

What's Your Platform? Introducing Platform Theory in Agricultural Communication

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The current advancement of several platforms allows a greater interconnection among people, making the world smaller day by day. Platform theory has emerged as a new concept that explains transformative force of platforms, revolutionizing the information-sharing process, way of transactions, and communication across various sectors (Parker et al., 2016). At its core, platform theory involves the creation of a digital or physical infrastructure that facilitates interactions between different user groups, generating value by enabling exchanges that would not otherwise occur (Van Alstyne et al., 2016). Platforms thrive on network effects, where the platforms' value increase as more users participate, creating a self-reinforcing ecosystem (Evans, 2016). This theory has been successfully applied in social media, e-commerce, and transportation, fundamentally changing industries and redefining the relationship between consumers, businesses, and service providers. The transformative nature of platform theory is particularly intriguing when considering its potential in agricultural communication.

We have several examples around us about platform theory in use. In social media, platforms like Facebook and Twitter connect millions of users, allowing them to share content, engage in discussions, and build communities around shared interests (Nielsen & Ganther, 2022). E-commerce giants like Amazon and Alibaba use platform models to connect sellers and buyers, offering seamless transactions across global markets (Cusumano et al., 2019). Transportation services like Uber and Lyft have applied platform theory to match passengers with drivers, creating a flexible and scalable transportation network without owning vehicles (Cramer & Krueger, 2016). These examples demonstrate how platform theory can create immense value by facilitating interactions, optimizing resource allocation, and fostering innovation.

Despite its success in other fields, platform theory remains underexplored in agricultural communication. Agriculture, a sector critical to global food security and economic stability, faces unique communication challenges that are yet to be fully addressed. Traditional agricultural communication has relied on linear models of information dissemination, such as government extension services, and agricultural journals. While these methods have been essential in the past, they often struggle to reach diverse stakeholders in real time, particularly in the face of rapid technological changes, globalization, and the increasingly complex demands

of modern agriculture (Rivera & Alex, 2004). Farmers, agribusinesses, consumers, policymakers, and researchers operate in silos, with limited integration among these groups (Aarts et al., 2014). The lack of a structure that can facilitate real-time communication, market access, and knowledge sharing across these diverse stakeholders has hindered the ability to respond quickly to new challenges related to and impacting agriculture, such as climate change, evolving consumer preferences, and shifts in market dynamics. Hence, there is a need for a comprehensive framework that can help understand the evolving communication needs.

This paper argues that platform theory can bridge existing gaps among agricultural stakeholders, leading to more efficient, transparent, and adaptive communication networks when applied to agricultural communication. By using the power of network effects and digital connectivity, a platform-based approach can enhance farmers' access to markets, provide real-time agrarian knowledge, and foster consumer trust in the food system. This paper explores how platform theory can be integrated into farm communication and proposes a conceptual framework for developing a platform tailored to the unique needs of the agricultural sector. More specifically, in the sections that follow, the paper describes platform theory, its core ideas, development, and example use cases, and propose a conceptual model for applying platform theory in agricultural communication.

Introduction to Platform Theory

The word “platform” refers to a raised, level surface or area in English. It has been documented since the 1550s, initially meaning a raised frame or structure with a flat surface (Online Etymology Dictionary, n.d.). Therefore, we can sense that platform means providing a base for whatever is needed for our purpose. Platform theory is the concept that gives basis and validity to different platforms. Platform theory has emerged as a framework for understanding digital ecosystems with modular and technological architecture explorations. Few initial works have been done on this theory by Baldwin and Clark (2000), centered on the design rules of modularity, which allows complex systems to be segmented into independent components or “modules.”

In recent years, platform theory has been popular across different sectors for which it acts as a base model for complex multi-sided relationships seen in digital ecosystems. This theory has its roots specially in the technological and economic spheres where middlemen were seen as a platform that enabled communication between various user groups and generated value through network effects (Rochet & Tirole, 2003). This practice gradually spread outside of conventional market group and extended on the disciplines like computer science, leadership studies, sociology, and communication. Today, platform theory is applied to analyze how various sectors harness digital spaces to create, manage,

and sustain interactions, with particular attention to how platforms enable both economic and social exchanges, influence user behaviors, and shape organizational practices (Parker et al., 2016). This evolution positions platform theory as an essential analytical tool in understanding not only market dynamics but also the informational and participatory structures within sectors such as agricultural communication, extension, and leadership. Later, we present some examples of using platform theory in agricultural social science in this article.

Core Components of Platform Theory

The structure and function of platform theory rest on several core elements, forming the foundation for its application across various fields. Network effects are the first factor that explain how the platform's value increases as more users sign up, starting a vicious loop that draws in even more users (Katz & Shapiro, 1985). Another element is the multi-sided market, which describes how platforms function by bringing together many user groups, each of which contributes something special to the whole (Rochet & Tirole, 2003). The third element of platform theory is openness. It explains role of different stakeholders which is to encourage a sense of togetherness and help the community to grow together (Eisenmann et al., 2009). For platforms to operate efficiently, another component, a strong governance framework, is also essential. Parker et al. (2016) talks about how governance creates guidelines, norms, and procedures that promote trust, control user interactions, and lessen disputes on the platform. The final component, scalability, may grow the platform user base without sacrificing functionality. The scalable design facilitates quick growth, which is essential for platform success in dynamic digital settings like digital agricultural platforms and e-commerce platforms (Baldwin & Woodard, 2009).

Evolution & Expansion of Platform Theory

The progress and evolution of platform theory focus on broader socio-economic impacts of digital platforms. Kenney and Zysman (2016) examined how the "platform economy" explained sectors like e-commerce, social media, and gig work. This work clearly showed how platforms have redefined business landscapes by lowering barriers to entry for small players. Moreover, in recent years, most research focuses on socio-technical systems as platforms embedded with cultural, political, and economic values. Gillespie (2018) discusses social media platforms as gatekeepers of information, shape public discourse and impact social norms through content algorithms. This new perspective emphasizes that platforms are not neutral intermediaries but active shapers of user experiences and societal values. Examples of platform models in education, leadership, and communication below helps to understand its active usage across disciplines.

Platform Theory in Education

Educational platforms such as Coursera, ETS, and MOOCs (massive open online courses) showcase the adaptability of platform theory in transforming traditional educational models. Zhu et al. (2016) examine the role of platform leadership and extended research in smart education, where different platforms can play a huge role. This use of platform-based education can provide global access to quality educational resources. Further, the fully online learning community (FOLC) model by Blayone et al. (2017) demonstrates how platforms enable social and cognitive interaction, key components of successful learning.

Platform Leadership

Platform leadership, introduced by Gawer and Cusumano (2002), is a model that focuses on companies' positions as ecosystem leaders. For instance, Intel and Microsoft have established themselves as leaders by setting open standards, thus enabling other companies to innovate around their products. In agriculture, organizations like the FAO (Food and Agriculture Organization) use digital platforms for information flow among agricultural communities globally (Raghunath et al., 2024).

Platform Theory in Agricultural Communication

Digital platforms have revolutionized communication by making interactions easier. They have been found useful in normal day to day communications to the communications during emergencies (Lawson et al., 2024). Social media platforms, such as Facebook, Twitter, and Instagram, serve as intermediaries between content creators and consumers. While discussions have been ongoing regarding platform accountability, transparency, and the defense of user rights in digital environments, the platforms continue to impact social interactions and news distribution. Agricultural sector is surrounded by several issues (Thapa et al., 2024), where platforms can be used in several ways. Mostly, research shows that they serve as vital tools for bridging information gaps and supporting smallholder farmers in different ways (Shakhovskoy et al., 2021). Hence, in the cases where extension service gaps are huge (Baral et al., 2021), use of appropriate platforms is crucial. Information and Communication Technologies (ICTs) are highly used platforms in agricultural communication (Pun et al., 2022). ICT platforms enable farmers to access weather forecasts, market prices, and crop management tips, often in real-time (Chhachhar & Hassan, 2013). Platforms like iShamba in Kenya and RML AgTech in India exemplify how platform theory is applied in agricultural settings, where modularity and scalability allow these platforms to reach remote rural populations effectively (Baumüller, 2018). We consider the examples of a currently used (social media) and a potentially useful

platform (artificial intelligence) to further clarify the potential of platform theory application in agricultural communication.

Example Platform in Agricultural Communication: Social Media

Social media platforms have gained high popularity in recent years (Timilsina & Adhikari, 2022). In agricultural communication, social media platforms can facilitate the networking of agricultural stakeholders (Hawley et al., 2018). These platforms are already used as extension platforms by several organizations providing the extension service (Shanmuka et al., 2022). However, it carries the potentiality to work in a more integrated way involving other agricultural stakeholders than agricultural extension workers and the farmers, such as funding agencies, input suppliers, policy makers, and researchers. The social media, in this case, provides the dynamic platform which can be used by the users to serve their respective purposes. In addition, social media can be used in combination with other platforms in a system approach to incorporate broader audience and enhance communication effectiveness.

Example Potential Platform in Agricultural Communication: Artificial Intelligence Assisted Platforms

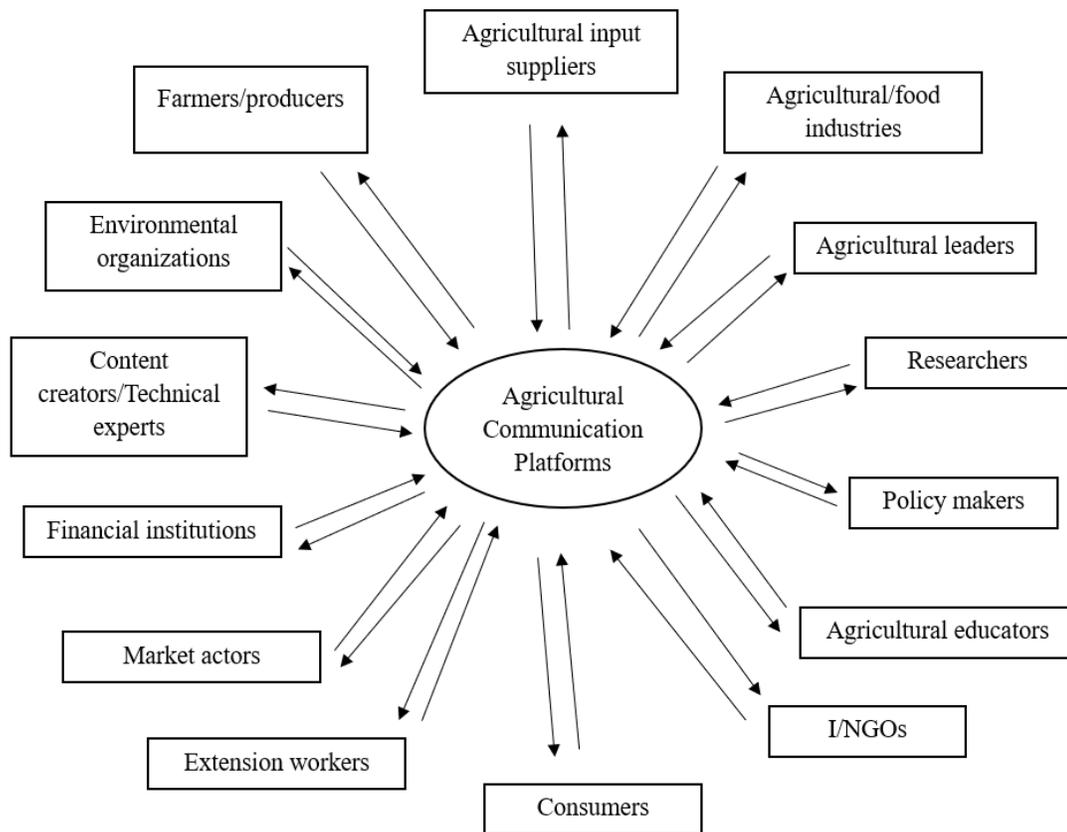
An example of emerging technology, not yet used extensively by agricultural communication, is the artificial intelligence (AI). AI has revolutionized the way communication is done traditionally, both in the personal as well as organizational level (Sundar & Lee, 2022). Organizations have started robotic call receiver, chatbots (Jiang et al., 2022), robotic program presenter (Abdelaziem, 2023), etc. to communicate information. Agricultural communication is still to experience the full potential of such AI tools. The AI tools can act as the platform in industrial communication in agriculture. The agricultural industries and organizations can leverage these technologies to facilitate the interaction among users and promote the networking with advanced AI features.

Proposing a Platform Theory-Based Conceptual Framework for Agricultural Communication

Based on the platform theory, we propose a framework for agricultural communication incorporating agricultural stakeholders and the interaction platform(s) (see Figure 1). However, in addition to these two components, we describe a latent factor in the model “The Control.”

Figure 1

Platform Theory Based Model for Agricultural Communication



The Platform

A platform is broadly defined as the space allowing interactions of the agricultural stakeholders. It should be noted that the platform can be a single platform (e.g., a farm journal), or a combination of multiple platforms (e.g., combination of social media, farm journals, and agricultural television). While digital platforms are major platforms in current communication scenario, we do not limit the platforms to just the modern ones. Traditional platforms (e.g., printed media) can also be the part of the system, which is relevant especially for rural communities which often face technological barriers, such as limited internet

connectivity and digital literacy. Platforms have operation and regulation mechanisms, which we assume to cover under “agricultural communication platforms” in the figure. However, we have described the mechanism below under sub-section “The Control.”

The Stakeholders

We identified several stakeholders of agriculture and kept them in the periphery of agricultural communication platforms as shown in the figure 1. In the figure, each stakeholder is accompanied by two arrows, one of which is pointing toward the platforms, and the other pointing toward the stakeholders themselves. Hence, with the help of the framework, we intend to suggest that stakeholders can do one-way, two-way as well as multiway interactions as per their needs with the help of the platforms. It is noteworthy that other stakeholders than the mentioned, if needed, can be added while using this framework. While each stakeholder can exchange the information in the platform freely, there still exists a regulation mechanism that prevent the stakeholders perform any unethical interactions.

Each stakeholder has its own features which can be explored by the future research to study the dynamic behavior in relation to platform characteristics. By suggesting a multi-stakeholder relationship with several platforms into play, this framework helps to capture a more dynamic view of agricultural communication allowing to provide an in-depth understanding needed for solving communication related issues in agriculture.

The Control

As stated earlier, one component we have not necessarily presented in the figure is the control mechanism of the system. The control or regulation is done in two levels: platform owners, and agricultural communicators. First regulator, the platform owner has the regulating mechanism for the overall communication. For instance, Meta controls what can and cannot be done in the Facebook platform. It imposes the regulations such as age restrictions, group norms, violent content norms, and admin system to allow or reject the posts. Second, the agricultural communicators intervene in the system to enhance smooth interaction on the platform making sure that they comply with both the platform owners’ rules and agricultural organizations’ objectives.

Conclusions

Platform theory has a potential of applicability in agricultural communication (research) to understand dynamic interplay of entities involved in communication. We propose a dynamic framework which has advantages over the traditional linear theories that only explore the unidimensional relationships. We argue that this platform theory-based framework in agricultural communication can

be a novel way to offer a unique solution to critical communication challenges in this field. Agricultural stakeholders such as farmers, researchers, and extension workers can benefit themselves by using the platform for seeking any information or support they need. It is the responsibility of the platform regulators to ensure security and reliability of the platforms. As the platforms are open to everyone, it is possible to create 'win-all' situation for stakeholder communication using this approach, emphasizing network effects and multi-sided communication. For instance, by creating a centralized digital infrastructure with unlimited communication opportunities among stakeholders, platform theory can enable farmers to connect with markets, access real-time data, and share knowledge across a broad network of stakeholders. Such a platform can enhance communication between farmers and consumers, providing transparency and traceability in the supply chain. It can also serve as a knowledge-sharing hub where farmers can exchange best practices, troubleshoot issues, and receive expert guidance. Moreover, the adaptability and scalability of platform-based models can facilitate the creation of resilient communication networks based on the contexts, and responsive to the agricultural community's evolving needs. Finally, future studies can apply this framework to study the complexity of how agricultural communication platforms (e.g., technology, media) operate.

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