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### Deploying business ecosystems to cope with ecological transformation

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# DEPLOYING BUSINESS ECOSYSTEMS TO COPE WITH ECOLOGICAL TRANSFORMATION

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A hydrogen bus in use in Central London, England.  
Source: Sludge G.

Arnoud De Meyer is Professor Emeritus and former President of Singapore Management University. He is an alumnus of the Vlerick Business School, taught and had several leadership roles at INSEAD, and was the dean of the Cambridge Judge Business School. He is an internationally recognised and widely published scholar in R&D and Innovation Management, Manufacturing Strategy, and International Management. Currently he is the Chair of the Temasek sponsored Stewardship Asia Center (Singapore), member of Hong Kong's University Grants Committee, Chair of EQUIS Accreditation Board and independent director of Viva Energy Australia (Melbourne), Banyan Tree Resorts and Hotels (Singapore), and upGrad (Mumbai, India). He recently published "Ecosystem Edge: Sustaining Competitiveness in the Face of Disruption" and "Building Excellence in Higher Education: Singapore's Experience"

At a time when businesses must innovate quickly and in support of sustainability, "going it alone" is no longer the most effective or efficient model. Business ecosystems – networks of companies, researchers and other stakeholders each involved in a given value chain – offer an effective route to companies seeking not only to find new advantages, but to drive wider systemic change. When innovation takes place through ecosystems, often, the results are faster to diffuse through an industry or value chain. To address needs of the ecological transformation like the transition to clean fuels, this is exactly what is needed; it is no use having commercially viable and scalable sources of green hydrogen if there are no trucks ready to use the fuel, for example. This article outlines the characteristics of successful innovation ecosystems, and the practices and mindsets that business leaders must adopt to become "ecosystem leaders."

Nearly 15 years ago, when I was still working for the University of Cambridge, I observed that entrepreneurs building businesses around the university were acting quite differently from what I had learned about entrepreneurship in the United States and in particular on the West Coast. I noticed that these UK based entrepreneurs preferred to work in loosely coupled networks, in contrast to the USA where companies strive for dominance and individual entrepreneurs are strong public figures. Faced with uncertainties in technology and markets, UK entrepreneurs around the University relied on these networks to reduce the impact of such uncertainties. Later my co-author Peter Williamson and I described in our book on the Ecosystem Edge<sup>1</sup> how loosely coupled networks or what we later called business ecosystems, were often deployed by companies to innovate in the face of uncertainty, share risks, scale up faster, react flexibly, and build shared intellectual property.

<sup>1</sup> De Meyer A and P.J Williamson. 2020. *Ecosystem Edge: Sustaining Competitiveness in the Face of Uncertainty*. Stanford Business Books.

## BUSINESS ECOSYSTEMS AT THE SERVICE OF ECOLOGICAL TRANSFORMATION

This is precisely what is needed to deal with the challenge of ecological transformation. Take for example the deployment of green hydrogen as a carrier of energy or a way of storing energy. We know that using hydrogen is less efficient than relying solely on electricity, as there are significant losses in the transformation of electrons into molecules. But in some applications, such as heavy trucking or shipping, or storing solar based energy over a long time, and where batteries are less effective, converting electricity into hydrogen may well be a good solution. Yet, the uncertainties and the required investments are very high. Therefore, it's logical that the producers of green hydrogen, manufacturers of powered trucks, potential hydrogen retailers and transport firms that would be prepared to use hydrogen powered trucks, have to come together in a consortium to share the risks in the face of uncertainty. They need a business ecosystem to address the hydrogen challenge.

Collaborating in loosely coupled networks is not a new form of organization. In fact, it is probably older than the multi-divisional firm that has become dominant today. But we have seen over the last 15 years a revival of the concept. Companies like Alibaba Taobao, the dominant Chinese online shopping mall, have been able to scale up very fast by collaborating in an ecosystem with firms that could provide financial services, last mile delivery, etc. The French software company Dassault Systemes, has been able to apply its algorithms for product lifecycle management (PLM) systems, originally developed for aviation or automotive applications, in many other sectors, such as fast-moving consumer goods, electronics, pharmaceuticals, mining, fashion, etc. They did so by collaborating closely with leading companies in each of these sectors, to understand how design was performed.

They also built an ecosystem of smaller specialized suppliers who could help them understand some of the specific challenges related to design and development in each of these sectors. Haier, the world's biggest producer of white goods, is another example. They built a platform on which thousands of micro-enterprises collaborate together to develop new products. Platforms for supply chain functions are common in industry, but Haier's platform is quite different. It can mobilize resources inside and outside the company, it doesn't limit membership on the platform nor specifies who does what and has an organic approach to tapping the capabilities of many organizations and marshalling resources that help shorten product development and manufacturing ramp up time<sup>2</sup>. It is a platform that is focused on agility rather than efficiency.

*Business ecosystems [are] often deployed by companies to innovate in the face of uncertainty; to share risks, scale up faster, react flexibly, and build shared intellectual property*

Relying on ecosystems is not exclusive to commercial applications. I have previously documented how the Building and Construction Authority (BCA) in Singapore is developing an ecosystem to improve productivity in the built-environment sector by relying on Building Information Management systems (BIM), investing in prefabricated modules and using alternative materials such as mass engineered timber<sup>3</sup>. This requires the sector-wide mobilization of partners that may not always be used to collaborate with each other, such as developers, construction companies, engineering companies, architects and regulators.

The cases we described are successful examples of innovation. We argue that part of their success is because they were prepared to build loosely coupled networks akin to biological ecosystems. Such ecosystems have three fundamental characteristics. First of all, it is always about creating additional value, value that a single company could not produce on its own. Secondly, it is about mobilizing a network of organizations and individuals, very often working as peers. And finally, the partners in the ecosystem will co-evolve their capabilities and roles and align their investments. Doing so they often build common IP, which we consider to be ecosystem goods, i.e., knowledge that is common to the ecosystem and differentiates it from competing ecosystems.

We have come to the conclusion that almost all organizations work in ecosystems, but often unconsciously. The challenge we see is how you take leadership in such business ecosystems and steer them in the direction that is favorable to your organization and to ecological transformation.

## HOW TO DEVELOP NEW BUSINESS ECOSYSTEMS

Through our many case studies we learned that there are 6 steps needed to kickstart and develop an effective business ecosystem.

First, your partners need to trust that you are truly prepared to work in a partnership of peers, not that you want to control them. Coordination in business ecosystems is built on trust. We saw several cases of large organizations that wanted to leverage the capabilities of smaller specialized startups and decided to acquire them and control them. In many of those cases the intellectual assets were embedded in people, many of whom left after such an acquisition. It is no doubt more difficult to work with such smaller organizations in an ecosystem, but it is probably more effective to collaborate with them.

<sup>2</sup> Ferdows K, H. L. Lee and X. Zhao 2022. How to turn a Supply Chain Platform into an Innovation Engine, HBR July-Aug, p.126-133.

<sup>3</sup> De Meyer A and S. Mittal. 2019. Developing the DfMA ecosystem in Singapore's Construction Industry, SMU Case Study SMU-19-0036.

The issue of trust becomes even more important when some of your partners are stakeholders with non-commercial objectives, e.g. communities, action groups, government and NGO's. This is often the case when we invest in ecological transformation.

Faced with uncertainty about markets, an ecosystem may operate more effectively when it can co-opt foundation customers, who can provide a better insight into what is needed to create additional value, and who have sufficient incentives to collaborate. Going back to the example of hydrogen, it is absolutely essential to include a transport operator in the ecosystem who can provide a deep understanding of how to use hydrogen as an energy carrier. And the example of Dassault Systemes illustrates that also very well: in each of the sectors in which they wanted to deploy their PLM systems, they worked with a partner who had a deep understanding of the sector and wanted to improve its own design capabilities. For example, with Gucci, they were able to understand fashion design, with Novartis to understand development in pharmaceuticals, or with BHP Billiton to get knowledge about the mining sector.

To cope with uncertainty, the partners in a business ecosystem need also a roadmap. Such a roadmap doesn't have to be very detailed, but it helps the partners in the ecosystem to align their investments and to develop capabilities that will contribute to the ultimate value that the ecosystem wants to deliver. Quite often such road maps are developed together. We saw how ARM, the Cambridge headquartered designer of RISC processors, used in smartphones, developed such a road map during a yearly conference in Cambridge. The conference brought together all the players in the value chain, such as chip designers and producers like TSMC, manufacturers of the machinery for producing and testing chips like ASML, the big OEMs of smartphones like Apple, Samsung, Huawei and others, and software producers. Amazon Web Services (AWS), the dominant provider of cloud hosting, shares its road map during its annual conference with the thousands of service providers that are available in the marketplace for AWS cloud services.

To build effective partnerships the ecosystem leader must analyze which partners are needed, communicate the value of joining, and invest in lowering, if needed, the barriers to entry to join the ecosystem. For Alibaba it may not be that difficult to communicate the value to suppliers of services and goods of joining their platform, but in many cases, they needed to help small suppliers with loans and technical support to get onto the platform.

Finally, when building an ecosystem, one may benefit from bringing on board partners that already have their own often smaller ecosystems. We saw an example of that in Singapore,

when Rolls Royce in the late 2000s, wanted to build a factory of airplane engines. They needed a large group of skilled workers and engineers, which were not available in Singapore. Rather than going directly to the universities, polytechnics and the Institutes for Technical Education to encourage them to develop programs that would graduate engineers and technicians with a deep understanding of aeronautics, they worked together with Singapore's Economic Development Board, which had already its whole of government ecosystem ready to support Rolls Royce.

## HOW TO SUSTAIN BUSINESS ECOSYSTEMS

While we have been guided in our research by successful case studies of innovative companies, we need to acknowledge that quite a few of these ecosystems fail. Such failure is often due to three sources: the inefficiencies of working with partners along with the ensuing potential transaction costs, an unfair distribution of the value that might be created, and a lack of understanding what leadership in a business ecosystem requires.

*All organizations work in ecosystems, but often unconsciously. The challenge is how you take leadership in such ecosystems and steer them in the direction that is favorable to your organization and to ecological transformation*

To overcome the inefficiencies inherent in ecosystems we are convinced that creating mechanisms that help build trust among the partners is probably the most important challenge for the ecosystem leader. We saw how companies were building portals to smooth the path of data exchange between the ecosystem leader and its partners and amongst its partners, always without trying to control all the exchanges. You can also develop a set of systems and organizational solutions to codify and manage the exchange of complex know-how. While we don't argue

for writing extensive contracts, we see the value of contracts that focus on high level outcomes, leave room for flexibility, are perceived to be fair across the whole of the ecosystem, and in particular are clear about dispute resolution. Finally, an ecosystem may suffer from free riders or partners who don't behave according to what the value creation requires, and thus one needs to agree on governance standards and if necessary, penalize bad behavior.

In most cases one develops and grows an ecosystem not for purely philanthropic reasons but because one wants to monetize one's contribution to the value creation. It is obvious that the bigger the value that one creates, the easier it is to distribute said value among the partners in the ecosystem. As always, the bigger the pie the easier it is to divide it. But we also advise participants in an ecosystem need to think about what their unique contribution is and how they can protect it. This has often been called the keystone, like the stone at the top of an arch or a dome that is essential to keep the construction together. It may be a small, quasi-insignificant contribution, but an essential one to the value creation by the ecosystem.





The Water Users Associations Development Project involves many stakeholder and helps improve irrigation and drainage in over 50,000 hectares of land in Azerbaijan. Source: Allison Kwesell, World Bank Photo Collection.

We saw many different keystones. Alibaba had control over data generated through the billions of transactions. For Dassault Systemes it was the quality of the algorithms that are hidden deep down in the software for PLM. For ARM it was the robust design of a quasi-universal RISC processor. And of course, once you have a keystone, you can charge “toll”. But it is important to the ecosystem leader to ensure that the distribution of the value created by the ecosystem is perceived to be fair.

Finally, one should realize that leadership in an ecosystem requires far more than traditional collaborative leadership. A successful ecosystem leader must believe that there is an opportunity to create new value for potential customers combined with a deep conviction that no single company can unlock the value opportunity acting alone. It requires a relentless focus on growing the size of the overall ecosystem pie. You must also be focused on attracting, engaging, and motivating people who are not in your organization, who are not necessarily your own employees.

Effective ecosystem leaders are good listeners. They have the capacity to listen, both to those within their own organization, but also to the weak external signals and messages that come from partners. Your partners may not want to tell you what they really think. Or they may not be able to express their tacit knowledge. Effective ecosystem leaders have the

*To build effective partnerships the ecosystem leader must analyse which partners are needed, communicate the value of joining, and invest in lowering the barriers to entry to join the ecosystem*

ability to encourage and nudge the ecosystem partners to respond flexibly to uncertainty. And they deploy their soft power, that comes from their vision, their credibility, and the evidence they have to bolster their case, to influence their partners. They get things done through a community of peers.

In fact, it is all about leading beyond your own organization. It is about building consensus and ensuring that a wide group of peers takes ownership of most of the decisions you will make as an ecosystem leader. That requires you to be an active networker, and to become a trusted source of knowledge and information, that others often haven't yet spotted. And finally, there will be conflicts in an ecosystem. Partners will disagree with each other. Therefore, an ecosystem leader must be prepared to embrace dilemmas

and diversity. Without ever forgetting what is the overarching identity of the ecosystem and the goal that you want to achieve in terms of value creation.

I am convinced that ecological transformation will require companies and governments to innovate in the face of enormous uncertainties. Business ecosystems are the most appropriate organizational design to share the risks, mobilize the assets and develop the required flexibility. To manage the ecological transition effectively we will need to become well versed in managing business ecosystems.