

Achieving Performance through Information and Communication Technology (ICT): A Study of Milk Retailers (MR)

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The research paper attempts to examine the relationship of information and communication technology (ICT) on the performance of milk retailers. Descriptive and one sample t-test has used to test the hypothesis. The research paper is divided into five sections, the first section discusses the information and communication technology (ICT) role in the dairy sector along with different determinants of the milk retail performance. The second section carried out the literature review on ICT role on dairy industry which also include the available literature on milk and milk products retail outlets in the selected district of the eastern Uttar Pradesh. The third section encompasses the method of data collection, research design, sampling techniques, sample size, and tools for analyzing the data. The second last section comprised of the descriptive statistic and t-test for carrying out the analysis of the data and finally, the last parts include the finding, conclusions, and recommendation part of the paper.

Keywords: Information and Communication Technology (ICT), Retailer, Organizational Performance.

1. Introduction

The efficiency and reliability of any process depend upon the timely availability of accurate information related to the process. Execution of ICT applications in milk retailer management is very essential in order to get 'entry ticket' to participate in the global dairy market. Management of the milk retailer performance in today's dairy market depends on the level of updated information available with them, reducing the reliance upon the human information

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storage and also duplication of work. The existing organizational structures need to link milk retailers to the concerned dairy companies and to the respective customers which can be only possible through implementing good ICT practices. ICT Implementation gives importance to its practices and complete checklists, various tasks, and procedures that milk retailer needs. The IT Infrastructure is originated as a collection of equipment/peripherals, each covering a specific practice within IT Service Management. ICT was built as a process-model based on the view of controlling and managing the dairy supply chain. Milk retailers should know the importance of information and communication technology practices, as they help in forwarding and backward integration of the supply chain. Through ICT practices, retailers can easily integrate their supply chain operations and get information and communicate information from ends, supplier-end, or customer-end successfully. So, retailers need to adopt ICT tools i.e., mobile phones, apps, and installation of a computer system with internet connectivity which will help them in communicating and managing the flow of information across their supply chain. Retailers need full adoption of ICT tools and techniques in order to get information quickly which becomes helpful in managing demand across the supply chain.

2. Literature Review

Innovations and developments in information and communication technology (ICT) is the need of the hour as it is leading to significant changes in the retail industry which is very essential. ICT has become vital for the function of retail companies which is providing success to the same. To stay competitive in the digitized retail market retailers, have to be aware of technological developments and have to manage related challenges and opportunities in order to get a competitive edge over the other (Sorescu et al., 2011). Development in communication technology made information collection and distribution easy across the organizational/operational process. ICT includes every technology that deals with the acquisition, processing, transformation, and distribution of information (Argandoña, 2003). Some of the most important ICTs in the retail industry are: the Internet, e-commerce (electronic commerce) (Jahanshahi et al., 2013), electronic payment (Sumanjeet, 2009), data mining (Bagga and Singh, 2012), radio-frequency identification (RFID) systems (Jones et al., 2005), electronic point of sale (EPOS) systems (Lynch, 1990), social media (Drury, 2008), smartphones and mobile apps (Kang et al., 2015), These technologies substantially influence the business models, processes, strategies and operations of retail companies (Sorescu et al., 2011). ICT is playing a significant role in improving the services of the dairy sector, as IT-

enabled tools support the SCM process with improved information management and modeling and facilitate the decision support system of the firm. In other words, it can be said that an IT-enabled SCM support organizational process with improved operational benefits helps the firms to gain a strategic advantage over its competitors, such as the establishment of the virtual enterprise, framing an e-commerce environment, single-point data storage and access, increased visibility, reduction in transportation and inventory cost, improved supplier and customer management, planning activity through real-time data processing and information trade-off within SCM entities. Impact of ICT on the SCM process can be observed through the various competitive dimensions of a firm such as reduction in response time, improved logistics management, improved upstream and downstream collaboration for better demand forecasting, establishing cross-boundary vertical integration within units of the firms, etc. Various kinds of the literature suggest that implementation of ICT and ICT enabled supply chain process equipped with “sensing tools”, “improved information sharing” and “control technology” can provide significant support toward sustainability in the dairy industry and managing supply chain operations (Cleaver and Schreiber, 1994; Sigrimis et al., 2001). For better dairy process management, information generation and information transformation play a vital role. Dairy farmers need to equip themselves with a two-way information system ranging from farm level to the enterprise level. An ICT enabled SCM provides the farmer with needed information, e.g. daily price update, information about modern techno-farming processes and tools, information related to forecasting of natural calamity and government support, etc. ICT has enabled better quality, transport, production, marketing, and services. It also facilitates the integration of locally generated revenue, manpower, resources, and facilities into the human empowerment grid. Various literature also suggests that ICT is acting as integrating and enabling technologies for the economy, and they have a profound impact on dairy society. ICT implementation in the dairy industry will deliver the advanced, reliable, fast supply of milk and milk products to their customers. The ICT is delivering various tools that are fundamentally needed to collect process and manage data and present it in a standardized format. Mohammad et al (2012) said that the application of information technology has a high influential impact on the improvement of the supply chain. Information and communication technology (ICTs) tools namely electronic mail (E-mail), barcoding, and radio frequency identification (RFID), enterprise resource planning (ERP), etc. helps in enhancing the performance of the supply chain in the dairy companies.

3. Research Methodology

3.1.Objective of the Study

- To examine the relationship between information and communication technology (ICT) and the performance of milk retailer.

3.2.Research Hypotheses

- Ho: There is no significant relationship between the use of the internet and milk retailer outlet performance.
- Ho: There is no significant relationship between the use of the mobile phone and milk retailer outlet performance.
- Ho: There is no significant relationship between information communication technology in the marketing of milk products and the performance of the retail outlets.
- Ho: There is no significant relationship between information communication technology on milk retailer's knowledge and performance of the retail outlets.
- Ho: Milk retailers are not satisfied with the different resources that are provided by the milk dairy plant.

3.3.Research Design

The research paper is a kind of exploratory study, consisting of finding out the nitty-gritty of the Indian dairy supply chain management, followed by a descriptive research design which helps in evaluating the association of ICT practices on the Milk Retailer (MR).

3.4. Sample Design

The research is being carried out with one identified group of respondents, i.e., milk retailer (MR), which is basically the supply chain member of the dairy industry.

3.5. Population of the Study

All the retailers selling milk and milk products in Varanasi, Mirzapur, Sonebhadra, and Bhadohi districts of eastern Uttar Pradesh.

3.6. Sample Frame

A list of milk and milk retailers operating in Varanasi, Mirzapur, Sonebhadra, and Bhadohi districts of eastern Uttar Pradesh was obtained from Pradeshik Cooperative Dairy Federation of Uttar Pradesh, Lucknow.

3.7. Sample Units

The sampling units are the individual milk retailers who sell milk and milk products in Varanasi, Mirzapur, Sonebhadra, and Bhadohi districts of the Eastern Uttar Pradesh.

3.8. Sampling Techniques & Size of Sample

Simple random sampling was used to select retail outlets from the available lists of milk retailers. A total of 112 respondents were selected from the given districts of the eastern Uttar Pradesh.

4. Data Collection Design

4.1. Primary Data Sources

Primary data was collected through a structured questionnaire, prepared for milk retailers. The researcher has interviewed a defined category of respondents personally in order to increase the accuracy and observe the phenomenon closely.

5. Questionnaire Design

A structured questionnaire was used for the collection of the data in Varanasi, Mirzapur, Sonebhadra, and Bhadohi districts of eastern Uttar Pradesh.

5.1. Pre-testing and Administering the Questionnaire

The researcher pre-tested the questionnaire by administering it to experts in academics and dairy companies. The academicians were senior professors of the Institute of Agricultural Sciences, BHU, especially the dairy department, and the Institute of Management Studies-BHU. The industry experts were managers who work in dairies companies such as Parag dairy etc. The questionnaire was 'self-administered' to the respondents.

6. Measurement and Scaling Design

6.1.For Milk Retailer (MR)

Agreement continuum (on five points Likert-type scale) for the one group of respondents i.e. milk retailer (MR) is used for accessing the response of the respondents as described below:

Agreement Continuum

1= Strongly Disagree, 2= Disagree, 3= Indifferent, 4= Agree, 5= Strongly Agree

7. Data Analysis

The data collected as responses to the questionnaire were entered into the computer using Microsoft excel software. The data were then subjected to analysis using an application software pack named 'Statistical Package for Social Sciences (SPSS) version 24.0'. The data generated from the questionnaires were subjected to different data analysis techniques.

8. Reliability Testing

Cronbach's alpha of the data from the questionnaire was calculated to be 0.826, which showed that the questionnaire was reliable to continue further analysis.

9. Analysis and Interpretation

9.1.Descriptive Statistics

The descriptive statistics depict that, 93.80% of respondents were male and 6.20% of respondents were female. The average age of the milk retailer involved in the selling of milk and milk products was 40-50 years, which constituted 42.60%, followed by the age group of 55-60 years with 31.50% respondents and 23.40% producer's age group were 30-40 years. 53.60% of respondent's family size were 1-4 members, 36% artisan's family size were 5-8 members, and 18.70% producer's family size was 9-12 members in the family. More than 50% of milk retailers were monthly earning income more than Rs.15, 000/ month and 24% retailer were earning Rs. 20,000/month through their retail outlets.

Objective 1:

- To examine the relationship between information and communication technology (ICT) and the performance of milk retailers.

9.2. T-test Analysis

First hypothesis: Ho: There is no significant relationship between the use of the internet and milk retailer outlet performance.

Table 1: One sample T-Test Analysis Summary Table

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Milk Retailer	112	3.9732	.81051	.07659

Table 2: One sample T-Test Analysis Summary Table

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Milk Retailer	12.707	111	.000	.97321	.8215	1.1250

The above table 1 and 2 exhibits that the mean value is 3.97, standard deviation 0.81 and standard error mean value is .07. The t value and the degree of freedom (df) of the data have 12.707 and 111 and the $p < .05$ ($p = .000$), which shows that we can accept the alternate hypothesis and reject the null hypothesis. This shows that the internet has a significant relationship with the performance of milk retail outlets.

Second hypothesis: Ho: There is no significant relationship between the use of mobile phone and milk retailer outlet performance.

Table 3: One sample T-Test Analysis Summary Table

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Mobile phone	112	4.0089	.86468	.08170

Table 4: One sample T-Test Analysis Summary Table

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Mobile phone	12.349	111	.000	1.00893	.8470	1.1708

The above table 3 and 4 show that the mean value is 4.00, standard deviation 0.86 and standard error mean value is .081. The t value and the degree of freedom (df) of the data have 12.349 and 111 and the $p < .05$ ($p = .000$), which shows that there was a significant relationship between using of mobile phone by milk retailer and the outlet performance.

Third hypothesis: Ho: There is no significant relationship between information communication technology in the marketing of milk products and the performance of the retail outlets.

Table 5: One sample T-Test Analysis Summary Table

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
ICT in Marketing	112	4.1339	.77687	.07341

Table 6: One sample T-Test Analysis Summary Table

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
ICT in Marketing	15.447	111	.000	1.13393	.9885	1.2794

The above table 5 and 6 describe that the mean value is 4.13, standard deviation 0.77, and standard error mean value is .073. The t-test value and the degree of freedom (df) of the data are 15.45 and 111 and the $p < .05$ ($p = .000$), which shows that there is a significant

relationship between information communication technology in the marketing of milk and milk product and performance of the milk retail outlets.

Fourth hypothesis: Ho: There is no significant relationship between information communication technology on milk retailer’s knowledge and performance of the retail outlets.

Table 7: One sample T-Test Analysis Summary Table

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Milk retailer’s knowledge	112	2.4554	1.08958	.10296

Table 8: One sample T-Test Analysis Summary Table

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Milk Retailer’s Knowledge	-5.290	111	.000	-.54464	-.7487	-.3406

The above table 7 and 8 depict that the mean value is 2.45, standard deviation 1.089 with a standard deviation of 1.089. The t-value is 5.29 with a degree of freedom 111 and p= 0.00 (< 0.05), which show that information communication technology has been playing a significant role to improve the knowledge of milk retailer which directly related with the performance of the retail outlets.

Fifth hypothesis: Ho: Milk retailers are not satisfied with the different resources that are provided by the milk dairy plant.

Table 9: One sample T-Test Analysis Summary Table

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean

Sufficient resources	112	4.0357	.82668	.07811
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Table 10: One sample T-Test Analysis Summary Table

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Sufficient resources	13.259	111	.000	1.03571	.8809	1.1905

The above 9 and 11 tables show that the t-statistics of 13.259 with 111 degree of freedom. The mean value is 4.03 with a standard deviation of 0.82 and $p < 0.05$ (0.000), which shows that accept the alternate hypothesis which supports the milk dairy provided the essential resources to the milk retailer. So, the overall supply chain of the milk strengthens the performance of the dairy sector.

10. Conclusion

Information communication technology has been playing a significant role in the overall growth and development of the dairy sector. In the same way, the milk retailers started using the internet like what's up for communication with the dairy units and electronic mode of payments for receiving payments from customers. These mediums saving the time, cost, and energy of retailers and improve the performance of the retailer outlets. Mobile became essential equipment for personal and business work, in the same way, the retailers of the milk were the frequent users of the mobile phone. They commonly using mobile for ordering the milk and updating the news regarding the milk stock to the dairy company. Information and communication technology act as a significant tool for marketing the milk and milk products because this is an information era which is used to aware, educate, and motivate the potential customer to buy products. It is the simplest method to informed the present and upcoming products of the company to its customers. It also enhances the knowledge of the retailers regarding their products and services offered by the dairy sector. The milk retailer informed the customer about the different products and their availability in the shop. Retailers are guided by the dairy company which helps them to take actions for the benefits of the company and retailers. They delivered milk and milk products according to the demand of the retailers. They are ready to support the retailers from technical to management levels. So,

information and communication technology has been playing a key determinant in the 3600 progress of retailer and dairy company.

11. Recommendations

11.1 Milk Retailers (MR)

Milk retailers should focus on continuous information exchange, which will be possible through the adoption of ICT tools and techniques, i.e., mobile phones or landline connectivity or use of the internet at the workplace, etc. Such continuous information exchange between firms provides rapid access to the required information, more sensitivity towards the needs of the customers, and faster response times than that of the competitors. It is also required for demand & supply forecasting, production planning, inventory management, and sharing knowledge of core business processes with supply chain partners.

- Milk being a perishable item, first in first out (FIFO) inventory method must be practiced by the milk retailers which will come through practicing good ICT tools and techniques.
- Milk retailers must ensure that they provide the customers convenient operating hours for supplying milk and milk products to them, especially during morning hours (between 6 a.m. to 10 a.m.) and during evening hours (between 5 p.m. to 10 p.m.), as maximum sales related to milk and milk products generally occurs during these two periods. This provides further satisfaction to their customers and profit to the organization.

12. Scope of Future Research

Every research is done to contribute something to society. Similarly, the present research will be useful for different dairy supply chain member i.e. milk retailers (MR) to strengthen their supply chain operations for market competitiveness. For milk retailers (MR), the research would be helpful in deepening their understanding of the role of ICT practices on organizational performance so as to provide satisfaction to their customers. It will also provide inputs on the impact of market orientation on supply chain management performance. The study has identified the key attributes of dairy SCM practices which will be applicable to dairy supply chain members. The study has provided the possibility of improvement in SCM practices adopted by dairy supply chain members in order to minimize cost and maximize customer values.

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