

Using a User-Centered Framework, We Can Assess the Usability of E-Agriculture Applications

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ABSTRACT

E-agriculture is a growing and well-known field with a focus on the development of rural regions and farming through value-added information and improved communication systems. With the widespread usage of mobile devices today and its applicability in every aspect of life, including agriculture. In Pakistan, there are several different agriculture-related apps in use. Usability emerges as a key determinant of whether users are generally utilising the new technology to create the most effective e-agriculture application software. Since individuals are not properly aware of the digital data options, usability in agriculture continues to be a challenging issue. The present deficiencies in agriculture mobile apps, such as memorability, learnability, operability fault handling, and flexibility, are not covered by the previous usability paradigm. The goal of this study is to evaluate the usability of e-agricultural mobile applications from the user's point of view and to provide a usability framework that identifies the most significant gaps currently present in agriculture apps. The suggested framework can be used to create a cutting-edge mobile app with features for agriculture. For this reason, two of the most popular agriculture apps, Bakhabar Kissan and agriculture Extension, are chosen to be measured and evaluated for their usability on our suggested framework from the user's perspective in order to fully utilise the apps and subsequently increase crop production to meet the needs of the nation.

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1. INTRODUCTION

As technology has developed, there are more e-agriculture applications for farming that make sophisticated use of ICTs such as satellite networks, GPS, contemporary

computers, and electronic gadgets to increase output quantity and efficiency. The ICT is used extensively in the agriculture sector by the e-agriculture society to benefit food protection and farm productivity [-2].

The FAO has identified a number of encouraging trends, including those that apply to mobile financial services, mobile agriculture information systems, and stronger ICT integration, but barriers will limit gains. In Pakistan, agriculture is a significant economic driver that supplies industries with raw materials and meets all food demands. Today's rapid use of mobile technology presents enormous economic potential and new avenues for boosting rural residents' incomes and the nation's economy through information and transfers of both public and private funds. Even with the widespread use of cell phones, there is conflicting information regarding their impact on the agriculture industry. These findings from a randomised assessment in Niger show that rural families are more likely to adopt information technology and have more connections to it. A more diverse crop basket for families in controlled villages, especially for the marginal income crops farmed by women, was sowed [3-4].

2. RECENT WORK

The study analysed the replies of participants who kept a journal of their struggles and experiences. suggestions on how HIT can assist address the problems found and enhance the quality of life for patients. Our study found that the primary reasons patients complain are a lack of communication with their health care professionals and a lack of guidance and assistance with managing their diabetes. Participants wanted a counsellor they could trust, someone who would listen to them, and someone who was nice and attentive. Additionally, they sought easier visit scheduling and problem-solving procedures [5-6]. Patients with diabetes who participated in the study kept diaries of their struggles and experiences in order to examine their reactions. suggestions on how HIT can assist address the problems found and enhance the quality of life for patients. Our study found that the

primary reasons patients complain are a lack of communication with their health care professionals and a lack of guidance and assistance with managing their diabetes. Participants wanted a counsellor they could trust, someone who would listen to them, and someone who was nice and attentive [7]. They additionally wished more straightforward systems for organising and altering visits as well as better difficulties solutions [8]. To study design and methodology for a programme to prevent digital diabetes, as well as the early lessons gained in data collection, registration, and recruiting [9].

3. RESEARCH METHODOLOGY

The background information about e-agriculture in Pakistan and awareness of it in rural regions serve as the foundation for the research design. Following a review of the literature on e-agricultural, the research gap in e-agriculture is found to be a concern in agriculture mobile apps. I have presented a system to assess the usability of mobile apps for e-agriculture in order to address this issue. Framework variables including memorability, satisfaction, learnability, efficiency, operability, error, etc., as well as the framework's structure and the relationships between its features, are defined in the first stage. Data collecting is the next phase. Following the creation of a study tool (questionnaire) from the farmers who are utilising the mobile e-agriculture application and are according to sample size. This step involves gathering sample data from localities and farmers in my area through field research. Three hundred twenty participants were chosen as the sample size [10-11]. Data preprocessing, the third step in the research process, takes analysis and outcome discussions into consideration. following the data collection by a survey. For statistical analysis of data based on a farmer's age, education, and agricultural experience, I used the SPSS application. The following figure defines the

entire research process. 1 There are fundamentally three steps to this study process. Figure 1 in the research design describes the entire process of this thesis. This process comprises three steps, the first of which involves gathering research background information. Data samples are gathered from

the chosen area. Results are calculated using statistical analysis in the last stage. utilising SPSS tools, anybody [12-13]. The following figure 1 describes the entire research process.

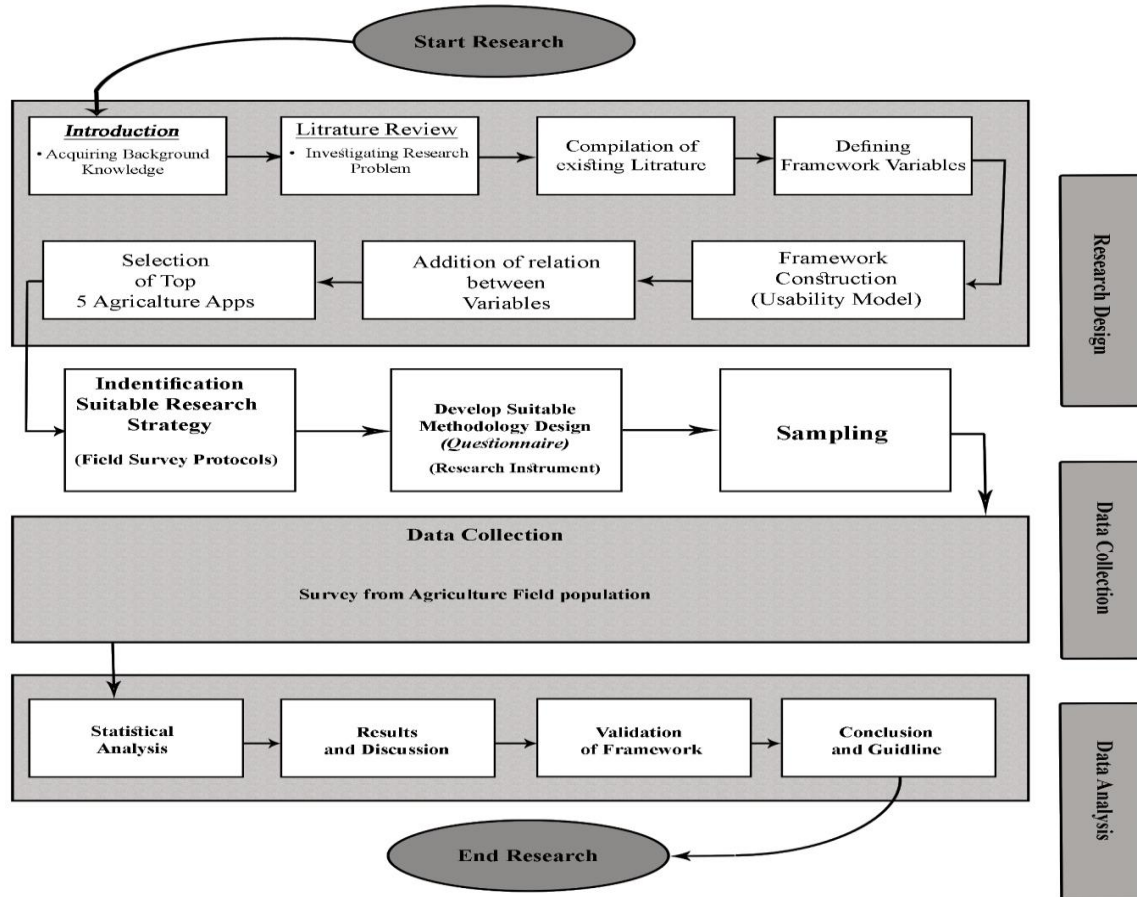


Fig.1. Research Model

4. PROPOSED METHOD

Data from programme users, including farmers and other people with a connection to agriculture, is collected in this review using questionnaire methodologies. In research, the survey is the process of gathering a dataset, and the survey tool is a crucial component of that process. This survey tool was created using data from a prior study on M-Agriculture and the applications used in the agricultural industry. This questionnaire tool has 39 questions regarding usability attributes, including questions about usability attributes in the context of agriculture, gender, age requirements, and awareness of mobile e-agricultural apps. These survey questions gauge many aspects of the usability of e-agriculture programs, such as recallability, efficacy, learnability, error, satisfaction, and understandability [14-15]. A Likert scale includes In order to get input from users of E-agriculture and E-agriculture apps, a Likert scale with five options—strongly agree, agree, neutral, disagree, and strongly disagree—was chosen. The characteristics are chosen in accordance with the features included in the chosen mobile applications for e-agriculture. (Bakhabar Kissan and Agriculture Extension). Data is gathered from

many villages in Tehsil Sahiwal, Punjab, Pakistan, of various educational levels, including No Formal Education, Primary, Middle, Matric, Intermediate, Graduate, and Master, in order to evaluate the usability of these apps. Members asked to be evaluated based on their perceptions of e-agriculture apps. In this review, information from programme users—including farmers and other individuals with a relationship to agriculture—was gathered using questionnaire approaches. The survey is the method used in research. The survey tool is an essential part of the process of compiling a dataset. This survey tool was created using data from a prior study on M-Agriculture and the applications used in the agricultural industry. This questionnaire tool has 39 questions regarding usability attributes, including questions about usability attributes in the context of agriculture, gender, age requirements, and awareness of mobile e-agricultural apps. These survey questions gauge many aspects of the usability of e-agriculture programs, such as recallability, efficacy, learnability, error, satisfaction, and understandability [16-17]. A Likert scale includes In order to get input from users of E-agriculture and E-agriculture apps, a questionnaire with five options—strongly agree, agree, neutral, disagree, and strongly disagree—is chosen. The characteristics are chosen in accordance with the features included in the chosen mobile applications for e-agriculture. (Bakhabar Kissan and Agriculture Extension). Data is gathered from many villages in Tehsil Sahiwal, Punjab, Pakistan, of various educational levels, including No Formal Education, Primary, Middle, Matric, Intermediate, Graduate, and Master, in order to evaluate the usability of these apps. The participants asked for an evaluation based on their perceptions about e-agriculture apps. There are two groups of participants in this data: those who are aware of mobile applications for e-agriculture and those who are unaware of it or do not own a smartphone. Through a manual survey, the information is gathered. People fill out the questionnaire form in groups, according to their personal experiences [18].

5. RESULTS AND DISCUSSION

We gathered the information from individuals in several villages. The SPSS frequency test calculates the frequency of their experience, age, educational level, smartphone usage, non-use, and awareness of agriculture mobile apps. Following are the results of frequency: Different ages of

persons participated in the data collecting. 320 people are distributed equally according to their ages, with 25% of the population in the 25–35 age range, 25% in the 35–40 age range, 25% in the 45–50 age range, and 25% in the 50–60 age range.

Table 1. Age-Frequency

Demographic Factor	Percentages	Frequency
Age of farmers		
25-35 years	25%	80
35-40 years	25%	80
45-50 years	25%	80
50-60 years	25%	80

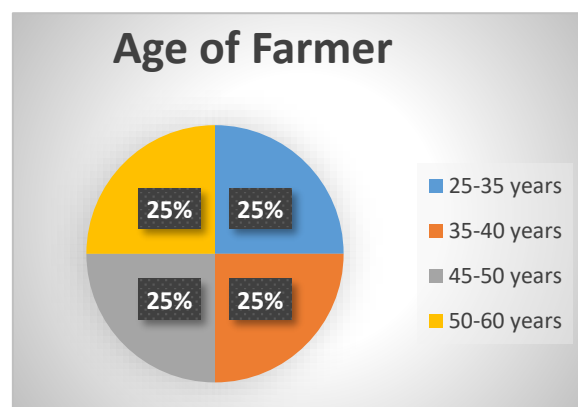


Fig 2. Age Percentages

Table .2 Education of Farmers

Demographic Factor	Percentages	Frequency
Education		
No Formal Education	25%	80
Matriculation	25%	80
Intermediate	25%	80
Graduate	25%	80

The data gathering involved persons with various levels of schooling. 320 people are distributed equally based on their level of education.

Table .3 Experience Farmer

Demographic Factor	Percentages	Frequency
Farming experience in agriculture		
5 or less than 5 years	25%	80
10 Years	25%	80
15 years	25%	80
More than 15 years	25%	80

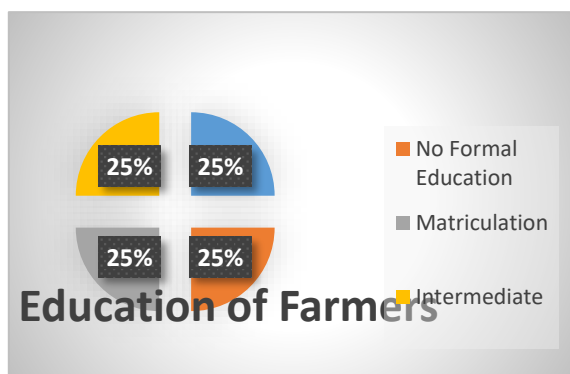


Fig.3. Farming Experience

People with various farming backgrounds and experiences took part in the data collection. Once more, 320 people are equally

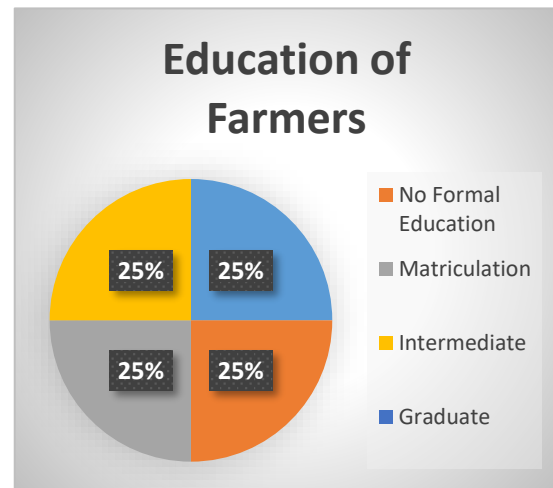


Fig.4. Farming Experience

distributed based on their level of experience. The statistical analysis of our intended normative framework, which included measures of memorability, efficiency, learnability, error, satisfaction, understandability, speed of performance, and effectiveness, People with various farming backgrounds and experiences took part in the data collection. Once more, 320 people are equally distributed based on their level of experience. The statistical analysis of our intended normative framework, which included measures of memorability, efficiency, learnability, error, satisfaction, understandability, speed of performance, and effectiveness, was shown in Figures 3 and 4.

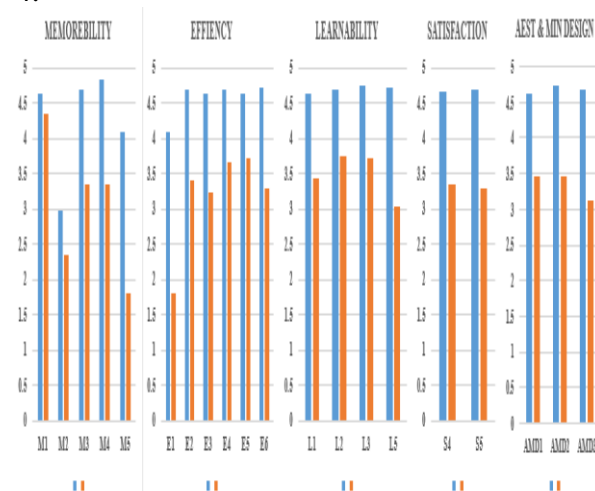


Fig 5. Education Frequency

6. CONCLUSION

The results suggest that farmers' attitudes were equally valuable because the majority of farmers have a positive attitude towards the remarks that were made.

The obtained results also suggest that farmers' attitudes were priceless because majority of them have a favourable attitude towards the stated assertions. Farmers reported that 92% of them felt confident using orders and remembering names, while only 8% of them expressed no opinion. The findings showed that most farmers have a favourable opinion towards the grant declaration. It was determined that it was challenging to recall particular guidelines for

entering orders, and the majority of farmers demonstrated a highly negative attitude towards this conclusion. The majority of farmers concurred that the command names had purpose, so Despite the fact that they were simple to recall, several farmers felt uncomfortable working on mobile apps. The mean score demonstrates the farmers' favourable response to this assertion. Farmers claimed that 75% of mobile app operations were simple for them to manage. The mean score reveals that farmers responded favourably to this assertion.

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