

A Conceptual Framework for Digital Platform: A Soft System Methodology Approach

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Abstract In the dynamic landscape of digital technologies, the need for effective frameworks to guide the development and operation of digital platforms is paramount. The purpose of this study is to provide a holistic and systematic method to address complex, ill-structured problems, making it particularly suitable for the nuanced challenges posed by digital platforms. The Soft System Methodology (SSM) was developed for this study, which deals with the challenges and critical factors for Digital Platforms. The conceptual framework presented in this paper synthesizes key elements from SSM, adapting them to the specific requirements and intricacies of digital platforms. The proposed framework emphasizes the importance of a systems thinking perspective in designing and managing digital platforms, considering both the technical and social dimensions. It provides a structured approach for stakeholders to analyze, model, and optimize digital platform processes, fostering adaptability and sustainability in an ever-evolving technological landscape.

Keywords: Digital platforms, Soft System Methodology, Conceptual framework, Systems thinking, Technology, Systems analysis

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10.1 Introduction

Research on the adoption of digital platform has been conducted in both developed and developing nations worldwide (Chen et al., 2020). The trends of digitalization and shifting of market places online is global, but due to infrastructure and trust deficits in the virtual world, platforms are not yet able to replace the physical market spaces completely (Kenney and Zysman, 2016; Gupta and Tiwari, 2023). Digital platforms systems are designed for convenience and allow users to connect from far away places and get the best of the goods and services remotely with just a click of their devices (Schubler, 2018). Risk issues with internet based platforms are increasing day by day and there are certain gaps which hinder the user to switch to online modes.

Platforms such as malls which link consumers & merchants and newspapers which connect subscribers & advertisers have existed for years. But the latest information technology has remarkably reduced the need to own any physical infrastructure and assets (Dai and Nu, 2020). IT has made building and scaling up platforms very cheap and simple, while allowing for smooth participation that strengthened network effects, and enhanced the ability to capture, analyze, and exchange large amounts of data that increases the platform's value to all the stakeholders (Parker and Alstynne 2016; Parkar et al., 2016). A platform is a business that enables value-creating interactions between external producers and consumers. It provides an open, participative infrastructure for such interactions while setting governance conditions for them. Its purpose is to complete matches among its users to facilitate the exchange of goods, services, or some social currency, thus enabling meaningful value exchanges between all participants (Jora R, 2022). In today's rapidly changing technological landscape, digital platforms emerged as a powerful force in shaping the way people interact, communicate, and conduct business (Berman and Willems 2020; Chen and Dubois 2019). A digital platform is a software-based infrastructure that enables multiple users to interact with each other, usually for a specific purpose or activity. These platforms are designed to facilitate communication, transactions, and collaborations between users, and they have become an essential part of modern life. From social media and e-commerce to on-demand services and cloud computing, digital platforms

have transformed the way we live, work, and play. They have created new business models and revenue streams, enabled unprecedented access to information, and transformed the way we connect and collaborate with others. As the digital landscape continues to grow, the importance of digital platforms is only expected to grow, as they become more deeply integrated into our daily lives and the global economy.

To sum up we can define Platforms as: “A platform is a business based on enabling value-creating interactions between external producers and consumers. The platform provides an open, participative infrastructure for these interactions and sets governance conditions for them. The platform’s overarching purpose: to consummate matches among users and facilitate the exchange of goods, services, or social currency, thereby enabling value creation for all participants.”

As these platforms continue to evolve, the need for robust frameworks and methodologies becomes crucial to guide their development and ensure their seamless integration into diverse environments. Despite the multiple research on digital platforms, certain gaps persist. These gaps may include the need for a unified conceptual framework that incorporates both technical and social dimensions, and a comprehensive understanding of the systemic interactions within digital ecosystems. Identifying and addressing these gaps is crucial for advancing our understanding and facilitating more effective strategies for digital platform development and management (Mittal et al., 2023). Hence, this study endeavours to address the complexities of digital platforms. The research objective encompass the development of a holistic conceptual framework and the application of Soft System Methodology to enhance our understanding of digital ecosystems. The research objective of this study are as follows:

RO-1: To understand the issues faced by various stakeholders in functioning of digital platforms.

RO-2: To develop a conceptual framework for the management of digital platform issues through the mapping of identified issues with their possible solutions.

These objectives guide the research towards providing actionable insights for stakeholders in the digital platform domain. The contribution of this research lies in its synthesis of Soft System Methodology principles into a conceptual framework tailored for digital platforms. By bridg-

ing the gap between technology and social dynamics, the study aims to offer a practical guide for stakeholders involved in the design, implementation, and management of digital platforms. (Asif M, et al., 2023; Tiwari, et al., 2021). This contribution aligns with the broader goal of fostering adaptability and sustainability in an ever-evolving technological landscape.

10.2 Literature Review

Since the 1990s, digital-driven technologies have accelerated the evolution of global business organisations, creating a new type of business organisation called the "platform economy." The platform economy model is the most notable economic model of the twenty-first century, may be characterised as a combination of economic and social activities generated by a transaction platform to link suppliers and consumers to enhance sales and profits (Xu and Lee, 2020). The pipeline business model, which was based on the idea of producing and selling more to build value, has been replaced by digital platforms, which are proving to be game changers (Parker et al., 2016). Industry borders and the nature of rivalry are being redrawn by digital platforms. Digital platforms have become a crucial part of modern business models, enabling firms to create new markets, generate revenue streams, and increase their customer base.

In the last ten years, there have been several studies conducted on the platform economy, most of these focused solutions towards implementation. However, the success of digital platforms is dependent on various factors, which are critical to their success. One of the most important is network effects, which refers to the value that a platform creates by connecting users and increasing the number of participants. According to Boudreau and Lakhani (2015), network effects drive user adoption, which can lead to increased value creation for all users. Furthermore, the ability to scale is another critical factor that can impact the success of digital platforms. Scaling involves increasing the platform's user base and capabilities to meet growing demand, while ensuring that quality is maintained (Chen and Dubois, 2019). Providing a seamless user experience is also critical, as it can improve user engagement and retention (Berman and Willems, 2020). Additionally, offering unique value propositions, building trust among users, and having a solid monetization strategy are other essential factors that can impact the

success of digital platforms. There are relatively fewer research that examine the dyadic interaction when it comes to digital platforms in business-to-business transactions; instead, most studies either concentrate on the client or service provider sides (Jiang et al., 2019).

Many organizations do not know the ideal B2B digital market (2011). Also, future study should examine platform service provider tactics and their effects on stakeholders and their response mechanisms. Consequently, there is a need to study the critical factors that lead to effective adoption of digital platforms (Chong et al., 2016; Johnson, 2013) and the performance of B2B digital platforms, which are prominent in businesses worldwide yet understudied. While the literature provides a rich understanding of digital platforms, certain gaps persist. There is a need for research that synthesizes existing knowledge into practical frameworks applicable to diverse contexts. By building upon prior studies, this research aims to contribute fresh perspectives and refine existing theories. Hence, this study includes the need for a unified conceptual framework that incorporates both technical and social dimensions, and a comprehensive understanding of the systemic interactions within digital ecosystems. The research involves formulating a comprehensive conceptual framework and employing Soft System Methodology to enrich our comprehension of digital ecosystems.

10.3 Research Methodology

10.3.1 Soft System Methodology

Soft System Methodology (SSM) is a qualitative approach used to tackle complex, ill-structured problems (shown in Figure 1). SSM involves a process of inquiry, which includes identifying the problem, defining relevant system components, and exploring potential solutions (Checkland, 1999; Checkland 2006). SSM is particularly useful in situations where the problem is not well-defined, and there is a need for stakeholder involvement to explore alternative solutions (Hanseth and Lyytinen, 2010). According to Hu and Wilson (2017), SSM can be used to analyse the critical success factors of digital platforms by providing a holistic view of the system and its environment. The basic approach of SSM can be summarized as a seven-step method-

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ology that utilizes the principle of human interaction to illustrate the situation of interaction (Checkland, 1981). Steps of the Soft System Methodology (SSM) are defined in Figure 1 and explains as below:

- Identification of problem situation: The approach to SSM starts from identification of real-world situation where it is difficult for certain stakeholders, now this problem is defined in such an unclear and non - structured condition that results in a symptom map.
- Problem situation expressed: By observing the symptoms map, classify the problem scenario and find the actual underlying issues and the root cause of a problem that leads to a rich picture of the situation.
- Root definitions of relevant purposeful activity system: Firstly, from the rich picture, the problem is described, and then establish a root-definition for process transformation which will address the related issues.
- Development of conceptual models: A theoretical representation is reflected by a conceptual model for the future system. This conceptual model recommends the formation of a particular definition that is referred to as the root definition, and the layout should be targeted to the components of the CATWOE model (Checkland and Scholes, 1999), which are as follows: clients (customers), actors (participants), transformation process, world view, owner, and constraint on the environment.
- Comparison of model and real-world: Here, the conceptual model is compared with the identified problems.
- Identify desired changes and alternative solutions: to achieve solutions, changes are theoretically optimal and culturally viable.
- Approach to solve the situation of the problem: Implementing a final model that can be introduced.

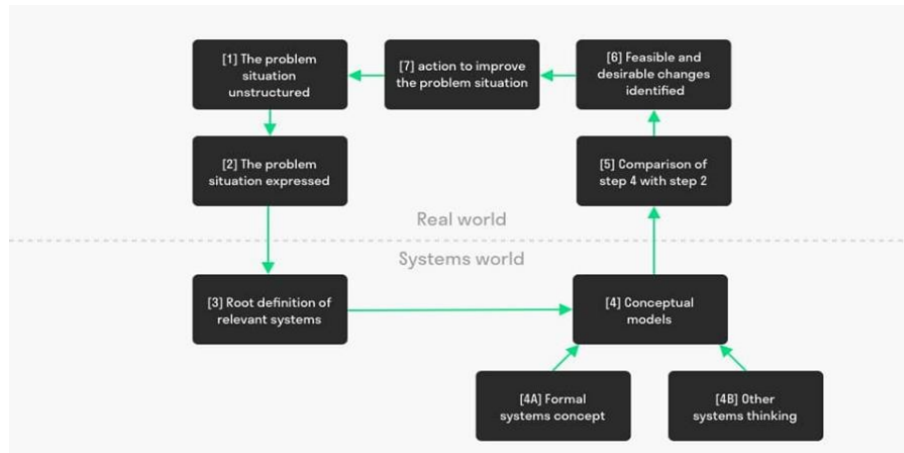


Figure 10.1: Seven Stages of SSM

10.4 Discussion and Analysis

10.4.1 Application of Soft System Methodology

To understand the functioning of Digital Platforms, Soft System Methodology Analysis was done. Various stakeholders were labelled as different Group Levels as follows:

1. Platform Development and Launch: This is the stage where the idea is conceptualized and analysed for market suitability. Here market condition is also important, whether it is a niche market or already matured market. It is important to give right input to the development and launch team, so that the product does not fail during the launch fail. Also, the developing team is also responsible for continuous improvement, so they are one of the major stakeholders.
2. Service Provider Platform User (SPPU): This is a customer for the Platform company but a Service Provider essentially for the customers who visit the platform to buy or access the service. They are usually called “Seller”.
3. Platform Service Provider Firm: The main job of these is to provide a Digital market

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space with safety checks and payment facilities. It is the platform's role to see that both the "Buyer" and "Seller" parties are satisfied with the service and enough trust is maintained between them.

4. Service User Platform User (SUPU): They access the platform to use the service or buy goods. They are the ultimate key player in determining whether the platform is a success or not. Most of the features.
5. Security/ Quality control: Most of the firms outsource this operation. Some firms have an inhouse team for security and quality control operations. They handle mostly the back-end operations.
6. After sales/ Customer care: These act as a bridge between the customer and the back-end operations team. Any complaint either from SPPU or SUPU are handled by this team. They are essentially on the front-end dealing with both the buyers and the sellers.
7. Regulatory Authority: These are essentially the government agencies looking after the trade practices of the Platforms. For example, Competition Commission of India (CCI) checks that fair trade is being practiced. Together they all work in sync with each other for the smooth functioning of the Digital Platforms and all have their importance and challenges. We will see those challenges in the study and try to find out the root cause behind the problem.

Symptom Map, which is a visual representation of the problem situation and the symptoms associated with it. The Symptom Map helps to identify the underlying causes of the problem and the stakeholders involved in the procurement process. The Symptom map (Figure 10.2) represents all the stakeholders, and the bubbles show the major challenges associated with each stakeholder.

These problems are preliminarily defined here which will be further elaborated in the Rich Picture. Symptom map is a preliminary representation of problems, they are unstructured at this stage, which will be further refined in the rich picture stage.

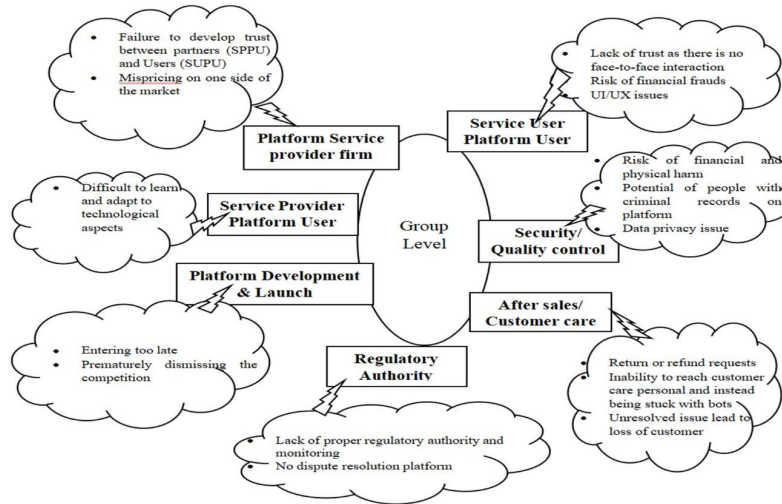


Figure 10.2: Symptom map for Digital Platforms

The Rich picture (Figure 10.3) is a schematic representation of the challenges between the functioning of each stakeholder. As we can see that there is a trust deficit between the SPPU and SUPU and the risk of financial frauds comes between SUPU and security/quality control team.

After defining the challenges for each stakeholder in the Rich picture the root problem is defined, and Alternate Root definition is formulated (as shown in Figure 10.4). The main problem identified is that there is dearth of trust between the partners i.e., the service provider and service user and the platform provider. The alternative to this problem is that is difficult to check fraudulent elements on online digital platforms as there is no face-to-face interaction. Also, another problem is of the fluctuating demand and the lack of flexibility provided to SPPU and SUPU for operations and control. This involves identifying the assumptions, values and beliefs of the stakeholders and considering alternative perspectives on the problem. On the bases of Root problem definition, Conceptual model (Figure 10.5) is defined. It is a hypothesis to recommend boarder solutions to the key problems identified. After conceptualizing the key issues and a broader solution to address thos problems, the Final Implementation Model (Figure 10.6) is made. This represents the final recommendations to improve the gaps in the smooth

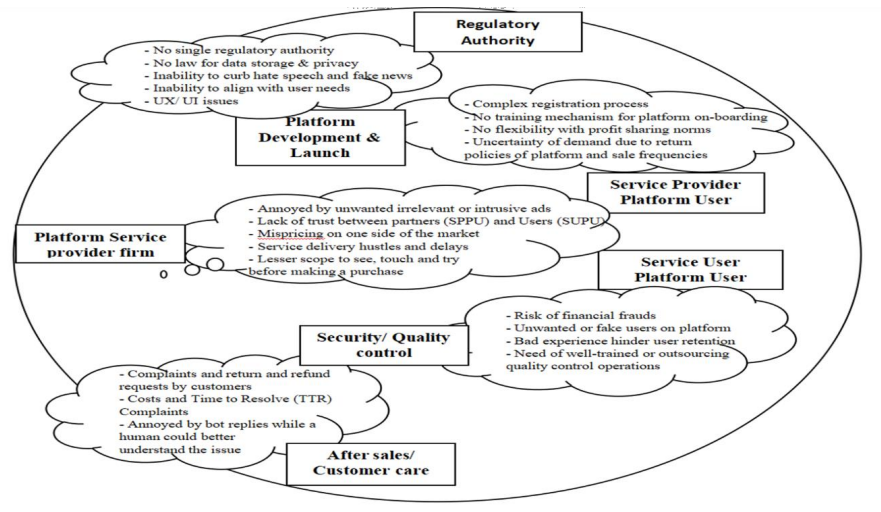


Figure 10.3: Rich Picture

functioning of Digital Platforms.

The recommendations are made on three lines- First is to ensure flexibility in the system by going the user choice and flexibility for profit sharing and other operations and pricing policies. Second is on the lines on improving the control and security of the platform. This is crucial for building trust amongst the partners SPPU and SUPU. Another recommendation is to ensure better communication, transparency, and accountability in the system. This is necessary to ensure accurate prediction of future demand and also there would be no mis- pricing on one side of the market. It will help in providing more positive user experience, increased innovation and greater efficiency.

10.5 Conclusion

In conclusion, this research has presented a conceptual framework for digital platforms, employing the Soft System Methodology (SSM) approach. The evolving nature of digital technologies necessitates adaptable frameworks, and the integration of SSM principles addresses the intricate challenges associated with digital platforms. The proposed conceptual framework

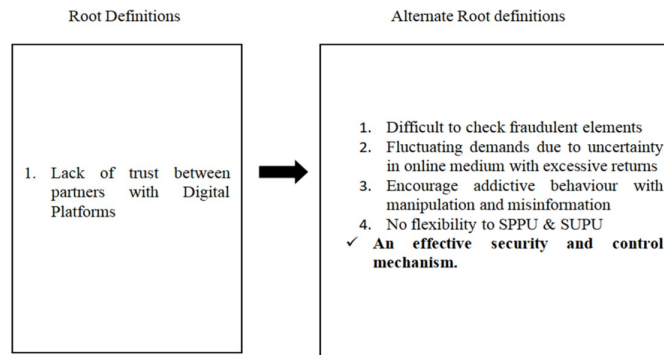


Figure 10.4: Root definitions

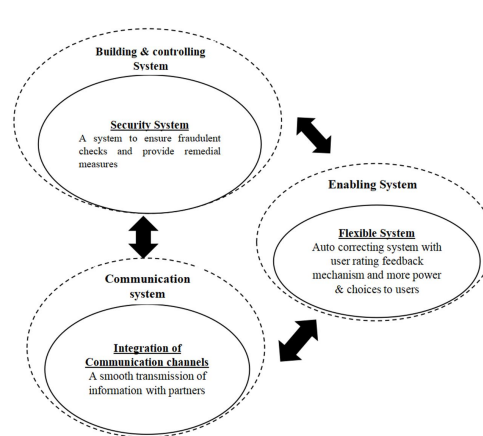


Figure 10.5: Conceptual Model

underscores the significance of a holistic perspective, emphasizing the interconnectedness of technological components, user dynamics, and organizational contexts. By adopting a systems thinking approach, the framework offers a structured methodology for stakeholders to analyze, model, and optimize digital platform processes. Through a thorough review of existing literature and case studies, we have demonstrated the applicability and effectiveness of the proposed framework. The synthesis of SSM principles into the framework not only enhances our understanding of digital ecosystems but also provides a practical guide for stakeholders in the design and management of digital platforms.

As digital landscapes continue to evolve, the presented framework stands as a valuable con-

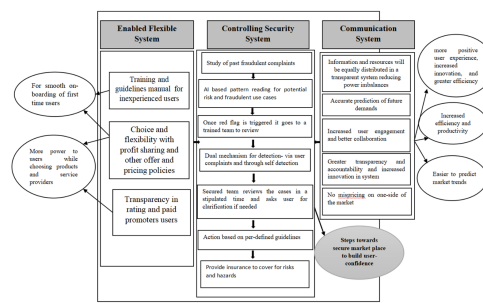


Figure 10.6: Final Implementation Model

tribution to both academic research and industry practice. Its emphasis on adaptability and sustainability ensures its relevance in navigating the complexities of technological advancements. Moving forward, this conceptual framework serves as a foundation for further research and practical applications in the dynamic realm of digital platforms. In essence, the integration of Soft System Methodology into the conceptual framework provides a robust and systematic approach, fostering a deeper understanding of the intricacies involved in the development and operation of digital platforms.

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