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## **Factors Influencing Implementation of Temenos T24 Core Banking System: Case of Banqure Populaire Du Rwanda**

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### **Abstract:**

*Banks are increasingly using projects in their daily work to achieve corporate goals. Despite all the advantages that the Temenos T24 system brings to its customers, most of the implementation services have experienced challenges ranging from not completing the implementation projects on budget, on time and in most cases the projects not being completed. In recent years researchers have become increasingly interested in factors that may have an impact on project management effectiveness and the success of projects. However, there is little research that shows how effectively core banking projects are managed and how they should be managed. The study sought to evaluate the factors influencing implementation of Temenos T24 core banking system in Banqure Populaire du Rwanda. To answer this, the study explicitly clarified significance of: dependencies between organization structures, human resource factors, technical competencies and project risk management. The study adopted descriptive research design. Purposive sampling was used to determine the sample size. Primary data for the study was collect educing structured questionnaires that were administered to the respondents. The population for this study comprised of staff from key departments of the bank who were charged with T24 core banking system development and implementation. For the purpose of this study, 54 staff were interviewed. Data collected processed through the SPSS version 21 and the output analyzed. From the study it was Human Resource management, Technical competency and project risk management (0.894, 0.661, 0.493, and 0.402) respectively.*

*All the factors had a significant p-value ( $p < 0.05$ ) at 95% confidence level. The significance values for relationship between implementation of T24 core banking system and organisational structure, Human Resource management, Technical competency and project risk management were 0.018, 0.031, 0.024 and 0.046 respectively. The positive relationship indicates that there is a correlation between the factors influencing implementation of T24 core banking system in BPR. The study recommends that the management of BPR should come up with measures to address the reported internal challenges in T24 implementation. The communication should be enhanced between all stake holders in the process of T24 implementation. The banks management should continue to lender their support and guidance to the banks' staff during the whole process of T24 implementation.*

**Keywords:** *Temenos T24, Core banking system, Organisational structure, Human Resource management, Technical competency.*

### **1. Background**

Globally, 2.5 billion people have no access to formal financial tools because they are either unavailable or are not designed to meet their needs. (WORLD BANK POLICY RESEARCH WORKING PAPER 6025, ASLI AND LEORA KLAPPER, 2012.) Poor households need financial tools to help them cushion against risk, build assets to secure their family's future and manage daily household cash flows, (Gramen 2006). Because of their precarious situation and unreliable income, the poor need financial services even more than the non-poor simply to survive from day to day. The need for financial inclusion for most of the unbanked communities has resulted in the liberation of the banking industry. This has seen a rise in new microfinances, commercial banks and other discount houses competing with well-established financial players, IBS 2008. Most of the banks today are technology driven and the competition has been very stiff to provide good service and value adding products to customers. Cutting edge solutions are required to compete effectively on the market, *Ahmed, et. al* 2006.

T24 core banking system has consistently been ranked as the first or second best-selling core banking software platform worldwide for the past 14 years (*International Banking Systems Sales League*), T24 has been developed using a complete service-oriented architecture that's modular so banks can deploy and integrate the required functionality alongside the needs of their business, Goolsby, K. (2008).

According to Infosys 2009, running 24/7 and in real-time equips the bank for the banking technology and market challenges of today and tomorrow. Infosys adds that T24 can be implemented and managed on premise or deployed as software-as-a-service (SaaS) – a cloud-based delivery model. SaaS offers quick, easy access to T24 core banking software without the need for significant internal IT resources and expensive infrastructure, making it the ideal deployment choice financial institutions that wish to move fast without the burden of complicated in house IT systems.

Temenos Group AG, headquartered in Geneva, is a market leading software provider, partnering with banks and other financial institutions to transform their businesses and stay ahead of a changing marketplace. Over 2,000 firms across the globe, including 38 of the top 50 banks, rely on Temenos to process the daily transactions of more than 500 million banking customers as well as over USD 5 trillion in assets. Temenos customers are more agile, able to offer more personalized products and services, to operate at lower unit costs, to react quicker to market opportunities and to manage risk better, Temenos report 2006. Temenos customers enjoy stronger operating metrics than their peers: on average, a 42% higher return on capital, a 32% higher return on assets and an 8.1 point lower cost-to-income ratio than that of banks still running legacy software. Temenos is the clear leader in its market. In 2013, Temenos topped both the Forrester and IBS Intelligence league tables for sales of mission-critical banking software Minz, M. (2006).

Lewis, K. 2003, depicts that all the advantages that the system brings to its customers, most of the implementation services have experienced challenges ranging from failure to complete on set time, overrunning of implementation budgets and in most cases the projects not being completed. He adds that recent year's researchers have become increasingly interested in factors that may have an impact on project management effectiveness and the success of projects. However, there is little knowledge as far as how effectively T24 core banking implementation projects are managed and how they should be managed, the determinants in implementation of T24 core banking system in various financial institutions. This study aims at filling this gap by presenting results from a case study and surveys of T24 implementations across various financial institutions. The purpose is to investigate and analyze the critical determinants for successful T24 core banking implementation. The study focussed on T24 implementation at Banque Populaire du Rwanda.

### *1.1. Statement of Problem*

Several core banking implementations have been carried out in financial institutions across the globe. One such core banking system is T24 owned by Temenos. The system has been implemented in many countries in Africa with several successes and failures alike. After many implementations of the core banking system, the banks in some cases remain with many requirements not automated or met by the system. Most of the implementations have not been able to strike a balance in as far as balancing the project triple constraint i.e. time, cost and scope. A number of implementations have been successful in terms of completion and meeting banks objectives while others have been failed to complete, others leading to litigation cases. A few cases in Africa has resulted in litigation cases and banks losing a lot of money in the process. The research will endeavor to make a critical investigation of the balance between technical competency, i.e. tools, and leadership ability in different types of organization and in different kinds of projects. All these are reviewed under the need to evaluate the factors influencing T24 core banking system implementation.

### *1.2. General Objective*

The main objective of this study was to evaluate the factors influencing implementation of T24 core banking system projects in Rwanda.

### *1.3. Specific Objectives*

This study was guided by the following specific objectives:

- i. To determine the effect of organisational structure on effective implementation of core banking system projects
- ii. To determine the influence of human resource management on the implementation of T24 core banking systems by Banque Populaire Du Rwanda.
- iii. To evaluate the effect of technical competency on effective implementation of T24 core banking system projects by Banque Populaire Du Rwanda.
- iv. To establish how project risks management influence the implementation of T24 core banking system

## **2. Literature Review**

### *2.1. Conceptual Framework*

In this study the dependent variable is effective T24 core banking system project implementation while the independent variables are the determinants of implementation of T24 core banking which are: project scope, technical competency, i.e. tools, and methods in project management, human resources management and project risk management. The variables and their relationship are shown in the figure below:

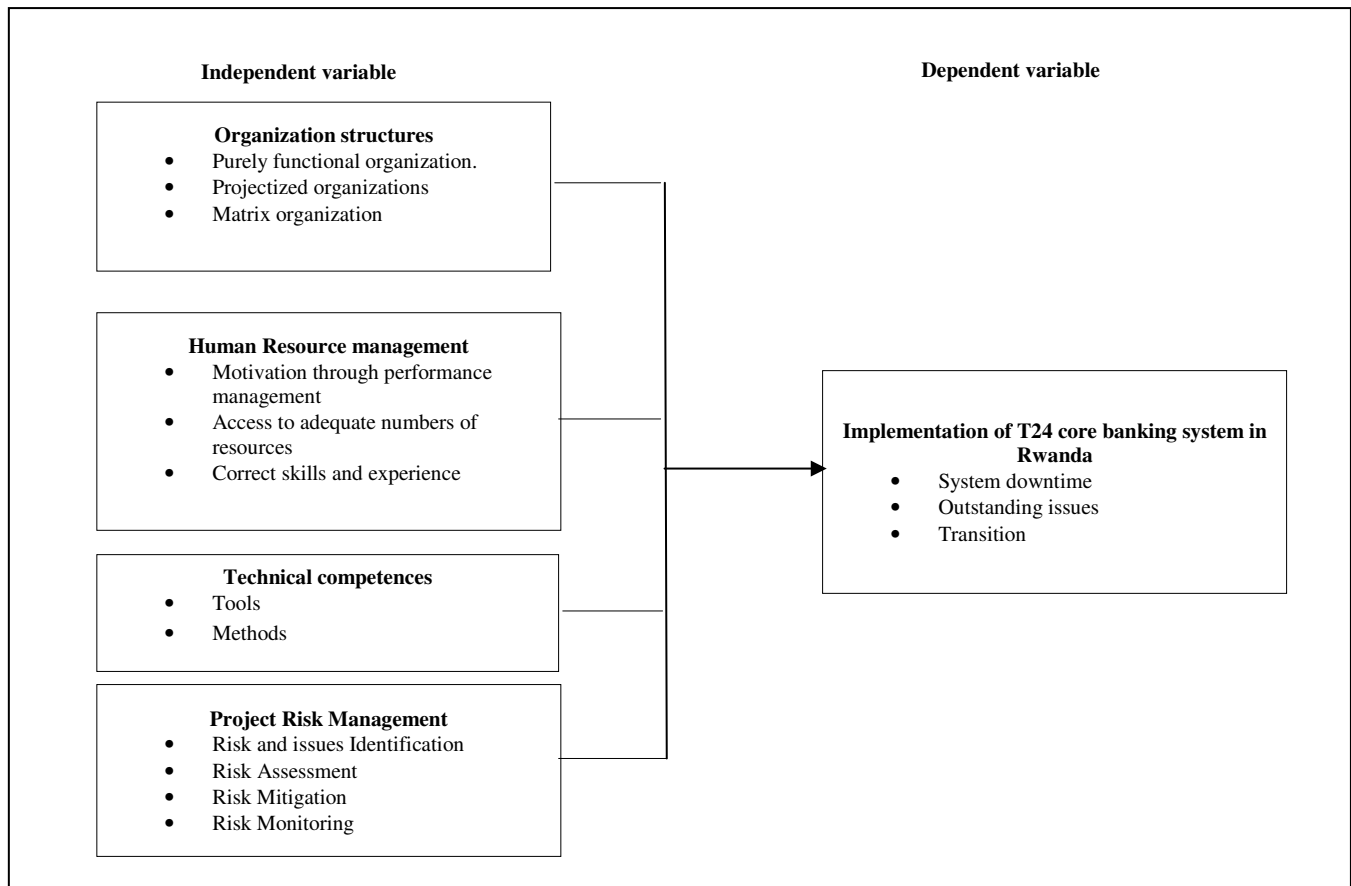


Figure 1: Conceptual framework

**3. Research Design**

The study adopted descriptive exploratory research. A descriptive study is a study concerned with describing the characteristics of a particular individual, or of a group (Kothari,2004).The study sought to evaluate the factors influencing implementation of T24 core banking system. The case study (BPR T24 Implementation 2009) is chosen for the reason that, to understand the core banking implementation project management process and system features, one needs depth and an intensive research method. A case study involves careful and complete observation and analysis of a unit in its relationship to any other unit in the group (Kothari,2004). A survey design is associated with a guided and quick collection, analysis and interpretation of observation, Mugenda & Mugenda (1999).

*3.1. Target Population*

The target population of this study comprised of 56 employees which includes bank employees, and consultants in the implementation of T24 core banking system at Banque Populaire du Rwanda. The whole population was censused.

*3.2. Sample Size Determination*

Stratified random sampling technique ensure that different groups of a population are adequately represented in the sample. Stratified sampling divides the population into homogeneous groups such that the elements within each group are more alike than the elements in the population as a whole (Nachimas and Nachimas 2008).

Sections	Population (Frequency)	Percentage
Credit Department	26	46
Finance Department	14	25
Information Technology Department	9	16
Operations department	5	9
Online banking department	2	4
<b>Total</b>	56	100

Table 1: sample size determination

Mugenda & Mugenda (2003), notes that purposive sampling allows a researcher to use cases that have the required information with respect to the objectives of his or her study. The sample technique used to identify respondents was purposive sampling technique. The whole population was censured.

#### 4. Research Findings and Discussion

##### 4.1. Demographic Characteristics of the Participants

Demographic information of the respondents was based on gender, age, level of education, duration in the bank and the position held by the respondents.

##### 4.1.1. Classification of Respondents by Gender

The study sought to determine the gender of the respondent and therefore requested the respondent to indicate their gender. The study found that majority of the respondent as shown by 62.5% were male whereas 37.5% of the respondent were female, this is an indication that both genders were involved in this study and thus the finding of the study did not suffer from gender bias.

##### 4.1.2. Classification of Respondents by Their Age Category

The study requested the respondent to indicate their age category, from the findings, it was found that most of the respondents as shown by 35 % of the respondents were aged between 26 to 35 years, 28% of the of the respondent were aged between 36 to 45 years, 20% were aged between 25 to 30 years, 17% of the respondents indicated that they were aged 46 and above, there was no one aged below 24 years .This is an indication that respondents were well distributed in terms of their age. Through the perception that advance age goes with experience, project team members involved in implementation of T24 core banking system in BPR were under 35 years.

##### 4.1.3. Classification of Respondents by Their Academic Qualification

The study requested the respondent to indicate their highest level of education. From the findings, 46% of the respondent indicated their highest level as bachelor's degree, 33% of the respondent indicated their highest level of education as diploma certificate, whereas 21% of the respondents indicated their highest level of education as post graduate, this is an indication that most of the respondents engaged in this study had bachelor's degree as their highest level of education.

##### 4.1.4. Period of Service of Respondents in Banking Industry

The study requested the respondent to indicate their duration in the bank. From the findings, 60% of the respondent indicated that they have been working for the bank for a period of 15 years while 40% of the respondent indicated that they have been working for the bank for a period of 2 years. This points out that it is recommended to have experienced project team members to form a strong project implementation team.

#### 4.2. Organization Structures

##### 4.2.1. Organization Type

The study pointed the extent to which organization structures influences T24 core banking system implementation. It also sought to identify to what extent various organization structures influence the implementation of T24 core banking.

	Frequency	Percentage
Functional Organization	14	30
Balanced Matrix	7	13
Project Team	12	22
Functional Matrix	11	20
Project Matrix	10	19
<b>Total</b>	54	100

Table 2: Classification of respondents on organization type

The study requested the respondent to indicate their organization type, from the findings, it was found that most of the respondents as shown by 30% of the respondents were on functional organization, 22% of the of the respondent were on project team, 20% were functional matrix, 19% of the respondents indicated that they were project matrix, while the rest of the respondents were on balanced matrix. Through the perception that functional organization, project team members involved in implementation of T24 core banking system in BPR adopted functional organization.

Seventy percent of the respondents ranked that functional organization was the mostly used within BPR implying that the bank was focused on the function of different groups hence in the implementation of T24 core banking the bank proved to have given support.

#### 4.2.2. Clustered within Your Organization

	Frequency	Percentage
By Function	10	19
By service	6	11
By target group	9	17
By place	7	13
By product	8	15
By project	14	25
<b>Total</b>	<b>54</b>	<b>100</b>

Table 3: Classification of respondents on organization clusters

Majority of the respondents indicated that the organization was clustered by project meaning that the organization had adequate team members directed towards implementing T24 core banking system within BPR

Most of the respondents 88% indicated that the level of organization was hierarchical while 12% of the respondents indicated that the organization was flat. This implied that using a hierarchical structure establishes clear authority for work and departments. Managers have authority according to management level and have the power to allocate resources, reward and punish behavior and give orders to their subordinates. No one is confused about the boundaries between departments and jobs, and everyone understands the chain of command. Therefore in BPR decision making is a plus to implementers of T24 core banking system.

Sixty nine percent of the respondents (69%) indicated that communication work in this hierarchy was formal whereas the rest (31%) indicated that communication work in this hierarchy was informal. This implied that a lot of paper work is experienced in BPR hence creating no room for innovation or for implementers to come up with possible solutions.

#### 4.2.3. Organizing Work

Respondents were asked to rate the way the company used the following statements regarding organizing work. A 5 point Likert scale was employed where: 1 = 25%, 2 = 25 -50%, 3 = above 50%, 4 = don't know, 5 = Please to introduce.

Indicator	1	2	3	4	5
Quality circles / groups	10(19%)	6(11%)	23(43%)	7(12%)	8(15%)
Integration of functions	6(11%)	22(41%)	20(37%)	4(8%)	2(3%)
Delegation of responsibility	2(3%)	30(56%)	22(41%)	0	0
Specialization	0	23(43%)	22(41%)	9(16%)	0
Planned job rotation	4(8%)	20(37%)	30(56%)	0	0
Incentives based upon quality of results	10(19%)	6(11%)	23(43%)	8(15%)	7(12%)
As per resource availability	7(12%)	23(43%)	22(41%)	2(4%)	0

Table 4: Classification of respondents on organizing work

The study sought to determine how the company did to organize their work. From the findings the study established that majority of the respondents agreed that; there was groups within the bank that were being directly involved in implementation of T24 core banking system. 30 % of the respondents indicated that delegation of work was given a top ranking within the organization. 20 % of the respondents indicated that Incentives within BPR was based upon quality of results and planned job rotation within the project implementers enabled all the members to be included in the support of T24 core system banking system.

Upon who makes the decisions in case of deviation during the project implementation 46% of the respondents indicated that project board was directly involved in making decisions, 30% of the respondents indicated that project manager was the one Who makes the decisions in case of deviation during the project implementation, whereas the rest were not sure who was making decisions in case of deviation during the project implementation.

#### 4.3. Human Resources Management

The study pointed the extent to which Human resource management influences T24 core banking system implementation. It also sought to identify to what extent various human resource and performance factors influence the success of core banking implementation.

	Frequency	Percentage
Very great extent	31	57
Great extent	16	30
Moderate extent	7	13
<b>Total</b>	<b>54</b>	<b>100</b>

Table 5: Human resource management influence on T24 core banking system implementation

From Table 5, majority of the respondents at 87% agreed that human resource management influenced core banking system implementation.

Human Resource management	Rating				
	1	2	3	4	5
Adequate resources	0	0	9(16%)	20(37%)	23(43%)
Skills and experience	0	2(3%)	4(8%)	22(41%)	24(44%)
Tools support project	0	0	0	30(56%)	24(44%)
Number of project team members	0	0	9(16%)	22(41%)	23(43%)
Performance management processes			4(8%)	30(56%)	20(37%)
Team building and skill development activities	0	0	6(11%)	8(15%)	40(74%)
Project team members are recognized and rewarded for their contribution to the project		6(11%)	10(19%)	23(43%)	15(28%)

Table 6: Human Resource Management Factors Influence on T24 Core Banking Implementation

The study has established that human resources management has a high influence on T24 core banking system implementation. For this to be effective, adequacy of resources and tools to keep the team supported and motivated was crucial. This finding is in agreement with Faqih, (2010) who contends that system failures can be attributed to poor project management especially where the level of expertise is lacking. It is therefore necessary to build the capacity of the team leaders and members who are motivated to lead a project of such magnitude. The team members need to understand the intricacies involved in system management as well as project management knowledge.

#### 4.4. Technical Competencies

The study sought the respondents to indicate the approximate year in which they first used project management tools in implementation of T24 core banking.

	Frequency	Percentage
Manual tools (&methods)	12	22
Computerized techniques (for ex. own Excel forms, MS Project)	42	78
<b>Total</b>	54	100

Table 7: Correspondents regarding use of tools

Regarding use of tools 78% of the respondents had used computerized techniques (for ex. own Excel forms, Ms Project) in the project implying that most of proper skills were being utilized to meet the deadlines. 22% of the respondents had only used manual methods in implementation of T24 core banking at BPR.

Regarding the number of years the respondents had used project management tools 12% of the respondents indicated that they had used project management tools for the past 12 months, 36% of the respondents indicated that they had used project management tools for the past two years whereas the majority 52% of the respondents indicated that they had used project management tools for the past 5 years.

Seventy percent of the respondents indicated that they had used project management tools in project planning and project control. Fifteen percent of the respondents indicated that they had used project management tools in their general work planning and presentations whereas the rest of the respondents indicated that they had used project management tools for their personal work not in the Bank.

From the findings most of the respondents 66% indicated that they used Ms Project for analyzing project whereas 14% indicated that they were confident in using Ms excel in all project related activities. The rest 20% of the respondents were not sure which tool they used more specifically in the project.

Eighty percent (80%) of the respondents indicated that they were happy using the Ms Project and Ms Excel since it enhanced them to efficiently and effectively track the project progress. 12% of the respondents indicated that they were not happy using the software's otherwise it was only that they had no option. 8% of the respondents did not take part in this question.

#### 4.5. Project Risk Management

The study sought to know the extent to which Risk Management influences T24 core banking system implementation. It also sought to identify to what extent certain risk management factors influence the success of core banking implementation.

	Frequency	Percentage
Very great extent	40	74
Great extent	8	15
Moderate extent	6	11
<b>Total</b>	54	100

Table 8: Extent to which risk Management influences T24 core banking system implementation

From the study findings in table 8, majority of the respondents agreed that risk Management influence T24 core banking system implementation to a very great extent.

Project risk management as a factor that is perceived to affect T24 core banking system was also studied. Respondents' opinions against the statements were recorded using the scale shown below: 1-Least important;2-Not Important;3-Not sure;4-Important;5-Very Important

	Rating				
	1	2	3	4	5
Risk assessment procedure	0	2 (3%)	4 (8%)	22 (41%)	24 (44%)
Risk Control measures.	0	0	0	30 (56%)	24 (44%)
Risk mitigation	0	0	9 (16%)	22 (41%)	23 (43%)
Business Risk analysis			4 (8%)	30 (56%)	20 (37%)
Operational Risk analysis activities	0	0	6 (11%)	8 (15%)	40 (74%)
Product Delivery Risk Analysis		6 (11%)	10(19%)	23 (43%)	15 (28%)
Liquidity/ Market Risk/ Profitability Risk Analysis	0	2 (3%)	4 (8%)	22 (41%)	24 (44%)

Table 9: Factors on project risk management T24 core banking system implementation

From the study findings the respondents indicated that risk was an important area to consider while implementing a core banking system. The important and most important risks were however operational and profitability risk and an analysis of these two areas needed to be keenly considered. This is because these two risks lead to direct financial loss to the bank and its stake holders. The respondents indicated that it is very important to have risk control measures put in place to minimize all forms of risk involved in project implementation. The study respondents identified profitability risk analysis and operational risk analysis as very important tasks before implementation and that it was very important to have risk control measures in place to minimize the possibility of these risks occurring and therefore shielding the organization from financial loss. According to Matta, and Ashkenas, (2003) system implementation failures arose due to unplanned implementation process. They advise that there is need to change focus and put emphasis in the implementation of projects. Some of the implementation challenges observed relate to integration risks where one part of the project is not compatible to the other part hence leading to malfunction and lack of interoperability of the parts. In essence, despite the individual team members completing their tasks in good time and within budget, the main project might still fail due to incompatibility of the parts brought together.

#### 4.6. Correlation Analysis

To quantify the relationship and strength of the relationship between the variables, the study used Karl Pearson's coefficient of correlation.

The Pearson product-moment correlation coefficient (or Pearson correlation coefficient for short) is a measure of the strength of a linear association between two variables and is denoted by  $r$ . The Pearson correlation coefficient,  $r$ , can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association, that is, as the value of one variable increases so does the value of the other variable. A value less than 0 indicates a negative association, that is, as the value of one variable increases the value of the other variable decreases

	Implementation of T24 core banking system	Organisational structure	Human resource management	Technical competency	Project risks management
Implementation of T24 core banking system (r) (p) Sig. (2 tailed)	1.000				
Organisational structure (r) (p) (2 tailed)	0.894 0.018	1.000			
Human resource management (r) (p) Sig. (2 tailed)	0.493 0.031	0.316 0.047	1.000		
Technical competency (r) (p) Sig. (2 tailed)	0.661 0.024	0.163 0.019	0.216 0.047	1.000	
Project risks management (r) (p) Sig. (2 tailed)	0.402 0.046	0.161 0.029	0.233 0.0464	0.462 0.014	1.000

Table 10: Correlation and the coefficient of determination

According to the Table 10, there is a positive relationship between implementation of T24 core banking system and organisational structure, Human Resource management, Technical competency and project risk management (0.894, 0.661, 0.493, and 0.402) respectively. The positive relationship indicates that there is a correlation between the factors influencing implementation of T24 core banking system in BPR. This notwithstanding, all the factors had a significant p-value ( $p < 0.05$ ) at 95% confidence level. The significance values for relationship between implementation of T24 core banking system and organisational structure, Human Resource management, Technical competency and project risk management were 0.018, 0.031, 0.024 and 0.046 respectively. This implies that organization structures was the most significant factor.

Analysis of the Table 10 presents the degree of correlation and levels of significance between factors influencing implementation of T24 core banking system. All the factors display weak correlation relationship with implementation of T24 core banking system. However within the factors which are the independent variables, organization structures have a high correlation of 89.6%. This high correlation between independent variables leads to multicollinearity between the variables and it leads to spurious results. A high degree of multicollinearity can also prevent computer software packages from performing the matrix inversion required for computing the regression coefficients or it may make the results of that inversion inaccurate and unstable.

### 5.1. Conclusion

Managing and coordinating a massive system like a core banking system for a bank is not an easy task. This is because effective and specific communication is required when leading and guiding all the stakeholders in a project. Banks have been known to hold very sensitive yet important information. This makes T24 core banking system development become a very sensitive (so as not to lose important information) yet large projects which depend on various determinants including complexity, duration of development, available budget and the desired quality of the project.

For a bank to successfully implement a T24 core banking system, the implementation staff needs to have the necessary support in terms of resource and skill required, have a clear plan based organization structures, while ensuring that the inherent risks are mitigated to protect the institution from potential loss. Project risk management should also have a definite implementation plan, skill and support plan once the system has been adopted.

### 5.2. Recommendation

Based on the study findings the following recommendations are made:

The recommendations from the study were that during an implementation effort, it is important to have a clear organization structure in place. It should be clear who has the authority to make decisions. When possible, management should try to ensure that the organization structure is clear, relatively decentralized and relatively formalized as decisions may be made more quickly. Clear procedures, rules and responsibilities may give organizational members certainty during an implementation effort. Furthermore, it may increase the motivation of organizational members. The top management should provide the necessary support to by ensuring that the necessary resources are availed for successful implementation

The human resources department should ensure that necessary training is carried out prior to project implementation and that the core implementation team should comprise of individuals with great expertise and experience in the various operations of the bank. The risk and compliance department of the organization needs to be involved in order to ensure that there are proper risk control measures in place.

### 5.3. Suggestions for Further Research

Despite the overall findings procedure in this study, there are still open opportunities for further studies. Further research on Effects of T24 core banking system change on profitability of financial institutions in Rwanda should be combined to develop a framework which can be empirically tested through a questionnaire survey to get more accurate results. The researcher recommends further studies on how Risk factors affecting the implementation T24 core banking systems in Rwanda

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