RE-IMAGINING THE DISRUPTIVE INNOVATION THEORY IN THE DIGITAL PLATFORMS ERA

Position paper

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Abstract

IFIP 8.6 is considering recent developments in the IS field and how they impact the adoption of ICT in organisations and society. This position paper questions the premises of the traditional disruptive innovation theory in light of the development and rise of the digital platforms phenomenon. It considers the case of Uber as an illustrative example to argue that its digital platform’s disruption takes a different trajectory that significantly challenges the traditionally assumed disruptive innovation theory. The paper then calls for the re-imagining of our current theorisation of disruptive innovation to take into consideration the unique characteristics of the digital platforms phenomenon.

Keywords: Disruptive Innovation Theory, Digital platform, digital innovation, Uber

1 Introduction

The disruptive innovation theory has been developed over two decades based on the original work of Christensen in 1997. Since Christensen’s 1997 publication of his book ‘Innovator's Dilemma’, the theory has gained significant attention in business and academia. The book describes the process through which new entrants to the market who acquire and utilise new technology could quickly achieve a dominant market position, potentially pushing incumbent firms out of their markets. The theory has evolved from a descriptive framework of technological developments and change to a more expansive causal theory of innovation and competitive response (C. Christensen, McDonald, Altman, & Palmer, 2017). According to the theory, disruptive innovation, whether involving disruptive technology, business models, or both, tends to provide different values from mainstream markets; either addressing the low-end of the market or a new market (C. Christensen, 1997; C. Christensen & Raynor, 2003). It offers products that are either of lower performance if measured on traditional performance attributes (Yu & Hang, 2010) or with new characteristics. Hence, disruptive innovation equips entrants to rapidly gain markets, replacing and pushing incumbent firms out of it. The reasons for customers switching to disruptive innovation have been identified as the affordable prices, new value proposition and the decreasing differences in performance dimensions (Adner, 2002).

Despite its popularity, the theory of disruptive innovation continues to be in need of elaboration and examination through different lenses (Yu & Hang, 2010). Indeed, “empirical management research on disruptive of innovation has simply not kept pace” with its popularity and extensive citation (C. Christensen et al., 2017). This paper argues that digital platform innovation challenges most of the assumptions of the original disruptive innovation theory and that it is in need of significant reformulation considering the unique characteristics of the digital platform phenomenon. As IFIP WG8.6 is formulating new directions for the working group that addresses emerging trends and contemporary
phenomenon, this paper invites the group to engage with the digital platforms phenomenon and elaborate on its disruptive nature.

2 Argument development

2.1 Assumptions of the Disruptive Innovation Theory

The foundation of the disruptive innovation theory was based on empirical research in the manufacturing sector. Research examined the hard disk drive industry (C. Christensen, 1997; C. M. Christensen, Suárez, & Utterback, 1998; King & Tucci, 2002), ink jet printing (C. M. Christensen, Johnson, & Rigby, 2002), American mills, the digital imaging industry (Lucas & Goh, 2009; Tripsas & Gavetti, 2000), and microprocessors (C. M. Christensen, Verlinden, & Westerman, 2002), among others. While the theory was later extended to address the service sector, its theoretical core has not changed from its manufacturing-based roots (C. M. Christensen, Bohmer, & Kenagy, 2000; Hwang & Christensen, 2008).

The theory is based on the view that: firstly, new technology surprises incumbents; secondly, incumbents are slow to take decisions to change their production lines, acquire fundamentally new technologies and change their industrial processes; and finally that new technology is adopted by entrants while incumbents struggle to cope, eventually failing to adopt it and consequently being pushed out of their markets. This theory portrays incumbents as stranded and stifled by their production lines, their existing technological and labour capability, and their need to attend to existing customers (C. Christensen, 1997; C. Christensen & Raynor, 2013; C. Christensen & Raynor, 2003). Even when it was extended to services and business models, the theory continued to assume that incumbents will lag behind the entrants and will struggle to cope with technological changes and new markets.

2.2 Digital Platforms

A digital platform represents a digital-based business model that enables interactions between two or more distinct sides of the market, mainly from the end-consumer market and the producer market (Hagiu & Wright, 2015). Each side is affiliated to the digital platform and it acts as an intermediary, taking control of the key terms of interaction (Parker & Van Alstyne, 2005). This platform-mediated network could be either open or closed. Open platforms encourage participation in their development, commercialisation, or use. Closed platforms are mediated by a single company that acts as platform-owner and mediates between two sides of the market without encouraging participation of complementary services, content, or designers. Linux is an example of an open platform whereas Uber is an example of a closed one (Eisenmann, Parker, & Van Alstyne, 2008). The business success of a digital platform is dependant on the sides of the market that it mediates. These could be multi-sided or two-sided. A multi-sided market involves many organisations, clusters and different types of users such as Apple, Amazon, and Google, while a two-sided market involves two types of users; end-consumers and producers, such as Uber. Digital platforms could be competing in a single-product market or several-products markets (Eisenmann, Parker, & Van Alstyne, 2010).

2.3 Statement of position

In this position paper, I argue that digital platform innovation challenges the assumptions and hence the explanation and usefulness of the traditional disruptive innovation theory. Drawing on the digital platform of Uber; the taxi hailing App, it is argued here that the agency of the disruptive force in digital platform innovation is more complex than industrial disruption. It involves not only the disruptive
entrant and disrupted incumbents but also the sides of the market that are mediated between by the digital platform. In this scenario, digital platforms’ customers play an active role in the trajectory of the disruption and are capable of further disrupting the initial disruptive entrant. In this sense, digital platform innovation provides an opportunity for distributed disruption as opposed to the single-force disruption envisaged by the theory. In this mode of distributed disruption, the entrant (disruptor) faces gradually stronger competition as well as serious setbacks and challenges from its sides of the market (end-customers and producers). Hence, the entrant could initially gain market; however, incumbents can technologically adapt and catch up faster. Instead of being pushed out of the market as in traditional disruption theory, incumbents will quickly adopt and adapt to the new digital platforms. Moreover, due to imitability and low barriers to the market, new entrants will adopt similar technology and business models to join the market, which will intensify the competition for the disruptor. This proposition challenges the assumption of the traditional disruptive innovation theory, particularly regarding the slow and rather passive decisions and movements of the incumbents and the dynamic state of competition.

Moreover, in digital platform innovation, the sides of the market (end-customers and producers) could play a key role in further disrupting the business of the entrant. As digital platform innovation attends to two or more sides of its market (drivers and riders in the case of Uber) that both act as customers for the entrant, both types of customers could disrupt the entrant, adding more pressure to the emerging intense competitions previously described.

In summary, the flexible and cheap technology that once allowed the entrant to disrupt also provides a low barrier to entry and fast imitable affordance that allows competitors (whether incumbents or new competitors) to disrupt the entrant. Digital platforms are also enabling customers to play a more dynamic and disruptive role that the traditional disruptive innovation theory has not considered.

The following section provides evidence and a brief discussion of the case of Uber.

### 3 Disruption in digital platforms: the case of Uber

#### 3.1 Uber: a two-sided digital platform

Uber is a transportation networking company (TNC) based in San Francisco. It provides an on-demand taxi service that connects passengers to local drivers in real time using smartphones, a mobile app, GPS navigation, e-payment systems and a pricing system. The company was founded in March 2009 by entrepreneurs Travis Kalanick and Garrett Camp and officially launched in June 2010. Since then, its operations have spread to over 250 cities around the world. Uber presents a case of mediating platform that connects customers and taxi drivers. The company’s services are provided through a free App that can be downloaded on any smartphone. It operates in collaboration with both Google maps and PayPal to provide customers with a cheap way to hail and pay for taxis from their mobile phones. The customer can access information such as the whereabouts of the nearest taxi, the name and rating of the driver, and also track the route of the journey while in the taxi. Customers pay for the service electronically. Uber applies surge-multiplying pricing where the service price increases if the demand for rides is higher than the taxi supply. So the price of the same journey flexibly increases based on demands.
3.2 Competitor disputes and fast adoption

Uber’s disruptive innovation was met with significant street protests, oppositions and legal actions by the taxi industry in many markets, including Europe, US, China, Brazil and Indonesia, among many others (Davies, 2016; Picy & Abboud, 2015). This strong opposition has led Uber to stop its UberPOP service that allows riders to hail non-professional drivers using their own cars after it was declared illegal and banned from many countries. For example, UberPOP was proclaimed illegal and the service was terminated in France, Italy, Spain, Germany, Denmark and China while appeals are pending in Belgium and the Netherlands. In China, massive street protests in different provinces including Hubei, Xi’an, Shanghai and Hong Kong were witnessed (Soo & Feng, 2015).

In addition to protests and legal bans, existing competitors also responded to the competition by developing their own apps, investing in similar services and facilitating better job conditions to attract Uber drivers. For example, in London, traditional taxi drivers have launched apps such as Hailo and Get Taxi while private taxis have launched apps such as Kabbee that offers similar services to Uber. In New York, the Taxi and Limousine Commission (TLC) changed its rules to allow cars no older than two years to become part of the city’s taxi fleet, reversing a nearly 20 year old TLC requirement that only new cars be added. These new rules encouraged Uber drivers to transform their black cars into traditional New York yellow taxis and operate as mainstream taxis. The TLC Commissioner said “If this pilot helps even a few drivers make a career decision that they otherwise wouldn’t have had the flexibility to make, then it will have been a success” (Harshbarger, 2015).

Encouraged by Uber’s success, new companies were established that imitated Uber’s platform and business model and hence started to compete with Uber in the mobile-based App taxi hailing market. Lyft, for example, was launched in 2012 in San Francisco to offer similar app-based services as Uber. Lyft is engaged in an active international alliances programme with other competitors of Uber, including India’s Ola, Singapore’s Grab and China’s Didi. This has formed what the press has called ‘anti-Uber alliance’ which is forecasted to increase Uber’s losses in international markets (Carson, 2016; Ramli, 2016). For example, two Chinese competitors of Uber called Didi Dache and Kuaidi Dache merged in February 2015 to establish a stronger competition against Uber under the name Didi Chuxing. Didi Chuxing has also since formed an international alliance with Lyft to provide services to customers that allow users of each App to hail rides from drivers of the other App when travelling to the other country, resulting in Didi investing $100 million in Lyft (Solomon, 2016b). Apple has also invested $1 billion in this new alliance which was announced in May 2016 (Clover & Thompson, 2016). This toughening of the competition in China has caused Uber to lose $1 billion a year (The Guardian, 2016). Travis Kalanick, Uber CEO, admitted in February 2016 that “We’re profitable in the USA, but we’re losing over $1bn a year in China. We have a fierce competitor that’s unprofitable in every city they exist in, but they’re buying up market share. I wish the world wasn’t that way. I prefer building rather than fundraising. But if I don’t participate in the fundraising bonanza, I’ll get squeezed out by others buying market share” (Narvey, 2016). In 2017, Uber has been pushed out of China but it still raised funds to buy 20% of the Lyft operation in China. Consequently, both competing companies are sitting on each other’s Boards forming a ‘coopetition’: a collaboration and competition approach between rivals (Yami, Castaldo, Dagnino, & Le Roy, 2010).

While Uber’s customer base is expanding very fast, its net operations are showing serious growth in its losses. According to a leaked confidential document issued by the company to potential investors as part of its financing effort, its losses in the first half of 2015 were nearly 50% more than its entire year’s losses in 2014 (Efrati, 2016). Overall, the data in these documents show that Uber’s business remains unprofitable. They reveal that Uber’s “GAAP losses (net revenue minus cost of revenue, operating expenses and other costs) totaled $671.4 million in 2014. Those losses expanded to $987.2 mil-
lion in the first half of 2015.” (Solomon, 2016a). Excluding its losses in China, , Uber’s loss was more than $2.8 billion in 2016 (Carson, 2017).

3.3 Drivers’ disruption

In the UK in October 2016, 21 Uber drivers won a court case that declares them employees of Uber (Employment Tribunals, 2016). This is a blow to Uber’s business model of considering drivers independent self-employed ‘partners’. While this type of ruling is made on a case-by-case basis and does not set precedent, if Uber is faced with more cases of this kind, it could be pushed to change its terms and conditions to consider drivers as employees and not self-employed individuals (Torrance, 2016). This could mean that in the future, Uber will be forced to pay them national living wage, holiday, sick pay, and pension contributions, while also being subject to employment law.

Drivers involved in this employment tribunal case have also established a representative group called United Private Hire Drivers (UPHD). When Uber’s licence faced renewal in May 2017, they organised a major go-slow protest through central London. Drivers argued that Uber’s long working hours and low pay were under the legal minimum wage, presented risk to public safety, and amounted to ‘slavery’. They sent a letter to the London Mayor stating that the Uber business model encouraged “abuses that would be more fitting of Victorian era London than a 21st-century global mega city …The fact that such abuses are carried out in a trade which is licensed and supervised by TfL [Transport for London] on behalf of all Londoners is nothing short of a public scandal. More than that, drivers working up to 90 hours a week on £5 per hour presents a significant public safety risk” (Booth, 2016). A few days before Transport for London’s decision regarding the renewal of the Uber licence, Uber UK announced an employment insurance scheme to protect its drivers where drivers pay £2 per week and the company pays the rest of the £8 per week cost. The scheme is operated by a third party company called IPSE that provides independent contractors, consultants and self-employed individuals across the UK with insurance protection (Maxwell, 2017).

Uber drivers’ protests concerning working conditions and a fair minimum wage have also taken place in other cities including Johannesburg, San Francisco, New York, Washington D.C. (Fiegerman, 2016), New Delhi, Bangalore, and Hong Kong, among others (Mint, 2017). In response to the legal challenges and market pressure in Hong Kong regarding safety and car insurance for passengers, Uber has also announced an insurance scheme for passengers operated by a third party called AIG (Yau, 2017).

3.4 End-Customers’ disruption

Customers have protested Uber’s surge pricing and its political involvement with the US administration, resulting in significant loss of its customer base. Amid protests of President Trump’s executive order that banned travel for Muslims, Uber’s announcement that they would turn off surge pricing for trips to New York’s JFK Airport angered New Yorkers. While the New York Taxi Workers Alliance announced a strike in solidarity with the protest, Uber’s announcement of normal operations and not applying its typical surge pricing was seen as capitalising on the protest. On 28 January 2017, a Twitter hash tag #deleteUber was created and by 3 February 2017, over 200,000 customers had deleted their Uber accounts (Shen, 2017). This pushed Uber to apologise for the incident and further distance itself from the US President when its CEO announced his withdrawal from Donald Trump’s business advisory council on 2 February 2017.

When London Underground went on strike in the UK on Monday 9 January 2017, Uber applied surge pricing where prices were between 3-5 times higher than usual. This attracted criticism of Uber’s
pricing model (Horton, 2017). Commuters expressed their anger at Uber’s pricing, describing it as greed and exploitation, and sharing on Twitter screenshots of the app showing surge pricing of 3-5 times higher (Godden, 2017; Horton, 2017). One commuter posted on Twitter “Usually costs me £8 to Uber it to work, today it would cost between £27-£35” while another posted “Tube strike and @Uber is 3.1x the normal rate yay #£90commute.”

In response to this fierce criticism, Uber has since changed its App to obscure the surge pricing feature so higher prices are calculated but the multiplication is not shown to passengers. As a result, passengers can only see an estimate of the total ride price.

4 Discussion and Conclusion

The paper argues that the concept of disruptive innovation as established by Christensen is in need of rethinking and reformulation to account for the digital phenomenon and in particular the digital platform phenomenon. It briefly presented the case of Uber to show that digital platform innovation could bring another perspective on the nature of digital disruption. In digital platform innovation, the disruptive force extends from the original entrants to the incumbent who can technologically catch up fast, to new competitors who enter the market, and also to the platform’s customers. These distributed disruptive forces slow down and interrupt the initial disruptor. This case study shows that Uber’s disruption of the market has in turn been significantly disrupted where it was forced out of markets forced to change its business model in markets, and forced to change the operation and features of its technology (App) in other markets. Digital platforms complemented by mobile technology and social media enable the sides of the market to enact digital forces that can significantly disrupt the platform operation and competitive position. In the case of Uber, these forces strained the company and forced it to change its business model. The business model that previously considered drivers as self-employed is changing to recognise them more as traditional employers, in some cases giving their drivers insurance rights. In other markets, riders have also gained insurance rights, thereby recognising Uber’s responsibility for their safety. Additionally, the pricing model based on supply and demand has been amended in some markets and obscured in others.

While more market entrants are adopting new technologies based on digital apps, unlike manufacturing technology, this technology is vulnerable to fast adoption by incumbents and can also encourage new entrants to the market. There is low barrier to incumbents’ adoption of mobile apps and associated technologies. Many factors could contribute to these low barriers of adoption, including low cost, short development time and familiarity of the technology. The development of enterprise mobile apps are generally significantly lower in cost and development time than traditional software development (Cohen, 2013; Heller, 2016). Furthermore, the use of mobile phones and apps is popular and widespread in populations. Due to their familiarity in everyday life, the adoption of apps by incumbents’ drivers involves little learning and adaptation. This low barrier to entry encourages the establishment of new companies to compete with the original entrant, thereby intensifying the competition and disrupting its competitive power.

In conclusion, the disruption of digital platform innovation brings about a different story of technology disruption than that proposed by the traditional theory of disruptive innovation theory, thereby calling for a reformulation of our long-standing knowledge of this theory. It is hoped that this position paper supports the IFIP8.6 group as it considers the impact of new technology on the group’s accumulated knowledge on the adoption and diffusion of innovation.
References


