



BRIDGING THE DIGITAL DIVIDE

*Analyzing the Effectiveness of the Digital
Platforms for Farmers in Pakistan*

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Title: Bridging the Digital Divide- Analysing the Effectiveness of the Digital Platforms for Farmers in Pakistan

Abstract

This research paper examines the effectiveness of digital platforms in bridging the digital divide for smallholder farmers in Pakistan. It explores the challenges faced by these farmers, the role of digital platforms in addressing these challenges, and the impact of user interface (UI) and user experience (UX) on the adoption and usability of these platforms.

Introduction

Why there is a significance of small farm holders? Why there is a lot of emphasis on improving the conditions for the Smallholder because of the fact their role is extremely crucial in ensuring the food security across the globe and particularly in the developing countries. As per the latest stats available on the website of Pakistan Bureau of Statistics (<https://www.pbs.gov.pk/content/agriculture-statistics>)¹ Agriculture contribute 24% of the total Gross Domestic Product (GDP) of Pakistan and almost half of the labor force is employed in this sector only. This is also the single largest source of foreign exchange earnings of Pakistan as well. It serves the food needs of urban and rural population of Pakistan. This entire contribution makes it more significant to look at the ways to improve the overall use of technology for all stakeholders but more particularly for the small farm holders.

Like mentioned above, Pakistani farmers are playing a crucial role in food security. However, they face numerous challenges as well which includes 1) limited access to markets, 2) access to financial services, and 3) agricultural inputs. Digital platforms offer a very promising solution to these issues by providing small farmers with access to valuable resources and information. This report explores how digital platforms can be made more accessible to small farmers, how to overcome the barriers they face, and the significant of user interface (UI) and user experience (UX) in enhancing digital access. Additionally, it includes an analysis of the effectiveness of digital platforms for farmers in Pakistan.

Challenges Faced by Small Farmers

Small farmers in Pakistan are facing numerous challenges that restrict their access to digital platforms:

1. **Digital Literacy:** The first and foremost the biggest challenge is the digital literacy of the farmers, they lack the necessary skills to use digital tools for their own benefits.
2. **Network Coverage / Infrastructure:** Poor internet connectivity and limited access to digital devices is another significant aspect that requires immediate attention and is a significant obstacle.
3. **Cost of digital devices and services:** Although there has been a significant improvement in this area but with the low per capita income and low knowledge on the importance of this spending, the cost is still an aspect which prohibit the access to the digital services.
4. **Knowledge, Awareness and capacity building:** Another important challenge is the lack of knowledge and ability to understand the benefits of digital solutions even which are available. Farmers may be unaware of the benefits of digital platforms or may distrust new technologies, primarily because of their capacity to understand the digital solutions.

Purpose of Research:

This research has been designed to analyse and understand the efficacy and utility of the digital platforms in the lives of small farmers. How are they using the digital platforms to make their farming activities more efficient and effective? The questions that we have asked ourselves while doing this research is how to make the use of digital platforms more useful for the small farmers in helping them during the crop cycles. It considers the features and functions of UI (User Interface) and UX (User Experience) both globally and nationally and provides detail of how UI and UX could be further enhanced to increase the adoption rate of these platforms by the farmers.

Digital Platform:

First we need to understand the concept of Digital Inequalities of Digital Divide. These inequalities have emerged as a growing concern first in modern societies. These inequalities relate to disparities in *access*, *actual use* and *use efficacy* of digital resources. Digital resources including transformative technologies, such as business analytics, big data and artificial intelligence are key for the transition of societies towards sustainability (Pappas et al. [2018²](#); United Nations [2018³](#)). Reducing digital inequalities is critical for sustainable and equitable digitalized societies. All types of digital inequalities are encompassed in the term *digital divide*. One of the first uses of the term is traced back in a US government report published in 1999 referring to the divide between those with access to new technologies and those without (NTIA [1999⁴](#)). The term was soon broadened to signify the “gap between those who can effectively use new information and communication tools, such as the Internet, and those who cannot” (Gunkel [2003⁵](#)). Overall, the term digital divide includes digital inequalities between individuals, households, businesses or geographic areas (Pick and Sarkar [2016⁶](#); OECD [2001⁷](#)). The ongoing digitalization poses a challenge for individuals who are not fully capable of using digital resources and may feel partially excluded or completely left out of the society.

What is a Digital Platform and how it can help the small farmers of Pakistan?

A digital platform is a digital environment which consists of the Web Application, Mobile Applications, the communication between these and other external services and integration between each of the elements that comprise it. It allows multiple participants to connect it and interact each other, so digital platforms are extremely dynamics and interactive.

We can say that a Digital Platform is usually a platform that allows exchange of multiple information which in return allows digital financial transactions as well between Business to Business (B2B), Business to Customer (B2C) and even Customer to Customer (C2C) to allow them to make their own choices and at their own terms and conditions.

Digital platform are aggregator of information that combines the software and technology to facilitate the communication between users. It is a platform which has a lot of data stored, it helps the users to gain access to large amount of information. There are also lot of other tools available on the digital platforms, some tools help you in development of the content and some contain both information and tools. It helps the user to interact and gain help from these platforms.²

The lack of access to Digital Platforms by the farmers has a huge impact on sustainability and productivity, especially in areas with low literacy rate.

It is the need of the time that the Govt. and private sector of Pakistan take a step forward and develop digital platforms for the farmers and address the challenges mentioned in the start of this paper. The access to these digital platforms with digital literacy can change the fate of these farmers if they will be able to access the data and information available on these platforms.

These digital platforms give farmer access to various tools such as precision tools and data analytics. Analytical tools helps the farmers to use the information on their respective soil, weather and seeds to make an informed choice and act accordingly e.g. they can adjust their farming plans based on the information available with regards to the weather forecasts and help the farmer in future planning (when to plant seeds, when to harvest crop, etc). There are many other tools which a farmer can access through the digital platforms to learn, get knowledge of the new methods of farming which are scientifically proven that they are better than the traditional methods used by the farmers. By using such tools farmers can get help in achieving higher yields, using resources efficiently and adopt modern farming methods. New farming techniques are also more eco friendly than the conventional methods. On the other hand, farmers with no access to these digital platforms are still using their traditional methods of farming resulting in a lower yield of their produce as compared to the digitally savvy farmers due to inefficient in resource management and leads to greater unsustainability. It is, therefore, important to address the issue of digital divide to make farming more efficient and sustainable.

To address digital divide, it is necessary to improve the digital literacy, infrastructure and to gain the local and government organizations' support.

User Interface (UI) & User Experience (UX)

Starting with a brief description of what UI and UX are. User Interface (UI) is basically the elements and layout which make easy for a user to use the digital platform. It is the appearance of the Apps, website or webpage and includes buttons, icons, menus, etc of a digital platform. Whereas, User Experience (UX) is the overall experience or review a user has about the digital platform- how well platform is focused, how effective its use is and how efficient it is.

UI and UX could be a game changer for a digital platform, if they are related with the user preferences, they could make the platform much convenient for the users and would quickly adopt a widespread use within the community. To increase the adoption rate of the digital platforms, UI and UX play an important role. Altering them according to farmers in areas with low literacy rate would increase the number of farmers using digital platforms. Many farmers around the world aren't using the digital platforms as they aren't educated enough, they face many difficulties while using the platforms and one of the major difficulties faced by many farmers is the language barrier. Farmers in many areas are only familiar with their hometown language. Most of digital platforms are only in English, and most of the farmers around the world are not familiar with it. Similarly, most of the farmers are not updated or adopted the modern devices, many are still using the old feature mobile phones, and some might not even use phones. This causes a difficulty for them to adopt new technologies including the modern smart phones and the latest technology used in it. To ensure that the farmers start adapting this latest technology and to narrow the gap of digital divide, there is a much stronger need that the Govt. should focus on this very important area and include the private sector as well as partner with the NGOs which have very deep roots in the rural segments of Pakistan

and these can help the Govt. in furthering their objective of Digital literacy across the country. The tech companies are required to bring in more innovation by changing the layouts of their applications and may be by including the pictorial as well as voice assistance as a feature to their apps in the future. The voice assistance according to the areas would be a great step forward for the farmers to take a big leaf forward in digital learning. Examples of multiple languages, buttons size and design could be made attractive, the UI could be used to make the complex platforms simpler so that it is easy for the farmers with low literacy rate to learn new and more sustainable methods while learning about more farming techniques and help produce high yield which will ultimately make the farmers more sustainable and help make an eco friendly environment. The Tech Companies are required to use the researchers to help them understand the requirements of the users so that the end outcome of the digital apps or solutions should be based on the user centricity. Many farmers and people who are illiterate are hesitant to face complex structures and prefer to live the simple life they are currently living. This is a joint goal of the govt. & Private companies to ensure user friendly solution and build the used cases to spread the awareness amongst the masses in their local language and in their local style e.g. small clips on local cable demonstrating the benefits of use of digital solutions or may be story telling by the successful farmers to their local fellow villagers can speed up the process of learning and adapting digital solution which ultimately will help the farmers to access the latest information about quality seeds, methods, and so far so information on available financial model that they can use to achieve their financial goals. In order to help them shift towards the digital platforms we seek help from UI and UX which help produce digital platforms suitable for such farmers as they make digital platforms more user centred, make use of calm technologies, make the platform more interactive and also reduce the level of complexity so that more and more farmers start to use such platforms and adopt better farming techniques with several more benefits. ¹¹

Global

The united nation #2 goal is to eliminate hunger from the world. Covid-19 being a major reason for the hunger in today's world, it could be seen through analytical data that around 20% of people in world were going through sever food hunger. However, in 2019 it was 19% less than compared to the year 2020. There are 7.9 billion people that need to be fed and the needs are to be met with the 608 million farms around the world. Small farmers tend to own approximately 84% farms worldwide and are held accountable for roughly 35% of world food supply. Small farmers have to face many problems which lead to low productivity, less sustainability and results in low income generation which leads them to just fulfil their own needs of food and in most cases no surplus is left, their income is so low that they could rarely meet and feed only their own families. ¹²

According to many studies and analytical data it is claimed that technology can play a role of wide disruptive force in agricultural sector and could benefit the farmers especially small-scale farmers. However, farmers mostly small-scale farmers are not having access to such technology or digital platforms and aren't able to progress further in their lives. As stated, 24–37% of farms of <1 ha in size have access to (3G) or 4G services, compared to 74–80% of farms of >200 ha in size¹³. In Africa, approximately 40% of farmers have access to the internet, although, the cost of internet in those is areas is extremely high.

Digital platforms could serve here an important role so that small farmers could produce a high quality and high quantity of yield, making it economically viable and leading to a profitable production. Digital platforms could provide small farmers with such a platform that could collect, access and analyse the data, providing the farmers an ease to identify their room of improvement and practice new methods that could be beneficial for them and for the people around the world. Digital platforms are still not that widely used due to many reasons, improvements in areas including: software services related to the context, last mile infrastructure and open standards. These areas could be improved by trouble shooting, supporting smallholder's technical capacity, adopting the lifecycles and development in digital innovation. Providing internet is not only the solution to increase the use of the digital platforms, but there is also a strong need for investment in the software infrastructure to provide the small farmers with access to the digital platforms. Agstack is a foundation that is developing open standards and trying to secure digital operating systems so that they can provide access to all stakeholders in agricultural sector worldwide. Open standards platforms are therefore easier for the farmers to use as it has low fee, it protects farmers data and help exchange contextually related tools and services. The open standard platforms are still going through advancements to get more focused, cost effective and become more valuable¹⁴.

UI and UX could be used to make the digital platforms more effective, helpful and easy to use for farmers all over the world. UI plays an important role to make farmers understand the features and functions of a platform. These features and functions could help farmers quickly adopt the use of digital platforms as they make it effortless for farmers to carry out the operations. It helps enhance the process of monitoring, analysing and control over the agricultural sector. UI designs could therefore be helpful in presenting complex data structures in a manner which makes it simple and understandable for the farmers and thus farmers never hesitate to use the digital platforms. It help to present critical aspects required for farming such as soil health, crop health, etc. UI is there to make a user-friendly environment between the farmer and platform, creating new technology such as automated machines like drones which includes easy to use features and can be more accessible. These technologies help in the process of navigation and operation with more efficiency. It also introduce functions and features such as responsiveness, responsiveness means making the platform more convenient for all types of users as mostly farmers are not having access to the computers but have mobiles thus the platform should be responsiveness enough that it works best on mobile devices to quickly adopt wide use. Live monitoring could be used on these platforms so that there is more check and balance over the crops and livestock of the farm creating an ease for the farmer to keep check and balance over each and everything in farm and would allow them to make much better decisions. Farmers having no access to such platforms still use the traditional methods which aren't sustainable enough, farmers using the platforms could achieve more sustainability by the help of UI, as it could tell the best suitable method a farmer should use considering the factors that could affect the yield. Thus, generating and telling the farmer the best suitable method of farming according to the farmer and his farm.

UX is similar to the UI and help remove the challenges from farmers life and provides farmer the unique needs of the farm. UX is more oriented to towards the farmers own focus, it will identify the challenges and would provide farmer with key points full of features and functions that are unique and relevant to specific farmer. UX help the designer of the platform to design such a digital platform that farmers who aren't that well educated and hesitate using complex digital platforms are able to

use. This could be achieved by using the UX and make the digital platform more simple and straightforward for the farmers. UX is also responsible for the integration of agricultural technology with the existing systems and farming processes. Many farmers have a concern that their existing workflows are not relating with the solutions given by these platforms and at times system could disrupt the existing farming practices which needs to be considered, by having good research over the UX this problem could also be solved and it should therefore be ensured that before creating the UX it must be considered and must relate with the workforce.¹⁵

Pakistan

Pakistan's agriculture sector is the main contribution towards the Pakistan's economy and having a significant effect on the GDP. Agriculture activity in Pakistan is done on large scale and is considered to be the main contribution in the GDP. Agriculture accounts for the 18.9% of GDP. Considering the importance of agricultural sector in Pakistan it could be seen that most of the Pakistani population is also involved in agricultural sector, stated that around 42.3% of the labour force is involved in this sector. 25% of Pakistani land is under cultivation throughout the year.¹⁶ By referring to this information, that agricultural sector is important for Pakistan.

Pakistan still currently has many digital platforms for the ease of farmers in cultivation. The most widely used digital platform for the help of farmers in Pakistan is "BaKhabar Kissan". It is a digital platform which had developed and enhanced the features and functions using both UI and UX. This app is roughly used by 700,000 people and is supported by both languages Urdu and English. They had tried to solve the problem, farmers with low literacy rate, could also use this platform as this is in the national language Urdu used all over the Pakistan and mostly farmers know how to read and write Urdu. Secondly, this app has UI which is extremely friendly there is no such complexity in app and easy to use by the farmers. The platform multiple functions and features, it helped and created a community of farmers from all over the Pakistan. Then it has a section of crop advisor through which farmers could seek help about the crop that should be grown, solution of problems faced during the cultivation, etc. Even a shop is created for the farmers to buy fertilisers, pesticides, etc. It is also connected with the satellite to help monitor the farm and includes rain alerts also. In order to monitor the farm with high level of preciseness, improving the crop health and manage an efficient farm they had also started a drone service. The advisory service had been made available to farmers at a very cheap rate due to collaboration with multiple telecom companies, which would help farmers increase the productivity and do an efficient and sustainable farming. They had also upload videos of more efficient farming methods so that even farmers with low literacy rate could learn through those videos and adopt the methods and techniques. They are also trying to expand the telecom solution service as they have partnered with various telecom companies like Jazz, Zong, Ufone and SCOM, and all of these networks are widely used across the country.¹⁷

Apart from Bakhbar Kisan there are a lot of more digital platform across the country which include platforms like Kisan Card which is introduced by the government and AgriFin which also aim to provide financial assistance with technological tools for farmers to adopt new, efficient and sustainable farming methods.

Digital Dera is the first of its kind digital agriculture community in Pakistan. It is set up in the province of Punjab which is the hub of the fertile ground. It is limited to a small area in Chak 26- SP in Pakpattan region and has helped more than 1500 farmers to find solutions for the problems faced while farming and also by teaching them about the new technology and services for agriculture. It is also contributed to a food security innovation lab where the AgriTech startup and investors from all over the country can test their products and innovation in their agricultural space. It provides them with high-speed internet facility and has session for small farmers about the awareness in local language. Its main aim to empower the farmers with technology and internet connectivity.¹⁸

Pakistan being a country where most farmers are less literate and tend to find these platforms difficult to use. The low literacy rate among the farmers is one of the major problems that restrict the use of these digital platforms. It is not just the language that these farmers find difficult to interpret but the level of complexity in these platforms the reports prepared by the platform about the forecasting, etc are also difficult to interpret by the low literate farmers. Farmers find it difficult to use the technology and therefore don't easily adopt to it, they are hesitant to use the platforms as they feel more convenient to use their own traditional matter. Even though the methods they use are less efficient than the methods told by these platforms. Due to low literacy rate and lack of education for farmers the rise in the adoption of digital platform is less. In order to increase the adoption rate of digital platforms UI and UX must be made simpler and more understandable by the farmers, the platform must be multilingual as many farmers only understand their own provincial language and are unaware of English. There should be more features and function to make the platform simple, even the result or reports shown must be explained through a voice or a written explanation in hometown language of farmers.¹⁹ Although UI and UX play a significant role in the development of digital platform related to agriculture, but still there is a much more important factor to raise the scale of adoption of digital platforms which is the lack of infrastructure. As half of Pakistan's population does not have access to the internet which makes difficult for farmers in those area to connect to the world. And many of the people living these areas are small scale farmers and this lack of infrastructure makes it difficult for the farmers to get connected with the digital platforms.²⁰ Thus, Pakistan government and UNDP must take an initiative and provide internet facility and develop infrastructure in areas of Pakistan where there is no internet as many farmers are practicing agriculture in those areas. Development would help the farmers gain access to the digital platforms and would help increase yield, sustainability and make the, use more eco friendly methods. Thus, development of infrastructure of internet would have an overall benefit to the country, as internet provides farmers access to digital platform and those platform help increase the yield and reduce the waste.

According to the international Fund for Agricultural Development (IFAD) it is considered that around 1.4 million farmers from the province Punjab in Pakistan had benefited from a 19-month digital agriculture project that had provided the farmers with advice from the agricultural specialists. It was also partnered with the Clime Forecasts Application Network which helped the farmers get to know about the forecasted weather a few days earlier so that farmers could carry the process accordingly. It is also stated that the 200,000 farmers were getting voice notes by the platform about the regular updates and advises about when to plant seeds and when to dig channels to divert the flow of flood water. Similarly, 300,000 cotton farmers were given advises about how to deal with pest with

environmentally friendly methods. It is said that around 34% farmers who used the platform has learned minimum one new method of farming that was suggested by the platform. ²¹

Conclusion

Farmers in Pakistan could achieve significant benefits from digital platforms, these platforms must adopt the changes to help small scale farmers access the digital platforms. UI and UX are ,therefore, important elements that can enhance the platforms use by making the platforms more simple, interactive, multilingual and easy to use. Although there is not a good internet infrastructure in Pakistan but still many farmers have internet facility but are having low literacy rate ,and thus could only access the platforms when it is easier for them to use and understand the methods and techniques told in it. UI and UX are there to bring the changes in these platforms and will increase the use of digital platforms by farmers significantly. These platforms could serve as a source of empowerment for famers, helping them to achieve sustainable farming, high yield, efficient resource management, etc. Not only individual farmers would get a benefit, the country, Pakistan, will to gain benefits by farmers use of digital platforms.

Citation

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