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How Business Ecosystems Unleash Business Value



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- Create and develop industrially applicable tools and techniques that deliver competitive advantage.
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Further information

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Executive Summary

The world is a complex place. Firms in the private sector compete in increasingly competitive markets, with more exacting solution-driven customers. Public sector organisations juggle a greater demand for services, with fewer resources. Society as a whole faces climate change, resource shortages, the pressures of population growth, and demographic change. No wonder corporate executives, emerging entrepreneurs, and public sector leaders lie awake at night worrying about how they can make their organisations better at what they do, more successful, and more resilient.

Complex challenges can require collaborative and innovative solutions. Advances in technology, for example, have created enormous opportunities for organisations to grow and improve standards of living, to tackle health care and education challenges, and to deliver economic prosperity. Consider a small agricultural producer in rural India, who is now able to use mobile communication to anticipate weather changes, improve food production and ultimately help reduce hunger in their local village.

It is becoming clear that organisations acting alone are not best placed to capture the opportunities available or solve the challenges that face them. But how can organisations act most effectively to realise the problem-solving potential of modern technology, take advantage of opportunities and secure more lasting success? Companies have already explored different forms of bilateral collaborative mechanisms, such as alliances and joint ventures, but more is needed.

Understanding and engaging with the broader ecosystem is the answer. An ecosystem is a constellation of diverse players, coalescing around a particular challenge, collaborating to deliver a complex solution. A handful of players, such as Apple, Google or the lending NGO platform, Kiva, have shown what can be achieved by leveraging the power of the ecosystem.

Despite the opportunity, the study of ecosystems is still in its infancy. Surprisingly little is known about how ecosystems function, or the roles required within ecosystems to allow them to function optimally. Many executives would struggle to describe the full complexity of the ecosystem they inhabit or the players within it.

We set out to find out more about how ecosystems operate, hoping that this would allow us to construct a framework that managers could use to navigate and shape their ecosystem to their advantage. For our study we looked for highly complex and innovative ecosystems, settling on the business ecosystems in three highly successful, but diverse cities: London, Vienna and Chicago.

We chose to study business ecosystems of cities (referred to as city ecosystems elsewhere in the text) because they are an extreme

example of an ecosystem. Getting the city ecosystem to work involves the coordination of education, commerce, entrepreneurship, governance, infrastructure, and much more besides. City ecosystems are massively complex. Deconstruct these ecosystems and it should be possible to apply our understanding of them, and the lessons we learnt, to other ecosystems that corporations inhabit.

As we hoped, our research revealed a number of important insights for organisations. Significantly we discovered that there is a specific logic to the inception, functioning and structure of the ecosystems of which players in an organisation need to be aware. Finally, to ensure that we can use these findings in more private-sector-oriented settings, we tested the framework in the publishing/educational ecosystem. Findings were directly applicable.

First, **ecosystems coalesce around a complex challenge or a goal and encompass all the players that share or relate to that goal/challenge in one way or another.**

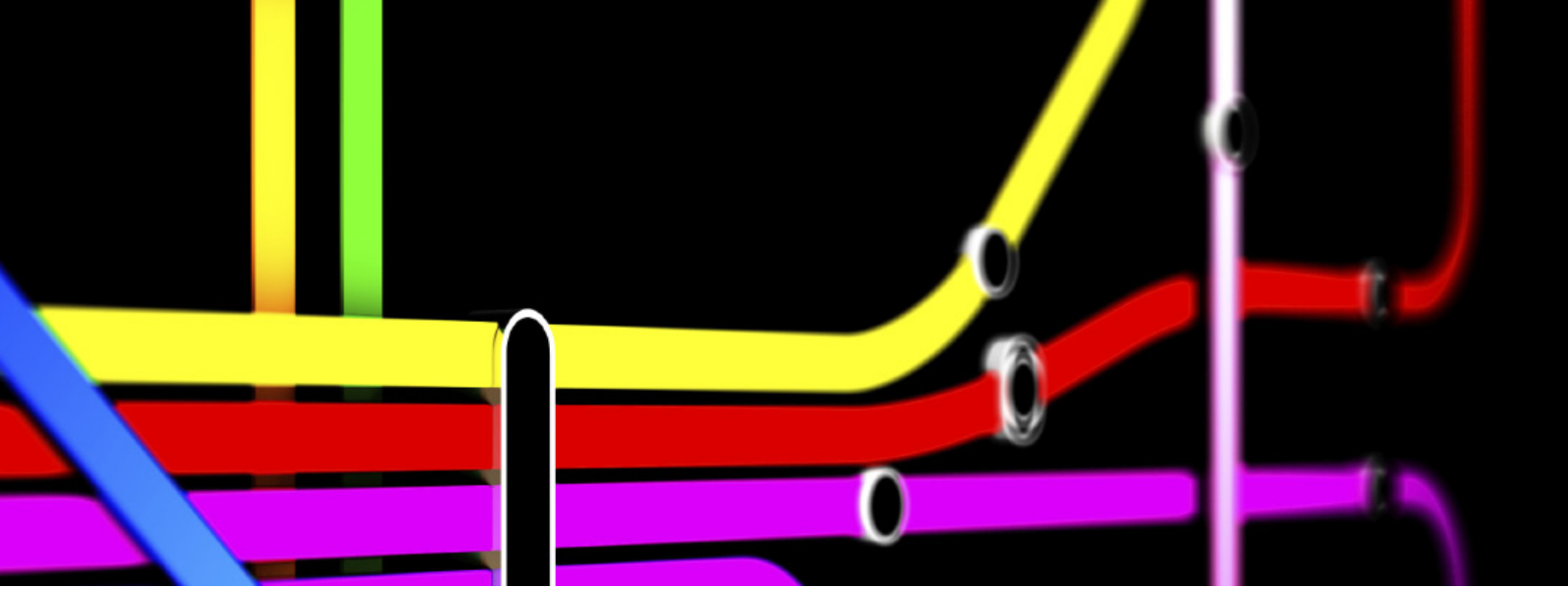
City ecosystems, for example, encompass a diverse set of public and private players that can contribute to the attainment of the same complex objectives – a good quality of life, high employment, and a strong economy – as well as many of the more specific sub-objectives that underpin those complex objectives, such as health care or education provision, and crime reduction.

Second, players can contribute to the attainment of complex objectives or sub-objectives by adopting one or more of **ten universal roles – ecosystem job descriptions**. The ten roles can be grouped into **four types, depending on the contribution of the player**: some players provide resources; some use those resources to resolve different sub-challenges; some construct a complex solution from different sub-solutions; and some are architects who govern the dynamics of resolving complex challenges.

The roles are:

Talent (e.g. colleges, universities) and **capital** players (e.g. private equity firms), which bring resources to the resolution of problems.

Scales (e.g. large firms), **niches** (e.g. small firms) and **innovators** (e.g.



entrepreneurs) that resolve the parts of problems (sub-challenges), where, respectively, economies of scale and scope, nimbleness and agility, or a novel approach, are needed.

Infrastructure (e.g. transport system), **connectors** (e.g. business network) and **facilitators** (e.g. incubator) are the glue that binds together different sub-solutions (e.g. incubators bring capital and entrepreneurs together).

And finally, the **hub** (e.g. city government), with the help of **promoters** (e.g. city business promotion agency) and guidance of **influencers** (e.g. national government), directs the whole ecosystem towards the common goal – the complex objective that they came together in order to solve.

When an organisation understands the roles in the ecosystem, and its own role therein, it can do its job more effectively. In turn, this can lead to greater resilience and sustainable success within that ecosystem. It may reveal new opportunities. Deciding to play a more prominent role in resolving an ecosystem challenge can be an attractive growth strategy, for instance. Indeed, deciding to lead an ecosystem in finding an innovative solution to a complex problem can help overtake competitors and even disrupt markets.

Organisations such as IBM, Amazon, NASA or Kiva have already pledged their strategies to tackling complex challenges. And for other organisations many complex challenges remain that have yet to be tackled properly.

Whether an organisation decides to improve its role in the existing ecosystem, change or add to that role, or catalyse a new ecosystem, our research suggests that the starting point is the same: understanding how both the current and potential future ecosystems work in the context of that organisation.

Map the ecosystem:

- **Identify the existing players.** Who are the participants? What are their business models, value propositions, value delivery and accountability spreads?
- **Identify and frame the complex challenge.** What is the ultimate goal that unites all the players? What is the challenge/need of the ultimate customer(s) of the ecosystem?
- **Identify the complex solution.** How is the challenge broken down? What are the constituent parts of the challenge (sub-challenges)? How are different sub-challenges being solved?

How are the sub-solutions integrated to address the complex solution? Take a look at the business models of all the players and construct the ecosystem business model!

Analyse the ecosystem:

- **Identify the ecosystem roles.** What roles do they play? What is your role? Who brings resources, solves the problem, manages the process?
- **Identify the relationships.** What are the rules of the game? What are the relationships like?
- **Identify the flows.** How does the money flow? Where does the power lie? What are the consequences for where the margins and profits lie?

Identify and implement innovation opportunities:

- **Identify the gaps and how you can help tackle them.** Are all the sub-challenges solved optimally? Can you provide a better service/solution to your part of the challenge or another part of the challenge? Do the integrating mechanisms work or could you take a more prominent role as an integrator? Is the solution that the ecosystem provides optimal? If not, could you enable a better solution, possibly by finding a better way of dividing up the challenge and facilitating the ecosystem to solve it?
- **SUPPORT THE STATUS QUO if you agree with the hub's current challenge-solving approach.** Improve the existing solution by improving how you perform your existing role, or by taking on a more prominent role in resolving the problem. Could you become an integrator of (a part of) the solution? **OR**
- **DISRUPT THE STATUS QUO if you think that there is a better way to resolve the complex challenge.** Introduce new or different services to solve the problem. Can you think of a better way to solve the problem? Providing new services or different services? Propose a new service to the market, consider and begin to assemble the ecosystem that will help you to deliver it. Prepare to be the hub.

Review and react:

- Evaluate the likelihood of the success.
- Review and react to the continued evolution of the ecosystem ■



Introduction

Companies are constantly searching for ways to achieve sustainable success. Opinion on how to achieve that success has differed over the last fifty years or so. In the past, the focus of strategic management has shifted from analysing the external environment and industry sectors, to building internal capabilities, from managing hypercompetition and navigating to blue oceans where there is limited competition.

Increasingly, however, our research suggests that the path to success is linked to another aspect of organisational life – the ecosystems within which firms operate. And that by understanding those ecosystems, and their role therein, companies can create an ecosystem advantage, allowing them both to create new opportunities and to seize opportunities that might otherwise have eluded them.

The emergence and importance of ecosystems is not surprising, especially in the complex and interconnected world in which we live. Consider how ecosystems have developed.

First there were markets. According to the economists, markets were efficient at matching supply and demand; however, markets had shortcomings. In conditions where markets were inefficient or would fail, where the information was not perfectly distributed, where it was difficult to sign a satisfactory contract, where specialised investments were needed, for example, companies were better able to solve coordination problems internally through the management of the workforce and incentives.

However, companies have their own shortcomings. They are, for example, often criticised for being bureaucratic and inefficient. To address some of these issues, to become more efficient, and to access complementary knowledge, many firms forged bilateral alliances, joint ventures, and other forms of collaborative arrangements with selected partners.

The success of this hybrid model – markets, companies, and collaborative initiatives – prompted companies to consider more carefully how they might organise their activities to meet their

objectives. They considered how they might push collaborative models further, for example. Take open innovation, where firms innovate with other participants beyond their boundaries, or virtual enterprise, a temporary alliance of organisations that combine to exploit business opportunities, and are facilitated by IT.

These large-scale organisational models and collaboration initiatives can be seen as precursors to more sophisticated and fully formed, intentionally designed ecosystems. Add to this advances in IT and it becomes clear, with corporate success stories like Google and Apple, that ecosystems can be an extremely effective way of coordinating effort between organisations to achieve a common purpose, allowing an unprecedented level of specialisation, scale and agility.

All firms operate in one or more ecosystems, whether they realise it or not. As ecosystems are, by their nature, adaptive, organisations have choices about the role they can play in ecosystems and their actors shape the nature of these ecosystems. Unsurprisingly, there is growing interest in ecosystems, as companies become more aware of the ecosystems that they inhabit, and think about how they can build, design and shape them.

However, ecosystems are a relatively poorly understood phenomenon. What we do know is based on the specific cases of a couple of high-flying ICT companies. While providing a source of inspiration, it is debatable to what extent it is possible to draw general conclusions from such specific and limited examples – especially conclusions that have value for more complex ecosystems in sectors such as energy, utilities, education, health care and public services.



Understanding ecosystems

Companies need to understand the fundamental characteristics of ecosystems before they are able to maximise the value they obtain from the ecosystem, whether that is by adopting a particular role or reconfiguring the ecosystem in a more favourable way. It is no use merely applying practices from simpler ecosystems to more complex ecosystems, for example.

How are ecosystems formed? Are they created by a single player? Can they spontaneously emerge?

What are they made up of? If they are not simply networks, supply chains or alliances, then what are they?

How are they structured? Can we reduce all the structures simply to a hub role (the orchestrator of the ecosystem) and then niche roles – all the others?

How do they function? What are the mechanics involved? We know that it is the job of the hub to develop and facilitate the development of governance rules for ecosystems.

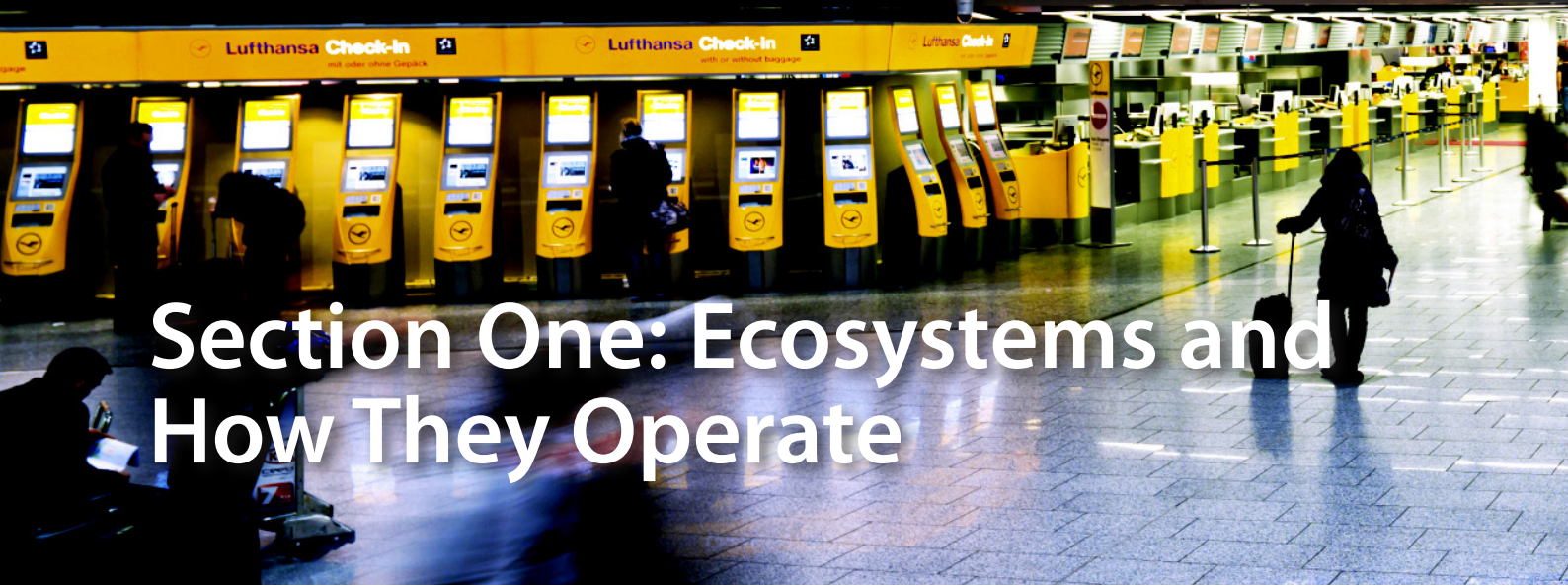
To explore these questions, we examined in great detail some of the

most complex ecosystems of all – the business ecosystems of cities.

Why cities? What do they have to do with the ecosystems that corporations inhabit? Cities are, of course, much more than basic urban and cultural services. They include a vast and highly complex business ecosystem that encompasses commercial, productive, entrepreneurial and educational elements.

City business ecosystems, which we will refer to as city ecosystems in this paper, need to coordinate all aspects of economic activity to achieve three overarching and interrelated goals, as revealed by our research, namely: improving the quality of life, creating jobs, and growing a strong economy. Furthermore, city governments – the hubs of city ecosystems – have increasingly been adopting technology and innovating around how they deliver these goals.

Where they differ from other business ecosystems is not in the fundamental principles, mechanisms, or structures but rather in size, complexity and maturity. Thus, studying and understanding how city business ecosystems are managed successfully, provides useful lessons for organisations with respect to their own ecosystems. ■



Section One: Ecosystems and How They Operate

The world is full of complex problems, many of which challenge national governments, cities, and corporations. How do you ensure that seven billion people are fed, educated, have work, and receive health care? At one time devising solutions to these challenges would have been left to governments and large public bodies. This was the best means of organising coordinated solutions that focus individual effort towards a common goal. These large systems, however, come at a price: they tend to lack flexibility, are often slow and not always innovative.

For some time this was considered a price that had to be paid in order to solve complex challenges. However, it has become apparent that large organisations and governments are not the only mechanisms for achieving the coordination needed to resolve complex problems.

Advances in technology have enabled instant communications and an unprecedented level of transparency, meaning that it is possible to collaborate much more effectively across organisational boundaries. In turn this means that smaller, more agile, more innovative players can dare to think about solving more complex problems together. Citizen customers can demand more complex integrated solutions rather than just individual products and/or services.

In the twenty-first century, operating through an ecosystem allows society to tackle complex problems in a faster, cheaper, and more innovative and entrepreneurial way, leading to better solutions and new opportunities.

Today, problems that could not be tackled before, or at least not with the same level of effectiveness, can be resolved by a newly formed ecosystem. For example, a number of African countries have used mobile infrastructure to jump-start the supply chains in remote areas. A pharmacist in rural Kenya can order drug supplies via her mobile phone. In other words, a complex problem that needed resolving, combined with technological opportunity, led to the emergence of an ecosystem.

However, ecosystems do not emerge just around an entirely new opportunity, or a challenge that has never been tackled before. They also emerge to find a better solution where an existing organisational solution is becoming ineffective. In the developed world, for example, telecommunication or transportation systems that 30 years ago represented rigid public systems are now ecosystems made up of diverse sets of players.

Existing ecosystems can reconfigure and regroup around a new challenge. In the past a pharmaceutical company might have

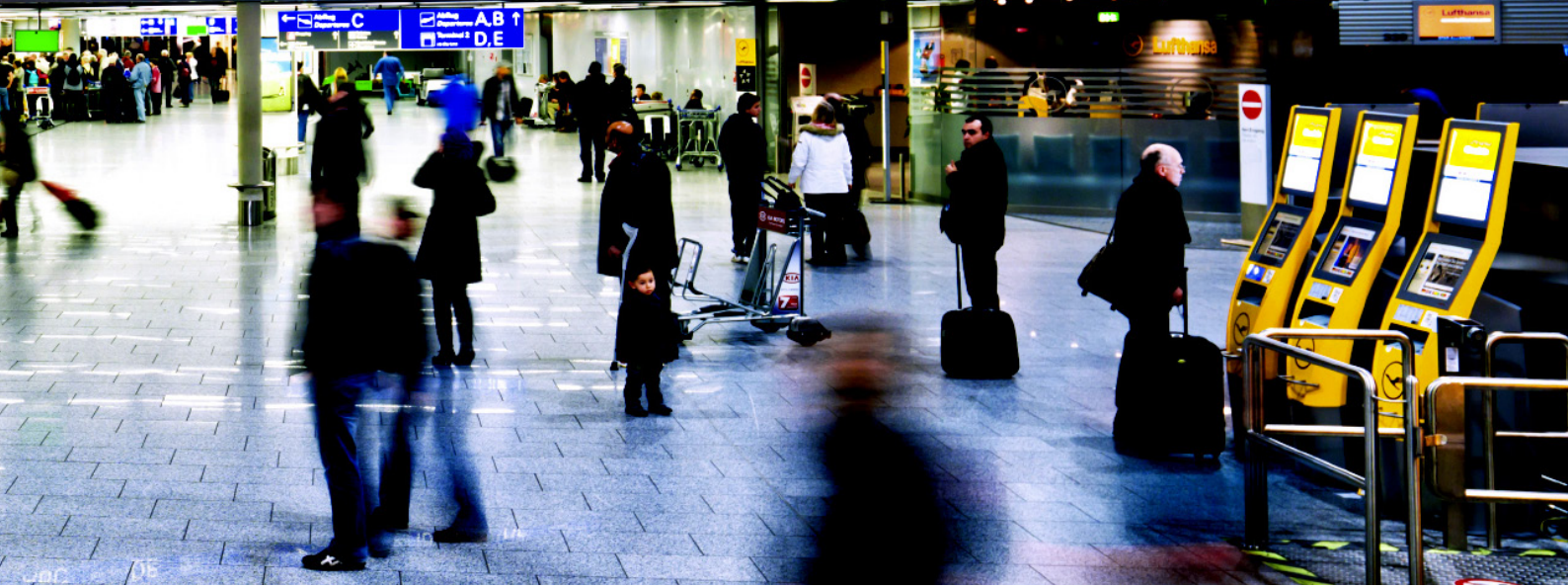
viewed itself as a drug manufacturer and be part of an ecosystem of different players, including suppliers, and contract research organisations, for example, that would help them achieve that goal. Today that same company might see itself as being in the business of health provision (a higher-order objective). They will therefore reconfigure their ecosystem to help them achieve that complex objective, while at the same time extending their list of partners and stakeholders that can help in tackling different sub-objectives. For example, IT companies may be able to help track patient compliance in a better way.

Thus, we suggest that ecosystems are defined by the challenge they are trying to solve or the objectives that they are trying to reach.

Ecosystems are the mechanism used to coordinate individual efforts to successfully resolve complex problems. They are created when it becomes apparent that an existing complex challenge can be resolved in a better way, or that the ecosystem may provide an opportunity to tackle a complex challenge that hasn't been tackled before. A complex challenge is an ecosystem waiting to happen, an ecosystem opportunity waiting to be exploited.

Our research indicates that **ecosystems are constellations of players – private companies, public institutions, individuals – that participate in resolving a complex problem.** In an economic context, city business ecosystems have consistently struggled with three complex challenges: ensuring that there are jobs, good quality of life, and a strong economy. Due to the extreme complexity of these problems and the sheer numbers (e.g. hundreds of thousands, even millions) of people needed to achieve these goals, they have been organising themselves to deal with this complexity using the ecosystem logic for a very long time.

How do ecosystems function? Ecosystems are more complex and work differently from a set of bilateral alliances. Complexity stems from the diversity of the relationships, the number of these diverse relationships, and the interdependencies between them. Furthermore, many of these relationships are informal, with the companies needing to influence each other indirectly.



Our investigation of three leading cities suggests that ecosystems function through the roles – the ecosystem job descriptions – that the participating players occupy. Roles define how a specific player within the ecosystem participates in solving the ecosystem’s grand challenge. High-performing ecosystems need all the roles to be performed.

Some ecosystem roles have been identified by researchers, notably

the role of the hub, the ecosystem orchestrator responsible for defining the rules and structures of the ecosystem. However, in complex ecosystems such as cities we **found that there are ten different roles or ‘ecosystem job descriptions’**. These roles cover areas such as resource development, the resolution of different problem areas, the connection of elements of the solution, and ecosystem governance, creating an overall complex solution■

Box 1: Methodology

City business ecosystems make a good research subject for several reasons.

At some point in their development, people in cities, through government, public bodies and other organisations, inevitably turn their attention to finding solutions to complex economic challenges, such as creating citizen employment, improving the quality of life and growing a strong economy.

At city level, achieving these objectives is extremely difficult and requires many, highly diverse, multi-sectoral sub-objectives. Consequently, and thanks to geographic proximity that enables and assists coordination, cities have used ecosystem-like functioning for a very long time. Moreover, many city governments (city hubs or ‘ecosystem managers’) have continually embraced the latest technology to enable their ecosystems to function more effectively. Economic pressures have been a particularly strong motivating factor in this regard.

For our study, in order to isolate the key characteristics and dynamics of successful ecosystems, we selected cities that were considered the most innovative and successful according to the core objectives of quality of life and a thriving economy.

The cities we selected were **Vienna, London** and **Chicago**. We started from the city government, gradually expanding the coverage of players through secondary sources (mostly websites and publicly available reports). Eventually, we mapped all the important players (over three hundred for the three cities).

Using the secondary sources we created a taxonomy of players according to the function that they performed in the ecosystem. To achieve this we tagged each player with a ‘quote’ – a paragraph of information from the secondary sources that explained the objectives and functioning of the players. Then each player had their quote summarised to create player IDs that explained that player’s objectives and function.

We then selected the most relevant players on the basis of how crucial the ecosystem objectives were to them, and performed interviews based on a structured questionnaire. We interviewed the most important players, particularly where their function involved coordinating or facilitating the resolution of one of the complex challenges – the three overarching objectives of quality of life, jobs and a strong economy.

We used interviews to understand how the ecosystems are organised and how they function, as well as to understand the functions of the players. By analysing all of our ecosystem data we were able to isolate ten ecosystem roles that a player might adopt in helping to solve the ecosystem challenge.

We applied the thinking that underpins the ecosystem frameworks (see Figures 1 and 3) that we constructed from our analysis of the three cities to another ecosystem to check that the framework is universal and can be applied to other non-city ecosystems.

As well as constructing the ecosystem framework, we also created a tool to help leaders apply our framework and form and manage ecosystems that are designed to tackle complex problems, such as those found in education, finance, defence, industrial engineering, and many other sectors (Box 2 provides the main steps of this tool)..

Section Two: A Tale of Three Cities – The Anatomy of an Ecosystem

1. COMMON PURPOSE

Cities are relatively large permanent settlements. Economically they represent complex systems built on common infrastructure (e.g. utilities, housing, and transportation), with a high concentration of people and businesses.

Overarching objectives

Ecosystems coalesce and are united around the desire to meet high-level, complex objectives. In the case of the cities that we studied, these objectives were to promote a thriving economy, create jobs and foster a good quality of life.

While these will always be high-level, complex objectives of city ecosystems, their emphasis varies. So, for example, of the cities that we studied Vienna has a higher emphasis on quality of life, relative to the other two objectives, compared to London or Chicago.

Furthermore, ecosystems vary in the sub-objectives that are used to meet the high-order, complex objectives. In the case of cities, for example,

sub-objectives for the high-level objective of creating a strong economy might include promoting the city to attract large players, improving airports and other infrastructure, and developing home-grown small- and medium-sized enterprises.

For quality of life, sub-objectives might include better underground infrastructure, and increased skills level, while for job creation they might include developing local skills, or attracting large employers to the city. Sub-objectives may overlap and help meet more than one high-level objective. In the case of the cities we looked at, for example, Chicago prioritises citizen safety as a sub-objective to achieve the quality of life objective. In London, by contrast, affordable housing is a priority.

Alternatively, take defence, for example, and an ecosystem where the overarching goal is to ensure the safety of the country for a given price. Here the emphasis on defensive or offensive systems, and the level of sophistication of those services, may change depending on factors such as strategic objectives, budgetary constraints, or the level of threat. As a result, defence capabilities, whether air, land, sea or cyber space, may be

How Ecosystems Function



Figure 1. How the City Ecosystem Functions



enhanced or cut back accordingly. For example, cyber space measures may be prioritised, due to a rising threat in this area, and the lack of an existing solution to deal with this threat.

Legacy and opportunities

The ecosystem objectives are not formed in a vacuum, however. They are formed in the context of what we term 'legacy', the prevailing conditions at the time, as well as being influenced by new opportunities to satisfy, in better ways, the needs of the final recipient or end client. The priority of objectives, and choice and prioritisation of sub-objectives, will be heavily influenced by both legacy and emerging opportunities or needs.

Only the most complex challenges require the formation of ecosystems. Individual companies can effectively resolve simpler challenges.

Legacy

Legacy, in the context of ecosystems, is the physical, digital, social and performance environment. For example, a city ecosystem may

have a poor crime record, or old and failing transport infrastructure.

Consequently, the ecosystem is likely to emphasise objectives that address those issues. Thus, a decision to focus on safety in Chicago is partly due to the city's legacy and pre-existing concerns about crime and security. In Vienna the emphasis on quality of life is largely due to the cultural legacy of the city.

Opportunities

Opportunities are the possibilities that might be realised by using the ecosystem more effectively. These possibilities are often associated with advances in technology.

So, for example, in Chicago it was clear at one point that advances in technology might allow the use of IT to create more transparency around governance, and facilitate the availability of open data. Furthermore, this in turn could lead to the creation of entrepreneurial companies and employment growth. As a result, capturing this opportunity became a key sub-objective.

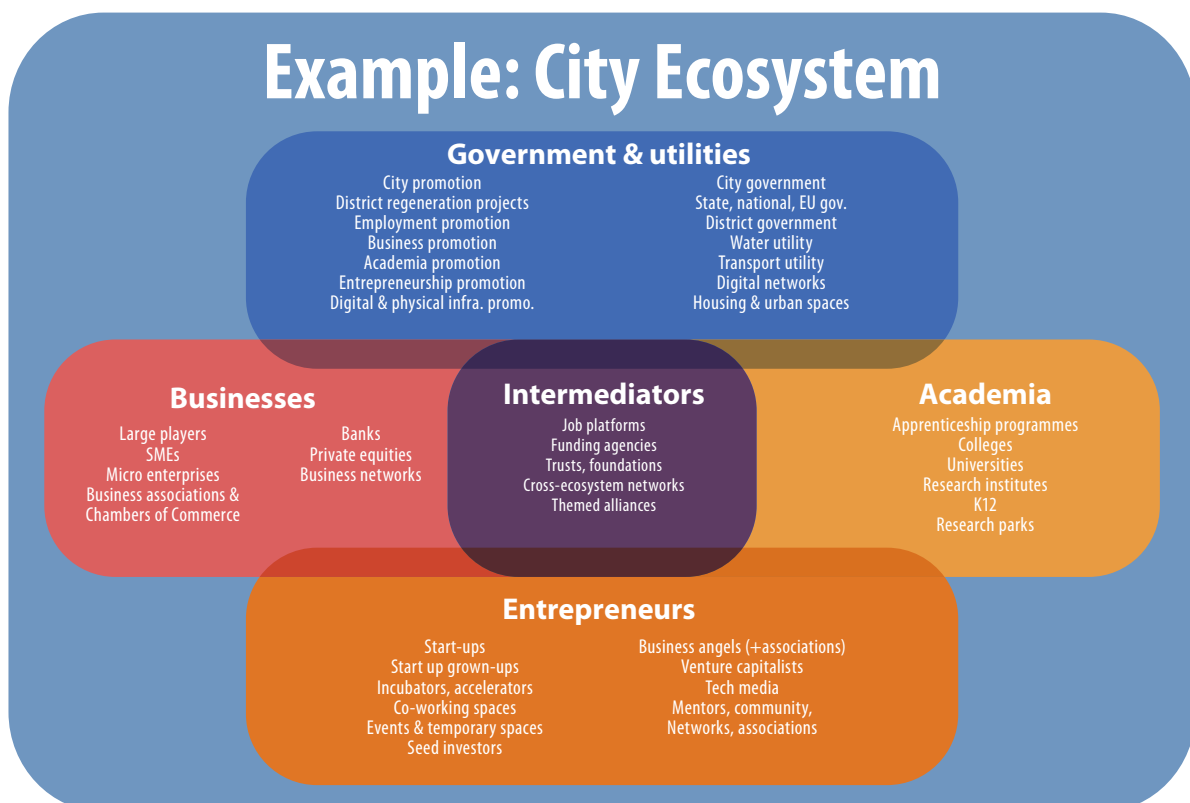


Figure 2. Ecosystem Players



Another example was when cities realised it was possible to use technology to grow a strong economy, and thus sought to attract entrepreneurs in the digital sector as a means to seize that opportunity.

Ecosystem players

So now we have a better understanding of the operating framework that shapes the purpose of an ecosystem: players coalescing around a high-order objective, supported by numerous sub-objectives. Furthermore, those sub-objectives are influenced by both the legacy environment at the time, and the opportunities obtainable through appropriate configuration of the ecosystem.

But who or what actually delivers these objectives? What does the ecosystem consist of? Who are its members and what do they do? It is important for an organisation to understand this in order to be able to shape the ecosystem or find the most valuable position in the ecosystem.

2. DIFFERENT ROLES IN THE ECOSYSTEM

The entities that make up the ecosystem we term 'players', and in a city,

as with many other ecosystems, they are diverse and numerous. In a city ecosystem they range from large organisations, such as the government and its various agencies, hundreds of major corporations, and educational institutions, to small companies and entrepreneurs, and the citizens.

These players can be grouped into five different categories: (i) government and utilities; (ii) businesses; (iii) entrepreneurs; (iv) academic institutions; and finally (v) intermediators, who connect the first four categories of player together.

Government and utilities: Government is a diverse group of players encompassing all the institutions that regulate the workings of the city, commissioning projects to improve the infrastructure, and designing programmes to help different groups of players. Utilities provide infrastructure such as water, electricity, and transport.

Businesses: Businesses include all the enterprises based in the city, from large companies to corner shops. They also include the representatives of companies, such as Chambers of Commerce or business associations, and trade groups.

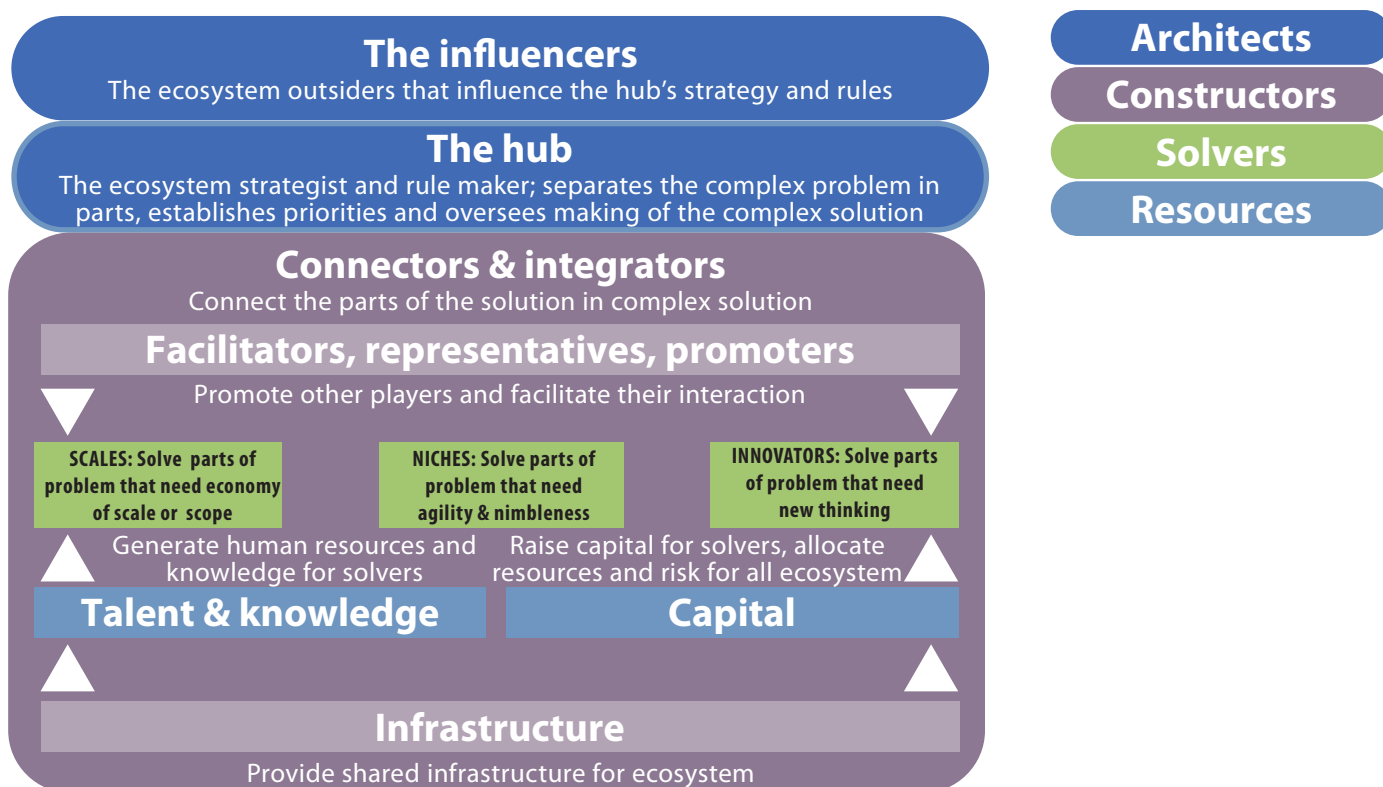


Figure 3. Ecosystem Roles



Entrepreneurs: Entrepreneurs encompass start-ups, and all the specialised players focused on providing financing, training, working space or any other service to start-ups.

Academia: Academia consists of those organisations and individuals, from primary school to university, including institutions that specialise in research, such as research institutes and research parks.

Intermediators: Intermediators are the players that connect the other four categories. They may provide funding for joint projects, for example, or a networking environment.

3. ROLE OUTLINE

Within these five categories our research suggested that there are approximately 150 distinct types of player [Figure 2 generalises these types to around 40]. Despite the large number, however, and high level of diversity, it is possible to classify all ecosystem players into just ten ecosystem roles, which can then be classified into four types based on their ecosystem contribution: resource providers; sub-problem solvers; complex (whole)-solution constructors; and complex-solution-architects.

Resource providers and sub-problem solvers are the heart and soul of the ecosystem. We refer to these organisations as pillars, the building blocks of the ecosystem, which focus only on their part of the problem. They often perform a similar role in multiple ecosystems.

Resource providers

There are two resource-providing pillars.

Capital: This role provides financial support for the projects and activities of other ecosystem players. Examples of specialised capital players include private equity firms that finance the established businesses, and venture capitalists that support start-ups.

Capital players derive an advantage from the power held over the ecosystem organisations in which they invest. Cash-deprived ecosystems allow capital players to extract significant benefits from the players they invest in, as well as the ecosystem hub (see below). In some cases, players not traditionally associated with this type of activity may decide to take on the capital role. In some cases, other players, such as scales, take on the role of the financier.

For example, the Viennese government provides capital for micro enterprises, such as corner shops. This financing helps them to achieve

one of the ecosystem's overarching goals: increasing employment among immigrant populations.

Talent and knowledge: The role of these players is to educate the workforce and generate the knowledge that the problem solvers need; to generate the skill set mix required by other players in the ecosystem. These players tend to be specialised players, such as universities and colleges.

However, other roles may get involved. City governments, as hubs, may take on this role temporarily in order to fill a gap in provision. For example, the UK government has been organising apprenticeship programmes that help to generate talent. This role contributes directly to the employment objective. Large companies may also indirectly contribute by providing people with experience.

Finally, the knowledge role may be shared by universities and innovators. The Viennese government, for example, has a separate department, ZIT, that finances and consults knowledge players and innovators in the high-tech sector on joint projects.

Sub-problem solvers

There are three roles involved in solving different aspects of the main problem: scales (for large sub-problems), niches (for small sub-problems) and innovators (for sub-problems that require novel solutions).

Scales: This role involves resolving problems that require economies of scale and scope within one organisation, and therefore is usually fulfilled by large private companies. Companies such as IBM in London, Baxter in Chicago, and Boehringer Ingelheim in Vienna, are vital for business development in those cities. Not only do they resolve large problems, but they are also very good customers for the small service providers, partners for the innovators, and employers of talent.

For example, a key milestone in the revival of the East London area of Royal Docks in the borough of Newham was the arrival of Siemens, which decided to place one of its key centres for clean tech in the area. This prompted more than a dozen innovators to announce that they would also locate themselves at the Royal Docks. Several small enterprises, such as shops, also began to appear. Similarly to players fulfilling a capital role, scales hold significant power as they play an important role.

Niches: Players taking on a niche role are well placed to take some of the smaller jobs in the ecosystems. From the smaller food manufacturers, to local shops and dry cleaning services, the niche role is about responding



quickly to small-scale demand. Players taking on the niche role need to be agile, and rarely require a lot of financing, or carry a lot of risk. Their power may be limited, but their role can be vital.

For example, Canary Wharf Group – the integrator of the London district with the same name – had to ensure that several coffee shops opened during the early days of Canary Wharf. Without coffee shops in the area, it would have been hard to attract office tenants.

Innovators: The role of innovator is increasingly important, as technological advances, coupled with knowledge and tech-savvy generation, allow for rapid change and innovation opportunities in many ecosystems. Innovators resolve existing problems in a novel way or find new problems and resolve them.

Start-ups and small entrepreneurial SMEs are the prototypical innovators. Nevertheless, universities (players adopting the talent and knowledge role) increasingly encourage their researchers to take on these roles and translate their knowledge into a better solution to a novel or existing problem.

Scales are also adopting the role of innovator. For example, a number of large companies in Chicago are surrounding themselves with start-ups in order to instil some innovator thinking in their organisations. Joint projects with local start-ups provide the ‘training in innovation for their executives’.

Solution constructor shapers

In order to construct the overall solution, players are required that are concerned with the functioning of the ecosystem as a whole. These are the solution constructors and architects, which we call shapers.

The three solution constructors represent the connective tissue of the ecosystem: facilitators and representatives (represent the interests of fragmented group of players, such as niches, and promote certain parts of the ecosystem); infrastructure providers (provide ecosystem infrastructure); and connectors and integrators (connect different players, for example, resource providers to the problem solvers).

Representatives, facilitators and promoters: Players fulfilling these roles contribute to the process of dialogue between players in the ecosystem.

A typical player adopting a representative function is the Chambers of Commerce, which represents the interests of the niches and scales, and influences the policies of the City government (the hub) or the State government (influencers).

For example, an organisation called London First represents the interests of large companies in London. It represents these companies, promotes their interests and facilitates dialogue with other stakeholders, such as infrastructure providers or national government. London First has been an active player in a number of debates of interest to London – covering issues that include immigration policy, metro line extensions and investments, for example.

Facilitators are companies that help pillars accomplish their objectives. They are particularly prevalent in entrepreneurial areas of the city ecosystem, where they help start-ups, by providing physical infrastructure, for example.

Promoters are similar to facilitators, but provide more of a counselling or network brokerage than direct services. Promoters may also be government entities. The Viennese government has set up a company called Inits, whose role is to provide consulting services, including fundraising and business development, on the matter of starting up a company of young enterprises (innovators) with an academic background.

Connectors and integrators: Players adopting these roles put together different sub-solutions into an integrated solution that addresses the complex problem as a whole.

Canary Wharf Group (CWG) is a scale player – an office-building construction service provider – that has taken on the role of integrator. CWG builds office space at the Canary Wharf, but also ensures that niche services are available for tenants, and that the district is safe by complementing the police service with the security services that they contract. CWG was also an investor in the metro line extension that runs to Canary Wharf.

Thus, an integrator, like CWG, ensures the functioning of the solution. They make sure that players take on the necessary roles, or they take on these roles themselves. They have a great deal of responsibility, and also significant power in the ecosystem.

Infrastructure: When players adopt this role they provide the infrastructure that the ecosystem uses. For a city, such infrastructure ranges from transportation to water and energy. Infrastructure players are usually not competing with other firms in that particular ecosystem. The infrastructure role differs from the scale role in that only one player in the ecosystem fulfils the role for each different facet of infrastructure.

Due to the exemption from competition, infrastructure players are



heavily regulated by the hub (the city government in the case of a city ecosystem). The hub may decide to take on the infrastructure role itself to ensure quality and avoid hold-ups or other inefficiencies.

Infrastructure players must coordinate extensively with other players in order to make infrastructure decisions that respect everyone's interests. For example, Transport for London (TFL), which provides the transportation service infrastructure in London, undergoes planning cycles that may last longer than a year. An ability to plan effectively and coordinate with important stakeholders is crucial for this role.

Solution architect

Finally, there are two solution architects: the hub (which sets the rules and policies that govern the process of problem solving), and influencers (which set the boundaries or influence the hub's policies).

The hub: This is probably the most important role in the ecosystem. The hub bears ultimate responsibility for the ecosystem's complex objectives. The hub is the main strategist and decides how the ecosystem will reach these objectives, what sub-objectives will be chosen to accomplish the objectives, and how they will be prioritised.

Box 2: Scenario Recognition When Do You Need to Leverage the Ecosystem?

You are an executive, possibly a strategist, in a large corporation, an emerging start-up or a public company. Your organisation is in one of the following situations:

1. Your organisation is operating in a market, where competition from the emerging countries is intensifying (e.g. industrial equipment manufacturers). Map your ecosystem and see if there are any opportunities to innovate your business model (your services or how you deliver them), perform your ecosystem role better than the competition, and secure your position.
2. Your organisation is operating in a decreasing market. Your role in the ecosystem may soon cease to exist or shrink considerably (e.g. the defence sector). Map your ecosystem and see if there are opportunities to change your role or to adopt a new one. How about becoming an integrator of the related products and services for your customer?
3. Your organisation is operating in a sector/ecosystem that may get disrupted, as the legacy solution provided by the current ecosystem is becoming suboptimal (e.g. higher education, which is under attack by free platforms such as Coursera). Map the ecosystem players and examine how its complex problem is currently being resolved. How is the problem being broken down and resolved? Can you find a better way to break down or resolve the problem, using new technologies or better customer focus? Think about the new solution and how it can be provided and the ecosystem that would be needed. What players would you need? What roles will they take? How can you incentivise them?
4. Your organisation is doing fine at the moment, but you are always looking for ways to improve and you are conscious that the future will bring new challenges and opportunities. Use the ecosystem mapping and challenge perspective to anticipate the new challenges and how the ecosystem will react to them. How will you position yourself to capture the best future opportunities?



The hub's main tools to achieve these goals, and fulfil its role, are regulation and policy. The player that adopts the role of the hub may also adopt a capital role in order to accomplish its objectives. For example, Vienna uses a substantial amount of taxpayer's money to directly finance innovation.

The power and informal influence of the hub are also important. For example, the Mayor of London's influence and power may encourage other players, such as large private companies, to focus on the City's ecosystem objectives.

Occasionally, in very open ecosystems, for example, the hub may merely regulate and mediate rule making, with rules emerging from the ecosystem.

Influencers: Players that adopt this role are usually not direct participants in the ecosystem that they seek to influence. They may be, for example, players that have a hub role in another ecosystem, which itself contains, or interconnects and is interdependent with, the ecosystem that they are influencing.

The Chicago City ecosystem, for example, is contained within the ecosystem of Cook County and the ecosystem of the State of Illinois. The City of Chicago coordinates with county government on some municipal matters, while the State government can influence the policies set in the City of Chicago.

Multiple roles

Ecosystems vary in terms of the type and number of players that adopt each role. For example, in Vienna, most of the promoters (facilitators and representatives) are government agencies. In Chicago, these are usually NGOs, or individuals with the power and interest to promote a certain cause in Chicago. Furthermore, one player may adopt one role or many roles.

So, for example, Apple/App Store is a hub and provides a platform infrastructure for the App designer and its clients.

This ability to adopt several roles is fundamental from the perspective of a single ecosystem participant, meaning that given the right resources and capabilities it is possible to evolve from one role to another. Players can accumulate roles, rather than swap one for another.

Furthermore, it is crucial to understand what each role entails. Not all roles require the same risk taking and investments. Adopting a shaper role always gives more ecosystem power than being a pillar. Different roles carry different responsibilities, require different capabilities and allow different levels and types of value creation and capture. The hub is the most important role, but also the role that requires the most specialised skills.■

Case Study: Pearson Learning Solutions and Higher Education Ecosystem

Our research has found that this framework for understanding how ecosystems are structured and function is broadly applicable to multiple markets and contexts.

Take Pearson Education, for example, a leading global learning services company that provides learning solutions for clients in multiple ecosystems, ranging from elementary education to corporate learning, drawing on educational materials and services and business information through the Financial Times Group.

Commonly, Pearson participates in and supports multiple ecosystems, which pursue shared complex objectives that include preparing students for productive jobs in the workforce, developing responsible citizens, and conducting basic and applied research.

In today's highly competitive global economy, higher education ecosystems play a pivotal role in supporting economic development through job preparation. Below, we describe a typical higher education (HE) ecosystem by listing the participants and identifying the roles that they play.

The university plays the role of the **hub** responsible for identifying which services are provided and how. These services are typically highly integrated, and include teaching and assessment, marketing, recruitment, course development, and credentialing, as well as student and faculty services.

The university also typically plays the role of **capital** through funding department- and college-level activities.

Multiple **influencers** shape and affect how these ecosystems carry out their objectives, including local government, local school districts, and not-for-profits.

The primary stakeholders of HE ecosystems include the students, parents, and employers, as well as government funders at local, regional and national levels. On the supply side are included other universities that train faculty and a growing group of technology, curriculum, assessment and service providers.

Identifying Ecosystem Opportunities - Step 1

Background: Adopting an ecosystem view allows players to engage in a process that gives them a broader perspective on solving challenges and identifying opportunities. We advocate adopting a progressive approach to developing an understanding of the ecosystem. Initially the process involves understanding your own environment in the context of an ecosystem or ecosystems, using the value proposition, value delivery and accountability spread that we describe in the White Paper, '**From Processes to Promise: How complex service providers use business model innovation to deliver sustainable growth**', released at Service Week, 21 September 2011.

The next step involves identifying and thinking about complex problems, and analysing if and how they are currently solved by the ecosystem, at the same time considering in this context who the ecosystem players are, and what roles might best be adopted by the organisation.

Taking on a new ecosystem role can have a profound impact on a player's business model and performance, as well as the business model and performance of other players. Here are some steps to help with this.

STEP 1 - Map the ecosystem:

- **Identify the existing players.** Who are the participants? What are their business models, value propositions, value delivery and accountability spreads?
- **Identify the complex challenge.** What is the ultimate goal that unites all the players? What is the challenge/need of the ultimate customer(s) of the ecosystem?
- **Identify the complex solution.** How is the challenge broken down? What are the parts of the challenge (sub-challenges)? How are different sub-challenges being solved? How are the complex solutions integrated from the sub-solutions? Take a look at the business models of all the players and construct the 'ecosystem business model story'.

Identifying Ecosystem Opportunities - Steps 2 & 3

STEP 2 - Analyse the ecosystem:

- **Identify the ecosystem roles.** What roles do they play? What is your role? Who brings resources, solves the problem, manages the process?
- **Identify the relationships.** What are the rules of the game? What are the relationships like?
- **Identify the flows.** How does the money flow? Where does the power lie?

STEP 3 - Identify & implement innovation opportunities:

- **Identify the gaps and how you can help tackle them.** Are all the sub-challenges – parts of the challenge – solved optimally? Can you provide a better service/solution to your part of the challenge? Could you provide a better solution to another part of the challenge that is currently served poorly? Is the complex solution integrated properly? Could you take a more prominent role integrating the sub-parts of the solution into the overall solution? Is the complex solution that the ecosystem provides optimal? Could you propose a better complex solution (a better way to divide up the complex challenge in the sub-challenges and resolve those parts) and get the ecosystem to provide it?
- **SUPPORT THE STATUS QUO if you agree with the hub's current challenge-solving approach.** Improve the existing solution by improving how you perform your existing role. Or by taking on a more prominent role in resolving the problem. Could you become an integrator of (a part of) the solution? **OR**
- **DISRUPT THE STATUS QUO if you think that there is a better way to resolve the complex challenge.** Introduce new or different services to solve the problem. Can you think of a better way to solve the problem? Providing new services or different services? Propose the new complex service to the market, consider and begin to assemble the ecosystem that will help you to deliver it. Prepare to be the hub.

Review and react:

- Evaluate the likelihood of the success.
- Review and react to the continued evolution of the ecosystem.

How is it changing? How are the other players influencing it? How do you maintain your position? How do you evolve the roles that you adopt to exert greater influence? Are there more opportunities? Could you reconfigure the ecosystem, its players, and/or roles to take advantage of those opportunities? Or construct a new ecosystem?

Teaching is a prominent sub-activity in an HE ecosystem. University faculty typically carry out this service and therefore take the '**scale**' role. The teaching programmes or courses of different faculty members are integrated in the curricula for students.

The role of **integrator** for content and teaching is entrusted to university departments and colleges. There are many other ecosystem roles connected with the teaching aspect of the HE solution. For example, the faculty senate plays the role of **representative** for the faculty.

Besides teaching, fundamental sub-activity represents support services, where the administrative staff takes on the **scale** role. The **integrator** role is usually scattered around different departments.

Increasingly, higher education institutions are rethinking the historically highly integrated services and traditional ecosystem roles. For example, Pearson is increasingly playing an **integrator** role for online and hybrid learning programmes. This role involves coordinating multiple services across the student lifecycle, from market research and services, recruitment services, to online curriculum development, and student services.

Conclusion

Using ecosystems to coordinate organisational efforts towards meeting specific challenges is becoming more prevalent in the twenty-first century economy. Indeed we believe that understanding and maximising effective use of ecosystems is the strategy that organisations must adopt in order to survive, grow, and succeed in the long term.

This paper provides an understanding of what ecosystems are – constellations of players coalescing around a common objective;

Engaging with partners like Pearson for **integrator** roles enables university leadership to focus on being the most effective **hub** for its ecosystem role. It can focus on devising strategies for the future of the ecosystem, deciding how to tackle the challenge of growing free educational platforms, such as Coursera, and how to engage in some kind of co-opetition with it, for example.

Taking the ecosystem logic further, there are other opportunities that Pearson can capture by reconfiguring its role in the ecosystem. For example, offline support services could be professionally integrated in the same way as online services to support college readiness and student success.

Further integration of services might be possible. Pearson could consider integrating student experience services with placement and career services, as well as alumni relation management. This type of integration may offer better career preparedness for students while at university and better career placement services■

how those objectives are shaped by the environment and potential opportunities; and how ecosystems function, outlining the structure, and mechanics, the players and roles involved.

In sharing our findings and insights about ecosystems we also hope to help leaders use ecosystems more effectively to solve new or existing challenges, disrupt the existing ecosystems, and even create new ecosystems■



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