

Innovations-Led Paradigm Shift in the Indian Banking Sector

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Abstract

Modern economists emphasize the importance of innovations and technological changes in the growth of an economy. The innovations and technological changes bring about transitional change in the growth of an economy. In case of India, the growth of tertiary sector in the gross domestic product has already achieved the 50% mark. Services sector, in general, and banking, in particular, plays a significant role in the growth of any economy. Banking sector is the most crucial pillar which supports the entire financial system. In the current phase of severe competition, performance is a buzzword and in addition to other factors, performance is a function of innovations. Therefore, an analysis of service sector innovation and performance in tertiary sector, in general, and of banking sector, in particular, is the need of time. In this context, this study is an attempt to relate the service sector innovation and performance in the Indian banking sector.

Innovation inputs are information and communication technology, R&D and human capital, throughputs are organizational change and outputs are productivity, profitability, efficiency and growth. Some of the innovations in banking sector are: introduction of ATMs, credit card, and debit card, smart card, increased categories of loans, Demat account, young stars account, senior citizens account, money transfers, core banking, various kinds of insurance, mobile banking, internet banking, mutual funds, filing IT returns and online taxation, updating current market trends, investing in diversified portfolio, employees retaining schemes, and so on. In this setting of argument, the work is an attempt to analyze the innovation and performance in the Indian banking sector.

Keywords: Innovation, Indian Banking Sector, Performance Parameter, Process Innovation, Product Innovation, Input Output

Introduction & Review of Literature

Innovation means something original or new. Innovation is introduction of a new good, introduction of novel method of production, the opening of a fresh market, the conquest of a new source of supply, carrying out of the new organization of any industry (Schumpeter, 1971). Innovation is an idea, a practice or an object that is perceived by an individual or other unit of adoption (Rogers, 1983). According to Senge (1990), the innovation is an idea that can be replicated reliably on a meaningful scale and a basic innovation is one that creates or transforms an industry. According to Cabral (1998, 2003), innovation is a new element introduced in the system, which changes, even if temporarily, the costs of transactions between at least two actors, elements, or nodes in the network. Innovation means new ways of doing something. It may refer to incremental, radical, and revolutionary changes in thinking products, processes, or organizations (McKeown, 2008). Van de Ven (1986) described innovation as a new idea, which may be recombination of old ideas, a system that challenges the present order, a formula or a unique approach, which is perceived as new by the individuals involved.

In other words, innovation is the successful introduction of a new thing or method. Innovation is the embodiment, combination, or synthesis of knowledge in original, significant, valued new products, processes, or services (Luecke and Katz, 2003). Innovation carries the organization from efficiency to creative heights and development. Broadly, the innovations are of two types: technological (information and communication technologies); and non-technological (R&D, human capital, and intangible assets). Different types of innovations in the services sector may be: opening of new markets, new ways of managing finance, new ways of organizing administration, new sources of raw material,

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new methods of production, creation of new services, and new processes (National Knowledge Commission, 2009). The idea of innovation is sourced externally and internally. According to Nelson and Winter (1982), innovation represents the adoption of a new idea, process, product, or service, developed internally or acquired from the external environment. The adoption of innovation follows from and is contingent upon an organization's capability of technical, strategic, and administrative skills.

The banking industry in India has been a witness to the last decade to several regulatory changes, resulting in a tough competition among banks. The entry of private sector banks and foreign banks, as a sequel to the implementation of the recommendations of the Narasimham Committee, has further enhanced the expectations of the in the areas of performance of the banking industry. Claessens et al. (2001) found that the increased presence of foreign banks is associated with reduction in profitability, non-interest income and overall expenses of domestic banks, besides revealing the positive efficiency effects on domestic banks, thus forcing the domestic banks to adopt for the innovative practices to sustain and improve their performance. Denizer (2000) examined the effect of foreign bank entry on Turkey's domestic banks and found that net interest margins, returns on assets, and overhead expenses of domestic banks decreased after foreign bank entry. Another significant innovation which has changed the face of banking is the use of the internet as a channel for financial services. The use of internet banking might, however, not be so easy for the consumers. Consumer's use of internet banking requires acceptance of the technology. The complexity of technology involves the changing of behavioural patterns (Metuer et al., 2000). On the one hand, technology can simplify consumers understanding of exchange, and on the other hand, in the absence of proper knowledge of technology consumers' understanding of exchange becomes more difficult. Internet banking is changing the banking industry and is having all the major effects on banking relationships. Banking is now no longer confined to the specific branches where one has to approach in person to withdraw cash or deposit a cheque or request a statement of accounts. In Internet banking, any inquiry or transaction is processed online without any personnel contact to the branch facilitating it as banking anywhere at any time; thus, the process of internet banking is becoming a necessity. The net banking, thus, is more of a norm rather than an

expectance in many developed countries since it is the cheapest way of providing banking services.

Main Objectives

The present study is of the view that the introduction of innovations has helped in inventing new products and processes and, thus, has made the banks more efficient. More specifically, it is broadly hypothesized that the innovation is positively associated with organizational and business performance. In this context, the main objective of the work is to design and empirically prognosticate a model that relates innovation and business performance in Indian banking sector. Hence, the following are the main objectives:

- To review the theory and empirics on innovation and performance evaluation.
- To quantify the performance and innovation parameters by developing a more inclusive measures of performance parameters and innovations parameters.
- To examine the relationship between innovation and business performance in banking sector in India.

Data and Methodology

The study is based on primary data to gather the microscopic view of the phenomena and corroborate the findings with ground reality and gather the feel of microscopic dynamism. Service sector innovations are of three types: process innovation, product innovation, and organization innovation. Process innovations are normally related to technology, in general, and information and communication technology, in particular. Product innovations are related to new concepts and new mix of services. Thirdly, organization-related innovations are related to business process re-engineering, business re-structuring, enterprise resource planning and development, etc. In case of banking, process innovation has come in the form of information technology; product innovation has come in the form of financial innovation; and organizational innovation has come in the form of restructuring, re-engineering and right-sizing of workforce. The study relates innovation and performance by using statistical technique of factor analysis and complete analysis has been carried at the level of four banking groups banks in India.

Sampling Distribution

Keeping in view the objectives of the study a questionnaire is design to capture the innovations in the banking sector. Primary data have been collected by using schedule cum questionnaire. At present, there are 163 scheduled commercial banks in India. The scheduled commercial banks consisted of 26 Public Sector Banks, 21 Private Sector Banks, 83 Regional Rural Banks (RRBs), and 33 Foreign Banks. Public sector banks comprise of State Bank of India and its six subsidiaries and 20 nationalized

banks, and the IDBI Bank Ltd. is classified as other public sector bank. Private sector banks comprise seven new private sector banks and 14 old sector private banks. Non random sampling technique has been used by taking sample of size of 233 banks. Area-wise data are collected mostly from Delhi–NCR and rest from Haryana and Punjab. From the sample, the respondents can be broadly categorized on the basis of managerial levels, comprising of different experience, qualification, gender, and region which they belong to. Category-wise description is as follows:

Table 1: Bank Group cum Region Wise Classification

Criteria	Classification	SBI	Nationalized Banks	Private Banks	Foreign Banks	Total
Groups/ Number of Bank Branches	Delhi–NCR	44	75	52	30	201
	Punjab	9	2	5	0	16
	Haryana	3	8	4	1	16
	Total	56	85	61	31	233

Source: Calculated $\chi^2 = 14.138^*$

Table 1 shows that out of the total sample of 233 banks, 56 respondents are from SBI, 85 respondents are from nationalized, 31 respondents from foreign sector, and 61 respondents from the private sector banks. In total, 201 respondents are from Delhi–NCR, 16 and 16 are from Punjab and Haryana, respectively. Further classification reveals that from the total of 56 respondents from SBI, nine respondents were from Punjab, three respondents from Haryana, and the rest 44 from Delhi–NCR. From the sample of nationalized banks of 85, two from Punjab, eight from Haryana, and 75 are from Delhi–NCR. From the sample of 61 respondents of private banks, five

respondents are from Punjab and four respondents are from Haryana and 52 are from Delhi–NCR. From the sample of 31 respondent’s foreign banks, 30 are from Delhi–NCR, and only one from Haryana. The critical table value of chi-square at 5% level of significance, and with 6° of freedom is 12.591, whereas the calculated value with SPSS is 14.138, which is higher, since the table value is less than the computed value of chi-square test; therefore, the result is significant. This is further supported by the *p* value. The value of *p* is .028 % which is less than 5% level of significance.

Table 2: Bank Group cum Sex Ratio

Criteria	Classification	SBI	National	Private	Foreign	Total
SEX	Male	32	66	43	22	163
	Female	24	19	18	9	70
	Total	56	85	61	31	233

Source: Calculated $\chi^2 = 6.790^*$

Further, the sample could be categorized on the basis of sex, experience, and managerial levels. Table 2 clearly indicates that proportion male-female ratio in banks is almost double which shows that banking industry is male dominating industry. Table 2 shows that out of the total male population of 163 respondents 32 respondents are from SBI, 66 are from national banks, 43 respondents are from private sector banks, and 22 respondents are from

foreign banks. From the total population of 70 female respondents, 24 respondents are from SBI, 19 respondents are from national banks, 18 are from private sector banks, and nine respondents are from foreign banks. The critical table value of chi-square at 5% level of significance, and with 3° of freedom is 7.814, whereas the calculated value with SPSS is 6.790, since the table value is more than the

computed value of chi-square test; therefore, the result is insignificant. This is further supported by the p value. The

value of p is .079 % which is higher than 5% level of significance.

Table 3: Bank Group cum Qualification of Respondents

Criteria	Classification	SBI	National	Private	Foreign	Total
Qualification of respondents	Graduate	17	32	8	4	61
	Postgraduate	30	40	51	23	144
	Professional	9	13	2	4	28
	Total	56	85	61	31	233

Source: Calculated $\chi^2 = 25.195^*$

Table 3 classifies the respondents in three categories, i.e., 61 graduates, 144 postgraduates and 28 professionally qualified. It shows the qualification of respondents, that is, out of 56 SBI respondents, 17 were graduates, 30 were postgraduate and nine were professionally qualified. Out of the total 85 respondents from nationalized banks, 32 were found to be graduate, 40 were found to be postgraduate, and 13 were professionally qualified. Out of 61 respondents of private sector banks, eight were found to be graduate, 51 were postgraduate, and two were professionally qualified. Out of the total 31 respondents among foreign banks, only four were found to be graduate,

23 were postgraduate and 4 were professionally qualified. Private sector banks were having the maximum number of postgraduates and national banks were having the maximum number of professionally qualified employees. The critical table value of chi-square at 5% level of significance, and with 6° of freedom is 12.591, whereas the calculated value with SPSS is 25.195, which is higher, since the table value is less than the computed value of chi-square test; therefore, the result is significant. This is further supported by the p value. The value of p is .000% which is less than the 5% level of significance. Therefore, the result is significant.

Table 4: Bank Group cum Designation Level

Criteria	Classification	SBI	Nationalized Banks	Private Banks	Foreign Banks	Total
Designation	Middle level	28	24	9	6	67
	Upper middle Level	12	48	37	20	117
	High level	16	13	15	5	49
	Total	56	85	61	31	233

Source: Calculated $\chi^2 = 29.965^*$

Table 4 shows the classification of respondents on the basis of their designation, though every bank uses a different designation for their employees. In order to overcome this limitation, all the 233 respondents were classified in three levels, i.e. 67 middle level respondents, 117 respondents from upper middle level, 49 respondents from the high level. The description of such levels is as follows: clerk, cashier, executive, head clerk comprises of middle level; the upper middle level comprises of manager, ast. manager, officer, and such similar ranks; whereas, chief manager, zonal manager, chief banker, and senior manager were put together in the high level. From Table 4, the conclusion can be drawn that from the total of 56 respondents of SBI, 28 are from middle level, 12 are from upper middle level, and rest 16 are from high level. Further, from the 85 respondents of nationalized

banks, 24 respondents are from middle level, 48 are from upper middle level, and 13 are from senior level. In the private sector banks from the total of 61 respondents, nine respondents are from middle level, 37 are from upper middle level, and 15 are from high level. From the 31 respondents of foreign banks, six respondents are from middle level, 20 are from upper middle level, and the rest five are from high level. The critical table value of chi-square at 5% level of significance, and with 6° of freedom is 12.591, whereas the calculated value with SPSS is 29.965, which is higher, since the table value is less than the computed value of chi-square test; therefore, the result is significant. This is further supported by the p value. The value of p is .000% which is less than the 5% level of significance. Therefore, the result is significant.

Table 5: Bank Group cum Years of Experience

Criteria	Classification	SBI	Nationalized Banks	Private Banks	Foreign Banks	Total
Years of Experience	0–5 years	17	16	17	6	56
	5–10 years	9	13	23	14	59
	10–15 years	5	25	15	10	55
	15–20 years	7	14	3	1	25
	20–25 years	0	1	3	0	4
	25–30 years	14	12	0	0	26
	30–35 years	4	4	0	0	8
Total		56	85	61	31	233

Source: Calculated $\chi^2 = 137.338^*$

From Table 5, it can be concluded that respondents were maximum from the experience group of 5 to 15 years and less respondents belongs to the experience range of 30–35 years. Bankwise distribution shows that in the private sector and foreign sector banks, age group of 20 and above respondents were nil. Further, in the private and foreign category banks, very few respondents were seen in the age group of 15 years and above. Younger workforce works in the private and foreign sector banks. The critical table value of chi-square at 5% level of significance, and with 6° of freedom is 12.591; whereas the calculated value with SPSS is 137.338, which is higher, since the table value is less than the computed value of chi-square test; therefore, the result is significant. This is further supported by the *p*

value. The value of *p* is .007%, which is less than the 5% level of significance. Therefore, the result is significant.

Results and Analysis of Primary Data

Keeping in view the objectives of the study, a questionnaire is design to capture the innovations in the banking sector. The questionnaire had two parts: Performance and Innovations; further, Innovations can be sub-classified in three parts, namely, Product innovation, Process innovation, and Organizational innovation. In all, 83 statements were used and result was captured via Likert scale. The weighted average score is used to see the comparative most important indicator in each of the below mentioned table starting from Table 6 to Table 21.

Table 6: Performance

S.No	Indicator	Rank	WAS	AVG	SD	CV	Very Low 1	Low 2	Average 3	High 4	Very High 5
1	Industry Leadership	6	0.54	3.54	0.81	22.88	3 (1.30)	17 (7.30)	85 (36.50)	107 (45.90)	21 (9.00)
2	Sales growth	5	0.68	3.68	0.89	24.18	3 (1.3)	22 (9.4)	58 (24.9)	114 (48.9)	36 (15.5)
3	Profit growth	3	0.77	3.77	0.75	19.89	0 (0)	16 (6.9)	50 (21.5)	139 (59.7)	28 (12)
4	Success rate in new products	4	0.73	3.73	0.76	20.38	1 (0.4)	14 (6)	58 (24.9)	133 (57.1)	27 (11.6)
5	Increase in market share	8	0.49	3.49	0.79	22.64	2 (0.9)	18 (7.7)	95 (40.8)	99 (42.5)	19 (8.2)
6	Improved quality of services	2	0.89	3.89	0.74	19.02	1 (0.4)	7 (3)	52 (22.3)	130 (55.8)	43 (18.5)
7	Increase in competitiveness	1	0.97	3.97	0.76	19.14	0 (0)	13 (5.6)	31 (13.3)	138 (59.2)	51 (21.9)
8	Interest income growth	9	0.46	3.46	0.8	23.12	3 (1.3)	21 (9)	90 (38.6)	104 (44.6)	15 (6.4)
9	Decline in non-performing assets	10	0.15	3.15	1.13	35.87	26 (11.2)	40 (17.2)	55 (23.6)	96 (41.2)	16 (6.9)
10	Increase in the number of customers.	7	0.52	3.52	0.95	26.99	9 (3.9)	23 (9.9)	67 (28.8)	107 (45.9)	27 (11.6)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 7: Cards

<i>S.No</i>	<i>Indicator</i>	<i>Rank</i>	<i>WAS</i>	<i>AVG</i>	<i>SD</i>	<i>CV</i>	<i>Very Low 1</i>	<i>Low 2</i>	<i>Average 3</i>	<i>High 4</i>	<i>Very High 5</i>
11	Debit card	1	0.88	3.88	0.82	21.13	4 (1.7)	5 (2.1)	55 (23.6)	120 (51.5)	9 (21)
12	Credit card	2	0.2	3.2	1.11	34.69	27 (11.6)	23 (9.9)	81 (34.8)	80 (34.3)	22 (9.4)
13	Smart card	3	-0.28	2.72	1.11	40.81	45 (19.3)	44 (18.9)	81 (34.8)	57 (24.5)	6 (2.6)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 8: Insurance

<i>S.No</i>	<i>Indicator</i>	<i>Rank</i>	<i>WAS</i>	<i>AVG</i>	<i>SD</i>	<i>CV</i>	<i>Very Low 1</i>	<i>Low 2</i>	<i>Average 3</i>	<i>High 4</i>	<i>Very High 5</i>
14	General insurance	2	-0.11	2.89	1.03	35.64	28 (12)	42 (18)	102 (43.8)	49 (21)	12 (5.2)
15	Life insurance	1	0.15	3.15	0.96	30.48	17 (7.3)	33 (14.2)	90 (38.6)	85 (36.5)	8 (3.4)
18	Health insurance	3	-0.22	2.78	1.06	38.13	39 (16.7)	40 (17.2)	93 (39.9)	55 (23.6)	6 (2.6)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 9: Loans

<i>S.No</i>	<i>Indicator</i>	<i>Rank</i>	<i>WAS</i>	<i>AVG</i>	<i>SD</i>	<i>CV</i>	<i>Very Low 1</i>	<i>Low 2</i>	<i>Average 3</i>	<i>High 4</i>	<i>Very High 5</i>
16	Personal loan	3	0.45	3.45	0.97	28.12	13 (5.6)	19 (8.2)	74 (31.8)	105 (45.1)	22 (9.4)
17	Car loan	2	0.64	3.64	0.94	25.82	12 (5.2)	8 (3.4)	64 (27.5)	117 (50.2)	32 (13.7)
30	loan for gold	5	0.01	3.01	1.17	38.87	27 (11.6)	55 (23.6)	61 (26.2)	68 (29.2)	22 (9.4)
31	Educational loans	4	0.27	3.27	1.08	33.03	21 (9)	29 (12.4)	68 (29.2)	95 (40.8)	20 (8.6)
32	NRI Home loans	6	-0.28	2.72	1.23	45.22	54 (23.2)	41 (17.6)	69 (29.6)	54 (23.2)	15 (6.4)
83	Home loan	1	0.84	4.64	0.94	27.82	12 (5.2)	8 (3.4)	64 (27.5)	110 (49.7)	39 (14.2)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 10: Markets

S.No	Indicator	Rank	WAS	AVG	SD	CV	Very Low 1	Low 2	Average 3	High 4	Very High 5
19	DEMAT Account	2	-0.54	2.46	1.09	44.31	54 (23.2)	66 (28.3)	70 (30)	37 (15.9)	6 (2.6)
22	Mutual funds	1	-0.12	2.88	1.11	38.54	36 (15.5)	41 (17.6)	82 (35.2)	63 (27)	11 (4.7)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 11: Age-Specific Accounts

S.No	Indicator	Rank	WAS	AVG	SD	CV	Very Low 1	Low 2	Average 3	High 4	Very High 5
20	Young-Star Account	3	-0.6	2.4	1.16	48.33	72 (30.9)	42 (18)	83 (35.6)	26 (11.2)	10 (4.3)
21	Senior Citizen Account	1	0.4	3.4	1.04	30.59	12 (5.2)	35 (15)	62 (26.6)	96 (41.2)	28 (12)
28	Pension Scheme / Retirement plan	2	0.19	3.19	1.11	34.8	22 (9.4)	40 (17.2)	63 (27)	88 (37.8)	20 (8.6)
29	Child Future career plan	4	-0.32	2.68	1.2	44.78	47 (20.2)	59 (25.3)	66 (28.3)	44 (18.9)	17 (7.3)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 12: Special Accounts

S.No	Indicator	Rank	WAS	AVG	SD	CV	Very Low 1	Low 2	Average 3	High 4	Very High 5
23	Saving cum Fixed deposit account	1	0.78	3.78	0.89	23.54	2 (0.9)	22 (9.4)	45 (19.3)	120 (51.5)	44 (18.9)
24	Low rate agricultural loan	2	0.41	3.41	0.98	28.74	6 (2.6)	36 (15.5)	78 (33.5)	83 (35.6)	30 (12.9)
25	Low rate loan to SSI	3	0.33	3.33	0.94	28.23	12 (5.2)	20 (8.6)	103 (44.2)	76 (32.6)	22 (9.4)
26	NRI Deposit schemes	4	0.31	3.31	0.98	29.61	15 (6.4)	28 (12)	75 (32.2)	100 (42.9)	15 (6.4)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 13: Special Services

S.No	Indicator	Rank	WAS	AVG	SD	CV	Very Low 1	Low 2	Average 3	High 4	Very High 5
27	Money transfers	2	0.69	3.69	1.01	27.37	10 (4.3)	19 (8.2)	49 (21)	111 (47.6)	44 (18.9)
33	Bill Payment Services	8	-0.04	2.96	1.19	40.2	37 (15.9)	43 (18.5)	61 (26.2)	77 (33)	15 (6.4)
34	Funds transfers	3	0.63	3.63	1.13	31.13	19 (8.2)	20 (8.6)	35 (15)	114 (48.9)	45 (19.3)

35	Mortgage Financing	4	0.24	3.24	0.93	28.7	11 (4.7)	36 (15.5)	83 (35.6)	93 (39.9)	10 (4.3)
36	Securitization	6	0.03	3.03	1	33	20 (8.6)	38 (16.3)	106 (45.5)	53 (22.7)	16 (6.9)
37	FOREX Transactions	5	0.16	3.16	1.16	36.71	25 (10.7)	39 (16.7)	68 (29.2)	75 (32.2)	26 (11.2)
38	Multi City Cheque Facility	1	0.9	3.9	0.9	23.08	4 (1.7)	16 (6.9)	36 (15.5)	120 (51.5)	57 (24.5)
39	Kiosks System	7	-0.12	2.88	1.2	41.67	38 (16.3)	49 (21)	70 (30)	56 (24)	20 (8.6)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 14: E-Channels

S.No	Indicator	Rank	WAS	AVG	SD	CV	Very Low 1	Low 2	Average 3	High 4	Very High 5
40	ATM	3	1.07	4.07	0.8	19.66	4 (1.7)	5 (2.1)	28 (12)	129 (55.4)	67 (28.8)
41	Internet Banking	4	0.89	3.89	0.89	22.88	1 (0.4)	21 (9)	37 (15.9)	117 (50.2)	57 (24.5)
42	Core Banking	2	1.2	4.2	0.71	16.9	2 (0.9)	3 (1.3)	19 (8.2)	131 (56.2)	78 (33.5)
43	Mobile Banking	9	0.42	3.42	1.03	30.12	13 (5.6)	29 (12.4)	64 (27.5)	100 (42.9)	27 (11.6)
44	Online Banking	7	0.63	3.63	0.97	26.72	5 (2.1)	29 (12.4)	51 (21.9)	110 (47.2)	38 (16.3)
45	Electronic Money Transfers	6	0.67	3.67	1.01	27.52	7 (3)	29 (12.4)	40 (17.2)	114 (48.9)	43 (18.5)
46	Customer Care Centres	8	0.44	3.44	0.97	28.2	12 (5.2)	26 (11.2)	62 (26.6)	114 (48.9)	19 (8.2)
47	Computerization	1	1.29	4.29	0.61	14.22	0 (0)	2 (0.9)	14 (6)	132 (56.7)	85 (36.5)
48	Increase in No. of Branches	5	0.8	3.8	0.78	20.53	0 (0)	11 (4.7)	65 (27.9)	116 (49.8)	41 (17.6)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 15: Other Services

S.No	Indicator	Rank	WAS	AVG	SD	CV	Very Low 1	Low 2	Average 3	High 4	Very High 5
49	Self Help Groups for Rural Masses	1	-0.42	2.58	1.02	39.53	47 (20.2)	46 (19.7)	102 (43.8)	34 (14.6)	4 (1.7)
50	Factoring	2	-0.48	2.52	1.08	42.86	53 (22.7)	54 (23.2)	84 (36)	36 (15.5)	6 (2.6)
51	Stock Market Updates	3	-0.5	2.5	1.06	42.4	50 (21.5)	67 (28.8)	69 (29.6)	44 (18.9)	3 (1.3)
52	Retail Banking	3	-0.5	2.5	1.06	42.4	2 (0.9)	16 (6.9)	54 (23.2)	118 (50.6)	43 (18.5)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 16: Human Capital

S.No	Indicator	Rank	WAS	AVG	SD	CV	Very Low 1	Low 2	Average 3	High 4	Very High 5
53	Bank has highly trained & qualified staff	2	0.87	3.87	0.82	21.19	0 (0)	21 (9)	32 (13.7)	137 (58.8)	43 (18.5)
54	Bank has highly experienced staff	1	0.89	3.89	0.86	22.11	0 (0)	23 (9.9)	31 (13.3)	127 (54.5)	52 (22.3)
55	Bank staff is innovative and motivated	3	0.7	3.7	0.86	23.24	4 (1.7)	23 (9.9)	38 (16.3)	140 (60.1)	28 (12)
56	Personnel Environment is Conducive	1	0.89	3.89	0.66	16.97	1 (0.4)	7 (3)	36 (15.5)	159 (68.2)	30 (12.8)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 17: IT Infrastructure

S.No	Indicator	Rank	WAS	AVG	SD	CV	Strongly Disagree 1	Disagree 2	Indifferent- rent 3	Agree 4	Strongly Agree 5
60	Generous budget for Hardware	3	0.88	3.88	0.77	19.85	4 (1.7)	13 (5.6)	21 (9)	164 (70.4)	31 (13.3)
61	Annual maintenance contract	1	1	4	0.57	14.25		3 (1.3)	20 (8.6)	182 (78.1)	28 (12)
62	Generous budget for Software	2	0.96	3.96	0.69	17.42	3 (1.3)	6 (2.6)	25 (10.7)	163 (70)	36 (15.5)
63	Training sessions	5	0.75	3.75	1.04	27.73	14 (6)	17 (7.3)	27 (11.6)	131 (56.2)	44 (18.9)
64	Latest processors, internet applications	4	0.78	3.78	0.89	23.54	10 (4.3)	14 (6)	22 (9.4)	159 (68.2)	28 (12)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 18: Relationship Capital

S.No	Indicator	Rank	WAS	AVG	SD	CV	Strongly Disagree 1	Disagree 2	Indifferent- rent 3	Agree 4	Strongly Agree 5
65	Strengthen customer relationship	2	0.89	3.89	0.79	20.31	6 (2.6)	7 (3)	34 (14.6)	148 (63.5)	38 (16.3)
66	Mergers, acquisitions	3	0.65	3.65	0.87	23.84	3 (1.3)	20 (8.6)	66 (28.3)	111 (47.6)	33 (14.2)
67	Improved quality of product/services	1	0.91	3.91	0.83	21.23	9 (3.9)	2 (0.9)	32 (13.7)	149 (63.9)	41 (17.6)
68	Employee benefit schemes	4	0.44	3.44	1.06	30.81	16 (6.9)	31 (13.3)	43 (18.5)	120 (51.5)	23 (9.9)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 19: Organization Structure

S.No	Indicator	Rank	WAS	AVG	SD	CV	Strongly Disagree 1	Disagree 2	Indifferent- rent 3	Agree 4	Strongly Agree 5
69	Smooth functioning and Integrity between the branches.	2	1.07	4.07	0.76	18.67	4 (1.7)	1 (0.4)	32 (13.7)	133 (57.1)	63 (27)
70	Back-up of data	1	1.21	4.21	0.64	15.2		3 (1.3)	11 (4.7)	150 (64.4)	69 (29.6)
71	Guarded against frauds	5	0.9	3.9	0.76	19.49	3 (1.3)	9 (3.9)	36 (15.5)	146 (62.7)	39 (16.7)
72	Recovery management	3	1.06	4.06	0.71	17.49		3 (1.3)	34 (14.6)	140 (60.1)	56 (24)
73	Redressal system	4	1.03	4.03	0.75	18.61	3 (1.3)	1 (0.4)	42 (18)	128 (54.9)	59 (25.3)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 20: Individual Learning and Adaptation

S.No	Indicator	Rank	WAS	AVG	SD	CV	Strongly Disagree 1	Disagree 2	Indifferent- rent 3	Agree 4	Strongly Agree 5
74	Reforms have enhanced job satisfaction of employees.	6	0.64	3.64	0.92	25.27	8 (3.4)	23 (9.9)	39 (16.7)	138 (59.2)	25 (10.7)
75	Reward System employees	7	0.45	3.45	0.89	25.8	3 (1.3)	36 (15.5)	64 (27.5)	112 (48.1)	18 (7.7)
76	Improved the employee performance	1	0.97	3.97	0.74	18.64	4 (1.7)	6 (2.6)	25 (10.7)	155 (66.5)	43 (18.5)
77	Workers are qualified and skilled enough for adapting the change	5	0.66	3.66	0.92	25.14	8 (3.4)	22 (9.4)	37 (15.9)	140 (60.1)	26 (11.2)
78	Learn new systems and applications	4	0.72	3.72	0.89	23.92	6 (2.6)	21 (9)	35 (15)	142 (60.9)	29 (12.4)
79	Resistance to adopt new techniques	9	0.14	3.14	1	31.85	13 (5.6)	52 (22.3)	69 (29.6)	88 (37.8)	11 (4.7)
80	External environmental change	2	0.82	3.82	0.76	19.9	3 (1.3)	8 (3.4)	50 (21.5)	138 (59.2)	34 (14.6)
81	Satisfaction with performance appraisal system.	3	0.79	3.79	0.81	21.37	1 (0.4)	15 (6.4)	56 (24)	122 (52.4)	39 (16.7)
82	Cross functional teams	8	0.44	3.44	0.95	27.62	7 (3)	33 (14.2)	65 (27.9)	106 (45.5)	22 (9.4)

Source: Calculated from Primary Data; Frequency on 5 point scale (1 to 5) along with its percentage is given in brackets

Table 21: Difficulty in Innovation

S.No	Indicator	Rank	WAS	AVG	SD	CV	Yes 1	No 2
57	Increase in cost	1	1.49	4.49	0.5	11.14	114 (48.9)	119 (51.1)
58	Difficult to adapt /use	2	1.43	4.43	0.49	11	100 (42.9)	133 (57.1)
59	Unawareness about the new innovations	3	1.38	4.38	0.49	11.2	89 (38.2)	144 (61.8)

Source: Calculated from Primary Data; Frequency on 2 point along with its percentage is given in brackets

During the last 10 years, the competitiveness of the banks was explored in terms of industry of the leadership, sales growth, profit growth, return on assets, increase in market share, improved quality of services, increased in competitiveness, and other parameters. After analysing the result of 233 respondents, mainly managers of different banking groups, it was found that Performance is the function of competitiveness, quality of services, and profitability. As per the response of the managers, the success rate in the new product and qualities service leads to profitability which in turn enhances the competitiveness and thereby performance.

In the next section, various Product Innovations and their marketability are captured, since it's crucial for the banks to maintain their market share and position in the competitive world. The product innovation and its impact on the satisfaction level of customers as seen in the various product innovations can be debit and credit and smart card, general insurance, Demat account, young star account, Senior Citizen account, Savings cum F.D. account various insurances different categories of loans, insurance, and the other services offered by banks are seen. Analysis shows that out of all products, Debit cards are most popular followed by savings cum fixed deposit account. The Savings cum deposit account seems to be the most important indicator, which generates lending strength for banks and enhances solvency. Home loan and car loan are very popular whereas the loan for gold and NRI home loans are less popular and thus contribute less to the performance and profitability of the banks as compare to home loans, car loans, and personal loans. The multi-city cheque facility, money transfers, and funds transfers are very popular, whereas Kiosks system and Bill payment services are the bottom-two products which have failed drastically. The other products like Securitization, FOREX Transactions, and Mortgage financing need to be

improved for the long run. Further, low-rate agricultural loan seems to be less popular because of high default rate DEMAT Account and Mutual Funds are less popular among different bank group. The analysis is indicative of the fact that the life insurance is more popular as compare to general insurance and health insurance. As per the response of managers, the weighted average score clearly indicates the popularity of life insurance over general and health insurance, severe competition, and marketing by the insurance firms is an additional disadvantage for banking industry to sell insurance products.

Further, the Process Innovations and its success are aimed to capture to see whether customers are satisfied with the change in the process like Internet Banking, Mobile Banking, Tele Banking, Customer Care Centre, Retail and Core Banking, and the other technological innovation changes that have revolutionized the face of Indian banking. Result is indicative that the process innovation plays a very crucial role in improving the performance of banks of all the banking groups and Computerization, Core banking, and ATM are most popular process innovations. Among the least popular process innovations are Customer care centres and Mobile banking with low weighted score. Therefore, to conclude process innovation parameter, it is evident that banks have been successful in increasing the number of customers by providing effective process innovations and thus are able to enhance their performance.

Information Technology (IT) Infrastructure refers to the amount of expenditure done on hardware and Software, regular training sessions have been useful or not, banks have sufficient support for the latest internet applications. The result on these parameters clearly shows that the annual maintenance is the most important parameter followed by the generous budget for software and

hardware. The training sessions and latest technology are two parameters on which the banks are lacking behind. However, SBI Group is leading in the case of effectiveness of training sessions.

Next parameter of Other Services is an attempt to probe that the new products and services have strengthened the relationship with the customers. Results indicate that the services like Self-help groups for rural masses, Factoring, Stock market updates, and Retail banking are having a similar average score. The banks should improve and increase the target market for the above-mentioned services in order to improve their performance in the long run.

To analyse the growth of employees in the bank, the parameter of Individual learning was used. The learning Process of individual its adaptation show happiness the employees at workplace since satisfied employees would be the most productive ones and it is also an attempt to see whether employees are adaptable to change and the present status of performance appraisal. All the indicators training, qualification, and experiences are positive and strong factors in determining satisfaction and individual learning except for one indicator, i.e. the staff is innovative and motivated. This shows that banks need to put more efforts in order to motivate their employees.

Relational Capital parameter indicates the role of innovations by establishing a relationship of cross-functional teams, cogence with the corporate governance, the smooth functioning of branches, and the mergers and acquisitions. The relationship capital analysis clearly shows that the banks are doing their best effort towards improving the quality of products and services. This indicator is closely followed by the customer relationship which is the latest buzz in the market. The mergers and acquisitions and the employee benefit scheme in order are weak determinants of relationship capital.

Now, with the advent in technology, many problems and frauds have also emerged showing the second side of IT revolution. The weighted average score of the parameters shows that the back of data, the smooth functioning between the branches, and recovery management are most important indicators of the organisational structure. Whereas the gardening the frauds and the redressed system are the weak indicators of the organisational structure. The overall analysis is indicative of the fact that the organisational structure parameter is strong and needs little more attention towards frauds.

Human capital parameter indicates that whether banks have been able to capture the best talent to ensure that their talent is nurtured and treasured and whether the environment is conducive to motivate staff for innovative ideas. As external environment changes, performance appraisal plays very important role in motivating the employees and their improved performance. Whereas the poor indicators were formation of cross-functional teams and resistance to change, since resistance to change is a poor indicator, it shows that employees are in fact open to change. Overall analysis is significant about the individual learning and adaptability towards new innovations and change.

To see the problems on the route to innovations was explored to access that whether it is increase in cost, difficulty in adaptation, or unawareness that restricts the use of innovations. The results reveal that cost and adaptability could be the factors affecting innovation to some extent for public sector banks whereas all the bank groups are well aware of the new innovation happening around.

Factor Analysis Results

The results obtained from survey of 233 respondents of mostly bank managers from various bank groups were revealed through Principal component analysis. By using SPSS 16.0 version, the Principal Component Analysis was carried out to explore the underlying factors associated with various variables. The Bartlett's test of sphericity was conducted to check the validity of constructs and the Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy analysed the strength of association among variables. Table 22 reveals sampling adequacy which aims to determine the suitability of using factor analysis technique. Result of KMO test revealed that sampling adequacy is 0.821, which is highly significant. Bartlett's test revealed that the result is significant at 1% level of significance.

Table 22: KMO and Bartlett's Test

<i>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</i>		<i>.821</i>
Bartlett's Test of Sphericity	Approx. Chi-Square	1882.643
	Df	105
	Sig.	.000

Source: Calculated

Table 23 reveals the affiliation of the various items to a factor. The initial runs based on Eigen values above 1.0 show the presence of three factors. To determine the minimum loading necessary to include an item in its

respective constructs, the variable loading greater than 0.50 was taken into consideration. The exploratory factor analysis results revealed that the analysis of innovations resulted in three factors with 64.35% of the total variance extracted.

Table 23: Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.474	36.491	36.491	5.474	36.491	36.491
2	2.822	18.813	55.305	2.822	18.813	55.305
3	1.357	9.046	64.351	1.357	9.046	64.351
4	0.907	6.047	70.398			
5	0.839	5.596	75.994			
6	0.608	4.055	80.048			
7	0.555	3.702	83.75			
8	0.5	3.331	87.082			
9	0.401	2.67	89.752			
10	0.329	2.192	91.943			
11	0.309	2.058	94.001			
12	0.289	1.928	95.93			
13	0.273	1.819	97.749			
14	0.19	1.264	99.012			
15	0.148	0.988	100			

Source: Calculated

Table 24 and Scree Plot below indicates that there are three main factors visible in the Scree plot as well as in the Rotated Component Matrix. The higher loading of an item in the factor indicates strong affiliation of an item to a specific factor. The study is evident to the fact that out of total 15 components, each item was homogeneously loaded into three different factors.

There are underlying three underlying dimensions in the form of contributors to Innovations, the first dimension belongs to Product cum Process Innovations, which comprises of items such as increase in performance of banks due to competitiveness, various categories of loans such as home loan and car loan, Age-specific account for elderly and youngsters, Deposit accounts such as savings cum deposit account. Process Innovations includes internet banking, Mobile banking, Tele banking, Customer care centre, Retail and core banking, and the other technological innovation changes that have revolutionized the face of Indian banking. Other Process innovation includes the following parameters, i.e., Self-help groups for rural masses, Factoring, Stock market updates, and Retail banking. This factor contributes 36.49% of variance.

The second underlying dimension of Organizational Innovation includes IT infrastructure, Relational capital, Organizational structure, and individual learning. IT infrastructure comprises of Generous budget for hardware, Annual maintenance contract, Generous budget for software, Training sessions and Latest processors, and Internet applications. Organizational structure comprises Smooth Functioning of Banks with their branches, safety and adequacy of data, and the Recovery Management System. Lastly, the Relational Capital comprises of cross functional teams, cogence with the corporate governance the smooth functioning of branches the mergers and acquisitions, improved quality of product/services, and Employs benefit scheme. This factor contributes 18.81% of variance.

The third underlying dimension of Product innovations comprises of following, i.e., Cards, Insurance, Market accounts, and Human capital. Cards comprise of Debit card, smart card, and credit cards; Insurance includes life insurance, health insurance, and general insurance. Market Account consists of D-Mat account and Mutual funds. Human capital parameter aimed at whether banks

have been able to capture the best talent or not to ensure that their talent is nurtured and treasured. This factor contributes for 9.04% variance.

Table 24: Rotated Component Matrix^a

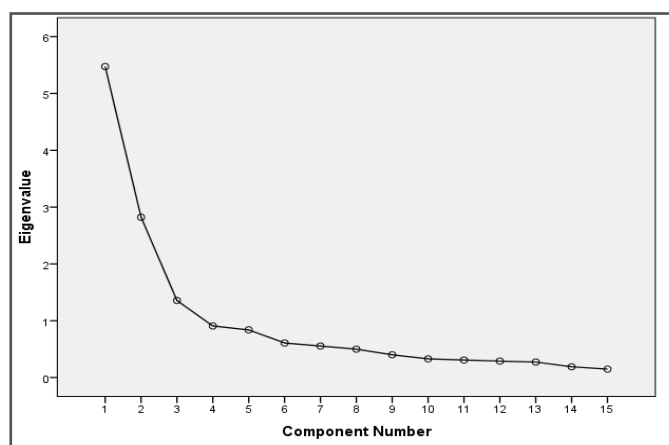
		Component		
		1	2	3
1	Performance	.693	.073	.089
2	Cards	.301	-.080	.673
3	Insurance	.258	-.050	.749
4	Loans	.851	-.006	.076
5	Market Account	.316	-.016	.678
6	Age Specific Accounts	.670	-.016	.434
7	Special Deposit Accounts	.665	.160	.149
8	Other Services	.593	.135	.566
9	Process Innovation	.613	.112	.530
10	Other Process Innovation	.676	.222	.436
11	Human Capital	-.278	.341	.628
12	IT Infrastructure	.020	.806	.078
13	Relational Capital	.056	.889	.027
14	Organisational Structure	.257	.788	-.076
15	Individual learning	.066	.877	.057

Source: Calculated

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.a

a. Rotation converged in 5 iterations.



Source: Calculated

Fig. 1: Scree Plot

Overall result is indicative of the fact that total 64.35% variance is captured by three factors; it is evident that it is the Process Innovation which has appeared as the most significant factor arising from the study. The factor analysis result above proved a high degree of separation, i.e. no cross loadings; hence, the factor analysis solution showed sufficient reliability and validity; therefore, it can be used in the further analysis.

Results of Multiple Regression Analysis

For the purpose to see the relative importance of innovation on performance of banks, the factor scores obtained in case of performance parameters were used as independent variable in the standard multiple regression analysis. The proposed regression model is as follows:

$$Y = \alpha + \beta_1 \text{PRDINNVMN} + \beta_2 \text{PROCINNVMN} + \beta_3 \text{ORGINNVMN} + \varepsilon$$

Where, the dependent variable is:

Y= Performance of banks.

Independent variables are:

PRDINNVMN i.e. innovations which have taken place in the form of product.

PROCINNVMN i.e. innovations which have taken place in the form of process.

ORGINNVMN i.e. innovations which have taken place in the form of organizational restructuring. α intercept, β slope and ε Error term.

In order to assess the influencing power of these factors, multiple regression analysis has been used. Table 25 depicts the results of multiple regression analysis. The value of multiple correlation coefficient (R) between the independent variables and the dependent variable is 0.548. The R^2 for the model is 0.300, thus showing that 30% of the variability in the outcome is accounted for by the predictors (independent variables). The adjusted R^2 for the model is 0.355, and it can be seen that the difference between the values of R^2 and the adjusted R^2 ($0.300 - 0.291 = 0.009$ or .9%) is not very high. This implies that if model was derived from the population instead of sample, it would have accounted for approximately 0.9% of less variance in the outcome. The f statistic obtained is 32.738 (p value =0.000), thus indicating that the independent variables have a significant influence on the dependent variable at 5% level of significance and that the model is effective. This shows that innovations have a great impact on the performance of the banks. Collinearity diagnostic confirmed that there are no concerns of multi-collinearity. The variance inflation factor was less than 3 for the above model.

The standardized coefficient for the independent variable PROCINNVMN is the highest (beta = 0.468, $t = 4.953$,

and $p = 0$). This result is in accordance with the result of factor analysis above that the process innovation has strongest influence on the performance of the banks. The

PRDINNVMN (beta = 0.104, $t = 1.133$, and $p = 0.259$) has the second strongest influence on overall performance of the banks, showing the importance of product innovation.

Table 25: Multiple Regression Analysis (Calculated)

Results of Multiple Regression Analysis –Coefficients					
Variable	Un-standardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.11	0.257		8.197	0
PRDINNVMN	0.092	0.081	0.104	1.133	0.259
PROCINNVMN	0.397	0.08	0.468	4.953	0
ORGINNVMN	–0.026	0.063	–0.024	–0.414	0.679
R	.548 ^a				
R Square	0.3				
Adjusted R Square	0.291				
Std. Error of the Estimate	0.42116				

Conclusion

It is evident that it is the Process Innovation which has appeared as the most significant factor arising from the study. Study shows that there exists a positive correlation between innovation and performance but the contribution of innovations to performance has a differential behaviour at disaggregate level. These innovations have lead to better performance but at the cost of higher operational expenses. To translate process and product innovations into higher performance, a package of other factors and conditions is required.

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