Open enterprise: how three big businesses create value with open innovation

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Executive summary

As businesses get bigger, staying innovative and agile is challenging. This report explores three industry-leading enterprises that have embraced an open approach – open source, open standards, open data, open innovation – to help retain their competitive edge.

> "We're becoming an open platform for our customers, a core piece of their operating infrastructure."
> **– Tim Baker, Global Head of Content Strategy and Innovation, Thomson Reuters**

The three multinationals featured in this report are proving that 'being open' is about more than just taking advantage of data made open by governments, other businesses and community groups. These companies have adopted an open approach to keep pace with change, adapt to new markets and influence whole sectors. In effect, they are becoming porous – using an open approach as a mechanism to improve their services, take advantage of new ideas and opportunities, and grow and collaborate more with their networks.

Thomson Reuters, **Arup** and **Syngenta** are embedding open principles into their operations to gain competitive advantage. All three are large-scale consumers of data, and sell data-based products. Today, the market for data – data itself, data services and platforms, and data analytics – is hyper competitive. Big businesses in every sector are asking themselves how they can use data more effectively to improve their operations. For Thomson Reuters, Arup and Syngenta, being open has become crucial for overcoming the challenges that many big businesses face:

- **reusing third-party sources of data** to drive internal decision making and create new competitive products and services
- **maintaining a leadership position** in increasingly competitive markets
- **keeping costs low for the business** and for customers and partners they work with
- **staying agile and ready to evolve** as the environment they operate in changes
- **collaborating with clients, and even competitors**, to tackle sector-wide challenges

Each of these businesses has addressed these kinds of challenges in a different way.

Thomson Reuters has taken what started as an internal data management solution and **created a new, collaborative information platform providing open data that anyone can access, use and share**. The team took this approach to improve client relationships, the quality of their data and uptake of their existing products.

Arup has **created and connected with an ecosystem** of open innovators. Backed by a compelling business model, the team is reducing transactional friction between their customers' challenges and their teams' ability to address them, through a porous data supply-chain. This has led to new products and new ways of working, and saved them time and money.

Syngenta started off **publishing open data to increase transparency** but soon realised that it could **help them shift to a more open, or networked, approach to operating**. The team are determined to capitalise on the new relationships that this will create.

Each has used an **open approach as a mechanism to retain competitive advantage**. Whether by publishing open data or building an open ecosystem, they are developing trust, creating networks and nurturing fertile ground for future innovation.

Introduction

In our networked economies, taking an open approach has become key to maintaining a competitive advantage.[1] The success of a company relies on having collaborative and fluid relationships with their partners, customers and even competitors. Whether it's through open data,[2] open source,[3] open innovation,[4] or a combination of them all, taking an open approach enables that collaboration.

In early 2015 we published 'Open data means business,' a report that highlighted 270 companies across the UK that used, produced or invested in open data – data that anyone can access, use and share.[5] It showed that open data is being used to create innovative products and services in a number of different sectors, adding to the growing body of evidence that demonstrates the economic impact of open data.[6]

Interestingly, the study demonstrated that the companies making use of open data are not all trendy startups. Nearly 10% of the open data companies we identified had 251 or more employees. We wanted to investigate how and why these organisations were working with open data. Detailed case studies of three big businesses – Thomson Reuters, Arup and Syngenta – form the majority of this report.

1   Wardley, S. (2013) *Openness vs Strategy*. [Blog] Bits or pieces? Available at: http://blog.gardeviance.org/2013/02/openness-vs-strategy.html. [Accessed 2016-03-08].

2   Open Data Institute, (2014) *What is open data?* [Online] Available at: https://theodi.org/what-is-open-data. [Accessed 2016-03-08].

3   Noyes, K., (2011) *10 Reasons Open Source Is Good for Business* [Blog] PC World. Available at: http://www.pcworld.com/article/209891/10_reasons_open_source_is_good_for_business.html. [Accessed 2016-03-08].

4   Gemuenden, H. G., Rohrbeck, R., and Hölzle, K. (2009) How Deutsche Telekom Creates an Open Innovation Ecosystem. *R&D Management*, [online] Volume 39(4), pp. 420–430. Available at: https://www.researchgate.net/publication/200044964_How_Deutsche_Telekom_Creates_an_Open_Innovation_Ecosystem. [Accessed 2016-03-08].

5   Open Data Institute, (2015) *Open data means business: UK innovation across sectors and regions*. [Online] Available at: http://theodi.org/open-data-means-business. [Accessed 2016-03-08].

6   Tennison, J. (2015) *The economic impact of open data: what do we already know?* [Blog] Huffington Post Tech. Available at: http://www.huffingtonpost.co.uk/jeni-tennison/economic-impact-of-open-data_b_8434234.html. [Accessed 2016-03-08].

Embracing open innovation: what's in it for big businesses?

It comes as no surprise that big businesses take advantage of open data from government and elsewhere. For commercial organisations, using open data provides additional insight at limited cost. Whether it's to help choose where to put a new store, or to create an analytical product for customers, there are clear advantages for businesses to use whatever data they can find. There are clear parallels between the increasing use of open data and the growing adoption of open source software. Both provide a cost-effective and increasingly trusted alternative to proprietary sources.

But nearly all businesses have treated the data they generate themselves as an asset to be closely guarded and released only to those prepared to pay for it, if at all. In some cases this careful handling is justified: for example, the sharing of personal data is limited by law. It's only now that some of the UK's market-leading enterprises are releasing their own open data. These companies have found that making some of their valuable data assets available – not just at no cost, but with permissive licences that allow the data to be accessed, used and shared by anyone – can reduce friction in trade with others, increase their market reach and build commercial resilience in the long-term.

Open data is just one strand of a more open approach to innovation. As they seek to gain a competitive advantage, big businesses are trying to be faster-moving, more adaptive and more disruptive. They have adopted a more open approach to external ideas and technologies as well. They are becoming porous organisations.

By examining the actions and motivations of Thomson Reuters, Arup and Syngenta we have found these three large businesses are seeking competitive advantage in a changing environment through strategically adopting an open approach. Some make use of open data, some publish it, but for each it forms a significant part of their open approaches to innovation.

Case studies

Thomson Reuters' data services go open

Thomson Reuters is a multinational organisation that **provides news and information to industry professionals**. The company offers a wide range of services – primarily around information and data – in areas including finance and risk, law, tax and accounting, intellectual property and science. Thomson Reuters reported **$12.2bn** in revenue in 2015.[7]

Thomson Reuters was formed through Thomson Corporation's merger with Reuters Group in 2008 and has since continued to grow, in part through acquisition. But as with any company that has evolved in this way, there can be challenges in integrating legacy data resources and systems.

In order to tackle this challenge, Thomson Reuters took an innovative linked data approach which allowed it to join up its specialised data assets without having to migrate them to a single database or data warehouse. It began by establishing central data 'authorities' to ensure that key entity data (such as organisations and people) was only mastered once. Each of these entities was assigned a Permanent Identifier (PermID). Each PermID provided a unique reference point for a single entity – for example, Thomson Reuters Corp itself has a PermID of 4295861160. The concept of permanence meant the PermID, and its relationship to a specific entity, would not change over time. Existing databases were "re-mastered" by adding PermIDs alongside legacy identifiers, with a view to ultimately replace them altogether. PermIDs were also used to uniquely identify other information objects such as news articles, deals and corporate actions.

Demand for the PermID approach

Thomson Reuters is no stranger to helping its customers with their data management challenges, having managed the RIC system for financial instrument identification for many years. The team therefore recognised that the work they were doing internally with PermID had broader applications. Not only were new internal products and services created, but Thomson Reuters was approached directly by clients who used its products and wanted to integrate them with their own data.

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7   Thomson Reuters, (2016) About Thomson Reuters. [Online] Available at: http://thomsonreuters.com/en/about-us. html. [Accessed 2016-03-08].

Like Thomson Reuters, these clients wanted to join up their own data holdings for internal use and provide consistent and interoperable data products and services to their clients. As Wilbur Swan, Head of Enterprise Metadata Services, puts it, data siloing issues were not unique to Thomson Reuters, but "a problem shared by all our clients".

Thomson Reuters "knew [it] had in PermID a solution to wider industry problems", says **Tim Baker**, Global Head of Content Strategy and Innovation. And as Dan Bennett, Head of Enterprise Data Services, explains:

> "We believe that this is the right thing for our customers because our customers are asking for it. And, in a very broad sense, when you do what's good for your customers it's generally good for you."

While providing access to the PermID system can help customers with their own internal data silo issues, **Tim Baker** sees the benefit for Thomson Reuters in "making [its] data much easier to use, which in turn makes it more accessible, more cost effective, and hopefully more widely used by [its] customers as a result". By providing the tools to integrate its data products and internal client data, Thomson Reuters saw a clear business opportunity.

The case for opening up PermID

Thomson Reuters then had to decide how to expose PermID to its customers. Past experience has taught the industry that releasing proprietary identifiers with restrictive licensing conditions can create significant problems. One key issue is reusers' inability to expose these proprietary identifiers to their own clients, and even to other departments within their business, in some cases. This has made people approach new proprietary identifiers with caution.

Thomson Reuters realised that the only way customers would embrace and be able to recognise the full potential of PermID was if it took a radically different approach – an open approach. Thomson Reuters and the Open Data Institute (ODI) had already explored the importance of identifiers in such an approach, in an earlier white paper which laid some of the groundwork for PermID.[8] "All we're trying to do is make it easier for our customers to work with us," explains **Dan Bennett.** "Only through making it open data was it actually going to be a reasonable experience for our customers." **Dan Meisner**, Head of Capability for Open Data, agrees: "For our customers, it's that commitment to openness of the identifier and of the information model that's important."

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8   Open Data Institute and Thomson Reuters (2014) *Creating value with identifiers in an open data world*. [Online] Available at: http://theodi.org/guides/data-identifiers-white-paper. [Accessed 2016-03-08].

Making a commercial case for open

While it was clear that allowing anyone to access, use or share the data was the only way to fully recognise the potential benefits of PermID, being a commercial organisation meant that Thomson Reuters had to justify this decision internally. This can be challenging, because "customers see an awful lot of value in this but commercially it's not easy to put a value on," notes **Dan Bennett**. "The benefits from this to us are mainly tangential," he adds. The issue is, as **Dan Meisner** puts it, that these indirect benefits and network effects "don't really fit very well into an Excel model for calculating your internal rate of return".

Ultimately the financial case was made, as **Dan Bennett** explains:

> "We don't exist to make money out of issuing those identifiers. We create those identifiers because it's important to our internal data model. The reality is that we have this data and are managing it anyway, so the incremental cost for us to expose it externally is not that great in the grand scheme of things."

As such Thomson Reuters decided to publish a subset of its data, including associated PermIDs, under an open Creative Commons licence (CC-BY 4.0). An extended set of fields offering further descriptions of the entities in question has been released under a Creative Commons non-commercial licence (CC-NC 3.0). They launched this service as Open PermID in 2015,[9] achieving an ODI Open Data Certificate in the process of release.[10]

Unlocking benefits to PermID itself

The benefits of providing this data openly are not limited to customers. In addition to recognising the indirect financial benefits of increased data use, Thomson Reuters expects open licensing will benefit the data itself. Because the data is open, Thomson Reuters can gain valuable external feedback not only from clients but also from others who choose to use the data because they all have a vested interest in its accuracy. "It's a bit like open source software," says **Dan Bennett,** "... which is generally thought to be more secure because you have more eyes on it. In the same way, having more eyes on our data will make it gradually stronger and richer."

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9   See https://permid.org.

10   See https://certificates.theodi.org/en/datasets/24563/certificate.

Not only does the company expect opening the data will improve its accuracy but, because linked data is used, when others link their own external open data sources to the PermID data, it enriches and increases the value of the Thomson Reuters data without additional effort.

Unlocking PermID also opens up new solutions for Thomson Reuters to sell. These include Thomson Reuters Intelligent Tagging which uses PermID when tagging unstructured data, helping organisations to enhance the value of their content sets.

Securing a future through an open approach

Regardless of any related commercial opportunities, in making the decision to release PermID under an open licence, Thomson Reuters is looking well beyond immediate costs and benefits. The company fundamentally sees the release as part of a long-term strategy responding to emerging trends and challenges in the industry. One of the main trends concerning Thomson Reuters is that "in many ways, we're in a post-scarcity world for data," explains **Dan Meisner**. Thomson Reuters is keenly aware that the proliferation of data has a significant effect. **Tim Baker** says "as a company, we've realised that customers want to use data from more and more sources. There's no value to them in a 'one-size-fits-all' approach to the data they use." **Dan Meisner** agrees:

> "Customers are grabbing data from different parts of their own businesses [and] they're looking at open data from government sources and elsewhere. The high-quality professional reference data that is our bread and butter is not becoming less important, but it's becoming less of an overall component of our clients' enterprise data inventory."

In the face of these changes, which **Dan Meisner** describes as "moving towards a networked data economy", Thomson Reuters sees its role as an actor that can "help the industry take this wealth of data and make it actionable information". The company believes it is well positioned to do this because of its existing expertise in data integration. As **Tim Baker** puts it:

> "In the past, there was a lot of value in the way data companies acquired, organised and presented information for their clients. And to an extent there always will be, but the real value now lies in the underlying data models, the naming mechanisms and the tools used to extract meaning from and link data. This is where our customers are looking for us to help them, and we've been reshaping our business to meet this need."

Thomson Reuters believes PermID forms a key part of this value proposition and that the timing of its release is also key.[11] "I think there's a sense that if we don't do it, somebody else might," explains **Dan Meisner**. Having witnessed the rise of platform firms across the tech sector, the company is determined to experiment and emulate the model. **Dan Meisner** explains:

> "Increasing amounts of open data are being published, and we're making the investment to be a foundational part of this future ecosystem. The basic idea is that just as this has helped us connect data from around our own organisation, it should then help our customers, our partners, and maybe even our competitors do the same with their data, and plug that into our organisation, our platform."

By positioning itself in this way, Thomson Reuters believes it can cement its position in the information industry for the foreseeable future. "The environment our customers operate in has fundamentally changed, and we have evolved our business model to suit," says **Tim Baker.** "We're becoming an open platform for our customers, a core piece of their operating infrastructure."

Open for business

Thomson Reuters has taken this approach not only to help its clients integrate their data but also to help them, and others, to better manage internal data. The company believes making it easier for customers to integrate Thomson Reuters data will increase its value and usage. In addition, by combining open data with stable identifiers, it gives clients freedom to experiment, link their own open or proprietary data and provide feedback on the identifier system, all of which makes PermID a stronger offering – both internally and externally. Thomson Reuters is also well positioned to create a platform based on its data and information model, becoming a central component in a future ecosystem. By embracing linked open data, Thomson Reuters is creating a competitive advantage in paving the way to build new products and generate new business models – both now and in the future.

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11 Fletcher, A. (2015) Thomson Reuters: 'Open is the new normal'. [Blog] Available at: http://theodi.org/blog/thomson-reuters-generation-open-new-normal. [Accessed 2016-03-08].

Arup builds a network of open innovators

Arup is a multinational professional services firm that **provides design, engineering and consulting services for the built environment**. It has around 11,000 employees and had a turnover of **£1.05bn** in 2014.

Using open data

Arup has long used publicly available data from a number of sources, including the Office for National Statistics (ONS). Its Digital Insight team makes use of ONS demographic data in urban planning and design projects as well as environmental statements and assessments. It also uses publicly available geospatial data to derive location-based insight for its clients. For example, its Hazard Owl risk information system uses real-time environmental data to constantly assess the risk of damage to commercial assets, such as office buildings or factories.

The use of open data is becoming increasingly common across the large number of projects the company works on at any given time. As **Damien McCloud**, Digital Insight Leader, explains:

> "We increasingly and always have had a need for third-party data. Clearly the emergence of open data is now getting to a point where the availability and reliability of that will impact on how we work as a firm globally."

This impact is well demonstrated by Arup's use of open data in combination with open source software in its built environment projects. For example, in sandscaping – the management of sand to support coastal protection or regeneration – Arup developed an open source system that ingests demographic, environmental and geospatial open data to help users locate the best areas for sandscaping and analyse project impact.

Finding new ways of collaborating

Alongside the use of open data, a key aspect of Arup's increasingly open approach to innovation is the way in which it partners closely with open data startups. Traditionally, Arup would complete its research and development (R&D) in house in order to develop new commercial services or improve existing ones, sometimes working with academia and other groups. The firm is now shifting to a more open, collaborative approach, in which it experiments more with external ideas as well as internal ones, and different paths to market. It is currently working in this way with two open data startups previously incubated at the ODI, Mastodon C and OpenSensors.

Mastodon C is a specialist big data company. It provides data science and technology services to a range of different organisations to help them better understand and gain insights from their data. In a recent project for one of Arup's clients, it used its data science expertise to help Arup quickly derive commercial insight from vast amounts of data related to airport infrastructure.

A fellow graduate of the ODI Startup programme,[12] OpenSensors is an online platform that enables anyone to publish real-time sensor data. As well as enabling users to better manage their own closed data, the platform is building a repository of open data that can be accessed, used and shared by anyone. Arup first worked with OpenSensors to install 200 sensors across its own London offices. The purpose of the installation was to help Arup take a hands-on approach to Internet of Things (IoT) research that could be scaled up quickly and effectively. Arup is now looking to work together with the two startups on further commercial work, such as the creation of a new asset monitoring platform.

Absorbing new ideas, technologies and data

The prime motivation for adopting this approach to open innovation and becoming a 'porous organisation' is the realisation that rapid, disruptive change is unlikely to come solely from within. Large organisations like Arup will have to quickly absorb new ideas, technologies and data in order to remain competitive over the long-term. **Volker Buscher**, Director, Arup Digital, explains how:

> "We think there are domains that would benefit not just from open data but an open innovation process. It's not just data, it's also open source in terms of code or the development of other digital assets.

> "I can't see an end to digital disruption rolling into our industry. The idea that we will have all the experts in house is unrealistic."

Beyond direct project work, this approach has the potential for wider, long-term impact across the business. Working with startups in this way means new ideas are injected into Arup's values, principles and policies. This is particularly relevant to the ethical considerations to be made around the use, reuse and sharing of data. Working this closely enables both sides to shape the other's thinking.

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12   See http://theodi.org/current-start-ups.

An experimental approach – where targets are often more loosely defined, with fewer concrete objectives or plans – requires an attitude to licensing and Intellectual Property (IP) that is different to that taken by most large organisations. According to **Volker Buscher**, this attitude is particularly likely to be shared by startups incubated at the ODI:

> "Open innovation frameworks and the use of Apache licensing for code development and sharing is really attractive to both sides. It allows us to create IP without having to have complex legal agreements, lawyers, and background and foreground IP discussion that just slows everything down in this new world.

> "What I found is that startups coming out of the ODI already have that understanding in their fabric. Some of the bigger companies that we work with or other startups without that background have a different view of the world. You spend more time with their lawyers than with their developers."

Bringing about faster change

From a startup's perspective, Arup's way of working provides a number of benefits, including no demands for equity, the retention of autonomy, and immediate access to clients and markets. **Volker Buscher** says:

> "The principle thing we bring is scaling. If we set up the asset monitoring platform that we are discussing with [the startups], we will be able to contact 100 clients within months – a different scale and a different pace than they would have been able to otherwise."

For Arup, the combination of skills and expertise enables it to scale promising projects more quickly. Working in partnership with the startups also allows them to rapidly move into emerging domains and seize opportunities that similar firms may not yet even be aware of. **Volker Buscher** explains that:

> "The biggest cost of not adopting this approach would be the loss of speed. We've been working with data and data analytics forever – we invented some of the structural analytics tools used around the world. That, in itself, is not new to us.

> "But when we understood the scale and complexity of distributed data architectures, combined with wanting to get involved with things immediately, this approach [was] needed. It is so much quicker than hiring a whole bunch of people or organising complex sub-consulting agreements."

Arup is currently in the process of quantifying the exact benefits of adopting this approach to open innovation. It is also exploring how it can publish its own open data in a way that creates tangible commercial value. On reflection, **Volker Buscher** contrasts his company's approach with the one taken by other large organisations:

> "There are lots of big businesses that have got accelerators or incubators but they usually involve investing in the startup, taking equity out and having very clear IP rules attached. That's a completely reasonable model that lots of companies use. We are exploring a different way of doing it."

Syngenta supports sustainability with open data

Syngenta is a global agriculture business that **helps farmers make better use of their available resources**, primarily through agrochemical and seed production. In order to continue to advance crop productivity, it invested more than **$1.4bn** in research and development (R&D) across 150 international sites in 2014.

Data-driven R&D

Syngenta has a history of using publicly available data in its R&D. Alongside data related to land, weather and soil conditions, it uses biological data that has been published openly to build a detailed understanding of crop (and pest) traits – like tolerance of environmental pressures and resistance to viruses. **Derek Scuffell**, Data Strategist for R&D Information Systems at Syngenta, describes how:

> "We certainly have made use of a mix of satellite data that we buy and public satellite data. In R&D, what we make really heavy use of is huge amounts of public molecular biology data, which in Europe is mainly hosted by the European Bioinformatics Institute."

In 2014 Syngenta funded the European Bioinformatics Institute (EMBL-EBI) to extract bioactivity data from a large number of academic journals. The data covered insecticides, fungicides and herbicides, including more than 40,000 compound records related to crop protection. It was made available as open data through the ChEMBL database of bioactive molecules – Syngenta's first experience of making data available for anyone to access, use and share.[13]

Publishing Syngenta's own open data

A year later, the company decided to publish its own open data as part of its Good Growth Plan. The plan addresses the long-term challenge of ensuring global food security for a rapidly rising global population. It focuses on the sustainability of Syngenta's business and seeks to support transformation and change within the organisation by setting out six significant commitments.[14]

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13 The European Bioinformatics Institute, (2014) ChEMBL_19 *Released - Now with Crop Protection Data!* [Blog] Available at: http://www.ebi.ac.uk/about/news/service-news/ChEMBL-19-released. [Accessed 2016-03-08].

14 Syngenta, (2013) *Syngenta launches The Good Growth Plan.* [Blog] Available at: http://www.syngenta.com/global/corporate/en/news-center/news-releases/Pages/130919.aspx. [Accessed 2016-03-07].

In April 2015 Syngenta collaborated with the ODI to make six open datasets available related to its Good Growth Plan, including descriptions of productivity, soil, biodiversity and smallholder reach.[15] The data will be updated yearly to measure the plan's actual performance against its stated commitments. It is collected by external companies as well as Syngenta. The reporting process, its quality controls and evidence is independently assured by PwC and the datasets achieved Silver level Open Data Certificates, verified by the ODI. One of Syngenta's key motivations for collecting and publishing data in this way was to develop external trust in the plan, which is essential for strengthening collaboration between private and public stakeholders for global food security. Making the data available has brought about an unprecedented level of transparency for the company.

Moving beyond transparency to wider use

As well as enabling anyone to assess the performance of the Good Growth Plan for themselves, publishing open data has had an instrumental role in the plan's promotion and communication. Head of Data Sciences **Graham Mullier** explains how the open data release caught public attention in a way that wasn't expected:

> "We've done publicity around the Good Growth Plan in the past when it was launched. The interest and engagement that we got from a much lower-key open data press release, all on its own, triggered similar levels of interest to some of the more expensive media-driven pushes we have done before. We were surprised at the way in which people picked up on the story."

Syngenta is now actively exploring other potential uses of the data. For example, its productivity dataset includes agricultural efficiency indicators for over 3,600 farms in 41 countries across Europe, Africa, Latin America, North America and Asia Pacific. **Elisabeth Fischer**, a development economist at Syngenta, hopes that this data will eventually be used by farmers around the world for resource efficiency benchmarking:

> "This is data that tells you how much input farmers needed in that year to produce a certain output. The data can be very interesting in countries where such data doesn't exist to provide a reference point. For example, if I farm my land and I need significantly more input than the benchmark, then maybe I have an opportunity to reduce my input needs and maybe it helps me find that solution."

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15 Syngenta, (2015) *The Good Growth Plan Progress Data*. [Online] Available at: http://www.syngenta.com/global/corporate/en/GoodGrowthPlanData/Pages/progress.aspx. [Accessed 2016-03-07].

In this scenario, a solution could then be developed by the farmer, together with their agronomic advisors, in a way that meets the commitments of the Good Growth Plan itself. The company is looking at ways the data could be improved and made more useful, such as including farming practices or other details. As **Elisabeth Fischer** explains:

> "[We see a need to] create a platform where farmers can get access to this information and benchmark themselves against what others are doing. To make it more relevant, we work to increase the scope of the data.

> "Eventually we want this data to help empower farmers to make better decisions on what works best for them and their land in order to feed a growing population. But this needs more than just our data and our offer. It's a piece of a puzzle and our contribution to developing a collaborative and unbiased approach."

Adopting a more collaborative approach

For Syngenta, opening up some of its data represents a wider, ongoing shift to a more collaborative business model in which data plays an increasingly significant part. It is estimated that there will be more than 20.8bn Internet of Things (IoT) connected devices by 2020.[16] As the quantities of data collected by these devices in the agriculture sector grow, **Graham Mullier** believes that Syngenta will need to work in tandem with others to meet the challenges laid out in the Good Growth Plan:

> "The rate of data generation is increasing. The granularity is getting finer and finer all the time. All of that gives us loads more data to work with and the chances of any one organisation being able to generate the data, host the data, analyse the data and come up with brilliant answers all on their own seems vanishingly small. We have to find ways of collaborating."

Through its own open data release and contributions to the Global Open Data for Agriculture and Nutrition (GODAN) initiative, Syngenta is playing an active role in bringing about this collaboration. Ultimately, it is acutely aware of the costs of not taking this approach and not opening up to others in the sector. **Derek Scuffell** explains his view that:

> "... if we don't have an open data approach then Syngenta will miss out on opportunities – those opportunities could be in new technologies or new research."

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16 Sorrell, S. (2015) *The Internet of Things: Consumer, Industrial & Public Services 2015-2020*. [Online] Available at: http://www.juniperresearch.com/researchstore/key-vertical-markets/internet-of-things/consumer-industrial-public-services. [Accessed 2016-03-07].

Meeting business challenges with open approaches

As businesses get bigger, staying agile and innovative can get harder. The case studies that we have examined in this report highlight five big business challenges and the open approaches that these organisations are taking to tackle them.

Third-party data: when and how to use it

The availability of data for businesses, governments and people to use in their own decision making is growing every year. And models for supplying data are becoming ever more sophisticated – from open data licensing to open APIs, open source data analytics tools and platforms, to commercial licences and complex bilateral data-sharing contracts. Each of the big businesses we have described here have become, at least in part, digital businesses that supply products and services directly to customers or internally with other parts of the organisation.

Arup has long-standing experience building products and services using data from third parties. The growing availability of **open data has reduced their costs and created opportunities for competitive advantage**. Using open data provides Arup with more space to innovate and test new products, in contrast with more traditional third-party data products that can come with restrictive terms and conditions. The remaining challenges for Arup are around data's availability and reliability. It is easier to build better services in places where more data is available and has inherent flexibility, as this helps Arup to **generate accurate insights and trial new approaches more cheaply and efficiently.**

Thomson Reuters has taken an interesting route to extracting the value of third-party data. Because they **have made their own reference data available as open data** through PermID, the team hope that others will link to it and provide them with additional context and information on the organisations they provide data about. This provides the potential for **Thomson Reuters' data to be enriched and made more valuable** by others, without any extra effort on their part.

Maintaining leadership in competitive data markets

Some businesses have traditionally made their living by selling access to data that they have collected, modelled and integrated. These organisations face a challenge living "in a post-scarcity world for data", as **Dan Meisner** from Thomson Reuters put it. They need to adapt their business models to the changing technological and competitive landscape.

The increasing competition felt by traditional data providers in the face of the web of data is much like the problems faced by the publishing industry in the face of the web of documents. New businesses and business models are emerging that disrupt traditional data providers. Data collection is getting cheaper and easier, and it is easier now than ever to collaborate on data provision. Existing market leaders must find new business models to avoid new competition undermining their business.

Thomson Reuters is addressing these challenges through publishing open identifiers and data about organisations to:

- drive integration of its products with customer data, embedding ongoing use
- reduce the cost of ownership of other Thomson Reuters products by making its data easier to use
- widen its market to include customers who need Thomson Reuters' data but who do not want to be locked into proprietary products

Keeping costs low for the business and for customers

Big businesses are more likely than most to grow through acquisition. As different organisations are grafted onto each other, there are frequently systems and data assets that overlap or need to work together. Even in organisations that grow organically, issues around duplication of data, systems incompatibility and restrictive data licences can frustrate ongoing use. And as organisations increasingly become porous and open to working with each other, the requirements for bringing data together spread outside the boundaries of a single organisation.

For Thomson Reuters, the need to integrate internal systems and data resources led to the creation of an open data product. Providing open data helped it to:

- design internal systems that could adapt as Thomson Reuters grew
- integrate Thomson Reuters' needs with customer needs
- drive uptake of Thomson Reuters products

This pattern reflects similar evolution in **Amazon**, where what was to become Amazon Web Services was initiated as a response to its CEO Jeff Bezos' mandate that all Amazon data and functionality be available through "externalisable" service interfaces.[17]

The challenge of system integration is felt as much by customers as by big businesses. Providing open interfaces can help provide efficiencies in-house and create value for customers.

Staying agile in shifting environments

While they bring scale, big businesses have a reputation for being sluggish. Slow responses to new opportunities are a problem for businesses when their competitive advantage lies in technological capability. It is unrealistic to expect organisations to hold all the experts they need in-house, but it can be hard to rapidly take advantage of new opportunities through hiring or subcontracting, particularly when there is legal wrangling over the ownership of intellectual property.

Many large businesses seek to inject innovation into their own organisations through accelerator or incubator programmes that invest in startups, often gaining equity and intellectual property rights over what they develop. **Arup**'s approach is slightly different. While it develops close working relationships with the startups it hosts, openness and flexibility form the foundation of those relationships. This applies to code, to data, and to a way of operating that centres around the free exchange of ideas between big and small businesses.

For **Syngenta**, releasing open data was part of its drive to transform and change itself as an organisation. Having externally visible data helps other stakeholders to monitor progress and hold Syngenta to account, creating greater impetus for the company to see through its commitments.

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17   Lane, K. (2012) *The Secret to Amazon's Success Internal APIs*. [Blog] Available at: http://apievangelist.com/2012/01/12/the-secret-to-amazons-success-internal-apis. [Accessed 2016-03-07].

Collaborating with clients and competitors to address big challenges

While big businesses may dominate their sectors, the 'wicked' problems that they face can seldom be tackled alone. Companies operate in a complex environment of customers, competitors, suppliers, partners, governments, charities and communities. Sometimes securing a long-term future for a big business means changing the way the sector works as a whole.

For **Syngenta**, the sector-wide challenge is how to ensure global food security. Recognising the importance of collaboration with private and public stakeholders to achieve this goal, Syngenta has used open data to:

- develop trust with potential collaborators
- encourage wider data sharing
- incentivise collaboration and discovery

Big businesses can be big open businesses

The big businesses that we have looked at in this report come from different sectors and have different markets. In each case, however, the business has **taken an open approach as a strategic response to challenges** that they face.

As part of their approach, **Thomson Reuters**, **Arup** and **Syngenta** have begun to:

- **understand their internal use of data**, how it should be managed and developed
- **articulate business cases** for improving internal data capability and increasing open data publication
- **improve the quality of data** they hold
- **build trust and collaboration** in the market
- **enable deeper engagement** with customers, collaborators and future partners, through feedback on data being published and its uses
- **create partnerships with new startups** and market entrants with an open ethos
- **build an organisational culture that is open** to feedback and insight inside the organisation, as well as outside in the environment it operates in

Addressing the challenges that big businesses face, and taking advantage of the opportunities that the data revolution brings, requires new ways of thinking and operating as a business. This is not only a technical challenge but also an organisational and cultural challenge. Big businesses that respond to these challenges are creating new business models and ways of working that give them a competitive advantage, whatever the future brings.

Big businesses can be big open businesses

Appendices

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