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Capturing the Value of Synchronized Innovation

By Jason P. Davis

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Coordinating new product development efforts with other companies in your industry can provide substantial benefits — but can be challenging.

BY JASON P. DAVIS

FOR MORE THAN 30 YEARS, Intel Corporation and Microsoft Corporation, two technology powerhouses, have closely synchronized many product development and launch activities in one of the most widely recognized corporate alliances. The early success of their collaboration set market expectations for a flow of coordinated semiconductor and software products. In some rapidly growing industries such as mobile telecommunications, such synchronization is more extensive, permeating the product development moves of dozens of young companies at once.¹

Intercompany synchrony in product development and innovation is hardly new, and some research has shown that synchrony can generate performance benefits for companies. However, prior research largely centered on the relationships between two companies rather than examining how synchrony emerges in broader industry networks or how individual or pairs of companies could capture the value of synchrony in different industry networks. (See “About the Research,” p. 57.)

For example, it is relatively common for companies to coordinate their product development efforts in hopes of generating increased sales and customer satisfaction. Yet while some businesses work hard to synchronize their product development processes with other organizations, others are significantly



THE LEADING QUESTION

How can a company coordinate its product development efforts with other companies in its innovation ecosystem?

FINDINGS

- ▶ Companies can synchronize with other companies using three main approaches: planning, reacting or combining these two approaches.
- ▶ Each approach has different implementation costs and different challenges.
- ▶ The network of relationships within the industry will influence how quickly synchrony emerges.

less formal about how they tie in with outside entities that are involved with related products or synchronize unwittingly with companies in their network.

Synchronization can take a number of forms, and the implementation costs vary widely. Moreover, keeping part of one company's operations synchronized with those of another organization can present substantial challenges involving control. Such challenges are magnified when capturing the benefits of synchrony depends on many other players in the industry network. Understanding what it takes to coordinate critical activities across industry networks can therefore be extremely helpful, particularly in technology-intensive industries, where innovation is distributed and companies are strategically interdependent.

Synchrony's Role in Distributed Innovation

In industries where innovation is highly distributed, companies often attempt to gain market advantages by coordinating their product introductions with those of other companies. Such advantages are frequently sought in technology-oriented sectors, where the benefits of product and component compatibility are obvious. For example, Sony Corporation and Microsoft, leading manufacturers of video game consoles, often try to coordinate product releases with game manufacturers such as Electronic Arts. Sony's and Microsoft's video game consoles generate little consumer interest unless they are paired with new games or rereleases of popular older games. As long as the products provide some complementary value when customers use both, synchronized product releases by different companies can increase customer satisfaction and stimulate joint sales.²

Although synchronization is common in industries where complementary products create value, it is also widespread in industries with highly complex products, such as the aerospace and medical diagnostics industries, where distributed innovation is the norm. A magnetic resonance imaging machine, for example, might be designed, manufactured and marketed by one company, but it is often built from subsystems and parts designed and manufactured by a variety of suppliers. Likewise, sophisticated aircraft are made of components developed by outside

suppliers. Indeed, some analysts have suggested that Boeing's 787 Dreamliner's highly publicized battery problems reflect the challenges of aligning the safety and testing procedures of outside suppliers with those of the integrating manufacturer. The design, testing, production and delivery of components would align perfectly in the ideal world, enabling a manufacturer to release its product on schedule with no quality issues. However, experience shows that this is easier said than done.

Synchronizing product introductions can be achieved rapidly and with relative ease in nascent industries. For example, the entrepreneurial ventures that produce mobile applications for Apple's iPhone and iPad have developed their own synchronized rhythm. While new applications are being released in these ecosystems every day, the majority of new and updated applications are released in two peak introduction periods — one just prior to summer and another during the holiday shopping season. Industrywide synchrony emerged very quickly in this sector, although it is still a fledgling market. Even in the face of low entry barriers and rapid growth, businesses were able to rapidly synchronize their efforts. In some cases, the new ventures developing applications are colocated, which facilitates social interactions that enable smoother coordination around release plans. In other cases, corporate strategic alliances can be used to align product releases.

These and many other examples in modern industrial ecosystems suggest that the network of relationships among companies (sometimes called the "alliance network") plays a key role in producing synchronization. Such relationships can range from intense collaborations (where two or more companies codevelop products) to arm's-length alliances (involving less interaction, perhaps just a joint sales and marketing agreement). The network of alliances determines if and how synchrony occurs, because it is through these links that companies influence one another to speed up or slow down their product development work.

Types of Synchrony

My research shows that enterprises synchronize their product development work in three different ways: by planning the synchrony proactively with a few

other partner organizations; by reacting to signals by other companies; or by combining these two approaches to create a hybrid approach. Each is based on particular types of intercompany relationships and therefore has unique costs and benefits.

Planned Synchrony The planned approach is one in which a small number of companies formally agree proactively to collaborate, with the explicit goal of synchronizing their product innovation and development activities on a given project. I call these companies “coordinators.” Apple Inc., for instance, collaborates closely with a small set of suppliers to ensure that the components for new devices are fully compatible and that the development schedules are closely coordinated to create new end products such as the iPhone. This approach to synchrony generally requires periodic meetings to align goals, determine budgets, establish or adjust schedules, review progress and address a wide range of other project needs.

Planned synchrony extends from project inception to product launch, and even beyond. Participating businesses can be relatively confident that their projects are being closely managed and tracked by other participants, and they can call for adjustments as needed to address problems or delays.

Such intercompany collaboration requires a significant level of commitment. Participating companies typically agree to provide specified amounts of talent, financial support and other resources for the project’s duration. Additional resources, for example professional alliance managers, are necessary to coordinate boundary-spanning projects, such as developing interfaces between proprietary technologies. As with most R&D investments, there can be considerable risk. However, the risk can be mitigated by closely managing the projects relative to mutually determined objectives and timelines. The collaborations between Intel and Microsoft that produced many versions of the so-called “Wintel” platform are prime examples of how proactive synchrony can extend across many product cycles and time periods.

Reactive Synchrony In many industries synchrony isn’t planned or coordinated — it’s simply a timely reaction to circumstances. Companies react to sig-

ABOUT THE RESEARCH

This article is based on research that explores how established organizations in the computer industry collaborate in developing a multitude of innovative products. Although there has been much research on the structural features that support innovation (longstanding relationships between partners, alliance contracts, etc.), there has been little about the strategic approaches and organizational processes that facilitate collaborative innovation in interorganizational relationships. My underlying research is a study of eight technological collaborations between 10 companies. It involved more than 100 interviews with executives, managers and engineers who were engaged in development projects that created the infrastructure technologies for Internet commerce and mobile applications, as well as video and voice communication systems. Leading semiconductor and Internet services companies were included in the study. A fuller description of the overall research of which this project is a part is detailed in the June 2011 issue of *Administrative Science Quarterly*.ⁱ Synchrony emerged as an important objective in collaborations, as did detailed best practices on how managers organize and coordinate intercompany synchrony and the desire on the part of participants to shape industry-level synchrony using a hybrid approach. To further understand the emergence of synchrony in networked industry ecosystems, I adapted a “firefly” model from theoretical biology that was developed by Renato Mirollo and Steven Strogatz in 1990.ⁱⁱ Experiments with this extended model indicated the role of network structure in accelerating synchrony. A more detailed description of this research is scheduled for publication in *Advances in Strategic Management* in 2013.ⁱⁱⁱ

nals from other companies and attempt to get in step with their efforts in order to advance mutual interests. For example, two businesses might have done little more than engage in a sales or marketing alliance with each other in recent years, but that experience might be sufficient to spur new collaborations. A manufacturer scaling up production of a particular item might work closely with businesses that make complementary products to broaden the market; the same process may work in reverse.

Typically, reactive synchrony spreads among companies with existing relationships because a prior alliance or joint venture is sufficient to convince partners to accelerate their schedules in response to each other. Because it is merely an acceleration of existing timetables, reactive synchrony requires comparatively less investment and commitment in coordination than planned synchrony; it is often favored by companies that are reluctant to make major commitments without some external signal that the market is ready for new product introductions. A developer of telecommunications equipment, for instance, might try to accelerate the release of products that have next-generation technology if partners that are producing complementary products have released theirs. A prior relationship with another company may be enough to convince

managers to accelerate their product introduction schedules in response to the partner's actions.

Research shows that businesses often engage in reactive synchrony unintentionally or unbeknownst to their company's senior leadership.³ Mid-level managers may simply accelerate their schedules in response to a change in another company's product release date or when managers become anxious about their ability to keep pace.

The real power of reactive synchrony is that it can quickly spread throughout an entire industry's network. This is often seen in new industries such as mobile applications or clean technologies — entrants initially make decisions on their own timetables but decide later to get in step with another company. Industrywide synchronization begins when the product development activities of two companies overlap, perhaps unintentionally. Their product releases may prompt a third company to follow suit with its own product introduction, and so on. This phenomenon has been compared to the behavior of fireflies, hundreds of which can momentarily glow in chorus with no apparent coordinating mechanism other than the momentary influence that one exerts on its neighbors when it flashes.⁴

Hybrid Synchrony Synchronization between companies presents an inherent conflict: Even if the benefits are obvious, many companies are reluctant to cede leadership by aligning with another entity entirely, as in planned synchrony. Industry pacesetters can manage the rate of product development with an eye toward market impact and cost. Schedule changes — which can shift the demand for talent, funding, training and other assets — can be disruptive. Thus, many companies strive to minimize disruptions; they want others to conform to *their* schedule rather than vice versa.

Acknowledging this tension is helpful when selecting which approach to synchronization to follow. Planned synchronization increases the likelihood that it will occur more or less as desired. However, it can be difficult and costly to orchestrate across a broad network. Reactive synchronization, by contrast, has lower costs, but the process takes a long time to implement, and the outcomes are less predictable.

In industries that produce highly complex products, such as computers and telecommunications

equipment, industry leaders can overcome the weaknesses of planned and reactive synchronization by blending the two approaches. First, they proactively engage with the company or companies they absolutely must coordinate with; second, they “signal” their intentions to a selected group of other companies in hopes that the broader network of companies will respond.

I studied a pair of partner companies that used the hybrid approach to develop Internet-based middleware technologies that connect different proprietary systems. One company, a large computing systems business, collaborated intensively with a large enterprise software company. Over a three-year period, the two companies synchronized their product releases in an effort to persuade other businesses to adopt each new generation of their technologies. As a vice president of the computer company explained, “We not only want to align with [the software company], but also want to influence other developers to use our new technologies. The sooner they adopt our new versions, the more popular each will become; however, we are doing nothing more here than publicizing our collaboration.”⁵

As the example suggests, most of the expense of hybrid synchronization is associated with the advance planning that resembles planned synchrony. However, the signals sent by the coordinators in the hybrid approach are considerably stronger than those of a purely reactive approach because more than one company is making a substantial investment in the project.

As the collaboration between Intel and Microsoft demonstrates, the hybrid approach offers important advantages to coordinating companies and also to companies in the broader network. In planned synchronization, coordinators invest heavily in a few close collaborations to align product development and releases. They are thus better protected from unexpected changes in project scheduling than they would be if they were simply reacting to the scheduling decisions of others. This also increases the likelihood that surrounding companies will synchronize as well.

For example, coordinating Intel's microchip and Microsoft's software releases aligns the two companies' product launches while at the same time

providing strong signals to other companies that aspire to reap benefits from synchronizing with them; the outside companies gain when their own projects attain their respective goals sooner. The middleware collaboration mentioned above between the large computer systems company and the enterprise software company offers a good example. It led to numerous innovations, including middleware that supports new technology for virtualization, portals and authentication, as well as 18 patent applications, and a 9 out of 10 average rating for innovativeness by collaboration participants.⁶

Managing Hybrid Synchrony

How do organizations implement and maintain hybrid synchronization? A common starting point is proactive engagement in product development relationships with one or more industry partners. As companies begin intense collaborations, they can signal their actions to other organizations within their networks, including through formalized press releases and partner-to-partner communications. If appropriate, they can adjust product development and manufacturing schedules in ways that are attuned to the respective needs of the other companies.

The mechanics of coordinating collaborative efforts between two or more companies are complex and difficult. Not only do organizations have different cultures, objectives, demands and priorities, they are often sensitive about sharing their product development and innovation plans. Project synchronization requires that companies engage with each other on multiple levels. (See “Putting Synchrony to Work.”)

Phase Coordination Companies aiming to synchronize with other companies can begin with project-related work already under way. The focus should be on making the efforts parallel. By coordinating product development phases, participating organizations can test compatibility at critical junctures, thereby avoiding unnecessary costs. Parallel phasing also allows the coordinating companies to pursue the sequencing that will enhance the project’s overall outcome. In one case, for example, a silicon chip producer and a computer manufacturer agreed to hold off on chip design until the silicon research work was complete.

Pace Adjustment Once companies agree on sequencing, they can shift their attention to timing. Different companies often move at very different speeds. For example, a semiconductor company that I studied placed a lot of emphasis on product planning but was slow at development, in part because it had an extremely low tolerance for defects. The company’s managers became frustrated when a product development partner, a telecommunications equipment maker, was dismissive of long-range planning and wanted to rush into production of rough prototypes.

Ultimately, the two companies resolved their differences. The telecommunications company, for its part, agreed to invest more resources into planning; the semiconductor company, meantime, agreed to accelerate the pace of product development (without giving up on procedures that assured high quality). The companies agreed that, while prototyping was necessary, it couldn’t come at the expense of quality control. In other instances, partners have found that it’s possible to adjust the speed of individual phases (such as manufacturing or marketing) to help ensure product compatibility or to accommodate another company’s pace.

PUTTING SYNCHRONY TO WORK

How do companies use synchrony with other organizations to their advantage? The following steps provide a useful map for how the process can move forward:

- 1. IDENTIFY AND ASSESS OPPORTUNITIES.** Look for links between your products and those produced by other companies that may be used in conjunction with your own. Where links do (or could) exist, identify opportunities to mutually build on them through product development innovation and marketing.
- 2. SELECT PROJECTS.** Use cost/benefit analyses to prioritize opportunities and carefully assess the potential impact that synchronizing and collaborating would likely have on your organization — particularly its culture, resources and ability to manage overall operations. If new to synchronization, consider projects of limited scope.
- 3. IDENTIFY POTENTIAL PARTNERS.** Determine which companies make the most sense to synchronize with and how formal the relationship should be.
- 4. INITIATE DIALOGUE WITH KEY PLAYERS.** Determine mutual interest, and define scope and terms of collaboration. Clearly signal project intent to other companies that might opt to synchronize reactively.
- 5. MUTUALLY DEVELOP PROJECT PLANS.** Align project schedules and required resource commitments, and create a definitive agreement that addresses such contingencies as unforeseen delays, expenses and other obstacles to performance.

Successful intercompany synchronizations vary widely in form and execution because each reflects the unique nature of its participants, as well as its industry, objectives, resources and cultures. Shaping synchronization efforts to fit participant needs is essential to generating positive outcomes.

Sharing the Road Map It's important for companies that are trying to synchronize product development efforts to release new products at the same time — that's what tells other companies in the industry to react. However, if product releases are too infrequent, the companies that should react may miss the signal. Innovative companies often cue other companies about upcoming products with product-development road maps. Such road maps tend to be highly confidential and are used to align product releases, marketing events and other milestones with close partners. Some companies establish milestones far into the future to ensure sustained synchronization.

Working off common road maps enables companies to avoid reacting to product releases by partners that do not involve them. For example, the semiconductor company and the telecommunications company discussed above shared their respective road maps with each other. As a manager at the semiconductor company explained, "We have learned to be cognizant of our different planning and product development cycle times. In some cases, we convince [the telecommunications company] to align around our milestone. In other cases, we engage earlier and align around theirs, which requires slackening our process, and that's not easy to do."

Working off a partner's road map can be useful because it generates external deadlines around which companies can organize their own internal activities. Companies can use shared project road

maps to identify and allocate resources as part of their internal planning and resource allocation efforts. What's more, road maps can send a message to the other businesses in the network that when they react they will not be left facing a marketing embarrassment.

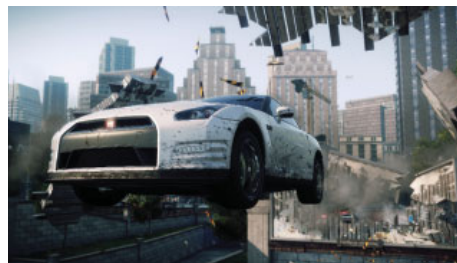
Encouraging Other Companies to Join in Synchrony

The best way to promote synchronization across a broad network of organizations is for coordinating companies to send signals that relevant projects are under way. Ideally, the signals should be sent to the whole network, even those members operating far away from the core. The signals are typically announcements in the trade or public media, or at industry events. For example, when Apple announces the development of a next-generation operating system, the goal is to motivate software companies to modify their product offerings to ensure compatibility and take advantage of features in the new operating system. Companies might also contact arm's-length alliance partners directly — a simple "heads up" that they are planning a synchronized product release.

In industries where companies routinely introduce new product versions, such as technology, entire networks often fall into a single rhythm. When an influential company adopts hybrid synchronization, its rhythm infects the whole network, increasing the likelihood that networkwide synchronization will occur. In a sense, coordinating companies function as leaders and help other companies achieve synchrony faster. In return, the coordinators enjoy a greater likelihood that the emerging synchrony will reflect their preferred rhythm.

The studies of spontaneous synchronization among fireflies mentioned earlier contain sophisticated mathematical models of synchronization processes that illustrate how rapidly it can spread across a network. To explore synchrony in industry networks, I adapted those models to reflect the proactive, reactive and hybrid synchrony types discussed above, thereby enabling

Sony and Microsoft, leading manufacturers of video game consoles, often coordinate product releases with game manufacturers.





Synchronization develops faster and more easily in denser networks with a greater number of alliances, such as the manufacturing and finance industries.

rigorous inferences about the speed with which synchrony can occur and the circumstances under which coordinators are most likely to succeed when establishing synchronous rhythms for their own industries. It turns out that both the speed and the circumstances affecting success depend on the nature of the industry's network structure.

The Impact of Network Structure on Synchrony

Industry networks can vary dramatically. In mature industries with large established companies, such as the semiconductor industry, many players have occasional collaborative partnerships with each other. In emerging industries, many new ventures haven't had time to develop alliances. Some networks are highly clustered, made up of subgroups within which partners are highly interconnected; in these subgroups, companies are quickly referred to other companies without working through vast referral networks. Other networks are less clustered and/or companies are less connected.

Network structure affects innovation synchrony in two ways. First, it influences how quickly synchrony develops. Synchronization develops faster and more easily in denser networks with a greater number of alliances, such as the manufacturing and finance industries. Perhaps counterintuitively, synchrony spreads more slowly in clustered networks where subgroups operate more independently but with highly interconnected mini-networks. Sometimes the subgroups are like separate cliques. While reactive synchrony can occur quickly *within* subgroups, it develops more slowly *across* them. Thus, it can take longer for subgroup rhythm differences in highly clustered networks to coalesce into a common rhythm that synchronizes the entire network.⁷

Second, network structure affects a coordinating company's ability to get other companies in its network to follow its product release rhythm. Hybrid synchrony achieves this more quickly in

denser networks than in sparser networks because there are more connections through which synchronizing signals can be sent. This occurs because the coordinator's hybrid approach piggybacks on the reactive impulses of other companies. Effectively, a noncoordinator relays signals from coordinators about their preferred rhythm.⁸

The implications are clear. Denser, less clustered industry networks, such as those organized around computer software, are likely to synchronize faster than networks that are less dense and more clustered, such as those organized around automobile suppliers.

Strategic Challenges of Managing Synchrony

Reaping the benefits of intercompany synchronization is costly. The biggest challenge for companies is maintaining sufficient levels of control. Planned synchronization offers the highest degree of control, but there are significant costs. Conversely, reactive synchrony affords relatively limited control in exchange for lower investment costs. Such trade-offs prompt many companies to adopt a more hybrid approach, which gives them project control in those areas they deem most critical yet allows cost savings in areas where they have more risk tolerance.

Sustaining an industrywide pace and rhythm for long periods, as occurs in the computer and auto industries, also presents challenges — especially when it involves hybrid synchronization. Here, coordinating companies can become so focused on their relationships with other companies that they inadvertently ignore the partner organizations they must have on board in order to be successful. It is therefore essential for companies to maintain broad and clear communications, especially with the network members who are critical.

Communicating across senior management ranks is vital because projects involving intercompany synchrony often have the potential to shape the

company's long-term performance. Clear communication with mid-level managers is also critical because they are the individuals charged with implementing projects and ensuring that they mesh smoothly with that of partner companies. Since these projects usually extend for months or even years, there is substantial risk that communications might break down, with serious and costly implications.

Synchronization within industry networks can provide companies with important mutual benefits. In industries where high interdependence is the norm, it is essential for managers to gain a better understanding of how synchronization works and the potential pitfalls across their collaboration networks. Companies need to take stock of their current and potential positions within their industries and markets. Managers of companies in younger industries need to explore how alignment with other companies can strengthen their company's position — and how their position might be disrupted. Managers of companies in more mature industries should examine how the structure of the industry might change and how active they want to be in promoting those changes.

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