

# TECHNOLOGICAL TRANSFORMATION OF ROBOT BANKING ON “FLOWERS” MODEL – A Research in Chennai

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## ABSTRACT

Techno dynamism happens all over the World in various fields. In Banking also, techno dynamism is part and parcel of banking development. The last two decades (2000 to 2019) are considered as techno dynamism decades in banking industry. Robot banking is an advancement of banking technological revolution. Robot banking integrates massive customization and individualized attention to the customers. Whenever technological transformation happens, there is a need to have sophisticated business model. “FLOWERS” model is a model developed by the researchers for transformation of technological revolution. F stands for Flexibility; L for Learning; O for Objective orientation; W for wondering with eagerness; E for Emotional intelligence; R for Readiness and S for Strong determination. Both flexibility and strong determination are needed for effecting any new technology into practice and for transformation efficiently. Such Flexibility with Strong determination is just like trunk of an elephant that can take a big wood very easily and strongly. Object orientation is just like eyes that would see vision, mission, plans and every thing. Emotional intelligence is very important to face any anticipated problems and win over such problems by solving them appropriately in time. Wondering with eagerness and Readiness are just like shield and weapon for a warrior that would be more useful in war. Therefore, for effecting transformation, Flexibility with Strong determination is like brain that is equated with trunk of elephant; Objective orientation is just like eyes; Learning is the food for brain; Wondering with readiness is just like shield & weapon and Emotional intelligence is like intellectual, brave & untiring soldier. In this research article, double stage sampling has been designed, one stage being bank employees and another stage being bank customers. Totally 100 bank employees and 600 bank customers were contacted by following simple random sampling method and multi stage quota sampling method respectively. It is found out that all the bank employees (irrespective of sectors) do have strong determination and readiness in launching Robot banking. But more interest is evidenced among private sector bank employees and foreign bank employees, rather than public sector bank employees. In this research article, technological transformation of Robot Banking on FLOWERS model will be discussed in detail.

**Key terms:** *Robot banking, Artificial intelligence, Augmented reality, Visual Banking, Digital banking, Mobile banking, FLOWERS model of transformation*

## INTRODUCTION

Digital India has become more popular since 2015. This paved a way for Digital transformation in every where, particularly in Digital banking. The year 2016, demonetization period paved a way for moving towards Digital banking very strongly. Technological dynamism

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happened every month, since 2016. HDFC Bank has been marching forward towards technological excellence, followed by ICICI bank. HDFC bank, once upon a time, it was started with few men and they utilized the talents of them to the fullest possible extent. They created teamspirit among such employees and developed synergy management. Human Resources management is the main thing for them. Human Resources management is considered as heart of their bank. Technological excellence is considered as their brain and nerves of their banking system. Financial management excellence is treated as like blood of their banking system. They want to launch Robot banking very soon in their branches. ICICI Bank, YES bank and such banks are also willing to launch Robot banking very soon, one after another. In this research article, technological transformation of Robot banking on “Flowers” model will be discussed.

### **ROBOT BANKING:**

Robot banking means performing various banking operations by using Robots. Therefore, Augmented Reality, Artificial Intelligence and excellent performance of banking would be possible. Digital banking paves a way for massive customization. The advantage of massive customization will come in Robot banking also. Whenever massive customization happens, individualized attention will be a lapse. Both massive customization and individualized attention would move in opposite directions. But, individualized attention is also needed. Robot banking brings individualized attention of customers. Hence, Robot banking integrates both individualized attention as well as massive customization together, and offering banking services excellently well.

### **Transformational approach of “FLOWERS” Model :**

Whenever a new technology emerges, it has to be administered cautiously. FLOWERS model will be more useful for effecting transformation successfully, without any flaw.

F – Flexibility

L – Learning attitude

O – objective orientation

W – Wondering with eagerness attitude

E – Emotional intelligence whenever anticipated problem happens

R – Readiness

S – Strong determination

This business model will be explained in this research article in detail.

### **EMERGING TECHNOLOGICAL ADVANCEMENTS IN FUTURE :**

Various emerging technological innovations are as follows.

1. Block chain technology
2. Smart watches
3. Google glasses
4. Upgraded ATMs, ATMs in the name of ITMs (Interactive Teller Machines) for doing multiple banking functions
5. Automated Financial services
6. Strategic partnerships
7. Extended Application Interfaces
8. Artificial Intelligence in Apps and Online banking transactions
9. Extended Security measures by using biometrics and video mechanisms and ensuring higher level security mechanisms

10. Video banking and Extended virtual reality
11. Robot banking
12. Application of Internet of things in retail banking
13. Focus on Retail banking and personalization of banking services
14. Cloud computing technologies and Sky banking

#### **BANKING OPERATIONS BY USING ROBOTS (Present) :**

The following banking operations are being done by using Robots as of now.

1. Welcoming and receptive approach to customers
2. Seeking requests from the customers and guiding them to the appropriate counters
3. Talking in different languages and interacting with the customers
4. Responding to customer requests with appropriate ready made answers
5. Helping and guiding the customers to select appropriate financial plan

#### **BANKING OPERATIONS BY USING ROBOTS (Near future) :**

The following banking operations will be performed by using Humanoid Robots in future, especially for the customers.

1. Welcoming and receptive approach to customers, interacting with the customers for their requests
2. Scanning customer faces and facial recognition
3. Recognizing the customer account and suggestions suitably
4. Offering financial advices to the customers in the right direction
5. Counselling the loan defaulters and helping them suitably
6. Rehabilitation of the business and advices in this regard
7. Offering various need based business advices by telling appropriate market trend and every thing to the corporate customers
8. Offering insurance advices and helping the customers appropriately
9. Helping the customers with appropriate legal advices
10. Helping the corporate customers for their business developments, exports and excellence in all the possible ways and means.

The following banking operations will be done by using Robots in future, especially for the bank employees.

1. Big data analytics and information processing
2. Offering needbased information to the needed executives and helping them in time
3. Taking care of customer services excellently well
4. Taking care of individualized attention and massive customization together
5. Bringing the bank to be profitable in the long term.

#### **REVIEW OF RELATED LITERATURE:**

There are various researches on Digital banking and a few researches on Smart banking are available. The researchers reviewed 112 such literatures on Internet banking, Smart banking and Digital banking. There are 13 researches on Robotic usages in various fields and its applications practically. There is one research on Robot banking that was done in Singapore. Karippur Nanda Kumar and Pushpa Rani have done a research on Robotic Automation Process : A study of impact

on customer experience in Retail banking industry in Singapore. But, there is no research on Robot banking in India, particularly in Chennai. Only a few conceptual papers on Robot banking were there, but they did not say anything about Robot banking operations completely. The present research on Robot banking has been made to bridge the particular research gap. The present research is made in 2018 – 19, recently.

### **RESEARCH METHODOLOGY:**

This research has been prepared to meet out twin objectives. First, to understand the possibilities for launching Robot banking by applying FLOWERS model for having efficient transformational approach in welcoming a new technology and second, to know the expected prosperities and precautions to be taken while launching Robot banking. In this research article, first objective will alone be fulfilled. Second objective will be published in another article.

The research has been made in Chennai. Primary data have been collected during the year 2018 – 2019.

Double stage sampling plan has been adopted, at one stage, bank officers and employees were contacted and at another stage, bank customers were contacted. Among the bank officers, simple random sampling has been followed. Technologically advanced banks were selected, based upon best technological banking award ceremony, 2018 (Financial Express, Economic Times, Business Standard, India Today newspapers and periodicals). Such banks are HDFC Bank, State Bank of India, IndusInd bank, YES bank, Bank of Baroda, DCB Bank, ICICI Bank, Kotak bank, Dhanalakshmi Bank, Bank of America, Corporation bank, Punjab National bank, Canara Bank, Axis bank, Bank of India, IDBI Bank, Indian bank, Andhra bank, Vijaya bank (19 banks). Apart from such awarded banks, City Union bank started Robot banking in T. Nagar branch and took initiative (1 bank). Therefore, totally 20 banks in Chennai were taken into account for sampling. There are 9 Public Sector banks, 8 Private sector banks and 3 foreign banks, totally 20 banks. From each bank, 5 bank officers in Chennai were contacted by adopting simple random sampling method. Only Managers or officer cadre employees were contacted to know the correct information. Sub staff, office assistants, low cadre clerks were ignored. Hence, it becomes 100 bank employees (20 banks \* 5 employees = 100 bank employees) in the first stage sampling [Public sector bank employees = 9 banks \* 5 = 45; Private sector employees = 8 banks \* 5 = 40 employees; Foreign banks = 3 banks \* 5 = 15 employees; totally 100 employees].

In the second stage, the sampling has been taken by following Multi Stage Quota Sampling method. Such 20 banks were taken into consideration and from each bank, 30 customers were contacted and it became 600 customers. Only the customers who use digital banking services were contacted. Because they can alone say about the technological advancements of the banking industry correctly. Other customers were ignored.

### **Corporate Banking customers (300 customers):**

From each bank 15 customers \* 20 banks = 300 customers, Among them, the customers were segmented as follows.

Manufacturers = 100 customers

Traders / Shop keepers = 100 customers

Service Business = 100 customers:

### **Individual Banking customers (300 customers):**

From each bank 15 customers \* 20 banks = 300 customers, Among them, the customers were segmented as follows.

Independent Professionals = 100 customers

Employees = 100 customers

Students & Home makers = 100 customers

Totally 714 customers were contacted and filtered into 600 for this research purpose. The respondents were contacted in person. Apart from such source, google forms were used and the link was sent to the customers' email ids and whatsapp. The responses were collected and organized. Necessary care has been taken by the Researcher to avoid or minimize various errors namely, sampling error, Data errors, Statistical errors (Type I error and Type II errors).

Regarding statistical calculations, manual analysis, analysis by using SPSS, analysis by using Excel were made. Necessary sufficient care has been made to portray the statistical results correctly. Statistical tests like Likert Scaling technique (5-point scale), Kruskal Wallis rank test, Spearman's rank correlation, Friedman's test are applied suitably, after validating data.

There are a few limitations. Only Digital banking users are contacted and non-users are not considered. Only bank managers, bank officer cadre employees and higher cadre clerks were contacted and others like office assistants, low cadre clerks were ignored. Time is yet another constraint. Chennai area (In and around Chennai) is the only area coverage. The periodicity is 2018 – 19. The responses are psychological in nature, subject to change when technological advancements happen and prosperities do happen. The responses may also change in future.

### **SAMPLING ADEQUACY AND DATA VALIDITY :**

After collecting the data from bank employees of 100 samples, by using SPSS, Kaizer Meyer Olkin Measure method (KMO) of sampling adequacy is considered for bank employees and it is 0.816. This means that *sampling is adequate*. Regarding validity, Cronbach's Alpha has been analysed and this is 0.756, for the sample of 100 respondents. This conveys that the *data are found to be valid*.

After collecting the data, by using SPSS from bank customers of 600 samples, Kaizer Meyer Olkin Measure method (KMO) of sampling adequacy is considered for bank customers and it is 0.857. This means that *sampling is sufficient*. Regarding validity, Cronbach's Alpha has been analysed and this is 0.767, for the sample of 600 respondents. This conveys that the *data are valid*.

### **FLEXIBILITY TO WELCOME ROBOT BANKING :**

Whenever any change is effected, normally, employees may have some reserved attitude to accept the same. They may not accept it, because of reluctance or fear of loss of employment or some unwarranted fear & worries. But, at the same time, customers may accept it with overwhelming responses. When Robot banking comes into effect, how the bank employees and bank customers feel about the same. The following table number 1 brings forth the necessary information.

**Hypothesis :**

- There is no significant variance of attitudes between bank employees and bank customers
- There is no significant variance of attitudes among bank employees, sector wise
- There is no significant variance of attitudes of bank customers between corporate customers and individual customers

**TABLE 1–FLEXIBILITY TO WELCOME ROBOT BANKING**

Flexibility attitude	Bank Employees (100)					Bank Customers (600)			
	Public (45)M1	Private (40) M2	Foreign (15) M3	OM1	OR1	Corporate (300) M4	Individual (300) M5	OM2	OR2
Welcoming Robots with receptive mind	4.444	4.50	4.677	4.540	3	4.578	4.800	4.689	1
Trying with Robots	4.533	4.30	4.467	4.433	5	4.311	4.677	4.494	7
Accepting Robots for banking service	4.400	4.85	4.267	4.505	4	4.444	4.677	4.561	5
Interacting with Robots	4.356	4.25	4.667	4.424	6	4.533	4.733	4.633	2
Expecting best banking service with Robots	3.956	4.05	4.767	4.257	8	4.356	4.557	4.565	4
Agility in banking with Robots	4.578	4.90	4.800	4.759	1	4.456	4.556	4.506	6
Mass customization and crowd management	3.378	4.85	4.933	4.387	7	3.956	3.856	3.906	8
Individualised attention possibility	4.311	4.80	4.667	4.592	2	4.545	4.677	4.611	3

**Source (for Table 1 to 11) :** Computed data from Primary source.

**Note (for Table 1 to 11):** Weightage points : Top most priority = 5 points; Moderately top priority = 4 points; Moderately Neutral priority = 3 points; Lower priority = 2 points; Very lower priority (Least priority) = 1 point

**Note : Abbreviations (For table 1 to 11) :** OM1 – Overall Mean for bank employees; OR1 – Rank for bank employees; OM2 – Overall Mean for bank customers; OR2 – Rank for bank customers; TW1 – Total Weightage for bank employees; TW2 – Total weightage for bank customers; W1 – Weightage for Public sector bank employees; W2 – Weightage for Private sector bank employees; W3 – Weightage for foreign bank employees; W4 – Weightage for corporate customers; W5 – Weightage for individual customers

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Spearman's Rank correlation between ranks of bank employees and bank customers	+0.6514	Nil	Relationship exists positively, but at medium level
Mann Whitney's U test, between ranks of bank employees and bank customers	U = 32 and z = 0.05241	0.4321	Reject hypothesis. Significant variance exists
Fried man's test among the mean values of bank employees, sector wise	3.25	0.19691	Reject hypothesis. Significant variance exists
Fried man's test among the mean values of bank customers (corporate & individual)	4.5	0.03389	Accept hypothesis. No significant variance exists
Kruskal Wallis test – H test – between ranks of bank employees and bank customers	1.1029	0.29362	Reject hypothesis. Significant variance exists

Table 1 and statistical results brings forth the following information. Attitudes of bank customers vary with bank employees. Bank customers do have overwhelming responses. Whereas bank employees do have some reservations. This is proved by H test and U test. Attitudes of bank employees vary among themselves, sector wise. Private sector bank employees and Foreign employees are more enthusiastic than public sector employees in welcoming Robot banking. This is proved by Fried man's test. But, at the same time, bank customers accept Robot and welcome it wholeheartedly. There is no significant variance of attitudes between corporate customers and individual customers. Irrespective of their nature, they accept the arrival of Robots wholeheartedly. This is proved by Friedman's test.

Bank employees welcome Robots for having agility in banking (Rank 1), followed by individualized attention to customers (Rank 2). Bank customers welcome Robot as like Guests (Rank 1), followed by interaction with Robots (Rank 2) and getting individualized attention from Robots (Rank 3).

### LEARNING ATTITUDE AMONG BANK EMPLOYEES :

Suppose Robot banking comes into effect, the bank employees have to learn such things wholeheartedly. The following table brings forth the necessary information.

**Hypothesis :** There is no significant variance of attitudes among bank employees, sector wise

**TABLE 2–LEARNING ATTITUDE ON ROBOT BANKING (Bank employees)**

Interest on learning	Bank Employees (100)								
	Public (45)		Private (40)		Foreign (15)		TW1	M1	R1
	W1	M1	W2	M2	W3	M3			
Robot Engineering mechanisms	182	4.044	180	4.50	68	4.533	430	4.30	6
Information Systems management	178	3.956	172	4.30	64	4.267	414	4.14	7
Advanced Big data analytics	164	3.644	162	4.05	66	4.400	392	3.92	8
Financial Management and Currency derivatives	196	4.356	194	4.85	70	4.667	460	4.60	4
Artificial intelligence	152	3.378	150	3.75	42	2.800	344	3.44	9
Operational aspects of Robots	198	4.400	196	4.90	72	4.800	466	4.66	3
Repair solving skills	204	4.533	198	4.95	74	4.933	476	4.76	1
Problem debugging & diagnosing skills and referring to skilled person	194	4.311	192	4.80	70	4.667	456	4.56	5
Robotic maintenance skills	206	4.578	194	4.85	72	4.800	472	4.72	2

**Source :** Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Fried man's test among the mean values of bank employees, sector wise	12.6667	0.00178	Accept hypothesis. No Significant variance exists
Kruskal Wallis test – H test – between mean values of bank employees, sector wise	5.2487	0.00724	Accept hypothesis. No Significant variance exists

It is inferred that learning attitudes between employees of various sectors do not vary with each other significantly, by applying H test analysis. All the sector bank employees do have intention of learning about Robot banking with keen interest. They show more interest to learn repairing skills (Rank 1), followed by maintenance skills and operational aspects of Robots (Rank 3). They want to do something constructively on Robot banking.

### LEARNING ATTITUDE OF BANK CUSTOMERS ON ROBOT BANKING :

Bank customers want to learn about Robot banking about operational aspects and dealing with Robots. They are tabulated as follows.

#### **Hypothesis :**

- There is no significant variance of attitudes between bank employees and bank customers
- There is no significant variance of attitudes among bank employees, sector wise
- There is no significant variance of attitudes of bank customers between corporate customers and individual customers

**TABLE 3–LEARNING ATTITUDE ON ROBOT BANKING (Bank customers)**

Interest on learning	Bank Customers (600)						
	Corporate (300)		Individual (300)		TW2	M2	R2
	W4	M4	W5	M5			
Getting a banking transaction done from Robot	1468	4.893	1476	4.920	2944	4.906	2
Awareness about Robot operations at basic level and in general.	1486	4.953	1488	4.960	2974	4.956	1
Understanding instructions how to operate Robot and following such things	1462	4.873	1472	4.906	2934	4.89	3
Understanding what should not be done on Robot and avoiding such things	1418	4.727	1438	4.793	2856	4.76	4

**Source :** Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Spearman's Rank correlation	+0.99	Nil	Higher positive degree
Mann Whitney's U test, between ranks of corporate customers and individual customers	U = 10 and z = -0.41779	0.6744	Reject hypothesis. Significant variance exists
Fried man's test among the mean values of bank customers (corporate & individual)	1.8	0.17971	Reject hypothesis. significant variance exists
Kruskal Wallis test – H test – between mean values of corporate banking customers and individual customers	1.5709	0.21	Reject hypothesis. Significant variance exists

Statistical tests inform very clearly that attitudes of customers vary between corporate customers and individual customers. Individual customers are more interested to learn Robot banking operations rather than corporate customers, because of their busy schedule and lack of patience. This is proved by Fried man's test, U test and H test very clearly. Customers want to know the basic operations of Robot banking and dealing with bank operations, by following instructions.

### **OBJECTIVE ORIENTATION ON ROBOT BANKING :**

When a transformation has to be effected, objectives should be very clear and achievable. Such set of objectives should follow the rule of "SMART" that means Specific, Measurable, Action orientation, Realistic and Time bound. Robot banking has to achieve the following set of objectives that are tabulated below.

#### **Hypothesis :**

- There is no significant variance of attitudes between bank employees and bank customers
- There is no significant variance of attitudes among bank employees, sector wise
- There is no significant variance of attitudes of bank customers between corporate customers and individual customers

**TABLE 4–OBJECTIVE ORIENTATION ON ROBOT BANKING**

Objectives or Purposes	Bank Employees (100)					Bank Customers (600)			
	Public (45) M1	Private (40) M2	Foreign (15) M3	OM1	OR1	Corporate (300) M4	Individual (300) M5	OM2	OR2
Providing individualized attention to customers	4.577	4.80	4.400	4.592	3	4.806	4.836	4.821	2
Easy & efficient works with perfection	4.088	4.20	4.533	4.273	5	4.413	4.453	4.433	6
Having mass customization (more customers)	4.800	4.85	4.800	4.816	1	4.713	4.767	4.74	4
Having agility in banking services	4.533	4.45	4.667	4.550	4	4.213	4.836	4.524	5
Efficient timely services in best way	4.818	4.90	4.267	4.661	2	4.816	4.856	4.836	1
Taking care of multiple	3.822	4.05	4.533	4.135	6	4.733	4.767	4.750	3

conglomerate customer segments (diversified & unrelated & various customers)									
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Source : Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Spearman's Rank correlation between ranks of bank employees and bank customers	+0.37143		Relationship exists positively, but at lower level
Mann Whitney's U test, between ranks of bank employees and bank customers	U = 10 and z = -1.2	0.23	Reject hypothesis. Significant variance exists
Fried man's test among the mean values of bank employees, sector wise	1.75	0.41686	Reject hypothesis. Significant variance exists
Fried man's test among the mean values of bank customers (corporate & individual)	6	0.01431	Accept hypothesis. No significant variance exists
Kruskal Wallis test – H test – between ranks of bank employees and bank customers	1.641	0.2	Reject hypothesis. Significant variance exists

It is understood that attitudes of bank employees vary with bank customers. This is proved by Rank correlation (lower positive degree), U test and H test. Attitudes of bank customers between corporate customers do not vary with individual customers. This is proved by Fried man test. Attitudes of bank employees vary with sector wise. Private sector employees and Foreign bank employees show more interest in setting objectives for Robot banking, rather than Public sector bank employees.

Bank employees want to have mass customization (Rank 1), followed by efficient timely bank service (Rank 2) and Providing individualized attention to the customers (Rank 3). Bank customers want to have efficient services in time (Rank 1), followed by providing individualized attention to the customers by Robots (Rank 2).

### WONDERING WITH EAGERNESS ON ROBOT BANKING :

In order to have efficient transformation, wondering with eagerness is wanted in each and every stage of development. The following table shows the information about wondering attitude of bank employees.

#### Hypothesis :

- There is no significant variance of attitudes between bank employees and bank customers
- There is no significant variance of attitudes among bank employees, sector wise
- There is no significant variance of attitudes of bank customers between corporate customers and individual customers

**TABLE 5–WONDERING WITH EAGERNESS ON ROBOT BANKING**

Wondering with eagerness	Bank Employees (100)					Bank Customers (600)			
	Public (45)M1	Private (40) M2	Foreign (15) M3	OM1	OR1	Corporate (300) M4	Individual (300) M5	OM2	OR2
Individual counselling about financial aspects by Robots	4.677	4.90	4.800	4.792	3	4.807	4.877	4.842	1
Seeing Robots with wondering sense and getting services	4.800	4.65	4.533	4.661	4	4.787	4.807	4.797	3
Eagerness to see the performance of Robots and work perfection	4.818	4.80	4.800	4.806	2	4.160	4.400	4.280	6

Wondering to compare Robot performance with human performance	4.733	4.85	4.267	4.617	5	4.367	4.360	4.364	5
Eagerness to see initial performance of Robots and further level of performances after having rigorous researches in it	4.808	4.95	4.667	4.808	1	4.877	4.807	4.842	2
Eagerness to see how Robots integrate individualized attention and massive customisation	3.778	4.90	4.533	4.403	6	4.360	4.800	4.580	4

**Source :** Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Spearman's Rank correlation between ranks of bank employees and bank customers	+0.5379	NA	Relationship exists positively, but at medium level
Mann Whitney's U test, between ranks of bank employees and bank customers	U = 17 and z = 0.08	0.9362	Reject hypothesis. Significant variance exists
Fried man's test among the mean values of bank employees, sector wise	4.0833	0.12981	Reject hypothesis. Significant variance exists
Fried man's test among the mean values of bank customers (corporate & individual)	0.6667	0.41422	Reject hypothesis. significant variance exists
Kruskal Wallis test – H test – between ranks of bank employees and bank customers	0.0256	0.87278	Reject hypothesis. Significant variance exists

Wondering attitudes of bank customers vary with bank employees significantly, based upon the results of H test and U test and rank R test. Wondering attitudes of bank employees vary among themselves sector wise, based on Fried man's test. Wondering attitudes of bank customers vary among themselves, based on Fried man's test. Bank employees have eagerness to see the performance of Robots after making improvements in it (Rank 1), followed by Robot's performance with perfection (Rank 2). Bank customers have eagerness to have individual counselling with Robots (Rank 1), followed by Robot's performance with improvements (Rank 2).

### EMOTIONAL INTELLIGENCE ON USING ROBOTS (Bank Employees) :

Whenever transformation is effected, both positive impacts and negative impacts may arise. If the superiors are not emotionally intelligent, they can not proceed into further advancements. Various problems may come at any time. Bank officers must be ready to face all those things, instead of finding faults with others and fingering to some body else. They must be emotionally intelligent when abnormality happens among the bank customers. The following table highlights the necessary information.

**Hypothesis :** There is no significant variance of attitudes among bank employees, sector wise

**TABLE 6 – EMOTIONAL INTELLIGENCE ON USING ROBOT BANKING(Bank employees)**

Emotional intelligence	Bank Employees (100)								
	Public (45)		Private (40)		Foreign (15)		TW1	OM1	ORI
	W1	M1	W2	M2	W3	M3			
When sudden repair happens on Robot, keeping balanced attitude	172	3.822	182	4.55	64	4.267	418	4.18	6
When children played with Robot unwantedly and the Robot starts functioning adversely, having tactful mind	206	4.577	192	4.80	66	4.400	464	4.64	1
When some body hacks Robot operations and its information system, keeping patiently and acting tactfully	124	2.755	154	3.85	56	3.733	334	3.34	12
When somebody steals money by misusing Robot, acting intellectually instead of getting excessive emotions	152	3.377	168	4.20	58	3.867	378	3.78	8

Even though affected customer scolds you and fights with you, acting very intellectually and diplomatically for solving the situations.	104	2.311	182	4.55	68	4.533	354	3.54	9
Suppose Robot is under repair and it may take some days to solve it, having alternative plans to do various banking activities manually	184	4.088	194	4.85	72	4.800	450	4.5	3
When more people started using Robot and overcrowding issue comes, solving the needs of customers with patience and managing crowd carefully	162	3.600	182	4.55	70	4.667	414	4.14	7
When cyber crime happens with Robot, like Cyber stalking or cyber bombing and the like, keeping patience to solve the situations tactfully	102	2.267	178	4.45	72	4.800	352	3.52	10
When the pass word of one person's account is misused by other customer in Robot banking, solving the problem carefully and tactfully	168	3.733	188	4.70	66	4.400	422	4.22	5
Suppose, Privacy of a customer is affected in Robot banking, solving the problem carefully	176	3.911	186	4.65	64	4.267	426	4.26	4
Suppose, network issue happens all of a sudden and consequential problem happens, trying to solve the issue carefully	188	4.178	198	4.95	72	4.800	458	4.58	2
Due to malfunctions off Robot, more number of affected customers crowd you and torture you, keeping patience and solving all the problems with due care and diligence	106	2.355	176	4.40	68	4.533	350	3.5	11

Source : Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Fried man's test among the mean values of bank employees, sector wise	17.1667	0.00019	Accept hypothesis. No Significant variance exists
Kruskal Wallis test – H test – between mean values of bank employees, sector wise	16.4291	0.00027	Accept hypothesis. No Significant variance exists

It is very clear from the statistical tests that attitudes of bank employees do not vary with sector wise. This means all the bank employees accept that they have to be emotionally intelligent when Robot banking is launched in their work place. They do agree that they have to be very careful with children play with Robot (Rank 1), followed by network issue happening and solution (Rank 2) and Robot repair mechanism and alternative plans implementation (Rank 3).

### EMOTIONAL INTELLIGENCE ON USING ROBOT BANKING (Bank customers) :

Because of network issues or electricity issues, Robot may not function well as per the expectation or some times, malfunction may happen. The customers may get angry or short temper immediately. Sometimes, they may lose money due to erratic network. The customers may be upset and getting extreme angry. The following table brings forth the details of emotional intelligence of customers. ]

**Hypothesis :** There is no significant variance of attitudes of bank customers between corporate customers and individual customers

**TABLE 7 – EMOTIONAL INTELLIGENCE ON USING ROBOT BANKING (Bank customers)**

Emotional intelligence	Bank Customers (600)						
	Corporate (300)		Individual (300)		TW2	OM2	OR2
	W4	M4	W5	M5			
Suppose Robot does not understand your slang and diction of language and it performs some other works which are not expected by you, having empathy on robot operations and keeping silence	1324	4.413	1442	4.807	2766	4.61	2

Loss of amount due to erratic network operations of Robot, keeping patience and solving the issue with Manager	1022	3.407	988	3.2933	2010	3.35	4
Suppose Robot misguides you due to its repair, understanding and solving the issue carefully	1414	4.713	1436	4.7867	2850	4.75	1
Suppose Robot does not understand your face and recognize it because of mechanical issue and it refuses to perform, contacting bank officials to perform the desired works	1044	3.480	1248	4.1600	2292	3.82	3

**Source :** Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Spearman's rank correlation between the ranks of corporate customers and individual customers	+0.8	NA	Higher positive degree
Mann Whitney's U test, between mean values of corporate customers and individual customers	U = 9 and z = -0.62668	0.5287	Reject hypothesis. Significant variance exists
Fried man's test among the mean values of bank customers (corporate & individual)	1.8	0.17971	Reject hypothesis. significant variance
Kruskal Wallis test – H test – between mean values of corporate banking customers and individual customers	0.8836	0.3472	Reject hypothesis. Significant variance exists

Bank customers are emotionally sensitive, when their account is under problem or when their money is transferred by mistake. This sensitivity is more among individual customers, rather than corporate customers. Corporate customers think that money will come back definitely to their account, but may be little bit late. But individual customers do not tolerate such things, because of their hard earned money. Individual customers are more sensitive than corporate customers. This is evidenced by U test, H test and Fried man test.

#### **READINESS ON USING ROBOT BANKING (Bank employees) :**

Bank employees have to be ready to use Robot banking with wholehearted attitude. Are they willing ? The following table portrays the necessary results.

**Hypothesis :** There is no significant variance of attitudes among bank employees, sector wise

**TABLE 8—READINESS ON USING ROBOT BANKING (Bank employees)**

Readiness	Bank Employees (100)								
	Public (45)		Private (40)		Foreign (15)		TW1	OM1	ORI
	W1	M1	W2	M2	W3	M3			
Getting ready with trained Robot Engineer and operator	188	4.1778	190	4.75	68	4.5333	446	4.46	5
Getting ready with Robotic maintenance expert	206	4.5778	194	4.85	66	4.4000	466	4.66	2
Getting ready with anticipated problems on Robots and possible solutions	202	4.4889	196	4.9	64	4.2667	462	4.62	4
Getting ready with well trained Information system experts	184	4.0889	188	4.7	62	4.1333	434	4.34	6
Getting ready with information security management expert and maintaining the Robot system well and solving hacking issues and other issues very carefully	212	4.7111	198	4.95	70	4.6667	480	4.80	1
Getting ready with Financial management experts and solving the issues well	208	4.6222	192	4.8	66	4.4000	466	4.66	3
Getting ready after having rehearsal with Robot, having trial, solving errors, improving in the need based direction and bringing Robot with reality	164	3.6444	186	4.65	68	4.5333	418	4.18	7
Getting ready with Artificial intelligence experts and taking care at any time	142	3.1556	184	4.6	64	4.2667	390	3.90	8

**Source :** Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Fried man's test among the mean values of bank employees, sector wise	12	0.00248	Accept hypothesis. No Significant variance exists
Kruskal Wallis test – H test – between mean values of bank employees, sector wise	12.66	0.00178	Accept hypothesis. No Significant variance exists

Bank employees are ready to launch Robot banking irrespective of sectors. This is proved well by H test and Fried man's test. Information security management is the main key area (Rank 1), followed by Robot maintenance (Rank 2) and Financial management (Rank 3).

#### **READINESS ON USING ROBOT BANKING (Bank customers) :**

Customers have to be ready to use Robot, by understanding basic operational aspects of Robot functions. The following table highlights the necessary information.

**Hypothesis :** There is no significant variance of attitudes of bank customers between corporate customers and individual customers

**TABLE 9–READINESS ON USING ROBOT BANKING (Bank customers)**

Readiness	Bank Customers (600)						
	Corporate (300)		Individual (300)		TW2	OM2	OR2
	W4	M4	W5	M5			
Getting ready to have awareness on basic Robot operations	1424	4.746667	1440	4.8	2864	4.7733	1
Getting ready for using Robot by following necessary instructions carefully, until it becomes user friendly	1388	4.626667	1412	4.706667	2800	4.6667	3
Getting ready to avoid the things not to be done very cautiously	1396	4.653333	1432	4.773333	2828	4.7133	2
Getting ready to face small problems if Robot does and ignoring it patiently and solving them carefully (tolerance)	1042	3.473333	1318	4.393333	2360	3.9333	4

**Source :** Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Spearman's Rank correlation between ranks of corporate customers and individual customers	+0.99	NA	Positive degree nearing to perfect to 1
Mann Whitney's U test, between ranks of corporate customers and individual customers	U = 8 and z = -0.83557	0.0041	Accept hypothesis. No Significant variance exists
Fried man's test among the mean values of bank customers (corporate & individual)	1.8	0.0012	Accept hypothesis. No significant variance
Kruskal Wallis test – H test – between mean values of corporate banking customers and individual customers	1.8436	0.0017	Accept hypothesis. No Significant variance exists

It is learned from the above table that attitudes of bank customers do not vary with each other between corporate customers and individual customers. Both of them are ready to have Robot banking services wholeheartedly. They are ready to understand what to be done with Robots and what not to be done with Robots.

#### **STRONG DETERMINATION ON USING ROBOT BANKING (Bank employees) :**

Transformation would fail, if strong determination is not there. Here, bank employees convey their attitude on their strong determination on using Robot banking.

**Hypothesis :** There is no significant variance of attitudes among bank employees, sector wise

**TABLE 10 – STRONG DETERMINATION ON USING ROBOT BANKING (Bank employees)**

Strong determination	Bank Employees (100)								
	Public (45)		Private (40)		Foreign (15)		TW1	OM1	OR1
	W1	M1	W2	M2	W3	M3			
Deciding Robot arrival and pre plan	212	4.711111	194	4.85	70	4.666667	476	4.76	1
Deciding long term vision on Robot banking clearly	204	4.533333	196	4.9	72	4.8	472	4.72	3
Deciding missions and objectives suitably	202	4.488889	198	4.95	73	4.866667	473	4.73	2
Deciding short term plans and devising suitable strategies on Robot banking	206	4.577778	192	4.8	71	4.733333	469	4.69	6
Deciding procedures, formalities, operational aspects and routine plans of Robot banking	208	4.622222	194	4.85	69	4.6	471	4.71	4
Deciding Customer Relationship Management System very clearly and following the same	210	4.666667	192	4.8	68	4.533333	470	4.7	5
Deciding Customer Complaints Management System very clearly and solving the same	202	4.488889	190	4.75	66	4.4	458	4.58	7

**Source :** Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P value	Acceptance / Rejection of hypothesis
Fried man's test among the mean values of bank employees, sector wise	10.5714	0.00506	Accept hypothesis. No Significant variance exists
Kruskal Wallis test – H test – between mean values of bank employees, sector wise	10.8868	0.00432	Accept hypothesis. No Significant variance exists

It is analysed that all bank employees do have strong determination on launching Robot banking, irrespective of sectors. This is proved by H test and Fried man's test. They have strong determination to have clear vision, mission, pre plans and every thing for launching Robot banking successfully. Comparing to public sector bank employees, private sector employees and foreign bank employees exhibit more interest on launching Robot banking.

### **STRONG DETERMINATION ON USING ROBOT BANKING (Bank customers) :**

Bank customers do have strong determination in welcoming Robot banking. The research results are portrayed in the following table.

**Hypothesis :** There is no significant variance of attitudes of bank customers between corporate customers and individual customers

**TABLE 11 – STRONG DETERMINATION ON USING ROBOT BANKING (Bank customers)**

Strong Determination	Bank Customers (600)						
	Corporate (300)		Individual (300)		TW2	OM2	OR2
	W4	M4	W5	M5			
Interacting with Robots wholeheartedly	1418	4.7267	1432	4.7733	2850	4.75	2
Tolerance in case of small problems with Robot	1042	3.4733	1388	4.6267	2430	4.05	4
Understanding Robots and how to talk to it with appropriate slang	1412	4.7067	1426	4.7533	2838	4.73	3
Welcoming Robot and making use of it in the long term with our heart and soul	1428	4.7600	1442	4.8067	2870	4.78	1

**Source :** Computed data from Primary source.

Statistical tests (@5% level of significance)	Test value	P	Acceptance / Rejection of
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		value	hypothesis
Spearman's Rank correlation between ranks of Corporate customers and individual customers	+0.99	NA	Positive degree nearing to perfect to 1
Mann Whitney's U test, between ranks of Corporate customers and individual customers	U = 7 and z = -1.04447	0.0034	Accept hypothesis. No Significant variance exists
Fried man's test among the mean values of bank customers (corporate & individual)	1.8	0.0010	Accept hypothesis. No significant variance
Kruskal Wallis test – H test – between mean values of corporate banking customers and individual customers	0.8836	0.0012	Accept hypothesis. No Significant variance exists

It is learned from the above table that attitudes of corporate customers do not vary with attitudes of individual customers. They do have strong determination to welcome Robots for long term purpose (Rank 1), followed by accepting Robots wholeheartedly (Rank 2).

### CONCLUSION:

Robots will perform more number of banking transactions in future. Humanoid Robots will resemble as like ordinary human beings and they will be friends to bank customers and bank employees. Time will come very soon to have more Robots to perform banking operations for 24 hours for 365 days without any tiredness. Robot banking is now at infancy level. But in future, it will be the main banking technology and will dominate banking industry all over the World.

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