



Internet Decolonization: Exploring the Prospects and Effect of Using Indigenous Languages in Fintech Services

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ABSTRACT

Fintech is transforming financial services through the integration of digital technologies. This research paper aims to explore the prospects and effects of using indigenous languages in fintech services in Nigeria. The study adopted a qualitative research design, using structured interviews to gather data from residents of Ibule Soro, a remote peri-urban settlement in Southwest Nigeria, to assess the community's perception and willingness to adopt indigenous language-based fintech service. The data were collected and analyzed qualitatively under the following themes: language, trust, and customer satisfaction. The focus group discussion focused on assessing the potential impact of fintech in Nigeria's financial services sector, particularly concerning the unbanked population and rural communities. The findings suggest that while digital financial services have provided many benefits, there are challenges that need to be addressed, such as poor internet connectivity, poor service delivery, and language barriers. The potential challenges with incorporating indigenous languages in fintech services identified include limited knowledge of indigenous languages among fintech operators, the numerosity of indigenous languages in Nigeria, and the lack of standardization. In summary, this study underscores the importance of considering indigenous languages to improve accessibility and ease of use, particularly for non-English speakers.

Keywords: Digital economy, Fintech, Financial inclusion, Internet decolonization, linguistic diversity

1. Introduction

The world is currently undergoing a digital revolution [1], with lifestyles becoming increasingly digitalized and continuously evolving [2]. As a result, the global landscape has become more informed, transparent, and efficient. This digital transformation has significantly impacted financial services, including payments, lending, investment, insurance, and other financial products [3]. The COVID-19 pandemic has further accelerated this process.

The digital economy has revolutionized the accessibility and convenience of financial services [3]. However, the prevalence of dominant languages, such as English, on the internet and in the fintech sector has led to linguistic colonialism and cultural domination [4]. This situation poses a significant challenge for non-English speaking populations in rural areas, limiting their participation in the digital economy due to language barriers [5].

Riding on telecommunications, Fintech plays a pivotal role in the digital economy by transforming financial service systems by integrating digital technologies [2]. Fintech has revolutionized financial services, offering enhanced accessibility and efficiency [6]; [7]. It has emerged as a catalyst for growth and a technological enabler, promoting financial inclusion and economic development [8].

While fintech has introduced convenience and speed into consumers' daily lives [9], ensuring that these benefits reach all segments of society, particularly marginalized groups is crucial. Previous studies have indicated a positive relationship between financial inclusion, economic growth, and the adoption of fintech services [10]; [11]. Therefore, creating a supportive environment for innovation in fintech and financial inclusion is essential for serving these populations [12].

Despite the advancements in fintech, an imbalance in the distribution of services persists, mirroring the colonial-era financial system [13]. The dominance of English and other foreign languages in fintech creates barriers for individuals who are not proficient in those languages, particularly those living in rural and remote areas with limited access to financial services and formal education [5]; [14].

In response to these challenges, there is a growing call for Internet decolonization to improve digital inclusion and promote linguistic diversity by increasing the use of more languages on the Internet [15]. Fintech services, in particular, have the potential to promote financial inclusion and contribute to decolonization efforts [16].

This research paper explored the prospects and effects of using indigenous languages in fintech services in Nigeria. It examined the potential benefits of using indigenous languages from the consumers' perspective. The study was conducted in Ibule Soro, a remote peri-urban settlement in Southwest Nigeria, to assess the community's perception and willingness to adopt indigenous language-based fintech services. This study builds upon previous research [17]

that examined the impact of mobile internet usage in the same community, revealing low usage of internet banking services and indicating potential issues of financial inclusion. The study area was also important as a core Yoruba-speaking community, which makes it desirable as a case in point for the future development of Yoruba-operated fintech service to serve the large community of Yoruba-speaking groups in Nigeria, West Africa and some parts of South America.

This research is not only significant for promoting decolonization but also seeks to preserve cultural heritage and foster financial inclusion among non-English-literate citizens of Nigeria, particularly those residing in rural and peri-urban communities. Professor Megan Davis of the United Nations Department of Economic and Social Affairs (UNDESA) [18] emphasizes the importance of protecting languages and preserving cultures, stating that "saving indigenous languages is crucial to ensure the protection of the cultural identity and dignity of indigenous peoples and safeguard their traditional heritage."

The findings of this study are expected to contribute to the broader discourse on decolonization, linguistic diversity, and financial inclusion in the digital economy.

1.1 Research Questions

The answers to the following research questions were sought to achieve the aim of the research

- What opportunities and challenges can be envisaged with the incorporation of indigenous languages in fintech?
- What is the perception of the study population towards the use of indigenous languages in fintech services?
- How will user perceptions of indigenous language-based fintech services in the study area inform service design and product development?

2. Research Methodology

The study was exploratory research which sought to explore the potential of using indigenous languages in fintech services as a means of promoting financial inclusivity and internet decolonization amongst the English-deficient rural and peri-urban populations of Nigeria. Therefore, the study involved qualitative data collection methods.

Random quota sampling of respondents from the study area was used in interviews, with a target sample size of 50 participants. Oral interviews were used because they allow for deeper interaction with the respondents and produce rich insights. Structured interview guides were used to ensure focus on the topic. The sampling involved the purposive selection Ibule-Soro, in Ifedore Local Government Area of Ondo State as the study area, as this study aimed to build on previous work done in the community.

Purposive sampling of an expert group of fintech practitioners was used to conduct a focus group discussion. The discussions guided by discussion protocols revolved around their perception of the need to decolonize the internet through the inclusion of indigenous languages in fintech services. And to harness their thoughts about the prospects and possible challenges with government regulation, consumer acceptability and market/sales implications.

The data collected was sorted and collated, entered and translated, where necessary. The data were analyzed using descriptive statistical methods in Microsoft Excel presented as frequency charts and using inferential statistics such as correlation, cross-tabulation and chi-square tests of significance in SPSS (Statistical Package of the Social Sciences, 22.0). A thematic analysis approach will be used to identify recurring themes and patterns in the data. Thematic word counts were used to qualitatively analyze data in texts. The study also involved empathy mapping which was done as an initial stage of the design thinking process of the product conceptualization and development.

3. Results and Discussions

This section highlights the outcomes of the research as tested and discusses the implication and its relevance to existing knowledge.

3.1 Results

3.1.1 Results of the demographic study

The demographic data collected in the course of the interviews found the following:

The age range of the respondents interviewed is from 18 to above 55 years, with the largest group being between 25-34 years old (34%). Above 60% of the respondents were young adults aged between 18-34 years. The distribution is presented in Figure 1.

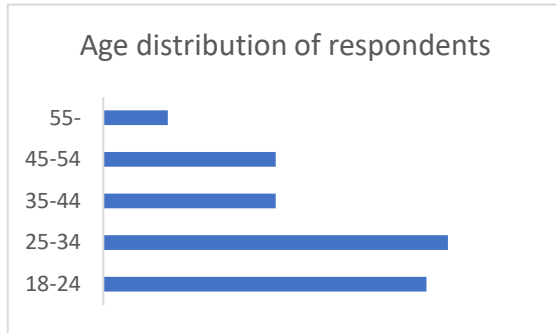


Figure 1: Age distribution of respondents

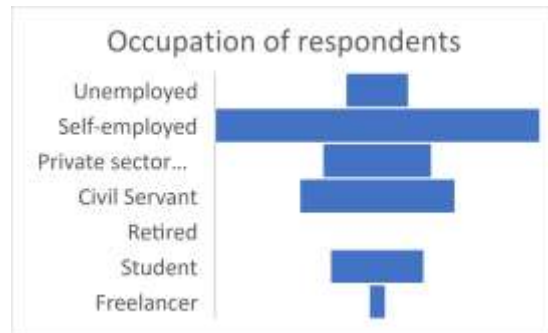


Figure 2: Occupation distribution of respondents

The gender of the respondents was equally distributed with 50% male and 50% female. The respondents' set is well educated as all the respondents interviewed have at least a secondary education, with the majority (78%) having completed some form of tertiary level education.

The largest group of respondents are self-employed (43%), followed by those employed in the civil servants (20%) and private sector (14%). The occupation distribution of the respondents in the study area is presented in Figure 2.

Overall, this data set suggests that the respondents are relatively young, educated, and mostly self-employed or working in the public sector. It also reveals that an equal number of females and males responded to the survey.

3.1.2 Use of Fintech Services in the study area

The study showed that the least frequently used fintech service in the study area is the digital lending/payment systems, which was four times less frequently reported than the digital/online banking service which is reported as the most frequently used fintech service. This is followed closely by SMS banking and then ATM/POS services. The frequency distribution of all the fintech services used is presented in Figure 3.

61% of the respondents in the study area reported using fintech services daily. 29% use fintech services a least once a week, and only about 2% reported rarely using the fintech services, implying that the community has a good level of uptake of fintech services. This phenomenon is reflected in the self-reported internet proficiency of the respondents wherein above 90% of the respondents were rated above 3 on a scale of 4 in the ability to use the internet, indicating a good level of digital literacy in the study area. This is presented in Figure 4.

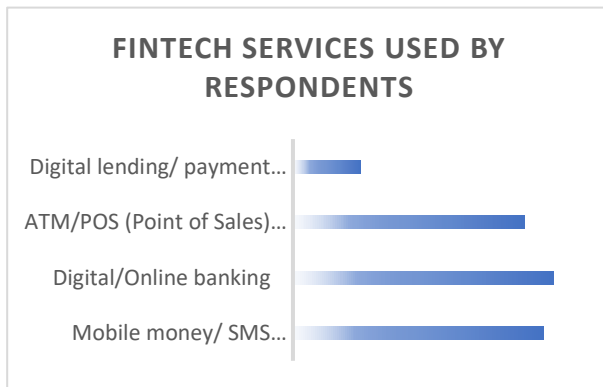


Figure 3: Frequently used fintech services in the study area

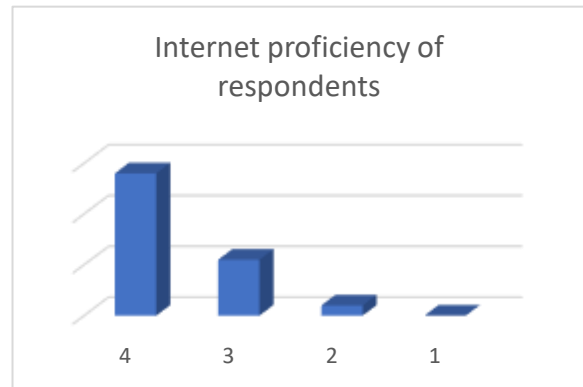


Figure 4: Internet proficiency in the study area

3.1.3 The perception of respondents towards the use of indigenous languages in fintech services

When asked the question, "Do you think it is important to use indigenous languages in fintech services?", a majority of the interviewees (over 70%) responded with 'yes'. Only 10% responded with a clear 'No', as shown in Figure 5. Equal distribution of Yes and No was recorded in response to the question, "Do you feel that fintech services are accessible to people who do not speak English?". Others (22%) were unsure as shown in Figure 6.

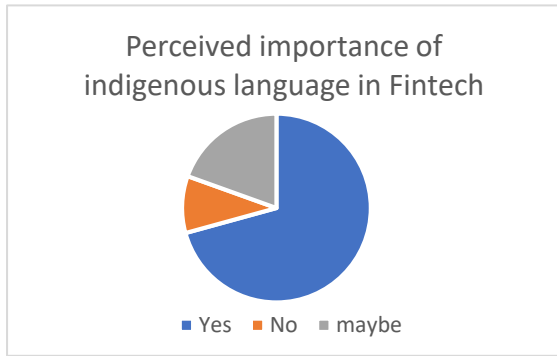


Figure 5: Importance of Indigenous language

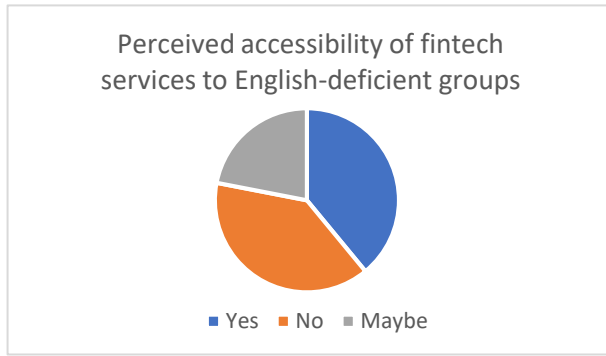


Figure 6: Accessibility of fintech services to non-English speaking groups

Only very few respondents (about 7%) were of the perception that including indigenous languages would not increase the accessibility of fintech services in their community. 78% of the respondents expressed a willingness to use Fintech services in their local language. 83% of the respondents implied a desirability towards fintech services in indigenous languages by reporting a willingness to recommend it to community members. The results are presented summarily in Table 1.

Table 1: Perception of respondents towards the use of indigenous languages in fintech services

Question	Yes	Maybe	No
Do you think that using indigenous languages in fintech services would make them more accessible to you and others in your community?	65.9	26.8	7.3
Are you willing to use fintech services if they were available in your local language?	78.0	12.2	9.8
Would you recommend the use of indigenous languages in fintech services to others in your community?	82.9	14.6	2.4

3.1.4 The perceived benefits and challenges of integrating the use of Indigenous languages in fintech services

Improved communication (37% of all responses) was identified by the respondents as the most important potential benefit of the integration of indigenous languages in fintech services. Cultural Preservation (23%) was also reported as a perceived potential benefit, as well as improved ease of transacting business (21%). One respondent felt that applying indigenous languages in fintech services would reduce the incidences of exploitation and financial fraud. As expressed in their own words, “Victims of fraudulent acts would reduce. A local person who is not so educated and fluent in English might be lured into doing what is wrong, thereby exposing them to the dangers of financial fraud”. Figure 7 represents all the perceived benefits reported in the study.

Limited knowledge of indigenous languages among fintech operators was perceived as the greatest potential challenge to integrating indigenous languages in fintech services (at 27% of all responses). This implies a perception that fintech services are operated by foreigners who do not understand the local languages available in the study area and could affect the acceptability of such services. Figure 8. Other respondents identified the numerosity of indigenous languages in Nigeria and its limited universality and standardization as potential challenges. In their words, “We have other languages other than the 3 major languages in Nigeria and it’s not everyone that understands any of the 3”. Another respondent cited lack of knowledge, low standard of living and limited internet access as possible challenges to the implementation and successful application of indigenous languages in fintech services.

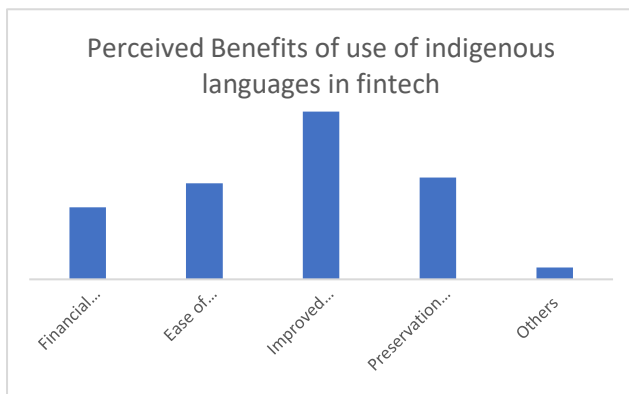


Figure 7: Benefits of using indigenous languages in fintech services

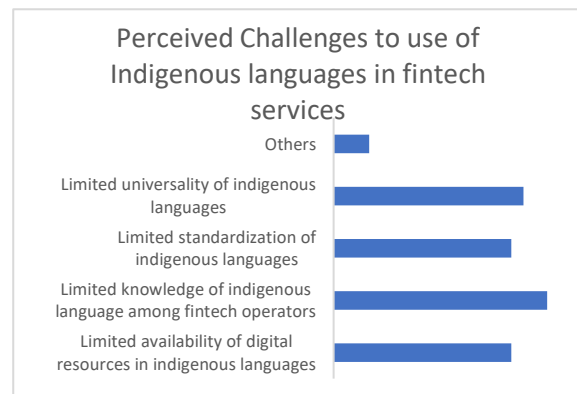


Figure 8: Challenges to the use of Indigenous languages in fintech services

3.1.5 Chi-square statistical test for significance of responses

The test statistics table presents the results of a chi-square test that was conducted on the survey data. The chi-square test is used to determine if there is a statistically significant association between each survey question and the other variables. The table shows the results of the chi-square test for each of the interview questions presented as the p-value. The variables tested are age, gender, educational level, occupation, English proficiency, and responses to various questions related to using indigenous languages in fintech services.

Table 2: Statistical test for significance

	Age	Gender	Education	Occupation	English proficiency	Internet proficiency
Do you think it is important to use indigenous languages in fintech services?	0.449	0.051	0.587	0.028	0.540	0.456
Do you feel that fintech services are accessible to people who do not speak English?	0.413	0.810	0.755	0.682	0.537	0.765
Do you think that using indigenous languages in fintech services would make them more accessible to you and others in your community?	0.435	0.509	0.606	0.021	0.861	0.345
Are you willing to use fintech services if they were available in your local language?	0.468	0.640	0.996	0.013	0.959	0.756
Would you recommend the use of indigenous languages in fintech services to others in your community?	0.035	0.287	0.059	0.073	0.023	0.224
Have you faced any difficulties using a fintech product due to language barriers?	0.387	0.064	0.532	0.644	0.288	0.429
Do you think using your native language in fintech services could improve your financial well-being?	0.061	0.036	0.592	0.070	0.285	0.086
How important is it to you to have access to financial services that are easy to use and understand?	0.000	0.308	0.008	0.398	0.000	0.702

The Chi-Square test results show that there is a significant association between all of the variables and the responses to the questions related to using indigenous languages in fintech services, as indicated by the very low p-values (all less than 0.05). This suggests that these variables may be important factors to consider when designing and implementing fintech services that are accessible to people who speak indigenous languages.

Looking at the individual variables, we can see that age, educational level, and occupation all have a significant association with the responses to the questions related to using indigenous languages in fintech services, with p-values less than 0.05. This suggests that younger people, those with higher levels of education, and those in certain occupations may be more likely to value the use of indigenous languages in fintech services.

Gender and English proficiency, on the other hand, do not appear to have a significant association with the responses to the questions related to using indigenous languages in fintech services, as indicated by p-values greater than 0.05.

Overall, the results of the Chi-Square test suggest that using indigenous languages in fintech services may be an important factor to consider for certain demographic groups, such as those who are younger, have higher levels of education, and work in certain occupations. These findings suggest that incorporating indigenous languages into fintech services could improve accessibility and usability for underserved populations and may be useful for companies and organizations that are designing and implementing fintech services, as they can use this information to ensure that their services are accessible and relevant to a wide range of users.

3.1.6 The Correlation of variables based on the research questions

The relationship between the variables tested as analyzed using Pearson's correlation tests are presented in Table 3.

Table 3: Correlation table (Pearson's correlation)

Correlations		How would you rate your ability to use the internet and fintech services? 1 - 4	Do you think it is important to use indigenous languages in fintech services?	Do you feel that fintech services are accessible to people who do not speak English?	Would using indigenous languages in fintech services make them more accessible to you and others in community?	Are you willing to use fintech services if they were available in your local language?	Would you recommend the use of indigenous languages in fintech services to others in your community?	Have you faced any difficulties using a fintech product due to language barriers?	Would using native language in fintech services improve your financial well-being?	How important is it to you to have access to financial services that are easy to use and understand?
How would you rate your ability to use the internet and fintech services? 1 - 4	Pearson Correlation	1	-.120	-.048	-.151	-.050	.194	-.127	-.271	.062
	Sig. (2-tailed)		.456	.765	.345	.756	.224	.429	.086	.702
	N	41	41	41	41	41	41	41	41	41
Do you think it is important to use indigenous languages in fintech services?	Pearson Correlation	-.120	1	.178	.292*	.655**	.408**	.063	.330*	.138
	Sig. (2-tailed)	.456		.216	.040	.000	.003	.662	.019	.339
	N	41	50	50	50	50	50	50	50	50
Do you feel that fintech services are accessible to people who do not speak English?	Pearson Correlation	-.048	.178	1	.114	.146	.068	-.111	-.258	.345*
	Sig. (2-tailed)	.765	.216		.430	.313	.638	.444	.070	.014
	N	41	50	50	50	50	50	50	50	50
Would using indigenous languages in fintech services make them more accessible to you and others in community?	Pearson Correlation	-.151	.292*	.114	1	.594**	.305*	.134	.002	-.207
	Sig. (2-tailed)	.345	.040	.430		.000	.031	.353	.987	.150
	N	41	50	50	50	50	50	50	50	50
Are you willing to use fintech services if they were available in your local language?	Pearson Correlation	-.050	.655**	.146	.594**	1	.626**	.029	.271	-.156

services if they were available in your local language?	Sig. (2-tailed)	.756	.000	.313	.000	.000	.841	.057	.279	
	N	41	50	50	50	50	50	50	50	
Would you recommend the use of indigenous languages in fintech services?	Pearson Correlation	.194	.408**	.068	.305*	.626**	1	-.289*	.299*	.028
	Sig. (2-tailed)	.224	.003	.638	.031	.000		.042	.035	.847
	N	41	50	50	50	50	50	50	50	50
Have you faced any difficulties using a fintech product due to language barriers?	Pearson Correlation	-.127	.063	-.111	.134	.029	-.289*	1	.034	-.321*
	Sig. (2-tailed)	.429	.662	.444	.353	.841	.042		.812	.023
	N	41	50	50	50	50	50	50	50	50
Would using your native language in fintech services could improve your financial well-being?	Pearson Correlation	-.271	.330*	-.258	.002	.271	.299*	.034	1	.109
	Sig. (2-tailed)	.086	.019	.070	.987	.057	.035	.812		.449
	N	41	50	50	50	50	50	50	50	50
How important is it to you to have access to financial services that are easy to use and understand?	Pearson Correlation	.062	.138	.345*	-.207	-.156	.028	-.321*	.109	1
	Sig. (2-tailed)	.702	.339	.014	.150	.279	.847	.023	.449	
	N	41	50	50	50	50	50	50	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

***. Correlation is significant at the 0.01 level (2-tailed).

The correlation table presents the relationships between the variables and the results are interpreted as follows:

- How would you rate your ability to use the internet and fintech services? 1 - 4:

This variable has weak negative correlations with "Do you think it is important to use indigenous languages in fintech services?" (-0.120), "Do you think that using indigenous languages in fintech services would make them more accessible to you and others in your community?" (-0.151), and "Do you think using your native language in fintech services could improve your financial well-being?" (-0.271). However, none of these correlations are statistically significant.

- Do you think it is important to use indigenous languages in fintech services?:

This variable has a weak positive correlation with "Do you feel that fintech services are accessible to people who do not speak English?" (0.178), but again, it is not statistically significant.

It has a significant moderate positive correlation with "Are you willing to use fintech services if they were available in your local language?" (0.655) and a strong positive correlation with "Would you recommend the use of indigenous languages in fintech services to others in your community?" (0.408). Both of these correlations are statistically significant at the 0.01 level.

- Do you feel that fintech services are accessible to people who do not speak English?:

This variable has weak positive correlations with "Do you think that using indigenous languages in fintech services would make them more accessible to you and others in your community?" (0.114), which is insignificant, and "How important is it to you to have access to financial services that are easy to use and understand?" (0.345), which is statistically significant at the 0.05 level.

It has a weak negative correlation with "Have you faced any difficulties using a fintech product due to language barriers?" (-0.111), but it is not statistically significant.

- Do you think that using indigenous languages in fintech services would make them more accessible to you and others in your community?:

This variable has a moderate positive correlation with "Are you willing to use fintech services if they were available in your local language?" (0.594) and a weak positive correlation with "Would you recommend the use of indigenous languages in fintech services to others in your community?" (0.305). Both of these correlations are statistically significant at the 0.01 level.

It has a weak negative correlation with "How would you rate your ability to use internet and fintech services? 1 - 4" (-0.151), but it is not statistically significant.

- Are you willing to use fintech services if they were available in your local language?:

This variable has a strong positive correlation with "Would you recommend the use of indigenous languages in fintech services to others in your community?" (0.626). The correlation is statistically significant at the 0.01 level.

3.2 Discussion

3.2.1 Significance of variables by response distribution

Age

Crosstabulation tests carried out using IBM SPSS (v22), to assess the significance of the relationship between variables showed that for all age ranges of respondents, the majority felt that the use of indigenous language in fintech is important, however, the relationship was not found to be significant with a chi-square p-value of 0.449.

More people aged 25-34 felt fintech services were currently not accessible to people who do not speak English. However, this was not a significant relationship. The relationship between age and this variable was found however to be non-significant with a chi-square value of 0.435, although, most respondents aged 25-34 believed that integrating indigenous languages into fintech would make them more available.

The relationship between the ages of respondents and their willingness to use fintech services in their indigenous language was found to be non-significant with the most willing group of respondents aged 25-34 years.

100% of the respondents aged 25-34 were willing to recommend the proposed service to others in their community. This relationship was significant with a p-value of 0.035.

73% of respondents aged 18-24 reported never facing a challenge using fintech services due to the language barrier. However, the relationship is not significant.

Deviating from the trend of responses from other age groups, respondents aged 25-34 believed that using their native language in fintech can improve their financial well-being. The significance of this relationship was at a p-value of 0.061.

To 100% of respondents aged 18-24 and 35-44 years, it was important for them to have access to financial services that are easy to understand and use. With a perfect significant relationship with a p-value of 0.000.

Gender

Group statistics on the responses of 25 males and 25 females to questions related to the use of indigenous languages in fintech services, covering aspects such as accessibility, willingness to use, recommendation, difficulties faced due to language barriers, and the importance of easy-to-use financial services, showed that; the mean values for each question in the male and female groups suggest that both genders have similar perceptions and attitudes towards using indigenous languages in fintech services. However, there are a few notable differences between the genders in some areas. For instance, females rated the accessibility of fintech services for non-English speakers slightly lower than males, with a mean value of 1.88 compared to 2.04. Additionally,

females were more likely to recommend the use of indigenous languages in fintech services to others in their community, with a mean value of 2.80 compared to 2.72 for males.

More males than females thought that it was important to use indigenous languages in fintech. While more males than females (64:36) reported that they had faced a challenge using fintech services in the past. More males than females (71:29) significantly reported (p-value 0.036) that using their native language in fintech could improve their financial well-being.

In terms of the impact of language barriers on fintech usage, males reported facing slightly fewer difficulties than females, with a mean value of 1.88 compared to 1.64. This indicates that language barriers may be more of a hindrance for females in accessing fintech services.

Interestingly, the mean values for the question about whether using native languages in fintech services could improve financial well-being were quite different for males and females. While males rated this possibility quite low with a mean value of 1.60, females rated it higher with a mean value of 2.12. This suggests that using indigenous languages in fintech services may have different perceived benefits for males and females.

Summarily, the data set suggests that both males and females recognize the potential benefits of using indigenous languages in fintech services, including improved accessibility and ease of use. However, females may face more significant language barriers than males, and they may also perceive greater benefits from using their native language in fintech services.

Education

Respondents with educational levels of secondary and tertiary education were more likely to recommend the use of indigenous languages in fintech to their community members (p-value 0.059). The importance of having access to financial services that are easy to understand had a significant relationship to the educational level of the respondents in the study area with a p-value of 0.008, especially among those with tertiary education.

Occupation

The relationship between the occupation of the respondents and how important they think the use of indigenous in fintech services was found to be significant at a p-value of 0.028. Same with the relationship with the thought that using indigenous languages in fintech services would make them more accessible to them and members of their community with a significant p-value of 0.021. When asked "Are you willing to use fintech services if they were available in your local language?", 100% of the unemployed and civil servants and 86% of the self-employed respondents expressed a willingness, showing a significant relationship with a p-value of 0.013. They were also willing to recommend the proposed service in a not-so-significant relationship with a p-value of 0.073. A similar value (0.070) was obtained indicating the most significant relationship between the occupation of the respondents and the perceived likelihood for the use of native language in fintech to improve their financial well-being.

English proficiency

Respondents who were rated 3-4 level of proficiency in English (who could at least speak and read) were significantly (p-value of 0.023) more willing to recommend the proposed service to members of their community. 100% of the respondents who self-rated 3 out of 4 in English proficiency reported that using easy-to-understand and use financial services was important to them. This showed a significant relationship between both variables at a p-value of 0.000.

The One-way ANOVA was used to test the influence the perceived importance of using indigenous languages in fintech services had on the reported willingness of the respondents to use the proposed service. The result gave the mean square value as 4.978 and a p-value of 0.000, indicating a highly significant positive relationship between both variables. Correlation analysis also showed a perfect and positively significant correlation between both variables.

3.2.2 Correlation of variables

Pearson's correlation test was used to test the relationships between several other variables to attend to the research questions. They are discussed here further;

Looking at the correlations between the variables, we can see that the ability to use the internet and fintech services is negatively correlated with the importance of using indigenous languages in fintech services, but the correlation is not significant ($r=-0.120$, $p=0.456$). This suggests that people who rate their ability to use the internet and fintech services higher do not necessarily see the importance of using indigenous languages in fintech services.

The importance of using indigenous languages in fintech services is positively correlated with the belief that fintech services are accessible to people who do not speak English ($r=0.178$, $p=0.216$) and with the belief that using indigenous languages in fintech services would make them more accessible to people in the community ($r=0.292$, $p=0.040$). This indicates that people who believe in the importance of using indigenous languages in fintech services also believe that fintech services are not currently accessible to people who do not speak English and that using indigenous languages could make them more accessible.

The willingness to use fintech services in the local language is positively correlated with the belief in the importance of using indigenous languages in fintech services ($r=0.655$, $p<0.001$), as well as with the belief that using indigenous languages in fintech services would make them more accessible to people in the community ($r=0.594$, $p<0.001$). This suggests that people who believe in the importance of using indigenous languages in fintech services are more likely to use fintech services if they are available in their local language.

The belief that using indigenous languages in fintech services would improve financial well-being is negatively correlated with the ability to use the internet and fintech services ($r=-0.271$, $p=0.086$), but the correlation is not significant. This suggests that the ability to use the internet and fintech services does not necessarily affect people's belief in the potential benefits of using indigenous languages in fintech services.

The importance of having access to financial services that are easy to use and understand is positively correlated with the belief that fintech services are accessible to people who do not speak English ($r=0.345$, $p=0.014$), but negatively correlated with the belief in the importance of using indigenous languages in fintech services ($r=-0.207$, $p=0.150$). This suggests that people who see the importance of using indigenous languages in fintech services may not necessarily prioritize the ease of use and understanding of financial services.

The relationship between the willingness of respondents to use fintech services in indigenous languages and their willingness to recommend it to members of their community was found to be positively correlated and significant at a p-value of 0.000.

Overall, the data suggests that people who believe in the importance of using indigenous languages in fintech services are more likely to use fintech services in their local language and see it as a way to increase accessibility to the services. However, the importance of using indigenous languages in fintech services may not necessarily be correlated with the ease of use and understanding of financial services. The study also found that respondents who had experienced challenges with the use of fintech services due to language barriers were more likely willing to use fintech services if were available in their native language. That is because there was found to be a significant positive correlation (p-value 0.029) between both variables. The study also showed that the correlation between certain demographic variables such as age and occupation of the respondents and their perception of the importance of using financial services that are easy to understand and use is significant with p-values of 0.003 and 0.039 respectively. The gender of the respondents was found to be significantly correlated (p-value 0.026) to their perception that the use of their native language in fintech services could improve their financial well-being. Females were more inclined to this perspective. The correlation between the age and gender of the respondents and their self-rated ability to use the internet was negative and significant with p-values of 0.003 and 0.031 respectively. This indicates that the younger and male respondents rated higher in internet proficiency in this study.

3.2.3 Focused Group Discussion featuring selected fintech practitioners in Nigeria

The focused group discussion focused on assessing the potential impact of fintech in Nigeria's financial services sector, particularly concerning the unbanked population and rural communities. The data was collected and analyzed qualitatively under the following themes:

- **Fintech's impact on the unbanked population:** Some of the respondents highlighted that while fintech has brought significant changes to Nigeria's financial services sector, its main goal of serving the unbanked population remains unfulfilled. This indicates that there is still a considerable gap in providing financial services to those who do not have access to traditional banking. The group suggests that existing fintech services are more popular among banked Nigerians seeking convenience. They agree that the use of indigenous languages might help to promote financial inclusion among the unbanked population in rural areas, inferring that by bridging the language barrier, fintech can potentially increase access to financial services for rural communities.
- **Challenges Faced by Banked Nigerians:** The respondents pointed out that many banked individuals in Nigeria are not satisfied with the current banking services offered by fintech companies. This indicates that there is room for improvement in meeting the needs and expectations of customers who are already part of the formal banking system. The group emphasized the importance of developing innovative and user-friendly solutions that cater to both banked and unbanked populations which can contribute to overall customer satisfaction and retention.
- **Language-related challenges:** One of the respondents cites an incidence where an elderly woman faced language-related challenges with a bank application. The SMS notifications were not delivered, forcing her to physically go to the bank to validate the transfer. This anecdote underscores the importance of providing fintech applications in languages that are more comfortable for users. It suggests that language plays a role in user experience and can influence the ease of using digital financial services. Other members of the group believe that language barrier is not the primary challenge hampering inclusion among the digitally illiterate Nigerians but rather a lack of trust in digital financial service platforms.
- **Fintech exposure in rural areas:** The group believed that the primary exposure to fintech in rural areas is through point-of-sale (POS) agents who interact with customers in indigenous languages. They suggested that POS agents play a crucial role in bridging the gap between fintech services and rural communities, asserting that including indigenous languages within fintech, applications could be a valuable addition, not a necessity. They, however, forecasted that the major challenge would lie in convincing people in rural areas to see the need to access these applications in the first place. Bringing to the fore the importance of education, sensitization and awareness campaigns to demonstrate the benefits and relevance of fintech services to rural residents in improving financial inclusivity. This is not in agreement with the responses from the users interviewed during the field studies who reported using digital/online banking and mobile money/SMS banking more often than ATM /POS in the study area.
- **Significance of fintech services in rural areas:** Some respondents expressed uncertainty about the significance of certain fintech services in rural areas. While loans and loan structures are seen as potentially beneficial, transfers, withdrawals, virtual cards, and foreign exchange services may not be essential for rural communities. They implied that the value proposition of fintech services may vary depending on the specific needs and priorities of different segments of the population. Additionally, they viewed the use of local languages in fintech services as a way to enhance user experience and foster a sense of belonging. However, representing all local languages adequately for all rural areas

may pose challenges. This is in concordance with the responses from the respondents in the field study, some of whom mentioned a sense of belonging as how they feel about the use of indigenous languages in fintech services. On the challenges, users highlighted the numerosity and lack of universality of the languages as major challenges envisaged.

- **Fintech and internet decolonization:** The group sees fintech as a smaller subset of technology or internet "colonization." They suggest that messaging and social networks have a better potential to promote internet decolonization compared to fintech. This perspective highlights the importance of various media tools in fostering a more inclusive and diverse digital landscape.
- **Government Regulations and market opportunities:** The panel questioned the significance of government regulations for achieving specific purposes in the market. They suggest that companies can explore capturing opportunities themselves without relying on regulations. They proposed that developing consumer apps in indigenous languages can be done without the burden of government regulations. This viewpoint emphasizes the role of market dynamics and individual initiatives in driving innovation and addressing consumer needs.

In summary, the focused group discussion sought to provide insights into the challenges, opportunities, and perspectives regarding fintech services, the unbanked population, and rural communities in Nigeria. It underscores the importance of language, trust, and customer satisfaction, and touches upon the significance of government regulations and the potential of fintech in promoting internet decolonization.

3.3 Empathy studies

The Empathy study was carried out to understand the feelings of the respondents as prospective users of the indigenous language-based fintech services. This is an important step in the design thinking and conceptualization process of product development. The method used to analyze the data sets is a thematic analysis, which involved identifying and analyzing word counts, patterns and themes within qualitative data. Responses to each question were analyzed case by case and the results were discussed in this section.

3.3.1 How do you feel about the idea of using your native language in fintech services?

After matching similar words and phrases, the general sentiment in this dataset is positive. The majority of responses express positive feelings by using words like "great," "good," "cool," and "brilliant" to describe their feelings about using their native language in fintech services. Some respondents are excited and elated about the idea, while others simply think it is a good idea. Others believe that it will enable easy access to financial services and promote inclusivity for those who only understand their indigenous language. However, a few respondents expressed neutral or indifferent feelings towards the idea while others express concerns that not everyone can read or write their native language fluently, which might pose a challenge. Overall, most respondents feel that using native language in fintech services will enhance easy accessibility and enable the flow of business transactions easily, making it a positive development while acknowledging the potential challenges that would need to be addressed for successful implementation.

3.3.2 Can you mention an emotion you felt at a time when you tried to use a fintech service, recently?

There are several emotions expressed in this data set related to the use of fintech services. Some people expressed positive emotions such as happiness, excitement, and feeling comfortable while others expressed negative emotions such as fear, frustration, and sadness. Some people expressed feeling indifferent or confused.

A common theme in the negative emotions expressed was related to poor network service or difficulties in making transactions due to technical issues. Some people felt frustrated or annoyed because they were unable to complete transactions or experienced delays. On the other hand, some people felt happy and relieved because fintech services provided them with ease and convenience in making transactions from the comfort of their homes.

Conclusively, the emotions expressed in this data set suggest that people's experiences with fintech services can be both positive and negative, depending on factors such as technical issues and ease of use.

3.3.3 In one word, can you describe your experience using technology in general, including smartphones and computers?

The majority of the responses are positive, with words like smooth, efficient, great, awesome, excellent, wonderful, amazing, and easy being used. These words suggest that people generally have a good experience using technology. Some responses also highlight the convenience and time-saving benefits of technology, with words like stress-free, saves time, and easily accessible at any time. A few responses, such as awesome when used with caution and although I feel I should use it less, suggest that there may be some concerns about overuse or potential negative effects of technology. Overall, the data set indicates that people generally have a positive experience using technology, but there may be some reservations or concerns about its use. A small number had mixed or neutral feelings about their technology experience.

3.3.4 Do you think using your native language in fintech services could improve your financial well-being?

The responses indicate a mix of opinions regarding the potential impact of using native language in fintech services on financial well-being. Some respondents believe it could be beneficial (Yes), while others are skeptical (No). There is also a significant number of individuals who are unsure or have mixed thoughts (Maybe). One response is neutral and does not provide a clear stance.

3.3.5 Can you describe any challenges or barriers you have faced when trying to access digital financial services?

The responses highlight that the most common challenge faced when accessing digital financial services was a poor network or internet connection, with several respondents mentioning network issues, network interruption, slow internet, and network failures that can lead to transaction failures or hanging payments. Other challenges include difficulties in understanding terms and conditions, lack of direct access to customer support, poor service delivery, service disruptions or errors, downtime and technical issues. Some respondents also mentioned issues related to the refund process and concerns about the confidentiality of their data.

3.3.6 Can you tell me about any cultural or traditional practices related to finance that are important to you?

The responses indicate that for some individuals, traditional practices such as 'ajo' (traditional contribution) and savings using a piggy bank ('kolo') are important cultural practices related to finance. However, a majority of respondents mention that they do not have specific cultural or traditional practices related to finance that are important to them. Some individuals mention general financial practices like savings, buying and selling, or exchanging goods and services. A few responses are more ambiguous or unrelated to cultural practices in finance.

3.3.7 Is there anything else you would like to share about your experience with fintech services or the use of indigenous languages in technology?

Some respondents suggested that fintech companies should improve their internet network, work on improving the systems for easy and seamless transactions, and ensure a prompt response from the server to earn the trust of the people. Some of the responses in their own words: "I will fintech companies to improve their internet network, which could reduce the frustrating part of it thereby enhancing fastness in any transaction". Another said, "I feel they should work more on improving the systems for easy and seamless transactions to earn the trust of the people".

In terms of the use of indigenous languages in technology, some respondents came up with brilliant suggestions such as: "Another thing I'm thinking about is the ability for the app/service to read things/options aloud in the local language. This makes it easier and would be cool to have". This suggests the inclusion or enhancement of audio features that would improve accessibility. Another said, "Every step should be interpreted in indigenous language with visuals if possible", suggesting that emphasis be laid on visual representation to aid ease of navigation and use of fintech apps. Others thought that "The use of indigenous language will make uneducated to use Fintech services". And "It will be good to use the Yoruba language on the phone and business online".

In summary, the data analyzed suggests that while digital financial services have provided many benefits, there are challenges that need to be addressed, such as poor internet connectivity, poor service delivery, and language barriers. Addressing these challenges will improve financial inclusivity as seen in the study area. However, this would require fintech companies to invest in improving their infrastructure, providing customer support, and making their services more user-friendly for individuals who do not speak or read English fluently.

3.3.8 Empathy Mapping

The four quadrants of an empathy map summarize what the user "Says," "Thinks," "Does," and "Feels" and is useful in the design thinking process of any user-centric product design and development process. The qualitative data set extracted from the interviews were classified into these four quadrants as depicted in Figure 9.



Figure 9: Empathy Map studying potential users of fintech services running on indigenous languages

4. Conclusion and Recommendations

In conclusion, this study provides insights into the demographics, use of fintech services, and the perception of respondents towards the use of indigenous languages in fintech services. The findings reveal that the surveyed population is predominantly young, educated, and primarily self-employed or working in the public sector. Both males and females are equally represented in the survey. The majority of respondents use fintech services daily, indicating a high level of uptake and digital literacy in the study area.

A majority of respondents expressed the perceived importance of incorporating indigenous languages in fintech services. They believe that using indigenous languages can make fintech services more accessible and are willing to use and recommend such services in their local language. Improved communication, cultural preservation, and ease of transacting business are perceived as potential benefits of integrating indigenous languages within the study area. Potential challenges to implementing the use of indigenous languages in fintech services identified include limited knowledge of indigenous languages among fintech operators, the numerosity of indigenous languages in Nigeria and the lack of standardization. Other challenges identified include limited internet access and low knowledge of how to use fintech services.

The study also highlights gender differences in perception as more males than females believe in the importance of using indigenous languages in fintech services and perceive potential benefits. Females were shown to face slightly greater language barriers and were more likely to recommend the use of indigenous languages. Respondents with higher education levels are more likely to recommend the use of indigenous languages in fintech services and emphasize the importance of easy-to-understand financial services.

Summary of research findings

The following relationships emerge from the responses:

1. Respondents who believe in the importance of using indigenous languages in fintech services also see benefits in doing so, such as improved communication with customers and preserving local cultures.
2. Respondents who believe in the importance of using indigenous languages in fintech services also acknowledge challenges, such as limited availability of digital resources and low knowledge of indigenous languages among fintech service providers.
3. Respondents who believe in the importance of using indigenous languages in fintech services also see a need to increase the accessibility of fintech services to non-English speakers.
4. Respondents who are willing to use fintech services in local languages also see benefits in doing so, such as improved communication with customers and ease of transacting business.
5. Respondents who are willing to use fintech services in local languages also believe in the importance of using indigenous languages in fintech services and see benefits in doing so, such as preserving local cultures.
6. Respondents who are willing to use fintech services in local languages also acknowledge challenges, such as limited availability of digital resources and low knowledge of indigenous languages among fintech service providers.

7. Respondents who are willing to recommend using indigenous languages in fintech services to others in the community also believe in the importance of using indigenous languages in fintech services and see benefits in doing so, such as preserving local cultures.
8. The focused group discussion indicates that there is still a considerable gap in providing financial services to those who do not have access to traditional banking.
9. The focused group viewed the use of local languages in fintech services as a way to enhance user experience and foster a sense of belonging, implying that a sense of belonging might be necessary to promote the uptake of the service.
10. The group agrees that the use of indigenous languages might help to promote financial inclusion among the unbanked population in rural areas, inferring that by bridging the language barrier, fintech can potentially increase access to financial services for rural communities.
11. The study highlighted that representing all local languages adequately for all rural areas may pose challenges to the implementation due to the numerosity and lack of universality of the languages used in rural areas and the existence of diverse dialects.

In summary, this study underscores the importance of considering indigenous languages in fintech services to improve accessibility and ease of use, particularly for non-English speakers. While challenges exist, the willingness and positive perception of respondents towards the use of indigenous languages indicate the potential for integrating these languages into fintech services to cater for a diverse user base.

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