

Disruptive Innovation in Digital Platform Markets: A Review of the Literature

Youbo Li*

The University of Melbourne, Melbourne, Australia

**Corresponding author: Youbo Li.*

Abstract

Digital platforms are now important competitors in retail, transport, accommodation and media. They connect different user groups and can grow quickly because data and user participation improve the service. For this reason, successful platforms are often called disruptive, even when they do not match the original theory of disruptive innovation. This paper reviews how the theory can be used more carefully in digital platform markets. It first explains low-end disruption, new-market disruption, sustaining innovation and the response of incumbent firms. It then discusses three mechanisms: entering through overlooked consumer groups, changing the business model, and using network effects and digital technology to expand. Pinduoduo is used throughout the review as a practical example. Its early focus on price-sensitive consumers, social group buying and links between consumers and merchants suggests a possible low-end disruptive path. Even so, Pinduoduo should not automatically be described as a complete disruption because its users were not all new consumers, existing platforms could respond, and some low prices depended on promotions. The paper argues that disruption theory is most useful for studying market entry and movement towards the mainstream, while platform theory is needed to explain rapid scaling, network effects and ecosystem management.

Keywords

disruptive innovation, digital platforms, Pinduoduo, business-model innovation, network effects

1. Introduction

Digital platforms have now become an integral part of everyday economic activities. Streaming media services, social media, accommodation platforms and transportation apps not only offer their own services, but also connect different groups and organize their interactions and exchanges. De Reuver, Sørensen and Basole describe platforms as sociotechnical systems in which technology, markets and institutions develop together [1]. Gawer adds that a platform can be understood both as a multi-sided market and as a modular technological structure [2]. Overall, these viewpoints help explain why the platform is able to reduce search costs, coordinate a large number of users, and change the way the industry operates.

The word disruptive is often used when one of these platforms grows quickly or causes difficulties for an established company. That use is understandable, but it is too broad. A company can be innovative, popular

and highly competitive without following a disruptive path. Christensen, Raynor and McDonald argue that disruption normally begins in a low-end or new-market foothold rather than in the center of the mainstream market [3]. This distinction is particularly important for digital platforms, as network effects can make the subsequent growth appear abrupt. Focusing solely on the platform's ultimate success may obscure its initial entry into the market.

Therefore, this review raises a rather specific question: In the process of disruptive transformation, how do market entry, platform business models, network effects and digital technologies interact with each other? The article firstly introduces the core ideas of the theory of disruptive innovation, then analyzes three mechanisms, and uses PDD as an example to discuss them at different stages, rather than treating it as an independent proof. Finally, it discusses the aspects well explained by the classic theory, the contents not covered in the digital market, and the weak links still existing in the existing research.

2. Theoretical Framework: Disruptive Innovation Theory

Disruptive innovation describes a process, not just a successful invention. In the classic theory, existing enterprises continuously improve their products for the most demanding and highest-profit customers. These improvements may eventually exceed the actual needs of customers with lower demands. At this point, new entrants can find space in the low-end market and offer cheaper and simpler products. The second path is market disruption by new entrants, where new entrants provide products to people who originally couldn't afford or use the product. The initial product may seem insufficiently powerful for mainstream customers, but over time, it may continuously improve and move up the market chain [3]. Only when this development begins to challenge existing enterprises does it truly have the meaning of disruption.

This process is different from sustaining innovation. Sustaining innovation can enhance the existing mainstream features that are already recognized by customers, regardless of whether the changes are minor or technologically advanced. However, disruptive products may initially perform poorly in familiar metrics but still attract customers because they are cheaper, easier to use, or more accessible. Technical aspects alone cannot solve this problem. More useful evidence involves the first customers of new entrants, their initial value proposition, business model, and future development direction [3]. Christensen and his co-authors pointed out that this theory has gradually expanded, but they also acknowledged that researchers do not always consistently verify its core claims [4].

There is considerable disagreement among people regarding the reliability of this theory. King and Baatartogtokh reviewed some cases that were widely regarded as destructive, only to find that many of them did not fully meet the core conditions [5]. Si and Chen also pointed out that there are inconsistencies in the definitions in the relevant literature [6]. These findings do not mean that the theory should be abandoned. They indicate that it is risky to label an enterprise only after it has achieved success. In this review, the theory is used as a set of questions to examine: who received the service first, what was provided, why existing enterprises responded in that way, and whether the later entrants entered the mainstream field.

The responses of existing enterprises are also one of the explanatory factors. An established company may notice a small platform but still decide not to replicate it. The new market may seem uncertain, have lower profit margins, and the services it offers may conflict with the brand or capabilities of the existing enterprises. From this perspective, ignoring new entrants does not necessarily mean negligence; in business terms, this approach may seem reasonable. However, digital incumbent enterprises in the digital field may react more quickly than those in previous disruptive studies because software features, discounts, and platform characteristics can sometimes be imitated rapidly. Therefore, whether disruption continues depends on the progress of new entrants and the ability of existing enterprises to adjust their business models.

Digital platforms make this analysis even more complex because value does not solely come from a single product; it also depends on the behaviors of consumers, sellers, and other supporting parties. The platforms have established participation rules, coordinated the ecosystem, and provided the technical core on which other services can develop [2]. Nambisan et al. believe that digital innovations are distributed among numerous participants, and their boundaries are not as clear as those of traditional product innovations [7]. Therefore, two theoretical perspectives need to be adopted: using the disruption theory to examine the entry path, and using platform research to understand how the platform expands and organizes value after entry.

3. Disruptive Innovation Mechanisms in Digital Platforms

3.1 Overlooked Consumers and Market Entry

The closest connection between a platform and disruption still lies in the initial idea of establishing a foothold. Platforms can reduce search costs, bring together small suppliers and make participation easier, which may be valuable for users who have received poor service in the past. However, the mere reduction in price has little effect. New entrants should first target neglected groups or non-consumers and provide them with a different value, and then continuously improve to cover a wider market. Without this process, competition may merely be a price war rather than a true disruption.

PDD is a useful case because its early market position can be compared with these conditions. When PDD entered the Chinese market in 2015, large and mature e-commerce platforms had already dominated the mainstream market. PDD focused more on price-sensitive consumers, including many users from lower-tier cities and rural areas, and combined low-priced goods with group buying. Liu and Si interpreted its transformation from this non-mainstream position to a broader consumer group as disruptive [8]. The company's early public reports also described it as a socialized and highly interactive shopping platform that provides value-for-money products and connects consumers with merchants [9]. These characteristics are closer to the low-end market positioning, although it is not yet fully certain about its classification.

However, PDD should not automatically be regarded as a complete example of disruptive innovation. Consumers in lower-tier cities may not be newcomers to e-commerce, and Alibaba or JD.com are not technologically incapable of providing services to them. Some of PDD's low prices are related to promotions and subsidies. This might help enterprises enter the market, but it does not prove that such business has a lasting cost advantage. The most reasonable conclusion is that PDD exhibits some typical characteristics of low-end disruptive enterprises. Calling it a perfect example goes beyond the current available evidence.

3.2 Platform Business-Model Innovation

The business model of the platform explains how it creates and acquires value through interaction, rather than relying on the traditional linear value chain. Multi-sided platforms bring multiple participants together, and the participation of each party is mutually beneficial. Governance rules, pricing, and access conditions affect the quality and quantity of transactions. Rochet and Tirole pointed out that analyzing platform pricing from the perspective of a single customer group alone is unable to understand its operating mechanism, because the demands of both parties will influence each other [10]. Therefore, digital platforms may provide subsidies to one party, charge the other party through commissions or advertisements, and utilize the scale effect to reduce the average cost of matching participants.

Business model innovation can bring about disruptive changes by offering products that are simpler, cheaper, or more accessible than existing alternatives. The group-buying model of PDD exemplifies this mechanism. Consumers can invite friends to form purchasing groups, thereby obtaining lower prices; their social behavior simultaneously creates demand and reduces customer acquisition costs. Merchants can obtain aggregated market demand, while PDD coordinates the transaction process without owning most of the goods. Liu and Si describe this combination as an added value process and a promoting network [8]. This model does not simply digitize existing stores; instead, it reorganizes customer acquisition, pricing, and interaction methods around social participation.

This mechanism has also changed the way performance is evaluated. Traditional retailers might measure performance by store productivity, inventory turnover rate, and direct customer relationships. However, platforms need to balance the participation levels among various market participants, maintain trust, and prevent low quality from undermining the entire network. Therefore, only when governance and matching mechanisms provide sufficient value to consumers and merchants can the low-price market foothold be sustained. Business model innovation is precisely the connection between the initial market opportunity and the ability to expand operations to meet that opportunity.

This situation also applies to other platform-based enterprises, but the comparison also reveals the limitations of the loose use of terminology. Airbnb helps ordinary homeowners provide available accommodation, enabling some consumers to access a different form of accommodation, which can be

interpreted as the creation of a new market. However, Uber, targeting the existing taxi market, offers a service that is usually more convenient for mainstream users. Therefore, Christensen et al. believe that Uber should not be classified as a typical disruptive enterprise [3]. This contrast indicates that the platform-based enterprise model, even without being disruptive, may still possess innovation and competitiveness. Only when the differences in business models are combined with an appropriate foothold and an upward market trend can a disruptive process be supported.

3.3 Network Effects and Digital Technology

The network effect describes that as the participation increases, the value that users may obtain also rises. In the market, more consumers will attract more merchants, and a wider range of merchant choices will in turn attract more consumers. The data generated by these interactions can enhance search, recommendation, fraud detection, and demand prediction capabilities. As a result, the platform can reduce matching costs and optimize user experience, thereby forming a positive cycle of participation, data, and service improvement. Hein et al. emphasize that in the digital platform ecosystem, value creation depends on platform ownership, the autonomy of complementary parties, and the mechanism for coordinating participants [11].

For PDD, social sharing helps attract consumers. The large consumer base then attracts businesses, and the resulting activity level supports personalized recommendations and more efficient matching. Therefore, digital technology enhances the platform's ability to expand its initial value proposition. The reason this mechanism is important is that most traditional disruptive innovations come from industries where product performance improvements are relatively slow. However, digital platforms can move from the initial stage to mainstream visibility more quickly because software is replicable and user interaction generates feedback effects.

However, network effects should not be confused with disruption itself. They explain the accelerated development and defensive capabilities after entry, rather than explaining why new entrants are regarded as disruptive. A platform may have been designed to target mainstream or high-end customers from the beginning, while also having strong network effects. Network effects may also lead to concentration, lock-in, and dependence among businesses, rather than bringing sustained benefits to all participants. Research on platform governance has found that as platforms gain dominance, sponsors may become more selective, and the distribution of value among complementary parties may also become unbalanced [12]. Therefore, digital technology is a complement to the disruption framework, but it cannot replace the need for an examination of the initial market position and the evolution of value propositions.

4. Key Finding

In the relevant literature, a common evolutionary sequence can be observed, although not all platforms follow this pattern. Firstly, the platform seeks out overlooked customers or opens up access for new users; secondly, its platform model integrates the scattered supply and demand relationships in a cheaper, simpler, or more convenient way; finally, network effects, software, and data drive the continuous improvement and expansion of the service. The first stage is precisely the key that makes this case have disruptive potential, while the subsequent stages explain why this early advantage may become important rather than remaining confined to a niche market.

PDD generally conforms to this sequence, but only partially does so. Its initial appeal to price-sensitive consumers seemed to be a low-end entry point. Group buying and social sharing helped to gather demand, while the expanding network of consumers and merchants supported the platform's expansion. However, there are still some important questions: many early users were already online shoppers, so the platform did not completely abandon them; moreover, the promotional pricing model may not be permanent. For these reasons, this article views PDD as a platform with disruptive characteristics, rather than an unquestionable example of disruption.

This mixed result explains why the classic disruption theory and the platform theory should be used together. The reason why Christensen's theory is useful is that it prompts the analysis to start from the perspective of customers and market position, rather than merely focusing on the later popularity. However, this theory pays less attention to multilateral pricing, platform governance, data feedback, and the extremely rapid expansion of software enterprises. Platform research is more directly related to these issues [1, 2]. In simple terms, the

disruption theory explains the direction of the competitive process, while the platform theory explains the numerous factors that drive and support this process.

5. Discussion

5.1 Limitations of Current Research

There are several limitations in the current literature that have affected this conclusion. Firstly, the term “disruption” is used too broadly. The success of digital ventures is often regarded as sufficient evidence, although the original theory requires more supporting evidence. Secondly, there is a hindsight phenomenon: successful platforms often receive the most attention, and their subsequent achievements may make the early strategies seem more planned than they actually were. Additionally, research on emerging market platforms such as PDD and other platforms is much less abundant than that for the major Western platforms. The brief PDD case report cited in this paper is relevant, but its length and evidence should only support rather than determine this argument [8]. Finally, many studies only examine a specific point in time, while the process of disruption is actually developed in multiple stages.

5.2 Future Research

Future research can benefit from more explicit case selection criteria and long-term tracking studies of the platform. PDD can be compared with other platforms such as Alibaba, JD, and other platforms in emerging economies. Such comparisons can help determine whether similar consumer and pricing strategies do indeed lead to similar competitive paths. Researchers should also distinguish between temporary subsidies and persistent business model advantages. Regulation and platform governance also merit more attention. A platform that initially acts as a challenger may eventually evolve into a powerful market gatekeeper. Therefore, future research should consider both how the platform expands the market and how the dominant platform may restrict the development opportunities of merchants or complementary parties.

6. Conclusion

Digital technology itself does not cause disruptive changes to platforms. The evidence reviewed in this article indicates that this process must start with an overlooked group or a newly created market. Different business models can reduce service costs or enhance their accessibility, while network effects, data and algorithms help drive their expansion. These subsequent mechanisms are indeed important, but none of them can independently verify the occurrence of a disruptive change.

PDD indicates that careful judgment is more useful than simple labeling. Its early focus on price-sensitive consumers, group buying, and the network between consumers and merchants provided reasonable support for the disruptive explanation. However, the uncertainty of non-consumption behaviors, the neglect of existing enterprises, and the existence of subsidized prices make it impossible to draw a clear conclusion. Overall, the classic disruption theory still helps in studying market entry and the transition to mainstream customer groups. The platform theory supplements the missing explanations in terms of interaction, scale expansion, and ecosystem power. Combining these two perspectives can more accurately illustrate how digital platforms challenge the existing market landscape.

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Conflicts of Interest

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