

Figure 1 - The Matrix (Source: Moschella)

I use the term “Digital” as a shorthand for both these “Matrix” technologies and the disruptions they enable.

Why the urgency?

Notwithstanding the volume of discussion around Digital, there is scepticism over the rate of technology take-up, particularly in industries that Moschella observes have been historically less susceptible to disruption: those whose products are physical goods and services rather than information (aerospace, manufacturing, energy), and those with a relatively high risk profile (law, insurance). Those seeking evidence to warrant complacency over the pace of change might find some comfort in the recent ONS report that only 7.4% of jobs in England were at high risk of automation in the next decade.⁷

However, it would be wise for leaders (not to mention government and individuals) to assume that the impact will be faster, and accordingly to act quickly. Why so?

- The results of such analyses of automation impact are highly susceptible to variations in methodology. The ONS itself, in a discussion of this point,⁸ notes that applying an alternative methodology yields a result nearly five times higher (35%) and that two other studies – by PwC⁹ and McKinsey,¹⁰ – give comparable results, suggesting that around 30% of UK jobs are at high risk of automation. Furthermore, such analyses focus on the extent to which the content of an occupation, or tasks within it, can be automated and therefore understate the extent of the impact that automation can have when coupled with other Digital technologies to arrive at radically different means of delivering the value sought by customers.¹¹

⁷ Office for National Statistics, *Which occupations are at highest risk of being automated?*, 2019, retrieved from <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/whichoccupationsareathighestriskofbeingautomated/2019-03-25>

⁸ Office for National Statistics, *The Probability of Automation in England: 2011 and 2017*, 2019, retrieved from <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/theprobabilityofautomationinengland/2011and2017>

⁹ PwC, *Will robots really steal our jobs?*, 2018, retrieved from <https://pwc.co.uk/economic-services/assets/international-impact-of-automation-feb-2018.pdf>

¹⁰ McKinsey Global Institute, *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation*, 2017, retrieved from <https://www.mckinsey.com/~media/mckinsey/featured%20insights/future%20of%20organizations/what%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/mgi%20jobs%20lost-jobs%20gainedreportdecember%202017.ashx>

¹¹ For example, the [\[OECD study\]](#), written in 2016, cites, as evidence of “a rather slow speed of change”, a study by [Boston Consulting Group](#) the previous year which estimated that the share of the consumer vehicle market taken by driverless cars would only reach 10% by 2035. This study took a like-for-like automation perspective, estimating the extent to which consumers

- All the studies referenced cite uncertainty over business case or return on investment as a barrier to take-up. But Digital era players – and their investors – are apt to follow a different approach. As Moschella observes of the large and successful Digital firms, “Most traditional businesses find it hard to run on anything but investment (ROI) criteria. This is in sharp contrast to the Matrix giants who are willing to invest heavily in new areas and accept sustained losses.” And discussing the implications for startup organisations of the Winner-Takes-All (WTA) dynamics inherent in the platform-based business models of the Digital era, University of California academics Kenney & Zysman characterise this as an era of “abundant startups trying to ignite WTA dynamics” in an environment where the “cost of creating startups is exceptionally low” and there is “extraordinary availability of funds”.¹² The Economist has recently observed that, even where network effects do not necessarily lead to absolute monopoly, “‘blitzscaling’ becomes a paramount goal”.¹³
- In general, the early signs of Digital disruption are already to be found in all industries. As William Gibson remarked: “The future is already here; it’s just not very evenly distributed.”¹⁴ That future can be seen even in the world of construction, one of the industries of slowest transformation (ahead only of agriculture and hunting),¹⁵ where generative design, digital twins and modular construction are all making an impact.¹⁶ And the same is true in other industries, prompting one leader to comment to me recently that he felt “like a frog in steadily warming water”.
- Finally, as we shall discuss below, the actions required to respond to the challenges of Digital are significant, particularly for established businesses: there may be no time to be a fast follower and, in any case, in WTA situations there may be no prizes for second place.

In summary, if you are a leader of an established organisation, you may well find yourself in an environment ripe for disruption sooner than you may have believed, faced with competitors who are unencumbered by the constraints you face and who are already planning disruption to which you are ill-prepared to respond. As McKinsey put it, even while reporting slow technology take-up in 2017: “companies that ignore these technologies do so at their peril: the gap in performance between early adopters of digital technologies in general and AI in particular is widening”.¹⁷

If you are in that position, it’s time to take action. In doing so, it is important to grasp first just why it is that Digital is not merely an operational challenge – like the previous waves of IT change with which it is sometimes confused – but a strategic challenge with importance as well as urgency.

would adopt automation of their role as driver by buying fully autonomous vehicles. However, when the same organisation, [just two years later](#), considered the impact of a broader combination of automation with other Digital technologies to deliver the customer’s desired outcome through a new business model, it came to the significantly bolder view that, by 2030, 25% of passenger miles would be in driverless cars – this time in the form of Shared Autonomous Electric Vehicles.

¹² KENNEY Martin & ZYSMAN John, *Unicorns, Cheshire Cats, and the New Dilemmas of Entrepreneurial Finance*, SSRN, 2018, at ssrn.com/abstract=3220780

¹³ The Economist, *Herd Instincts: Unicorns going to market*, 2019

¹⁴ *The Science in Science Fiction [sic]*, National Public Radio, 30 November 1999, retrieved from [https://choice.npr.org/index.html?origin=https://www.npr.org/2018/10/22/1067220/the-science-in-science-fiction?t=1557501239976with quotation at ~11:20](https://choice.npr.org/index.html?origin=https://www.npr.org/2018/10/22/1067220/the-science-in-science-fiction?t=1557501239976with%20quotation%20at%20~11:20)

¹⁵ *Imagining construction’s digital future*, McKinsey, 2016, retrieved from <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/imagining-constructions-digital-future>

¹⁶ See, for example, [Autodesk](#) and [Katerra](#)

¹⁷ McKinsey Global Institute, *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation*, 2017, retrieved from <https://www.mckinsey.com/~media/mckinsey/featured%20insights/future%20of%20organizations/what%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/mgi%20jobs%20lost-jobs%20gained-report-december%202017.ashx>

Why the importance?

The pattern of innovation – how the “what” of delivery is changing

Organisations’ identities (whatever their vision statements may claim) are often anchored in “what” the organisation does, rather than the outcome provided, with improvement effort focused on how that “what” is delivered: Henry Ford’s “faster horse”. But Digital is enabling rapid changes in “what”. And these changes are not limited to those wrought by “Internet giants” such as Google and Uber. Consider this smaller example: an innovative service that I learned of recently, developed by some former colleagues of mine.

When we worked together in a consulting firm some years ago, that team had been involved in the development of procurement consulting services for health organisations within the NHS: analysing spending, and identifying ways of reducing cost and securing greater value for money. Given the potential for repeatability of method, it would have been a natural step to turn this into a more commoditised consulting service. But the team, now in a new venture, AdviseInc,¹⁸ went further.

A fundamental component of the procurement advice service was the gathering, cleansing and analysis of spend data: an intensive activity that had to be carried out individually for each organisation on each occasion. Recognising this, AdviseInc invested in gathering and cleansing spend data right across the NHS, making the results available through its price benchmarking tool, creating a “data utility” that obviated the need for costly data collection and analysis. This then enabled them to create higher-order services – including customer-intimate training and support – to help clients realise maximum benefit from that data. The effect has been to enable clients to achieve, through a subscription service, insights that hitherto required a management consultancy engagement, and to obtain that benefit both continuously and at a fraction of the cost: a better outcome delivered through a very different “what”.

This pattern – of new products and services becoming industrialised and commoditised to the point that they become utilities on top of which new services, delivering greater value to the end customer, can be built – is not new. Strategy writer Simon Wardley¹⁹ uses a “Wardley map” (figure 2) to illustrate the historical recurrence of what he dubs the *Innovate-Leverage-Commoditise* cycle.²⁰

¹⁸ See adviseinc.co.uk

¹⁹ See WARDLEY Simon, blog.gardeviance.org from which material is reproduced under [Creative Commons Licence](https://creativecommons.org/licenses/by/4.0/) and also *An introduction to Wardley “Value Chain” Mapping*, 2015, retrieved from <https://www.cio.co.uk/it-strategy/introduction-wardley-value-chain-mapping-3604565/>

²⁰ WARDLE Simon, *Understanding Ecosystems*, 2014, retrieved from <https://blog.gardeviance.org/2014/03/understanding-ecosystems-part-i-of-ii.html>

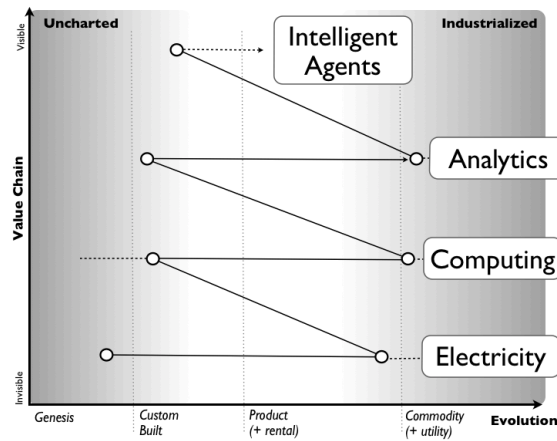


Figure 2 - The Innovate-Leverage-Commoditise cycle (Source:Wardley)

The example – depicting the evolution of electricity from invention to a utility which underpinned the analogous evolution of the electronic computer, etc – uses the two axes common to all Wardley maps:

- The vertical axis represents the value chain, with the ultimate customer and their need at the top and the most basic building blocks – invisible to the customer – at the bottom.
- The horizontal axis represents the stage of development of the value chain component on the typical lifecycle from the genesis of a product or service, to its custom use for individual customers or applications, to its standardisation as a product through to its becoming a ubiquitous commodity product or utility service.

While this pattern may not be new, its recurrence is accelerating. It renders firms providing custom or productised offerings vulnerable to disruption on two fronts, enabled by both the automation and connectivity aspects of Digital:

- commoditising competitors – now enabled by such automation technologies as AI, analytics and robotics – turning the hitherto custom or productised offering into a standardised, ubiquitous service, as illustrated by the disruption of traditional IT hosting vendors by Amazon Web Services and other cloud providers;
- new entrants, enabled by ready connectivity to commodity services, bringing innovative offerings of greater value to the end customer, as in the oft-cited example of the disruption of Blockbuster by Netflix.

Business ecosystems – how the “who” of delivery is changing

Moschella’s characterisation of Digital technologies as “The Matrix” highlights the fact that they cut across and join up traditionally distinct industry verticals. This linkage across industries reflects an organisational development that first came to the fore in the mid-90s, when James F. Moore introduced the concept of **business ecosystems**, asserting:²¹

“In the old world, companies would primarily see themselves as competing with similar businesses within their respective boxes. In the new world, companies compete to unite disparate contributors to create powerful total

²¹ MOORE James F., *The Death of Competition: leadership and strategy in the age of business ecosystems*, 1996, Harper Business

solutions or experiences – and then to establish thriving business ecosystems dedicated to providing these solutions to customers.”

Moore’s business ecosystem concept – seen from the perspective of a participant in the ecosystem – is illustrated in figure 3 below and shows the **core business**, including its direct suppliers and channels, surrounded by the **extended enterprise**, which includes customers and suppliers of complementary products and services, in turn surrounded by the wider **business environment**, including investors and other stakeholders, regulators and competitors.

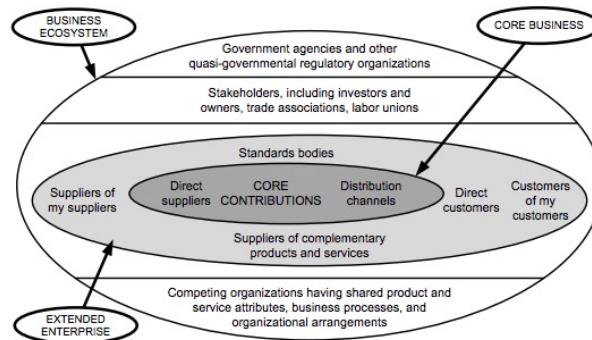


Figure 3 - Business Ecosystem (Source: Moore)

As Digital has developed, the concept of business ecosystems has become more prominent: even in 2012, a study by innovation academics Llewellyn Thomas and Erkor Autio found 94 academic papers covering the topic,²² and there have been more since.

That interest reflects Digital’s intrinsic properties, which facilitate and drive both ecosystem formation and the pattern of innovation we discussed above. Such properties (identified by Autio and Llewellyn)²³ include: the homogeneity of data, i.e. the ability of all digital devices similarly to access data; layered modular architecture, so that lower layers are designed to facilitate the creation of higher layers, and loose couplings between products that enable them to be combined in new ways. The authors give this vivid example:

A hotel website can feature Google maps to help its customers find its location and related information. The hotel website, in turn, can be part of another platform, say, a hotel search and reservation service. Google maps can leverage the hotel search service to enhance map searches. It can also provide a link back to the hotel website to enhance the utility of its search results. This kind of recursivity greatly enhances the possibility of unpredictable combinations within digital ecosystems.

The strategic peril of ignoring ecosystem dynamics is illustrated by the failure of Intel’s first foray (the Xscale project) into the mobile market, where the organisation had sought to replicate the strategy (of centring on a major partnership) which had served it so well – with “Wintel” – in the PC market. As economists Rong and Shi observe:²⁴

²² THOMAS Llewellyn & AUTIO Erkor, *Modeling the ecosystem: a meta-synthesis of ecosystem and related literatures*, paper presented at DRUID 2012

²³ AUTIO Erko & THOMAS Llewellyn, *Ecosystem value co-creation*, 2018, Proceedings of Academy of Management Annual Meeting

²⁴ RONG Ke and Yongjiang She, *Business Ecosystems: construct, configurations, and the nurturing process*, Palgrave Macmillan, 2014

The Mobile phone market was more complicated and fragmented, which was very different from the PC industry [...]. As a result, Intel learned an essential point: the business ecosystem should be regarded as being as important as the key partners. Then Intel adjusted its strategy for future re-entry into the mobile market.

There is, indeed, a growing appreciation in industry of the importance of ecosystems: in 2018, Accenture found that 76% of UK business leaders agreed that current business models would be unrecognisable in the next 5 years, with ecosystems the main change agent.²⁵ This is unsurprising given the number of Digital-enabled ecosystems that we have seen emerge recently, with a particular phenomenon including 2- or even n-sided markets centred on Digital platforms: Uber and Airbnb are obviously examples, but so too are Amazon (given its third-party retailers) and Facebook (with both users and advertisers being customers of the platform).

Action is lagging behind recognition, but is underway – 46% of those executives were pursuing ecosystem-based models and 38% felt they were at the point of understanding where ecosystem partnerships would be beneficial: again, the time for action is now.

In the remainder of this paper, I set out three strategic questions to consider as you start to take that action:

- What role will you play in your changing world?
- What must you have in order to play your role?
- What does your world need from you?

Question 1 – What role will you play in your changing world?

To understand this question, it is first necessary to understand what your world is and how it is changing. (If yours is a large and/or complex organisation, there may of course be multiple “worlds” to consider.) Questions to ask include the following.

- What does the value chain for your “world” look like – from ultimate customer need down to fundamental building blocks – and how evolved are the various elements, from experimental genesis to commoditised utility? The Wardley maps, introduced above, are a good way of plotting this, as illustrated by the fictitious TV company example in figure 3, which Wardley²⁶ uses to introduce the technique. The map starts at the top with the fundamental need – the end user’s need to be entertained during their leisure time – and traces the value chain delivering that need: from the choice of distribution mechanism (specially-produced internet broadcast versus commodity DVD), to the special skills of artistic direction, to computing products and the utility of power).

²⁵ Cornerstone of Future Growth: Ecosystems, Accenture, May 2018, retrieved from https://www.accenture.com/_acnmedia/PDF-77/Accenture-Strategy-Ecosystems-Exec-Summary-May2018-POV

²⁶ WARDLEY Simon, *An Introduction to Wardley (Value Chain) Mapping*, 2015, retrieved from <https://blog.gardeviance.org/2015/02/an-introduction-to-wardley-value-chain.html>

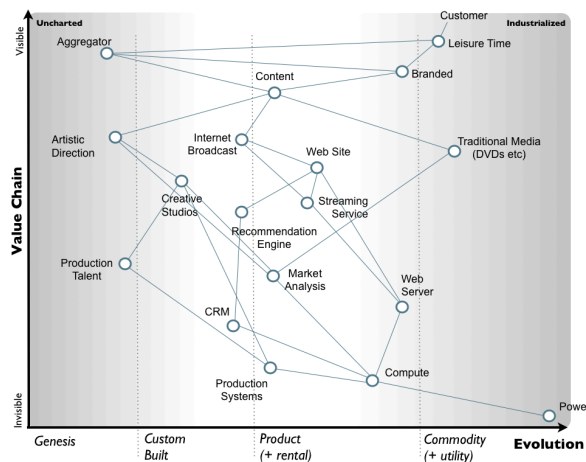


Figure 4 – Example Wardley Map (source:Wardley)

- How are the elements within your map evolving? How are the elements that you produce or consume evolving left-to-right? Is there evidence – perhaps experiments by startups – of new offerings higher up the value chain?
- What is your current ecosystem? How does your ecosystem map to the value chain picture, ie who does what? It is particularly valuable, if you do not have direct interaction with the end customer, to map those elements of the value chain above you. Make sure to consider organisations with whom you are not directly connected, eg competitors.
- How is the ecosystem as a whole evolving? Moore²⁷ describes business ecosystems going through four stages of evolution – birth, expansion, leadership and self-renewal (or death) – analogous to Wardley’s stages of left-to-right evolution, each stage having distinct challenges as shown in figure 5. For example, one might say that social networking is in the leadership stage (with Facebook as the leader) and possibly entering self-renewal as Facebook evolves its business model; that ride-hailing services are in their expansion stage and possibly entering the leadership stage with the Uber and Lyft IPOs; that fully electric vehicles are making the move from birth to expansion, as standards mature; and that autonomous vehicles are at the birth stage.

The Evolutionary Stages of a Business Ecosystem		
	Cooperative Challenges	Competitive Challenges
Birth	Work with customers and suppliers to define the new value proposition around a seed innovation.	Protect your ideas from others who might be working toward defining similar offers. Tie up critical lead customers, key suppliers, and important channels.
Expansion	Bring the new offer to a large market by working with suppliers and partners to scale up supply and to achieve maximum market coverage.	Defeat alternative implementations of similar ideas. Ensure that your approach is the market standard in its class through dominating key market segments.
Leadership	Provide a compelling vision for the future that encourages suppliers and customers to work together to continue improving the complete offer.	Maintain strong bargaining power in relation to other players in the ecosystem, including key customers and valued suppliers.
Self-Renewal	Work with innovators to bring new ideas to the existing ecosystem.	Maintain high barriers to entry to prevent innovators from building alternative ecosystems. Maintain high customer switching costs in order to buy time to incorporate new ideas into your own products and services.

Figure 5 – Challenges across evolutionary stages of a business ecosystem (Source: Moore)

²⁷ MOORE James F., *Predators and Prey: A New Ecology of Competition*, Harvard Business Review, 1993, retrieved from <https://hbr.org/1993/05/predators-and-prey-a-new-ecology-of-competition>

Having understood your world, it is then possible to turn the rest of the question: what do you want your role in your ecosystem to be?

In their exposition of the business ecosystem concept, lansiti and Levien²⁸ identify roles that organisations might play in an ecosystem, and the corresponding strategies they might employ to maximise both their own success and the health of the wider ecosystem:

- **Keystone** organisations are the hubs of ecosystems, providing a stable and predictable set of common assets that other organisations use to build their own offerings. They are critical to ecosystem health and lansiti and Levien note that by “carefully managing the widely distributed assets [they rely] on—in part by sharing with [their] business partners the wealth generated by those assets—[keystones] can capitalize on the entire ecosystem’s ability to generate, because of its diversity, innovative responses to disruptions in the environment”.
- **Niche** is the role played by most ecosystem members, developing specialised, differentiated expertise founded on capabilities provided by other ecosystem members.
- **Dominators** exploit critical positions in the ecosystem in a direct manner (in contrast with the indirect power of keystones). Organisations adopting such roles can pose dangers to the health and survival of an ecosystem, and I return to this under Question 3 below.

Your choice of role will depend on your purpose, your ambition and your capabilities, looked at in the context of the current state of your world (value chain/network and ecosystem) and how it is evolving. The answer to this question will drive your strategy, not least the answer to our next question.

Question 2 – What must you have in order to play your role?

This question, of what one must possess oneself rather than draw from the wider ecosystem, is not novel – the make/buy decision is hardly new! However, it has assumed new importance and urgency because of the following characteristics of the Digital age:

- **The availability of commoditised capabilities and the emergence of platforms** – The Innovation-Leverage-Commoditise cycle described above is progressing ever-faster, as demonstrated by the plethora of startup firms whose innovative offerings are founded on commodity cloud services. These startups illustrate the point that it is easier to create new higher-order offerings to customers if those underpinning capabilities that have been productised or commoditised elsewhere in the market are being sourced from appropriate providers. By contrast, retaining within your organisation functions that have been commoditised by others can lead to inertia, whether this be from lag in the development of those underpinning capabilities or from resistance to innovation from those parts of the organisation built around those legacy capabilities. Such inertia is one of the factors that can render incumbents vulnerable to disruptive startups.²⁹

²⁸ IANSITI Marco & LEVIEN Roy, *Strategy as Ecology*, Harvard Business Review, March 3004

²⁹ See, for example, the discussion at WARDLEY Simon, *A pet favourite - Inertia*, 2014, retrieved from <https://blog.gardeviance.org/2014/02/a-pet-favourite-inertia.html>

- **New models of work** – The connectivity enabled by Digital tools is facilitating new models of work and collaboration, examples including the ability of engineers from multiple organisations to collaborate on design through the use of BIM;³⁰ the emergence of the gig economy; platform organisations, epitomised by Uber, which operate by optimally connecting customers and providers of a service; and the open source movement. Talent strategy expert Gyan Nagpal describes digitally-enabled businesses as having access to a “dynamic capability spectrum” (figure 6): a range of sources of human capability falling into three categories: network capability (long-term institutional arrangements for capability access, such as acquisitions, strategic alliances and joint ventures, and outsourcing); internal capability (one’s own staff); and external capability (agencies, freelancers – the gig economy – and crowdsourcing).³¹ This is a useful lens through which to consider the full range of possible configurations of the core and extended enterprise layers of one’s ecosystem.

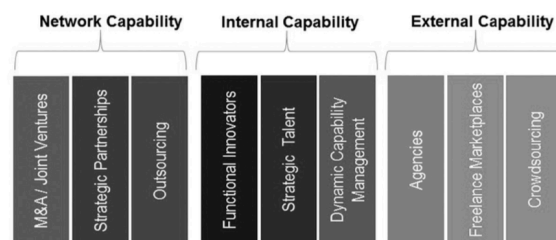


Figure 6 – The Dynamic Capability Spectrum (Source: Nagpal)

In summary, it is increasingly straightforward not to own elements of one’s value chain/network – or one’s talent base – and owning the wrong elements can lead to inertia. Hence the question: what *should* one own?

Nagpal gives an example of the sort of thinking needed to answer this question. Considering what talent an organisation should own as internal capability, Nagpal identifies three categories:

- Strategic (or “balance sheet”) talent: those responsible for revenue-producing relationships, core product development and long-term intellectual property;
- Functional innovators: those able to transform functions (HR, finance, IT, etc) to operate simply, efficiently, underpinned by appropriate use of data analytics and automation;
- Dynamic capability management: those able to integrate effort across the full capability spectrum: managing flexible and mobile talent, integrating and curating effort from different sources.

The second and third categories highlight that, with Digital enabling such profound changes in models of work, the ability to manage the response to those changes will become itself a core organisational competence and potential source of competitive advantage.

Nagpal stresses the need to root thinking about one’s future “talent recipe” in an understanding not just of the organisation’s future role but of its current position. He has cited a lack of interest and

³⁰ BIM = Building Information Modelling

³¹ NAGPAL Gyan, *The Future Ready Organization: how dynamic capability is reshaping the modern workplace*, 2019, Harper Business (forthcoming)

investment in the capability analytics required to gain that understanding as a material cause of inertia in the face of disruption.³²

Alongside human capability, other critical assets requiring an analogous analysis of current and future positions are likely to include:

- Intellectual property – as Digital commentator Tim O’Reilly puts it, referring to “the algorithms at the heart of a company like Uber or Lyft”: “In many cases the company with the best math wins.”³³
- Data – the advertising-based business models of companies such as Google and Facebook are founded on the data they hold. But data can have value not just in supporting current business models but in enabling future strategic developments. For example, O’Reilly observes: “The current race in autonomous vehicles is a race not just to develop new algorithms, but to collect larger and larger amounts of data from human drivers about road conditions, and ever-more detailed maps of the world created by millions of unwitting contributors [...] [considering] who will win in self-driving cars, one has to ask not just who will have the best software, but who will have the most data.”

Of course, taking the opposite course and opening out intellectual property and data may stimulate ecosystem development, as illustrated by the positive impact of open source software. Thus question 2 is a tricky balancing act: which assets – for example human capability, data, intellectual property – are at the heart of your competitive advantage and must be retained, and what – in the interests of your own flexibility and resilience, and the needs of the wider ecosystem – should come from elsewhere? This need to consider the wider ecosystem in strategy formulation leads to our third question.

Question 3 – What does your world need from you?

The health of the extended enterprise

Focusing in particular on the organisations in the “extended enterprise” ring of Moore’s model, Iansiti and Levien³⁴ stress the interdependence of ecosystem members. They cite (ironically given our focus here) the “Internet bubble” of the years around the turn of the century as evidence that “members of a network share a common fate, meaning that they could rise *and* fall together”. This means that contribution to ecosystem health is an important strategic objective.

Iansiti & Levien identify three measures of health: Productivity (“a network’s ability to consistently transform technology and other raw materials of innovation into lower costs and new products”), Robustness (“surviving disruptions such as unforeseen technological change”) and Niche Creation (“the capacity to increase *meaningful* diversity through the creation of valuable new functions, or niches”).

How do the ecosystem roles of keystone, niche player and dominator contribute to ecosystem health? The answer is straightforward for niche players: Iansiti and Levien see these as being

³² NAGPAL Gyan, personal communication

³³ O’REILLY Tim, *WTF? What’s the future and why it’s up to us*, Random House Business Books, 2017

³⁴ IANSITI Marco & LEVIEN Roy, *Strategy as Ecology*, Harvard Business Review, March 2004

responsible for most of the value creation and innovation in an ecosystem and therein lies their contribution to its health.

Keystone organisations can increase all of the measures of health by making it easier for ecosystem participants to connect to one another and develop new products (productivity), by incorporating technology innovations while providing a stable point of reference (resilience) and by offering innovative technologies to a variety of potential niche players (niche creation).

The third role, that of dominator, is more problematic. Iansiti and Levien distinguish two types of dominator: physical dominators and value dominators. Physical dominators seek “to directly control the assets [they] rely on, by acquiring [their] partners or otherwise taking over their functions [so that] a physical dominator ultimately becomes its own ecosystem, absorbing the complex network of interdependencies that existed between distinct organizations, and is able to extract maximum short-term value from the assets it controls.” The authors suggest that this can be an effective strategy in a mature industry, but can leave a company vulnerable in the event of change, citing IBM as an example of a physical dominator that fell prey to change with the rise of the PC ecosystem. This exemplifies the inertia we discussed under question 2 above.

Value dominators, by contrast, are unambiguously destructive – both to their ecosystem and hence, in the long run, themselves, as they seek to extract maximum value from the ecosystem without contributing to its health. Such behaviour can be deliberate. The authors cite Enron as a particularly egregious example, in that it intentionally exploited used its strategic position to exploit information asymmetries across its market while displaying aggressive behaviour that impeded the development of trust within the ecosystem. It can also be inadvertent: as an example of a “hub landlord” strategy, Iansiti & Levien cite this from the “dot-com” boom and bust of the turn of the 21st century:³⁵

When AOL and Yahoo! struck aggressive deals with their dot-com partners in the boom years of the internet bubble, they financially weakened their partners and set the stage for the collapse to come. [...] Although Yahoo!'s and AOL's actions may not have contributed to the individual performance of these financial firms as conventionally measured, the collective effect of their actions on the system as a whole was destabilizing – and ultimately catastrophic for the entire ecosystem.

Iansiti and Levien thus present as key to ecosystem health the extent to which ecosystem members both create and share value in the ecosystem. O'Reilly echoes this, quoting Bill Gates as saying: “A platform is when the economic value of everybody that uses it exceeds the value of the company that creates it.”³⁶

The health of the whole ecosystem

While we have focused so far (as does much of the writing on business ecosystems) on the middle “extended enterprise” ring of Moore’s model, the principles of ecosystem health are relevant to the whole model, in particular the need for value creation and sharing to balance value extraction.

³⁵ IANSITI & LEVIEN, *The Keystone Advantage: what the new dynamics of business ecosystems mean for strategy, innovation and sustainability*, Harvard Business School Press, 2004

³⁶ O'REILLY Tim, *The fundamental problem with Silicon Valley's favourite growth strategy*, Quartz, 2019, retrieved from <https://qz.com/1540608/the-problem-with-silicon-valleys-obsession-with-blitzscaling-growth/>

This is reinforced by the value network thinking of Verna Allee.³⁷ Her approach to assessing the health of what she terms “value networks” (networks of roles linked by transactions which may be tangible – formal exchanges of money, goods and services – or intangible – knowledge, reputation, etc.) includes the assessment of whether there is a pattern of healthy exchange and reciprocity, whether nodes are realising value (productivity) and the extent to which nodes are adding value to the network as a whole.

So let us consider the rest of the ecosystem model, beginning with its inner, core business, ring. This includes an organisation’s direct suppliers and, indeed, its own staff. Both can be found on Nagpal’s full-spectrum talent model. The fine boundary between the two is illustrated by the contemporary debate over whether Uber drivers should be thought of as suppliers or as staff. Both categories form part of the ecosystem.

This is recognised in a post by platform design specialist Simone Cicero. Discussing the application of Wardley Mapping to platform-based ecosystems like Uber, Cicero positions suppliers and customers at the same level in the value chain (see figure 8) – or indeed value network – noting that providers “move away from being treated as part of the “infrastructure” and travel to the top of the value chain [also expecting] personalized experiences, and the possibility to express their full potential.”³⁸ An analogy for permanent staff can be recognised in the finding of Nick Kemsley of Henley Business School “that talent is exhibiting customer behaviours and that we should begin to engage with it in the same way that we engage with the customers who buy our products and services” and that more than one organisation has moved responsibility for its employee value proposition into its marketing function to drive alignment with its customer brand.³⁹

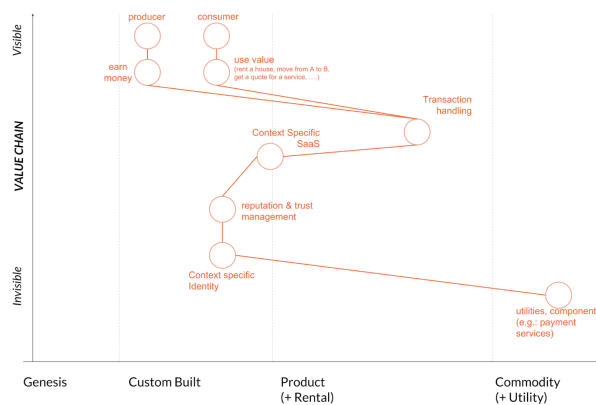


Figure 7 - Wardley map illustrating supplier/customer parity in platform-based ecosystems (Source: Cicero)

This importance of individual talent within business ecosystems is evidenced by growing concern over the extent to which value is being shared with those individuals, and the long-term implications for the future sustainability of these networks. For example, Kenney & Zysman comment that “loss-driven market domination strategies which generate capital gains without attaining even mid-term

³⁷ ALLEE Verna, *Value Network Analysis and value conversion of tangible and intangible assets*, Journal of Intellectual Capital, 2008

³⁸ CICERO Simone, *Understanding Platforms through Value Chain Maps*, Medium, 2018, retrieved from <https://stories.platformdesigntoolkit.com/platform-value-chain-z-shape-385f759faffa>

³⁹ KEMSLEY Nick, *Employer Value Proposition – Time for HR to up its game*, Henley Centre for HR Excellence, 2015

market sustainability, appear to encourage strategies that will treat labor as a commodity, whose cost is to be minimized rather than seen as an asset whose value can contribute to long-term competitive advantage for the firm”.

Turning to the outer ring of Moore’s model, the wider business environment, one can see concerns over ecosystem health and over the balance between the sharing and capturing of created value manifested in a range of contemporary debates, including:

- Concerns over the societal impact of new industries: including what the Economist described as “increased congestion and other environmental costs, a weakening of public transport systems, the precarious lives of the workers who make these platforms function and a more friable body politic”.⁴⁰ Is value being provided to all who are affected in the wider ecosystem?
- Concerns over privacy and control over information, illustrated by Shoshana Zuboff’s coining of the phrase “surveillance capitalism”,⁴¹ and over “fake news”;
- Concerns over the equitability of the tax practices of Silicon Valley firms, for example those that economist Mariana Mazzucato cites as “depriving the US taxpayer of revenues from technologies, embodied in Apple products, whose early development the taxpayer had funded”.⁴²

From the opposite side of the debate, evidence comes from examples of major platform companies demonstrating an appreciation of the need to respond to such threats to ecosystem health:

- Uber’s integration of TfL live data into its app in 2019,⁴³ so that users can compare the taxi option with other services, can be seen as a response to concern over the firm’s impact on public transport and the environment.
- Facebook’s recently (in 2019) announced plans to “surface high-quality and trustworthy information”⁴⁴ can be seen as a response to the concern over “fake news”.
- Looking further back (2015), Google’s decision to open source its TensorFlow machine learning engine,⁴⁵ the first time that it had made available code of such core importance.

Most recently, the recommendations of the UK Government’s Digital Competition Review, point to the need for organisations in hub positions to follow good “keystone” practice in, for example, of personal data mobility and open standards.⁴⁶

⁴⁰ The Economist, *Herd Instincts: Unicorns going to market*, 2019

⁴¹ ZUBOFF Shoshana, *The Age of Surveillance Capitalism*, Profile Books, 2019

⁴² MAZZUCATO Mariana, *The Value of Everything: making and taking in the global economy*, Penguin Books, 2018

⁴³ *Uber adds public transport information to London app*, The Guardian, 30 April 2019

⁴⁴ TRANSCRIPT – Mark Zuckerberg in Berlin / Second Personal Challenge 2019, Facebook Newsroom, 1 April 2019

⁴⁵ *Google Just Open Sourced TensorFlow, Its Artificial Intelligence Engine*, Wired, 2015 retrieved from <https://www.wired.com/2015/11/google-open-sources-its-artificial-intelligence-engine/>

⁴⁶ *Unlocking digital competition: Report of the Digital Competition Expert Panel*, HM Treasury, 2019, retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785547/unlockingdigitalcompetitionfuranreviewweb.pdf

In short, you need to think about your full ecosystem and the role you need to play in the sharing of value to ensure its longer term health, not least in the interests of your own sustainability. This is the case even though doing so is not without challenge.

The first challenge is the practical impossibility of mapping a full ecosystem absolutely comprehensively in today's densely connected world. But this is no reason not to seek to map its most salient aspects. While avoiding "paralysis by analysis", if one is going to "move fast and breaking things", it is nonetheless helpful to be able to sense when one has broken something and respond appropriately. For as Iansiti and Levien put it, referring to the Yahoo!/AOL case discussed earlier, neither "was unaware that they were embedded in a network [...] Both explicitly viewed themselves as hubs in these networks. But without a framework for assessing network health, they proceeded with strategies that optimized short-term financial gains while undermining critical domains in their ecosystems – strategies from which they are still trying to recover."

A further challenge is that the concept of value is somewhat slippery. Indeed, writing on the impact of Digital on the economy, Brynjolfsson and McAfee observe that "we know less about the sources of value in the economy than we did fifty years ago",⁴⁷ going on to observe that the intangibles that count for much of the value in the Digital world (human capital, organisational capital, user-generated content and intellectual property) do not figure in calculations of GDP. Mazzucato similarly notes the limitations of such measures as GDP as part of her wider argument that "the concept of value must once again find its rightful place at the centre of economic thinking".

While the understanding of how value can rightly be measured is clearly a domain for further study, the question is not purely academic. It is a real question that is in part being answered empirically through debates of the sort described above. The future of today's major Digital platforms could well rest on the extent to which their business models are judged to be equitable, acting as net creators and sharers of value rather than net value extractors – acting (to use the language of Iansiti and Levien) as generative keystones rather than destructive value dominators. Commenting on the dangers of getting the balance wrong, O'Reilly warns: "Our entire economy seems to have forgotten that workers are also consumers, and suppliers are also customers. When companies use automation to put people out of work, they can no longer afford to be consumers; when platforms extract all the value and leave none for their suppliers, they are undermining their own long-term prospects. It's two-sided markets all the way down."

It could be said that some organisations have only taken action on challenges of this nature when they have become highly visible. The message for those embarking on a Digital transformation is the need to factor in thinking about the wider ecosystem and value within it, both at the outset and as strategy evolves in execution.

Conclusion

Acting on Digital is a matter of **urgency**: change is already happening and, while its rate may be hard to predict, the time required for action is significant and neither the competitive landscape nor the potentially "Winner-Takes-All" nature of Digital markets will be forgiving to those slow to act. It is also a matter of strategic **importance** because of the structural change that Digital is provoking in industries, both in **what** is delivered – with yesterday's new invention becoming tomorrow's

⁴⁷ BRYNJOLFSSON Erik & McAFFEE Andrew, *The Second Machine Age*, W.W. Norton & Company, 2014

commoditised utility, supporting the development of new offerings of even greater value – and in **who** is delivering it, with the emergence of business ecosystems.

Taking that action starts with coming to an initial view on three strategic questions:

- **Question 1 – What role will you play in your world?** – In answering this question, it is important to start out with a clear view of purpose – if this is unclear (not uncommon) then it should be question 0! But context is then all. We have looked at two complementary ways in which you can think about your world: as a value chain/network and as an ecosystem. The question is: given the current state of that world, how it is evolving and may evolve, your purpose, your ambition and your capabilities, what do you want your role to be? For example, are you to be a keystone organisation – perhaps acting in a platform role – or is it more appropriate to occupy a (possibly large and significant) niche?
- **Question 2 – What must you have in order to play your role?** – In the Digital world, it is both easier to draw on external services and talent to deliver the value for which you are responsible, and more critical to do so when appropriate, because to retain the wrong internal capability can lead to the threat of inertia. So which assets – for example human capability, data, intellectual property – are at the heart of your competitive advantage and must be retained, and what – in the interests of your own flexibility and resilience, and the needs of the wider ecosystem – should come from elsewhere?
- **Question 3 – What does your world need from you** – One's survival in an ecosystem depends on the survival of the ecosystem. So are you a net value contributor to, rather than net value extractor from, your ecosystem? Where this is hard to determine – because of the wide extent either of your ecosystem or of the forms of value in play (from money to data to real intangibles such as reputation) – then do you at least have the mechanisms in place to make these judgements and react yourself before, as is happening in many debates over the societal impact of Digital today, others judge and react for you?

While these questions are, of course, only a first step in Digital transformation, their fundamental nature makes the step critical. If you are embarking on a transformation, ask them. If you or your organisation has embarked on a transformation without having answered them, then ask these questions now. And if thinking about such transformation is yet to begin, do not delay. Either way, I suggest **ACTION THIS DAY!**

Afterword

This paper is the first in a planned series on Digital Transformation, hence its very deliberate focus on the most basic of questions. This is developing thinking, drawing on a number of strands of published research, and test and challenge can only benefit it. If you or your organisation are grappling with the issues tackled here, then do get in touch with me, whether to share your own insights, challenge this thinking or perhaps offer an opportunity to test its application. You will find my contact details at chalmers-advisory.com.

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