D6.3 BUSINESS MODELS, LESSONS LEARNED AND SUCCESS STORIES

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1 Executive summary

D6.3 “Business models, lessons learned and success stories” aims to highlight how ODINE contributed to creating a self-sustainable European ecosystem for open data[1] by helping the incubated companies generate impact[2]. More specifically, in this deliverable you will find an analysis of the business models related to open data and the analysis of the results of the business model survey that was conducted with the aim to derive valuable information on the lessons learned by the incubated companies of all the cohorts. Furthermore the ODINE advisors proposed the conduct of in depth interviews with selected ODINE companies with the objective to showcase the range of the business models further developed during the ODINE incubation and the wide spectrum of business opportunities that open data can help materialize. More particularly the ODINE interviews serve the aim to uncover unique insights gained by the business experience of the incubated companies after their successful completion of the ODINE programme. The ODINE Consortium hopes that these registered lessons learned will further develop open data entrepreneurship at European and global level. Whereas the business model survey follows a generic approach focusing on quantitative data, the conducted interviews focus on presenting qualitative info, such as brief company description, company related facts and figures, the problem addressed, the solution provided, key achievements, lessons learned during and after the ODINE incubation programme and advice for other open data startups and future plans beyond the ODINE incubation period. In addition to the above a survey for the ODINE Evaluators has been conducted with the objective to include their point of view, expertise and recommendations with regard to the ODINE incubator. In this regard, effort has been made to incorporate all aspects related to the ODINE business models, lessons learned and success stories in this deliverable.

[1] https://opendataincubator.eu/creating-a-european-ecosystem-for-data-innovation-reflections-on-odine/
[2] https://drive.google.com/file/d/0B9kvZsqqoHxLTG5mRTlBWVRKdU0/view

2 Introduction

D6.3 serves the objective to register the variety of the business models further developed and refined at the ODINE incubator and to highlight innovative and self-sustainable business models, based on the use of open data. In this regard qualitative and quantitative analysis and info have been incorporated in this deliverable, as well the lessons learned based on the business experiences of the incubated companies, which can guide and support all aspiring entrepreneurs in the domain of open data. Last but not least the results of the ODINE evaluators' survey have been integrated in this deliverable with the aim to highlight the widest possible range with regard to the business models, success stories and lessons learned during ODINE.

3 Understanding ODINE business models involving open data

The goal of this section is to explore the business models of the ODINE funded companies. By doing so, we aim to communicate much of what has been learnt during the ODINE programme about how these businesses operate and the strategies they employ to create value from open data. It also grants us a unique opportunity to study in depth a range of the nascent businesses involving open data, allowing us to contribute to the emerging field of study around business models involving open data.

To do this we first examine the existing work in this field, including the theoretical work around business models generally but primarily focused on the range of conceptual models being proposed for open data businesses. The empirical study of the ODINE businesses is completed by the analysis of the results of the business model survey we conducted with the aim to gain insights into business model innovation in the domain of open data.

Moreover the BMCs of various ODINE companies, as developed after their incubation, can be accessed in the resources section[3] at the ODINE website. Apart from inspirational purposes, this serves the purpose of understanding the business models at a glance.

3.1 Literature Review

In this section, we first define a business model and then, explore the literature around different types of business models and business models involving open data.

According to Alexander Osterwalder and Yves Pigneur, a business model is a series of interrelated components that explain how a company operates, makes profit and generates value (2013) . To facilitate its description, many scholars use a couple of business model frameworks.

[3] https://opendataincubator.eu/resources/

3.2 Business Model Frameworks

Deriving from the definition of business model, Hamel designed four core building blocks (2000)[4]:

- **Customer logic**, which defines the relationship between the business and its customer.
- **Strategy**, which states the business's mission.
- **Resources**, which articulates what the business does, knows and owns.
- **Network**, which defines the structure of suppliers and partners that enable the business to operate.

He claimed that the boxes were not only connected by three elements (customer benefits, configuration of activities and company parameters), but also influenced by four factors: efficiency, uniqueness, fit and profit accelerators (2000).

Similarly, Shafer, Smith and Linder based their business model framework on a four-block model (2005)[5]:

- **Strategic choices**, which determines the strategic decisions a business has to make in order to maximise its value proposition.
- **Value creation**, which describes the way a business makes its product/service different from its competitors.
- **Capture value**, which outlines the way a business presents its product/service.
- **Value network**, which defines the structure of suppliers and partners that enable the business to operate.

Shafer et al. argued that profitable businesses shaped their focus on how to differentiate themselves from other businesses (2005). Therefore, the success of a business relies on their ability to earn profit, while creating and capturing distinctive values (Shafer et al, 2005).

Mark Johnson and Clayton Christensen also summarised their framework of successful businesses into a structure of four boxes (2010)[6]:

- **Customer value proposition**, which clearly states the product/service that a business sells in order to solve its targeted customer's problem and how it is presented.
- **Profit formula**, which describes how a business makes money.
- **Key processes**, which determines the key actions/activities that a business must undertake in order to operate

Johnson and Christensen used this business model to prepare businesses to tap into "white space activities", opportunities that are new to the current enterprise (2010). Thus, they defined this

[4] Hamel, G. (2000). *Leading the revolution*. 1st ed. Plume.
[5] Shafer, S., Smith, H. and Linder, J. (2005). The power of business models. *Business Horizons*, 48(3), pp.199-207.
[6] Johnson, M. and Christensen, C. (2010). *A New Framework for Business Models*. [online] Harvard Business Review. Available at: https://hbr.org/2010/01/is-your-business-model-a-myste-1 [Accessed 25 Apr. 2017].

framework to be fitted for companies that want to succeed when experiencing changes in their commercial activities (Johnson and Christensen, 2010).

3.3 Business Model Canvas

Some other scholars constructed very similar structures ranging from three to twelve components and covered essential aspects of a business model, but were not as complete and widely used as the Business Model Canvas (Zeleti, Ojo and Curry, 2014[7]; Chesbrough, 2010[8]; Stähler 2001[9]; Hambrick and Fredrickson, 2001[10]). The Business Model Canvas was developed after nine years of research involving 470 co-authors from 45 countries, by Alexander Osterwalder and Yves Pigneur (2013). It breaks down a business model into nine core building blocks:

- **Key partners**, which aims at defining the network of suppliers and partners that enable the business to operate.
- **Key activities**, which describes the main actions that the business has to take in order to operate.
- **Key resources**, which determines the main assets that the business needs to operate.
- **Value proposition**, which defines the range of products and services specifically made to serve the targeted customers.
- **Customer relationship**, which describes the relationship that a business has with its targeted customers.
- **Customer segment**, which labels the targeted groups of people that a business seeks to deliver to.
- **Channel**, which sets the ways a business liaises with its targeted customers to provide their value proposition.
- **Cost structure**, which outlines the expenses involved in the business operation.
- **Revenue stream**, which outlines the earnings a business get from its targeted customers.

[7] Zeleti, F., Ojo, A. and Curry, E. (2014). *Emerging business models for the open data industry*. [online] Available at: http://dx.doi.org/10.1145/2612733.2612745 [Accessed 25 Apr. 2017].
[8] Chesbrough, H. (2010). *Open innovation*. 1st ed. Boston (Mass.): Harvard Business School Press.
[9] Stähler, P. (2001). *Tools: Business Model Canvas, 6 Steps Approach to Business Model Innovation*. [online] Business Model Innovation. Available at: http://blog.business-model-innovation.com/tools/ [Accessed 24 Apr. 2017].
[10] Hambrick, D. and Fredrickson, J. (2001). *ProvenModels - strategy diamond*. [online] Provenmodels.com. Available at: https://www.provenmodels.com/598/strategy-diamond/donald-c.-hambrick--james-w.-fredrickson/ [Accessed 26 Apr. 2017].

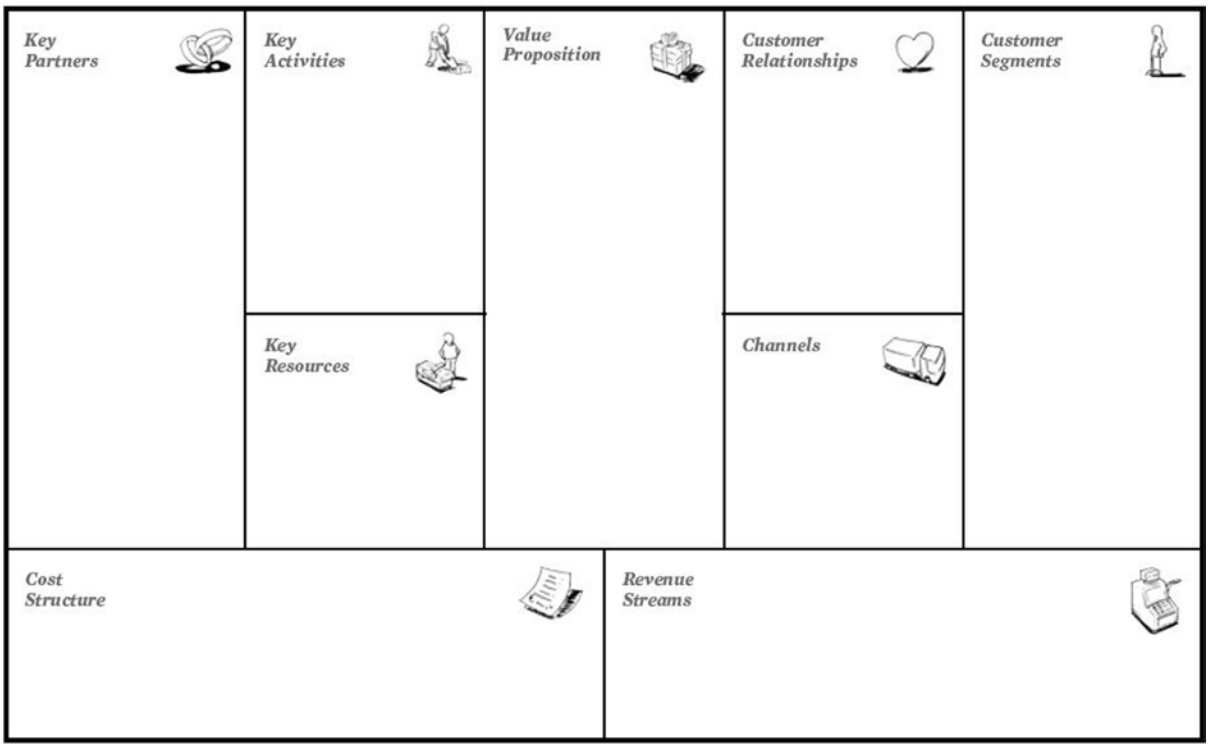


Figure 1 Osterwalder business model canvas

The nine building blocks have been globally implemented and referenced by large businesses and organisations (Osterwalder and Pigneur, 2013).

However, many other scholars were not entirely satisfied with the latter model and have thus based their research on it (Maurya, 2012[11]; Stacey, 2015[12]).

3.4 Lean Model Canvas

Ash Maurya created the Lean Model Canvas, represented in figure 2, as he wanted to focus on actions, while being entrepreneur-oriented. He reproached the business model canvas as being "too simple" and skipping the "learning" that got the established companies where they are (2012). Therefore, he suggested a model that substituted the key partners, key activities, key resources and customer relationships boxes with problem, solution, key metrics and unfair advantage (2012). He believed that many startups failed because the ratios of uncertainty and risks were too high; the substitute boxes were:

- **Problem**, which helps to have a clear statement of the issue that the business is solving.
- **Solution**, which aims at solving the stated problem as specifically as possible.

[11] Maurya, A. (2012). *Why Lean Canvas vs Business Model Canvas? – Love the Problem*. [online] Love the Problem. Available at: https://blog.leanstack.com/why-lean-canvas-vs-business-model-canvas-af62c0f250f0 [Accessed 25 Apr. 2017].

[12] Stacey, P. (2015). *open business model canvas | Paul Stacey*. [online] Edtechfrontier.com. Available at: https://edtechfrontier.com/tag/open-business-model-canvas/ [Accessed 24 Apr. 2017].

- **Key Metrics**, which narrows down the number of activities that the business should focus on.
- **Unfair advantage**, which would first stay empty, as few are the startups that possess a real comparative advantage to begin with. This encourages the business to work towards it (2012).

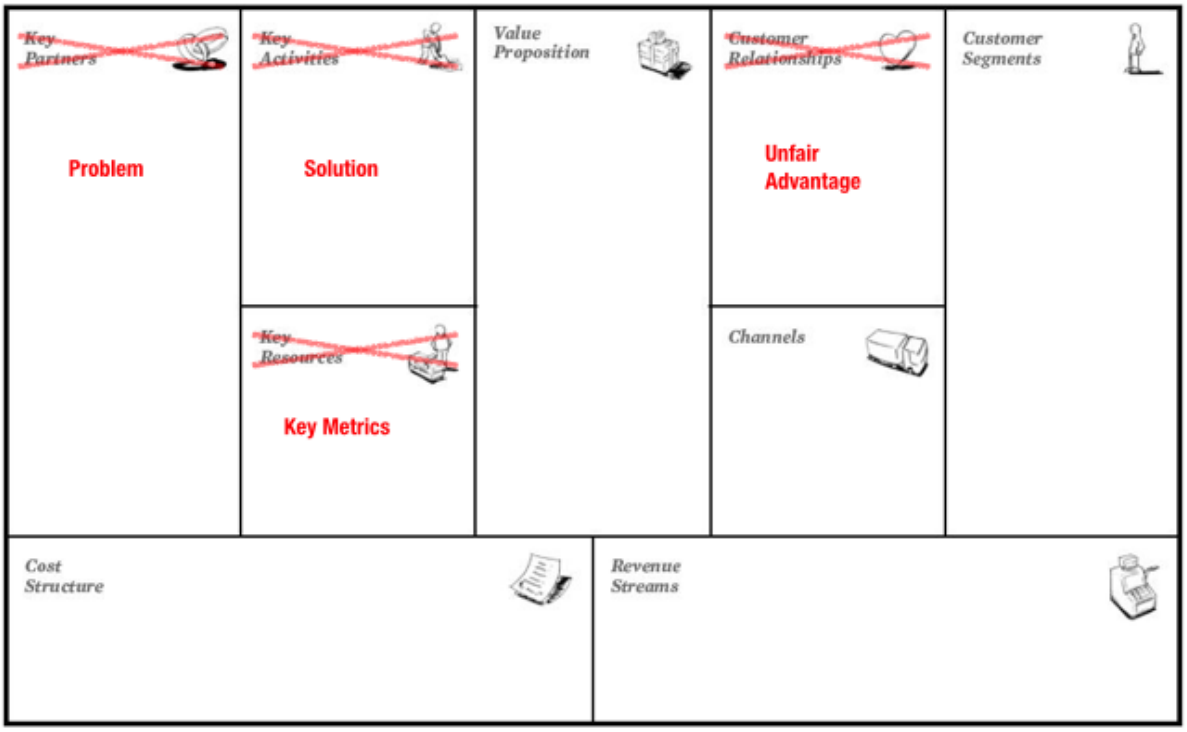


Figure 2 Lean Canvas

Maurya decided to take out key partners, key activities, key resources and customer relationships because he found that some boxes were overlapping and that some others were more "outside-in" oriented, giving outsiders an inside view of the business, instead of being entrepreneur-oriented (2012). The Lean Canvas is designed for entrepreneurs and startups, and is primarily problem-solving focused.

3.5 Open Business Model Canvas

More recently, Paul Stacey designed the Open Business Model Canvas with his colleague from the Creative Commons to answer some of the most recurrent questions regarding the sustainability of a business using a free product (2015). The model tackled concerns shared by not only the public, but also the private sector on the sustainability of an open business. The authors added to Osterwalder and Pigneur's Business Model Canvas two more building boxes:

- **CC license**, which determines the CC licence that the business needs to operate.
- **Social good**, which describes the business's social contribution.

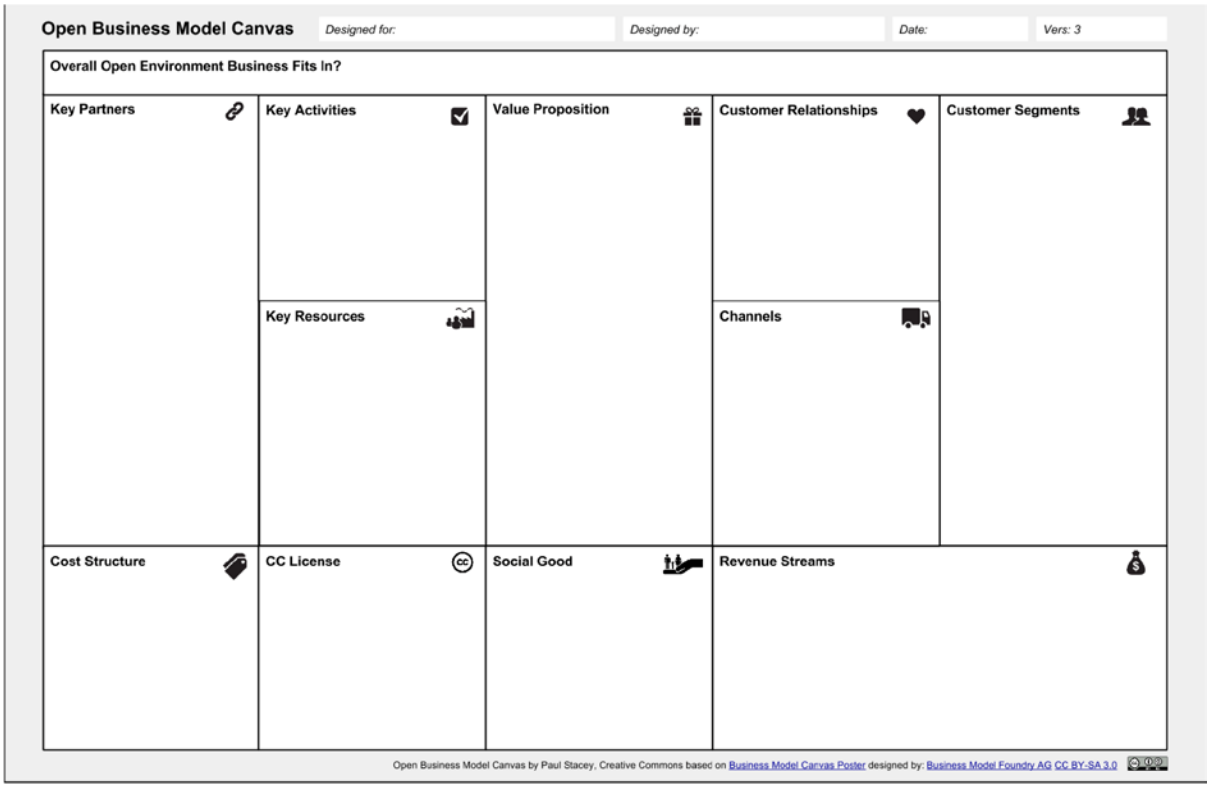


Figure 3 Open Business Model Canvas

They realized that more and more entrepreneurs were interested in building socially responsible and financially stable startups. Thus, this Open Business Model Canvas is for businesses that want to combine social responsibility with the use of technology and open licensing strategies to make their product as accessible, easy to use and re-distributable as possible.

3.6 Business Models involving open data

The previous business models that we have seen are no longer sufficient to map out the recent businesses created around open data, which is data that anyone can access, use and share (ODI, 2017)[13]. With an increase in businesses and individuals applying data to improve their commercial activities, it is only by defining new models to capture the increasing value that the provision of open data can be sustainable. Indeed, open datasets only have value if they are organised, updated, maintained, correct and timely managed (Tennison, 2012)[14]. Consequently, not only new models, but also new categories of users have emerged.

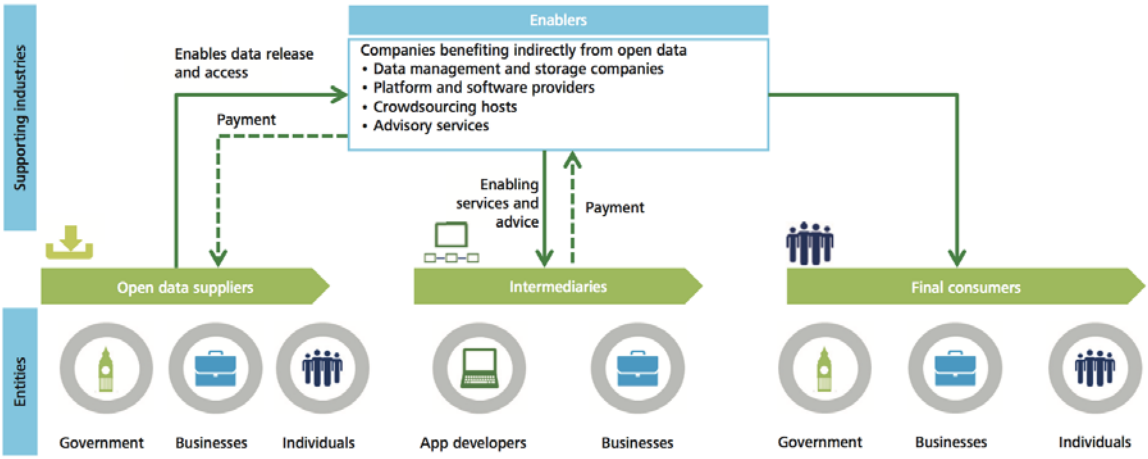
A number of business models have been identified to help open data publishers and businesses sustain and improve their data-publishing operations (Tennison, 2012). They are called business

[13] Open Data Institute. (2017). *What is open data? | Open Data Institute*. [online] Available at: https://theodi.org/what-is-open-data [Accessed 25 Apr. 2017].
[14] Tennison, J. (2017). *Open Data Business Models*. [online] Available at: http://www.jenitennison.com/2012/08/20/open-data-business-models.html [Accessed 26 Apr. 2017].

models involving open data. This has also created different kind of players in the open data ecosystem (Thomson Reuters, 2014[15]; World Wide Web Foundation, 2015[16]; Deloitte, 2012[17]; Opendata.esd.org.uk, n.d.[18]):

- **Open data suppliers**, who issue and share data that can be used and reused, through an open interface.
- **Intermediaries**, who use open data, connect Open Data Suppliers to Final Consumers and are located at some point on the open data supply chain.
    - **Aggregators**, who collect and combine open data to offer a consolidated dataset on a specific theme.
    - **Enrichers**, who utilize open data to improve an existing product or service through better insights.
- **Enablers**, who facilitate or supply the use of open data. However, they neither use nor re-use open data.
- **Final consumers**, who use data to drive information.

The ecosystem diagram below illustrates the role of each player, their relationship and the type of entities involved (Deloitte, 2012). As the figure shows open data can be supplied by public sector bodies, businesses and individuals. The latter organisations not only give access and enable data release, but also receive payment from companies: the enablers, who take advantage of open data, sell to intermediaries and support its access to final consumers. Application developers and businesses constitute the intermediaries category, they build on data which get delivered to final consumers, who can also be public entities, businesses and individuals.



[15] Thomson Reuters. (2014). *Unlock your data*. [online] Available at: https://innovation.thomsonreuters.com/en/labs/data-identifiers.html [Accessed 11 May 2017].
[16] World Wide Web Foundation. (2015). *Open Data Intermediaries: Their Crucial Role*. [online] Available at: http://webfoundation.org/2015/08/open-data-intermediaries-their-crucial-role/ [Accessed 3 May 2017].
[17] Deloitte. (2012). *Open growth - Stimulating demand for open data in the UK*. [online] Available at: https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/deloitte-analytics/open-growth.pdf [Accessed 3 May 2017].
[18] Opendata.esd.org.uk. (n.d.). *Open data | LG Inform Plus*. [online] Available at: http://opendata.esd.org.uk [Accessed 31 May 2017].

Figure 4 Ecosystem diagram (Deloitte, 2012)

With these new data identifiers, Howard (2013)[19] agreed with Ferro & Osella (2013)[20] on the existence of eight business models involving open data. The models below are designed and used by either open data suppliers and/or intermediaries and/or final consumers.

Business Models involving open data	Concept/definition
Freemium *Open data suppliers, Intermediaries and Final consumers*	A business model that relies on giving away a core product/service for free and selling premium product/service (Kumar, 2014)[21]. With technology improving, the marginal cost of some products becomes very low, which enables its distribution for free. Thus, only a small percentage of users need to opt for the paid product to make the business profitable (Kumar, 2014; Sukhraj, 2015[22]; Tunguz, 2014[23]).
Premium *Open data suppliers, Intermediaries and Final consumers*	A premium model provides high-end services and products. The model relies on the publisher's image, since the quality of their product is their value proposition. The business seeks a high profit margin while targeting a lower sales volume (Ferro and Osella, 2013).
Open Source	A business model using open source is a business that offers source code that can be publicly accessed, edited and distributed (Opensource.com, n.d.)[24]. This framework enables businesses to use their source code for free but charge on an "added-value" basis and through dual

[19] Howard, A. (2013). *Open data economy: Eight business models for open data and insight from Deloitte UK*. [online] O'Reilly Media. Available at: https://www.oreilly.com/ideas/open-data-business-models-deloitte-insight [Accessed 7 May 2017].
[20] Ferro, E. and Osella, M. (2013). [online] Available at: https://www.w3.org/2013/04/odw/odw13_submission_27.pdf [Accessed 4 May 2017].
[21] Kumar, V. (2014). *Making "Freemium" Work*. [online] Harvard Business Review. Available at: https://hbr.org/2014/05/making-freemium-work [Accessed 3 May 2017].
[22] Sukhraj, R. (2015). *10 Phenomenal Freemium Models That Are Actually Worth Paying For*. [online] Impactbnd.com. Available at: https://www.impactbnd.com/blog/10-phenomenal-freemium-models-that-are-putting-yours-to-shame [Accessed 4 May 2017].
[23] Tunguz, T. (2014). *The Common Characteristics of Successful Freemium Companies.* [online] The Common Characteristics of Successful Freemium Companies. Available at: http://tomtunguz.com/when-to-go-freemium/ [Accessed 5 May 2017].
[24] Opensource.com. (n.d.). *The open source way*. [online] Available at: https://opensource.com/open-source-way [Accessed 4 May 2017].

Open data suppliers, Intermediaries and Final consumers	licensing (Ferro & Osella, 2013; Opensource.com, n.d.).
Infrastructural Razor and blades *Open data suppliers, Intermediaries and Final consumers*	As the "razor and blades" model, the idea is to sell an initial product at an attractive price or give it out for free (razor), which later encourages users to continue following-up by purchasing further products or services (blades). In this model, the products (blades) are usually classified as inelastic, in other terms, not affected by changes in income or price. Thus, this creates high margin and makes the business profitable (Ferro & Osella, 2013; Picker, 2010[25]).
Demand-oriented platform *Open data suppliers, Intermediaries and Final consumers*	This model offers customized open data sets. The business charges their customers for the added-value upon the original raw open data according to their needs (Howard, 2013; Ferro & Osella, 2013).
Supply-oriented platform *Intermediaries*	The concept of this business model is to manage, store and maintain data for any data holders. Its revenue model is based on a monthly fee that customers pay in order to get their data maintained, saved and easily accessible (Howard, 2013; Ferro & Osella, 2013).
Free, as branded advertising *Open data suppliers, Intermediaries and Final consumers*	This kind of business model is about leading customers towards a brand or company by enhancing their visibility with open data. The service provider helps brands making their data accessible, which can be seen as a marketing cost for them. However, this is convenient when the cost of distribution is very low (Howard, 2013; Ferro & Osella, 2013.
White-Label Development *Open data suppliers, Intermediaries and Final consumers*	This model refers to a product or service built by one company and customised for another one. The latter company buys the product or service without branding, so that they can customize it. Therefore, the manufacturer company can focus on making the product as cost-effective as possible without worrying about its marketing (Young

[25] Picker, R. (2010). The Razors-and-Blades Myth(s). *SSRN Electronic Journal*.

	Entrepreneur Council, 2014)[26].

Figure 5 Business models involving open data

Jeni Tennison defined seven other business models, specifically for open data suppliers, to create value from open data (2012).

Supporting primary business	In this model an open data release is a natural tool to develop the business' core operations. The publication of open data in an organisation make their product better and brings more revenue to the primary business.
Sponsorship	The sponsorship business model lies on giving away a product for free while receiving money from sponsors. The business obtains revenue from organisations that believe that a specific dataset should be accessible to the public.
Charging for changes	In this model, public bodies collect information from individuals and organisations, who are required to make their data available for government use. In this model, public bodies charge an administrative fee to individuals or companies.
Dual licensing	The concept is to apply either open (free) and closed (paid for) licences under different conditions. This model has been used by some open source products. Fees can be applied regarding the size or value of a company. A licence can also limit the use of a product, unless it is purchased.
Support and services	The support and services model works best around businesses around open source. They usually offer data availability along with paid packages and licenses.

[26] Young Entrepreneur Council (2014). *Forbes Welcome*. [online] Forbes.com. Available at: https://www.forbes.com/sites/theyec/2014/06/03/why-a-white-label-solution-is-easier-than-building-your-own/#4b23f819dd9e [Accessed 5 May 2017].

Cost avoidance	This business model helps data publishers to find profitable publishing solutions by reducing cost. Publishing open data can save publishers a significant amount of money if that data is used to underpin a range of products that satisfy different user needs, without the publisher needing to pay for them.
Increasing quality through participation	The idea is to increase the quality of data that the organisation relies on by getting third parties to contribute to its maintenance. This way, the business can generate higher margins, by either earning more and/or decreasing its cost.

Therefore, the seven publishers business models could be summarised as the following (Open Data Institute, 2017)[27]:

- **Freemium**
- **Cross subsidy**, which encourage the access to open data by delivering other benefits and services.
- **Network effects**, which throughout collaboration, businesses not only increase the quality of data and reduce data maintenance cost, but also make their products and services more visible in the market.

Besides this, Zeleti, Ojo and Curry used the 15 business models involving open data described above, applied by open data suppliers, intermediaries and final consumers, to draw emerging business models (2014). They condensed all of them into a six-box model and thus named it the 6-V Business model framework:

- **Value proposition**, which states the solution that a business is providing. This box describes the product, services, its distribution channel, information and price.
- **Value adding process**, which specifies the activities and resources that a business has to create value. This includes physical resources, human resources, supply chain management, partnerships and technology.
- **Value in return**, which defines the value (monetary or non-monetary) that a business gains with its product or services. This can be advertising space, future contracts, opportunities, profit or commission.
- **Value capture**, which refers to the means of catching some percentage of the value offered and use it to support the value proposition.
- **Value management**, which describes the management structure of a business. It includes an organisation's culture, mindset, stakeholders and shareholders.

[27] Open Data Institute. (2017). *How to make a business case for open data | Guides | Open Data Institute*. [online] Available at: https://theodi.org/guides/how-make-business-case-open-data [Accessed 16 May 2017].

- **Value network**, which helps a business deliver its value and perform to its best. This involves customers, business partners, suppliers, service flow, product flow and information flow.

Through this model, they defined categories of business models involving open data based on value propositions because they believed that it identifies the direction of a business and helps it find their revenue streams (2014). Consequently, the authors grouped the 15 frameworks into five categories of business models:

- **Freemium** (Freemium, Dual-Licensing, Charging for Changes, Open Source, Free as Branded- Advertising)
- **Premium** (Premium, Sponsorship, Support and Services, Demand-Oriented Platform, Supply- Oriented Platform, White-Label Development)
- **Cost-saving** (Increasing Quality through Participation, Cost Avoidance)
- **Indirect Benefit** (Support Primary Business)
- **Razor-Blade** (Infrastructural Razor and Blades)

Additionally, Ferro and Osella also used Alexander Osterwalder's business model canvas to explain the re-use of Public Sector Information (PSI) (2012)[28]. They took the nine boxes framework and simplified it into a four-element multidimensional framework:

- **PSI raw data**, which is about identifying the key resources, here the raw data.
- **PSI processed data**, which defines the type of data elaboration (e.g. data aggregation, data structuring and classification, visual analytics…).
- **PSI-based value proposition**, which evaluates the role of the PSI in the value proposition (e.g. final good itself, key ingredients of a product, key ingredient of a service...).
- **PSI-based revenue**, which refers to the price mechanism (e.g. freemium, premium, free).

The structure focuses on enabling public data publishers to make profit (Ferro and Osella, 2012).

This literature review aims at providing an overall comprehension of the various existing business frameworks, with and without open data, and understanding of their revenue generation systems.

4 Methodology

The goal of this research is to explore the business models of the ODINE funded companies and use them to help inform wider research into business models involving open data. To do this we not only need to understand how the businesses operate but also how they compare to existing classifications of business models using open data, allowing us to test these existing models against real-world examples of businesses involving open data.

In order to gain this understanding we chose to develop a survey based on the existing literature exploring business models and specifically business models involving open data. This short survey

[28] Ferro, E. and Osella, M. (2012). [online] Available at: https://www.w3.org/2012/06/pmod/pmod2012_submission_16.pdf [Accessed 24 Apr. 2017].

was then distributed amongst the ODINE funded companies, resulting in a high response rate. The results were then analysed with a view to understanding how the companies operate and how this compares to other companies and existing research.

4.1 Survey design

Based on our findings in the literature review, we used many of the existing frameworks to help inform the design of the questions in the survey. Primarily, the goal of the survey was to break down the key areas identified in the Business Model Canvas[29] (for example: revenue streams, customer segments etc) and the Ferro and Osella paper[30] (for example: role of PSI, pricing mechanism) into multiple choice categorical questions which were both simple to answer and useful for analysis. This way we could ensure that we could return a high response rate by keeping the survey short - we also used branching logic to minimise the number of irrelevant questions each respondent saw. We also wanted to be able to quantify the responses to traditionally qualitative questions so that we could analyse the results without introducing significant bias from categorisation of answers.

In addition to taking from existing business model literature, we reused questions from earlier business surveys run by the ODI, namely the Open data means business survey[31] in an attempt to provide for comparison on the role of open data in business for future research. We also made the decision to focus part of the survey to uncovering more on the 'freemium model' which appears most often in existing research. A full list of questions and response categories is provided in Appendix A. The survey was explicitly designed to be applicable and adaptable outside the ODINE programme, so that it could be reused on a greater scale to look at the wider open data ecosystem in future research.

4.2 Survey distribution and analysis

The survey was first distributed to all 57 ODINE startups in November 2016 using the main contact emails provided during the incubation programme. This initial email was followed up twice, once in December 2016 and January 2017. Over this period we received 56 responses to the survey, however this high number was a result of multiple responses by 14 of the ODINE companies. In these cases, the first response was taken resulting in 42 valid responses for analysis, a response rate of 74%.

The resulting data was analysed using Google Sheets and 'R' statistical language and environment[32]. Given the scope of the study, after initial exploratory analysis we decided to focus our analysis on the questions that are most pertinent to exploring the core business model structure, as opposed to those that went into great depth on the role of open data or nature of the

[29] Osterwalder, A. and Pigneur, Y. (2013). *Business model generation*. 1st ed. Hoboken, N.J.: Wiley, p.14.
[30] Ferro, E. and Osella, M. (2012). [online] Available at: https://www.w3.org/2012/06/pmod/pmod2012_submission_16.pdf [Accessed 24 Apr. 2017].
[31] https://docs.google.com/document/d/14b56awYTzI3rIwmPy-IVnooPcoIyGbQmwSgJhPlB8aQ/pub
[32] https://www.r-project.org/about.html

freemium model. Given the relatively small size of the ODINE programme, even with our very high response rate, we deemed the sample size too small to do any significant segmentation or other analysis. In light of this we focused on reporting only descriptive statistics for the questions we focused on. However, because respondents were able to state whether their company name could be used in relation to their answers, we are able to explicitly report examples of companies based on their response to the survey giving us greater qualitative depth.

Because of the constraints placed on the analysis and with the aim of stimulating further research, companies were able to opt into releasing their answers as open data - either with their company identified or not, which many chose to do. The table below gives an overview of the companies' response, with 38 opting to publish their answers and only 4 opting out. As such the resulting data will be published alongside this deliverable.

Answers to "As part of this research, we would like to release the survey results as open data. Do you give us permission to release to your response to this survey as open data?" (42 respondents)		
Response	Count	Percentage
No	4	9.52%
Yes, but with my company name removed	19	45.24%
Yes, with my company identified by name	19	45.24%

Figure 6 Answers regarding the release of the survey results as open data

4.3 Results

In this section, we report the results of the business model survey. We provide an overview of responses to a subsection of the questions asked. This subsection was chosen on the basis described in the survey analysis section of the methodology, in order to focus the analysis more explicitly on the ODINE respondents business models. The results presented deal with each of these questions individually.

4.3.1 About

An important part of how businesses operate depends on the context of the industry they identify themselves as being a part of. Using question 6, we aim to surface this factor which provides context to the overall business model adopted.

Question 6: Which category best describes your company's area of business?

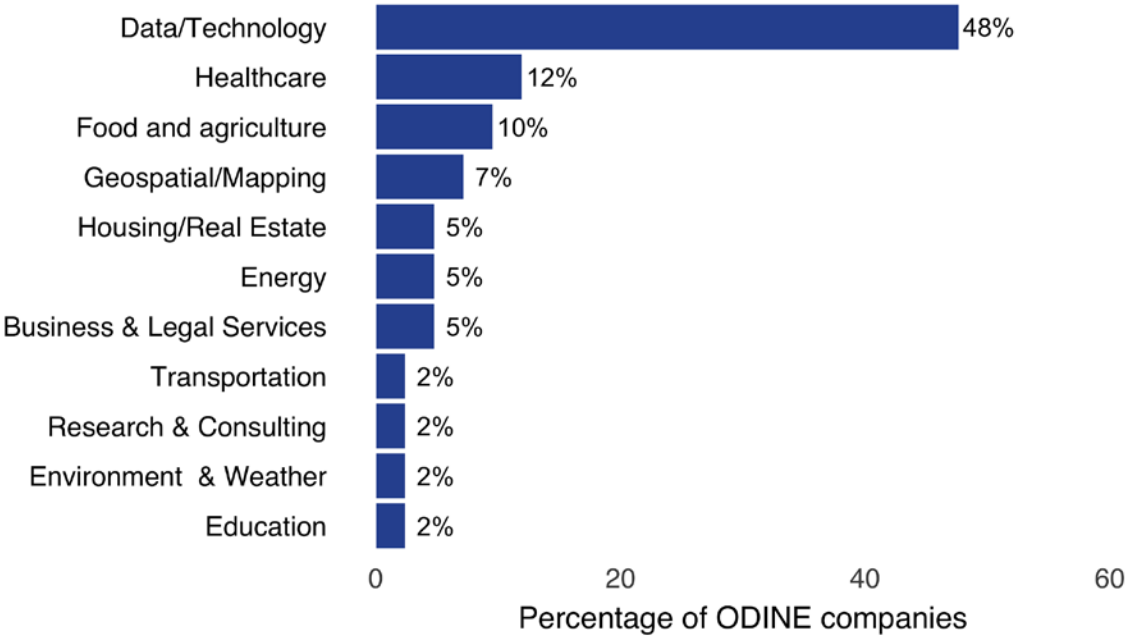


Figure 7 Which category best describes your company`s area of business? (42 respondents, single response required)

Sector	Count	Percentage
Data/Technology	20	47.62%
Healthcare	5	11.90%
Food and agriculture	4	9.52%
Geospatial/Mapping	3	7.14%
Business & Legal Services	2	4.76%
Energy	2	4.76%
Housing/Real Estate	2	4.76%
Education	1	2.38%
Environment & Weather	1	2.38%
Research & Consulting	1	2.38%
Transportation	1	2.38%
Finance & Investment	0	0%
Governance	0	0%
Insurance	0	0%
Scientific Research	0	0%
Total	42	100.00%

Figure 8 Which category best describes your company`s area of business (42 respondents, single response, required)

Almost half the ODINE companies that responded to the survey describe their business area as “data/technology” (48%). Only three other sectors claim above 5%; “healthcare” with (12%) followed by “food and agriculture” (10%) and “geospatial/mapping” (7%). The remaining respondents are split relatively evenly throughout 8 other sectors each having between 2-5%. Four of the sectors were not represented at all; “finance & investment”, “governance”, “insurance” and “scientific research”.

4.3.2 Products and services

A core part of business models are the products and services offered by a particular company. We are particularly interested in the products or services developed through ODINE as these are explicitly related to open data. Using question 7, we aim to understand the nature of the products and services on offer to enable us to analyse how these fit into the overall business model adopted.

Question 7: Which of these best describe the products or services you have developed through ODINE?

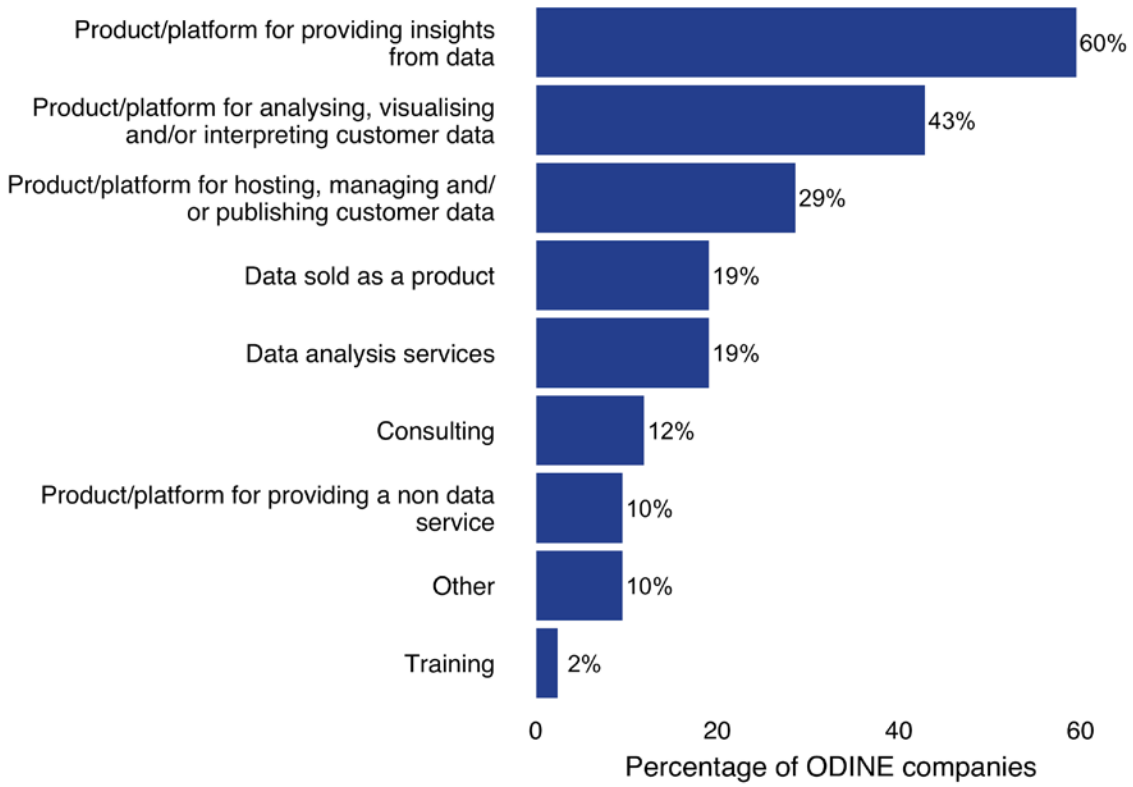


Figure 9 Which of these best describe the products or services you have developed through ODINE? (42 respondents, multiple responses allowed)

Product or service	Count	Percentage
Product/platform for providing insights from data	25	59.52%
Product/platform for analysing, visualising and/or interpreting customer data	18	42.86%
Product/platform for hosting, managing and/or publishing customer data	12	28.57%
Data sold as a product	8	19.05%
Data analysis services	8	19.05%

Consulting	5	11.90%
Product/platform for providing a non data service	4	9.52%
Other	4	9.52%
Training	1	2.38%

Figure 10 Which of these best describe the products or services you have developed through ODINE? (42 respondents, multiple responses allowed)

Almost two thirds of ODINE respondents have developed a “product/platform for providing insights from data” through the ODINE programme (60%). Just over two fifths have developed a proposition which is aimed at analysing, visualising and/or interpreting data provided by the customer (43%). In addition, over a quarter of them are developing products or services which host, manage and/or publish data from customers (29%).

Just under a fifth of ODINE respondents sell data as a product (19%) and the same number have developed data analysis services (19%). Over a tenth of respondents are providing consulting services to clients (12%) only one respondent developing training products or services (2%). Interestingly just under a tenth of have developed a product or service they would classify as a non-data service.

4.3.3 Target markets and customers

Another key aspect of business models, highlighted in the literature review are the customers and industries that businesses are targeting. Using questions 8, 9, 10 and 11, we aim to surface the types of industries and customers targeted by ODINE companies.

Question 8: Which of the following sectors are you targeting with your product or service?

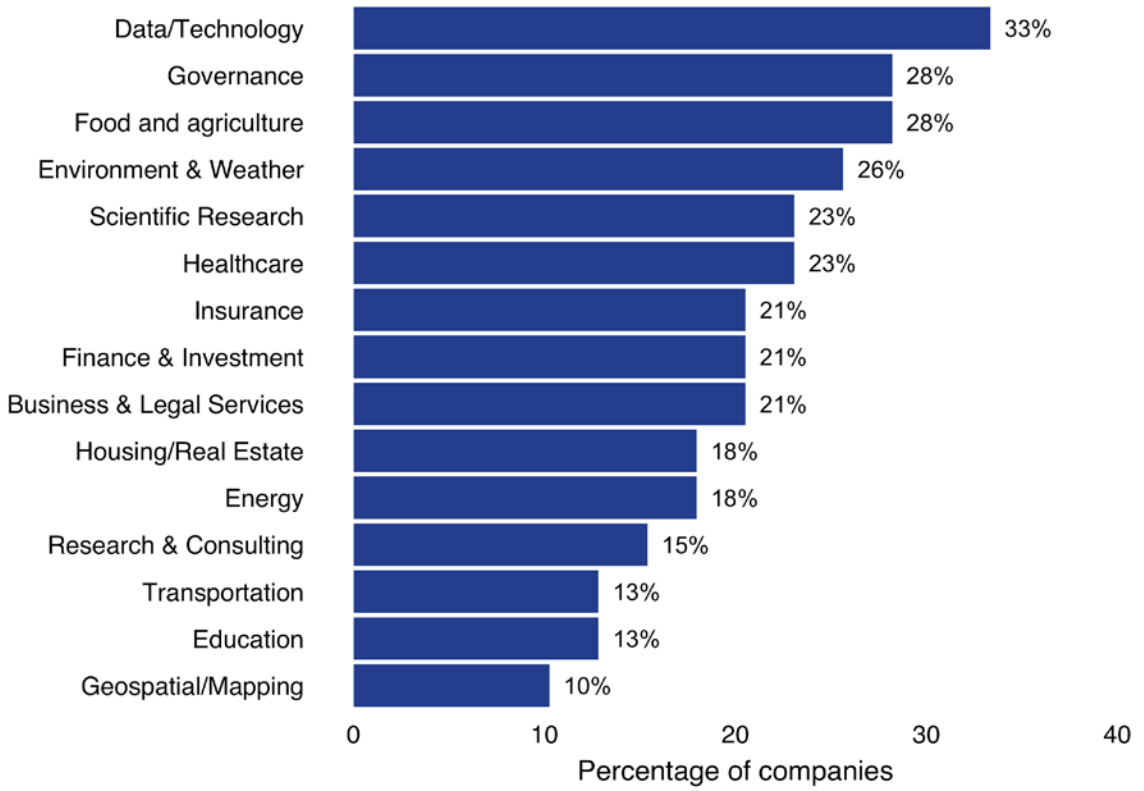


Figure 11 Which of the following sectors are you targeting with your product or service? (39 respondents, multiple responses allowed)

Sector	Count	Percentage
Data/Technology	13	33.33%
Food and agriculture	11	28.21%
Governance	11	28.21%
Environment & Weather	10	25.64%
Healthcare	9	23.08%
Scientific Research	9	23.08%
Business & Legal Services	8	20.51%
Finance & Investment	8	20.51%
Insurance	8	20.51%
Energy	7	17.95%
Housing/Real Estate	7	17.95%
Research & Consulting	6	15.38%
Education	5	12.82%

Transportation	5	12.82%
Geospatial/Mapping	4	10.26%

Figure 12 Which of the following sectors are you targeting with your product or service? (39 respondents, multiple responses allowed)

A third of ODINE respondents said they are targeting the “data/technology” sector, which is perhaps unsurprising (33%). Almost as many respondents are targeting the “governance” sector, which potentially indicates they are targeting the public sector (28%). Interestingly, the same number reported they were targeting the “food and agriculture” sector (28%) while just over a quarter are targeting “environment and weather” which are potentially overlapping in many ways (26%).

Question 9: What type of customers are you targeting?

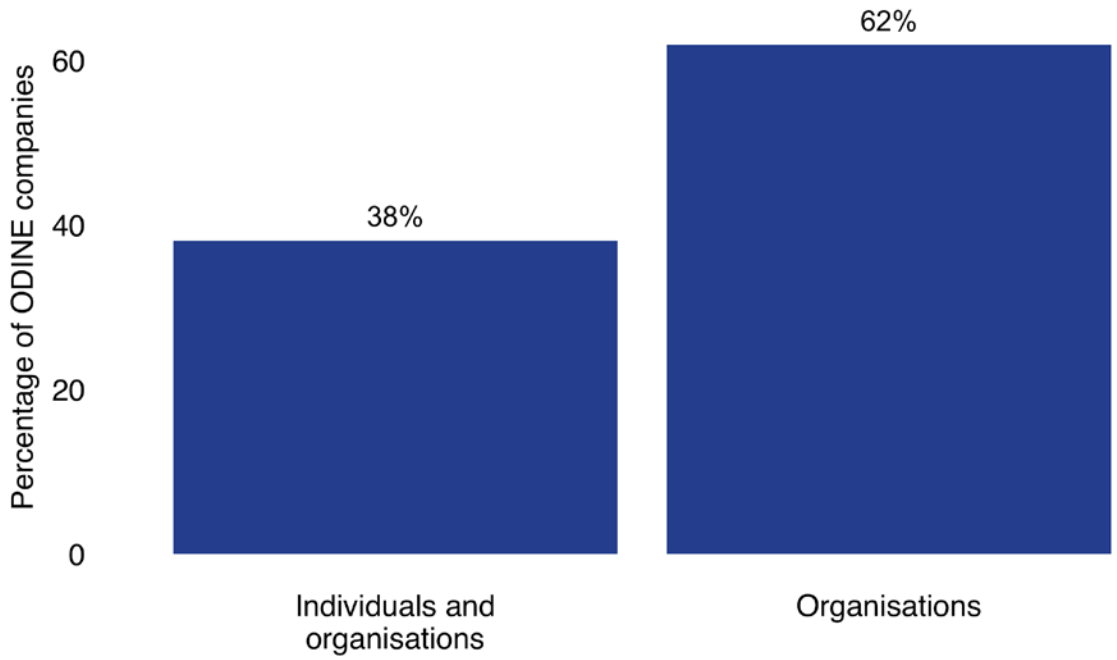


Figure 13 What type of customers are you targeting? (42 respondents, single responses)

Customers	**Count**	**Percentage**
Organisations	26	61.90%
Individuals and organisations	16	38.10%
Individuals	0	0%
Total	42	100.00%

Figure 14 What type of customers are you targeting? (42 respondents, single response)

Almost two thirds of ODINE respondents said they were targeting only organisational customers (62%). The remaining respondents indicated they are targeting both organisational and individual customers (38%). Perhaps most importantly none of the respondents said that they only targeted individual customers, which is atypical of companies in general.

4.3.3.1.1 Question 10: Which types of individuals are you targeting?

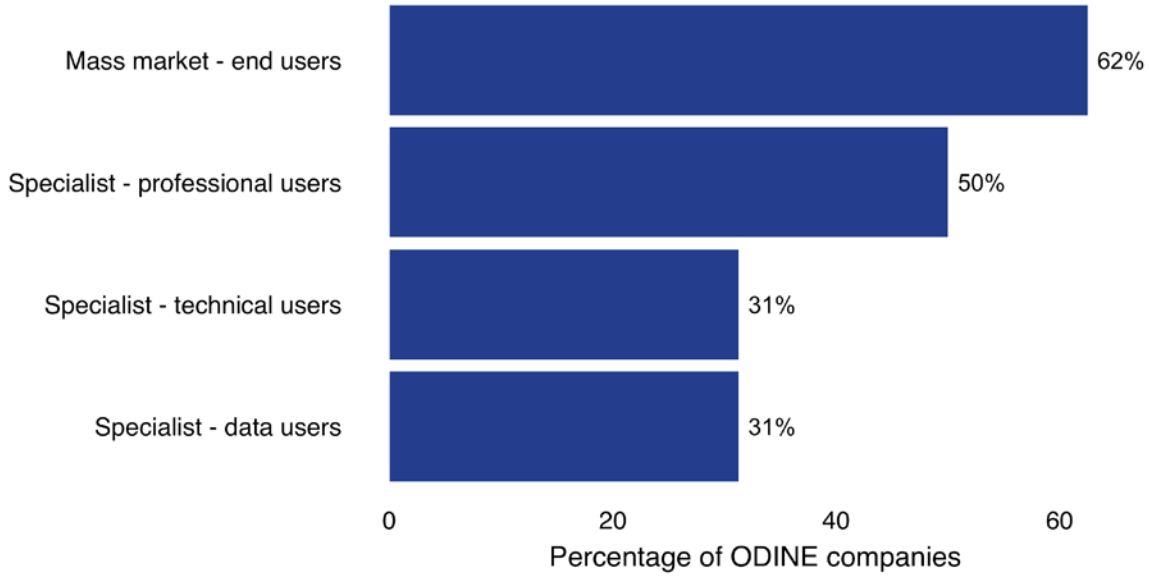


Figure 15 Which types of individuals are you targeting? (16 respondents, multiple responses allowed)

Individual	Count	Percentage
Mass market - end users	10	62.50%
Specialist - professional users	8	50.00%
Specialist - technical users	5	31.25%
Specialist - data users	5	31.25%

Figure 16 Which type of individuals are you targeting? (16 respondents, multiple responses allowed)

Of the respondents that said they were targeting individuals, over 60% are targeting mass market end users (63%). Half said they were targeting professional users (50%) while just under a third said they were explicitly targeting technical users (31%) and data users (31%).

4.3.3.1.2

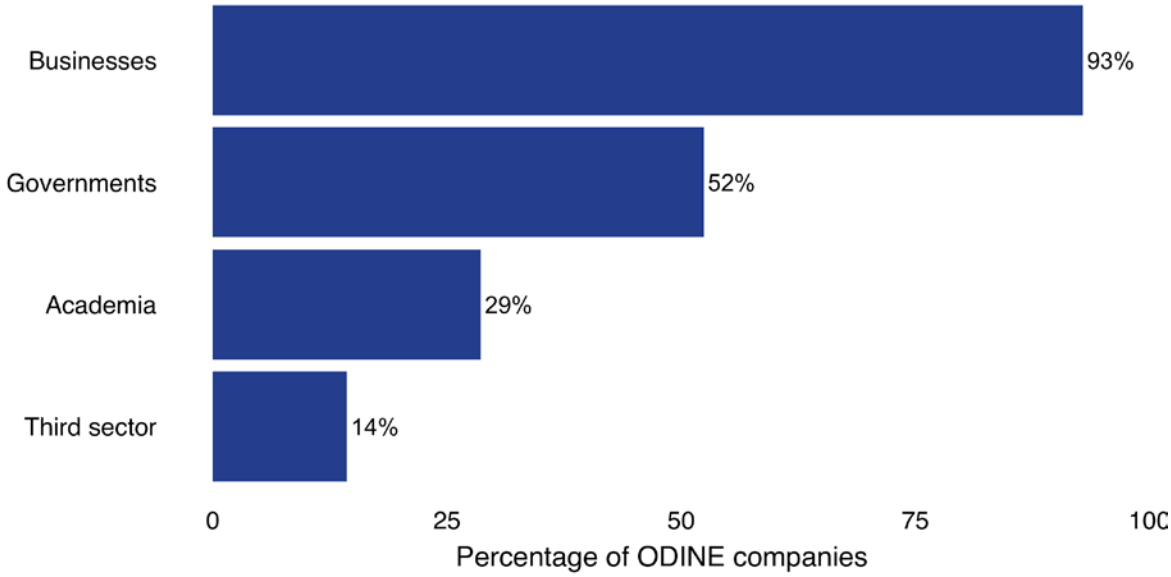


Figure 17 Which type of organisation are you targeting? (42 respondents, multiple responses allowed)

Organisation	Count	Percentage
Businesses	39	92.86%
Governments	22	52.38%
Academia	12	28.57%
Third sector	6	14.29%

Figure 18 Which types of organisations are you targeting? (42 respondents, multiple responses allowed)

Of the ODINE respondents who said they were targeting organisations, which in this case was all of them, over 90% said they were targeting other businesses (93%). Just over half are targeting government customers (52%) and under a third are targeting academia (29%). Only just under 15% were targeting the third sector.

4.3.4 Revenue streams

The means for deriving revenue from products and services are incredibly important for understanding how a business functions. Using questions 12 and 13, we aim to understand the revenue structures of the ODINE companies and the role these take in supporting the business models adopted.

4.3.4.1.1 Question 12: How do you derive revenue from your product and/or service?

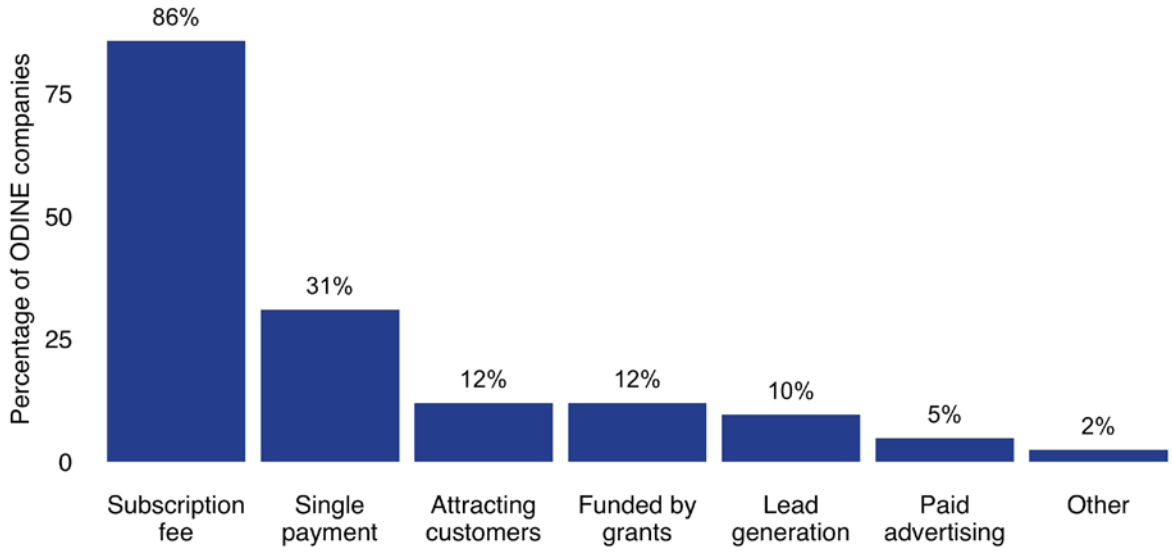


Figure 19 How do you derive revenue from your product and/or service? (41 respondents, multiple responses allowed)

Revenue stream	Count	Percentage
Subscription fee	36	85.71%
Single payment	13	30.95%
Attracting customers to other paid for products or services you offer	5	11.90%
Funded by grants	5	11.90%
Lead generation for paid products or services you offer	4	9.52%
Featuring paid-for advertising	2	4.76%
Other	1	2.38%
Funded by donations	0	0%

Figure 20 How do you derive revenue from your product and/or service? (41 respondents, multiple responses allowed)

Over 85% of respondents use some form of “subscription fee” to generate revenue from their products and services. This is almost three times as many as the next most stated revenue stream, “single payment” (31%). In addition, over a tenth of respondents answered that their products or

services were funded by grants, with the assumption made that this refers to those made outside the ODINE programme (12%).

While over 10% stated that they derive revenue by “attracting customers to other paid for products or services” they offer (12%), a similar number derive it by generating leads for other paid products and services (10%). Around 5% of respondents derived revenue from featuring paid advertising (5%) and none were funded by donation.

4.3.4.1.2 Question 13: Is your product or service ever free at the point of use?

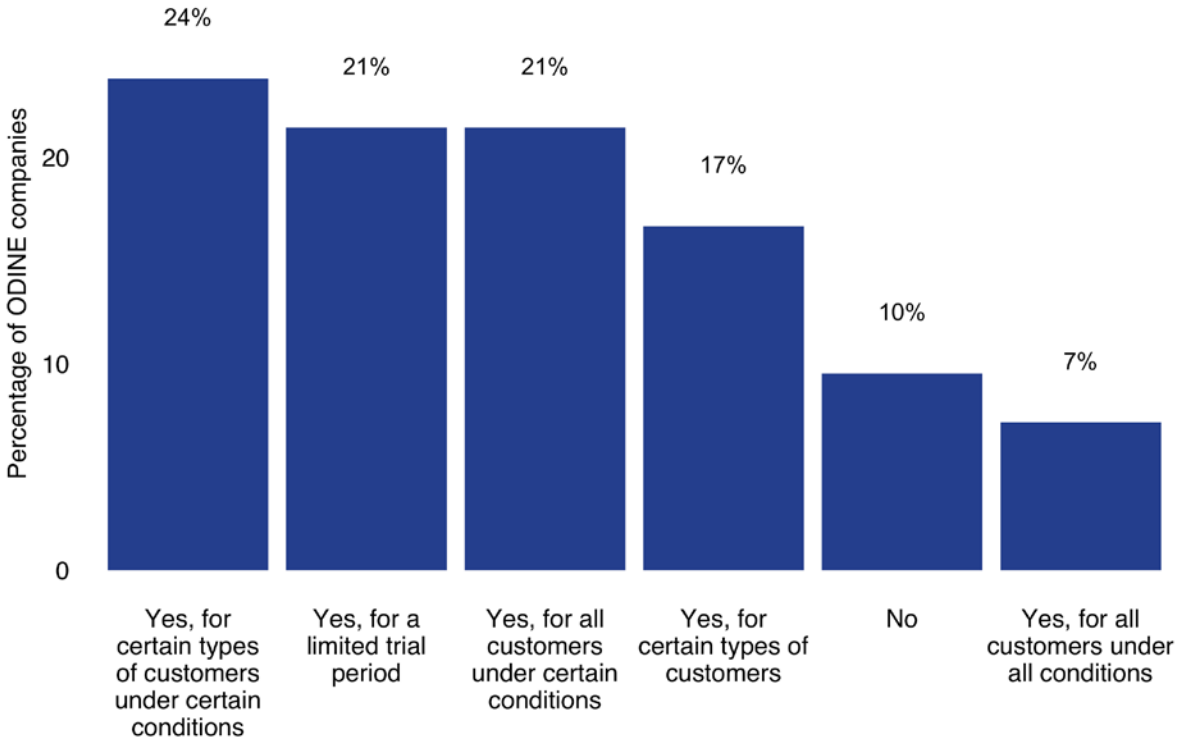


Figure 21 Is your product or service ever free at the point of use? (42 respondents, single response required)

Figure X. Is your product or service ever free at the point of use? (42 respondents, single response, required)

Free	**Count**	**Percentage**
Yes, for certain types of customers under certain conditions	10	23.81%
Yes, for a limited trial period	9	21.43%
Yes, for all customers under certain conditions	9	21.43%
Yes, for certain types of customers	7	16.67%
No	4	9.52%
Yes, for all customers under all conditions	3	7.14%
Total	42	100.00%

Figure 22 Is your product or service ever free at the point of use? (42 respondents, single response required)

Of all ODINE respondents, 90% provided their product or service free under some conditions (No: 10%). As part of this, almost a fifth are offering a limited trial period (21%) while the remaining 70% provide their product or service for free at all time under certain conditions. However only 7% provide their service free for all customers under all conditions, whereas around 15% provide it only to certain customers (17%) and just over a fifth provide it only under certain conditions (21%). The majority of those who provide the service for free only provide it to certain types of customers under certain conditions (24%).

4.3.5 Role of open data in ODINE companies

Finally the role open data plays in the ODINE companies is perhaps the most important for understanding how business models involving open data function in practice. Using questions 16, 17, 22, 23, 27, 28 and 31 we aim to observe exactly how open data influences the business models adopted by the ODINE startups.

Question 16: Which of the following statements best describes your company?

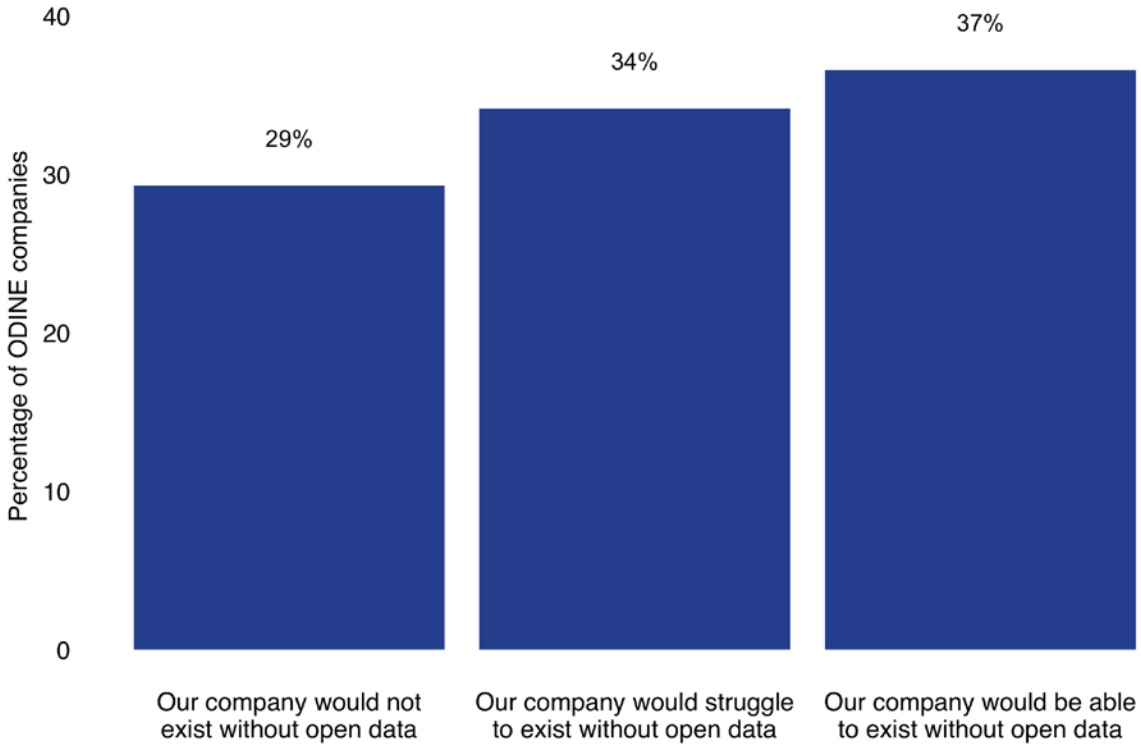


Figure 23 Which of the following statements best describes your company? (41 respondents, single response required)

Would exist	Count	Percentage
Our company would not exist without open data	12	29.27%
Our company would struggle to exist without open data	14	34.15%
Our company would be able to exist without open data	15	36.59%

Our company would be easily able to exist without open data	0	0%
Total	41	100.00%

Figure 24 Which of the following statements best describes your company? (41 respondents, single response)

When asked about the role of open data plays in their business, under a third of respondents said their company “would not exist without open data”. In addition, just over a third said their company “would struggle to exist without open data”. The largest proportion stated that their company “would be able to exist without open data” (37%), however none of the respondents said their company “would be easily able to exist without open data”.

4.3.5.1 Use open data

Question 17: Does your company use open data published by others?

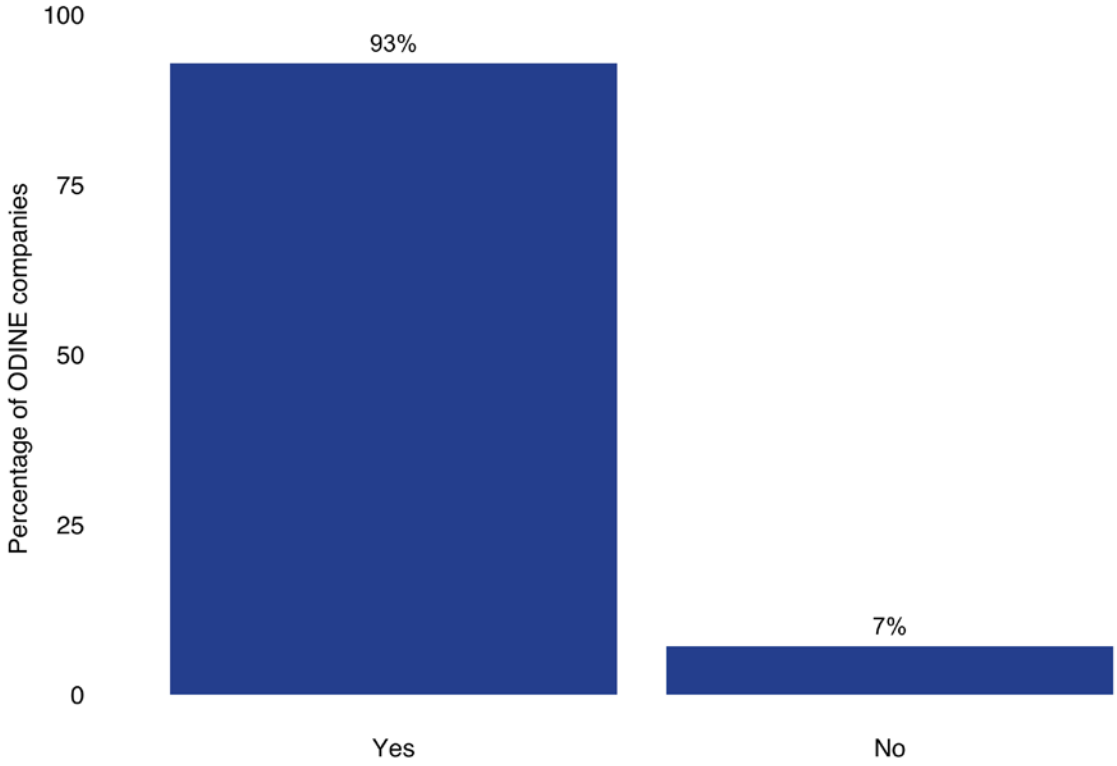


Figure 25 Does your company use open data published by others? (42 respondents, single response required)

Use open data	Count	Percentage
Yes	39	92.86%
No	3	7.14%
Total	42	100.00%

Figure 26 Does your company use open data published by others? (42 respondents, single response required)

Over 90% of all ODINE respondents use open data published by other sources (93%).

Question 22: What role does the use of open data play in your company?

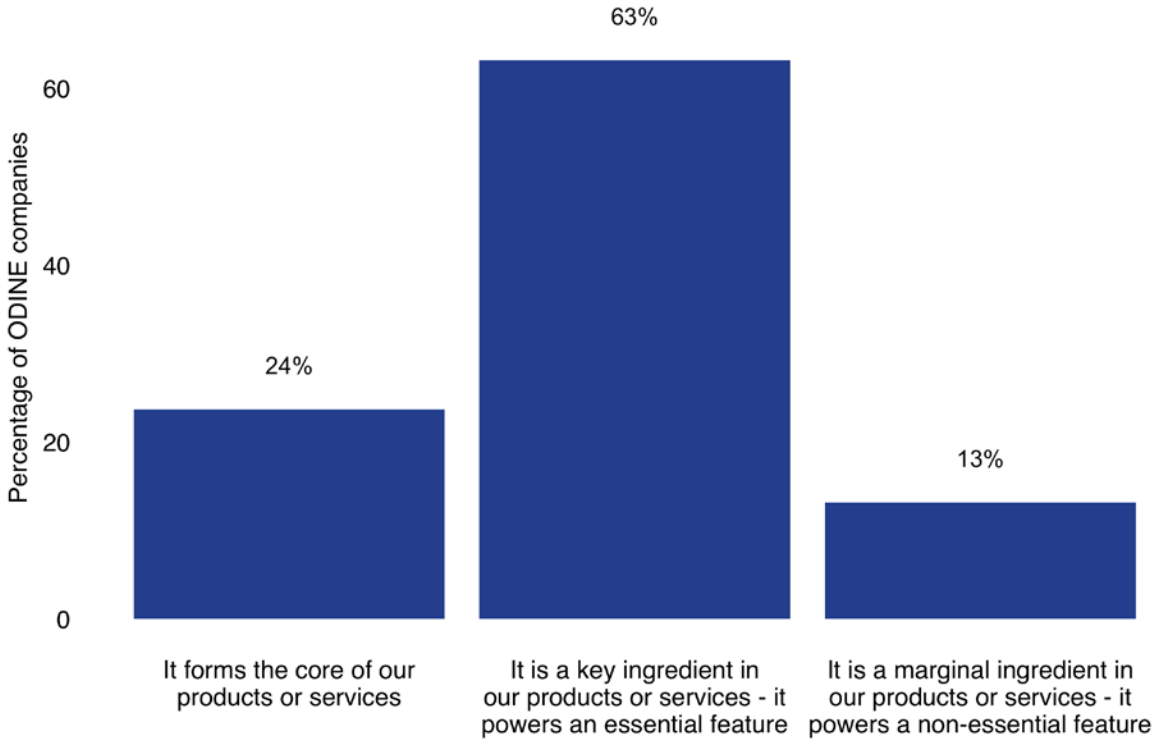


Figure 27 What role does the use of open data play in your company? (38 responses, single response)

Role of using open data	**Count**	**Percentage**
It forms the core of our products or services	9	23.68%
It is a key ingredient in our products or services - it powers an essential feature	24	63.16%
It is a marginal ingredient in our products or services - it powers a non-essential feature	5	13.16%
Total	38	100.00%

Figure 28 What role does the use of open data play in your company? (38 responses, single responses)

Of the 39 respondents (93%) using open data, almost two thirds said open data was a key ingredient in their products or services (63%). In addition, almost a quarter stated that it forms the core of their products and services (24%). The remainder state that it is only a marginal, non-essential ingredient in their offering (13%).

Publish open data

Question 23: Does your company publish open data?

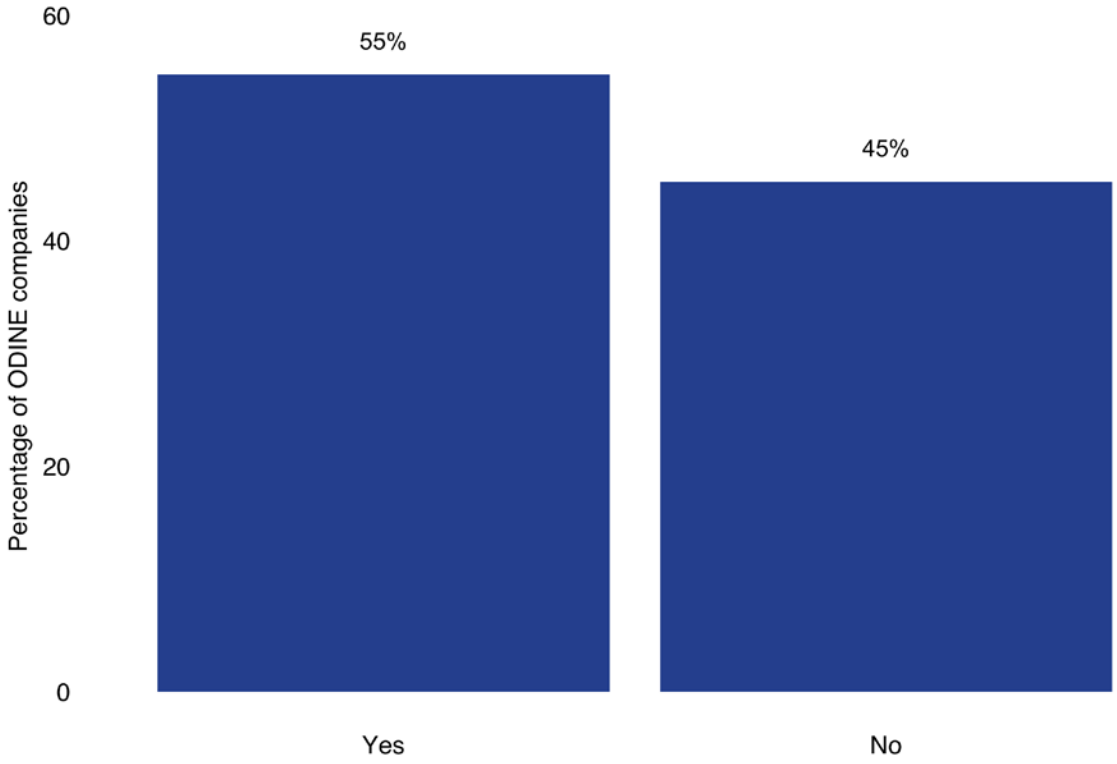


Figure 29 Does your company publish open data? (42 responses, single response required)

Publish open data	Count	Percentage
Yes	23	54.76%
No	19	45.24%
Total	42	100.00%

Figure 30 Does your company publish open data? (42 responses, single response required)

Of all ODINE respondents, over half publish open data (55%).

Question 27: What role does the publishing of open data play in your company?

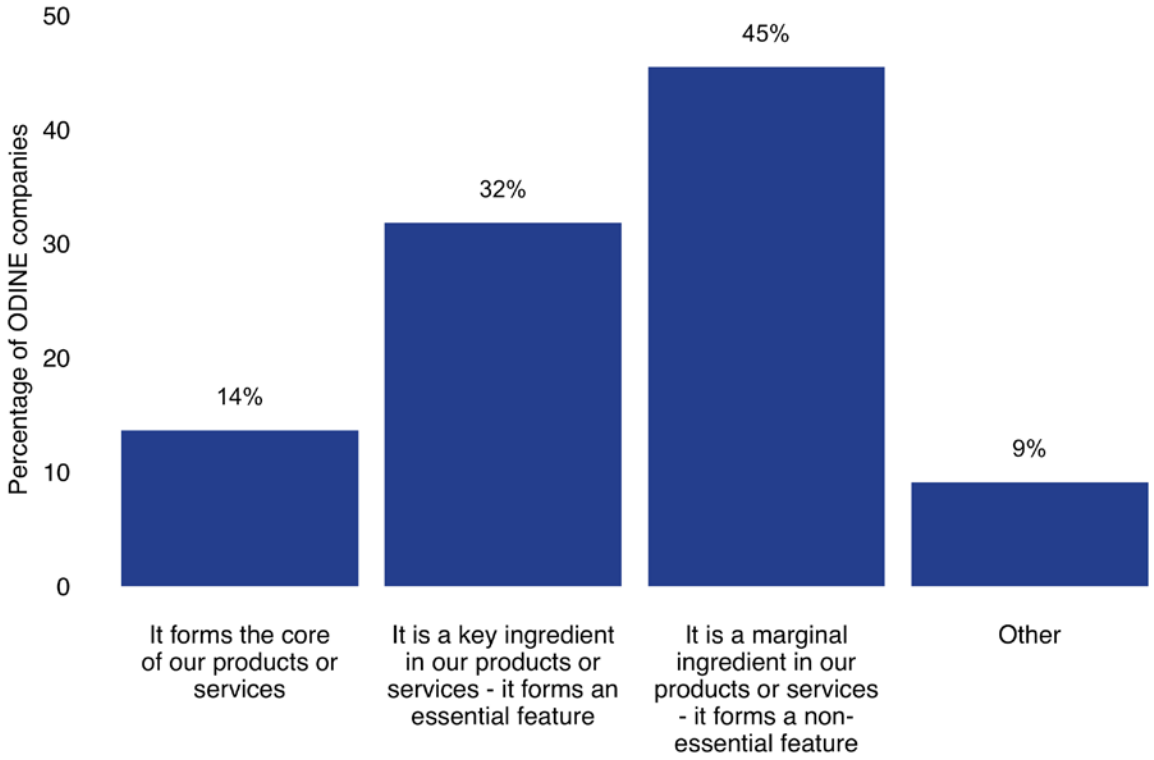


Figure 31 What role does the publishing of open data play in your company? (22 responses, single response required)

Role of publishing open data	Count	Percentage
It forms the core of our products or services	3	13.64%
It is a key ingredient in our products or services - it forms an essential feature	7	31.82%
It is a marginal ingredient in our products or services - it forms a non-essential feature	10	45.45%
Other	2	9.09%
Total	22	100.00%

Figure 32 What role does the publishing of open data play in your company? (22 responses, single response required)

Of the 23 ODINE respondents who are publishing open data, almost a third state that it is a key, essential ingredient in the products and services they offer (32%). For almost half however, it is only a marginal, non-essential ingredient (45%). Only in 14% of ODINE respondents publishing data does it form the core of their products and services.

Question 28: Does your company support others to publish open data?

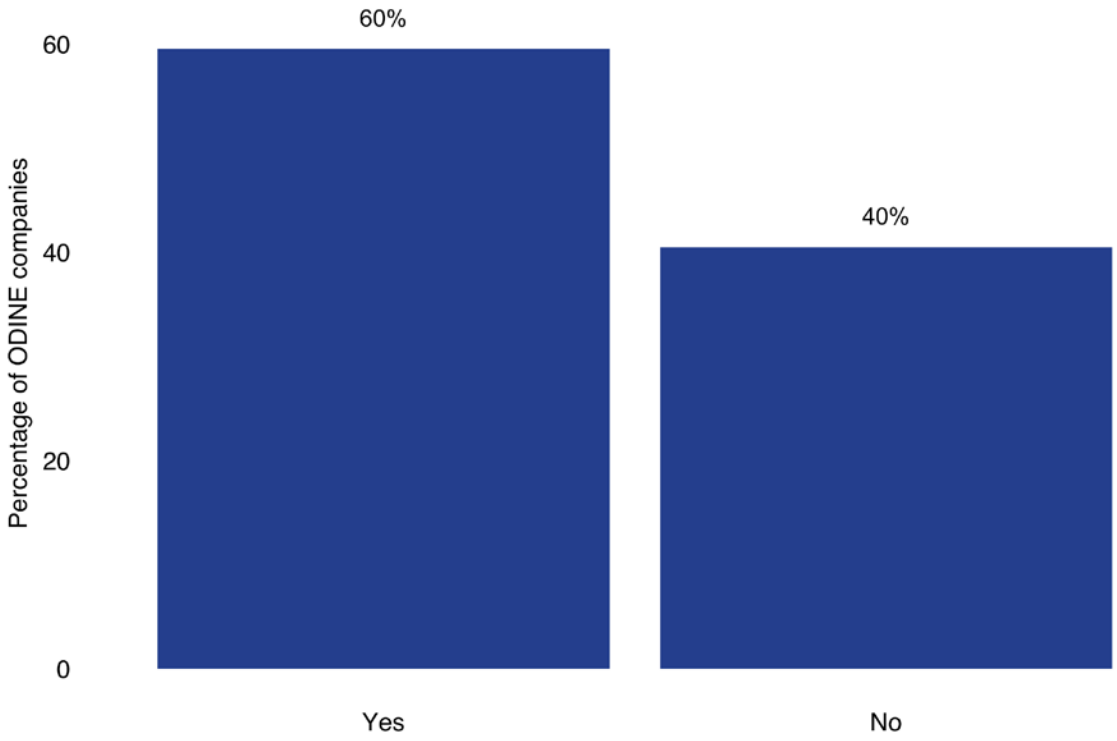


Figure 33 Does your company support others to publish open data? (42 responses, single response required)

Support others with publishing open data	**Count**	**Percentage**
Yes	25	59.52%
No	17	40.48%
Total	42	100.00%

Figure 34 Does your company support other to publish open data? (42 responses, single response required)

Approximately three fifths of all ODINE respondents in some way support others to publish open data (60%).

Question 31: What role does supporting the publishing of open data play in your company?

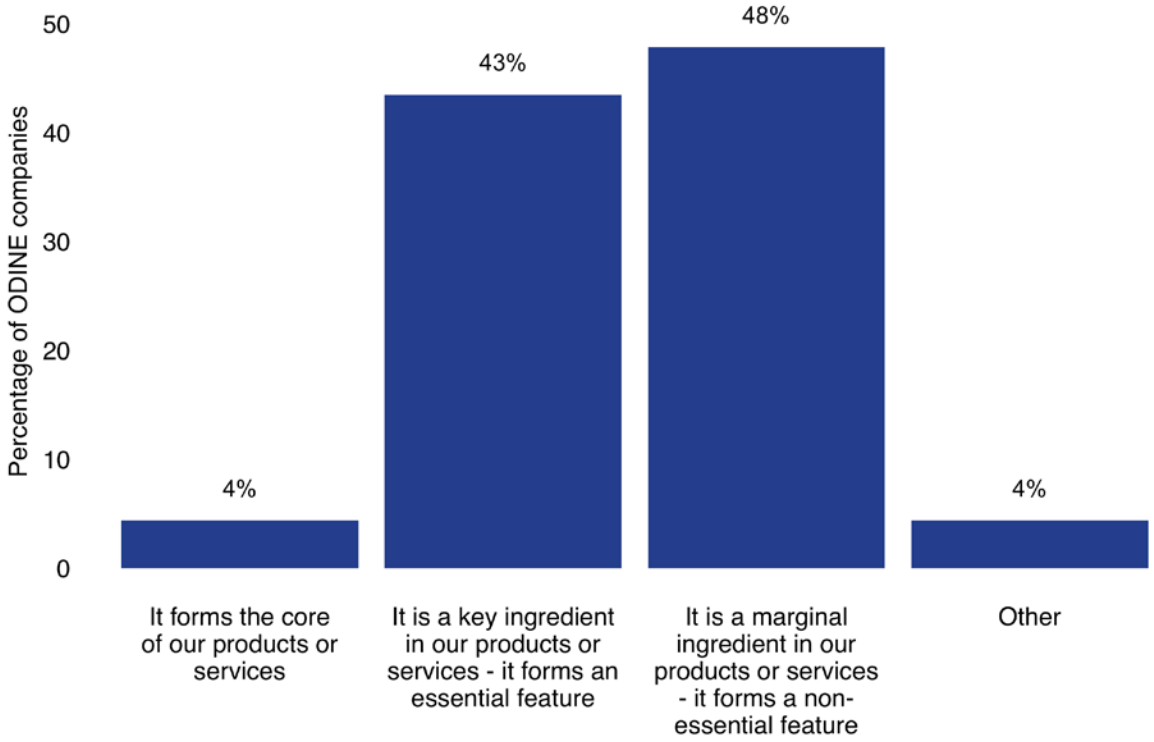


Figure 35 What role does supporting the publishing of open data play in your company? (23 responses, single response)

Role of supporting others with publishing open data	Count	Percentage
It forms the core of our products or services	1	4.35%
It is a key ingredient in our products or services - it forms an essential feature	10	43.48%
It is a marginal ingredient in our products or services - it forms a non-essential feature	11	47.83%
Other	1	4.35%
Total	23	100.00%

Figure 36 What role does supporting the publishing or open data in your company? (23 responses, single response)

However of the 25 respondent companies that support others to publish open data, less than 5% do so as a core offering (4%). Just under half report that it is a marginal non-essential ingredient (48%) compared to the just over 40% who report it to be a key, essential ingredient.

5 Analysis of the Results of the ODINE Business Model Survey

In this section we will use the results of the survey to examine the role open data plays in ODINE businesses and its effect on the business models they have adopted. The core challenge faced by all early stage businesses is to become sustainable. In many cases, this challenge involves finding and implementing a successful business model. While for many this can be a significant challenge they are often able to draw upon and iterate on a number of existing models, which have been tested and used many times before.

However, businesses that are centred around open data may experience this challenge to a greater extent than others. Since the idea of open licensing is to make access to data as accessible as possible, deriving sustainable revenue streams can be more difficult. The distribution of openly licensed content is a recent, but growing, phenomenon, and openly licensed data is even more recent, so there are fewer existing, tried and tested models available.[33] As such businesses involving open data must experiment more widely to discern the types of business models that are most effective and relevant.

To understand the frameworks being used by the ODINE businesses, we must first examine the role of open data in their proposition. Once we have understood the role open data plays, we look into the products and services they are providing and importantly the revenue models they are adopting to make these products sustainable. Finally, we investigate the customers and sectors the businesses are targeting.

5.1 The importance of open data

The first question that must be asked of any business relying on open data is how important open data actually is to their operation. The results of question 16 examine how core open data is to each of the business and were relatively evenly split between three distinct patterns on the subject.

[33] https://www.w3.org/2013/share-psi/wiki/Best_Practices/Open_Data_Business_Model_Patterns_and_Open_Data_Business_Value_Disciplines

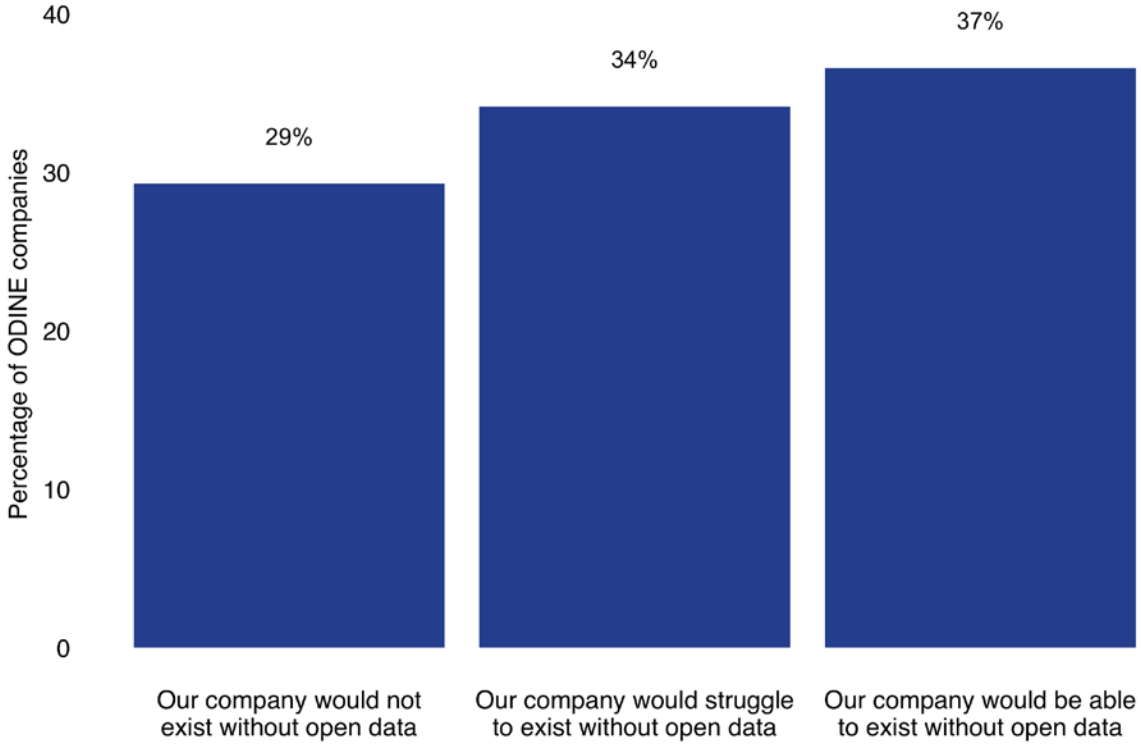


Figure 37 Importance of open data for the business model of the incubated companies (41 respondents, single response)

Approximately, one third stated that they would not exist without open data, this suggests that most of these businesses are likely to have started solely with the intention to exploit the value of open data or have since founding become so reliant on open data that they would no longer be able to exist without it.

- An example is **Zazuko,** a Swiss owner-managed consulting company for Semantic Web and related technologies. The problem they see was the lack of connections between archive catalogs and the Web of Data. Thus, they offer not only a product/platform for hosting, managing and/or publishing customer data, but also consulting services to governments and businesses. Their concept would not exist without open data, as their core activity relies on publishing open data from public and third sectors. Consequently, open data plays a core element in their business operations.

Another third said they would struggle to exist without open data, which indicates a significant reliance on open data. While they believe they could exist without open data, it is likely that such models would then rely on data still being shared, but not under an open licence.

It could also infer that these businesses are capturing value or building additional features using open data that are not core to the value proposition but greatly enhance their overall offering, potentially constituting their Unique Selling Point, or USP.

- A startup, incubated by the ODINE programme, collects live event data to link event organisers and consumers. With the openness of data, this platform enable tourists and locals to save time and efforts to get information about activities happening around them.

The remaining respondents stated that their business would exist without open data. While at first this might seem challenging for an incubation programme founded to help open data companies to have the most respondents in this category, it is important to note that no businesses responded that they could ‘easily exist without open data’. One possible explanation for the high number of responses is that these businesses have an already established proposition and business model that does not rely on open data. Such businesses might be experimenting with open data to enhance their existing products or services.

Or they could be looking to build new complementary products or services, which capitalise on the value of open data and enhance their overall offering.

- For example, one of the ODINE companies offers a precision agriculture platform along with a field application and a dashboard, which not only standardizes and records data from the field and 3rd parties, but also communicates between stakeholders. Besides, it provides analytics such as pest alerts and predictions and treatment efficacy reviews as well. Thanks to open data, their value proposition drives smarter treatment decisions, more efficient use of field labor, and a counter-balance to stringent regulations.

In all three of these categories, it is clear that engaging with open data is seen as either a core facet of the business or one which provides additional value to the company. By integrating open data into their products or services they hope to build more competitive offerings to take to the market.

5.2 The role of open data

To understand the operation of open data businesses, the first thing to do is to recognise the role that open data plays in that business. From the literature, three current role archetypes have emerged in the open data ecosystem: publishing open data, using open data and supporting others to publish open data (Thomson Reuters, 2014; World Wide Web Foundation, 2015). In our research we wanted to examine how different businesses might be engaging with open data through each of these three roles.

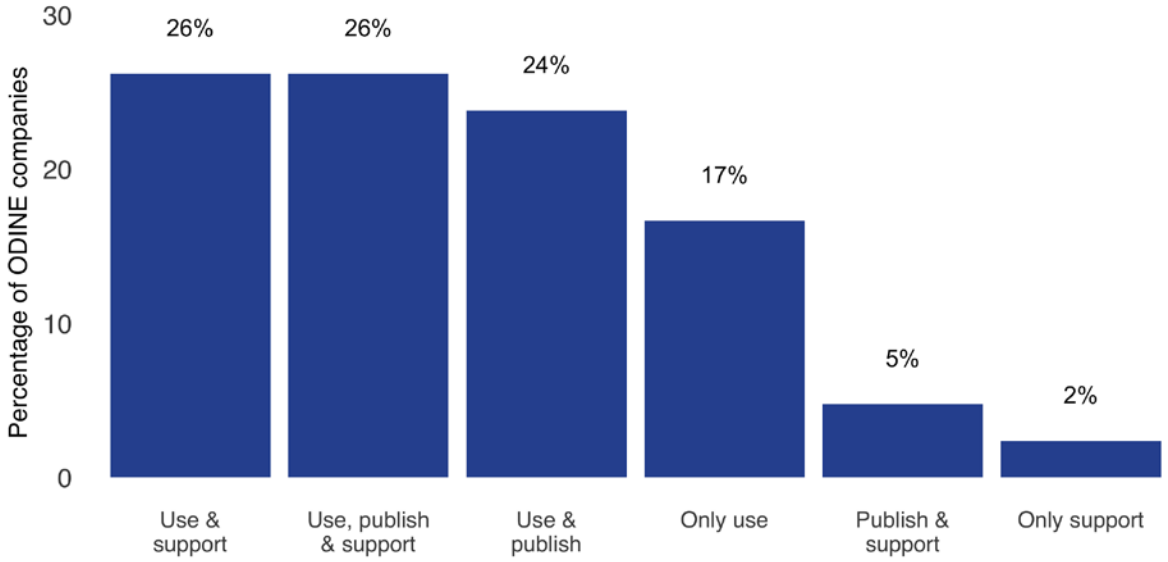


Figure 38 The use of open data by the incubated companies

Role of open data	Count	Percentage	Examples
Use & support	11	26.19%	Sun Energia, BikeCityGuide Apps GmbH, Derilinx
Use, publish & support	11	26.19%	Thingful, InSymbio, Glimworm IT BV, Zazuko GmbH, SIRIS Academic SL
Use & publish	10	23.81%	Wholi, Unigraph, HybridStat, YuScale
Only use	7	16.67%	Openlaws Gmbh, Exceedence Ltd, Guide2Property
Publish & support	2	4.76%	Prospeh d.o.o.
Only support	1	2.38%	Sinergise
Total	**42**	**100.00%**	

Figure 39 The use of open data by the incubated companies

As can be seen above, the majority of businesses engage with open data through more than one of these archetypes (81%). This differs from the traditional understanding that businesses tend to only perform in one of these roles. In fact, over a quarter of ODINE respondents said they performed all three roles (26%). Interestingly, the same number stated that they both use and support others to publish but do not publish themselves, though it must be noted that supporting others to publish may take a variety of different forms. This is not explored in this report and would warrant further study.

Just under a quarter of respondents said they use and publish open data, which might typically be characterised as an “infomediary role”, although again the actual form of this use and publication is unclear. The highest number carrying out just one activity is, as might be expected, use of open data (17%). While this role is typically assumed to be the most clear cut in terms of business case

– ingesting open data and not publishing – it is interesting that it is noticeably lower than all those who use and carry out another role as well. Less than a tenth of companies are not using open data at all, only publishing and supporting or just supporting. Notably none of the ODINE respondents were only publishing open data, potentially indicating that while over half of companies are publishing data, they have yet to build business models, which create and release open data without drawing open data in themselves or helping others to publish.

What is clear from the findings is that the three roles businesses might take with respect to open data often overlap. This indicates that the role of open data in business models is not as clear cut as some of the previous research suggests. Unfortunately, given the small sample size, we were unable to segment the result of the other questions by these categories in an attempt to classify each of these roles, but the opportunity exists for wider reaching research into this area, potentially adopting a similar methodology.

5.3 Building products and services with open data

In the business model canvas, value proposition is one of the most crucial areas. A business involving open data needs to find a way to shape their products and services around open data in the most profitable way. Our survey discloses that services using open data are the most common within the incubated startups. Indeed, 60% of them offer a product or platform providing insights from open data, 43% give analysis, visualisation or/ as well as customer data interpretation services, 19% data analysis services, 12% consulting and 2% training. This means that startups see more business opportunities emerging by exploiting open data and creating services around it, than by publishing or supporting.

According to the new established ecosystem, offering services using open data would make them sit between the open data publishers and the end users. Consequently, they are intermediaries.

This makes “using”, “supporting” and “publishing”, the three main products and services created with open data; and according to their relationship with open data, they are either a core, key or marginal ingredient to the business value proposition.

The results of the survey show that a high percentage of businesses use open data to generate insights and provide analysis, the majority (63%) see it as a key ingredient that powers their business’ main features.

- For instance, **InSymbio** is the first B2B marketplace for bioeconomy. They noticed that tons of biological materials are wasted every year, and they wanted to provide a marketplace for biomass, residues and by-products for the production of bioenergy, biomaterials and chemicals. Therefore, the business focuses on cleaning, enriching, aggregating, analysing and visualising data for private entities in the food and agriculture sector. The founders stated that they would struggle to exist without open data, which makes open data a key ingredient to their activities.

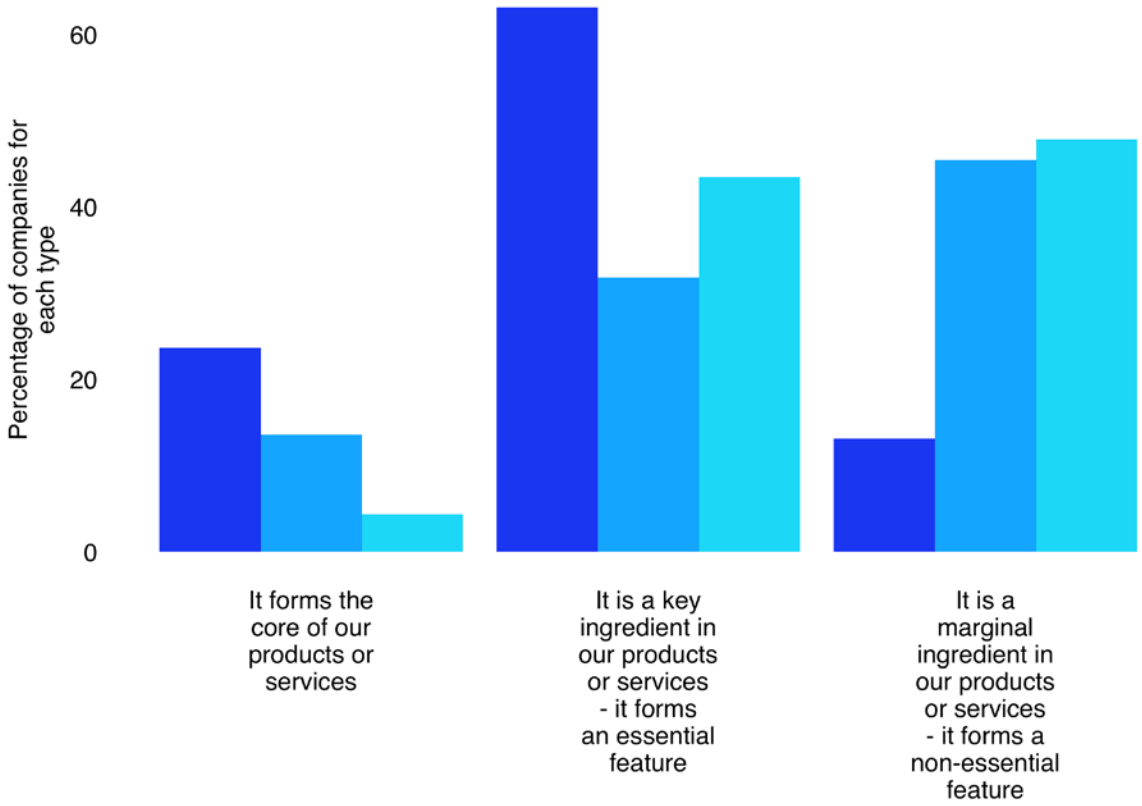


Figure 40 Role of open data with regard to product and services development in the context of ODINE

Role of open data	Importance	Percentage	Count
Use	It forms the core of our products or services	23.68%	9
	It is a key ingredient in our products or services - it powers an essential feature	63.16%	24
	It is a marginal ingredient in our products or services - it powers a non-essential feature	13.16%	5
	Total	**100.00%**	**38**
Publish	It forms the core of our products or services	13.64%	3
	It is a key ingredient in our products or services - it forms an essential feature	31.82%	7
	It is a marginal ingredient in our products or services - it forms a non-essential feature	45.45%	10

	Other*	9.09%	2
	Total	**100.00%**	**22**
Support	It forms the core of our products or services	4.35%	1
	It is a key ingredient in our products or services - it forms an essential feature	43.48%	10
	It is a marginal ingredient in our products or services - it forms a non-essential feature	47.83%	11
	Other*	4.35%	1
	Total	**100.00%**	**23**

Figure 41 Role of open data with regard to new products and services development in the context of ODINE

Only one business out of five identifies open data as being the core ingredient for their business operations, while building on it.

- **Unigraph** is a data/technology startup, which combines information silos to create a graph representation of the world's knowledge (ODINE, 2017)[34]. Their concept is to provide insights from data by cleaning, aggregating, validating and combining/mashing up data and sell to businesses and governments in the Business & Legal Services, Finance & Investment, Governance and Insurance areas. Open data used to be locked in isolated silos, come under different formats, be inconsistent and require a lot of cleaning and reconciliation before it could provide value. This case shows that open data is a core element to their essential product and services, and without it, the business would not exist.

Among the respondents that use open data, 13% define open data as a marginal player, which influences their secondary activities.

- **Thingful** is one of them. This data/technology startup is a search engine for the Internet of Things. Although the business states that they would struggle to exist without open data, they do not perform any operations on open data. Indeed, they want to enable individuals and institutions to control how their IoT data is used, and to empower them to make more valuable and effective decisions through secure, cross-domain data discovery and access. Open data is thus only a marginal ingredient.

The second most developed products and services are performances around supporting others to publish open data, such as hosting, managing and publishing customer data. Almost two thirds of companies provide this service and around half of them mentioned that it was a marginal ingredient to their business.

[34] https://opendataincubator.eu/category/unigraph/

- Thanks to open data, **Sun Energia** was able to act as the matchmaker for buildings and solar energy. The Finnish startup saw struggles from property owners to get unbiased information on the true savings potential of the solar producible on their rooftops and solar providers to find the right customers for their offerings and convince them of the benefits of solar power. To solve this problem, they use and support open data to sell to end users, businesses, public bodies and third sector organisations. They aggregate, provide analysis, visualisation and interpretation of customer data. The founders state that they would struggle without open data and thus use open data as a key component for those operations but as a marginal one for some other secondary features of their business.

This case study is aligned with our findings above, as it shows that the business is a combination of “use and support” and each operation has a different relationship with open data. The business activities using open data make open data a key ingredient and the ones supporting open data make it a marginal ingredient.

However, a large percentage of entities (43%) value open data in supporting operations as key.

- **Glimworm IT BV** is an innovative ICT (Information and Communications Technology) business in the data/technology area from Amsterdam, specialising in connecting cities to citizens with Internet of Things interactivity. They not only enrich, aggregate and validate data, but also generate sense networks and related data that they offer to governments and businesses. The company would not exist without open data, but it states that open data has only a key role in their business operations.

It is surprising that for a startup, which seems to rely entirely on open data, qualifies open data as only a key component of its supporting products and services.

Finally, only one out of 23 startups categorises supporting others to publish open data as their core element of their operations.

- **Prospeh d.o.o/ Origin Trail** is a food and agriculture startup. Their goal is to solve challenges around the lack of clarification of quality food producers from less transparent companies with hidden provenance of ingredients. With open data, they now can reveal provenance of food to enable more ethical consumption and sell to individuals and businesses. Therefore, the company publishes and supports open data to display complete transparency of their supply chains from farm to fork through a mobile application or website module without applying any additional features to their packaging or products. They stated that they would struggle to exist without open data, which makes open data a core piece of their value proposition.

The third activity that a business could implement with open data is publishing. Nevertheless, none of the incubated startups of ODINE publishes exclusively. They either “publish and use” or “publish and support”, while making open data a marginal ingredient (45%).

- **Wholi** is a data/technology business, which aim is to match people upon recommendation. Their targets are individuals, more specifically specialists, businesses and third organisations, such as charities. They publish customer data and generate insights from open data published by the government. Since they disclose that they would be able to exist without open data, the marginal role of publishing open data could be predicted.

This startup illustrates that an open data business, which is able to sustain itself without open data, reports open data as a marginal actor in its business model.

One third of the respondents who publish qualify open data as a key piece of their concept.

- **Zumo Gmbh**, which is an agency for design and engineering in healthcare, gives insights, analysis, interpretations and visualisations, and publishes data generated by users. The startup then sells their services to end users and businesses in healthcare, food and agriculture sectors. Although they say the company would be able to exist without open data, it acts as a key ingredient in their publishing services. This shows that open data is still necessary for the main business operations.

However, YuScale is one of the rare ones that made publishing open data their core activity.

- **YuScale** helps diabetics control their nutritional content of their food, while serving the Healthcare, Insurance and Scientific Research sectors by translating food into nutrients. They provide analysis, visualisations, interpretations and publish open data with nutritional content about food generated internally, by users and published by others as open data. Their aim was to replace imprecise guesses with measured data and image recognition. The company claimed that it would struggle to exist without open data, but it already qualifies it as a core element to their services, which means that open data plays an important element in data publishing.

Most of business's value propositions “use” open data and the majority of them qualify it as a key part to their products and services. Then “publishing” and “supporting others to publish open data” are evenly spread and both see open data as a marginal element to their products and services development. Consequently, we notice that open data is not yet seen as a core piece of business operations. This can be explained by the unfamiliarity with open data as a new resource, thus it affects its reliability and increases risks for businesses that want to use it.

5.4 Deriving revenue from open data products and services

One of the core element that keeps a business running from the business model canvas is the revenue structure. It was found that 86% of businesses using open data base their revenue streams on subscription fee. This might suggest that the majority are providing ongoing services as opposed to one-off product - this could be the data itself or could involve hosting platform or analysis platform/tool. This would be consistent with expectations around digital platforms often operating as-a-service models.

- For example, one of the startups' aim is to use 'CityTrees' to make urban air clean and profitable. Their revenue streams come several ways, from single payment, subscription fee, advertising and grants.
- However, another startup, providing insightful accounting for micro businesses, relies entirely on subscription fees. They help solve the challenge of millions of micro businesses by managing their cash flow.

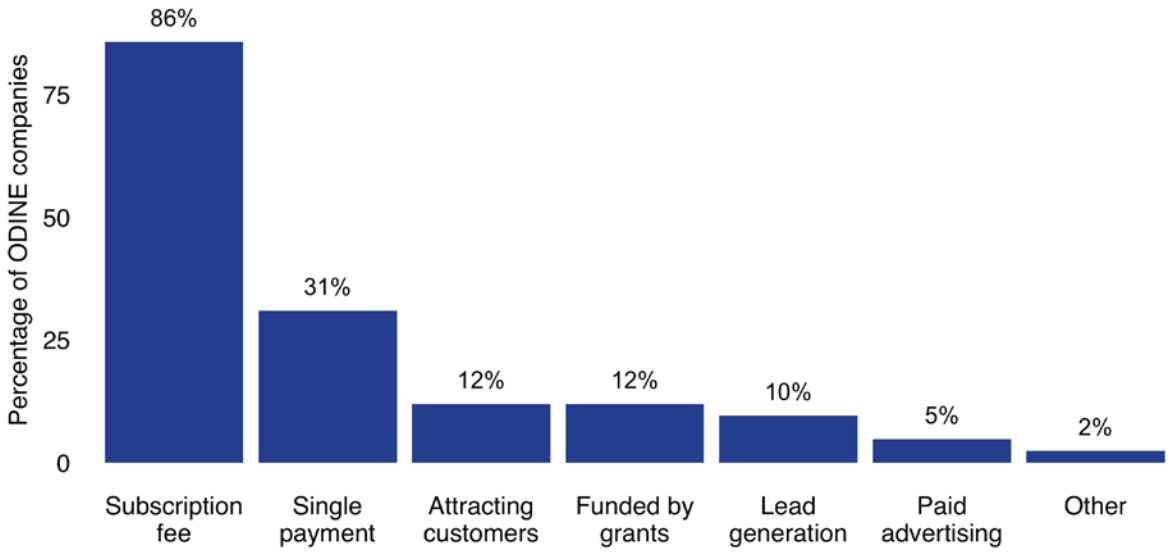


Figure 42 Revenue generation from product and/or service (41 respondents, multiple responses required)

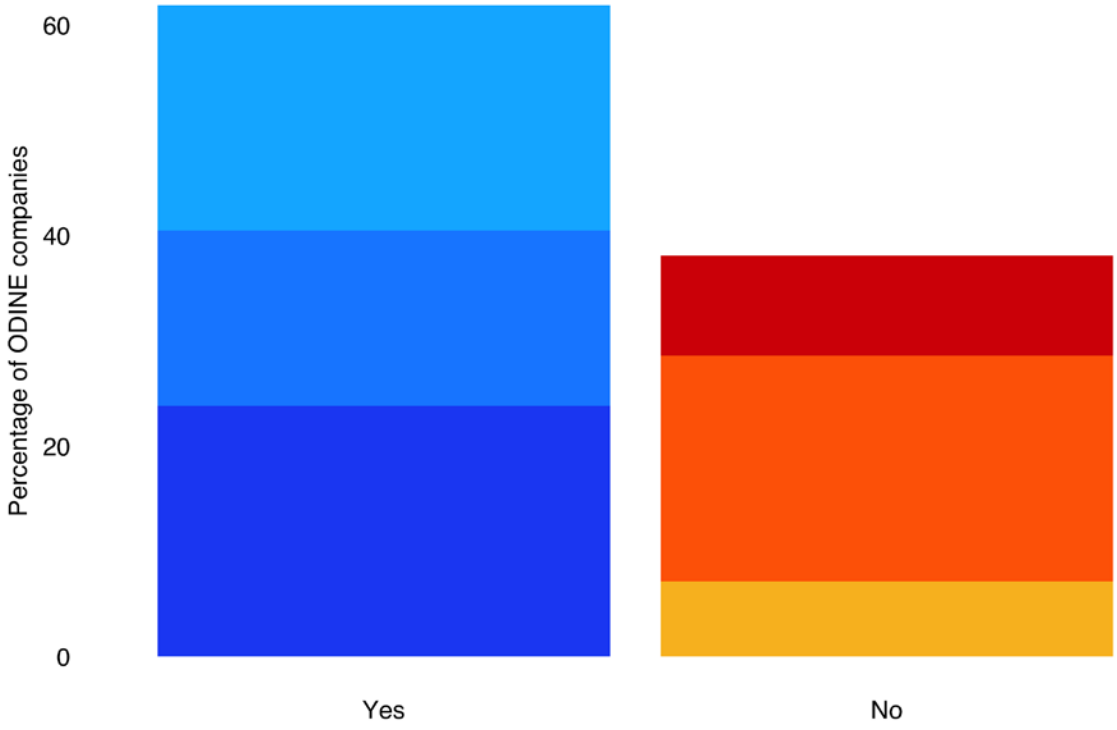
While the majority are using a subscription service to derive revenue from their products, they are also employing other mechanisms. For instance, almost a third of respondents are using single (one-off) payments, which might indicate they are selling one-off products whether that takes the form of datasets, software, pieces of data analysis or other non-data related one-off products (31%).

Relatively low numbers are employing other revenue streams, less than a tenth are using grant funding which may indicate some of the businesses are developing products with social or environmental good they want to get funded by a third party. This seems to be in line with much of

the literature generated by the Creative Commons organisation[35]. However, this answer may have been erroneously interpreted by respondents given that all of them were funded by ODINE grants to develop the products. Notably in this category, none of the respondents recorded they were looking to attract donations, which might be indicative of more commercial models being employed.

Finally, there are also a relatively low number of companies using revenue streams, which do not involve direct payment from the user. For instance, just over a tenth are using their open data products or services to attract customers to other paid for products or services (12%) and a tenth using them to generate leads for paid products or services (10%). Both of these indicate they are using models that appear to be a form of cross subsidy or razor and blade models. In addition, 5% are using revenue from advertising to derive revenue from the products and services they offer.

These last three models all seem to suggest that some companies might be providing services that are free at the point of use. Indeed the freemium model has been proposed in much of the literature relating to business models involving open data, especially those connected to publishing open data. Indeed those operating freemium models would likely use a subscription fee for the paid tiers, as they often use as-a-service models of access. In response to question 13, companies stated whether their products were ever free at the point of use. Of those who replied 'yes' only three of the answers indicated freemium models, as limited trials are not usually considered freemium neither are those which are always free and derive revenue by other means.



Key: Response to Question 13: Is your product or service ever free at the point of use?

[35] CC book + slides + canvas

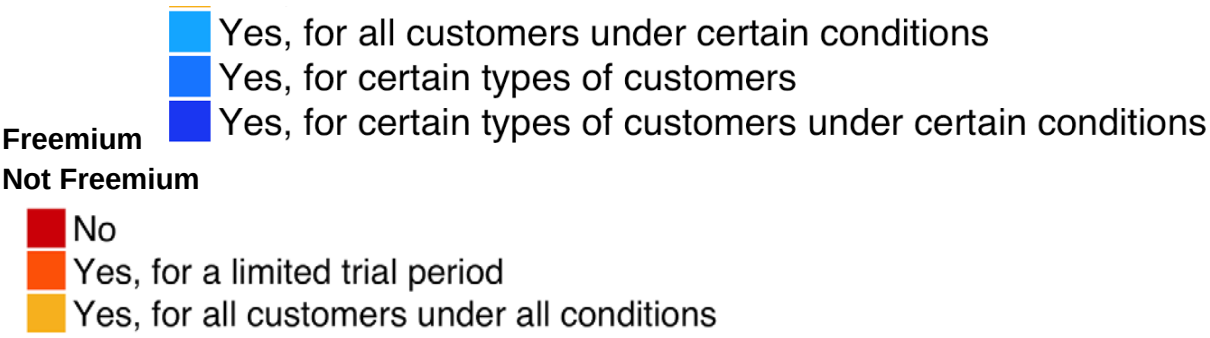


Figure 43 Free disposition of products and/or services per customer segment and time duration

Freemium	Response to Q13	Count	Percentage
Yes	Yes, for certain types of customers under certain conditions	10	23.81%
	Yes, for all customers under certain conditions	9	21.43%
	Yes, for certain types of customers	7	16.67%
	Total freemium	**26**	**61.90%**
No	No	4	9.52%
	Yes, for a limited trial period	9	21.43%
	Yes, for all customers under all conditions	3	7.14%
	Total not freemium	**16**	**38.10%**
Total		**42**	**100.00%**

Figure 44 Free disposition of products and/or services per customer segment and time duration

As shown above, over two thirds of respondents were applying some form of freemium model (62%). This seems to indicate a high popularity of the freemium model among ODINE businesses. The freemium model is particularly interesting in the cases where data forms the product or service, indicating that the companies will publish open data at no cost, while potentially introducing paid tiers for high usage or guarantees on uptime or data availability through service level agreements. In addition, these paid tiers might also be dependent on the organisation, for instance where commercial usage is required. For example:

- **Sinergise** offers seamless access to global archive of open earth observation data over OGC standard web services. They make their data available to all customers under certain conditions and charge businesses, governments, academia and professional users a subscription fee upon request.

- Another example, **Guide2Property** is a real estate platform that gives a personal guidance to buyers and tenants during the entire process, from the search until the move. Their data is available for certain types of customers under certain conditions and impose a fee to businesses, governments and end users.

Similarly for the cases where businesses are publishing data, the 7% of businesses providing their product or service free of charge for all customers provides an interesting case, which tends to indicate they are employing cross-subsidy models, or perhaps razor and blade models of value adding services on top.

Unfortunately, given our sample size it is difficult to compare the revenue models being employed with the role of open data, namely whether it is used, published or supported. Also exploration of the exact nature of the freemium criteria is out of scope for this report, however we hope future research will be able to look more closely at the nature of freemium conditions, preferably including the data collected and published by this study.

On the whole it appears that a sizeable majority of ODINE respondents are providing service based models, with a very high proportion offering some form of freemium pricing model.

5.5 Selling open data products and services

According to the survey results, slightly less than half of our startups categorize themselves as part of the “data/technology” sector. This means that almost one out of two startups come from the data/technology area and that open data in this industry is published, more accessible and more advanced.

- For example, **BikeCityGuide Apps GmbH** is a data/technology startup, which provides smart services for cyclists to encourage cycling in cities.

With an important gap of more than 35% between the most common and the second most common sector, the other half of startups come from a large range of industries, such as “healthcare”, “energy” and “education”, which goes from 2% to 12%. This shows that open data is either not accessible or more difficult to access and/or not available in the latter sectors.

- One healthcare startup that ODINE incubated is in MedTech improvement and they provide the first cheap and portable Automatic External Defibrillators (AED).

- Another startup in the education sector aims at inspiring children to appreciate writing.

Not only is the area of business important, but so are the targeted sectors. The charts indicate smaller gaps between industries. A third of our sample of respondents target customers from the “data/technology” industry and more or less one fourth aims at a wide number of industries, such as “governance”, “food and agriculture”, “environment and weather”, “scientific research” and “healthcare”. This demonstrates that there is no particular industry that attracts open data, since one company can target multiple industries.

- **Openlaws Gmbh**, which offers easy law information for all, aims at customers in Business & Legal Services, Education, Governance and Insurance areas.

Customer types

The survey reveals that two thirds of startups sell their products and services to organisations exclusively and the other third to both organisations and individuals. This is not a surprise that the targeted organisations is made of 93% of businesses as selling to businesses is more advantageous. Indeed, for a company to implement new products and services, use them and keep paying for them, means that they create real value and solve problems, which enables businesses to design long-term customer relationships.

- As one of the startups in data/technology sector saw a lack of transparency and inefficiencies regarding company mobility, they now offer a solution for companies to help them understand, optimize and organize work. This implies that their target customers are SMEs, fleet management companies and leasing companies in data/technology and insurance.

Although the private sector takes up an enormous portion of their target audience, half of the respondents who sell to organisations answer “government” as part of their target audience and a third say “academia”, which are not neglectable.

- For example, **Exceedence Ltd** describes themselves a technico-financial software for renewable energy project. They supply not only insights from data but also analysis services, training, and consulting to organisations. They target businesses, governments and academia in various sectors such as Energy, Finance & Investment, Research & Consulting and Scientific Research.

On the other hand, the targeted individuals is made of 62% of end users/mass market, which means that the received data is not being built on afterwards and is directly used as knowledge.

- For instance, a German health startup focuses on accelerating patients’ access to medical innovation and they sell their services to the mass market and businesses. The platform directly connects with patients to offer access to matching clinical trials.

Whereas the specialist category of consumers use the end products and services for other purposes.

- One of our respondents qualifies themselves as the real estate bloomberg. They use open data to do data analysis, which allow data users and professional users in the housing/real estate industry to make instant decisions about the purchase/sale/rental/refinancing of a home.

Given the fact that the level of access and availability of open data is still different across industries due to its newness and concept of transparency, the sector in which open data is widely used is undoubtedly the data/technology sector. The gap between the latter industry and the others is more obvious in the startups’ area than among the targeted customers’ ones. This can be

explained with the low level of open data accessibility and availability in other industries than data/technology. Once businesses get open data in hand, they can sell it to any organisations and individual in any industries.

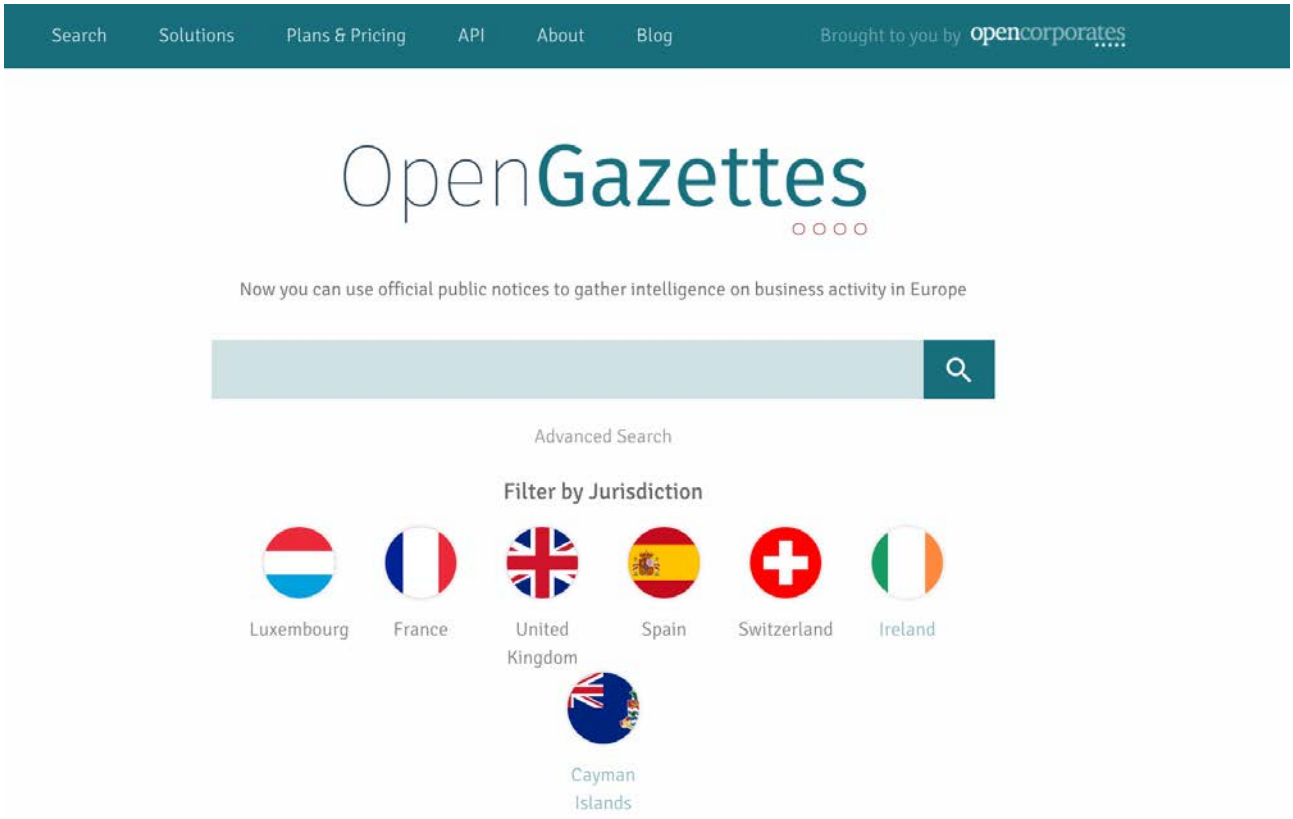
The most targeted customers are businesses and specialists. These findings show that the end products and services are very likely to be used and built on in order to not only improve aspects of other organisations and individuals, but also create social impacts. Indeed, one of the ODINE programme's main objective aimed at choosing and supporting business ideas with economic, social and environmental benefits.

Although analysis of companies supported by ODINE have been conducted and findings have been drawn, there are some limitations to keep in mind. The first limit of this research is that companies, which applied for the European incubation programme, were already working or keen to work with open data. This means that they were already familiar with the benefits of open data. The second limitation is the language used in the survey, which may not have been understood commonly among participants. As many terms around open data are relatively new and were not clearly defined, there is the possibility that respondents misunderstood some terms and thus misinterpreted the questions.

6 Success stories

In this section, we will explore success stories from selected ODINE companies. We believe that the selected companies can provide a general overview of the success and progress achieved within the context of ODINE via different angles. With regard to the selection criteria for this group of companies, the ODINE advisors were consulted and asked to recommend selected ODINE funded companies that would best highlight the competences and business capabilities range of the incubated companies with regard to the usage of open data. Our aim was to interview a limited and representative number of companies and uncover specific insights in terms of their development after the ODINE incubation, since the business model survey already covered all generic and business model related aspects. In this context, individual interviews were conducted with the selected companies based on a common questionnaire for the sake of consistency, while allowing the possibility to highlight company specific aspects and attributes by customising parts of the questionnaire where necessary. All companies agreed that the collected info will be published as part of this deliverable and used for any ODINE relevant purposes.

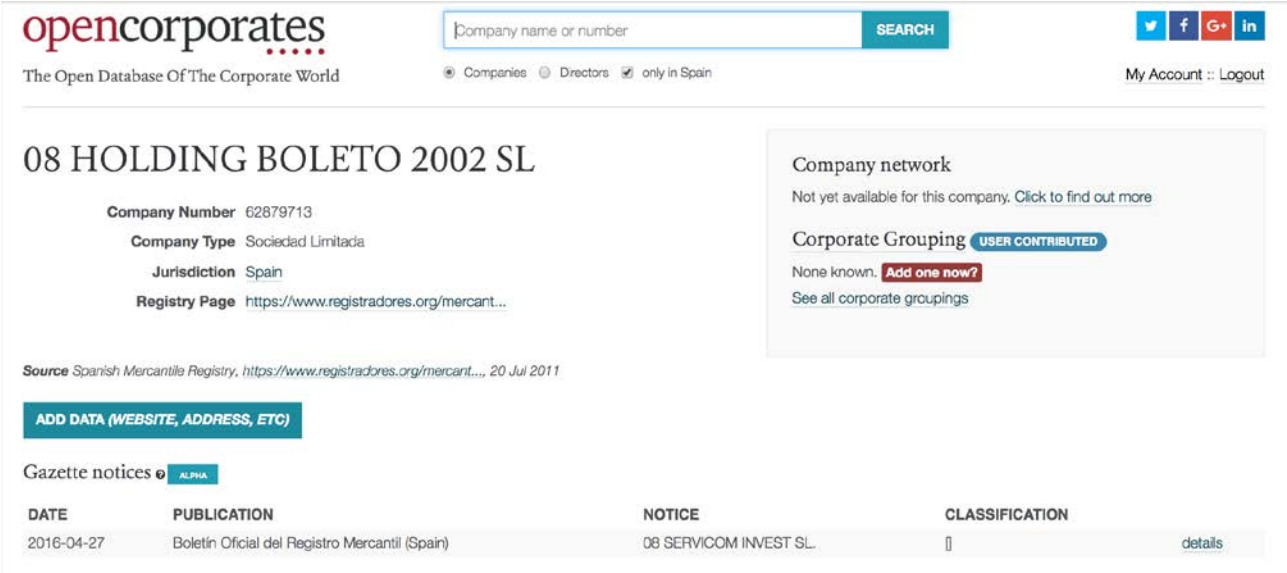
6.1 OpenGazettes/OpenCorporates (Cohort 2)



Brief company description

OpenGazettes opens up government gazettes, aggregating them across multiple countries and enabling powerful searches into the unstructured and rich seam of corporate events information contained in them. It is powered by OpenCorporates – the largest open database of companies in

the world.



Company related facts and figures

1. OpenCorporates connects and standardises the world's official business information. The company only works with official public sources in over 110 jurisdictions, and provides full provenance for it.
2. As part of OpenCorporates, OpenGazettes is operating in high growth environment with increasing revenue, employees, investment, and customers. OpenCorporates has 25% year on year compound growth on own funds.
3. The company's biggest achievement is keeping true to the mission of being a social impact business with a compelling commercial data access proposition and a world changing free service shining a light on the opaque corporate world.

The problem addressed

Government gazettes are used in many parts of the world to publish important notices about companies, from incorporation and dissolution to winding up orders, AGMs, mergers and more. However these notices are almost unknown, and rarely connected with the companies to which they relate.

The solution provided

OpenGazettes opens up government gazettes, aggregating them across multiple countries and enabling powerful searches into the unstructured and rich seam of corporate events information contained in them. This will be incredibly useful for investigators, law-enforcement, and the underlying data will be of interest to business information providers, and to companies of all sizes who are doing business with the companies associated with the notices. Right now we have notices from Luxembourg, France, United Kingdom, Spain, Switzerland, Ireland, and Cayman

Islands (contributed by a community member who is an investigative journalist).

Key achievements

- Gazette notices from Luxembourg, France, United Kingdom, Spain, Switzerland, Ireland, and Cayman Islands,
- One of the few open datasets about Cayman Islands submitted by an investigative journalist and featured in the Guardian[36],
- Critical corporate events are published in the gazettes weeks before appearing on the company register,
- Gazettes notices will often contain information that can't be found anywhere else.

Lessons learned during and after the ODINE incubation programme and advice for other open data startups

ODINE has been an incredible opportunity for OpenGazettes/OpenCorporates to work on a project in a fixed amount of time, and with the reporting structure that was very helpful in keeping track of the milestones. There were a couple of areas where ODINE could have provided more value for instance, reaching business trade publications to showcase our work, and mentors on legal issues.

The OpenGazettes/OpenCorporates team thinks that businesses are already realising the benefits of working with open data. It is reusable, better quality and has provenance. There is also a thriving community of people who champion this space. Getting in touch with the relevant communities helps supported the pilot of the product but at the end of the day, what seemed to matter the most to the clients was the data is quality compared to that of the competitors. Open data is the future of authentic, more accurate and real time data. It will become the foundation for public good and innovation in business. Businesses are already realising the potential of open data, which is why you can see them launching open data products and governments adopting open data principles. This is why OpenCorporates has become such a critical tool to the workflow of traders, businesses, insurance companies, law enforcement, investigators and reporters.

Future plans beyond the ODINE incubation period

OpenGazettes/OpenCorporates is going to be extending the work on EU Government Gazettes as part of the Horizon 2020 euBusinessGraph project. For this project, the OpenGazettes/ OpenCorporates team is committed to double the number of gazettes that will be scraped and added. Moreover the gazette notices will be used as a key input into new 'corporate events' functionality, providing this both through an events feed, and via alerts.
OpenGazettes/OpenCorporates will be focusing the next six months on core company data (now having 125 million companies) and preparing the work for corporate events functionality. Separate from this according to its estimations, the company is expected to continue the growth of the past 2 years, targeting at least 40% y-o-y revenue growth.

[36] https://www.theguardian.com/odine-partner-zone/2016/may/31/opengazettes-government-gazettes-data-open-corporates

6.2 Plume Labs (Cohort 2)

Brief company description

Plume Labs[37] helps users understand their environment and monitor exposure to air pollution for improved wellbeing. Flow, Plume Labs' smart, connected mobile accessory, will help users track, monitor and reduce their exposure to air pollution wherever they are. Its companion AI is launching a global movement to map air quality to help users avoid its harmful effects. Our mobile app, the Plume Air Report, allows users to find clean air by providing real-time air quality forecasts in over 60 countries thanks to open data and machine learning predictive algorithms. It uses the global data platform, Plume API - providing both B2B services and free access to innovative environmental projects.

[37] Media kit: https://www.dropbox.com/sh/vks6gi6n1uuyz3o/AABZBYydyIY4xlxZY_AXCZRQa?dl=0

Company related facts and figures

Plume Labs just announced a key round of seed funding totalling 4 million euros[38]. In 2016, along with Digitas LBi and Twitter UK, Plume Labs flew Pigeons over London wearing special pollution monitoring backpacks -- an early prototype of our Flow trackers. The campaign raised awareness of air pollution among the cities inhabitants and earned a wide variety of global press attention[39].

In 2015, Plume Labs drew attention to a pollution peak in Paris during which the city was more polluted than Shanghai and Beijing. This led to the city instigating immediate reduction measures by banning half of cars from the cities streets

The problem addressed

The World Health Organization, the UN agency tackling global public health challenges, estimates that air pollution kills 8.5 million people per year worldwide. A 2010 MIT study concluded that, in the US alone, 53,000 people died every year because of tailpipe emissions from cars – nearly double the amount of road casualties! Beyond the trillions of dollars lost by world economies yearly

[38] For more information can be found at the company blog: https://blog.plumelabs.com/2016/12/15/one-step-closer-to-making-the-air-more-transparent/

[39] https://www.theguardian.com/environment/2016/mar/14/pigeon-patrol-takes-flight-to-tackle-londons-air-pollution-crisis

in productivity losses and health costs, pollution has a staggering environmental and human cost – a dual environmental and health crisis.

The solution provided

Flow, Plume Labs' personal connected tracker, has the potential to reveal this invisible threat and empower consumers to make changes in their lives to overcome it. By helping make pollution visible, Plume Labs allows its users to learn more about their own exposure in order to better understand and manage it. In doing so, the users build better routines to improve their environmental health.

Air pollution might sound daunting and leave urban consumers feeling helpless. However, there is much they can do to breathe cleaner air. Identifying better routes when commuting can make drastic changes as pollution levels often vary hugely from one street to the next. Finding a clean air moment to take your kids outside, or getting recommendations about the best urban spaces to go to escape pollution, can also make a huge difference.

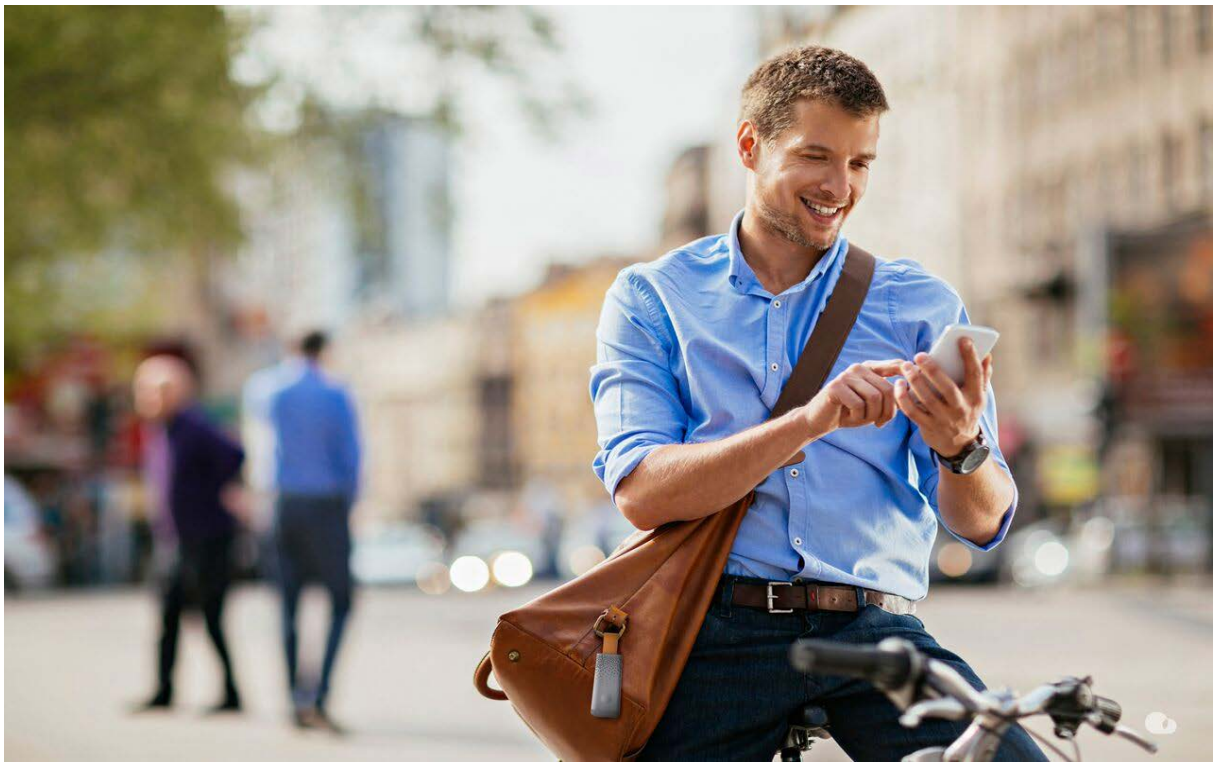
Indoor pollution can be surprisingly strong and leave users unknowingly exposed (sometimes 8 to 10 times more than outside). Flow can warn you about products you use or inform you about the best moments to ventilate. Forming better habits to reduce one's exposure can be surprisingly effective and go a long way to improving health and well-being.

Key achievements

Flow was awarded two major accolades during CES 2017 Las Vegas, the status of CES 2017 Innovation Awards Honoree (in the Tech For A Better World category), and as an Engadget Best Of CES 2017 Finalist for best Digital Health and Fitness Product. Flow also received considerable

press coverage during the event, making it onto several “Top 5” lists of the best gadgets reviewed at the show[40].

Plume Labs’ wider world with the application and global data platform also received commendations, including a Cannes Lion Award, and a Sustainia 100 award.



Lessons learned during and after the ODINE incubation programme and advice for other open data startups

According to Plume Labs, “ODINE is a fantastic community of Open Data innovators and advocates that have helped us tremendously at the beginning of our company’s journey”. The financial support from the programme was crucial in order to help Plume Labs demonstrate their technology, prove its market, and establish the first steps of its open data and machine learning enabled platform for live and forecast air quality data.
Being backed by the Open Data Institute and the European Union’s Horizon 2020 programme was also very important for Plume Labs in terms of communicating the quality and importance of their work to governments and environmental agencies, as well as with to its scientific partners, in Europe and around the world.
With regard to open data, Plume Labs view is that “Open Data is a strong and established movement that’s here to stay. But there is still a long road for it to be fully accepted as the norm by governments and public officials, and responses to innovators trying to build on top of public sector data are still contrasted around the world”.

[40] http://venturebeat.com/2017/01/23/5-super-smart-gadgets-that-debuted-at-ces-2017

Thus Plume Labs has chosen to start building its global air quality platform on top of open data from public sector environmental monitoring networks, but its long term vision is to crowdsource air quality levels thanks to personal air quality trackers worn by our users. Not only will the sensors help individuals understand their personal exposure much better: they will also help map air pollution variations across urban areas — and, in turn, release more open data for researchers and activists leading the fight against air pollution!

Future plans beyond the ODINE incubation period

In six months, Plume Labs will have launched their pre-order campaign, crowdfunding early support for the mass production of our smart, mobile air quality trackers. Having created a community of early adopters across the world, this company will be making the move into full industrialisation, aiming to bring Flow to market towards the end of 2017. Major releases are also planned for its Air Report application and Plume API products.

6.3 Green City Solutions (CityTree), Cohort 3

Brief company description

Green City Solutions addresses the global problem of air pollution by combining a special, vertical installed moss culture with Internet-of-Things (IoT) technology. The product, called “CityTree”, combines specific plants that eat particulate matter (PM), nitrogen dioxide and ozone – offsetting 240 tons of CO_2 equivalents per year in total. The plant filter has the same effect as up to 275 urban trees, but requires 99% less space. The construction contains sensors collecting environmental and climatic data, to regulate and control the unit and ensure that the plants survive. Thanks to solar panels and rain water retention systems, the unit requires only a few hours of maintenance per year. By using technologies like WiFi, iBeacon, NFC and digital screens, CityTrees can also transmit digital and visual information.

Company related facts and figures

Even though traditional air purifying filters are used indoor, where the amount of air to be cleaned is limited, they still require constant connection to a power supply and frequent change of filters, which then need to be disposed. Thanks to moss cultures growing by using pollutants as nutrients, the CityTree cleans vast amounts of outdoor air pollution with no need of changing a filter whereas the self-sufficiency of the unit guarantees maintenance reduced to a minimum. Currently, Green City Solutions does not have a direct competitor on the market. However, its indirect competitors are green rooftops or façade greening on buildings which either clean air very little due to extensive greening, weight limitations and its location above street level (90% of air pollution is located in a street canyon), or are usually not applicable in city centre hot spot areas due to the city's ownership structure.

Since the beginning of the Green City Solutions venture, this solution has been implemented in several European cities with current installations in Oslo (Norway), Paris (France), Hannover, Dresden, Berlin (in Germany) and Hong Kong. This product was also able to be temporarily deployed for a number of conferences, fairs and campaigns in Munich, Berlin, Hannover, Halle, Dresden, Regensburg, Krefeld and Jena through its mobile and freestanding design. Green City Solutions' customers are companies looking for a sustainable solution for advertising, campaigns and mobile commerce, and cities for air pollution control. In this context, Green City Solutions generated a steady revenue stream through a service fee executed by a local subcontractor. Apart from the four founders, the team of Green City Solutions consists of 16 more clean air advocates, spanning

various fields including hardware-, software- and business development. In January the company announced the successful closing of its first financing round.

The problem addressed

Air pollution is the world's largest single environmental health risk and the cause of every seventh death worldwide. Today, in total over 94% of people living in the cities in Europe and up to 3 billion people worldwide are exposed to air pollution, which exceeds quality guidelines[41]. The number of people moving into cities will increase by 20% before 2025 due to fast urbanisation and population growth. (Air Pollution is responsible for over 6 million deaths and in Europe alone this causes over 1.6 trillion USD in annual economic damages.)

The solution provided

The CityTree is a 4 meter high 3m wide and 60 cm deep, freestanding unit, which contains specific moss cultures that eats particulate matter (PM), nitrogen dioxide and ozone – together offsetting 240 tons CO_2 equivalents per year. The construction contains smart sensors collecting environmental as well as climatic data, to regulate and control the unit and ensure that moss culture survives. Thus, the CityTree has the same effect as up to 275 normal urban trees, but requires 99% less space and 90% less investment. Every CityTree has a capacity to clean the air in proximity of up to 50m. Thanks to solar panels and a rain water retention system, the unit requires only a few hours of maintenance per year. Furthermore, CityTrees allow digital and visual information transmission through e.g. Wi-Fi, iBeacon or other mobile commerce technologies for the purpose of sponsored messages and advertising while integrated screens make them “green gateways” to the Smart Infrastructures of the cities.

Key achievements

Green City Solutions considers the following three achievements key for its future business development; the installation of CityTrees, the closing of its first financial round[42] and the urban pilot testing in Modena[43].

Lessons learned during and after the ODINE incubation programme and advice for other open data startups

Green City Solutions’ revenue and profit model consists of two pillars driven by air purification and digital value. On the latter, participation in ODINE, opened up new business models and revenue streams for Green City Solutions that could not have been accessed before. Furthermore, the development of the online platform put the company on the “Open Data Map”, resulting in new opportunities. Thanks to the ODINE program, this company gained more visibility. Moreover it

[41] http://www.who.int/mediacentre/factsheets/fs313/en/
[42] http://greencitysolutions.de/presse/2017/02/03/green-city-solutions-lands-seven-figure-first-round-financing/
[43] http://greencitysolutions.de/presse/2017/02/13/german-start-up-green-city-solutions-is-bringing-clean-and-cool-air-to-italy/

participated in an event organized in Eindhoven and expanded its network to other companies; a networking that will now be followed by a collaboration for a bid for a much larger H2020 project related to open data. Participation in ODINE was one of the main reasons for which Green City Solutions was invited to participate in the consortium.

When working with ODINE, it took Green City Solutions approximately a month from the official start of the project to hire developers and divide respective duties among team members, resulting in time taken away from the project execution. Therefore, Green City Solutions would suggest giving more time for the startups to prepare for the start of the project. According to Green City Solutions, after the funding is confirmed, there needs to be an initiation phase during which startups are allowed to look for additional appropriate developers to join their team. The core team always needs to be established but in order to maximize the outcome, applicants should be granted a preparation phase for the recruiting process from the point where the certainty of funding is given. Additionally, in order to set up a milestone plan, to achieve specific goals with the funding provided by ODINE, one needs to be able to understand what the other team members are capable of doing and how they can depend on each other. To overcome this, Green City Solutions would suggest setting stricter guidelines in the application process and consider teams, which already have track records of working together.
Green City Solutions would suggest that startups looking to work with open data have a clear and precise business case based on potential customer feedback. They need to, in detail, consider what kind of open data they need, research the sources and consider how they can use it to enhance their business. With the standardization of open data still on the way, the amount of time and effort needed to get traction is still based on the core value of a startup. From the Green City Solutions' point of view, open data can definitely leverage existing business models and open up new ones based on the original proposal, while keeping in mind that traction in terms of users or paying customers still comes first.

Future plans beyond the ODINE incubation period

In 6 months' time Green City Solutions is going to be in Modena working with its Climate KIC partners, Proambiente and the City of Modena on the urban pilot project of the CityTrees with regard to the effectiveness with which all data collected from this pilot research project is going to be published as open data.

6.4 Viomedo (Cohort 4)

Brief company description

Viomedo accelerates new treatments by matching patients with clinical trials. The startup has used ODINE funding to build out the patient-trial matching technology. More specifically, Viomedo develops an online platform that offers patients simple access to matching clinical trials. By connecting patients in need with clinical trial opportunities, Viomedo accelerates the process of developing new therapies. Consequently, new cures can reach all patients faster.

Company related facts and figures

Viomedo considers the following milestones to be of critical importance for its future business development:

- 6 digit revenues in H2 2016
- 12 employees
- Clients include three top 10 pharmaceutical companies amongst others

The problem addressed

Medical researchers face large and mounting difficulties in terms of recruiting patients into their clinical trials. This is why it takes ever more time and money to bring innovative therapies to market. Overall, about 40% of trials fail to achieve minimum patient enrollment. In phase 3 trials, the ratio is even worse with three out of five. Ultimately, 85% of all trials are delayed with each day costing up to $8m (€7.1m). One of the largest challenges in clinical development is finding the right patients to take part in clinical trials. Hence more and more trials are moving patient recruitment outside of Europe to countries such as Russia and China. This leaves many EU patients without early access to clinical innovations within trials and many doctors without early experience with novel therapies. Without European innovation this problem will only grow as trial sizes increase and therapies become more targeted.

The solution provided

Even today many patients cannot effectively be treated with the standard of care. Most patients don’t want to wait many years until new therapies become available. They want to take action. They want to contribute to the medical progress. Viomedo connects patients with medical research in order to help improve existing therapies and find cures. In this regard, Viomedo constitutes the leading platform for medical research in the German speaking region. Together with researchers, patient support groups, research hospitals and pharmaceutical companies we want to transform medical research all over Europe. Viomedo - tomorrow’s medicine, today.

Key achievements

Viomedo achieved the following milestones:

- was used by more than 100.000 patients, doctors and caretakers in Q4 2016 alone
- was awarded the Health-i Award from one of the largest insurers in 2016
- the media coverage it received included large outlets such as Handelsblatt, Apotheken Umschau or Tagesspiegel among many others

Lessons learned during and after the ODINE incubation programme and advice for other open data startups

The ODINE incubation programme proved to be of great significance for Viomedo, since the received funding literally kept Viomedo alive in an otherwise really difficult time. Moreover the constant reporting, required from the ODINE side, provided focus to Viomedo in terms of developing its business model and strategic capabilities. Furthermore, winning an EU funded grant provided third parties such as users, employees, investors and clients with confidence as well with unique business development opportunities such as productive exchanges with other open data companies and coverage in the Guardian. On the other side, Viomedo would have gladly received additional support in terms of making health data more accessible and connecting to investors or potential clients.
When it comes to advising other startups that are active in the open data domain, Viomedo would advise to only make use of that is already available and to work towards ensuring that more data will become available.

Future plans beyond the ODINE incubation period

Viomedo future is currently focussing on the implementation of its internationalisation strategy together with existing clients and the deeper integration into the value chain. According to the company's estimates, in 6 months time the following goals are expected to be implemented:

- Viomedo will have doubled its headcount,
- Viomedo will be series A investment ready,
- Viomedo will have completed its leadership team.

6.5 OpenSensors (Cohort 5)

Brief company description

OpenSensors are a startup providing a real time data exchange for the Internet of Things. OpenSensors primarily help clients looking to use sensors and connected devices to improve the use and experience of commercial buildings. They support these clients from exploration of potential to deployment and data analysis. By actively partnering with reliable hardware manufacturers they enable clients to chose the most appropriate IoT technologies to tackle tangible problems.
OpenSensors has also built a strong open data community of early-adopters, most of whom run environmental sensing projects. Open data is at the heart of the platform which hosts open data

projects for environmental data whilst in building and asset data is private to the individual businesses. This strong community is also playing a part in enabling OpenSensor's clients to develop their ideas and projects quickly.
OpenSensors joined the ODINE programme in May 2016 as part of Cohort 5, and graduated in October 2016. They can be found on Twitter, Facebook and LinkedIn.

Company related facts and figures

- OpenSensors's support for open data is at the heart of their platform and business model – differentiating them from other IoT suppliers.
- The OpenSensors platform has over 10,000 open data users, supporting around 25 million messages each day.
- OpenSensors's built environment clients include a range of high-profile Commercial Real Estate firms like Arup, Cushman Wakefield and Zaha Hadid Architects.

The problem addressed

The Internet of Things (IoT) – the concept of connecting a whole range of devices to the internet – is not particularly new. However it has, in recent years, been heralded as the next stage of the networked world. By connecting billions of sensors and other devices to the internet, proponents hope to bring the digital and physical realms closer together. Estimates of the value of doing this stretch into the hundreds of £billions. Gartner currently estimates there are 6.4bn devices, which are not smartphones, tablets or personal computers, connected to the internet in 2016, heading up to 20.8bn by the end of the decade.
However, these types of estimates have been slowly scaled back by those who made them. Even the fiercest advocates of the IoT would likely admit it is going through an inevitable hype cycle. More recently, concerns have been made about the security of these devices as they are exploited malicious online actors. Perhaps one of the biggest challenges to the IoT is the scepticism brought about by a whole host of internet-enabled consumer electronics. In some, if not most of these cases, it can be difficult to understand the problems that are being solved.
However, there are many problems for which increased use of sensors and other IoT devices could be a large part of the solution. Since its creation, OpenSensors has supported a large number of companies, community groups and private citizens to tackle a whole range of tangible problems, for instance monitoring air quality levels in various cities. They recognise that not all problems faced by users can be handled by a single platform. For instance, the technical standards and schemas need to be specific to the needs of the wearable space are very different from the environmental space, it is clear that as the Internet of Things matures segments will fragment around specific verticals. Indeed, Yodit Stanton, CEO and founder of OpenSensors, believes the term IoT will become meaningless within a few years because enterprise and consumer applications have such significantly different needs.

Environmental sensing and building management

Instead of trying to provide for all the possible problems faced by users, OpenSensors since joining the ODINE, have focused on tackling a specific set of problems. They have done this by focusing

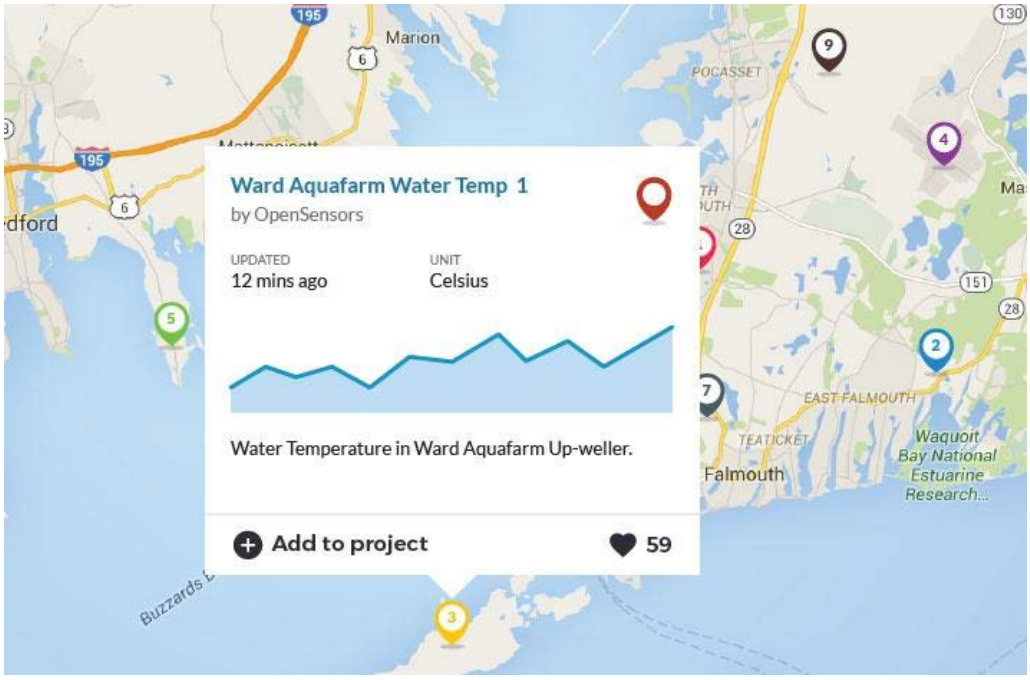
on the most popular problems being tackled by current users of the platform. This has lead them to focus primarily on environmental sensing and building management. The environmental sensing projects tend to come from community initiatives to improve the availability of environmental data, such as air quality and river level data. This data is often published as open data and is used to help communities lobby and take action on environmental issues which are important to them, such as local flood risk and defenses.

The other side they have chosen to focus on is building management. While ‘smart cities’ narratives might dominate the technology press, Yodit believes that the smart cities evolution is actually happening a lot slower than other verticals within IoT. Existing challenges in areas like management commercial real-estate like offices and public buildings, are often overlooked in proposed solutions. There is however increasingly high demand and potential for ‘data-driven buildings’ and ‘data-driven building management’ to solve these existing issues. OpenSensors are seeking to help architects and office managers use sensors and other internet enabled devices to improve the sustainability and usability of the buildings they are responsible for.

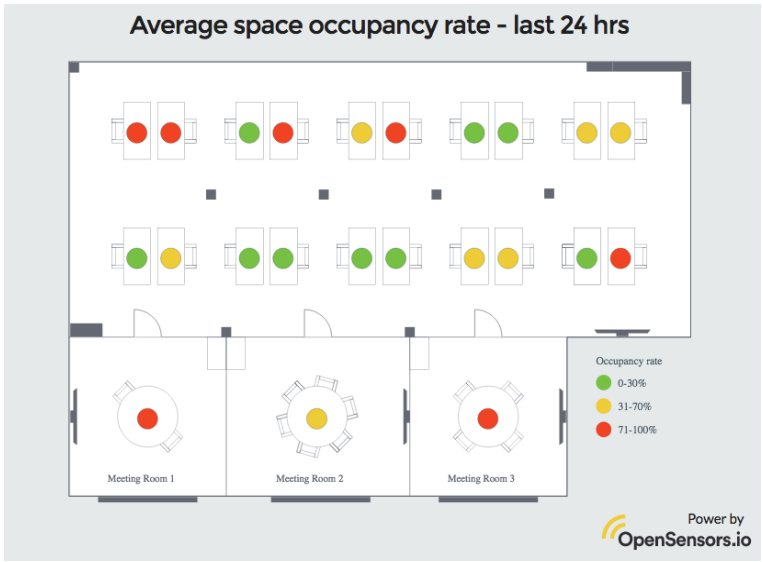
The solution provided

OpenSensors’s key focus is to enable their clients to get ‘early wins’ and value from their IoT data. There are many opportunities to do this in the context of building management. Firstly, real time information and alerts give maintenance staff the ability to identify anomalies and react promptly to problems with assets. Secondly, analysis of historical trends enables managers to understand daily/weekly/monthly performance patterns, using peaks, troughs and averages. In turn, that helps them make better strategic decisions on how to manage capacity and improve operational efficiency. Finally, with enough historical data, you can predict future capacity and schedule planned maintenance of your assets. For example, knowing the patterns that leads to failures enables you to identify problems early on and have a plan to handle it.

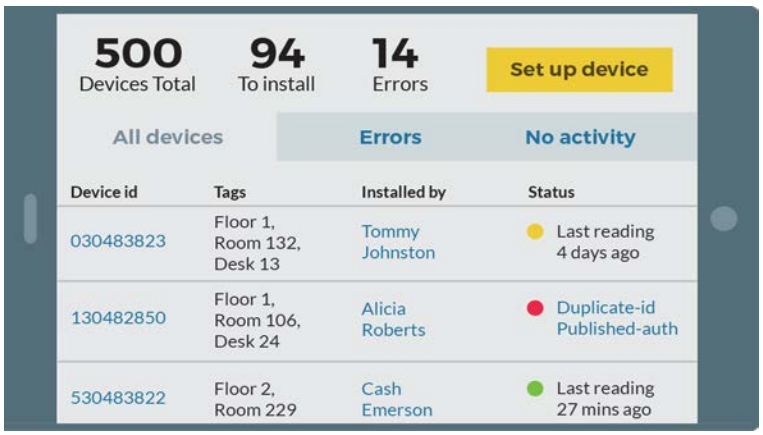
However, the hardest problem in IoT is enabling people to easily interpret what is going on with their assets and identify operational inefficiencies, even with this data to hand. To tackle this, OpenSensors generate visualisations which enable building managers to quickly and intuitively access this information without requiring a technical background. They provide these visualisations to clients through a range of dashboards, maps and alert systems. These include a map of assets, a project/timeline visualisation dashboard to manage deployments and an network utilization status dashboards to monitor the current state of the network.



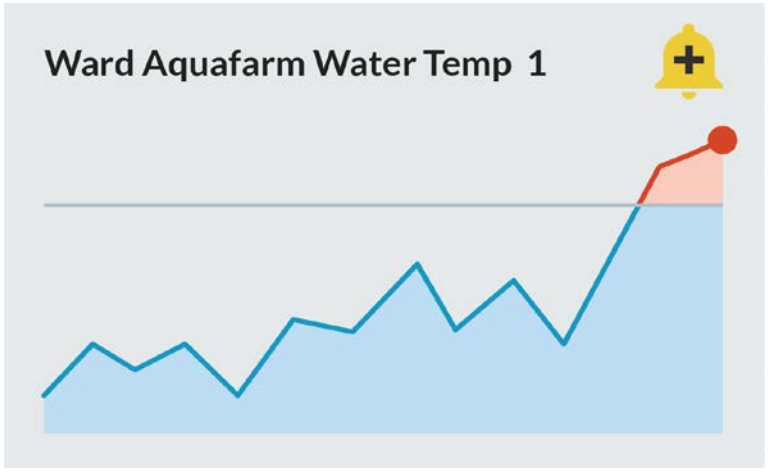
Map of assets which shows relevant information from individual assets.



Heat map of office occupancy overlaid on an office plan.



Operational dashboard which monitors the health of sensor networks.



Trend line visualisation with notifications for when data exceeds normal thresholds.

Full service provision

While the self-service model originally worked for the early adopters who were primarily “open data people”, more mainstream consumers “don’t want to calibrate sensors...or something that is ‘hacky’” according to Yodit. Potential clients come to OpenSensors and want to know how they can best create a data-driven built environment including what sensors they should use. This has led OpenSensors to develop a more holistic service, beginning with a discovery workshop with clients in the built environment to help them best understand their needs and potential solutions.

When it comes to the provision of sensors, OpenSensors are in a unique position. A whole range of their early community users have begun to commercialise their IoT hardware solutions. This is allowing them to create a means by which the infrastructure for IoT and development of the open data side can be funded. Given that these devices often run using the OpenSensors platform, OpenSensors are in a unique position to judge their effectiveness and collaborate with them. As such, OpenSensors partner with the hardware manufacturers and provide a ‘list of trusted sensors’, which they know can and have been used effectively, to their clients. The clients then buy directly from the suppliers.

OpenSensors and their hardware collaborators then enable clients to deploy their sensor networks, with OpenSensors providing a ‘hands on’ onboarding process to the platform. They have also developed the IoT University programme, which provides a range of educational materials relating to IoT projects.

Key achievements

In 2016, OpenSensors have seen a dramatic increase in the number of users on their platform with over 10,000 open data users worldwide. This makes them the largest open data IoT community in the world and has resulted in them processing around 25 million events or messages each day. These users are engaged in a wide range of different projects mainly around environmental sensing. OpenSensors themselves worked with the ODI on a project to enable local residents measure the impact of Heathrow on air quality, which garnered mainstream media attention and was discussed in the UK parliamentary Environmental Audit Committee.

When it comes to the data-driven buildings they have been working with building managers as well several major built environment enterprises including Arup. They are working with Cushman Wakefield, one of the largest real estate advisory services in the world, to create an IoT lab in Cushman Wakefield’s offices.

Amongst these Zaha Hadid Architects (ZHA) are one of their clients, as part of ZHA’s pursuit of ‘data-driven design’. They are aiming to use data to understand how workspaces are actually used. This understanding will help inform the design process to improve the experience of the people that work in theses buildings and improve the efficient use of space and resources. According to Yodit, they are going after this “in a pretty massive way” – embracing lots of different types of sensors in lots of different contexts. They are also exploring using lots of existing, primarily open, environmental datasets to assess the impact on and of their buildings.

They have already had over 2,000 signups to their IoT University programme. To cope with the increasing levels of demand the team has almost doubled in size, from 5 to 9, over the duration of the ODINE programme.

Lessons learned during and after the ODINE incubation programme and advice for other open data startups

OpenSensors have managed to build a thriving startup which also supports the publishing of open data. Their focus on particular domains within IoT has certainly enabled them to be more focused and effective. Some of this focus has come from their inclusion in the ODINE programme according to Yodit. Setting specific objectives, sharing them externally and being held accountable through regular reporting has definitely helped them to maintain this focus.

In addition, their decision to focus on client demand and to target specific clients has enabled them to develop a more holistic sales and marketing strategy. They have benefitted from access to mentors in through the ODINE programme who have complementary skills to their own. Yodit explains that the existing OpenSensors team had very strong technical skills but it was very useful to have mentors as 'sounding boards' for ideas on sales and marketing. They have also benefitted from effectively collaborating with the community that they have built around the platform. By building a strong open data community and offering they have gone on to benefit from somewhat obscured network effects.

Future plans beyond the ODINE incubation period

OpenSensors have done much of the groundwork and are now looking to scale. They are confident in their assumptions and the enthusiasm of the people who are approaching them. Their goal is to move in and test out existing ideas in new markets, at first focusing on the US and Europe. They are doing this by taking the model that they know works and finding partners in those markets who are like the ones they already have. As Yodit puts it," the next 12 months are about saying 'this worked in these markets so maybe they will work in other markets, other cities'". She acknowledges that this will present its own challenges but is confident in the steady and methodical approach they are taking.

6.6 Environment Systems (Cohort 7)

Angle: Transforming business model from consultancy to SaaS

Brief company description

Environment Systems is an environmental and agricultural data consultancy. Moreover this

company is a trusted provider of evidence and insights to governments and industry across the world.

Company related facts and figures

Always-on, near real-time accessible data insights from satellite Earth observations can help us better manage our environment, and support sustainable agriculture. Environment Systems is an established consultancy company and is now in the position of growing its data services offering. Feedback from existing and new customers is already very strong - so the company's expectations in terms of business development are high.

The problem addressed

We face growing challenges of sustainable environmental management and food security.
To help with this timely, high quality information is required in order to help us make the best decisions in terms of policy, commerce and land management. Satellite data has played a role in this for the last 40 years but access to data has often been sporadic, technically difficult and expensive. The availability of Sentinel and other high availability satellite sources (e.g. Planet) is solving the problem of sporadic coverage. Environment Systems aims at solving the rest of the problems.

The solution provided

Environment Systems offers easy access to free and open data products for download directly to a user's desktop. The data are regularly updated, thanks to the weekly availability of satellite imagery which offers data in near real-time. This information is invaluable in many practical environmental and agricultural monitoring applications. As well as free and open imagery, Environment systems will be providing, in the near future, a number of 'Premium' service options that build on its expertise to deliver not only imagery but value added data products, change and feature analysis.

Key achievements

All KPIs set by Environment systems before its incubation at ODINE have been met, or exceeded. Before receiving the ODINE funding, Environment Systems only offered consultancy services. Afterwards, Environment systems offers easy access to free and open data products for download straight to your desktop. Across both these offerings Environment systems continues to be trusted providers of evidence and insight to governments and industry across the world. In other words, these two service offerings are complementary.

Lessons learned during and after the ODINE incubation programme and advice for other open data startups

ODINE gave Environment Systems the opportunity to undertake internal development. This has enabled the company to move into data services. This builds upon our own in-house technology and processing chains for automated cloud-based processing of satellite imagery.
The proliferation of open data, including Earth observation imagery from new and existing satellite constellations, is opening up exciting new opportunities in environmental and agricultural applications. To maximise the use of open data choosing the right licence is key. Based on our experience using a Creative Commons licence is a good basis for open data.

Future plans beyond the ODINE incubation period

Environment Systems will soon be releasing a 'Premium' offering of its Surface Texture product. Moreover it has other products in the pipeline too (including data services based upon the Sentinel 2 satellite), and it will be promoting both free and premium offerings.

In the next 6 months, Environment Systems plans to extend its Data Services offering beyond the confines of the UK to parts of South America and Africa. It aims to become market leader in the provision of free and open data services that provide always-on, near real-time accessible data insights from satellite Earth observations. Furthermore the company intends to drive growth into its consultancy work that delivers bespoke advice and solutions for land management, monitoring and policy. Environment Systems will offer easy access to free and open data products for use within its customer's own information workflows, with the objective to enable organisations to better manage and protect our environment and to sustainably grow food for our planet.

6.7 Sinergise / SENTINEL Hub (Cohort 8)

Angle: The impact a company can have in making open data actually usable, in their case Copernicus' spatial data

Brief Company description

Sinergise[44] is a Slovenian software company focused on the development of large-scale GIS solutions in the field of land administration and agriculture support, including cloud based GIS - Geopedia. It is headquartered in Ljubljana, working with clients from all over the world - from nearby countries such as Croatia, Serbia, Macedonia and Montenegro to France, the United Kingdom, Azerbaijan, Moldova, Ghana, Nigeria, Tanzania and Mauritius. Its solutions are used by more than 2 million people annually and help governments manage assets worth many trillions of EUR.

One of its advanced geospatial applications is Sentinel Hub[45], where Sinergise tries to put Copernicus open satellite data in use, making them easily accessible to end-users and application developers around the world. The Sentinel Hub provides unprecedented access to earth observation data, focused on Sentinel satellites but also supporting other sources such as Landsat, Planet and others. It uses Amazon Web Services cloud and innovative methods to efficiently process and distribute data in a matter of seconds. It can be integrated into any mapping application for web application allowing for any easy-to-use and cost-effective way to exploit the

[44] http://www.sinergise.com/
[45] http://www.sentinel-hub.com/

data. It removes the major hassle of downloading, archiving and processing petabytes of data and simply makes the full and global archive easily available immediately via web services. Application developers can focus on added value services and end-user applications rather than having to deal with the complexity of remote sensing data. Sentinel Hub will increase the uptake of the Copernicus programme[46].

Company related facts and figures

Sentinel Hub provides access to quadrillion of bits of information coming from Copernicus, USGS and other satellites in a matter of seconds either in its web-applications or over OGC standard web-services, within users' own GIS environment.

Sentinel Hub started as a research project within Sinergise end of 2015. Mid 2016, when Sinergise joined ODINE, there was an operational prototype in place, which already attracted first users, but lacked overall public affirmation. In the following six months Sinergise gathered more than 80.000 EUR of direct service revenues, over 300.000 EUR of customized projects and 1.2 MIO EUR of grants. In recent weeks Sentinel Hub was processing more than 2 million of requests done by several thousands of users. The company considers the launch of EO Browser on of its greatest achievements[47], which in the first week provided more than 30 years of Sentinel and Landsat satellite images to over 12.000 users, processing more than 1.1. million of requests[48] along the way.

The problem addressed

There are several terabytes of free and open earth observation data being generated every day, remaining mostly unused due to complexity and sheer volume.

The solution provided

Sentinel Hub provides OGC standard web services, which give seamless access to all these data to anyone in a matter of seconds.

Key achievements

Sentinel Hub won the 2016 Copernicus Masters Competition[49]. More precisely, Sinergise came out on top in the competition's T-Systems Open Telekom Cloud Challenge and went on to edge out the winners of six other categories for the grand prize[50].

Copernicus open data provide a tremendous opportunity for the humanity to finally observe what is happening with its planet, the Earth, almost in real-time, both on global scale - climate changes -

[46] Further information on the Copernicus programme is available at: www.esa.int/copernicus, www.copernicus.eu, http://www.esa.int/Our_Activities/Observing_the_Earth/Copernicus
[47] https://twitter.com/sinergise/status/845159406694125568
[48] http://www.sentinel-hub.com/blog/eo-browser-goes-public
[49] http://www.sentinel-hub.com/blog/slovenian-company-sinergise-wins-2016-copernicus-masters-competition
[50] http://www.sentinel-hub.com/blog/esa-director-general-johann-dietrich-worner-visits-sinergise

as well as locally - nearby environment being destroyed by mine fields, forest clear cuts or other types of exploitation. These data give the power to people all around the world, which were so far seeing such possibilities only in action movies. But only if someone actually uses these data. Sentinel Hub is making this a reality.

Lessons learned during and after the ODINE incubation programme and advice for other open data startups

ODINE provided first external affirmation of Sentinel Hub's mission goals. The funds made it possible to focus to a wider picture. More active engagement of ODINE's mentors and coaches might help to spread the word even faster and wider.

Sinergise advises entrepreneurs in the domain of open data to find an answer to the question: "so you are selling free data?" as this will be often heard. Moreover the added value should be presented attractively enough in order to lead to funding opportunities.

Future plans beyond the ODINE incubation period

Sinergise is working hard to tap into even more unused open data and to make services better for application developers, making it possible for them to build end users' solutions for precision agriculture, environmental monitoring, oil and gas, defense and numerous other fields.

In 6 months' time Sentinel Hub will be powering web applications[51] around the world, addressing the needs of hundreds of thousands of users.

6.8 Derilinx / DataSparks (Cohort 8)

Angle: How open data can help create a product that helps consumers reduce energy consumptions and governments meet environmental targets

[51] http://sentinel-hub.com/about/press

Brief Company description

Derilinx spun-out from the Insight Centre for Data Analytics NUI Galway in 2014. Derilinx has a proven track record of successful projects carried over the years in conjunction with central government agencies and local authorities such as the launch and management of the Irish Government's National Open Data Portal[52]. DataSparks is a solution developed by Derilinx as part of a Small Business Innovation Reasearch (SBIR) Initiative, supported by the Sustainable Energy Authority of Ireland (SEAI) and Enterprise Ireland.

Company related facts and figures

The interactive design and the high level of customisations ensures the BER Hero plug-in can easily be integrated and used in any corporate or eCommerce website.
Based on reliable and up to date information, our BER estimation and comparison, becomes an influential leverage tool in home owners' decision process.

- USP for Property Management Agencies

Include BER information in property sale and rental advertisements helps landlords to enhance the value of their assets.

- USP for Contractors & Tradesmen Portals

Encourage eCommerce and motivates homeowners to proceed with retrofits by showing them their potential energy-efficiency improvements and savings derived from those upgrades.

- USP for BER Assessors

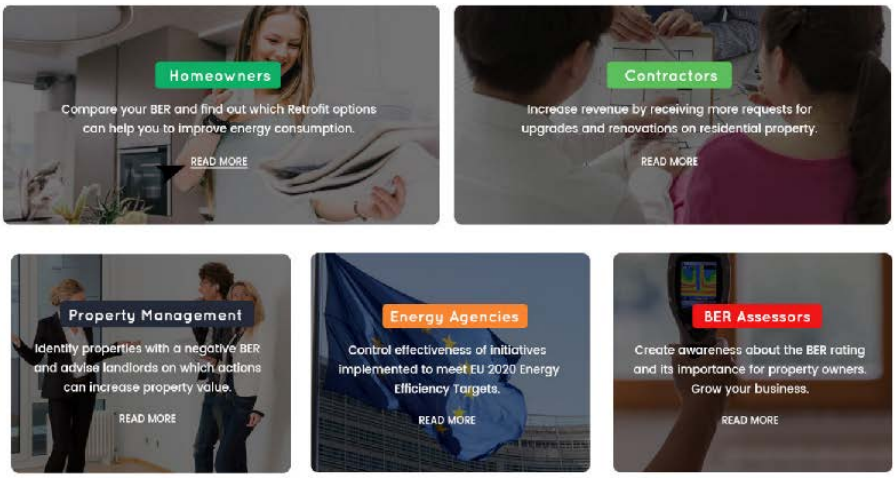
Target new customers with personalised and data-driven recommendations for upgrades.

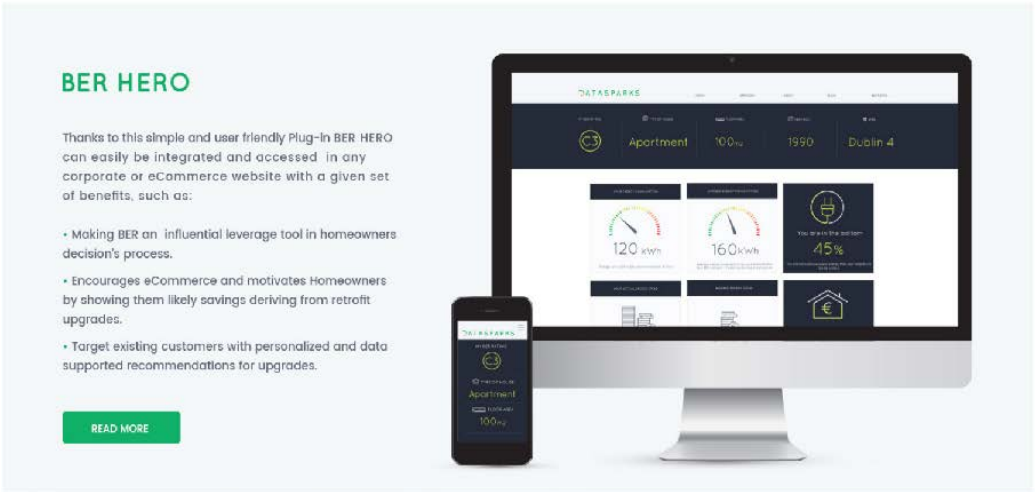
- USP for Energy Agencies

Track and monitor results related to sustainable energy implementation to meet EU and National 2020 energy targets.
The initial approach around the design of BER Hero was directed to create awareness and provide valuable information and insights to homeowners in relation to energy efficiency questions in general and the BER score in particular.
We soon discovered there were more ways to exploit BER Hero amongst other energy stakeholders such as:

- Homeowners
- Contractors/Tradesmen Portals
- Property Management Agencies
- Energy Agencies
- BER Assessors

[52] https://data.gov.ie





Target Clients and Revenue Model

Target Customer	Need	DataSparks Services	Revenue Model
Homeowners	Want to understand how to reduce energy costs & improve comfort.	1) BER HERO Homeowners 2)Advertising Options	1)Free access to User. 2) Revenue from direct advertisement of interested companies in the recommendation section.
Property Management Agencies	Want to help Landlords to increase property value.	1) Customized Version of BER HERO Plug-in 2)Customised insights visualization on their web. 3)Customised recommendations section for their Users	1) Monthly Licence Fee for BER HERO OR Commission Scheme 2)Fee-For-Service 2)Fee-For-Service

Contractors/ Tradesmen Portals	Encourages ecommerce and motivates customers by showing them likely savings of Upgrades	1) Customized Version of BER HERO Plug-in 2)Customised recommendations section for their Users	1) Monthly Licence Fee for BER HERO OR Commission Scheme 2)Fee-For-Service
BER Assessors	Create awareness about BER Certification and increase revenue.	1)BER HERO plug-in 2)Customized BER HERO recommendations section for their Users	1) Monthly Licence Fee for BER HERO OR Commission Scheme 2) Fee-for-Service
Energy Agencies	Want to meet EU targets	1)BER HERO plug-in 2)Customized BER HERO functionalities, 3)implement Reporting System in their Portal	1) Monthly Licence Fee for BER HERO OR Commission Scheme 2) Fee-for-Service 3) Fee-for-Service

Derilinx has hired its Head of Business Development, Software Developer & Data Analyst and plans to hire its Online Marketing Acquisition Specialist.

The problem addressed

Following the implementation of the European Union Energy Performance of Buildings Regulation 2012 in Ireland, BER assessment and correspondent certification began a mandatory information to be disclosed for properties' rental and sale advertisements. The SEAI has been implementing a wide range of informative campaign and actions to create awareness around this specific topic and stimulate participation by the general public around the energy efficiency question.

The solution provided

Our WebApp BER Hero helps people understand their energy usage, how it compares to their peers and how their energy efficiency can be improved through retrofits in order to reduce energy consumption, improve home comfort and increase property value.
Derilinx conducted the following value proposition for each stakeholder category:

- Homeowners: Compare BER and find out about which retrofits options can help them to achieve warmer and comfortable homes, while keeping energy costs down.
- Property Management Agencies: Identify properties with a negative BER and advise landlords on which actions can increase the property value.
- Contractors, Tradesmen Portals: Increase revenue by receiving more requests for

upgrades and renovations on residential properties
- Energy Agencies: Control results and effectiveness of initiatives implemented to meet EU2020 targets.
- BER Assessors: Create more awareness about the BER certification and its importance for property owners. Stimulating the environment and grow the business.

Derelinx's feedback based on their experience about how open data can help create a product that helps consumers reduce energy consumptions and govs meet environmental targets.
Energy efficiency and alternative sustainable energy sources are topics of major concerns for Ireland at the moment. National government is working towards the 2020 targets as planned, and is also committed to completing a further energy policy update as defined in the White Paper "Ireland's Transition to a Low Carbon Energy Future 2015-2030[53]".
Minister Denis Naughten affirms in a recent Interview to EOLAS, that the only possible way to achieve the necessary transition to a low-carbon energy future would be through the participation and engagements of people and communities around the country.
DataSparks directly addresses this challenge by creating more awareness and participation within homeowners providing them with energy insights. We identified an opportunity to create and deliver a service based on Open Data that would help stakeholders of the energy industry striving towards more efficient energy consumption.

BER Hero provides users with a BER rating comparison based on energy industry official data and a list of customised recommendations on how they could improve the energy-efficiency of their property in a cost-effective and convenient manner, ultimately reducing energy wastage, improving comfort and increasing the value of their property.

Derilinx connected with manufacturers, service providers, energy suppliers, waste reduction technicians, energy agencies and other knowledge leaders for pulling together and interpreting different data sources and data sets:
- Carbon emissions, energy production, energy imports and fuel poverty;
- Building Energy Ratings, energy efficiency, households and heating;
- Property prices, energy consumption, fuel types and fuel prices;
- Energy grants and energy credits.

Data collected was then integrated and enriched around the outcomes we wanted to obtain in relation to a specific energy consumption parameter: The Building Energy Rating (BER).
Derilinx developed algorithms that would provide BER estimation, market comparative analysis between peers and other valuable information for Homeowners.

Future plans beyond the ODINE incubation period

Derilinx has developed a strategy for each one of the following stakeholder categories:
- Homeowners
    1. Promote DataSparks Portal and Ber Hero within homeowners starting from SEO

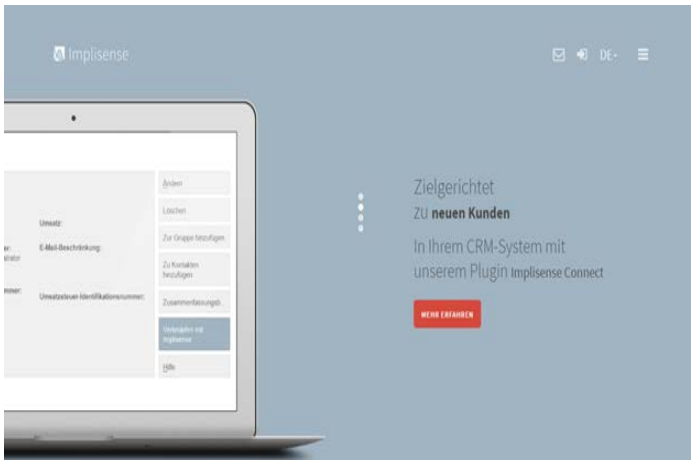
[53] http://www.dccae.gov.ie/documents/Energy%20White%20Paper%20-%20Dec%202015.pdf

activities, BlogContent, Social Media advertising
2. Create revenue from advertising in the recommendation section

- Property Management agencies
  1. Keep working with collaborators on alternative display's functionalities for BERHERO. The Goal is to close the Deal.
     Support sales pipeline through:
  2. Lead generation (Online)
  3. Email Marketing
  4. Direct sale by contacting Company's owners/representatives
- Contractors/Tradesmen Portals
  Support sales pipeline through:
  1. Lead generation (Online, SEAI database, Energy Expo)
  2. Email Marketing
  3. Direct sale by contacting Company's owners/representatives
- Energy Agencies
  Support Marketing and sales pipeline through:
  1. Lead generation
  2. Get in touch with organization's representative and organize face to face meetings where to present BER HERO alongside our Bespoke Services for Energy Agencies.
- BER Assessors
  Support sales pipeline through:
  1. Lead generation (Online and SEAI Database)
  2. Email Marketing
  3. Direct sale by contacting Assessors

The Derilinx vision for DataSparks is that home energy upgrade information based on BERs is readily available and actionable for every homeowner and property buyer/seller/renter. Our aim is to grow DataSparks into a scalable, investor-ready product. Initially, we envision DataSparks will be rolled out across Ireland, following which, DataSparks will be available in all EU and other countries where energy efficiency ratings are used.

6.9 Implisense (Cohort 5)



Brief company description

Founded by applied researchers and business developers from the Fraunhofer IAIS in 2013 Implisense[54] is now a Berlin based startup with 12 employees. Implisense provides Big Data Analytics for B2B Sales, such as lead recommendation, company news monitoring and marketing automation. Based on the experience with our ODINE-Projekt we are now building a platform to analyze and monitor companies associated with specific verticals, regions and trends in Germany, UK and other European countries to introduce our services to a broader audience.

Company related facts and figures

In order to provide its services, Implisense maintains a live index comprising 6 million companies from Germany and the UK profiled with pre-structured information from company websites, job ads, business news, and open company data. Its API combines front edge text- mining with look-alike scoring algorithms in near real--time and its comprehensive index and ultra-fast analytics makes Implisense a stand-alone player in this market.

Implisense was able to quadruple its revenue in 2016, becoming break-even with our 10 FTEs. As it is planning to begin scaling up its services end of 2017 and in the beginning of 2018, Implisense has already started looking for suitable candidates as series A investors.

Implisense's customer portfolio comprises large enterprises from publishing, ICT and finance amongst which three DAX 30 companies are included as clients, as well as several other internationals (Cisco Germany, British Telecom Germany). With the Fraunhofer Society alone Implisense has about 2.000 users utilizing our CRM solution.

The problem addressed

In many B2B companies sales procedures expose a lack of efficiency when it comes to generating new net-prospects. Besides, qualifying inbound leads is associated with high manual efforts (due to disregarding the use of data-based support technologies). This results in competitive disadvantages compared to more data-driven sales departments and forgone business opportunities as market volumes are not exploited to their full potential.

The solution provided

Implisense's clients can use its SaaS, DaaS or CRM plugin to create target profiles of their B2B customers by simply uploading a list of company names. Implisense's system computes recommendations which fit these profiles, both for the acquisition of new customers or the assessment of cross selling opportunities for existing ones. Alternatively, its clients can integrate the Implisense DaaS or CRM plugin to keep their target profiles and recommendations up-to-date fully automatically.

Furthermore, the Implisense users can specifically search for companies associated with trends, technologies and other properties. In addition, Implisense's clients can monitor events associated with specific companies or groups of companies to identify reasons to call or integrate them as triggers into their marketing automation processes.

[54] www.implisense.com/en/

Key achievements

Apart from its growth path and customer portfolio, Implisense is particularly fond of itsrange of complementary services and products. Working with lead customers, Implisense has been able to subsequently develop different products and formats suiting clients at different stages of adopting data driven sales methods. These include generating hands-on lists with relevant information on recommendations for cold calling, automated reports about recommended companies with reasons to call for sales reps, the Implisense SaaS to manage sales intelligence online for smaller clients and its DaaS in order to work from within a CRM for large corporates.

Lessons learned during and after the ODINE incubation programme and advice for other open data startups

During the ODINE project, Implisense has been able to work with open data from the UK. Compared to the UK, in Germany, which constitutes Implisense`s core market, access to business and economic data, which are otherwise fully or partly open in the UK, was more restricted. According to Implisense, "despite the fact that company register data are announced to be fully opened soon, in practice, however, there are still barriers to access them in a machine-friendly format. In addition, some data despite being open, have a insufficient quality increasing the barriers to use them. Data on industry import-exports and other industry statistics, for example, lack a comprehensive coverage and depth thus making them difficult to use for predictive algorithms. In general, German politics lack motivation to recognize open data as a comprehensive concept and develop a long-term open data strategy. As far as our use case is concerned rather random and incomprehensive open datasets are provided. In our opinion, this favours outdated business models and hinders innovation in our business domain[55]".

According to Implisense, ODINE had a strong impact on its business development. With the ODINE Project European Company Explorer Platform[56], Implisense was able to start expanding its index to a second European country, the UK, integrating about 2.8 million new companies into its system. Moreover, Implisense prototyped a service for a new use case, monitoring trends for specific companies or groups of companies. In addition, Implisense was able to develop a new business model by offering a part of our UK features and data for free on ECEP.

On the practical side, ODINE with its crisp reporting process and clear evaluation criteria, helped Implisense to structure the management of this project and keep an eye on the most important goals. The ODINE network helped Implisense with advice in our weak spots. Most importantly, Implisense were able to participate in many events and thus made our first appearance on the international stage (E.g., us at Madrid IODC 2016[57]). Moreover, ODINE sustainably directed Implisense's business thinking towards open data and open source. This concerns the way of Implisense providing its services for the German market, but also in terms of using more open data in its algorithms.

According to Implisense, the digitalization of German companies is just stating. Thus, the demand for data-driven technologies in B2B will increase, just as the importance of open data being an

[55] For more details on the process of opening data in Germany, you can access Implisense's blog post: http://blog.implisense.com/what-do-we-need-to-foster-open-data-in-b2b/ .
[56] ECEP: ecep.implisense.com; currently redesigned
[57] http://blog.implisense.com/implisense-auf-der-4-iodc-in-madrid/

essential ingredient when building those technologies. Implisense would advise entrepreneurs to not ignore this development when creating new business models as this would equal ignoring business opportunities and missing the chance to offer better products to thecustomers. Hence, when setting-up a business, Implisense would advise entrepreneurs to consider open data as vital contributor to your technology as early as possible. Moreover, both offering open tools and open data constitute an interesting source for generating leads. In general, creating a long-term open data strategy for the own company and follow up on it (e.g. regarding the search, implementation and dissemination of open data, as well as networking in this domain). Finally, when finding out that data you are looking for are not open yet, sometimes, it is simply a matter of asking friendly the responsible authorities whether, they can provide them.

Future plans beyond the ODINE incubation period

After successfully delivering a PoC for ODINE, Implisense decided to build a trend and search platform for companies in its core market, Germany. It will offer parts of its services to a broader audience for freely enabling users to efficiently find new business partners and B2B customers or monitor companies associated with certain trends and topics. Its more sophisticated services, like lead recommendations, will be available in our SaaS and DaaS. The platform will launch this summer (2017) and will be followed by its co-integration with Implisense's UK-index[58]

Moreover, building on its positive experience with open data, Implisense is currently working on incorporating regional economic and business data from OSM and the German Federal Bureau of Statistics into our data index.

In 6 months' time Implisense will be in the middle of its expansion to the next European country. When working with company data from UK, Implisense was able to reduce building time of a data index for a new country by 60 %. Given this positive experience with the open-data-friendly UK, Implisense will direct its efforts towards France, where important company data are open as well. Thus, Implisense will create a platform to find B2B leads and analyse markets in the coherent space of the three biggest economies of Europe.

At the same time, Implisense is also looking forward to publicly offering more features for the users of its platform, e.g. the analysis of news, jobs and press releases associated with single companies or arbitrarily chosen groups of companies.

6.10 The Ascora case

In this section, feedback derived from the conducted interview with Dr. Sven Abels of Ascora is included. Ascora did not manage to pass the reviewing stage and thus never benefited from the ODINE incubation. However the constructive feedback it received from the ODINE evaluators, affected the future development of the company. The aim of the inclusion of this case study in this deliverable is to highlight the viewpoint of a company created thanks to the ODINE call.

[58] For updates, you can follow Implisense on twitter @Implisense or check out its blog: http://blog.implisense.com/

Brief Company Info

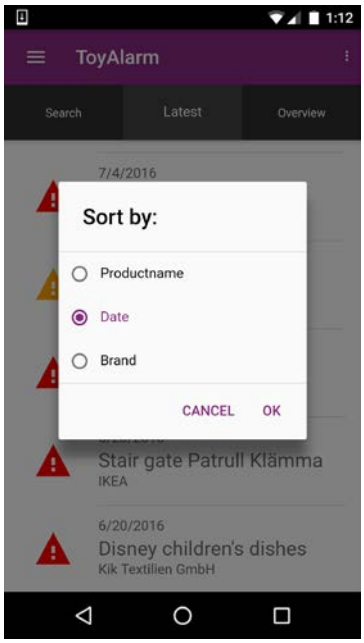
Ascora GmbH[59] is an SME based in northern Germany, developing and selling consumer software as an Independent Software Vendor for web, mobile and desktops.
Ascora GmbH is an SME based in northern Germany. Ascora is developing and selling software as an Independent Software Vendor with products that are used around the world. Ascora is one of the leading providers of software apps in Germany with more than 8 Mio users; applications include desktop applications as well as web and mobile apps. As such, Ascora is very skilled in creating consumer-driven software solutions with high user friendliness, low error rate and adaptive system requirements.
Ascora has broad experience in creating highly scalable and cloud-based systems including messaging, data management and the handling of big data aspects. Because of its large user base, servers of Ascora currently manage between 100 and 150 Mio messages/month. Ascora applies its knowledge in the consumer domain but also within the domain of Industry 4.0, Media and eHealth and our solutions are used by large players in the market. Those four domains highly benefit from the high expertise with availability, security and scalability aspects that Ascora can provide. Ascora's age of business comprises 9 years and its mission statement is the following: "User-friendly consumer apps backed by scalable, secure and flexible data management".

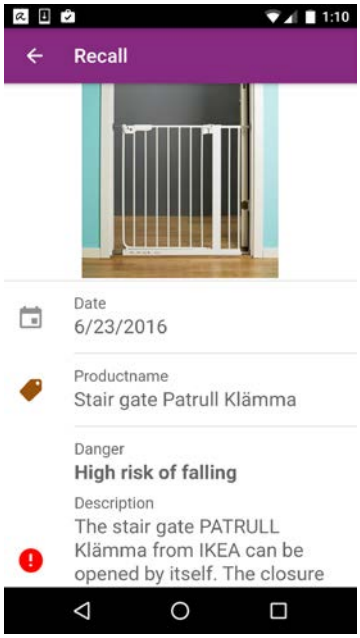
Ascora's ODINE application

Ascora submitted a proposal to the ODINE call with the name OpenRapex: "OpenRapex will create an open service for making use of the EU RAPEX messages and an app on top of it allowing parents of young children to get instant notifications in case of unsafe toys."
RAPEX (Rapid Alert System) is an European-wide alarm system for non-food dangerous products in Europe. It is updated on a weekly base and openly available. Yet, the usage possibilities for consumers and for developers to make use of this data is limited. Developers are hindered by a missing API around it and consumers are mainly hindered by a lack of good apps to make use of the data.
The idea was to better access and use this data and to provide an app dedicated to one area of the RAPEX open data: Toys for parents of young children. - Toys listed at the RAPEX index have been proven to be dangerous by the EU and provide a serious risk for small children. Toys are instantly

[59] Founder: Dr. Sven Abels, CEO
Location (city, country): Ganderkesee, Germany
Company Name: Ascora GmbH
Company URL: www.ascora.de
Founding year: 2007

removed from the sales as soon as being listed but in many cases, toys are already sold and it's often not possible to track the person who bought them. Most European citizens are not aware of the RAPEX list and cannot benefit from it. The envisioned app shall change this and provide the missing bridge for making the RAPEX list accessible in everyday life. The ODINE proposal has not been selected for funding. However, the Ascora team liked this idea so much that they funded it themselves and created a first version of the app at https://www.toyalarm.de/en/.





Ascora was not demotivated by not receiving ODINE's funding. On the contrary, the Ascora team considered that since the reviewers were not convinced, then their business plan had to be reengineered. However, when discussing this, the Ascora team came to the final conclusion that the idea to help young parents with a toy warner on top of the open RAPEX data is still a very good goal, which the Ascora team liked. So regardless of the ODINE rejection, the Ascora team decided to still start the project and to fund it themselves.

However as Ascora claims, it would not have had the project idea without ODINE. The fact that the Ascora team heard about ODINE at an EC event organised by the EuDEco project (eudeco-project.eu) and saw the call, was the incentive to start investigating into how a business could be developed with the use of Open Data. Then the Ascora team members stumbled upon the RAPEX system and got the idea for ToyAlarm. Thus according to Ascora: "clearly ODINE acted as an inspiration for us and a catalyst for making use of open data".

Ascora values the feedback from the evaluation stage as useful, because it helped the comapny to sharpen the vision when deciding to self-fund the further development.

In terms of the future of open data startups in Europe, Ascora believes that data is becoming more and more available and we can already see many apps which make use of them for different purposes – weather its about weather forecasting, traffic information, product data or user exchange. Data itself plays an important role in most consumer apps today. As such, Ascora expects many consumer driven apps to be built around data. However Ascora values the open

data ecosystem ’s maturity level in Europe to be still at a very early stage.

As an open data startup, these are the greatest challenges that Ascora faced:

1. “It’s hard to find data in a structured way. There are websites for open data but they are often country-specific or region-specific

2. Data is often not updated: We can often find data about e.g. the crime rate in specific regions but it’s coming from e.g. 2013 and not constantly updated. We often find CSV files with historical data instead of data feeds with steam/up-to-date information.

3. Data is not integrated: We can find lists of popular “first names” for Berlin but not for all of Germany or for all of Europe”.

Nevertheless Ascora managed to easily find and use the data sources of the EC.

Lessons Learned from the experience with ODINE

Ascora enjoyed the process of writing the proposal and the interviews as well. Both have helped us to sharpen the idea. The short proposal page limited forced the Ascora team to reduce the idea to a very sharp vision, which helped the team a lot.

7 Lessons Learned

This paper explored ODINE startups’ new business models built around open data, which are still emerging and being tested. With the help of the business model canvas, we established a survey that enabled us to familiarize with the different value propositions and the role of open data, revenue structures and consumers targets.

Although the three activities - use, publish and support others to publish - treat their relationship with open data differently, it is not only difficult, but also rare for businesses to rely on only one role. Unlike traditional perceptions, new business models now suggest a mixture of two or more value propositions.

“Using open data” is the most commonly applied value proposition, but it does not make open data a core ingredient within the business operations. Instead, it acts as a key element in most business models seen with ODINE. Supporting others to publish open data is also commonly operated in a business, it is seen by the majority of respondents as a key piece to the end products/services. For other businesses, the majority says publishing open data makes open data a marginal ingredient. The findings show that the role of open data towards businesses is not yet well defined and it is still very evenly split. Therefore, it may not yet be relevant and no startup is either fully dependent or independent on open data.

The most widely used revenue system is by subscription, and more precisely, a very large number of respondents use Freemium, which seems to be a dominant pricing structure for open data business.

Regarding targeted customers, businesses and specialists of a wide range of industries, from "healthcare" to "environment and weather", are identified as potential users of ODINE startups' products and services. Indeed, companies and experts can add value to the value proposition being offered and make profit by selling to further end consumers. Therefore, the products and services developed through open data create crucial values applicable in many different sectors.

As for future research, we would suggest that a focus on businesses using open data as a core ingredient for their products and services and the nature of freemium conditions can be conducted. This would then lead to a better understanding of the type of the businesses, challenges and/or opportunities that open data could be beneficial to.

7.1 From the Evaluators' survey

In this section we describe part of our lessons learned on business models which we derived from a survey with the ODINE pool of evaluators. We focus on business models of open data companies in general and the ODINE applicants in particular. After the end of the ODINE call we collected feedback from our pool of independent experts, the ODINE evaluators, through a questionnaire which focused on several aspects of ODINE and its companies. Here, we focus only on the part of the questionnaire related to business models while in deliverable D3.3 "*Summary of the program, lessons learned, and best practices*" the rest of the aspects discussed in the survey are examined.

A total number of 15 ODINE evaluators participated in our survey: 4 females and 11 males, mostly between 30 and 50 years old, and living/working in 7 different European countries. Their area of expertise ranging from Open Data (46.7%) to Technology (26.7%) and Business (26.7%), as shown in Figure 46. Moreover, 80% of them have already three or more years of experience in consulting startups (Figure 46), and all except one of them participated in more than one ODINE evaluation round.

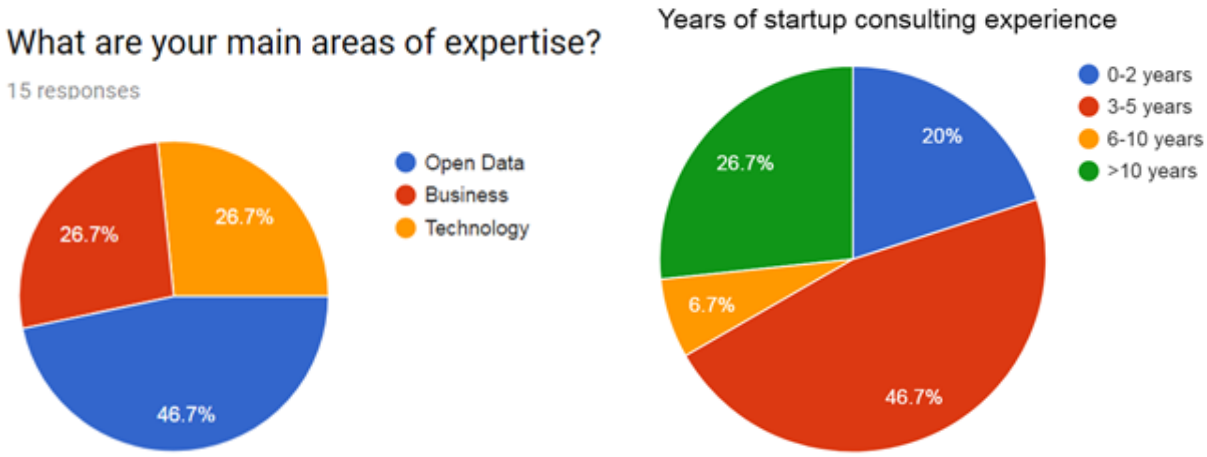


Figure 45 ODINE Evaluators: Areas of expertise (left), years in startup consultancy (right)

In the questionnaire, one of the relevant questions for collecting the impressions of the evaluators on the ODINE applicants' business models was the following: "What is your view on the business models of the SMEs that submitted a proposal to ODINE?. A few aspects on the ODINE applicants could clearly be extracted from the evaluators' replies. For instance, 9 out of 15 evaluators (60%) stated that the SMEs that applied to ODINE presented a wide variety of business models and different types of businesses. In particular, relevant comments stated that "*most of them use freemium and its derivations*". Further, "*dominant business models were Software (and Data) as a Service, through mostly web applications. SAAS and DAAS are the most logical step to make based on open data. Still, the combination with hardware is also very interesting as the sales/profit can be in devices*". Also, "*only a few of the SMEs use partnerships as a way to expand the market*".

In addition to the wide range of business models of the ODINE SMEs, 6 out of 15 evaluators were aligned on the fact that a few SMEs, at the time of the proposal, were already advanced and solid with good propositions, while most of them were still not mature or early stage. An interesting comment on the early stage SMEs was that indeed they presented "*weak business models, but […] this is not very important. Team and idea are much more important (at that stage), the business model will change anyway*".

Finally, an interesting comment on the business models of the applicants was: "*Overall, there is a lack of business expertise. Many of the projects are technically great but have no idea about how to generate revenue, marketing, sales, etc*". This point is in line with the high demand we received at ODINE for mentoring services related to business models and marketing aspects, in contrast to a lower demand for technological support.

7.2 From the business model survey

This paper explored ODINE startups' new business models built around open data, which are still emerging and being tested. With the help of the business model canvas, we established a survey that enabled us to familiarize with the different value propositions and the importance of open data, revenue structures and consumer targets.

The three activities, use, publish, support others to publish, treat their relationship with open data very differently. Using open data is the most commonly applied value proposition, but it does not make it a core ingredient within the business operations. Instead, it acts as a key element in most business models seen with ODINE. Supporting others to publish or supporting open data is also commonly operated in a business, it is seen by the majority of respondents as a key piece to the end products/services. For other businesses, the majority says publishing open data makes open data a marginal ingredient. The findings show that the role of open data towards businesses is not yet well defined and it is still very evenly split. Therefore, it may not yet be relevant and no startup is either fully dependent or independent on open data.

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Regarding targeted customers, businesses and specialists of a wide range of industries, from “healthcare” to “environment and weather”, are identified as potential users of ODINE startups’ products and services. Indeed, companies and experts can add value to the value proposition being offered and make profit by selling to further end consumers. Therefore, the products and services developed through open data create crucial values applicable in many different sectors.

As for future research, we would suggest that a focus on businesses using open data as a core ingredient for their products and services is conducted. This would then lead to a better understanding of the type of the businesses, challenges and/or opportunities that open data could be beneficial to.

8 Appendix A - Business model survey questionnaire

This appendix lays out the business model survey that was sent to ODINE companies. It has been reproduced here as it would have appeared to respondents, who received it in a Google form.

In the interest of space, instead of reproducing questionnaire with duplicate questions — as it was laid out in the google form — the branching logic is represented in the relevant section titles and questions by text direction in square brackets. Statements at the end around following up with participants for interviews have also been removed in the interest of space.

ODINE business model survey

Purpose
The purpose of this survey is to better understand the different business models of ODINE-funded open data companies.

Details
The survey contains questions about your company, your products, your revenue streams, your customers and your use of open data. The survey should only take between 7 - 10 minutes to complete.

How your data will be used
The data being collected will be used to create a report on business models involving open data being used by ODINE companies. You personally will never be identified and unless express permission is given, your answers will not be directly attributed to your company.

About you

Your personal details will never be disclosed to any third party or used in the report. We are collecting these to verify the identity of respondents.

- What is your name? [Short-answer text, required]
- What is your email address? [Short-answer text, required]

About your company

We would like to confirm the current details of your company.

- What is the name of your company? [Short-answer text, required]
- What is the current one line description of your company? [Long-answer text, character

limit: 160]
- What is your company's current headcount? [Short-answer text, numerical]
- Which category best describes your company's area of business? [Drop-down, select one]
- Business & Legal Services
- Data/Technology
- Education
- Energy
- Environment & Weather
- Finance & Investment
- Food and agriculture
- Geospatial/Mapping
- Governance
- Healthcare
- Housing/Real Estate
- Insurance
- Research & Consulting
- Scientific Research
- Transportation

About your products and/or services

We would like to confirm the details of your current products and/or services and target customers.

- Which of these best describe the products or services you have developed through ODINE? [Checkboxes, multiple responses allowed]
- Data sold as a product
- Product/platform for analysing, visualising and/or interpreting customer data
- Product/platform for hosting, managing and/or publishing customer data
- Product/platform for providing insights from data
- Product/platform for providing a non-data service
- Data analysis services
- Training
- Consulting
- Other - [text]
- Which of the following sectors are you targeting with your product or service? [Checkboxes, multiple responses allowed]
- Business & Legal Services
- Data/Technology
- Education
- Energy
- Environment & Weather
- Finance & Investment
- Food and agriculture

- Geospatial/Mapping
- Governance
- Healthcare
- Housing/Real Estate
- Insurance
- Research & Consulting
- Scientific Research
- Transportation
- What type of customers are you targeting? [Multiple choice, select one, required]
- Individuals
- Organisations
- Individuals and organisations

About customers [Appearance of questions based on answer to Q9]

[IF ANSWERED 9a or 9c] Which types of individuals are you targeting? [Checkboxes, multiple responses allowed]

- Mass market - end users
- Specialist - professional users
- Specialist - technical users
- Specialist - data users

[IF ANSWERED 9b or 9c] Which types of organisations are you targeting? [Checkboxes, multiple responses allowed]

- Businesses
- Governments
- Third sector organisations (e.g. charities)
- Academia

About your revenue streams

We would like to understand how you derive revenue from/for your product/service.

How do you derive revenue from your products and/or service? [Checkboxes, multiple responses allowed]

- Single payment
- Subscription fee
- Featuring paid-for advertising

- Attracting customers to other paid for products or services you offer
- Lead generation for paid products or services you offer
- Funded by grants
- Funded by donations
- Other
- Is your product or service ever free at the point of use? [Multiple choice, select one, required]
- No
- Yes, for a limited trial period
- Yes, for certain types of customers
- Yes, for certain types of customers under certain conditions
- Yes, for all customers under certain conditions
- Yes, for all customers

About free [Appearance of questions based on answer to Q13]

[IF ANSWERED 13c or 13d]

For which types of customers is your product/service free at the point of use? [Checkboxes, multiple responses allowed]

- Individuals
- Businesses
- Governments
- Third sector organisations (e.g. charities)
- Academia
- Other

[IF ANSWERED 13d or 13e] Under what conditions? [Long-answer text, character limit: 500]

About open data

We are aiming to understand how your company uses data which has an open licence as part of its business model.

Which of the following statements best describes your company? [Multiple choice, select one]

- Our company would not exist without open data
- Our company would struggle to exist without open data
- Our company would be able to exist without open data
- Our company would be easily able to exist without open data
- Does your company use open data published by others? [Multiple choice, select one,

required]
- Yes
- No

[IF ANSWERED 17a] About using open data

What open data do you use? [Checkboxes, multiple responses allowed]

- Open data published by government
- Open data published by businesses
- Open data published by the third sector
- Open data published by academia
- Open data published by individuals
- What types of open data do you use? [Checkboxes, multiple responses allowed]
- Agriculture & food
- Business
- Consumer
- Demographics & social
- Economics
- Education
- Energy
- Environment
- Finance
- Geospatial/Mapping
- Government operations
- Health/Healthcare
- Housing
- International/Global development
- Legal
- Manufacturing
- Science and research
- Public safety
- Tourism
- Transportation
- Weather
- Please name the specific dataset(s) you use and the organisation(s) that publishes them [Long-text answer]
- What, if any of the following operations, do you perform on the open data you use? [Checkboxes, multiple responses allowed]
- Cleaning
- Aggregation
- Enriching
- Anonymization

- Combination/mashup
- Analytics
- Visualisation
- Validation
- Other
- What role does the use of open data play in your company? [Multiple choice, select one]
- It forms the core of our products or services
- It is a key ingredient in our products or services - it powers an essential feature
- It is a marginal ingredient in our products or services - it powers a non-essential feature
- Other

Publishing open data

Does your company publish open data? [Multiple choice, select one, required]

- Yes
- No

[IF ANSWERED 23a] About publishing open data

Where does this data originate? [Checkboxes, multiple responses allowed]

- Generated internally
- Generated by our users
- Published by others as open data
- Other
- What types of open data do you publish? [Checkboxes, multiple responses allowed]
- Agriculture & food
- Business
- Consumer
- Demographics & social
- Economics
- Education
- Energy
- Environment
- Finance
- Geospatial/Mapping
- Government operations
- Health/Healthcare
- Housing
- International/Global development
- Legal

- Manufacturing
- Science and research
- Public safety
- Tourism
- Transportation
- Weather
- Please name the datasets you publish and, where possible, provide a URL
- What role does the publishing of open data play in your company? [Multiple choice, select one]
- It forms the core of our products or services
- It is a key ingredient in our products or services - it forms an essential feature
- It is a marginal ingredient in our products or services - it forms a minor feature
- Other

Supporting others to publish open data

Does your company support others to publish open data? [Multiple choice, select one, required]

- Yes
- No

[IF ANSWERED 28a] About supporting others to publish open data

Who do you support to publish open data? [Checkboxes, multiple responses allowed]

- Governments
- Businesses
- Third sector organisations
- Academia
- Individuals
- What types of open data do you facilitate the publishing of? [Checkboxes, multiple responses allowed]
- Agriculture & food
- Business
- Consumer
- Demographics & social
- Economics
- Education
- Energy
- Environment
- Finance

- Geospatial/Mapping
- Government operations
- Health/Healthcare
- Housing
- International/Global development
- Legal
- Manufacturing
- Science and research
- Public safety
- Tourism
- Transportation
- Weather
- What role does supporting the publishing of open data play in your company? [Multiple choice, select one]
- It forms the core of our products or services
- It is a key ingredient in our products or services - it forms an essential feature
- It is a marginal ingredient in our products or services - it forms a minor feature
- Other

Additional comment

Do you have any other comments?

Further research

At the ODI we like our research to be as open and replicable as possible, we would like to secure your express permission to make it this way.

Do you give us permission to identify your company in connection to your responses to this survey? [Multiple choice, select one]

We will never identify you as an individual.

- Yes
- No

As part of this research, we would like to release the survey results as open data. Do you give us permission to release to your response to this survey as open data? [Multiple choice, select one]

- Yes, with my company identified by name
- Yes, but with my company name removed

- No