,883		
X4.1				0,884	
X4.2				0,836	
X4.3				0,803	
X4.4				0,824	
X4.5				0,724	
Y.1					0,780
Y.2					0,853
Y.3					0,890
Y.4					0,863
Y.5					0,867

Based on the results of the outer loading in the table above, all indicators for each variable have a correlation value of > 0.7, so it can be stated that all indicators are **valid**.

4.3.2. Discriminant Validity

The validity test in the form of discriminant validity is carried out to ensure that each concept of each latent model is different from other variables. The following are the results of the discriminant validity test in this study:

Table 11. Table of Cross Loading

	Optimism **(X1)**	***Innovativeness*** **(X2)**	***Discomfort*** **(X3)**	***Insecurity*** **(X4)**	***CRM Readiness*** **(Y)**
X1.1	**0,870**	0,656	-0,446	-0,422	0,610
X1.2	**0,843**	0,654	-0,366	-0,372	0,627
X1.3	**0,883**	0,661	-0,506	-0,479	0,657
X1.4	**0,847**	0,718	-0,527	-0,554	0,704
X1.5	**0,820**	0,640	-0,353	-0,383	0,602
X2.1	0,544	**0,767**	-0,286	-0,303	0,398
X2.2	0,558	**0,794**	-0,288	-0,288	0,453
X2.3	0,589	**0,816**	-0,422	-0,455	0,520
X2.4	0,586	**0,769**	-0,327	-0,296	0,490
X2.5	0,748	**0,791**	-0,507	-0,507	0,654
X3.1	-0,415	-0,382	**0,814**	0,691	-0,484
X3.2	-0,463	-0,442	**0,908**	0,681	-0,524
X3.3	-0,469	-0,418	**0,895**	0,644	-0,477
X3.4	-0,481	-0,448	**0,888**	0,766	-0,573
X3.5	-0,447	-0,421	**0,883**	0,704	-0,520
X4.1	-0,430	-0,376	0,750	**0,884**	-0,474
X4.2	-0,514	-0,447	0,808	**0,836**	-0,563
X4.3	-0,410	-0,379	0,476	**0,803**	-0,491
X4.4	-0,453	-0,389	0,714	**0,824**	-0,461
X4.5	-0,283	-0,390	0,442	**0,724**	-0,364
Y.1	0,584	0,512	-0,603	-0,577	**0,780**
Y.2	0,704	0,638	-0,495	-0,484	**0,853**
Y.3	0,661	0,581	-0,495	-0,500	**0,890**
Y.4	0,635	0,526	-0,434	-0,444	**0,863**
Y.5	0,612	0,527	-0,479	-0,482	**0,867**

Based on the results of the discriminant validity test conducted, all indicators have the highest score in their block have a correlation value of > 0.7. With these results it can be stated that all indicators are **valid**.

4.3.3. Average Variance Extracted (AVE)

To evaluate discriminant validity, it can be seen with the AVE (Average Variance Extracted) method for each construct or latent variable. The model has better discriminant validity if the square root of the AVE (Average Variance Extracted) for each construct is greater than the correlation between the two constructs in the model. The following are the results of the AVE test in this study:

Table 12. Table of Average Variance Extracted (AVE)

Variable	**AVE**	**Results**
Optimism (X1)	0,727	Valid
Innovativeness (X2)	0,620	Valid
Discomfort (X3)	0,771	Valid
Insecurity (X4)	0,665	Valid
CRM Readiness (Y)	0,725	Valid

Based on the results of the AVE calculations in the table above, all variables have an AVE value > 0.50, so it can be stated that all variables are **valid** variables.

4.3.4. Reliability Test

The reliability test is carried out by looking at the value of Cronbach's Alpha or Composite Reliability. The minimum value is 0.7 while the ideal is 0.8 or 0.9. The following are the results of the Realiability test in this study:

Table 13. Table of Reliability Test

Variable	Cornbach's Alpha	Composite Reliability	Results
Optimism (X1)	0,906	0,930	Reliable
Innovativeness (X2)	0,849	0,891	Reliable
Discomfort (X3)	0,925	0,944	Reliable
Insecurity (X4)	0,874	0,908	Reliable
CRM Readiness (Y)	0,905	0,929	Reliable

The reliability test is carried out by looking at the value of Cronbach's Alpha or Composite Reliability. The minimum value is 0.7 while the ideal is 0.8 or 0.9.

4.4. Inner Model

Structural tests are carried out after going through instrument tests. This test is used to see the relationship between variables. The following is a table of the results of the inner model output in this study:

Table 14. Table of Inner Model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Optimism (X1) -> CRM Readiness (Y)	0,508	0,510	0,051	9,905	0,000
Innovativeness (X2) -> CRM Readiness (Y)	0,116	0,118	0,051	2,272	0,012
Discomfort (X3) -> CRM Readiness (Y)	-0,165	-0,169	0,050	3,305	0,001
Insecurity (X4) -> CRM Readiness (Y)	-0,132	-0,127	0,055	2,402	0,008

Interpretation as follows:

- Coefficient of Determination (R-Square)

The R-Square value indicates that CRM Readiness (Y) is influenced by Optimism (X1), Innovativeness (X2), Discomfort (X3) and Insecurity (X4) of 0.633 or 63.3%, while the rest is influenced by other factors not present in model of 36.7%.

- Q-Square

The Q-Square value indicates the magnitude of the relevance of all independent variables to CRM Readiness (Y). The Q-Square value obtained in this study is 0.600. A Q-Square value that is greater than 0 and close to 1 means that the observed values have been well reconstructed with predictive relevance.

- P-Value

Optimism variable (X1), Innovativeness (X2), Discomfort (X3), Insecurity variable (X4) has a significant effect on CRM Readiness (Y) with a p-value of <0.05 (less than 0.05).

- Parameter Coefficient (Original Sample)

Contributor:

The parameter coefficient of Optimism (X1) and Innovativeness (X2) on CRM Readiness (Y) is 0.508 (X1) and 0.116 (X2), which means that there is a positive influence from Optimism and Innovativeness on CRM Readiness. The higher the optimism felt and innovativeness by lecturers and students, will increase CRM Readiness at Jendral Soedirman University Purwokerto.

Inhibitor:

The parameter coefficient of Discomfort (X3) and Insecurity (X4) on CRM Readiness (Y) is -

0.165(X3) and -0.132(X4), which means that there is a negative effect of Discomfort and Insecurity on CRM Readines.

The lower the Discomfort and Insecurity felt by lecturers and students, will increase CRM Readiness at Jendral Soedirman University Purwokerto.

- T-Statistics

Optimism (X1), Innovativeness (X2), Discomfort (X3) and Insecurity (X4) variables have a significant influence on CRM Readiness (Y) because they have a t-statistics value greater than 1.64.

The following is a research model after testing:

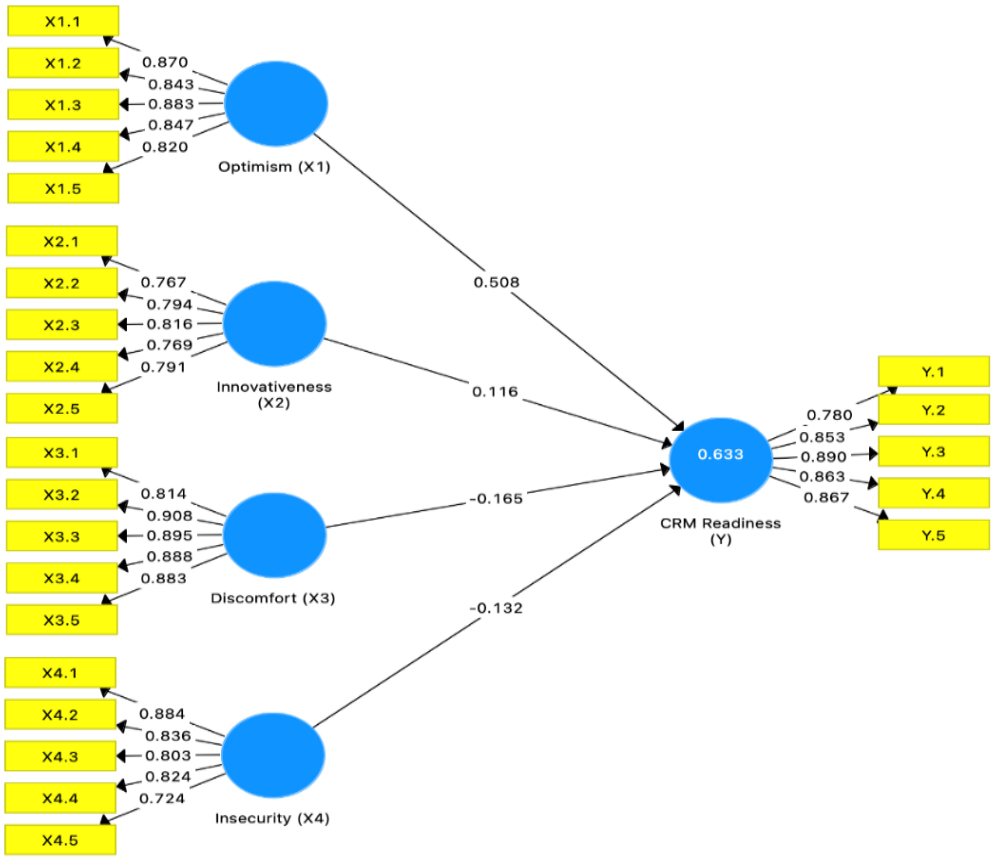

Fig.4: Output of PLS Algorithm

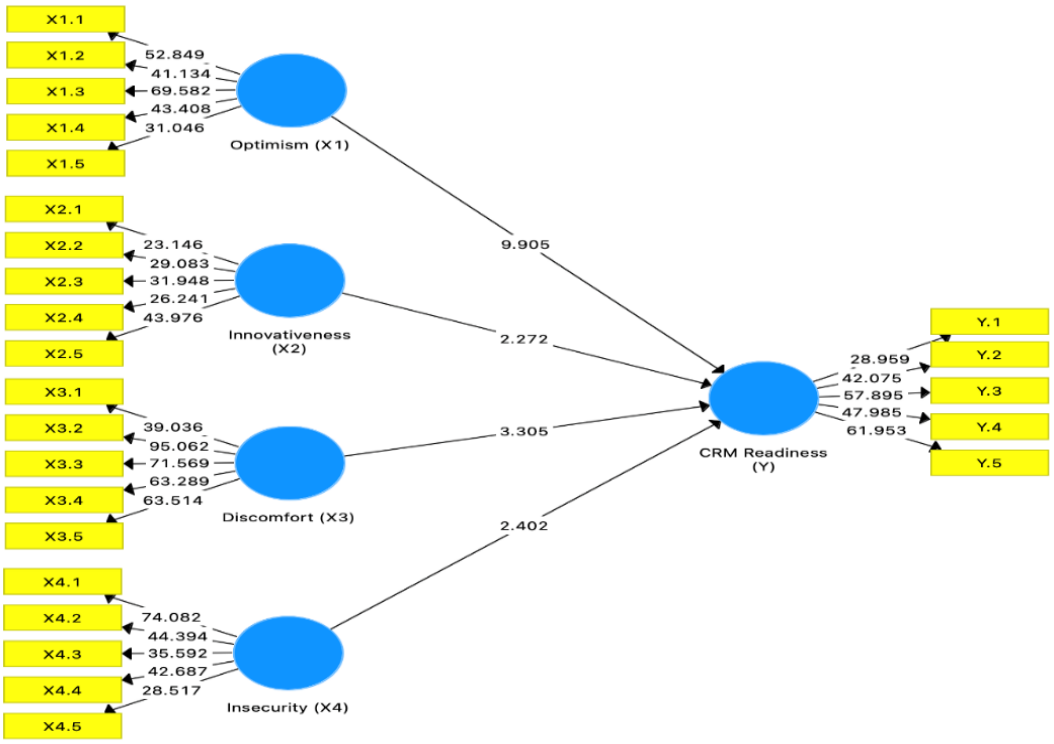

Fig.5: Output of Bootstrapping

5. Results and Discussions

Based on the above research results, recommendations can be drawn for management in preparing CRM development programs, as follows:

- Customer Relationship Management

Based on the above analysis, the CRM variable with the "Technology" indicator received the highest score of 4.14, indicating that the technology at Unsoed is sufficient to support the use of CRM. However, "Knowledge and Insight" obtained the lowest average score of 3.93, indicating the need for attention from management to enhance CRM knowledge among management and students at Unsoed. It is recommended to organize digital outreach activities related to CRM and provide guidelines for updating existing CRM systems as alternatives to develop CRM knowledge at Unsoed.

- Optimism

Based on the results of the descriptive analysis, the indicator with the highest score of 4.12 is "Use of computer programs," indicating a high level of interest and enthusiasm among campus management and students, which needs to be maintained. The component of the Optimism variable that requires improvement is "Confidence in using a computer," with an average score of 3.94. This suggests that management should focus on increasing user confidence in computer usage. Strategies such as providing CRM insights through socialization or offering a manual book on system usage could be implemented.

- Innovativeness

According to the findings of the descriptive analysis, the indicator with the highest score in the "Pioneers in terms of technology" category is 4.10, indicating that the technology at the campus meets operational needs in a reliable and innovative manner. However, the aspect of the Innovativeness variable that needs attention is "Independent in knowledge of technology," which obtained an average score of 3.99. This implies the need to enhance user knowledge on using computers and systems on campus. Strategies such as improving the IT team's skills, providing CRM training or workshops, or

promoting the new CRM system can be considered to enhance user insights.

- Discomfort

The indicator with the highest score of 2.44 is "Technology complicates work," suggesting that it is the most inhibiting factor in technology readiness. Management should evaluate the use of technology to ensure it enhances work effectiveness, considering systems or hardware that are user-friendly for entry-level users. The lowest average score in the Discomfort variable is found in the "Troubled technology when needed" indicator, with an average score of 2.24. This indicates that the Information System at Unsoed is perceived to have minimal errors and problems. It is important to maintain or further improve the system to ensure optimal implementation of CRM using the Unsoed information system.

- Insecurity

According to the findings of the descriptive analysis, the indicator with the highest score is "There should be a double check of the automated process," indicating the user's fear of data loss due to errors, with a score of 2.52. This indicates that it is the most limiting factor in technological readiness. Management should focus on improving system quality through the use of an IS Security framework. Users should also enhance their knowledge related to technology and regularly back up data. The lowest average score in the Insecurity variable is observed in the "The insecurity of the information sent can be seen" indicator, with an average score of 2.33. This suggests that the level of user confidence in information security at Unsoed is quite good.

- Results

The results of this study indicate that the University is categorized as ready to develop CRM. However, there are several points that need to be addressed to improve indicators that contribute to CRM readiness. Optimism, Innovativeness, Discomfort, and Insecurity are benchmarks for technology readiness, including the perspectives of IT and management attitudes towards system and technology changes. These aspects were considered quite good based on the responses from the distributed questionnaires. The research hypothesis is as follows:

1. Optimism has a positive effect on customer relationship management readiness.
2. Innovativeness has a positive effect on customer relationship management readiness.
3. Discomfort has a negative effect on customer relationship management readiness.
4. Insecurity has a negative effect on customer relationship management readiness.

With the results of the above research, it can be concluded that all hypotheses can be accepted. The TRI variables of Optimism and Innovativeness are found to be significant contributors to CRM readiness. As the values of these variables increase, the level of CRM readiness also increases.

- Findings:

The most significant difference in this study compared to previous studies is the implementation of TRI, which has been proven to have a significant effect on CRM Readiness. In the research conducted by Kamanghad et al. (2019), CRM Readiness was assessed solely based on the CRM indicator itself, specifically in the context of CRM Mobile, resulting in e-readiness as the output. However, in this study, it is found that the TRI perspective influences CRM readiness through variables that act as contributors and inhibitors. This research provides a more comprehensive understanding of the factors that contribute to CRM readiness, as it considers both supportive and inhibitory aspects. This enables management to better identify areas that require attention, improvement, or reduction in relation to CRM readiness.

- Discussions for Management:

Based on the TRI analysis, it can be concluded that the Optimism and Innovativeness variables exhibit high technology readiness. This indicates that respondents hold positive views about technology and believe that it offers increased control, flexibility, and efficiency, enabling them to effectively utilize technology in the context of CRM. On the other hand, the Discomfort and Insecurity variables reflect low technology readiness, indicating that respondents feel a lack of control over technology, as

well as distrust and skepticism regarding its proper functioning.

- Recommendations for Management:

Based on the suggestions gathered from the distributed questionnaires, several important points emerged as the majority of respondents' answers. These recommendations are as follows:

1. Improve server quality: It is recommended to enhance the quality of servers to improve the performance and reliability of the CRM system.
2. Repair the OJS Journal system: The OJS Journal system requires repairs to ensure its proper functionality and usability.
3. Enhance IT soft skills: A strong system relies on qualified human resources. Continuous efforts should be made to improve the quality of IT soft skills among the staff.
4. Increase protection for user account security: Always prioritize increasing protection measures to prevent unauthorized access and hacking incidents on user accounts.
5. Implement One Stop Service CRM: Consider implementing a unified One Stop Service CRM system that can accommodate all user needs in a single, integrated platform.
6. Improve internet connection: Focus on improving the internet connectivity to ensure a reliable and efficient online environment for CRM operations.

- Limitation and Future Study

This study exclusively utilizes variables from the Technology Readiness Index to measure CRM readiness. The independent variables investigated focus solely on suggestions and recommendations regarding CRM readiness from the perspectives of human resources and technology systems. Future studies are suggested to develop analytical tools for measuring CRM readiness, such as considering financial infrastructure perspectives, including financial planning utilization. Additionally, it is recommended to provide output in the form of suggestions for CRM applications that can support the agency's CRM system.

The sample size is limited to Jenderal Soedirman University, which suggests that future studies could expand the scope to include all higher education institutions within a specific region or beyond. The data collection methods were restricted to questionnaires and some articles; therefore, it is recommended for future studies to conduct interviews with campus management or explore other data collection methods for improvement.

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