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Impact of Chaos theory: Implications for Consumer behavior pattern in Gujarat during Pandemic

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Abstract:

Chaos Theory with its roots in the natural sciences, provides a holistic approach for understanding the dynamic and fluid nature of organizations and the market scenario. This paper provides a review of literature that outlines the origins and basic principles of Chaos Theory. It relates pandemic situation with chaos theory and try to develop a study on effective implication of the same. Prime focus would be perception among the consumers and their buying pattern in terms of Chaos which raised due to pandemic situation since 2020.Survey would be conducted using a well- designed questionnaire and primary data would be collected based on the perception of consumers.

Keywords: chaos theory, consumer buying behavior pattern

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1. Introduction

Henri Poincare discovered that the "gravitational and orbital behavior of bodies in the solar system could not be explained" in the 19th century, which is when Chaos Theory first emerged.

uses straightforward, linear Newtonian physics. (Cutright, 1997, p. 3). Meteorologist Edward Lorenz developed on Chaos Theory in the 1960s. Lorenz examined weather simulations on computers. His objective is to increase the consistency of these sophisticated systems using patterns. (Cutright, 1997). Chaos theory has a significant effect that was seen during the pandemic. Different operating systems underwent a number of developments that have an impact on consumer purchasing habits. The community outside of their organizations may be impacted if the deployment is unsuccessful. The beginning of the nonlinear occurrences might be the company losing clients as a result of issues with poor customer service caused by the newly introduced system. The customers of the company can stop doing business with them as a result of the changes. By applying Chaos Theory to businesses, we can observe that quick fixes or minor adjustments within a company can have a disastrous effect on the system as a whole. (Stapleton et al., 2006). Additionally, it's possible that the newly implemented system is up to par, more effective, and will have a multiplicative effect.

2. Literature Review

Chaos theory is now used in management settings, despite its origins in pure mathematical and physical applications. Among the first to apply Chaos Theory to the socialapplications was Physicist Alvin M. Saperstein (Kiel & Elliott, 1996). Mason (2007) defines Chaos Theory as a tool for self-organization within the workplace. Chaotic systems are often seen as being subject to random activity; however, what is being observed is volatility resulting from the complication of the organizational system (Pryor, Amundson, & Bright, 2008). Chaos helps us see that although the system’s shape is predictable, its exact form occurs through individual acts and choices (Wheatley, 1999). Within organizations, order exists without reliability (Cartwright, 1991, as cited by Wheatley, 1999). According to Theitart and Forgues (1995), “organizations are dynamic systems governed by nonlinear relationships” (p. 21).

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According to Theitart and Forgues (1995), planning improves the organization's ability to protect themselves against potential environmental threats. Organizational leaders must be aware of the various internal and external systems that are intrinsically involved in the organization. A system can be affected by even a little alteration.

According to Mason (2007), the implications of Chaos Theory are that "many interactions in a system can produce unexpected patterns or behaviors because stimulating one part of the system can have unexpected effects in the other, unanticipated, parts of the system" (p.12).Departmental head in any Organization can apply Chaos Theory by recognizing and attempting to understand the randomness that is involved in the change process, while also acknowledging that it cannot be controlled (Hannay, Ross, & Erb, 2000).

Peters (1987) contends that organizations must adapt and thrive amongst chaos, rather than merely learn to cope. Organizational leaders can use business principles to their advantage by modifying their business strategies to take advantage of flexibility in a chaotic environment. Chaos Theory has been helpful in describing the uncertainty, confusion, and periods of rapid change that we often experience on a daily basis, both in our personal lives and in the workplace (Hannay et. al., 2000).

Accepting Chaos Theory as a prism through which to assess an organization's general adoption of the change process has an impact on how plans are created and executed.Organizations adopting this notion might start to explore and evaluate potential, unforeseen effects of executing change rather than imposing a predetermined set of changes.Levy (1994) presents a disorganized viewpoint on corporate strategy.The author argues that tiny adjustments, such as a competitor's new business strategy or the adoption of new technology within the company, can have significant effects on the organizational system. Many companies around the world face an ever-changing environment and continuing technology progresses that often results in reorganization

(Snyder, Acker-Hocevar, & Wolf, 1995). Due to how frequently many companies fail to adapt to these shifting situations, organizational theorists and practitioners are turning to new ideas like Chaos Theory.The framework provided by chaos theory enables the intense interdependence that exists both within and between organizations.Because of this

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interdependence, changes in the system that seem irrelevant or minor might have unexpected impacts.In contrast to previous theories and organizational frameworks, chaos theory acknowledges the order and predictability of the basic disorder and unpredictability that exist in organizations.

Snyder, Acker-Hocevar, and Wolf (1995) postulate that if organizations considered chaos as a norm within their organization, they would open themselves to a variety of options and possibly new, previously unimagined futures. Hannay, Ross, and Erb (2000) state that organizations are constantly situated on the edge of chaos and are vulnerable to volatility and resulting in change. Due to the development of chaos within the workplace, individuals within the organization seek stability (Mason, 2007). The potential for creativity, which is stimulated by the unlimited possibilities, arises from this need for stability. It is only when an input is taken out of the system (referred to as negative feedback) that the organizational system gets pushed back to its original state, resulting in stability (Mason, 2007).

Although leaders cannot precisely plan for a change process, they can recognize patterns, as they occur, and design conditions that lend themselves to adaptability (Hannay et. al, 2000). Organizations that are flexible leave themselves up to fresh perspectives and opportunities for change implementation. This strategy could also be used in conjunction with more conventional change approaches, where scenarios, goals, and milestones are outlined, but where an organizational culture that is open to new possibilities and mid-stream adjustments is strongly ingrained.

3. Methodology

3.1 Design and measurement

This study employed a mixed methodology. A systematic questionnaire was used to gather the main data. This questionnaire included the respondents' demographic information as well as their opinions on how consumers of different banks saw chaos theory (different modifications made by the bank to its goods and operational systems). Using Cronbach's alpha, the dependability of each dimension was evaluated. The five characteristics of Chaos theory were used as independent variables and the Overall Satisfaction (S) as the dependent

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variable in this study's linear regression analysis. The following diagram illustrates the relationship in the regression model between the independent and dependent variables:

Y = b0 +b1X1 +b2X2 +b3X3 +b4X4 +b5X5 + error

Where Y is the overall customer satisfaction following the application of the Chaos theory (S), b0, b1,... b5 are parameters, X1 is the change to the infrastructure (I), X2 is the change to the marketing strategy (M), and X3 is the change to the transaction system. Changes to security systems (T), X4 (S) X5 is adjustments to numerous customer service procedures (P).

3.2 Hypothesis

The study concentrates on various attributes of Chaos Theory during and post pandemic that leads to customer satisfaction.

In this backdrop, the following hypothesis statements were formulated in consistent with the literature review which provides the scope and depth of the study.

H01: Change in infrastructure during pandemic has no impact on consumer buying pattern

H02: Change in various marketing strategy during pandemic has no impact on consumer buying pattern.

H03: Change in various security systems during pandemic has no impact on consumer buying pattern.

H04: Change in various transaction system like shifting to online mode during pandemic has no impact on consumer buying pattern.

H05: Innovative changes at customer service level during pandemic will have no impact on consumer buying pattern.

3.3 Questionnaire design and data

Structured questionnaires from the study's original sources were used to gather the study's primary data people who actively participated in shopping during the pandemic. The questionnaire included questions about the demographics of the respondents and their opinions on how the implications of Chaos theory would affect their typical purchasing patterns. The respondents were asked to use a seven-point Likert scale (1 = strongly disagree,

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2 = disagree, 3 = somewhat disagree, 4 = neither agree nor disagree, 5 = somewhat agree, 6 = agree, and 7 = strongly agree) to evaluate their level of satisfaction with various applications of chaos theory in their banks. According to Lewis (1993), 7-point scales had a greater connection with the outcomes of t-tests. Foddy (1994) asserts that scale validity and reliability require a minimum of 7 categories. Inferential and descriptive statistics have both been used in data analysis. We used Excel to create a multivariate regression model and to determine the descriptive statistics. The questionnaire was well-structured and aimed to cover every component of the study's goal. The Cronbach's alpha approach is used to evaluate the survey instrument's reliability. According to Bryman and Bell (2007), the reliability test determines whether or not respondents' ratings on individual traits have a tendency to be correlated with their scores on those other attributes. An alpha coefficient greater than or equal to 0.75 is typically regarded as satisfactory and a good sign.

3.4 Demographic profile of sample data

Data profile Description

Primary data: Structured questionnaire

Secondary data: Obtained from online journals and magazines.

Sampling method ‘Snowball’ (Morgan, 2008; Malhotra, 1999; Tuncalp, 1988).

Data collection: Questionnaires were sent via email and also distributed personally to nearly 150 respondents.

Response rate: 112 response were obtained

Yielding a response rate of 74.6%

Respondents’ profile

Male: 48.62%; female: 51.38%

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3.4 Descriptive statistics

Descriptive Statistics of various variables under study

Table-1

	Attributes	Mean	Standard Deviation
1.	Infrastructure for shopping purpose should be changed instantly making it customer friendly during pandemic.	6.61	0.67
2.	Innovative marketing strategies should be implemented to attract consumers during pandemic	6.60	0.54
3.	Changes in various procedures at customer service level including complaint handling should be made more appropriate for consumers.	6.76	0.42
4.	New procedures and policies for customers which includes change in the transaction systems by upgrading it to online mode for customer convenience.	6.77	0.43
5.	Online mode of payment and cashless delivery needs to changes during pandemic.	6.87	0.46
6.	Change in the security system(e.g.OTP) is user friendly for the customers.	6.59	0.54
7.	Customer satisfaction increases based on the chaotic behavior which occurs in system by small incremental changes in various outlets.	6.85	0.49

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3.5 Regression Statistics

Table-2

Regression Statistics								
Multiple R	0.508375738							
R Square	0.258445891							
Adjusted R Square	0.223466924							
Standard Error	0.435113389							
Observations	112							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	5	6.994191931	1.398838	7.388608	5.60011E-06			
Residual	106	20.06830807	0.189324					
Total	111	27.0625						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	2.213713746	1.200158411	1.844518	0.0679	-0.165717032	4.59314452	-0.165717032	4.593144525
X Variable 1	-0.015654702	0.078877637	-0.19847	0.843059	-0.17203729	0.14072789	-0.17203729	0.140727886
X Variable 2	-0.01651439	0.098322366	-0.16796	0.866933	-0.211448043	0.17841926	-0.211448043	0.178419263
X Variable 3	0.495269976	0.096175626	5.149641	1.21E-06	0.304592443	0.68594751	0.304592443	0.685947509
X Variable 4	0.15632348	0.079657882	1.962436	0.052333	-0.001606019	0.31425298	-0.001606019	0.314252979
X Variable 5	0.064453008	0.062108136	1.037755	0.301746	-0.058682413	0.18758843	-0.058682413	0.187588429

4.1 Interpretations:

The model summary of the regression model, which shows customer satisfaction as a function of service quality aspects, is shown in the table above. The model summary table's R value (0.508) shows a positive correlation between all five of the investigated attributes. According to the R2 (0.258) result, the independent factors account for 22.68% of the total variation in the dependent variable (overall satisfaction). According to this study's R2 value of 0.258, five separate aspects of chaos theory account for 25.8% of the differences in overall

customer satisfaction. The regression model significantly and well predicts the dependent variable, according to the ANOVA results. According to F-statistics, at the 5% level (0.00 0.05) of significance, the entire model is highly significant and an excellent fit.

S = 2.213 + (-0.015) (I) + (-0.016) (M) + 0.495(T) + 0.156(S) + 0.064(P)+Error

In above regression model three attributes of chaos theory change in the transaction system change in various policies and procedures at customer service level and Changes in customer security has a positive impact on Overall satisfaction of the customers. Furthermore, Marketing Strategy and Infrastructure has negative impact on the customer satisfaction based on the chaos theory attributes.

4.2 Conclusion and Recommendation:

In this paper, an attempt has been made to investigate the impact of the chaos theory from the perspective of customers and their reaction towards changes which occurred in various organisaition in terms of policies and implementations after pandemic started. The overall results indicate that impact of various attributes of chaos theory as perceived by the customers was below their expectations. According to the findings of regression analysis, three of the five characteristics of chaos theory have a favorably significant impact on overall customer satisfaction. The findings of the study have important ramifications for understanding the pattern of consumer satisfaction for the retail industry during a pandemic in terms of chaos theory. Additionally, it aids in creating an appropriate strategy for modifying and adapting services for retail clients in order to exceed their expectations of satisfaction. As the pandemic progressed view of customers towards buying changed, there would be an existence of heavy competitions among all different competitors. It was inevitable for all the banks to be more innovative and try to bring all the incremental changes in the systems and the approaches as well. Timely changes will increase the customer satisfaction to greatest possible extent. There may be the possibility of negative impact as well whenever we use the attributes of chaos theory, so we need to be very careful in selecting and implementing the change process in the organization. As observed in the above model as well, Changes in infrastructure and and Changes in the Marketing strategy has a

negative impact on overall customer satisfaction and it affected the buying behavior of customer as well.

4.3 Limitation of the Study

The study's time span and sample size were both constrained. The study only looked at five aspects of chaos theory and gave each dimension an equal amount of weight. It was discovered after looking at the data that included more attributes in the analysis could increase the model's precision. The response rate was another problem that was encountered. Only 74.6% of 150 surveys that were distributed via various methods were returned.

4.4 Future Research

Future study should focus on a larger sample size and clients from all retail sector segments. The research can be expanded to compare the effects of different Chaos. By contrasting the aspect under study with pre- and post-pandemic conditions, more research may be done. The study might potentially be repeated at the national level in other service industries (health, higher education, etc.).

4.5Disclosure statement

The authors made no mention of any potential conflicts of interest.

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