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Supplier-complementor alliances: Enhancing value creation for the ecosystem

Liang CHEN

by Chen Liang

SUPPLIER-COMPLEMENTOR ALLIANCES

Enhancing value creation for the ecosystem.

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Suppliers can better protect their positions in an ecosystem by building stronger relationships with 'complementors', which are businesses that offer products or services that enhance the value of the core product. Such supplier–complementor alliances (SCAs) can enhance the value of the entire ecosystem, including that of the leader.

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SCAs such as Nvidia–Adobe drive innovation by encouraging suppliers to develop products that cater to broader needs beyond the ecosystem leader's specific demands. This strategic alignment between suppliers and complementors also ensures that suppliers build a more resilient and diversified business model.

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SCAs present both opportunities and challenges within ecosystems–suppliers can benefit from increased bargaining power, which could be a challenge to the ecosystem leader. Effective management of SCAs is thus crucial for maintaining a healthy ecosystem.

Snagging a big contract from a tech giant such as Apple is the Holy Grail for supplier firms. Electronic components manufacturer Luxshare saw its share price jump three percent on the day it became the only firm other than Foxconn to assemble Apple's premium iPhone Pro models.[1] Luxshare first gained access to the tech giant's ecosystem in 2011. It initially produced peripherals such as charging cables before graduating to Airpods–Apple's signature wireless ear buds–in 2017. AirPods subsequently contributed some 26 percent to its revenue the following year.[2] This milestone eventually led to the coveted contract to assemble iPhone Pro models. However, being so closely wedded to lead buyers or ecosystem leaders like Apple also carries substantial risks.

The main hazard is that much of the investment Luxshare had made to manufacture Apple products and accessories, which encompasses machinery, human capital, and training, is going to be specific to Apple. To win the contract for iPhone Pro models, the Apple supplier had spent hundreds of millions of dollars to acquire iPhone-related manufacturing and supply chain firms such as Wistron and Pegatron. While these moves signal to Apple its ability to meet production demands and standards, the specialised knowledge and skills that Luxshare has acquired are non-contractible. In other words, Luxshare's strengths and advantages are not relevant or translatable to other ecosystems.

This puts suppliers like it at risk of being left high and dry when the leader orchestrates a macro or technological environment shift in the ecosystem, such as when Apple transitioned away from Intel to ARM-based processors in 2020. Luxshare's investments will therefore lose value substantially if it stops supplying to Apple. Apple knows that and can always abandon Luxshare. The other risk is that if Apple decides to change its own tech, Luxshare's investment could be made obsolete or it could be forced to adapt its product accordingly. These are all additional risks and costs Luxshare has to bear because of its Apple-specific ecosystem investment.

We argue that suppliers can better protect their positions in an ecosystem by building stronger relationships with a type of firm known as 'complementors'. These are businesses that offer products or services that enhance the value of the core product–in this case, Apple's iPhone–and this coupling can lead to increased demand for both parties' products.

Here, we introduce the idea of a 'supplier-complementor alliance' (SCA) to characterise this unique relationship and its implications for the buyer-supplier relationship, particularly a supplier's 'membership status' in the ecosystem. Our research suggests that when a supplier develops capabilities that are informed by its complementors' on-the-ground experience and customer feedback, the SCA in turn enhances the value of the entire ecosystem, including that of the leader.

SUPPLIER-COMPLEMENTOR ALLIANCES

Focusing on the role of SCAs in ecosystems is critical because we know so much about the buyer-supplier dyad, but it is less clear as to what complementors are, why they are important, and how they can add value too. We argue that without a critical mass of complementors, supplier firms committing to an ecosystem leader could end up making a losing bet. For example, while Microsoft's switch to ARM processors (i.e., the new supplier) represents better performance vis-à-vis the chips from Intel (the incumbent supplier), Windows software developers (complementors) accustomed to building apps based on Intel chips were not keen to transition to the new architecture. Without those apps, a more powerful Surface Pro would serve little purpose; without consumer demand, Microsoft's suppliers cannot generate returns on investments that might have been made as per Microsoft's expectation or request.

In another example, the dynamics between Nvidia and Adobe are characteristic of those of an SCA.[3] Nvidia, a global tech leader with its graphics hardware, has long been a natural partner to facilitate Adobe's premier visual editing products,[4] but recent widespread interest in Generative Artificial Intelligence (GenAI) has driven further collaboration between them.[5] Even Apple, which had phased out Nvidia graphics cards (often used for graphic and video editing on Adobe software) on its Mac models during a fractious relationship, has started working together with Nvidia on the Apple Vision Pro VR headset.[6]

Another example of a high-profile SCA is that of AMD and Bethesda Game Studios in the Microsoft/PC ecosystem. The pair collaborated on the latter's *Starfield* PC video game, making AMD its 'exclusive PC partner'.[7] While the technically demanding game runs smoothly on AMD's Central Processing Unit (CPU) and graphics cards, the game experience on PCs running on rivalling Intel and Nvidia hardware is described as a "bizarrely worse experience".[8] For Microsoft, which owns the Windows ecosystem in which such PC games are played, AMD is a valuable partner not only for any investment in R&D and production capabilities, but also for delivering a positive experience to the consumer via an alliance with complementors such as Bethesda.

These examples of SCAs illustrate the link between suppliers and complementors–that is, complementors need to leverage the suppliers' components to build products and fulfil certain functions. The reliance on the ecosystem leader already carries considerable risk for suppliers, as we saw in the earlier Luxshare example. This is because suppliers need to be willing to expend considerable financial outlay when convincing an ecosystem leader of their commitment to its supply chain and manufacturing processes.

At the same time, an ecosystem leader needs to balance its reliance on a handful of suppliers against other critical considerations, such as production deadlines and bottlenecks. Here, we use Apple's prime supplier Taiwan-founded Foxconn as an example. When COVID-19 was still seven months from being cleared as a 'global health emergency',[9] the world's largest iPhone factory operated by Foxconn in the central Chinese city of Zhengzhou was gripped by a major outbreak in October 2022. Besides the negative publicity generated by the shocking scenes of thousands of workers leaving the factory on foot with their luggage, it led to another hit to Foxconn's production schedule following the closure of two of its factories in Shenzhen, China in March 2022. Notwithstanding analyst criticism over a shortfall of about six million iPhone 14 Pro and Pro Max units,[10] Foxconn had until that point been Apple's only supplier that was assembling its premium iPhone models. It operated multiple factories across China, including one in the epicentre of the pandemic, Wuhan, and had consistently made investments,

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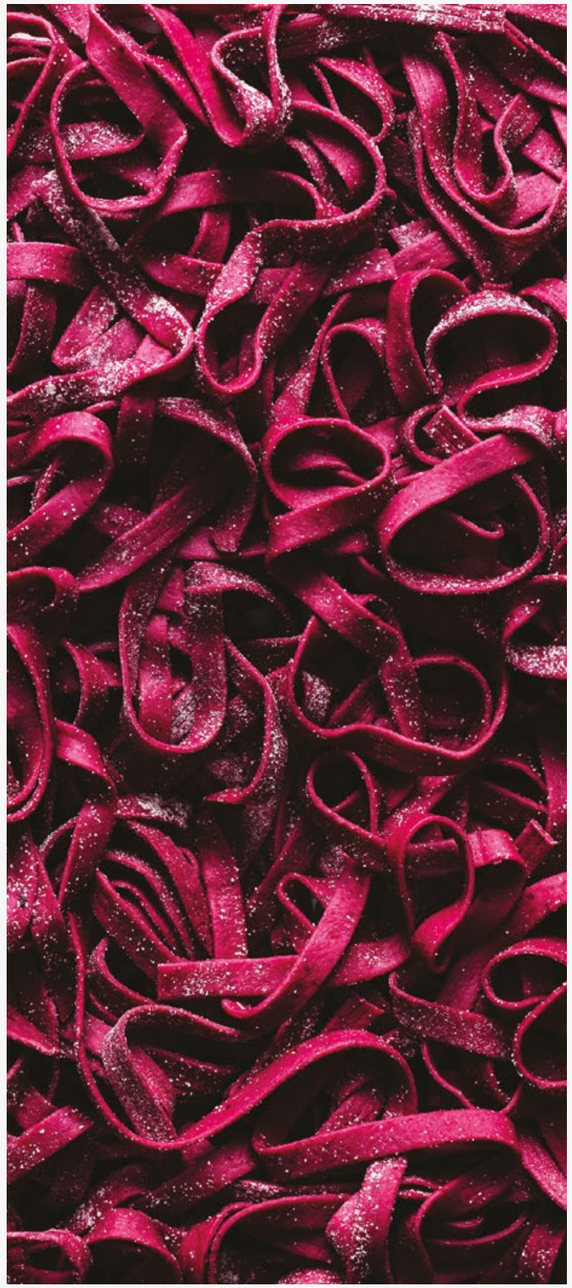
including a US$2-billion plant in Chengdu[11] and a US$356-million upgrade of its facilities in India in 2019,[12] to meet Apple's requirements. For sure, Foxconn's iPhone-making investments are a source of competitive advantage for ecosystem leader Apple, which enjoys the fruits of innovation and efficiency borne of its suppliers' financial risk-taking. However, Apple's over-reliance on this arrangement also led to the magnified COVID-19 supply chain issues and analyst criticism, and its eventual production diversification via Luxshare.

And therein lies the tension: suppliers, while wanting to signal their value to Apple, do not want to be stuck with it or put in too much investment exclusive to Apple. On the other hand, while reliant on its suppliers' investment/capability, Apple does not want to be overly dependent on any single supplier, as it had learnt its lesson during the COVID-19 pandemic.

This is where SCAs can help suppliers like Foxconn and Luxshare deliver additional value, so that they stay in the ecosystem and generate continued revenue for themselves without having to overcommit to ecosystem leaders like Apple.

SUPPLIERS VERSUS ECOSYSTEM LEADERS

We next discuss how suppliers, as focal firms in the SCA configuration, could recruit complementors to achieve such ends, and how the ecosystem leader can retain control of its dominant position.



One way for ecosystem leaders to keep ambitious suppliers in check is by maintaining close control over the core technology, such that they can define tightly the way complementors utilise components in product development.

Supplier's role: Not just pleasing the ecosystem leader

Instead of driving component innovation specific to an ecosystem leader, suppliers can reconfigure their product offerings in a way that alleviates downstream bottlenecks to create innovation and enhance the ecosystem's focal value proposition. In other words, suppliers' ecosystem-specific investments may not be the only way to bring value to the ecosystem (which is to satisfy the ecosystem leader). Suppliers that work with complementors such as downstream software/app developers can stay abreast of market demand independent of those of the ecosystem leader. Similarly, complementors in such arrangements with component suppliers are better able to maximise their technical capabilities even if they are integrated into a certain ecosystem. The net result is value creation for the entire ecosystem.

Going back to the Nvidia-Adobe and AMD-Bethesda SCA examples, the value that suppliers such as Nvidia and AMD offer is underlined by their various complementor partnerships within the tech industry. Be it AMD tweaking its hardware to deliver a better gaming experience for Bethesda or Nvidia modifying its code to deliver better rendering results on Adobe software, SCAs have the potential to elevate a supplier's contribution to a wide array of complementors beyond the partnered one. By working closely with complementors, suppliers can find ways to overcome bottlenecks often borne of an ecosystem leader's control of the technical specifications that predefine, and possibly restrict, technological opportunities.

Therefore, the more SCAs that suppliers and their complementors draw up, the more likely it is that productive innovation can be unleashed in a rising-tide-lifts-all-boats scenario that creates value for ecosystem leaders such as Apple and Microsoft. In turn, such ecosystem leaders would be more likely to retain the partnered supplier's membership in their ecosystems, especially when the supplier demonstrates its potential to boost value creation across a wide range of complementor domains, whether they are software developers, cloud service providers, hardware manufacturers, or service providers.

While often the case, such SCA configurations do not always have to be couplings between hardware and software suppliers. Component suppliers usually supply hardware. Complementors though do not always provide software; they could also be manufacturers of IoT (Internet of Things)-based devices, such as sensors and domestic appliances. That said, we anticipate that an ecosystem leader's dominance may steer the ecosystem towards developing more hardware-software alliances, and away from hardware-hardware ones. This is because the ecosystem leader is likely to invest in the major hardware complementors, as what we have seen in the case of Xiaomi.[13]

Ecosystem leader's role: Protecting itself

Using SCAs as a way to assess a supplier is good news to firms such as Foxconn and Luxshare as it presents a value-creating path that involves relatively less

specific investment exclusive to the ecosystem leader. Perhaps because of this, ecosystem leaders have good reason to fear suppliers that might also grow too strong and become a competitor. Returning to the example of Nvidia, the firm controls an estimated 90 to 95 percent of the high-end AI chip market,[14] and is already a key part of AI projects under the biggest tech firms ranging from Google to Amazon to Tesla. Its dominance of the market has prompted some observers to say that "most companies aren't merely buying chips from Nvidia; they're buying entire systems".[15] There is also an opportunity for such powerful suppliers not so much to usurp or replace the leader, but to break away and create a different ecosystem where it is the leader. If Nvidia becomes an ecosystem leader, its ecosystem would be very different from the one which Apple dominates.

One way for ecosystem leaders to keep ambitious suppliers in check as a response to strategic actions by suppliers and complementors is by maintaining close control over the core technology, such that they can define tightly the way complementors utilise components in product development. A perfect example of such architectural innovation, which determines how the different components of the system interface or connect with one another, and how complementors are connected to the core technology, is Nvidia's Cuda framework, which allows developers to code on the graphics processing unit. If complementors can only mobilise certain component functions through the lead firm's technology (such as the use of software like Application Programming Interfaces or APIs as they are commonly referred to), suppliers, as well as complementors, may find it challenging to break away from the lead firm.

Large complementors are usually untouchable in the sense that consumers will keenly demand their products (e.g., killer games) in the focal product (e.g., iPhone). This is their strongest form of protection. Complementors cannot do much other than multihoming to a competing ecosystem like Android/Samsung, so that they do not place all their eggs in one basket. This can be done with the help of some middleware, which is software that helps to interface or connect different computer programs or systems. Another strategy is to engage in integration so that one firm (such as a powerful supplier) acquires and owns multiple complementors in order to beef up its bargaining power against the ecosystem leader.

In an ecosystem where suppliers are dispersed and disconnected, SCAs will be instrumental as the suppliers are able to work out with their complementors on how their products or services interface with one another to realise the latter's value proposition.

THE ECOSYSTEM WILL BENEFIT

Our research suggests that SCAs accrue benefits at the ecosystem level. As mentioned, suppliers are usually unwilling to undertake innovation that is highly specific to the ecosystem leader. This is because the lead firm may change its architectural design over time (e.g., major upgrade in response to AI) which could distort the focal component's interface with other components, that is, how components are connected with one another and how their functions interact. In turn, this change imposes additional adjustment costs on the supplier. But when a supplier develops capabilities that are informed by its complementors' capabilities and experience, the SCA enhances the value of the entire ecosystem, including that of the leader.

However, the conundrum remains–while an SCA creates value for the lead firm by increasing the attractiveness and customer satisfaction of its core product, it also has the potential to break away or at least increase its bargaining power against the lead firm. This could possibly make it more dependent on the supplier and therefore lose the architectural control it had over the entire ecosystem, such as deciding what components to use or replace.

In a tightly-connected supplier network, the usefulness of an SCA is probably limited because suppliers can work out within themselves how to respond collectively when the architectural design as determined by the ecosystem leader changes. However, in an ecosystem where suppliers are dispersed and disconnected, SCAs will be instrumental as the suppliers are able to work out with their complementors on how their products or services interface with one another to realise the latter's value proposition. In turn, such specific innovation engendered by suppliers with their complementors will lead to better performance of the focal product, higher revenue, and market share. Thus the next step for us is to better understand the complexities at play in such successful SCA scenarios. AMI

DR CHEN LIANG
is Associate Professor of Strategy and Entrepreneurship at Lee Kong Chian School of Business, Singapore Management University

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