THE SCOPE OF AI-EMBEDDED CHATBOT FOR CUSTOMER INTERACTION IN BANKING INDUSTRY OF NEPAL

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ABSTRACT

The use of modern technology is inevitable for the banking Industry. When the customers are themselves, technology-driven, it is very important for the banks to upgrade their technology. Artificial intelligence (AI) enabled technology is considered a significant technique in the modern world, for solving various tedious/repetitive tasks intelligently and in an automated manner. A Chatbot is a software tool that is used for simulating people's interactions in an online environment. Using a natural language, Chatbot can answer queries, do various pre-defined activities, and even provide the required information to the users like a human. Chatbots can be more user-friendly than traditional banking services for providing several services simultaneously to multiple users. AI-embedded Chatbot can be used for the conversation with users intelligently. Such a system is not a new topic for the effective customer interaction in banking sectors, however, its use might be a new technology topic for the banks in Nepal. This paper investigates various aspects of AI-embedded Chatbot and, purposes to use it for providing efficient banking services in Nepal, especially for effective consumer interaction. In this paper, through the descriptive statistical analysis, the role of the Chatbot in enhancing the customer experience with Chatbot has been investigated. Similarly, the investigation of the effectiveness of Chatbot for replacing the human interaction in the bank has been presented. A suitable framework for implementing AI-embedded Chatbot in the Banks of Nepal has been proposed. Lastly, various innovative ideas and solutions for improving the technical and process-related problems have been proposed for the effective use of AI-embedded Chatbots.

Keywords: Artificial Intelligence (AI), Chatbot, banking services, customer interactions, data-mining, machine-learning

1. INTRODUCTION

In comparison to the rest of the world, Nepal has been quite sluggish to adopt new technology. Despite its modest progress, Nepal is catching up with the rest of the world in terms of digital transformation. After the post-covid scenario, Banks are looking into a variety of AI-related solutions to improve their digital offerings (Shrestha, 2020).

In today's world, AI is seen as extremely vital, and it is widely used. AI is being implemented in every field and industry. The banking industry is one of the fastest-growing sectors. AI has aided banks in doing a variety of jobs more efficiently and productively. Specifically for improving customer service and sales. Because AI employs a variety of algorithms, it aids in the reduction of errors and flaws. AI assists in the conversion of data into valuable information, which is the most crucial activity in today's world. AI is fit for handling countless information designs more effectively than a human (Shrestha, 2020) (IBM Cloud Education, 2020). AI is already being hailed as the banking industry's future since it allows banks to use advanced data analytics to detect various suspicious or deceptive transactions and improve compliance. AI not only aids in anti-money laundering, but also in managing and analyzing enormous amounts of

data in a short amount of time and generating useful information from it. This data can be transformed into a valued service for clients, increasing income (Shrestha, 2020) (Donepudi, 2017).

A chatbot is considered a category of AI that is broadly employed in a variety of industries. Often known as a virtual-assistant, chatbots are comparatively recent technology/tools that have been extensively utilized ever since their commencement (Shrestha, 2020). Chatbots are generally viewed as one of the most exceptional & competent types of human-machine correspondence. A Chatbot, then again, is just a portrayal of the normal advancement of a framework for responding to questions utilizing regular language handling from an innovation angle (Shrestha, 2020). The discussion between an individual and a CSR is smoothed out by a chatbot, which further develops the client experience. Alongside this, the organization can give an assortment of new chances to expand the client commitment process and the organization's functional proficiency (Shrestha, 2020).

The chatbot applies ML and other learning technologies to the personal information of the customers that the organization has to develop a customized and personalized service to their customers. This can help the customer and even the customers will appreciate these kinds of customized services they receive (Shrestha, 2020).

1.1. Problem statements

Everything these days is fast, from fast food to information; everything is needed in a hurry and at an extremely fast pace. Fast information processing is critical in all the sectors of industry and especially the financial industry because there is data about customers and the main purpose of the banking industry is to serve customers. As a result, banks must invest in digital technologies to improve customer service (Shrestha, 2020).

Everything in the financial business spins on the client. Clients who are continually presented with innovations maintain that banks should convey consistent encounters. Banks have ventured into retail, IT, and media communications to fulfill these needs, offering administrations, for example, portable banking, e-banking, and constant cash moves (Shevlin, 2021). The combination of banking and enterprises like IT, broadcast communications, and retail has expanded the progression of sensitive information through virtual organizations that are defenseless against digital assaults (cyber-attacks) and misrepresentation. These episodes hurt not exclusively banks' incomes, yet in addition to their clients' trust and connections (Shrestha, 2020).

Customers require a better customer experience in addition to data security. With the increasing number of customers, bank employees are finding it increasingly difficult to attend to all of their needs. The personnel has to answer the same question from practically all customers, which makes work stressful (Tiwari, 2021). As a result of the update in technology and working culture, each business must adapt to new technology (Truby, et al., 2020) (Shrestha, 2020).

It's especially tough to adapt or follow new trends in a country like Nepal, where the regulations aren't always clear. In the context of Nepal, there are no effective norms and regulations for cybersecurity. However, if customers are already tech-savvy, the company must keep up with them.

Thus, this research will distinguish and prospect the extent of AI-empowered chatbots for client associations in the financial field. This research will assist with noting if the chatbot is what really banks need in the present time taking into thought the client's perspective of speedy access to data. In the event that any bank carries out Chatbot, will there be just pros or is there are cons as well? Also, the main inquiry, are the banks in Nepal prepared with the expected infrastructure.

1.2. Aims and objectives of the research

This research means to edify on the extent of Chatbot for client association in the financial industry. Additionally, to see the real point of view of Chatbots in the context of Nepal. The major objective of this

research is to concentrate exhaustively on the innovation of Chatbot. The extent of AI-empowered Chatbot in the context of Nepal has been studied. The specific objectives of this research are as follows:

- to determine the role of AI-enabled chatbots in enhancing the customer experience,
- to find out if AI-Chatbot can be the replacement for human interaction at the bank,
- to find out if banks in Nepal have the required infrastructure for implementing Chatbots, and
- to purpose, a regulatory or conceptual framework describing the prospects and challenges of effective implementation of AI-enabled Chatbot in Nepal.

1.3. Research questions

The following are the questions that this research is trying to answer:

- Is there any significant role of a chatbot in enhancing the customer experience?
- Can Chatbot be considered the replacement for human interaction at the bank?
- Do the Banks of Nepal have the required infrastructure for implanting Chatbot?
- What will be the suitable conceptual framework for the effective implementation of AI-enabled Chatbots in Nepal?

1.4. Scope and significance of the research

The extent of this exploration is to decide whether AI-empowered Chatbots can change the client experience and assist the Banks with developing their business by accomplishing supportable upper hand and satisfying the client's requests. This exploration likewise assists with figuring out the impression of clients when a bank carries out innovation like a Chatbot. This exploration will likewise focus on the issues and limitations of the chatbot application

This research will assist with contributing to the possibility of things to come of Chatbots in the financial industry of the Nepal market.

This research might be valuable for the following :

- Specialists who are keen on enumerated learning about AI-empowered Chatbot execution in the financial industry
- Banking and Financial areas of Nepal
- Government sector of Nepal who are working predominantly with the client information.

2. LITERATURE REVIEW

Chatbot with AI is considered that part of technology which is being used for the conversation with users that too intelligently. Using a natural language, Chatbot can answer queries, do various activities, and even provide the required information to the users like a human (Luger & Sellen, 2016). A Chatbot is not anything new, but it's been around for a long time in a variety of domains like education, Sales & Marketing, and Customer Services.

A Chatbot is not new because it has been in existence since the early 1960s in the form of ELIZA which was used for solving problems and language translation (Weizenbaum, 1966). In the period from 1970-to 1980's, there was a fast development in text & NL interfacing study as evidenced by Cliff and Atwell (1987), Wilensky et al (1988). Since then, a slew of additional Chatbot designs has emerged, including MegaHAL (Hutchens & Alder, 1998), CONVERSE (B. Batacharia, 1999), ELIZABETH (Shawar & Atwell, 2002), HEXBOT (Hexbog, 2004), and AL-ICE (Artificial Intelligence Foundation, 2007). According to (Singh & Shree, 2017), syntax, semantics, and pragmatics are significant variables to think about while using NLP to comprehend how data is moved from a human to a machine.

As per (Richad, et al., 2019), banks may offer customer care 24 X 7 via chatbots that can be accessed from anywhere. Customers can utilize the chatbot to quickly find out about various financial items and

services, for example, promotions, trade rates, and even the nearest location of ATM, as well as sign up for loans and credit cards, and check their balance in their account, and other managerial administrations.

Joy and pleasure, according to Ringle, have a considerable impact on customer behavior intentions. According to Dreyer, consumers felt comfortable about a company introducing chatbots if they would have a favorable experience with the new technology.

To deliver an excellent customer experience, a Chatbot can respond quickly to client questions (Richad, et al., 2019). According to (Deloitte, 2022), in most cases, bank customers receive immediate help via Chatbots 24X7, rather than waiting for a response via email or a human advisor. Chatbots are taught to respond to clients in a specific tone and have been demonstrated to be more attentive and sympathetic than humans.

The provision of providing information and support to a service provider's users is referred to as customer service. Consumer service can either be designed to increase business revenues by increasing customer connection with the service provider, or it can simply be designed to give users the assistance and information they require (Goodman, 2018). Customer service operations success is inextricably tied to user experience; bad customer service is likely to result in dissatisfied consumers, who are less likely to return (Goldstein, et al., 2002).

Advancement in AI and NLP in this second wave claims significant increases in Chatbot interpretational abilities over the first generation. These technical advancements imply that Chatbots have a reinvigorated role in customer service. Chatbots will become and have become a significant element of customer support in the coming years, this was quoted according to consulting and advisory firms such as CapGemini (CapGemini, 2016) , Oracle (Oracle, 2016) and Forrester (Ask, et al., 2016).

3. RESEARCH METHODOLOGY

3.1 Research methodology

The study required both descriptive and exploratory research methodology where qualitative and quantitative research methodology was required for achieving the objective of the study. As this research is focused towards understanding the opportunity and scope of Chatbot, it is more important to understand the experience and opinion of the research participants. So, qualitative research methodology is best suited for this research as it allows to understand how the participants feel about Chatbot.

3.2 Research approach

A mixed method research or in simple words, blended techniques research is a methodology for gathering, investigating, and "blending" both quantitative and qualitative approach techniques in a solitary report to comprehend the research (Lund, 2011). The mixed method is used when both quantitative and qualitative information together, gives a superior understanding of the research than one or the other kind. This research is completed with mixed method. The mixed method helps to fuse the subjective part into a generally quantitative review (Shorten & Smith, 2017).

3.3 Research strategy

The research topic is not new in the field of digital automation and digital banking but in context of Nepal, Chatbot is new and emerging. Chatbot has not been explored properly in banking sector of Nepal, so related research papers and journal in context of Nepal was not available. The related papers were taken in consideration to similar country size and developing nations like Kenya, Bangladesh, Indonesia, various states of India, Vietnam, Middle-east, etc.

3.4 Data collection methods and tools

The technique or a method of gathering any data is referred to as a data collection method. For research purpose, various journals, academic papers, and research papers were used by various researchers, and case studies of similar countries like Bangladesh, Vietnam, and India was also taken into consideration as proper research has not been done in Nepal. The major goal of this study was to determine the reach of chatbots and assess user perceptions of employing chatbots for customer service in the banking industry.

The data collection method for this study was an online survey. All the collection method was done online due to the increase in cases and situation caused by COVID-19. A structured questionnaire was prepared and circulated to various participants from all verticals using the Microsoft form.

Mode	Number of Survey Sent	Number of Respondent	Response Rate
Online	400	309	77%

Some of the sample questions are as below:

- Personal Information: Age, Gender, Education Level, Industry Sector
- Institution Related Question
- Bank Related Questions
- Trust Factor in Chatbot
- Expertise of the Chatbot
- Risk Factor of using Chatbot
- Anthropomorphism behavior of Chatbot
- Customer Experience

3.5 Sample selection

Because the goal of this research is to determine the level and scope of adaption for the application of Chatbot, it is critical to contemplate both the general public perspective and perspectives of the banking professionals. The overall sample size is 300 people, and the categories are given in the tables as follows:

SN	Participants Category	Total Number of Participants
1	People from Banking and Financial Institutes	100
2	Customers of Banks- General Public	100
3	People from IT Industry	100

SN	Gender	Total Number of Participants
1	Male	150
2	Female	150

SN	Age Group	Total Number of Participants
1.	Below 20	10
2.	21-30	110
3.	31-40	120
4.	41-50	50
5.	51 Above	10

3.6 Sampling method

For this research, the non-profitability sampling method was used for collecting data from various participants. In a non-profitability sampling method, participants are chosen in a non-arbitrary manner, meaning it's a very easier way of collecting samples (Showkat & Parveen, 2017).

In the non-profitability sampling method, a mixture of Convenience sampling and the Snowball sampling method are used. The convenience method helps the researcher to incorporate the people who end up being generally available for the survey. It is a simple and modest method for collecting data. The Snowball Method is also selected assuming the crowd is difficult to get. Snowball inspection can be utilized to get more participants for the survey with the help of the participants.

3.7 Validation and reliability

The data collected and the collection method used for this research has been done through Online survey form- Microsoft Form. The Microsoft Form was dispersed among friends, colleagues, stakeholders, people working in ICT sectors and students of IT background. The data collected has been validated as a reliable source. The journals and academic papers used for this research has been chosen from within the past five to seven years.

4. DATA ANALYSIS

4.1. Reliability testing

Reliability testing aids in determining the appropriateness of measuring the variable created throughout the survey questionnaire. It's critical to evaluate a survey to ensure to acquire useful information, and Cronbach's alpha (CA) is one of the most valuable and useful estimations to use during the study approval process.

In this research survey, we are trying to determine the scope of Chatbot from the perspective of people from the banking sector and general people with both IT and non-IT backgrounds. Using the reliability testing, the quality of the questions can be determined. The CA helps in determining the consistency of the variable along with the result and the used method.

For this research, SPSS is used for reliability testing and the below image shows the result. Several methodologies and researchers use the interpretation of reliability with the CA range of 0-1 where the

minimum recommendation is 0.65-0.8 (Goforth, 2015). The reliability testing shows a value greater than 0.7 which is "Acceptable" (Goforth, 2015).

4.2. Analysis based on various factors

4.2.1 Age

Age plays a very important role in a survey. Age categorizes the participants according to their experience and work style. The demographic category of age helps to see the different perspective of various age group. In this survey, 5 categories of age groups are defined where the total number of participants are 309. Most of the respondents were from the age group 20-40 being the most active and working people coming from various industry sectors.

4.2.2 Gender and education based distribution

Gender and Education Level are very important variable while analyzing the result of the survey. Education level can determine the perspective of how a person thinks and gender can also affect the result of a survey. For this survey, out of 309 participants, 166 were male i.e., 53.72% of the participants were male, 140 participants were female considering 45.31% of the total participants and the remaining 0.97% of the participants did not want to define their gender. Most of the participants are from the Education level "Bachelor" consisting 63.11% out of the total.

4.2.3 Industry based distribution

For this research survey, distribution as per industry sector seemed to be very important. As Chatbot for banking sectors was out main concern, it was very important to know the perspective of participants from the banking industry, people from IT industry and the general participants from various industry sectors. Different participants from different industry verticals seemed to have their own perspective of Chatbot. For this survey, most of the participants are from Computing/IT Industry consisting of 37.54%, the participants from BFSI's are 33.33% and the remaining 29.13% are from different industry sectors.

4.2.4 Bank's infrastructure and adaptation of digital solution in Banks of Nepal

Chatbot is a part of Digital Banking and Automation, and the banks of Nepal have been establishing Digital Banking team recently. Without proper team and infrastructure, the bank cannot cope up the trending automation and digital tools. In this survey, a separate section was created for the participants of BFSI sector where the questions related with bank's internal infrastructure, perspective of digital banking tools and chatbot was asked. A total of 103 participants were from BFSI industry sector. Following are the findings:

-100% of the bank's participant have responded "Yes" stating that they have a dedicated digital banking team in their banks. It can also be seen that 66.02% of the banks have dedicated team members of 6-10 team members for digital banking.

-94.17% of the participants said that they have an internal data center at their banks but only 12.62% of the participants have said that they have a dedicated resource/infrastructure assigned for Digital Banking. Total respondent from banking industry strongly agree that the bank is investing in digital solutions.

-78.6% of the total respondent from banking sector said that they are well aware about Chatbot.

4.2.5 Experience with Chatbot

In this survey, general information regarding the use of website and chatbot was asked to the participants, following are the findings:

- more than 80% of the participants use website to get any kind of information.
- 91.13% of the total participants have used Chatbot services in various websites.
-almost 75% of the total respondent prefer using Chatbot as a primary communication.

4.2.6 Trust in Chatbot

In this research survey, it was very important to know the perspective of trust factor for the using Chatbot by the people. It can be seen that majority of the participants tend to agree on trusting Chatbot which is 66.2% of the total participants. Approximately 90% of the participants have given a positive response on trusting a Chatbot.

4.2.7 Human characteristics

Customer service oriented business-like banking sector needs to have a good customer service representative who can deal with customers and their problems well. Using an automated AI- Chatbot for customer service can be tricky but when bots are well managed, they can have the Anthropomorphism characteristics which means the attribution of characteristics or behavior similar to Humans. In this survey, participants were asked various questions related with the topic, following are the results:

59% of the participants felt that chatbot was natural, which means they did not feel like they were talking to a robot or an automated system.

- 67.6% of the total participants felt that the chatbot was natural, which means when the user communicates with a chatbot, it felt as if they were talking to a human customer service representative.

4.2.8 Expertise of the Chatbot

- 80% of the total participants got their answers to their questions and 77% of the total participants responded that the chatbot appeared knowledgeable.
- 72% of the participants responded that they were sure about the competence of the chatbot and 73% of the participants felt the chatbot was well equipped for the assigned task.

4.2.9 Customers experience

The ultimate motto of customer-oriented business-like banking sector is to enhance their customer experience and satisfy their customers. A bank uses a Chatbot so as to be 100% available for their customers. In this research survey, the participants were asked various questions related with their experience on using Chatbot and below is the result.

- 81.88% of the total participants responded yes when asked if they will be using Chatbot more in the future and 16.7% responded with a maybe. When asked if participants are willing to recommend Chatbot to others, 80.1% of the participants responded yes and 15.7% responded with a maybe.
- 61.7% of the total participants agreed it was easier to use Chatbot than talking to Sales Representative. When asked if Chatbot can be a replacement for the CSR at the bank, 66.9% of the total participants responded with a neutral answer.

4.2.10 Perspectives of Chatbot from peoples of banking industry

While adopting the implementation of Chatbot might affect the customers, it also has a direct or indirect affect inside the bank as well. In this survey, the people from banking industry were asked few questions related to their perspective of Chatbot. A total of 103 participants were from BFSI industry sector.

-22% i.e., 23 out of 103 banking people agree that Chatbot can help increase customer satisfaction whereas 74.8% i.e., 77 participants gave a neutral answer -72.8% of the total participants gave neutral answer, i.e., 75 participants neither agreed nor disagreed with chatbot being a replacement for human interaction for customer service.

4.3 Descriptive analysis

A descriptive statistical analysis is used for describing the data that was collected. In this research survey, a total of 309 participants answered the survey question, where the participants were from either banking sector or non-banking sectors- general people. Different sections were created in the survey which helped in answering the research questions.

According to the descriptive analysis of survey results (Refer Fig. 1), in Age, the mean value is 2.78 which mean most of the participants were from age group 21-30 and 31-40 but more over 31-40 age group. The Standard Deviation (SD) is <1 which means the almost all the respondents have given the answer which belong to similar group average of the total participants. The gender and education level also have similar lower SD giving similar to age SD, but the industry sector SD seems to be high, i.e., 2.00 which suggests high divergence or fluctuation in the results. This means non-banking participants belong to various industry sectors.

Regarding the different factor of Chatbot, trust factor, risk factor, human characteristic and customer experience have SD<1 which means the almost all the respondents have given the answer which belong to similar group average of the total participants whereas expertise of the Chatbot and questions which are bank related has SD>1 which mean there is high fluctuation in the result.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Age	309	1	5	2.78	.803	.336	.139	.116	.276
Gender	309	1	3	1.56	.517	-.016	.139	-1.504	.276
Education Level	309	1	4	2.37	.569	.755	.139	.172	.276
Industry Sector	309	1	8	4.09	2.000	.230	.139	-.977	.276
Trust Factor	309	0	4	2.71	.803	-2.602	.139	6.586	.276
Expertise of the Chatbot	309	0	5	3.46	1.079	-2.330	.139	4.885	.276
Risk Factor	309	0	4	2.12	.898	-.435	.139	.613	.276
Anthropomorphism	309	0	5	3.22	.980	-2.445	.139	5.587	.276
Customer Experience	309	0	4	2.40	.730	-2.414	.139	5.701	.276
Bank Related	309	0	4	1.10	1.556	.729	.139	-1.455	.276
Valid N (listwise)	309								

Figure 1: Descriptive statistics of the survey result

4.3.1 Correlation analysis

This test helps to understand the relationship between various variables. The Pearson correlations must be between -1 and +1. In this research survey, the correlation analysis between the Bank and general People was done. The results are shown in Figure 2.

In the Figure 2, it can be seen that all the variables have the Pearson correlation value between -1 to +1, which shows strong positive relation between bank people and general people on their perspective of Chatbot whereas human characteristics of the Chatbot variable and expertise of the Chatbot variable have the highest correlation (r=.936). In comparison to other variables, customer experience and human characteristics also have a high positive correlation value (.880). From the figure, we can also see that significance is .000 that means the correlation is indicating that it is highly significant which indicates correlation existence between the banking people and general people.

Correlations

		trust	expertise	risk	humancharac ter	customer experience
trust	Pearson Correlation	1	.816**	.720**	.824**	.847**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	309	309	309	309	309
expertise	Pearson Correlation	.816**	1	.420**	.936**	.872**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	309	309	309	309	309
risk	Pearson Correlation	.720**	.420**	1	.423**	.553**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	309	309	309	309	309
humancharacter	Pearson Correlation	.824**	.936**	.423**	1	.880**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	309	309	309	309	309
customer experience	Pearson Correlation	.847**	.872**	.553**	.880**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	309	309	309	309	309

Figure 2: Correlation between bank and general people

4.3.2 One-way ANOVA

In this research survey, One-way ANOVA testing was done to compare the various factors like trust, risk, expertise, and human characteristics of Chatbot with customer experience of the participants. Below figure shows the result.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
trust	Between Groups	14.673	19	.772	1.213	.245
	Within Groups	183.914	289	.636		
	Total	198.586	308			
expertise	Between Groups	59.407	19	3.127	3.018	.000
	Within Groups	299.430	289	1.036		
	Total	358.837	308			
risk	Between Groups	14.598	19	.768	.951	.520
	Within Groups	233.538	289	.808		
	Total	248.136	308			
humancharacter	Between Groups	42.838	19	2.255	2.577	.000
	Within Groups	252.847	289	.875		
	Total	295.685	308			

Figure 3: ANOVA testing result

From Figure 3, it can be seen that the there is no significant association between trust factor and customer experience as P value=.245 which is greater than .05 stating there is extremely low significance between the two factors. Similarly, the risk factor and customer experience also have no significant association as the P value=.520 which is again greater than .05.

Whereas the variables expertise of the Chatbot and human characteristics are extremely significant to customer experience as the P value=0.000 of both variables. This means there is highly significant relationship between customer experience with expertise of the Chatbot and Chatbot having human characteristics.

5. CONCLUSIONS AND RECOMMENDATIONS

This part of the research consists of the findings that were obtained from the research, the conclusions that were drawn, the future works, the limitations of the work and future recommendations on the work that can further be approached in order to carry out another research following the trails of this research paper.

5.1 Findings for research questions

The major goal of this research was to discover the perspectives of Chatbots in the context of persons from the banking industry and the general public, based on the following factors:

- Bank Related Questions
- Trust Factor in Chatbot
- Expertise of the Chatbot
- Risk Factor of using Chatbot
- Anthropomorphism behavior of Chatbot
- Customer Experience

With the help of research papers and the online questionnaires, the research questions can be now answered.

RQ1. Is there any significant role of Chatbot on enhancing the customer experience?

Findings: The finding in the research gave a positive response stating yes there is significant role of Chatbot on enhancing the customer experience. As bank are customer centric, their ultimate goal is customer satisfaction which can be achieved through better customer experience. In today's digitally equipped banking environment, a Chatbot is one of the services that improves consumer engagement. Consumers, for example, like to use Chatbot services to see, search, contact, and inquire about various things. Because individualized and personalized services needs be offered, Chatbots appear to be more user-friendly than traditional banking. For example, Chatbots can handle a large number of customers requests simultaneously. To deliver an excellent customer experience, a Chatbot can respond quickly to client questions. In most cases, bank customers receive immediate help via Chatbots 24X7, rather than waiting for an answer through email or a human assistant. Bots are tone-trained to respond appropriately to clients and are shown to be more thoughtful and empathic than humans.

The observations are as below:

- Customers are now technologically updated.
- When customers can get easy access to answer their queries, satisfaction level increases.
- Trust factor and risk factor play an indirect role on using Chatbot.
- Expertise of the Chatbot affects the use of Chatbot
- Ability of the Chatbot to display human characteristics enhances the overall customer experience.

RQ2. Can Chatbot be considered the replacement for human interaction at the bank?

Findings: The research gave a neutral finding stating that Chatbot may not be considered a replacement of human interaction, but it is a value-added service for the bank. In perspective of bank, Chatbot does help the customer service department by looking into the simple and monotonous task. These tasks when handled by Chatbot in the beginning has been helping the employees of bank to be more focused on internal works. But, when it comes to complex tasks, human interaction is a must. Whereas in perspective of general users, they have a neutral reaction, as the customers wants their questions to be answered, and as long as their questions are answered, they are not bothered if it was from an automated bot or a human.

The observations drawn are as below:

- Customers do not care if they are talking to a Chatbot or human as long as their question are answered.
- Banking people do not see Chatbot as a replacement.
- Chatbot is not a complete replacement but an additional helping hand for the bank.

RQ3. Does the Banks of Nepal have the required infrastructure for implanting Chatbot?

Findings: Yes, the banks of Nepal have been investing a good capital for making their infrastructure ready for implementing various digital solutions. Results from the survey has shown that the Banks in Nepal has been creating a separate dedicated Digital Banking Team to assigning a separate infrastructure and resource. With the rise in the advancement of technology, the banks in Nepal have been updating their backend system with the latest hardware and software.

The observations are as below.

- All the banks have their in-house data center.
- Banks have started investing in IT.
- Banks have dedicated digital banking team.
- Banks have been aggressively adopting digital solutions since the past 2 years.

5.2 Conclusions and recommendations

AI is clearing the world in achieving a significant change in the financial business, and the financial world is advancing faster than any time recently. In the financial business, AI has been utilized in regions, for example, center banking, hierarchical viability, client help, and even analytics. Banking is at this point not just about actual branches for AI; it's about an entirely different time of today banks. Present day banks are developing and extending because of the presentation of new financial services.

Innovation is taking into account more noteworthy infiltration of the financial framework, as well as better monetary reasonability and the capacity to go through with more modest transactions. The use of innovation actually emphatically affects bank development and improvement. Because of the coming of Chatbot, more clients are lured, and banks can extend its branches. Banks might utilize Chatbot to further develop the client experience by empowering smooth, 24X7 client assistances, yet AI in banking apps isn't just restricted to retail banking. Simulated intelligence is getting momentum in speculation banking's back and center workplaces, as well as each and every other income administrative oversight.

In today's date, everyone is going through a digital transformation. Not just banks but the customers as well, which leads to customers to expect their banks to be digitally updated. To keep up with the expectation, even banks have been implementing various digital solutions for their internal growth and better customer satisfaction. This research showed that customers have been using Chatbot as a primary communication platform to get the information which illustrates that the customer preference is also a Chatbot. When it comes to answering simple questions, Chatbot can handle those but when complex queries are asked, human interaction is required. Similarly, the general public or customers expressed a neutral response to the replacement of customer care representatives as long as their questions were resolved, according to the survey. Chatbot was viewed as a value-added service rather than a replacement by bank employees. Lastly, majority of the banks have already started to believe that investing in IT is not a bad option rather it helps to build a strong backend foundation. The finding also shows that bank have a good infrastructure ready at their premises for adapting digital solutions.

According to this study, financial institution consumers have a favourable view regarding the use of digital technologies such as Chatbots. Though there are limitations and challenges to it, the banks have been adopting digital technologies in a fast pace. For country like Nepal, the change in digital rules and policies might affect this kind of adoption. Not just for banks, we can see technological adoption in general people as well, the young generations are now technologically sound and want their surroundings to also be the same.

Below are some of the recommendations for each stakeholder.

i. Banks
   - The banks could run a pilot testing project or do more POCs related to Chatbot.
   - Proper UAT for at least a month or 2 before going live so that customers cannot complain about any bugs.
   - Explore the options for Chatbot for implementing it in all of the social media pages.
   - Define proper workflows of each module.
   - Define which module needs special care and human interference, for e.g., when customer talks about Loan as this is the revenue generation for banks.

ii. 3rd Party Technology Vendors
   - They could organize various awareness program related to Chatbot.
   - They need to make aware that chatbot is not just for chatting, but this bot can also be used for various internal workflows of the banks.
   - As Nepal market is very price sensitive, they could provide chatbot in affordable price.
   - They could provide the facility of language option, as many customers prefer Nepali language option.
   - They could provide services like SAAS, so that banks don't have to worry about the backend infrastructure.

iii. Customers
   - Encourage and use the various digital solutions adapted by the banks.
   - Do not be afraid to explore more technology.

iv. Government Authorities
   - The government should work on creating better IT policies for the country.
   - Proper rules and guidelines must be circulated by the Central Bank.
   - The government should encourage the use of digital technologies.

5.3 Limitations of the research

The limitations of this research are listed as below:

- The reference papers taken in consideration for this research is not in context of Nepal as proper research has not been done in Nepal regarding a Chatbot.
- The sample size was limited as the survey was conducted in a particular city of Nepal rather than in the whole population of the country.
- Due to COVID-19, the situation of face-to-face discussion was not possible due to which visit to banks was restricted.
- Unwillingness of bank to give proper details of Infrastructure.

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