

Digital Transformation in Textbook Publishing

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Keywords: Textbook; QR Code; Pipeline; Platform; In-Use Information

Abstract: As products of the education industry, textbooks play an irreplaceable role in publishing. However, under the impact of the Internet, traditional textbooks still face a huge crisis. QR codes have grown enormously in China over the last two to three years, and publishers are increasingly trying to introduce them into textbooks to avoid the competition observed between newspapers and online news. The digital revolution has provided a variety of quality services by sharing consumers' in-use information. Despite these creative digital innovations, existing changes have not yet turned textbooks from a pipeline into a sustainable platform. In the huge market of traditional textbooks, consumers can access the online pages of publishers by scanning QR codes on book covers. China's current digital book market is still dominated by the unilateral export of developers. Even firms which have a large number of users' in-use information, cannot utilize this information fully. Therefore, this article will explore how to continue improving the platform construction of traditional textbooks, so as to enhance its market competitiveness.

1. Introduction

In 2017, 118 publishing groups in China had a total revenue of \$52.72 billion, reflecting a 2.41% increase over 2016.[1] Our analysis of the publishing industry in 2017 2, Tab.1 shows that textbooks accounted for a large share of this market (30.93%). This is not surprising, given the importance the Chinese population places on education. Indeed, it is how Chinese students perform in school that directly determines their economic well-being and financial security. Textbooks supported 50% of the profits of China's publishing industry, stemming from a large student consumer base.

Figure 1. Income of publishing companies' main products in 2017[¥100 million]

	Text-book	Proporti on (%)	General book	Proporti on (%)	Audio-visual Product	Proporti on (%)	Newspa per	Proporti on (%)	Others	Proporti on (%)
Chinese Media	30.62	19.87	33.30	31.61	3.56	2.31	/	/	86.63	56.21
Changjiang Media	29.25	22.97	14.61	11.47	0.62	0.49	1.26	0.99	77.47	60.8
Central China Media	50.41	50.29	14.84	14.80	0.53	0.53	0.15	0.15	34.30	34.22
Winshare Media	54.75	62.79	5.76	6.61	/	/	/	/	26.68	30.60
Shangdong Media	60.58	54.73	16.25	14.68	0.90	0.81	/	/	32.97	29.78
Southern Media	36.85	56.32	9.41	14.38	0.04	0.06	0.86	1.31	18.82	27.93
China South Media	74.16	52.57	21.29	15.09	1.12	0.79	0.16	0.19	44.08	31.25

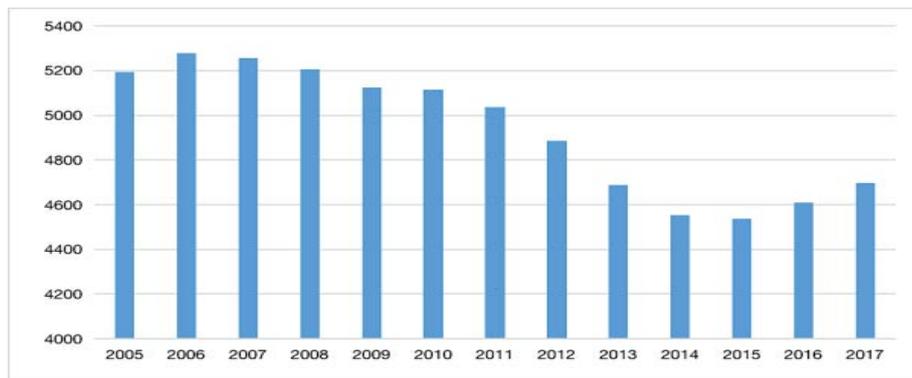


Figure 2. Numbers of K-12 students in China from 2005 to 2017 [10,000]

Fig.2 shows a decline from 2005 to 2015, but the overall number of K-12 students increased. We expect this increase to continue in the coming years given the increasing need for more learning resources from a growing population of students in China. The Chinese government, also, is interested in boosting this growth. Given all these conditions, it may thus seem that the publishing industry has an optimistic future.

Despite these trends, the traditional Chinese publishing industry faces looming threats because of new business models empowered by new digital technologies. Ever since the onset of the Internet era, and the rising popularity of mobile devices, people's access to information has diversified, and their reading habits have changed. This trend has been felt most by the newspaper publishing segment of this industry. Evidence comes from a reduction in the total number of newspaper publications, which dropped by 9.3% in from 2015 to 2016. The contribution of the newspaper industry to retail sales in 2015 was only 2.89%, and it fell to 2.45% in 2016. Such trends could easily follow into the textbook publishing segment very soon.[2-3]

New digital technologies have the potential to radically transform how traditional textbooks are published, distributed, and used by customers. In this paper, we elaborate on both the impending digital threats to the textbook publishing sector and approaches by which they can not only overcome those threats, but also grow their businesses.

2. Why is the Traditional Textbook Publishing Segment Under Threat?

To understand the precise threats new digital technologies can pose on legacy textbook publishing businesses, it is important to first understand how the business models of new digital players differ from those of legacy businesses.

2.1 Key Points of Innovation

Pipeline and Platform (Geoffrey G. Parker, 2016)

Pipeline businesses entail a step-by-step arrangement for creating and transferring value, with products at one end and consumers at the other.[4] Such a sequential set of activities is also known as a value chain (Michael Porter, 1985), referring to a process in which enterprises accept raw materials, add value through production, manufacturing and other processes, create finished products, and then sell them to consumers.

Platform business models facilitate exchanges between two or more independent groups, and they serve as a foundation upon which other parties can interact to build complementary products or services. Facebook allows users, app developers and other participants to work together. Platform owners exchange user information for revenue. For example, they provide users' preferences, interests, and locations to Spotify so that they can find what types of music are popular with friends and those around them. As the number of participants on each side of these businesses grew, value increased, generating what is called Network Effects. With the advent of the Internet, platforms have become digital, exponentially enhancing the ease and scale with which they generate exchanges.

Fig.2 briefly describes the above two processes.

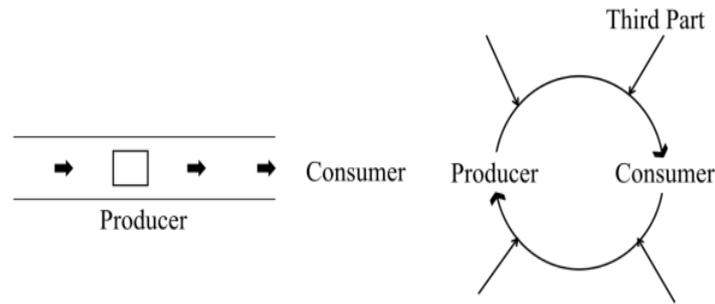


Figure 3. Structure of Pipeline and Platform

Production Ecosystem and Consumption Ecosystem(Subramaniam, 2019)

The differences between pipelines and digital platforms are also captured through the concepts of production and consumption ecosystems.

Production ecosystems consist of interdependencies enmeshed in a value chain, such as producing and selling a production or delivering a service to a consumer. Alibaba and Tencent have been able to hit the traditional banking industry because they can extend their business services to consumption ecosystem, while traditional banks can only stay in production ecosystems.

Consumption ecosystems are interdependencies entailed in the usage of a product or service. Companies like Alibaba and Tencent dominate the Chinese economy today because of their powerful digital platforms. In order to accelerate the development of the e-commerce industry, Alibaba created the QR code - payment (Alipay). Merchants now only need smartphones instead of POS to tap into digital payment space. To some extent, this enabled the Chinese to skip the credit card revolution and go straight to mobile payments. Tencent followed a similar method through its social network—WeChat. They added P2P money transfers to this platform and made the realization of currency circulation within communication become reality. After dominating the payment market that China’s banks had no serious interest in, Alibaba and Tencent were quick to compete with traditional bank’s businesses such as deposits, loans, and insurance. For example, Alibaba issued SME loans worth \$63.4 billion, amounting to 30% of the loans issued by the Industrial and Commercial Bank of China, the top SME lender in the country in 2017.[5]

Banks’ legacy businesses lost considerable market share because they failed to understand the consumption ecosystems of new digital technologies. Although banks have made much effort by improving efficiency, simplifying processes, and creating apps (simply collections of existing businesses instead of a digital platform), they still only improved the business in the production ecosystem, without extending the business to the consumption ecosystem. However, the consumption ecosystem is home to the real battle against tech giants.

The key to the success of digital platforms such as Alibaba and Tencent is that they use the Internet and smartphone apps as sensors to gather real-time digital information from their users. They can then share this in-use information with other app developers to create digital ecosystems and enhance consumer experiences.

2.2 Why Do Traditional Textbook Frims Need Changes?

Traditional textbook publishing businesses are fundamentally pipelines—only when they sell books can they make profits. In this industry, a value chain comprises of all the steps, from the publishing of content to distribution and sales. Specifically, they entail activities such as obtaining raw materials (articles, printed paper, etc.), logistics, transportation, and marketing.

Traditional textbook publishing businesses could also face the same fate of newspapers and banks if they do not understand the new changes brought about by new digital technologies because these digital platforms have already disrupted the retail part of the publishing value chain, and soon they can have a direct impact on the core publishing aspect of the same value chain. Most traditional book firms have sufficient book sales and stable consumer bases (most are students), which enhance the competitiveness for firms to survive in the production ecosystem. In China, from

2010 to 2017, the printing volume of books rose from 7.17 billion to 9.24 billion annually. Although book publishers are still benefiting from increasing sales, similar products like news and subscriptions are encountering decreasing printing volume. Within all printed books, the impact of textbooks may be minimal in the short term, but we cannot ignore the potentially huge risks because of the change of people's reading habits following the times.

New opportunities in consumption ecosystems for textbooks are available today. In the next section, we elaborate on our ideas for how these opportunities could be realized.

2.3 New Digital Opportunities for Textbook Publishing

In this section, we will show how QR codes allow textbook publishers to enter into consumption ecosystems.

With the development of technology and the popularity of e-commerce, traditional companies are able to use in-use information to satisfy different needs and thus enter the consumption ecosystem via QR codes.

QR codes have the characteristics of high capacity, high precision, and good encryption, which means that through the QR code, people can get abundant and accurate data. By scanning the QR code through mobile phones, users can quickly surf the Internet, eliminating the cumbersome process of entering the URL. Firms can also get much information, for example, about the consumption level of consumers when they pay, allowing firms to produce more products that consumers can afford. Traditional book firms can start to consider the possibility of entering the consumption ecosystem according to the advantages of the QR code. For instance, a kind of textbook involving the Chinese college entrance examination, printed by Capital Normal University Publishing Media contains QR codes on the back of the book to provide access to an online workbook for users. Through QR codes, users can write down questions they did wrong and take notes online, scientifically organizing points behind each question.

In the preliminary phase, it can be justified that QR codes are an optimal sensor. Through Internet access, the advantages of QR codes in modern market competition are very obvious. The use of QR codes in supplementary books facilitates students to complete practice exercises—students do not need to write the questions by hand, so they can study more efficiently by using computers to classify questions quickly. These advantages and functions are all improvements in production ecosystems. Although traditional teaching aids use technology and Internet connections, they still do not extend their businesses to consumption ecosystem, so they are not digital platforms. Companies can provide goods other than textbooks, but this mode of business is still in its infancy—since no other functions are provided, companies' products lack versatility to satisfy a large quantity of consumers in the consumption ecosystem; besides, due to the nature of outsourced products (because of the inability of technological autonomy), traditional publishing industries cannot mass customize and sustain its digital platforms.

However, if the textbook industry wants to survive in the consumption ecosystem, it should create stand-alone platforms with independent management. Besides, to maximize customization, traditional publishers should use QR codes more reasonably, and use them as sensors to collect the types and price trends of consumer goods, before providing relative services to consumers. If not, they will lose much value from consumption ecosystems. There is no denying that legacy firms need to continue to improve their competitiveness in the consumption ecosystem.

We have used the opportunity in this paper to design a platform, in order to allow the traditional publishing industry (pipeline) to truly enter into consumption ecosystem.

3. What Should Legacy Textbook Publishers Do?

Traditional textbook publishers should create a platform involving several participants with QR codes: the changing legacy textbook publisher itself, consumers (universities, teachers and students) and other publishers in partnership.

When scanning the QR code, the platform will receive information about the types and proportions of students' online homework errors. Then, the platform will arrange students' in-use information

for participants. For instance, textbook publishers can produce related book resources to help users better understand knowledge points and offer certain practice questions; teachers can gain access to teach students who have problems online; universities can also provide related courses to help students.

(1) Solving the Problem: Real-time Interactive

As a kind of extension of the textbook, the prime function of the platform will be solving problems of the legacy industry. Readers are likely to be confused with the conceptions or definitions written in the textbook if they try to find something more through the QR code. Thus, the interface should contain more detailed explanations and extended exercises. At the same time, in-use information containing at what time and in which chapter the user scanned the QR codes (chapters they are not familiar with), as well as how long the user spent, will also be collected to the platform so firms can know what kinds of questions students struggle with. Publishers can make good use of the information to satisfy the needs of consumers, such as providing relative videos concerning a certain chapter on the platform.

However, our platform is not only designed to be an extra textbook online, but also an interactive community based on network. Students will get their own accounts, including class IDs. This kind of interactive community improves network effects; the more users exist, the more value one single user can get. On the other hand, the more considerable the quantity of users is, the more valuable the platform will be. ID tags can be chosen by the users, such as “Junior/biology/UCLA”, “freshman/business”. Students will be able to exchange their own ideas and get inspired about one particular chapter of the textbook in the quick comments section. If users want more specialized aid, they can even pay for available and certified tutors online and invite them to discussion rooms to solve problems together. To consumers, this is more of a real-time interactive between participants on the platform, rather than reading texts printed by legacy book publishers individually.

(2) Further Understanding: Online Lectures & E-shop Services

The platform will offer online lectures provided by teachers on the platform, so users can choose to watch and subscribe at any time. Meanwhile, exercise books of their own, or those of other publishers in partnership will be recommended according to users’ scanning or searching records. All of these are possible only because the platform knows what their users want from them quite well, through in-use information. For example, if one user scans the QR codes located in the marketing strategy chapter, the user will receive some recommend links related to it. The links will include related online lectures and exercise books.

Another function of the platform is textbook wholesale. Nowadays, although e-books are gaining more and more popularity for convenience and availability, the status of physical textbooks in Chinese schools is still irreplaceable. Nowadays, however, university students live and study more independently than high school students, and there is a lack of information interaction among university students. Under these circumstances, university students prefer to buy textbooks in retail bookstores or online shops separately and individually, which is much more expensive than wholesale. In order to save money for university students, our platform also serve as a “monitor”, which gathers and matches the needs and demands of a similar group of students from different places and sells the textbooks to the group at a wholesale price. The more students involved, the cheaper the price, so consumers who want the service will try to invite more peers spontaneously. Thanks to existing users, this process itself can help create network effects, which create more value for the platform and consumers themselves.

(3) Other Functions: Cooperation with Universities/Other Publishers

There are several other functions on the platform. One of which is the cooperation with universities and other publishers. Universities or scholar groups on this platform will be able to post new academic arrangements and lecture schedules. This kind of behavior has positive effects for several participants. Most directly, with the information exchanged, the students can be well aware to enjoy better education sources, while the universities can be more connected to one another. At the same time, the platform can certainly scale up and earn more revenue. Universities can even create a collective account to provide convenience for their own students. Students can get into their

university's collective account through student ID certification. Afterwards, they can learn free lectures by their own professors on the platform. As mentioned before, the students can watch free lectures provided by their own school on the platform through the collective account and enjoy more services than the average consumer; for example, at the very beginning interface of problem solving, references and other digital materials from their own library will be attached to aid one particular problem.

From another perspective, there are many competing publishers in the area of textbooks now in China. If a single publisher wants to create a large-scale digital platform, it may face some challenges due to its own limited resources. Thus, it has to get more publishers involved and expand its scale, similar to what Alibaba has done. The platform builder can cooperate with and provide APIs to other similar publishers in order to build a larger platform and create network effects in succession.

Conclusion

Legacy businesses only focus on their value chains and improve their production ecosystems. The traditional publishers only know the basic means of business competition instead of creating new value in consumption ecosystem, which means they cannot provide additional products and services. As a result, the legacy businesses are under attack because of digital platforms, which can get users' in-use information easily by using sensors and have the capability to provide additional digital experience in consumption ecosystem.

As the modern digital trends of sensors being used in physical products, these legacy publishing firms now have opportunities to do the same thing as digital platforms and enter the consumption ecosystem of books. When QR codes are combined with textbooks, people can get more digital experiences after scanning QR codes. The digital platform of textbook publisher will utilize the in-use information gathered from users to create more value in consumption ecosystem. In this platform, users can get more services, the other third-party participants can make more profits, and the publisher itself can have stronger competitiveness in this industry.

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