

Management for Professionals

R. Srinivasan

Platform Business Models

Frameworks, Concepts and Design

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Preface

Firms that operate a platform business model have come to dominate the world today, in terms of both scale and performance (market capitalization). Some popular examples include Airbnb, Uber, Facebook, Amazon, and Google. Apart from these, there are quite a few firms operating as platform business models in their specific domestic markets, as well as reaching global consumers.

A unique feature of these platform business models (in contrast to pipeline business models) is that they operate as networks, quite often intermediating between different sides of users. Pretty much like an exchange, some of these firms facilitate interactions, reduce transaction costs, and help with matchmaking across specific user groups. Though such business models were not new, the proliferation of digital technologies and the easy access to the internet through mobile devices have provided the much-needed fillip to the growth and proliferation of these businesses.

This book is an exploration of the economics and strategies of these platform firms. As a student of strategy, I attempt to provide a template and framework for analyzing platform firms' economics and strategies, while acknowledging that each firm's strategy is unique (akin to its signature). I write this book as a guide to entrepreneurs and intrapreneurs in their journey of establishing and nurturing their platforms as well.

My journey into studying platforms started with a series of accidents. A friend of mine invited me to join his team meeting with a phrase, "we seem to be doing something right, but we are not able to explain why are succeeding." The team was actually building a platform, with a product framework. I spent a few hours with the team providing them with the basic concepts of network businesses and platforms, and things began to fall in place in their minds. Within a week of this meeting, a faculty colleague invited me to join a case-writing project which seemed unique. The executive in the firm was talking about leveraging network effects, and my faculty colleague (not from the strategy discipline) was not in sync with the theory and practice of platform business models. The case was being written at a time when the product firm was envisioning a transition to becoming a platform. The very next week after the case-writing conversation, I had to stand in for another colleague of mine for a start-up's meeting with its users. Over breakfast with the founders, we agreed that the best way for that start-up to scale was to reposition

itself into a platform. These series of interactions of organizations large and small, mature and young, convinced me that there is a need for deeper understanding of platforms as business models. This exploration led me to seek more and more platform firms, and I got access to study a variety of platform firms, including those founded well before the turn of the millennium with rudimentary technology, which again convinced me of the need to highlight the role of technology as just an enabler in the design of platform business models. And like in most cases, practice was leading theory development.

I continued my exploration through three routes—case writing (using primary access to founders and leadership teams of these firms), consulting (I got involved with quite a few start-ups, and entrepreneurs wanted mentoring and advisory support in their journeys), and teaching (I designed and delivered courses on platform business models across business schools in India and Europe, primarily the Indian Institute of Management Bangalore and Friedrich–Alexander University of Erlangen–Nuremberg).

In the process, I have had the fortune of high-quality research support. Mayura walked in with a dilemma of whether to join a Ph.D. program and spent a good nine months; Sandeep and Pramoth also got bitten by the doctoral bug after completing their Advanced Management Programme at IIMB and joined the research team while pursuing their day jobs as well as their academic studies at other institutes; Padma had just completed her Ph.D. and was looking to join academics as a full-time researcher. I also had the good fortune of having passionate teaching assistants throughout my teaching journey—Sandeep, Padma, and Pramoth at IIMB; Hari, Aida, Aga, and Julius at FAU. Across various years, these teaching assistants made copious notes of my sessions and sometimes even audio recorded them and transcribed them into text for my use.

In addition, the team at the Friedrich–Alexander University of Erlangen–Nuremberg (especially Kathrin, Angela, and Albrecht) was constantly looking for opportunities to integrate my research on platforms with their focus on open innovation and servitization.

This book is a culmination of all these efforts—case writing, academic research, and consulting/mentoring firms that operate platform business models. Over the past three years, I have also invested in writing some of my thoughts on my personal blog page (r-srini.in). Though I would like to have been more regular in publishing the blog, it gave me the initial impetus to consolidate my learning into this volume. And during the COVID-19-induced lockdown and the resultant virtualization of teaching activities, I have also been able to record a MOOC on the same topic on EdX/ IIMBx (available at <https://www.edx.org/course/platform-business-models>), which would be a good supplement to this book.

Bengaluru, India

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For providing me with space and freedom to explore my passion, IIMB.

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For accommodating my idiosyncrasies in converting my thoughts into a MOOC, IIMBx team (Sanjana and Shwetha in particular).

For producing this idea into a coherent whole, Nupoor and Sharmila (Springer).

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Bengaluru, India

R. Srinivasan

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About the Author

R. Srinivasan is Professor of Strategy at the Indian Institute of Management Bangalore. He teaches courses on strategy and platform business models for MBA students at IIMB and the Friedrich Alexander University of Erlangen-Nuremberg, Germany. He has written a lot of cases and articles on platform businesses in India and Germany. He also engages with a variety of startups and businesses that operate platform business models as an advisor and consultant. He earned his doctoral degree from the Indian Institute of Management Ahmedabad.



Have you ever wondered what differentiates an Airbnb from a traditional hotel? Or an Uber from a city taxi service? These are some of the many popular platforms that have come to dominate the world of business in the past decade. These platforms are typically asset light (Airbnb does not own a single hotel, nor does Uber a taxi) but have enough market power to lead their respective industries. Typically, such platform business firms intermediate between different sets of users, leverage network effects to grow the market, and in some markets dominate industries leveraging winner-takes-all economies. This chapter introduces the platforms as a unique business model and distinguishes them from traditional businesses.

What Are Business Models?

Models

A model is a replica of reality, a miniature, a life-like definition. It is common to use models to refer to an abstraction of something that exists in reality. Such models could take shape of prototypes that are used as a base for replication into life-size; an abstract representation of various scenarios and interdependencies like financial models; a description of a personality as in role models; or even fashion models that are used for demonstration purposes. Models abstract from the original. Some models help predict the future by connecting the dots. Models help in replications, visualizing connections and relationships, and for projections of the future. Models help in reducing the risk of failure and contribute to reduction in costs and/or elimination of rework.

Business Models

Business model is a representation of the business. It diagrammatically represents who the primary customers are, what are their needs, what is the business' value proposition, how does the business interact with the customers, how does the business organize its operations, what are the specific resources required for these operations, and the costs and revenue structures of the business. Organized as a chart, the business model canvas, proposed by Alex Osterwalder, provides a template for representing the business model in a logical way (see Fig. 1.1).¹

As one can see, the business model represents the various choices the firm has made, including its decision on specific customer segments, value offerings, and partnership arrangements; and the resultant resource requirements, value flows, and cash flows.

Platform Business Models

There are various things people refer to when they say platforms—a railway platform, a raised platform from where one could give an oration, or a technology or automotive platform that forms the basis for product design and manufacturing. The first thing that comes to everyone's mind when we say the word platform is a railway platform. Drawing from the analogy, a platform is a business model that brings together multiple sets of users—like trains and passengers. Imagine a railway station that has no signage or announcements on the arrivals and departures of specific trains! There would be chaos, right? A critical value offering of railway platforms is the provisioning of information to its users. The railway platform also provides a comfortable infrastructure for passengers to wait for the train, alight from or board the train. Another important value created by platforms is the specifications of the terms of usage or rules. In the absence of rules and norms, there could be serious chaos and inefficiencies. Put together, these three values—information, infrastructure, and rules—define how platforms operate.

In contrast to traditional businesses that Van Alstyne, Parker, and Chaudary (2016) refer to as pipelines, platforms add value in a different form.² In pipeline businesses like say, when a consumer buys bread, value flows from one direction to the other in the value chain—from the farmer who produced the wheat; to the small businessman that made the flour out of that wheat; to the baker that baked the bread; to the distributor and retailers that sold the bread; finally to the consumer. And the money flows the reverse direction—from the consumer to the retailer/distributor to the baker to the flour-maker to the farmer. These characterize pipeline businesses as money and value flow as fluids flow through a pipeline.

¹Osterwalder, A. and Pigneur, Y. (2010). *Business Model Generation: A handbook for visionaries, game changes and challengers*, NJ: John Wiley & Sons.

²Van Alstyne, M.W., Parker, G.G., and Chaudary, S.P. (2016). Pipelines, Platforms, and the New Rules of Strategy, *Harvard Business Review*, April 2016.

Key partners	Key activities	Value propositions	Customer relationships	Customer segments
	Key resources		Channels	
Cost structure		Revenue streams		

Fig. 1.1 Business model canvas. Adapted from: Osterwalder and Pigneur (2010)

In contrast platform businesses have different value flows. The transition from pipelines to platforms as business involves three key shifts: resource control to resource orchestration; internal organization to external interaction; and focus on customer value to ecosystem value (Van Alstyne et al. 2016). Take for instance a traditional newspaper. The newspaper caters to two user groups—the readers and the advertisers. The value flow is from the bureau (or the agencies) to the newspaper firm to the reader. If in consideration to this value, the readers paid the newspapers a commensurate fees, then the newspaper would still be a pipeline business. On the other hand, newspapers, in their interest to grow the readership, provide discounts to the readers, and make it up by charging advertisers. The value flow for advertisers come from the newspapers providing them space to communicate with the readers. In return for this value, the advertisers are willing to pay a significant amount to the newspaper. The operations of a traditional newspaper would work like this (i) source good quality news, produce a good newspaper (quality paper and printing), distribute efficiently (reach readers on time), and be open to feedback from readers; (ii) analyze the readership data—who’re my readers and what do they like reading; and (iii) market space on the newspapers to those advertisers who are willing to pay for reaching their messages to the specific segments of readers that the newspaper caters to. In this two-way value creation process, newspapers can afford to subsidize the readers and make money from the advertisers; as the advertisers value more readers and are willing to pay to reach them. In such kind of platform business models, traditional frameworks that define customers may not be appropriate—as one cannot say who are the customers to a newspaper—the reader or the advertiser? It is also not correct to say that a newspaper caters to two separate sets of customers, as the value created and offered is interdependent—in the absence of readers, advertisers would not be willing to pay!

Single- and Multi-sided Platforms

An important distinction one needs to make in the discourse on platforms is that of simple platforms from multi-sided platforms. Simple platforms are those that cater to one set of users only, as in the case of automotive platforms or technology platforms. In these contexts, a platform refers to a base model or technological core that can be leveraged to produce multiple products and services. For instance, an automotive company may use an engine across multiple vehicle models. Or a technology core like a robotic engine that could be used to make multiple assembly lines efficient. These are examples of simple platforms, or single-sided platforms. Our focus in this book is going to be on multi-sided platforms, where the platform caters to multiple sets of users, like the newspaper adding value to readers and advertisers; or an airport providing services to passengers and airlines; or a marketplace that brings together buyers and sellers.

Network Effects

The core idea behind multi-sided platforms is the concept of network effects. By network effects, we refer to the value one set of users attach to the other set of users in the platform. The number and quality of users on one side attract users on the other side. For instance, the number and quality of the right segment of viewers of a television channel attracts specific advertisers to the channel. The more the number of children watching a particular channel, the more the advertiser targeting its communication to children is willing to pay to advertise on that channel. These network effects are referred to as cross-side or indirect network effects. Given that the willingness to pay is directly proportional to the number of specific users (on the other side), it is labeled as positive. Such network effects could also be indirectly proportional, as in the case of advertisements and readers in a newspaper. The more the readers, more the advertisers are willing to advertise and pay, but not vice versa. The more the space advertisements take in the newspaper, the less the readers are willing to read and pay for the newspaper. Such network effects are labeled negative cross-side network effects. There could also be contexts where more number of users on one side begets more users of the same side. For instance, social networking applications like Facebook attracts users to connect and commune with similar users—their friends, family, and colleagues. More people like oneself are active on Facebook, more likely that one will be active on Facebook. In such cases, the value of the social network is directly proportional to the number of users. Imagine a social networking site where none of your friends/acquaintances are active? It would be of no value at all. Such network effects where the value of the platform is directly proportional to the number and quality of users of the same side are called direct or same-side network effects. Such same-side network effects could also be negative. That is, when the value of the platform is indirectly proportional to the number of users of the same side, the network effects could be negative same

	Positive	Negative
Same-side or direct	Social networks like Facebook	Sellers on a B2B exchange
Cross-side or indirect	Marketplaces like Amazon	Advertisers on media

Fig. 1.2 Matrix of network effects

side. A good example of negative same-side network effects would be a B2B exchange. More the number of direct competitors one finds in a B2B exchange, the less value it is for individual businesses to affiliate with the platform. And therefore the willingness to pay to join such a platform is indirectly proportional to the number of direct competitors. In such cases where users value exclusivity or differentiation from other users, platforms may experience negative same-side network effects (Fig. 1.2).

Network effects are not the same as popularity or word-of-mouth attraction of users. In word-of-mouth attraction, users highlight the value they derived out of the business and therefore urge others to join and enjoy the same value. On the other hand, network effects highlight the increase in value added by the business to the users as more (or less) users join and use the same. In other words, the value created is proportional to the number of users (beyond simple economies of scale); the fact that there are more users (either on the same side or the other side), the platform is able to offer more value to everyone.

Platforms Make Markets Efficient

A lot of traditional industries are characterized by three classic information economics problems—information asymmetry, adverse selection, and moral hazard. **Information asymmetry** refers to the differences in the information available across different contracting (interacting) parties. Ideally, when one party has more or less information than the other, the contracts might be inefficient. Take the instance of a used-car market. The seller in the market has significantly more information about the vehicle than the buyer. In such a case, the seller has economic incentives to hide/suppress information about the vehicle, especially adverse information like accidents or product issues. When the seller exploits this asymmetric information to bargain higher prices at the cost of the buyer, this is known as **adverse selection**. In the context of inefficient markets, adverse selection imposes significant costs of contracting, as the buyer (who has lesser information) has to invest time, energy, and additional costs in finding and verifying information provided by the seller. In spite of all this pre-contracting costs, there is a likelihood that such asymmetry may not be overcome. Post-contracting, a likelihood of a change in behaviour of one party that can have a material impact on the other party is known as **moral hazard**. Moral hazards can manifest through renegeing on contracts like change in pricing

models, service commitments, or the like. In order to overcome moral hazards, it is important to write out detailed contracts involving governance and mediation.

Typically platforms when they intermediate between different sets of users, it allows for increasing the efficiency of these markets. Imagine a travel-support platform like TripAdvisor. In that platform, user reviews on the hotels and vacations bridge information asymmetry between service providers and clients; prior information about prices and packages published by the hotels help ameliorate the adverse selection issues; and intermediating all payments and reviews through the intermediary (TripAdvisor) insures against moral hazards. In most markets characterized by such inefficiencies, platforms have contributed significantly in improving economic value for both transacting parties.

Platform Roles

Typically platforms as businesses have multiple roles: *providers, sponsors, and users*. First is that of platform provider—those providing the infrastructure and therefore interact with the users. On the other hand, sponsors do not deal directly with the users, but work in the background and design/ shape the information flows and rules.³ It is the sponsors that define who can participate or not in the platform; what access would each set of users have; and the norms of interactions amongst users. Users are typically independent people/organizations that interact with the platform and other users. In some platforms, providers and sponsors are part of the same organization; and in some others, they could be independent. For instance, in the case of an electronic marketplace like eBay, the same firm controls both the roles—that of platform sponsor and provider. However, in platforms like music players using mp3, there could be multiple providers competing with each other in the market, using a common set of standards (in this case, mp3 is a sponsor, while hardware manufacturers like Apple or Samsung would be the providers). These roles form the basis for platform firms to architect their unique business models in their specific industries.

Platforms as Networks

Platforms typically operate in network markets. Network markets are characterized by four special features⁴: complementarity, compatibility, and standards; consumption externalities; switching costs and lock-in; and significant economies of

³For more details about platform sponsorship, please read Katz & Shapiro (1986). Technology adoption in the presence of network externalities, *Journal of political economy*, 94: 822–841.

⁴For more details, read Shy, O. (2004). *The economics of network industries*, Cambridge UK: Cambridge University Press. (Chapter 1).

scale in production. These market characteristics allow for specific economies and give rise to unique business models.

Complementarity, Compatibility, and Standards

In network markets, consumers consume products as systems together with complements: like hardware and software; music player hardware and the audio files; and cars and roads/pathways. Consumers shop for whole systems rather than just products or services. The video games one plays should be compatible with the hardware, and vice versa. For such complements to work with each other, it is imperative that the products are designed to be compatible with each other. In most cases, these compatibilities are defined by the setting and following of industry-level standards. For such standards to evolve, there is a need for conscious cooperation and coordination between producers of complementary products and services. Some markets could evolve to be served by a single/dominant standard, like Microsoft's operating system in PC markets or Android in mobile smart phones; or a small set of competing standards, like mp4, AAC, and WMV in digital consumer video formats. In markets with competing standards, there is a market for aggregators that are compatible with multiple standards or converters that help users convert content from one format to others.

Consumption Externalities

Consumption externalities refer to the increasing value of the product/service as more and more people adopt the same.

How would like to be the only person in the world to own a telephone?

How valuable is an exclusive telephone? Pretty much useless, right? The value of the telephone increases proportionally to the number of people, especially those in your network, to own and use the telephone. The more the number of people using the telephone, the more valuable it is to you. These externalities are also referred to adoption externalities. In such markets with adoption externalities, there could be multiple equilibria. Either no one uses a telephone or everyone uses one.

In the case of normal goods that do not exhibit adoption externalities, the demand curve is downward sloping—as price decreases, demand should grow. But for products with adoption externalities, the slope may not be continuously uniform. There could be cases where beyond a point (after achieving a critical mass), the demand may disproportionately increase. This stems from the fact that the marginal utility for the n th customer is dependent not just on the inherent product quality but is also a function of the number of customers already in the network, n .

As more and more people start using a software utility like the ERP programme in an organization, more and more people get trained in using the programme, and the quality of experience improves. This results in higher marginal utilities resulting from the *externality* for subsequent users. An important concept to understand here is the concept of critical mass. Take, for example, fax machines.⁵ Typical reduction in prices driven by fall in costs of electronic components did account for small growth in adoption of fax machines in the US market. However, once the market achieved a critical mass, the users in the corporations using fax machines used fax machines more and more to communicate with other users, and that led to a nonlinear growth in demand. Such adoption externalities are critical to the evolution of network markets. Below the critical mass, the adoption rates are linear and small, and above the critical mass, the demand expands significantly. Consequently, either no one uses these products and services, or everyone uses them!

Switching Costs and Lock-In

Network markets are also characterized by significant switching costs. As the network grows in size and penetration, the costs of switching increase exponentially.

Why is the world stuck with a QWERTY keyboard?

A common example of how network markets create switching costs is the prevalence of QWERTY keyboards as a dominant standard. The QWERTY keyboard was designed in the world of mechanical typewriters where it was important to have letters commonly used together arrive at the cylinder from different angles, lest a fast typist have the levers representing the letters jammed! In other words, a keyboard was designed with an intent (among other things) of slowing down typing. When mechanical typewriters gave way to electronic typewriters and subsequently computers and mobile phones, the world is still “stuck” with QWERTY keyboards! Due to the dominance of QWERTY as a standard, all those who used typewriters were trained on using the same. When electronic typewriters and early computers were introduced, it was easy for these users to transition to using those devices due to the acceptance of QWERTY keyboard as the standard. And eventually, everyone learnt using the QWERTY keyboard, and every device therefore had a QWERTY keyboard. It was not the case that there were no alternates, there

⁵For more detailed research on adoption externalities, read Economides & Himmelberg (1995). Critical mass and network evolution in telecommunications, in Brock G. (Ed). 1995. Toward a competitive telecommunications industry: Selected papers from the 1994 Telecommunications Policy Research Conference. Available on the internet at neconomides.stern.nyu.edu/networks/tprc.pdf (last accessed on 10.08.2020).

was a DVORAK keyboard, but the switching costs were so high, that the QWERTY keyboard continues to persist.

Firms can also deliberately build switching costs for their products and services. Some of the ways product manufacturers lock-in their customers are described below. These are some instances, and firms can choose a combination of a few of them as well.

- a. **Contracts:** In the market for complements, firms can tie in their users with contracts for using their own/approved products as complements. For example, automotive and electronic product manufacturers mandate the use of approved spares during after-sales services, failing which the warranties may not be guaranteed. These mandates may be essential for continued efficiency, quality, and reliability of the product/service. So, when you buy a BMW car, you are pretty much locked-in to buying BMW spares only! If you want to break that, the risk is all yours!
- b. **Training and learning costs:** In products and services with significant complexity of usage, the costs of training and learning may be critical upfront investments. Take the instance of an ERP product. Once all the employees, contractors and other stakeholders of the organization are trained into using that particular ERP product (which is a significant effort and cost in itself), it is pretty much difficult to switch to another product/service. The change management effort may be so significant that the firm continues with its existing product/service.
- c. **Backward compatibilities and data conversion costs:** Another related switching cost in network markets is the maintenance of backward compatibilities with existing products and artefacts. For instance, while upgrading software, it is imperative that one maintains backward compatibility with existing IT artefacts (databases, email systems, and user files) as well as hardware products and services. This could be a significant switching costs for firms to upgrade their products from their own service providers rather than use something entirely new.
- d. **Bureaucratic costs of search:** In some cases, the bureaucratic costs of searching and contracting with a new vendor might be so prohibitive that organizations might prefer to work with existing vendors and their products and services. Not just search costs, there may be significant costs involved in training the newly appointed vendors and their team members in quality standards and processes of the firm. In markets with tiered-global supply chains like in the fashion industry, it might be very difficult to train new vendors on quality expectations and delivery expectations.
- e. **Loyalty costs:** In some markets with very little differentiation between competitors' products and services, service providers might lock-in participants with loyalty benefits. In such markets where the consumer might not be able to differentiate the quality of services (as in airlines) or might not be competent to evaluate the quality differences (as in doctors and hospitals), loyalty programmes may be very effective in increasing switching costs.

Significant Economies of Scale

As a consequence of these standards, externalities and switching costs, firms operating in these markets enjoy significant economies of scale.

What does it cost to produce the second copy of a software product?

These markets are characterized by high fixed (and sunk) costs upfront, with very little marginal costs of production. The average cost curve drops significantly to almost zero as the scale increases. As we had discussed before, once the critical mass is achieved in these markets, consumers' marginal utilities increase disproportionately, whereas the producers marginal costs drop exponentially as well, resulting in extraordinary contribution margins.

Platforms as Ecosystems

As it can be observed, platforms create, capture, and distribute value working as ecosystems, in collaboration and complementarily with multiple organizations. These groups of organizations have been defined using a biology metaphor—ecosystems. Moore, in a seminal article, introduced business ecosystems as an alternative to the traditional economic organizations: markets and hierarchies (Moore 2006).⁶

Business ecosystems have been studied in a variety of industries.⁷ Ecosystems typically comprise numerous firms, individuals, and communities who may be independent and autonomous, but connected with each other through a technological core⁸ (Baldwin 2012). This distributed nature of the ecosystems present four unique design parameters for organizing and value creation.

1. Modularity: The evolution of modularity in industries has led presented a lot of opportunities for growth. Modularity has helped achieve economies of scale in design, engineering, and manufacturing; facilitated reduced complexity in

⁶For a detailed description, Read, Moore, J.F. 2006. Business Ecosystems and the View from the Firm, *The Antitrust Bulletin*, 51, 1. Spring 2006.

⁷For more details, read: Adner R, Kapoor R. 2010. Value creation in investment ecosystems: how the structure of technological interdependence affects firm performance in new technology generations. *Strategic Management Journal* 31: 306–333; Baldwin C, Clark K. 2000. *Design Rules*, Volume 1, *The Power of Modularity*. MIT Press, Cambridge, MA.; Iansiti M, Levien R. 2004. *The Keystone Advantage: What the New Dynamics of Business Ecosystems Mean for Strategy, Innovation, and Sustainability*. Harvard Business School Press, Boston, MA.; and von Hippel E. 1988. *The Sources of Innovation*. Oxford University Press, Oxford, UK.

⁸See: Baldwin, C. Y. 2012. "Organization Design for Business Ecosystems." Special Issue on The Future of Organization Design, *Journal of Organization Design* 1, 1.

manufacturing by a variety of globally distributed and specialized manufacturers; and therefore helped customers with increased (backward and cross-brand) compatibility and resultant customer satisfaction. Baldwin and Clark (2000) had elaborated on the antecedents and consequences of modularity on industry evolution and profitability. Famously known as Joy's law,⁹ many technology companies in the world believe in this: "No matter who you are, most of the smartest people work for someone else [other than you]". For such distributed value addition to happen, it is imperative that all constituents in the ecosystem work on specific aspects of the whole and have the ability to integrate.

2. **Absorptive capacity:** In an ecosystem, it is important that the firms overcome a set of biases, including "not-invented-here." Firms in the ecosystem should be open to receiving inputs and ideas from others and have the absorptive capacity to integrate the knowledge gathered from outside with that generated inside. This integrative capability is critical in the ecosystem co-creating value. Such capacity requires three sets of routines—ability to continuously scan the environment and engage with external innovators; ability to sift through the external body of knowledge out there and the internal innovation projects and their outcomes; and the ability to integrate these two streams of knowledge to create and capture value. These three capabilities are critical to work and create value in an ecosystem, else, there could be loss of control and centralization of value creation and capture. Of course, these capabilities are not evenly distributed across all the firms and actors in the ecosystem. There could be firms/actors that are central to the ecosystem, who set the standards, define the norms and rules of engagement, and stake higher claims on the value created (capture disproportionately more value). These "focal" firms are variedly referred to as orchestrators and facilitators in the ecosystem. Orchestrators define the norms and information flows; whereas facilitators provide the infrastructure for interaction among the members of the ecosystem.
3. **Co-evolution:** Co-evolution is about orchestrating and facilitating reciprocal interactions among technologies, business processes and routines, products and services, market mechanisms, firms, and regulators.¹⁰ The process of co-evolution may involve a variety of activities including co-creating technological standards across competitors and complementors in an industry as well. Such co-evolutionary processes help entire ecosystems grow and flourish. Pretty much the biological metaphor of a biosphere, that support a variety of life forms, in symbiotic co-existence, co-evolution enables all the diverse actors in the business ecosystems co-create value for everyone involved.
4. **Public goods:** Given that an ecosystem is built around the principles of cooperation among complementary actors operating in their own niches while creating value for the whole, the outcomes of these ecosystems are most often treated as public goods. An innovation that is a product of the entire ecosystems'

⁹Anderson, C. 2012. *Makers: The new industrial revolution*, Crown Business.

¹⁰The process of co-evolution has been studied in complexity theory (Moore, 1996).

effort should be available for leverage by all participants in the ecosystems, with equity. Most often, this shared outcome is likely to be much larger than the sum of individual efforts, and that would be a significant incentive for participants to contribute to (and benefit out of) the business ecosystem.

These four ecosystem characteristics—modularity, absorptive capacity, co-evolution, and public goods—provide opportunities for platforms to architect ecosystems. Some platforms operate as focal firms, evangelizing and enabling other participants and actors to affiliate with others in the ecosystem. Presence of modularity is essential for seamless affiliation and value creation. In the absence of modularity, there may be requirements for participants to invest in specific assets, that are exclusive to that focal firm. It is also imperative that the focal firm manages its role carefully and allows for knowledge flows across the entire ecosystem. Some platforms do exhibit more control over the ecosystem than others, like the difference between the Apple's AppStore and Google's Play Store.

Key Platform Decisions

Given the unique nature of platform businesses, there are six key decisions to be undertaken by every platform business.

1. Platform firms need to decide and articulate the specific sets of users that they cater to, and define/discover/develop network effects. The strength, direction, and sustainability of these network effects for the basis for subsequent decisions—value architecture, pricing and network mobilization, growth strategies, and ecosystem development.
2. Platform firms need to clearly articulate their value architectures—what value do they provide and how. Each platform has to evolve a signature combination of utilities that constitute its value architecture.
3. Given the nature of interactions between users and the network effects, it is important to decide which side(s), if at all, to subsidize and monetize; and the impact it has on the network development and growth of users.
4. In platform businesses, given the network effects and interdependencies, no one joins unless everyone joins. Solving these chicken-egg problems or penguin problems is a critical platform decision and will shape the growth and sustainability of the platform.
5. How platforms compete with other firms and platforms, and vie for market dominance is another important decision, shaping industry evolution and market shares.
6. Platforms also have a significant impact on how they work with other complements and the evolution of the ecosystem. Conscious engagement with the ecosystem will shape the industry structures and standards as well.

These six critical decisions are to be undertaken by the firms' top management and leadership; and form the core of the subsequent chapters. Chapter 3 elaborates on how to analyze the strength and direction of network effects and the consequences of the same for growth. This chapter also provides a roadmap for product firms to transition to platforms. Chapter 5 focuses on the value architecture of platform firms, based on the four core utilities added by platforms. This chapter provides insights into how platformization will transform industries and enhance choice, reduce costs, and build communities.

Chapter 7 discusses the network mobilization issues and presents a long list of strategies for resolving the penguin problems and subsequent scaling of platforms. Chapter 11 elucidates the various pricing models and evolves the criteria for subsidization and monetization of specific user groups. Chapter 13 presents the various aspects of platform architecture and its implications for resource and capability development at the firm level.

Chapter 15 takes an industry perspective and defines the industry conditions for the existence of winner-takes-all markets. The chapter also discusses the nature of such industries and how governments and regulators deal with such firms. Chapter 17 elaborates the envelopment dynamics, where large multi-platform bundles envelop focused platforms. The implications for enveloping firms and those fighting the threat of envelopment are discussed in detail, apart from dilemmas faced by regulators managing such markets. Chapter 19 devolves into the issues of how firms operate multiple business models within the same firm to complement each other. For instance, business models like software-as-a-service (SaaS) and multi-sided platforms (MSP) complement each other in terms of capabilities, network mobilization and rapid scaling. The final chapter integrates all these issues and takes the ecosystem view to discuss contemporary issues around platforms. Some of the issues that have no easy solutions like global dominance by platforms in certain markets, existence of contestable markets, and the role of global and regional regulators are discussed in the concluding chapter.