



Raising Open and User-friendly Transparency- Enabling Technologies for Public Administrations



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Organisation: Ortelio LTD

Author / email: info@ortelio.co.uk

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Reviewed and approved by

Date	Name	Organization
22-01-2018	Diana Krebs, Abir Ghattas	OKI team
24-01-2018	Adegboyega Ojo	Insight Centre, NUI Galway

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1 INTRODUCTION

1.1 GENERAL BACKGROUND

The purpose of this deliverable is to present work carried out within Workpackage 7 (“Sustainability and Exploitation”) of the ROUTE-TO-PA project and more particularly to present the ROUTE-TO-PA business models that have been identified by the consortium.

We recall that the overall goal of the ROUTE-TO-PA project is to enable citizens to establish a more effectively transparent relation with their Public Administrations, on the basis of the meanings that individuals, groups or communities (co-)construct with respect to open data. For this, specific technological tools have been developed: a set of transparency enhancing toolsets or extensions for CKAN and other open data platforms (TET) and a social platform for engagement with and co-creating open data (SPOD). Within SPOD, a component, named My space, provides a feature (SIM) that allows to use data to make decision trees.

When used together, SPOD (and SIM) and TET enable citizen-users, with their public administrations, to better explore dataset, discuss open data visualisations, better understand them and thereby change their perception of the degree of effective transparency of Public Administrations.

The aim of Workpackage 7 is to identify potential business and sustainability opportunities for these important ROUTE-TO-PA outcomes and to create the plan for the sustainability of these tools after the end of the project.

1.2 METHODOLOGY

The ROUTE-TO-PA sustainability and exploitation plan (WP7) deals with setting up the environment for exploiting (and commercializing) the ROUTE-TO-PA platform. This section presents the methodology that will be implemented to realise the project’s exploitation potential, which consists of the following two phases:

- Business model exploration
- Business model implementation

The aim of the **Business model exploration phase** (presented in the current document “D7.3 Business models”) is to identify relevant business models that will increase the exploitation potential of the ROUTE-TO-PA platform. In doing so, we firstly briefly present the ROUTE-TO-PA main exploitable outcomes and we describe the main ROUTE-TO-PA competitors (Section 2), we give a literature review on open source business strategies (Section 3), we continue the literature review with an analysis of business models for the public sector open data providers (Section 4) and we finish the report by presenting the ROUTE-TO-PA business model. The results of this report (ROUTE-TO-PA business model) will serve as input to the final deliverable of WP7, the ROUTE-TO-PA business and sustainability plan that will be delivered at the end of the project.

The **Business model implementation phase** (presented in “D7.4 ROUTE-TO-PA business and sustainability plan”) will present the individual and co-operative exploitation plans of ROUTE-TO-PA project partners. It will also build upon the selected business model(s) towards a formal business plan, which will include further collaboration plans of project partners.

All two phases consider contributions from project partners through two mini workshops (Appendix 3: Mini workshops on identifying ROUTE-TO-PA value) that were conducted within project meetings, as well as through discussions that take place online, over teleconferences, and during the project meetings.

2 THE ROUTE-TO-PA PLATFORM AND COMPETITION

2.1 ROUTE-TO-PA PLATFORM

In this section, we briefly present the main ROUTE-TO-PA technical outcomes that would be the basis for designing our business model. The ROUTE-TO-PA platform is composed of two main technical outcomes:

- the **Social Platform for Open Data** (SPOD) enabling social interactions among open data users and between open data users and government data; and
- the **Transparency-Enhancing Toolset** (TET) that is a next-generation open data portal.

It is important to note that though there are more than one technical outcomes, we are developing a business model for the integrated ROUTE-TO-PA platform that includes all of the components that have been developed in ROUTE-TO-PA. The combination of these components is what brings the most value to users (and potential customers) and this is why we present ROUTE-TO-PA platform as a single entity. Below we describe the main characteristics of the two different components and then we move to presenting the main competitors.

2.1.1 SPOD (SOCIAL PLATFORM FOR OPEN DATA)

The main purpose of SPOD (Social Platform for Open Data) is to engage citizens through a “**purposeful and personalized relationship**” between **citizens** and **Open Data**, not seen only as one between government and individual citizens but between government and networks of citizens that collectively attribute meanings to this information. The information by ROUTE-TO-PA is shared, interpreted, personalized, made easier to understand and discussed to assess its meanings.

The SPOD platform enables social interactions among citizens around open datasets coming from different sources (dataset providers). Beside a traditional social network, the discussions are organized in “Public Rooms”, grouped in the Agora. Each user has also a personal space, called “My space”, where it is possible to place visualization of open datasets, URLs and notes so that they can be re-used later in discussions. Users can practice writing their status in “What’s new” where all the activities of all the users are shown. Within the Collaboration layer of SPOD platform, a component, named My space, provides a feature (**SIM**) that allow users to use open data to create a decision tree. SIM generates decision trees that enable responsible decision making at each stage of the data life cycle (collecting, processing, sharing, analysing and using).

More information about SPOD can be found here: <https://github.com/routetopa/spod/wiki/English-version> and in the respective ROUTE-TO-PA deliverables:

- D4.1 Alpha version of SPOD¹
- D4.3 Beta version of SPOD²
- D4.7 Final releases of the ROUTE-TO-PA platform

SPOD is also available as an Android native mobile application³. SPOD app has been developed in the last year of the project and its implementation covers the main features of the SPOD platform like Agora, Co-creation Knowledge, Data and Media rooms and Newsfeed.

¹ http://routetopa.eu/wp-content/uploads/2015/06/D4.1_Alpha_version_of_SPOD.pdf

² http://routetopa.eu/wp-content/uploads/2017/09/D4.3_Beta_version_of_SPOD_v1.0.pdf

³ <https://play.google.com/store/apps/details?id=eu.spod.isislab.spodapp&hl=en>

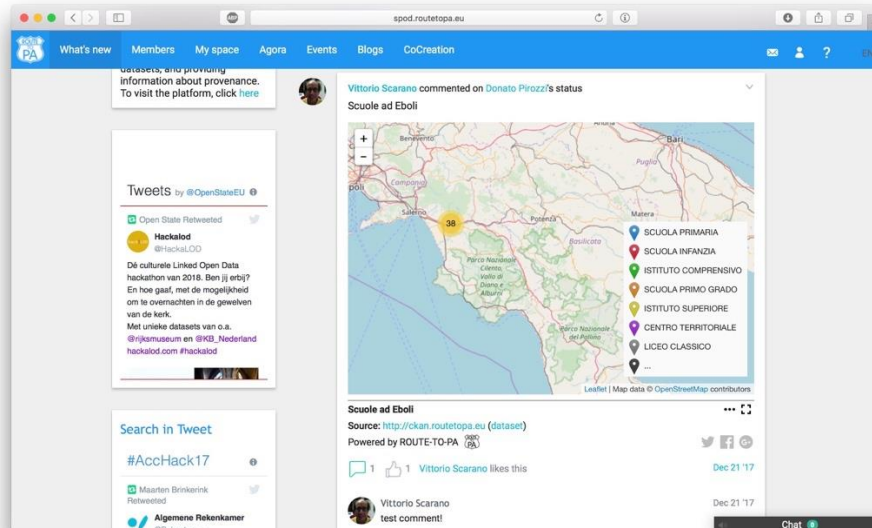


Figure 1: Social Platform for Open Data (SPOD)

2.1.2 TET (TRANSPARENCY ENHANCING TOOLSET)

TET is the next-generation open data portal containing set of tools that facilitate a better understanding of the data by providing connections and links to related datasets and providing information about provenance. TET is enhancing transparency through improved accessibility by personalized presentation of datasets in different forms and facilitates better understanding of these data by providing important contextual information like the metadata and provenance information as well as information on related or linked datasets. TET is an extension of CKAN⁴ that among other offers:

- User friendly interface inspired by popular portals to simplify search and discovery of datasets that includes improved search experience by making it easy to discover relevant datasets (e.g. autosuggestion).
- Search results filtering: User can filter results by date, location, theme, file formats etc. and sort using different options.
- Dataset preview is enriched with options that help users in better understanding the dataset and related files in single glance.
- Dataset summary provides users descriptive statistics related to the data associated with the dataset.
- Auto-generated charts and analytics.
- Datasets quality metrics.
- User readable metadata.
- Sql querying.
- Better metadata management.
- Metadata quality check/validation
- Personalization information for no-logged in users
- Datasets linking (related datasets)
- Detailed user profiles
- Personalized search and recommendation
- Recommendation for related datasets

⁴ <https://ckan.org>

- Tabular view and PivotTable

More information about TET can be found in the respective ROUTE-TO-PA deliverables:

- D4.2 Alpha version of TET⁵
- D4.5 Beta version of TET⁶
- D4.7 Final releases of the ROUTE-TO-PA platform

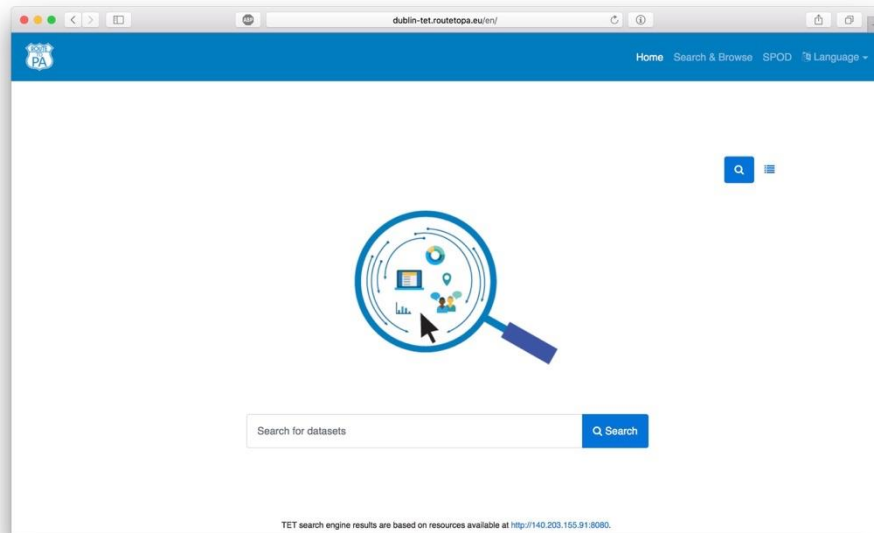


Figure 2: Transparency Enhancing Toolset

2.1.3 ROUTE-TO-PA AS OPEN SOURCE

ROUTE-TO-PA project adopts the “**Free and Open Source**” (FOSS) software development model. Each software contribution to the project is open source. From the early stages of the project, and for dissemination and exploitation purposes, the ROUTE-TO-PA platform was released as open source on Github (<https://github.com/routetopa/>). This enables other developers to view and contribute to the development of the ROUTE-TO-PA components by submitting issues, submitting code, and creating new services.

Our proposed business model will focus on this aspect. That the ROUTE-TO-PA platform will continue to be completely open source. We will discuss in detail the benefits of open source when we will introduce open source business models in Section 3. Before moving to that, it is important to look at the market and see what other platforms exist and what do they offer (Section 2.2).

2.2 ROUTE-TO-PA COMPETITORS AND THEIR BUSINESS MODELS

In this section, we present the most important ROUTE-TO-PA competitors; software products or companies that are offering public administration services which deal with open data, and are similar to ROUTE-TO-PA. We did a thorough literature review and we also reviewed all technologies that appear in the OGP toolbox⁷. The OGP Toolbox is a collaborative platform that gathers digital tools developed and used throughout the world by organizations to improve democracy and promote transparency, participation and collaboration. The platform aggregates software and services used by governments and civil society around the world for referencing, sharing

⁵ http://routetopa.eu/wp-content/uploads/2015/06/D4.2_Alpha_version_of_TET.pdf

⁶ http://routetopa.eu/wp-content/uploads/2017/09/D4.5_Beta_version_of_TET_v1.0.pdf

⁷ <https://ogptoolbox.org/en/>

and re-use. Examples are open data portals, public consultation platforms, tools for monitoring and co-creating legislation, discussion forums, civic tech solutions, and online platforms to monitor the implementation of National Action Plans.

2.2.1 DATA.WORLD

Competitor name: data.world	http://data.world
<p>Description: Data.World is a social network geared toward helping data scientists connect. Data.World looks a lot like Facebook. Each user gets a profile with a picture and their name and the ability to upload data sets. There is also a “feed” component. Rather than people, Data.World allows users to follow specific data sets. Users can search for, copy, analyze, and download data sets. Uploading data to Data.World means the data are in one central place and format and can therefore be easily combined, a traditionally difficult task. Data scientists can also connect by commenting on data sets – much like friends communicate on Facebook. Though, at the moment there isn’t any direct messaging capability.</p> <p>The following statement is taken from the Data.world website: Data.world is helping people who work with data to solve problems faster by creating new ways to discover, prepare, share and collaborate. The main purpose of data.world is to (a) strive to build the most meaningful, collaborative and abundant data resource in the world in order to maximize data's societal problem-solving utility, (b) advocate publicly for improving the adoption, usability, and proliferation of open data and linked data, and (c) serve as an accessible historical repository of the world's data.</p> <p>Founded in 2015, Data.world’s total amount of investment to date is \$32.7 million. The startup currently has 34 employees.</p>	
<p>The problem: The problem data.world is trying to solve is the fragmentation of data. There are 18 million open data sets, but they are often stored in different places, aren't machine-readable and take considerable time to understand and analyze.</p>	
<p>The solution: Data.world wants to solve these problems by establishing a platform that is part social networking site, part data aggregator. The company wants to become a central repository for open data sets, but also make it easier to find, understand and analyze the data.</p>	
<p>The company: Data.world is a public benefit corporation (rare for a tech company) and its main goal is to be a transformative network for solving world problems than it is about growing revenue in the short-term.</p>	
<p>Business model: Data.world plans to make money by charging companies or organizations for the ability to have "private" accounts that allow them to keep their data a secret. Most of its users won't have to pay anything. The service is free unless users want to store data in a private workspace. This is similar to GitHub's business model.</p>	
<p>Data.world vs ROUTE-TO-PA</p> <p>Similarities:</p> <ul style="list-style-type: none"> • Both are platforms with social characteristics (timeline, friends/followers) that aim to assist in discovering, creating and sharing open data. • In both platforms, users can co-create datasets. Users can upload new open or private datasets and can collaboratively create new datasets (projects). You can invite others and you can collaborate to create new datasets. <p>Differentiations:</p> <ul style="list-style-type: none"> • ROUTE-TO-PA is an open source platform that can be installed by anyone. Data.world is not open source and it cannot be installed by others. It is a single installation, a one-stop access point to open 	

datasets. In that respect, we also have a completely different business model as this will be described in Section 5.1.

2.2.2 CKAN

Competitor name: CKAN	http://ckan.org
<p>Description: CKAN is a tool for making open data websites. It is similar to a content management system like WordPress – but for data, instead of pages and blog posts. It helps organisations to manage and publish collections of data. Once data is published on CKAN, users can use its faceted search features to browse and find the data they need, and preview it using maps, graphs and tables – whether they are developers, journalists, researchers, NGOs, citizens, or even your own staff.</p>	
<p>The problem: Making data open involves practical as well as policy steps – data actually needs to be made available online in ways that ensure it is easily findable and usable.</p>	
<p>The solution: An open source open data platform that makes it easy for governments, companies and other organisations to make their data open, online, and accessible.</p>	
<p>The company: Open Knowledge International is a global non-profit organisation focused on realising open data's value to society by helping civil society groups access and use data to take action on social problems. Open Knowledge International is a worldwide network of people passionate about openness, using advocacy, technology and training to unlock information and enable people to work with it to create and share knowledge.</p>	
<p>Business model: CKAN is open source. It can be downloaded and installed by anyone that is interested in developing an open data website. Customers can acquire commercial support for their CKAN installation. There are three companies that offer this kind of support in the European Union, in the United States and in Australia:</p> <ul style="list-style-type: none"> • Viderum⁸ Ltd. is an open data solutions provider spun off from Open Knowledge (i.e. it is owned by Open Knowledge). Viderum provides services and products for governments, institutions, and local authorities to publish open data. Specifically, they offer low-cost CKAN hosting on a scalable cloud-based infrastructure, CKAN technical support, custom open data website and CKAN extension development, and technical consulting related to open data. • OpenGov⁹ was founded in 2012. The team observed dedicated public servants struggle against outdated technology that prevented them from accessing timely spending information and communicating their priorities to citizens and elected officials. Believing there was a better way, the team set out to build cloud-based, easy-to-use government performance solutions to power more open, effective, and accountable government. Today over 1,500 public agencies in 48 states form a growing network leveraging OpenGov's Smart Government Cloud to achieve better budgeting, improved reporting and operational performance, and comprehensive transparency and open data. OpenGov solutions drive impact by giving governments the right tools and relevant data for more informed decision-making and better outcomes for the public. • Link Digital¹⁰ is a Canberra based digital agency that has been providing quality web design, development and consulting services to an extensive list of government, commercial and non-profit clients since 2001. 	

⁸ <https://www.viderum.com>

⁹ <https://opengov.com>

¹⁰ <https://linkdigital.com.au>

Customers: It is used by national and local governments, research institutions, and other organizations who collect a lot of data. Numerous organisations and developers now use and contribute to CKAN, making it a better product and a sustainable technology ecosystem.

CKAN vs ROUTE-TO-PA

One big difference is that CKAN does not offer the social and the co-creation features that SPOD offers. On the other hand, comparing CKAN and TET (that is an extension of CKAN) we can argue that TET extends the functionality of CKAN in the following ways:

Content management system support: CKAN Integration with a content management system enables publishers to publish content related to datasets and publish updates related to the portal in an easy way.

Pivot Table: CKAN platform has limited data analysis capabilities, essential for working with data. ROUTE-TO-PA added a PivotTable feature to allow users to view, summarize and visualize data. From the data explorer in this example, users can easily create pivot tables and even run SQL queries.

OpenID: ROUTE-TO-PA created an OpenID plugin for CKAN which enabled OpenID authentication on CKAN.

Recommendation for related datasets: The application recommends related datasets a user can look at based on the current selection and other contextual information.

Combine Datasets Feature: This feature allows users to combine related datasets in their search results within TET into one “wholesome” dataset.

Personalized search and recommendations: Personalized search feature allows logged-in users to get personalized search based on details provided in their profile. In addition logged-in users are provided with personalized recommendations based on their profile details.

Metadata quality check/validation: Extra validations to dataset entry form are added to prevent data entry errors and to ensure consistency.

2.2.3 OPENGOV

Competitor name: OpenGov	https://opengov.com
<p>Description: OpenGov is a company that offers a complete suite of software products, all designed to enable public agencies to make data-driven decisions, improve budgeting and planning, and inform elected officials and citizens. According to the company's website, the platform complements traditional accounting and enterprise resource planning systems by providing user-friendly access to data. Among others they offer the following products:</p> <p>OpenGov Transparency</p> <p>OpenGov Transparency visualizes government financial and nonfinancial data, allowing the public to drill down into graphs and tables. This product also includes saved views that answer common questions, annotations, maps, and performance dashboards.</p> <p>OpenGov Open Data</p> <p>OpenGov Open Data, powered by enterprise-ready CKAN, delivers public data to civic developers, businesses, and citizens. This solution provides a hosted and managed CKAN instance with customizable portals.</p>	
<p>The problem: Public servants struggle against outdated technology that prevent them from accessing timely spending information and communicate their priorities to citizens and elected officials.</p>	
<p>The solution: OpenGov’s comprehensive open data and financial transparency solutions help agencies of all sizes drive accountability, make data more useful, engage the public, and unlock economic potential.</p>	
<p>The company: OpenGov was founded in 2012 and is a Silicon Valley technology company that offers cloud-based software for public sector budgeting, reporting, and open data, powering more effective and accountable governments. Today over 1,500 public agencies in 48 states form a growing network leveraging</p>	

OpenGov's Smart Government Cloud to achieve better budgeting, improved reporting and operational performance, and comprehensive transparency and open data.

Business model: OpenGov is selling a cloud based platform and support services to public administrations in the US. They work in close collaboration with their customers and they develop customized solutions.

OpenGov vs ROUTE-TO-PA

OpenGov is a US based company that offers open data services to public administrations. They have a wide range of products from budgeting and planning, to citizen engagement for feedback and better decision making, and to open data and financial transparency solutions that help agencies to drive accountability and make data more useful. They offer CKAN installation services but they miss the social and the co-creation features of ROUTE-TO-PA. It is also important to notice that their own customized solutions are not open source.

2.2.4 CONCLUSIONS

data.world is free for users but plans to make money by charging organisations for the ability to have "private" accounts that allow them to keep their data a secret. This solution can be also applied by PAs.

Other open data solutions e.g. CKAN have their code free as open source. Anybody can use it. However, there are affiliated companies that provide support services. For example, in the CKAN case, there are at least three companies that support CKAN. The first is located in Europe (Viderum Ltd. a spin off of Open Knowledge), the second in US (OpenGov) and the third in Australia (Link Digital).

Other companies like Socrata and OpenGov have a wide range of services targeted to Public Administrations. Many of these services are relevant to the ROUTE-TO-PA tools. But their business model is very specific. They work closely with their customers (OpenGov has more that 1600 governments across the US) and try to offer them customized solutions.

Similar to the previous business model, there are some open data platforms (e.g. OpenDataSoft) that are completely closed, and customers can only pay to use them.

The fact that one of our main competitors in this market (i.e. data.world) managed to gather \$32.7 million investment shows that there is a clear potential in the open data area. Furthermore, we see that there are companies especially in the US that work closely with public administrations and develop customized solutions for them. In that respect, we believe that whoever takes up and utilizes the results of ROUTE-TO-PA can make a sustainable business. The detailed economics of a potential ROUTE-TO-PA business will be drafted presented in the next version of this deliverable (D7.4 Business and sustainability plan).

3 OPEN SOURCE BUSINESS MODELS (STATE-OF-THE-ART)

In ROUTE-TO-PA we have everything as open source. In that respect, before designing our business model we need to look at appropriate business models and strategies in the open source software market. Within this context, this section aims to contribute in building up knowledge resources that can help businesses and public administrations (or whoever wants to exploit the results of ROUTE-TO-PA) to have a deeper understanding of the concepts, roles and mechanisms that drive open source business strategies.

3.1 OPEN SOURCE AND VALUE CREATION

3.1.1 OPEN SOURCE FEATURES AND PROPERTIES

Control over the use and distribution of software is the critical differentiating factor between the open source and proprietary model for software production. Proprietary software is based on the value of a fixed and exclusively owned property right that is protected by trademarks or patents and its usage can only be transferred under certain conditions that are usually stated in end-user licence agreements (EULAs). Open source, on the other hand, relies on use rights that in most cases are non-excludable, non-rival and limitlessly transferable. In this sense, open source sets right away the foundation for a different approach on generating and harvesting software value.

Free and / or open source software is defined as software that can be freely run, distributed and modified by accessing its source code. Although there are different definitions of open source, there are some basic principles and properties on which they all rely. These refer to:

- the freedom to run a software program for any purpose
- the freedom to study and modify a software program by accessing its source code
- the freedom to distribute copies of a software program, whether modified or not

Some additional requirements and specifications for open source software have been defined by the Open Source Initiative¹¹:

- licence compliance of the derived works with the original software
- integrity of the author's source code
- no discrimination against persons, groups or endeavour fields in open source contributions.
- licence distribution
- licence not tied to a specific product or restricting other software
- licence must be technology neutral

The inherent features and properties of open source software set a different paradigm for software development and use than that of proprietary software. Contrary to closed-source software that is based on proprietary licensing, open source does not restrict but promotes the ability to use, copy, distribute and modify the software. As a result, it is decoupled of exclusive rights of use and acquires the features of a public good: it is a mutually non-exhaustive resource in the sense that its use by a user or an organisation does not reduce its utility for other potential users. It also employs an open and participatory software development scheme based on ongoing contributions that build up a pool of open, accessible software code and related resources for anyone to use and draw from. Code contribution in open source repositories that are usually moderated by open source

¹¹ <https://opensource.org>

communities and non-profit foundations is not coming merely from volunteers but also, to a critical extent, by IT firms and enterprises¹². This open and collaborative model of software production shifts the conventional linear supplier-to-customer pattern to more complex schemes, based on user involvement, multiple producers and continuous feedback and community support.

However, it should be noted that the business growth of open source could not be fully explained based on its collaborative software development model, as it also relates to market competition practices and rival business strategies of IT firms.

3.1.2 EVOLUTION OF THE OPEN SOURCE SOFTWARE

Free and Open Source Software (FOSS), is a huge market that has matured in the past decade and has become mainstream that started to disrupt existing business models for billion dollar technology companies. In our days, there are many technology companies that are using open source business models and monetize their products and additional services, creating value through cheaper and improved technologies. Open source is here to stay and continues to create big opportunities for non-traditional players. Look also at the blockchain technologies and how open source managed to play a very important role in this area.

Strategically speaking, open source has changed the way businesses perceive, purchase, and utilize software. In the past, businesses were attracted to open source software because it was a lower cost alternative to closed source software. In a very interesting survey (the results of which are depicted in Figure 3) published by Kumar et al (2016) we can see the drivers for open source adoption. In 2011 though the price tag was still a key consideration, the primary reason for adopting open source Software was to **avoid being locked into one software vendor**. More recently, **quality of software solutions** ranked as the primary reason for open source software adoption.

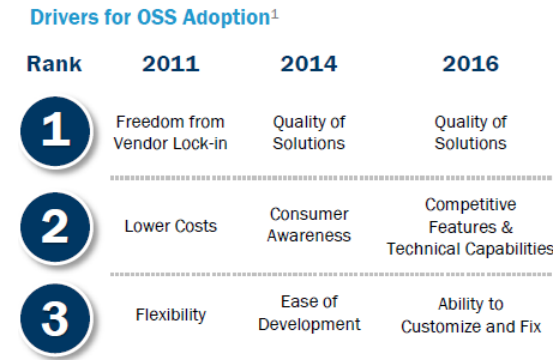


Figure 3: Drivers for Open Source Software adoption

As more enterprises moved to open source software the entire culture and methodology around software development was disrupted. Traditional business models were threatened. Today, open source is foremost a development methodology; not a single product, technology, licensing scheme or business model. It is the strategic foundation on which software is developed, delivered and deployed. For enterprises, open source is an engine of innovation, which allows faster, more agile product development, accelerated time-to-market and superior interoperability.

¹² A great example is IBM and its use of Linux servers. They realized early on that it was services not software that would count in the future.

3.1.3 CREATING VALUE WHILE SELLING FREE

When software is created, it is worth something to an end user. That means that it solves a user problem or creates a new opportunity and therefore comes with a price tag. As users buy the software and adopt it, revenue is generated. Many software companies tend to think that higher prices will generate more revenue. However, it is **user adoption** that is the driver for creating value. User adoption levels increase, as do revenues, when software prices drop – but only up to a point. Beyond that point, dropping price will cause revenues to decline. However, when a software company chooses to offer its software for free as open source and shifts its focus to monetizing user adoption, it can uncover opportunities for additional revenue models such as **support, hosting, consulting, customization or add-on software**.

As Kumar et al (2016) mention, **companies developing and utilizing correctly their open source business model understand how to monetize adoption and leverage community collaboration to create even more value with their software offerings**.

The idea of companies that make money around open source is not new but how it is done continues to evolve. Community is a crucial component of successful open source business models today. According to the aforementioned enterprise-driven and community based modes of developing open source, two main types of open source software occur: community open source and commercial open source. Although community-based open source projects can also be commercialised, the key differentiating factor is that of ownership and decision-making control over an open source project. It should be noted that commercial open source also makes full use of the incremental software code base, feedback inputs and resources contributed by several users or open source communities.

Community open source software is developed, managed and supported by communities. A community of users, volunteers and contributors determines source code integrations, software releases, fixes and updates. The community also owns and manages all related resources (e.g. documentation, troubleshooting resources, graphics and artwork) and defines distribution and dissemination strategies. Community-based open source is the main setting under which a potential vendor lock-in is prevented by retaining software and related support services open to market competition and out of the control of a single vendor or of oligopolistic software supplier groups.

Commercial open source software is owned, developed and supported for-profit by an enterprise that maintains the copyright and determines software development and implementation strategies¹³. Riehle (2010) has described this type of open source development and distribution as the “single-vendor commercial open source” model. This model of single corporations sponsoring and controlling open source projects is expected to increase its share in the following years. In this model, the full copyright, patents and trademarks are controlled by one stakeholder with the purpose of monetization. Code contributions can be made by community members but the stakeholder gets full rights to them.

A strong community is a critical success factor for open source software companies, and the most successful companies produce open source software from a mix of community and commercial open source.

In ROUTE-TO-PA we have to develop an optimal way to **engage the community to contribute code**. Our key challenge in the business plan (D7.4) should be around maintaining control and influence on product strategy, quality, documentation, user experience, features and functionality without alienating the community or losing agility and innovation.

¹³ Some typical examples of this model are Redhat’s Enterprise Linux, Novell’s Suse Linux or MySQL database.

3.1.4 THE HYBRIDISATION EFFECT

Open source is often seen through a dual perspective: either as a threat to the value of proprietary software products or as an enabling factor for new types of software services and revenue models.

Open source, however, has a far more complicated impact on business models than being a mere competitor or rival of proprietary software vendors. Several proprietary software companies are experimenting with open source projects or they are integrating open source based components and services in their offerings. At the same time, global software players and IT service providers such as Red Hat have developed open-source enabled business models that combine openness, community involvement and services to clients on a subscription basis. Open source had a hybridisation effect in business models allowing for combined elements of both proprietary and open source domains and enabling mixed models to reduce costs and generate revenues. Within this context, open source based and proprietary business models are expected to keep converging responding to combined needs for openness, interoperability and control over data and intellectual property rights. While the typical options of proprietary or fully open source models will still stand, more hybrid business models are expected to emerge. These models will also be increasingly based on services or combined offerings of software products and services.

3.2 OPEN SOURCE BUSINESS STRATEGIES

There is a wide range of “hybrid” business strategies that combine open source and proprietary features and blend licensing regimes, delivery channels and revenue models. The term “open source business strategies” refers here to licensing regimes and revenue models that exceed the conventional proprietary model by making full use of open source properties and capabilities. Although comprehensively integrating distinctive open source features (e.g. source code availability), open source business strategies use variations of both open source and proprietary licensing regimes to market their products and services.

The current stage of commercial open source projects that are marketed by large vendors through proprietary-like packaging or mixed licensing could be described as the second generation of open source business strategies. Some of the most widely used Linux distributions (e.g. Ubuntu, Red Hat Enterprise, Suse) are owned and marketed by IT companies that generate revenue by selling certified open source products and related services. What Riehle in 2010 has defined as the “single-vendor commercial open source business model” applied by large open source vendors such as MySQL, Alfresco, Sugar CRM or Jaspersoft tends to be the dominant open source business strategy today.

This section outlines and describes the main types and variations of open source based business models according to their features, advantages and disadvantages. Business models and strategies that are fully or partially based on open source features and components can be grouped by several differentiating factors or criteria resulting to numerous combinations of software delivery and revenue generation strategies. For the purpose of this report, six most worthy business models are selected and described outlining the main strategies by which open source is marketed:

- Dual licensing
- Software as a Service
- Advertising
- Professional services
- Open core
- Crowdfunding

More open source business models that we have identified in the literature are presented in Appendix 1: Alternative open source business models.

3.2.1 DUAL LICENSING

Dual licensing is applied in cases where the same software code is released and distributed under both a free software (e.g. GPL) and a proprietary licence. This model offers users an exception from the “copyleft” requirement to release derivatives under the same licence type by providing a second, proprietary licence option. In this way, licensees (e.g. companies, developers) are able to decide whether they want to adopt an open source or more restrictive approach on controlling software use, distribution and sub-licensing.

The benefit of dual licensing is that it can work both ways. Open source licensing allows external contributions under the same license type while proprietary licensing helps to fund and commercially promote a software product. In dual licensing models the core product is controlled by a single vendor or original developer not allowing for competing or substitution products (forks) to be introduced by developer communities.

It has been shown, however, that this model may also lead to limited external contributions by developers, due to the “same licensing regime” requirement.

A typical example of a dual licensing business model is that of MySQL. MySQL provides the option of choosing between GPL and a commercial licence. Within this scheme, those producing and distributing open source under a “copyleft” licence can use the GPL licensed MySQL code. On the other hand, developers or companies who wish to use the MySQL code but are not willing to release the source code of their own software products may acquire the commercial licence.

3.2.2 SOFTWARE AS A SERVICE

Open source lies at the core of new software provision modes such as Software as a Service (SaaS) and cloud based service provision and is expected to have an increased impact and penetration on these, still forming, market segment. The SaaS and cloud computing paradigm facilitates the deployment of open source software stacks and favours web-based revenue models (e.g. online subscriptions, pay per instance or usage over time, storage limit etc.). The competitive advantage of the SaaS¹⁴ model lies at its multi-tenant architecture allowing to serve multiple clients through one shared instance or application. The core software is server-based. Customers subscribe to the online service often with freemium pricing, that is a gratis offering plus one or more paid offerings with added features. There might or might not be a FOSS desktop or mobile component.

It should be noted, however, that SaaS is not necessarily tied to open source as various proprietary software offerings can also be deployed on cloud-based infrastructures applying various combinations of revenue streams.

3.2.3 ADVERTISING

Companies may decide to invest in open source projects as a means to generate revenue from alternative sources not directly related to open source software products. Alternative revenue may come from advertising. Advertisements are displayed directly (in the functioning software or in the installation process) or indirectly (in the website or manuals) which generate revenue. The owner contracts the ads either directly or through an advertising network, perhaps using a provided software development kit. In the mobile app variation of this model, the app store provider is also involved.

¹⁴ Or Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS) model.

3.2.4 PROFESSIONAL SERVICES

Revenue is generated from paid professional services provided along with the software rather than the software itself. The financial return can come from further implementation, installation, support, maintenance, consultation, training, localization (translation) to other languages.

3.2.5 OPEN CORE

The “Open Core” model offers both a basic, free software version and a proprietary version that provides extended functionality through proprietary components and plug-ins. In this way providers can create their own market segment for proprietary add-ons while users may either opt for the open source or the proprietary version if satisfied by provided functionality compared to price.

In order for open core model to be successful, a certain balance of attractiveness between the basic, free software version and the value-added proprietary version should be achieved. Firms applying the “open core” model usually either apply dual licensing or adopt the Mozilla Public Licence that offers greater flexibility than GPL.

3.2.6 CROWDFUNDING / DONATIONS

In crowdfunding, the project owner or even an individual developer proposes a defined amount of development work and a budget for implementation. Interested parties contribute any amount they want, and if the budget target is reached, then the developer commits to complete the defined work, in some cases depending on the crowdfunding site used, the project owner can also claim the money even if the goal is not reached. The most used platform for crowdfunding are: Kickstarter¹⁵, gofundme¹⁶ and Indiegogo¹⁷. Internet micro-payments systems like PayPal, flattr, Bitcoin, Altcoins help this approach.

Donations involve requesting financial contributions from individuals or organizations, where the organization that develops the open source products retain control in deciding how to allocate the contributions towards the development and distribution of its products. Some organizations offer various levels of memberships with different fees and some projects explicitly ask for donations to support the open source development.

3.2.7 CONCLUSIONS

Despite variations, what is common in “open source business strategies”, is that although making full use of open source features, they are often not purely open source. Software vendors and service providers are increasingly combining both open source and proprietary in trying to get the best of both worlds. They invest in the open source development model based on increased interaction with the developer communities as a means to improve code quality, better manage software complexity and distribute R&D costs. At the same time, they also apply commercial licensing models as a way to establish provider-to-customer relationships.¹⁸

¹⁵ <https://www.kickstarter.com>

¹⁶ <https://www.gofundme.com>

¹⁷ <https://www.indiegogo.com>

¹⁸ The 451 Group, *Open Source is not a Business Model. How vendors generate revenue from open source software.*, Commercial Adoption of Open Source, October 2008.

3.3 OPEN SOURCE MARKET PENETRATION

In contrast to its early years, open source software is not a marginal field, consisting mostly of pilot, experimental projects based on a few developers or researchers. It is now a rapidly developing sub-sector, largely based on thousands of community and task force members that keep delivering well known mainstream applications (e.g. Mozilla Firefox, Libre Office, Gimp) operating systems (e.g. Debian, OpenSUSE) or advanced, reliable solutions (e.g. Apache webserver). Open source is now fully integrated in the software market providing packaged software, custom software solutions for organisations and enterprises or IT services accompanying open source installations.

Open source is expected to continue penetrating the market based on both its inherent features and capabilities as well as on current developments in the ICT sector and the market environment. The ability of open source to meet advanced needs through an efficient management of software complexity is a key competence that will continue to have significant impact in the market.

There are certain drivers for an increased FOSS market penetration in the following years:

1. Open source is considered a great way to improve and guarantee **code quality**.
2. Open source offers businesses the ability to **share and distribute R&D costs**.
3. Open source provides an efficient mechanism to **manage software complexity** and respond to the demand for advanced, enterprise-ready software solutions.
4. Open source applications and operational systems have already been expanding in **multi-platform environments** and various market segments (e.g. tablets, mobile phones, robots, IoT devices).
5. Open source lies at the core of still **emerging technologies and market segments** such as cloud computing, Software-as-a-Service, blockchain.

On the other hand, there are also certain inhibitors and limitations that could restrict the impact of open source on the market and therefore they should also be taken into consideration:

1. Although widely used in advanced, custom developed systems and solutions, open source has a low penetration level in mainstream applications (e.g. office suites).
2. New software-as-a-service models, covering all scales and types of software, may also pose a potential threat to open source solutions made available through conventional delivery channels.

3.4 THE POSITIONING OF OPEN SOURCE IN EMERGING TECHNOLOGIES AND MARKET TRENDS

Open source is not only highly compatible but has also greatly enabled some of the major recent developments in the software industry such as service-oriented architecture (SOA), virtualisation and cloud computing and blockchain architectures. In this sense, it lies at the heart of some of the most critical trends that are already shaping the software market environment within the next few years.

Move towards services

One of the major identified trends in the software sector is the overall transition from conventional software types and revenue models such as packaged software licensing to software being delivered as an on-demand service through the internet. This trend of delivering software-based solutions as re-usable components or customised services has been mainly enabled by two technological drivers: service oriented architecture and cloud computing.

Service Oriented Architecture (SOA)

Service Oriented Architecture (SOA) refers to flexible design principles and architectures in software development that allow for the combination of reusable components and applications in order to deliver suites of interoperable

services. The backbone of SOA is middleware which serves as the “glue” software (e.g. application servers, web servers, tools and utilities) between various components and applications running on different operating systems. By focusing on protocols, functionality and interoperability of services, SOA offers increased flexibility not only for the IT processes and infrastructures of enterprises and organisations but also for clients and customers.

Cloud Computing

Cloud computing is an umbrella term used to describe the provision of scalable sets of software-based services (e.g. storage, applications, operating systems, processing resources) delivered on-demand through the internet. Cloud based services are usually grouped into three main categories referring to hardware, platforms / operating systems and applications: “Infrastructure-as-a-Service”, “Platform-as-a-Service”, and “Software-as-a-Service”.

With software being increasingly offered as a service, a field of opportunities for new business models has opened up. Contrary to conventional delivery channels and revenue models, SaaS is based on single deployments for multiple clients that can access services through the internet on a pay-what-you-use basis. It should be noted, however, that although the SaaS and cloud computing paradigm facilitates the deployment of open source software stacks and favours web-based revenue models (e.g. online subscriptions, pay per instance or usage over time, storage limit etc.) it is not necessarily linked to open source or to specific business models. The cloud rather enables a whole new set of possibilities, particularly for SMEs that can opt for various combinations of software application modules and revenue models.

Blockchain

Today, open source tends to be where innovation happens, such as in machine learning, mobile, cloud computing, and big data. As Cloudera cofounder Mike Olson¹⁹ has declared, “No dominant platform-level software infrastructure has emerged in the last ten years in closed-source, proprietary form”. Deloitte is equally correct to highlight, in its “Evolution of Blockchain Technology”²⁰ research, that “open source could be the ideal petri dish for attracting a critical mass of **blockchain** coding efforts, talent, and overlapping objectives that accelerate an ecosystem with common standards.” Open source not only affords the freedom for blockchain developers to tinker, but also to collaborate.

According to Deloitte’s data, GitHub has more than 86,000 blockchain-related projects, averaging 8,603 new projects every year—with 26,885 new projects in 2016. Although at first these 99 percent of the projects were launched by individuals, the percentage of projects pushed by organizations has climbed to 11 percent. Of course, it is worth mentioning here that the average lifetime of blockchain projects is 1.22 years (Figure 4).

¹⁹ <https://www.linkedin.com/pulse/20131003190011-29380071-the-cloudera-model/>

²⁰ <https://dupress.deloitte.com/dup-us-en/industry/financial-services/evolution-of-blockchain-github-platform.html>

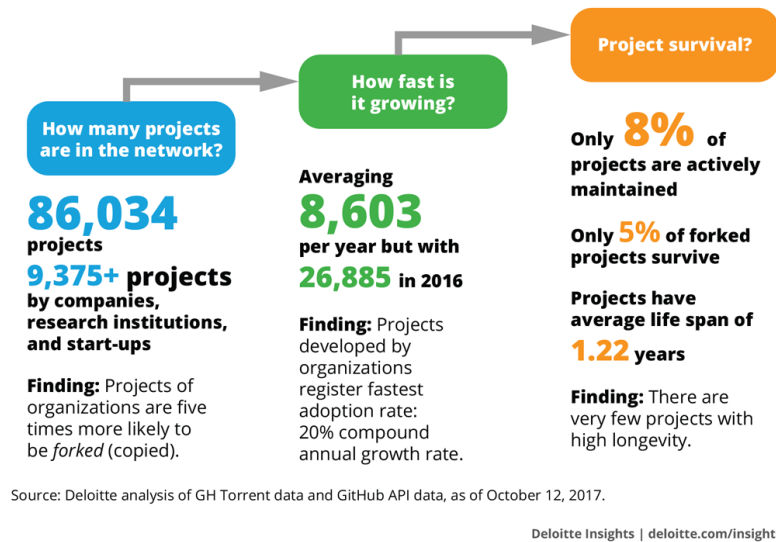


Figure 4: Blockchain on GitHub

3.5 CONCLUSIONS ON OPEN SOURCE AND BUSINESS STRATEGIES

Although the term “open source business models” is widely used, it may be occasionally misleading since open source does not represent a specific business model and open source enabled business strategies are not always fully or purely “open source”. Software vendors and IT companies are increasingly blurring the line by interchangeably implementing both open source and proprietary licensing regimes in order to identify the best sources and methods to generate revenue. Open source as a distinctive software development model had a great impact in hybridising strategies for producing and marketing software.

Business strategies that are purely based on open source models and licensing schemes can be viable and are applied by certain vendors and IT companies. Most vendors, however, generate revenue by implementing hybrid development models and licensing (e.g. open source and commercial) strategies.

Open source will continue to grow and will further penetrate the market not only because it is closely linked to current developments and future trends such as cloud computing, blockchain etc. and the move towards services, but also because it offers an unrivalled advantage in managing software quality and complexity while distributing costs and initial investment.

Within this setting, open and “closed” source business strategies do not necessarily compete but rather converge or complement each other as software vendors and IT companies are trying to meet their clients’ needs in more flexible and effective ways by combining open source accessibility and added proprietary features or components.

4 BUSINESS MODELS FOR PUBLIC SECTOR OPEN DATA PROVIDERS

In the previous section, we reviewed business strategies of open source software. It would be interesting to complement this research with information about business strategies of the public sector domain and more specifically of the public sector open data providers. Since we are dealing with public administrations (in Section 5 we will see that the main ROUTE-TO-PA customers are public administrations), it would be interesting to see and maybe try to propose business strategies that our customers (public sector) could utilize when using ROUTE-TO-PA. We would like to see our customers of the platform building strategies that could enhance the potential sustainability of the ROUTE-TO-PA solution at their premises.

For a company that is producing physical goods and its aim is to make money, the goal may be simple: Sell products/services in order to generate a profit. For public administrations whose goal it is to provide a specific public service, the business model becomes more complex as there may be specific legal constraints and obligations. In the following paragraphs, we try to present some business strategies that public administrations could follow in order to create and deliver value out of open data.

4.1 COMPONENTS OF A BUSINESS MODEL

In order to better understand the potential business strategy of a public authority we need to first briefly describe the core components of a business model. De Reuver et al. (2008) distinguish four common components of a business model: a service component, a technical component, an organisational component and a financial component (Johnson et al 2008, Osterwalder and Pigneur 2010). These components are not isolated but are mutually interconnected.

We focus on the **service component** as it is the starting point of any business model, and on **the financial component** as this determines the sustainability of all other components.

4.1.1 SERVICE COMPONENT

The service component describes the type of service an organisation offers (what), the intended target group and/or market segment (to whom) and the added value to the user (why). For government open data organisations, the services on offer would typically be web services for viewing and/or downloading open data, possibly in combination with fee-based services. The target audience for open data is society at large, i.e., other government bodies, businesses and citizens. Each user has its own preferences. A public administration can select to set up services for a specific market segment, such as other public sector bodies, and to outsource data supply to other segments, such as the private sector and citizens.

4.1.2 FINANCIAL COMPONENT

The financial component breaks down into two components: the **costs** (what will it cost) and the **revenues** (how will costs be recovered). In the next section, we present revenue models for public administrations that we have identified in the literature.

4.2 REVENUE MODELS FOR PUBLIC ADMINISTRATIONS

From a literature review, we identified possible revenue models for public sector bodies:

4.2.1 OPEN DATA MODEL

In this model, open data are supplied free of charge. The costs are financed out of the annual budget of the public administration. There are no direct benefits to the data provider. However, the indirect benefits may be **efficiency gains** (Houghton 2011), **improved decision-making** (Janssen et al 2012), strengthen **law enforcement** (Huijboom and van den Broek 2011), a better-informed **citizen**, lower levels of citizen's perception of **corruption** (Granickas 2013), or more innovative applications based on the open data and thereby **higher societal benefits** (Huijboom and van den Broek 2011).

4.2.2 SUBSCRIPTION MODEL

A product can be used after an upfront fee has been paid for a specific period. Subscription models are best suited to services that are used frequently (Rappa 2010). There may be subscription differentiation between different types of users (e.g. citizens can use the platform free of charge and businesses with a fee but having the ability to create and download large amounts of open data). The advantage of this model is that the data provider has the assurance of a predictable and constant revenue flow known in advance. The advantage for the user is that fees are known in advance; irrespective of how many times the service is used.

4.2.3 UTILITY MODEL

The utility model is based on the principle of a user-pay system. Users pay each time they use a service, often per unit. Units may be time-based, volume-based or per session. This model has to be able to handle micro-payments per unit. This model is best suited to services for ad-hoc users when access to content is more important than possession of content (Welle Donker 2009).

4.2.4 ROYALTY MODEL

In the royalty model when a product is used as a resource to develop and market value-added products, the usage-based fee depends on the success of the final product. The fee, the royalty, is typically a percentage of gross or net revenue generated by the reuser (van Loenen et al 2006). The advantage of this model for the reuser is that the final fee is only payable after a value-added product is successfully marketed for a profit. The disadvantage of this model is that contracts must be exchanged in advance.

4.2.5 RAZOR AND BLADES MODEL

With the "razor and blades" model, a product is supplied for free to entice the user to pay a fee for associated services. The razor is provided free of charge, the blades are provided at a cost. The free product has little value in itself and only becomes valuable with the associated services. This model may be used for creating vendor lock-in, by e.g., supplying free data in a proprietary software format (Rappa 2010). In an open data setting, Ferro and Osella (2013) call this "Infrastructural Razor & Blades": A product/service is provided for free via APIs ("razor") while reusers are charged only for computing power that they employ on-demand in as-a-service mode ("blades"). Application of this model is limited to contexts and domains in which the computational costs are significant (Ferro and Osella 2013).

4.2.6 COMMUNITY MODEL

The community model depends on the loyalty of the users (Rappa 2010). Users invest their time and effort in developing and maintaining a specific service or platform, e.g., OpenStreetMap. The community model may also be used to facilitate user feedback to improve a data service or to improve the quality of published data (Tennison

2012) as a valuable addition to other forms of collecting data (DotEcon 2015). Revenue is raised through voluntary contributions, sales of related products and/or contextual advertisements. Companies, such as Garmin and Nike, use community platforms to obtain an insight into the usage of their products, to receive feedback and to use the sensor data (mobility patterns) generated by the platform users. This business model can be very useful for organisations that have an obligation to publish information but lack the resources to do it well (Tennison 2012).

4.2.7 ADVERTISING MODEL

Data and/or services are provided (usually, but not necessarily, free of charge) mixed with advertising messages. Revenue is generated through banner ads, intracommercials and/or storing, combining and selling user registration data (Rappa 2010).

Rappa (2010) describes more advertising revenue models, such as the contextual/targeted advertising and the affiliate model (providing purchase opportunities to internet surfers). Ferro and Osella (2013) describe a “Free as Branded Advertising” model (aimed at persuading an audience towards a brand or company) and a “White Label Development” model (outsourcing required expertise to specialised firms). Although advertising models may not be suitable to all public sector organisations depending on national policies and/or cultural attitudes, other countries have formulated policies for advertising on government websites.

4.2.8 DATA AS A SERVICE

The Data as a Service Model (DaaS) is focused on providing customers a way to mine their own insights. DaaS hinges on a value proposition for supplying large amounts of processed data with the idea that the customer’s job-to-be-done is to find answers or develop solutions for their customers. The customers in this case may be solution providers looking to use close to raw data to enhance their own offerings (i.e. value proposition) or even developers wanting to develop niche applications to address consumer pains. The data in this business model is aggregated from the company’s own customers or from outside sources (key partners).

4.2.9 INFORMATION AS A SERVICE

The Information as a Service model, focuses on providing insights based on the analysis of processed data. In this case the customer’s job-to-be-done is more about coming up with their own conclusions or even “selling” an idea based on certain information. Additionally, IaaS customers don’t want to or do not have the resources to process and analyze data. Rather they are willing to exchange value for analysis from trusted parties. Unlike the DaaS business model, which is about aggregation and dissemination of lots of processed data for customers to create their own value propositions from, the IaaS business model is all about turning data into information for customers who need something – and are willing to pay for something – more tailored. To do this, key activities must include analysis and data visualization as well as perhaps research that enhances the analysis of data. What’s probably more interesting about this business model is that the value proposition may also be more targeted for specific customer segments.

4.2.10 ANSWERS AS A SERVICE

The Answers as a Service model is focused on providing higher-level answers to specific questions rather than simply the information that can be used to come up with an answer. AaaS customers often need specific direction in order to make decisions. In fact, the customers in this case may be willing to make spontaneous “buying” decisions given the right value proposition (i.e. answer). This business model, is the top of the pyramid when it comes big data. The key with this business model is that given the company’s ability to create real, trusted value in the answers it provides to customers, customers in turn will exchange an increased amount of value in kind.

4.3 THE INFORMATION VALUE CHAIN

Although there is big literature related to business models of organisations providing (open data) services, it appears that there is a tendency to use the term business model to actually describe the different activities an organisation may undertake to provide data services (e.g., Rappa 2010, Janssen and Zuiderwijk 2014), to describe the different roles an organisation may occupy in the information value chain (e.g., Deloitte LLP 2012), or to describe pricing mechanisms for information products (e.g., Rappa 2010; Ferro and Osella 2013). The first two aspects are part of the service component of a business model; the latter is part of the financial component. In the previous chapter, we have described the financial component (revenue streams) of a business model. In this chapter, we will describe the service component, and specifically the roles an organisation may occupy in the information value chain.

4.3.1 ROLES IN THE PUBLIC SECTOR INFORMATION VALUE CHAIN

Public administrations collect and process vast quantities of raw data to information as part of their public tasks. The data are combined and transformed in multiple steps to produce the information needed to carry out these public tasks. In the information value chain, most of the costs occur in the initial stages whereas most of the value is created in the latter stages (Krek and Frank 2000).

We consider four activities in the information value chain:

- a. collecting data,
- b. aggregating and storing data,
- c. processing data, including quality control and transforming into user-friendly formats, and
- d. using the information product (cf. van Loenen and Zevenbergen 2010).

Each step in the chain builds on the previous step and in each step, value is added to the information product. Value can be added by e.g., adding new attributes to the data or by combining with other data, e.g., data from companies, sensor data and/or crowd-sourced data. In addition, value may be added by developing tools or by supplying specialised knowledge to assist the users. The information product can be an end-product but may also be the first step of the next value chain.

In this section, we briefly describe the different roles in the information value chain, using the five roles for organisations within the public sector information value chain distilled by Deloitte LLP (2012) as a basis for the Service Component. These archetype roles are:

- i. **Suppliers** of (open) data could be public sector organisations, businesses and also citizens (co-creation). Data are supplied for reuse by third parties. There are no direct monetary benefits from supplying the data; instead, broader benefits could be greater transparency, enhanced reputation and/or societal benefits.
- ii. **Aggregators:** Organisations that collect and aggregate open data, sometimes combined with proprietary data. Such aggregation often occurs on the sectorial or geographical level. The aggregated data could be used to present the data more efficiently or to perform analyses.
- iii. **Enablers:** Organisations that provide a platform, tools and technology for third parties to use open data. The enablers do not use the data as such but act as an intermediary between data holders and users by providing cost-effective and efficient solutions, and/or by coordinating feedback. Winning platforms are those that are more convenient, more user-friendly, better organized, and more visually appealing. In addition to providing an open data platform, enablers can offer additional services, such as consultancy. The enabler's open data platform can be a demand-oriented platform where users pay a charge for user-friendly and reliable access to data or a supply-oriented platform where the data holders pay a fee to use the enabler's resources and expertise instead of developing their own open data platform.
- iv. **Developers:** Organisations and individuals that design, develop and sell applications for end-users. Such applications, such as multi-modal route planners, typically use highly dynamic open data. Developers

may sell their applications directly to end-users or build custom-made applications for other organisations.

- v. **Enrichers:** Organisations (typically larger companies) that use open data to enhance their existing portfolio through better insight, efficiency gains or as a tool to sell other products.

End-users are at the end of the information value chain and could be the start of a new value chain. In Figure 8 we have combined the different roles identified by Deloitte LLP (2012) and activities as part of the public sector information (PSI) value chain.

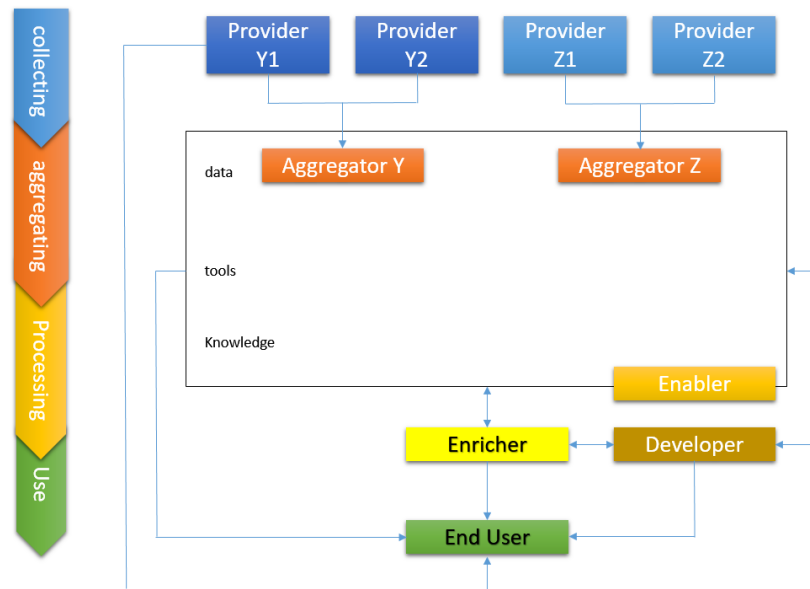


Figure 5. The roles and activities identified by Deloitte LLP (2012) and their relation to the PSI value chain

5 ROUTE-TO-PA PROPOSED BUSINESS MODELS

Bearing in mind all the review mentioned so far, we present here the ROUTE-TO-PA business model. The business model will be used in the next deliverable of WP7 (D7.4 Business plan), in order to prepare the ROUTE-TO-PA business and sustainability plan. The proposed ROUTE-TO-PA business model that is presented here is a result of:

- A thorough examination of the available **business models/strategies for open source software** and their multiple variations (including the analysis on the Public Sector Open Data Providers) presented in Section 3.
- Two business modelling mini workshops that were conducted in two different project meetings (Appendix 3: Mini workshops on identifying ROUTE-TO-PA value).
- The main results of the ROUTE-TO-PA platform evaluation derived from ROUTE-TO-PA WP5.
- The results of a Market Analysis that was conducted in “D7.1 Market Analysis”.
- A thorough feedback that we received during the Common Exploitation Booster event (Brussels, 24 October 2017) where we had the opportunity to pitch the ROUTE-TO-PA business model. The core ROUTE-TO-PA business model was presented and validated during this event, organized by the Directorate General for Communications Networks, Content and Technology (CONNECT) and the Research Executive Agency (REA)^{21,22}. The event aimed at promoting the results of ICT-enabled Open Government projects and gave the floor to 5 selected projects (among them ROUTE-TO-PA) to pitch their business models in front of an audience of 100 persons from a large spectrum of stakeholders, including project representatives, public administration representatives, EU policy makers and professionals active in the investment and start-up community. A full report of the event is available here: https://ec.europa.eu/info/sites/info/files/egov-event24oct17-report_0.pdf. More information and photos of the event can be found in Appendix 4: Common Exploitation Booster event.

Based on the above, we have identified a core business model for the entity that would take over and exploit the ROUTE-TO-PA platform. In parallel, we also propose business models for the ROUTE-TO-PA public administrations that would potentially use the platform. Based on these business models we will build the ROUTE-TO-PA business and exploitation plan on the upcoming Deliverable “D7.4 ROUTE-TO-PA business plan”.

5.1 ROUTE-TO-PA MAIN BUSINESS MODEL

As mentioned above, we suggest one core business model for the integrated ROUTE-TO-PA platform. The reason that we do not present several business models for the different components of the ROUTE-TO-PA platform (SPOD, TET, SIM) is that we believe that the integration of the different components brings value that is worth exploiting through a unique business model, and not by each component by itself.

For presenting the ROUTE-TO-PA business model we will use the Lean Canvas methodology (Figure 6). Lean Canvas²³ is an adaptation of Business Model Canvas²⁴ by Alexander Osterwalder which Ash Maurya created. Lean Canvas promises an actionable and entrepreneur-focused business plan. It focuses on **problems**, **solutions**, **key metrics** and **competitive advantages**. The structure is similar to the well-known Business Model Canvas, but some parts have changed. The Lean Canvas was introduced to the ROUTE-TO-PA consortium during the preparation for a Common Exploitation Booster event, and it was considered as an appropriate tool for depicting

²¹ https://ec.europa.eu/info/digital-transformation-public-administrations-event-3_en

²² <https://ec.europa.eu/digital-single-market/en/news/horizon-2020-open-government-projects-showcase-their-initiatives-support-sustainability>

²³ <https://blog.leanstack.com/why-lean-canvas-vs-business-model-canvas-af62c0f250f0>

²⁴ <https://strategyzer.com/canvas/business-model-canvas>

the ROUTE-TO-PA business model. It is being used from thousands of entrepreneurs, investors and leading business schools around the world mainly for the following reasons:

- **The problem:** Most startups fail because they fail to understand the problem that they are supposed to solve with their proposed solution. They often waste time, money, and effort building the wrong product that does not solve any particular problem. In Lean canvas, the “Problem” box is explicitly stated.
- **The solution:** Once the problem is understood, we are in the position to define a possible solution to this problem. In Lean canvas, the “Solution box” is also explicitly stated.

Before presenting the suggested ROUTE-TO-PA business model, it is important to define the term *business model*. “A business model describes how an organisation **creates, delivers** and **captures** value”. In the Lean canvas (Figure 6), the way an organisation creates value is presented in the “**Unique Value proposition**” box which describes the uniqueness of the proposed solution. In order to understand the compelling value proposition, we need first to understand our **customers** and their **problems** well (“Customers” and “Problems” box). The value is being delivered through the **Solutions** and **Channels** boxes in the Lean canvas. The value is being captured via the **Revenue Streams box**, which describes a fancy way of getting paid. The other boxes on the canvas describe the **Unfair advantage**, the **Costs** the **Key metrics** we would use to measure success.

ROUTE-TO-PA - business model

PROBLEM	SOLUTION	UNIQUE VALUE PROPOSITION	UNFAIR ADVANTAGE	CUSTOMER SEGMENTS
EXISTING ALTERNATIVES	KEY METRICS	HIGH-LEVEL CONCEPT	CHANNELS	EARLY ADOPTERS
COST STRUCTURE			REVENUE STREAMS	

Lean Canvas is adapted from The Business Model Canvas (BusinessModelGeneration.com) and is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported License.

Figure 6: Lean Canvas

When designing the Lean canvas, we start by firstly defining the **Customers**. We then move to the **Problem** that these customers have and that we are trying to solve. There is no business model without revenue. That is why we directly move to the **Revenue streams** box since we need to be able to articulate a revenue story from day one. For each problem we mentioned earlier, we need to come up with a **Solution**. We then move to the centre of the Canvas which is the **Unique Value Proposition**. The unique value proposition is a single clear statement that we make to our customers in order to get their attention. The **Channels** box is where we list our path to customers. Building a scalable path to customers is key to realizing the full potential of our business model. **Key metrics** represent the key numbers we need to track to measure the progress in our business model. Here it is important to understand and define the minimum success criteria. The **Cost structure** box describes the main costs for getting ready to enter the market (e.g. customer acquisition costs, distribution costs, hosting, people

etc.). Finally, the **Unfair advantage** describes something in our solution that cannot be easily copied or bought (e.g. insider information, personal authority, dream team, existing customers, large network effect, community etc.).

In the following section, we present box by box the core elements of the proposed ROUTE-TO-PA business model.

5.1.1 CUSTOMER SEGMENT

The main customers of ROUTE-TO-PA are **Public Administrations**. These are the customers that are willing to pay for the ROUTE-TO-PA services. Of course, there are other stakeholder groups that have been identified both in WP4 and in WP5 (e.g. schools, universities, businesses) and that might be willing to pay for ROUTE-TO-PA. All these different groups and all the potential exploitation possibilities will be presented as a separate section in the upcoming deliverable D7.4 Business plan. It is not part of this document to present business models for other sectors since we have been working mainly with Public Administrations and this is the main market that we are aware of. The exploitation potential of other stakeholder groups will be presented in the next version of this deliverable.

Before moving to the next Lean canvas box, we briefly mention the needs that Public Administrations have when dealing with open data. Based on the literature and on our experience derived from the collaboration with PAs, we can argue on the reasons that PAs would have to use ROUTE-TO-PA. In general, PAs are looking for ways:

- to curate their datasets,
- to communicate to citizens and to businesses their open datasets,
- to engage citizens in co-creating datasets.

Moreover, PAs receive numerous requests for information from citizens, the private sector and internally from other administrations. Handling all of these requests costs **time** and **money**. The requested information is usually open, and if it was more transparent, then the **Request for Information Costs could be substantially reduced**. Furthermore, transparency can encourage **citizen engagement**. **Citizen** feedback can then increase the **quality of public data**. Last but not least, open data can assist the fight against **corruption**.

5.1.2 PROBLEM

Open Data is still a new field of business, growing rapidly (see also Appendix 2: Open data market size). The total market size for Open Data for the period 2016-2020 is estimated at 325 bn EUR. In the same period, nearly 30,000 Open Data jobs may be created. Furthermore, **potentially 1,705 million euro of cost savings can be reached in 2020 by the national governments of the EU28+**. Also, several cost savings for society exist.

Despite these figures and although open data has been in our lives for many years, it is a common belief that it is very difficult for citizens to process (search, discover, understand, visualize) the data they need. Open data “as is” is not enough. Up until now the use of open data is lagging behind and the actual impact of open data remains limited.

Citizens are interested in better and more effective access to open data that is produced and held by public administrations while businesses need easy access to open data to improve their operational capacity.

However, there are **many PAs that are lagging in relation to the use of open data**. They fail to create open datasets and when they do, many problems arise:

- a) The datasets are not of **high quality**: missing data, missing metadata, missing labels of variables.
- b) Limited **usability** of the datasets: datasets are unclear or too generic.
- c) Datasets are **inconsistent**: two different datasets of the same data subject have different values.
- d) Lack of **transparency**: there is a lack of tools to facilitate the comprehension of open data.

We should also mention here what we have identified in WP5, that many PAs are “data illiterate”.

Easier and more transparent access to open data can lead to:

- a) social innovation and economic growth (new products, services etc.)
- b) improved government services and efficiency to fight corruption in the administration,
- c) strengthening democracy,
- d) reduced administration costs.

5.1.3 REVENUE STREAMS

After considering the different open source business models that have been presented in the previous sections of this document, the following revenue streams have been identified as the most appropriate ones for the ROUTE-TO-PA platform.

Software as a Service: In the software as a service (SaaS) revenue model, public administrations can access the ROUTE-TO-PA platform online instead of installing it on their own servers. This ensures they always use the latest version of the software, and they do not need to worry about their computer’s technical specifications, storage capacity, installation overheads, etc. More specifically, in the ROUTE-TO-PA case, we will use the software rental revenue model where the customer pays a negotiated subscription fee to use the software license for a certain limited time. The price of the rental can be based on the length of the agreement, the number of users in the customer organization, the software’s functionalities, or the PA’s size. The software might be cheaper for smaller PAs than for larger ones.

For customers, especially when talking about PAs, software renting offers more possibilities for price negotiations and for varying the usage terms and contract length. The total software costs are also predictable and contractually defined, so there are no hidden costs related to the software, and the PAs know the financial resources that must be allocated during the contract.

Professional Services: In the professional services revenue model that we suggest here, we take the successful ROUTE-TO-PA open source platform (<https://github.com/routetopa/>) and we generate revenue from paid professional services provided along with the software rather than from the software itself. These services may include **implementation of extra features, support, maintenance, consultation, training, localization** (translation to other languages), etc.

5.1.4 SOLUTION

The proposed solution is the integrated ROUTE-TO-PA platform that is composed of:

The **Social Platform for Open Data** (SPOD) that enables:

- social interactions around open data among open data users and between open data users and public administrations,
- users to collaborate and prepare and study their own datasets,
- visualization of datasets,
- creation of decision trees (SIM).

The **Transparency Enhancing Toolset** (TET) that facilitates search and discovery of open data improving accountability and transparency of open data.

Our integrated platform can improve citizen engagement, reduce costs for PAs and increase the quality of open data while in parallel it can promote innovation and the development of new services around open data.

More information about the integrated ROUTE-TO-PA platform and the functionalities of the different components can be found in the respective deliverables (D4.3, D4.4 and D4.7). Let us focus now on how the ROUTE-TO-PA platform can solve the problems that are mentioned in Section 5.1.2.

More specifically:

Reducing public administration costs	PAs receive numerous requests for information from citizens, the private sector but also from other administrations. Handling all of these requests costs time and money. The requested information is usually open, but if it was more transparent, the Request for Information Costs could be substantially reduced.
PAs are lagging behind open data use	ROUTE-TO-PA offers innovative and state-of-the-art tools to support PAs in storing open data, in allowing users to search and discover this data, and in co-creating new open datasets. Given the importance and the growth of the open data sector especially in the government domain, we believe that the ROUTE-TO-PA tools would significantly assist PAs in making steps towards utilizing open data.
The datasets are not of high quality : missing data, missing metadata, missing labels of variables. Datasets are inconsistent : two different datasets of the same data subject have different values.	There are two ways that ROUTE-TO-PA improves the quality of open data: a) through our social platform users can comment on the datasets, can clone the datasets and improve them, b) ROUTE-TO-PA offers extra validations to datasets entry form to prevent data entry errors and to ensure consistency.
Limited usability of the datasets: datasets are unclear or too generic. Users do not understand and as a consequence do not use or reuse open datasets.	ROUTE-TO-PA offers the ability for users to view, summarize and visualize data. Users can easily create graphs through datalets. A datalet is used to create rich, reusable visualization of open data. In ROUTE-TO-PA, everyone can, without no technical expertise, create and share visualization of a chosen dataset, with the following simply steps: <ul style="list-style-type: none"> ✓ Upload open data dataset from recommended datasets by SPOD, or a search suggested by a treemap, or external (remote) dataset via API; ✓ Select the field of the chosen dataset; ✓ Select from a variety of visualizations with customized chart (title of the chart, etc.); ✓ Share your visualization over the SPOD.
Lack of transparency : there is a lack of tools to facilitate the comprehension of open data.	ROUTE-TO-PA 3layer architecture ensures that in each layer transparency is enhanced: <ul style="list-style-type: none"> ✓ Data layer: The Transparency-Enhancing Toolset TET is the next-generation open data portal containing set of tools that facilitate a better understanding of the data by providing connections and links to related datasets, and providing information about provenance. ✓ Social Collaboration Layer: SPOD enhances transparency by enabling users to socially interact over open data, by forming

	<p>or joining existing online communities that share a common interest and discuss common issues of relevance.</p> <ul style="list-style-type: none"> ✓ Presentation Layer: through this layer users are able to create rich, reusable visualization of open data making open data more transparent to all citizens. ✓ As a conclusion, ROUTE-TO-PA ensures citizen-friendly, conscious and effective access to open-data, by offering easy understanding of, and social collaboration on, open data offered by PAs.
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5.1.5 UNIQUE VALUE PROPOSITION

High quality Open Data provisioning: reducing public administration costs, engaging citizens!

A unique value proposition is a promise of value to be delivered to customers. It is the main reason customers would buy from us and not from competitors. The above short statement encompasses the services we provide and the problems we solve. More specifically our Unique Value proposition is related to our 3-layered architecture that integrates the following:

- a) easy high quality open data access (through TET) – **Data layer**,
- b) citizens collaboration/engagement around open data (through SPOD and SIM) – **Social collaboration layer**,
- c) easy presentation, visualization and communication of open data – **Presentation layer**.

We open up data and services and facilitate citizen participation and engagement in governance, thus making government decisions more open. Searching, discovering, understanding, interpreting, visualizing open data becomes easier while at the same time we allow **co-creation of open data and co-creation of ideas/solutions**.

To the best of our knowledge no other platform combines the above-mentioned features.

5.1.6 CHANNELS

The channels we present here describe how ROUTE-TO-PA can communicate with and reach its customers (public administrations):

Awareness: this is how we plan to raise awareness about ROUTE-TO-PA products and services:

- By contacting potential customers. We plan to create a list of PAs in Europe and communicate to them the ROUTE-TO-PA platform and results.
- By utilizing our networks. All partners have a large number of contacts in the government sector and we plan to contact them individually and inform them about our offerings.
- By creating social media campaigns targeted to customers trying to create a brand name in the area. For that purpose, we aim to utilize Facebook, twitter, LinkedIn, AdWords, Facebook ads, newsletters, attending relevant events, sponsor events etc.

Evaluation: this is how we plan to help customers evaluate our products and services:

- By using GitHub: we have already our source code on GitHub where users and customers (developers, public administrations, citizens) can comment, report bugs etc.
- By allowing users to review our platform online either by sending an email or by submitting a review form.

Purchase: this is how we plan to allow customers to purchase ROUTE-TO-PA platform:

- By downloading our platform through GitHub.
- By offering the platform as a SaaS online.
- By installing the platform to customers upon request with a fee.

Delivery: this is how we deliver value to customers:

- We deliver value installing the ROUTE-TO-PA platform to our customers (either as a SaaS or as a standalone installation) and by
- Providing supporting services, training and consulting either online or onsite.

After sales: this is how we plan to provide post-purchase customer support:

- We will provide support to our customers via email, via an online form and via several online tools e.g. Slack.

5.1.7 KEY METRICS

The key metrics will help us understand if ROUTE-TO-PA business works well. These are indicators to measure the success as we move forward. For the beginning, the following key metrics will help the ROUTE-TO-PA business grow:

- Number of platform installations and number of customers asking for support.
- Number of software developers contributing to our source code on GitHub.
- Number of customers that are satisfied with the proposed solution after installing it.
- Profit generated making the ROUTE-TO-PA business sustainable in two years²⁵.
 - In the first year we expect to have 10 new customers that will pay an annual fee of 10.000 euros per year.
 - In the second year, we expect to have 10 new customers that will be added to the current 10 = 20 customers in the second year – we should also calculate how many of the 10 first-year customers will stay for the second year.

5.1.8 UNFAIR ADVANTAGE

This is where we describe what makes us unique that cannot easily be copied. It is true that our solution is completely open source. It can be replicated and extended by anyone. Anyone can use our business model and make a business out of our results, which is fair. However, we have an advantage. Our advantage is the know-how that we gained through our participation to the ROUTE-TO-PA project and the multidisciplinary team we have. Through this knowledge, and also through the fact that we have already installed ROUTE-TO-PA in the pilot sites and in early adopters, we can have a good head-start in attracting customers, installing ROUTE-TO-PA and offering support. We have the know-how and we can guide customers on how to use the platform and on how to successfully maintain it.

5.1.9 COST STRUCTURE

Cost Structure defines all the costs and expenses that ROUTE-TO-PA will incur. This final step in this process is followed by a detailed business plan (D7.4 due on May 2018) and is important, because it will help us decide whether to proceed or not with the ROUTE-TO-PA business case. The figures below are subject to change in the upcoming Business planning deliverable, but an estimation has already been made on what are the requirements for setting up a ROUTE-TO-PA company:

²⁵ More details will be presented on the ROUTE-TO-PA Business Plan due on May 2018 (D7.4 ROUTE-TO-PA Business model)

Human resources (Software developers to maintain, update and constantly improve the ROUTE-TO-PA software):

- 2 full time software developers (2 * 40.000 euros = 80.000 euros per year)
- Business development / marketing (to form partnerships, to promote the services to the target audience)
- 2 full time business developers (2 * 45.000 euros = 90.000 euros per year)

Hosting and other operational costs (20.000 euros per year).

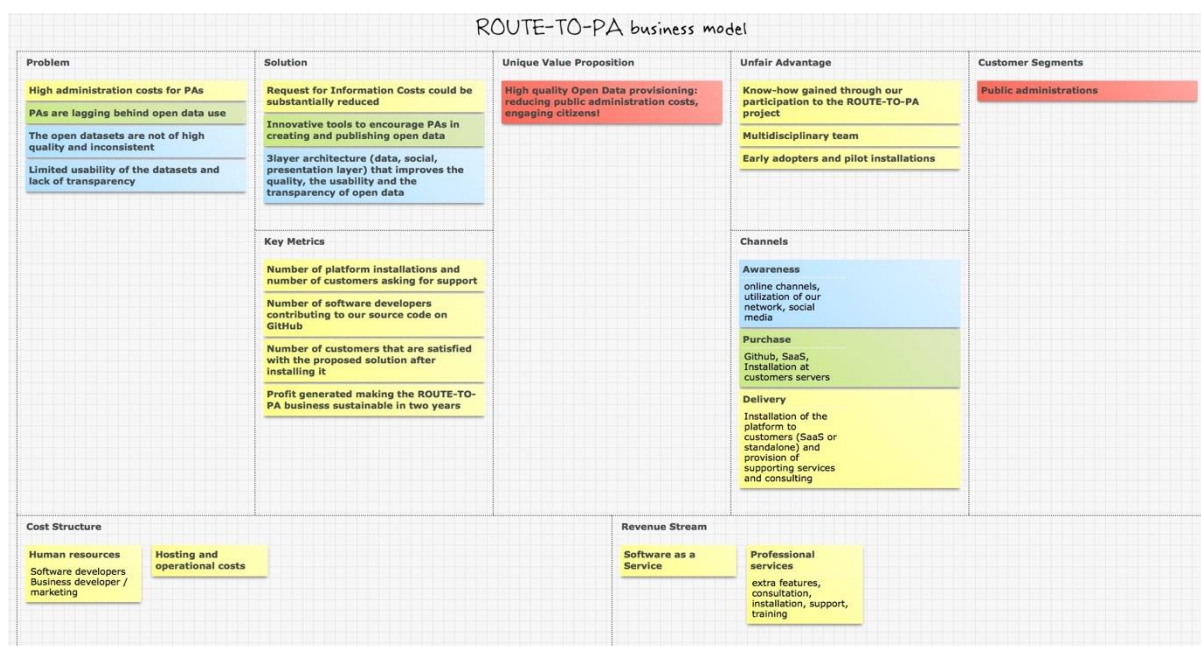


Figure 7: Core ROUTE-TO-PA business model

5.2 ALTERNATIVE BUSINESS MODELS

We have already mentioned that we are going to briefly present alternative business models focused on how public administrations can create value by installing ROUTE-TO-PA. The main asset that PAs would have using ROUTE-TO-PA has to do with the open data they would possess. Data in general and more specifically open data, has clearly become an important corporate asset and organisations want to know how to measure and value the information they hold. Many are asking how much they could earn by selling data to others. But the value of data depends on how they will be used and who will use it. The same piece of data could have different value for different users, depending on their respective economics.

Based on the above, we suggest and we present (using the Business model canvas methodology) two innovative business models for PAs using ROUTE-TO-PA. These are: (i) The Data As A Service business model, and (ii) The Information As A Service business model. Thus, the organisations that will provide ROUTE-TO-PA services will have the opportunity to choose the one that is closer to their needs and targets.

5.2.1 DATA AS A SERVICE (DAAS)

The DaaS's business model canvas is presented in Figure 8. What is unique about this business model is that the key activities to create, market, and sell a viable value proposition are relatively low cost.

It should be said, that in order to engender trust among all customers, the most important – and probably expensive – activity in this business model is processing data such that it is stripped of any sensitive customer details. Once the data in question has been processed/cleaned-up by the companies' key resources (or key

partners), the rest of this business model is about ensuring the customers are able to get/use the data to enhance their own value propositions. Because the data in this case is only valuable as a support mechanism for customers to create other value propositions. Examples of organizations that use this business model are government open data sites, like **datasf.org**, and commercial vendors, like **Gnip**.

Below, in Figure 8 we can present the Data as a Service business model tailored to the needs of PAs that have installed the ROUTE-TO-PA platform.

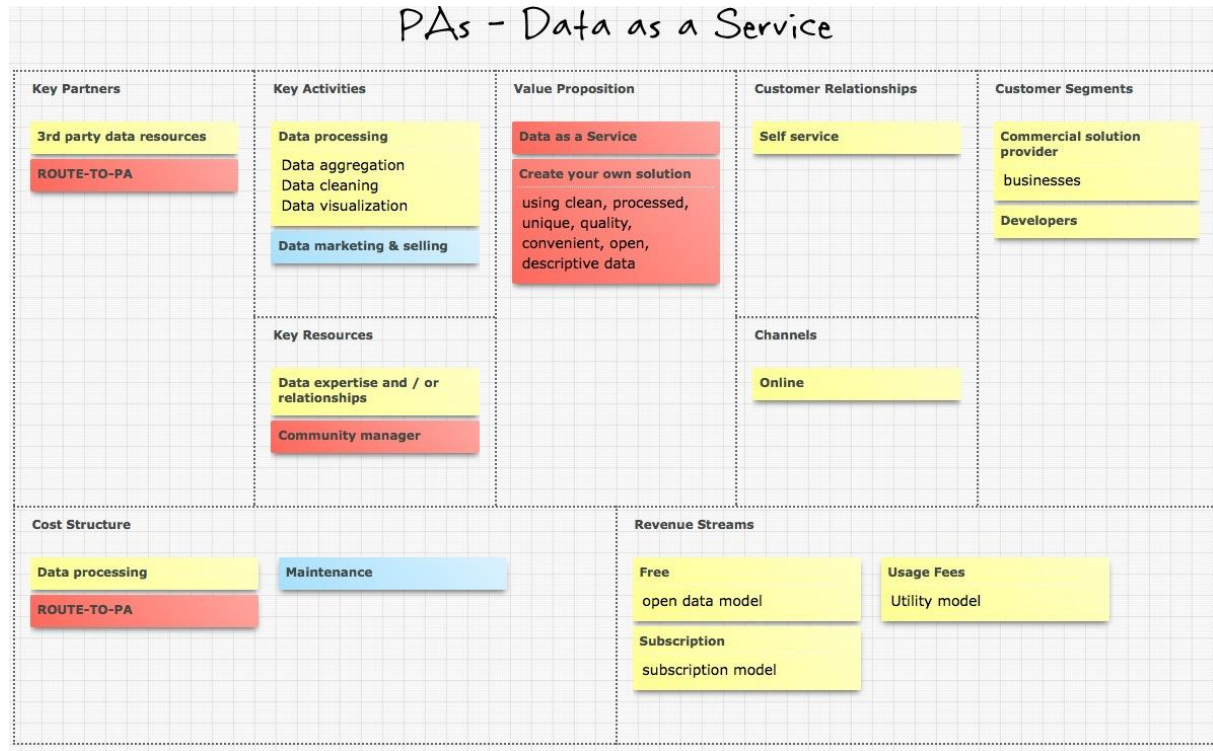


Figure 8: ROUTE-TO-PA Data as a Service business model

Key Partners: In order for this business model to work, PAs will need access to third party data resources. Of course, the collaboration with ROUTE-TO-PA business should be important for the maintenance and support on the ROUTE-TO-PA platform.

Key activities: This business model is based on processing data and providing clean, quality data to customers.

Value proposition: The value proposition lies to the fact that customers can use clean, quality data to create new services and applications.

Customer relationships: Customers should be able to acquire the data by themselves (online and automatically) using one of the suggested revenue streams.

Customer segments: Customers are commercial solution providers (businesses) that have an interest in creating new services out of the open data. Customers also include Developers who wish to develop new applications by using ROUTE-TO-PA open data.

Channels: The main channel that customers can reach the ROUTE-TO-PA service is online through the ROUTE-TO-PA platform installation.

Cost structure: The main costs for PAs are data processing (for cleaning data) and maintenance costs for the ROUTE-TO-PA platform. Costs could also include support services from the ROUTE-TO-PA entity (fees for installation, maintenance, updates etc.).

Revenue streams: The service can be free of charge (open source model), the advantages of which are mentioned in Section 4.2.1). Other revenue streams that can be utilized are: subscription model and utility model. The

revenue model clearly depends on the PAs strategy. A good solution would be the data.world paradigm (mentioned in Section 2.2.1), that is free of charge and in some cases businesses are charged.

Key resources: Employ a community manager with data expertise is important for the sustainability of the ROUTE-TO-PA platform as also mentioned in WP5 of ROUTE-TO-PA.

5.2.2 INFORMATION AS A SERVICE (IAAS)

Though this is not a business model that we expect to see PAs using it very often, we still think that we need to mention it since it is an innovative business model from which open data providers can create sustainable solutions. The Information as a Service business model, focuses on providing insights based on the analysis of processed data. In this case the customer's job-to-be-done is more about coming up with their own conclusions or even "selling" an idea based on certain information. Additionally, IaaS customers don't want to or do not have the resources to process and analyze data. Rather they are willing to exchange value for analysis from trusted parties. Unlike the DaaS business model, which is about aggregation and dissemination of lots of processed data for customers to create their own value propositions from, the IaaS business model is all about turning data into information for customers who need something and are willing to pay for something more tailored. To do this, key activities must include analysis and data visualization as well as perhaps research that enhances the analysis of data. What's probably more interesting about this business model is that the value proposition may also be more targeted for specific customer segments. This business model is very difficult to be applied by PAs. However, if PAs decide to use as key resources the ROUTE-TO-PA entity for support, then they have many chances of creating value out of this business model.

More information about this business model below (Figure 9):

Key Partners: In order for this business model to work, PAs will need access to third party data resources and solutions for data analytics. Of course, the collaboration with ROUTE-TO-PA business should be important for the maintenance and support on the ROUTE-TO-PA platform and also for the support on the provision of analytics services (if possible).

Key activities: This business model is based on analyzing open data sources and providing visualizations.

Value proposition: The value proposition lies to the fact that customers can make better decisions using data that have been processed, analysed and visualized. Data is more accurate, descriptive, convenient, unique, and trusted.

Customer relationships: Customers should be able to acquire the data by themselves (online and automatically) using one of the suggested revenue streams. Customers can also contact directly the PA to ask for specific services.

Customer segments: Customers are commercial solution providers (businesses) that have an interest in creating new services out of the open data.

Channels: The main channel that customers can reach the ROUTE-TO-PA service is online through the ROUTE-TO-PA platform installation.

Cost structure: The main costs for PAs are related to data analysis and visualization. Costs could also include support services from the ROUTE-TO-PA entity (fees for installation, maintenance, updates etc.).

Revenue streams: The main revenue streams that can be utilized are: subscription model and utility model. The revenue model clearly depends on the PAs strategy.

Key resources: Data analysis expertise is needed for this business model to work properly.

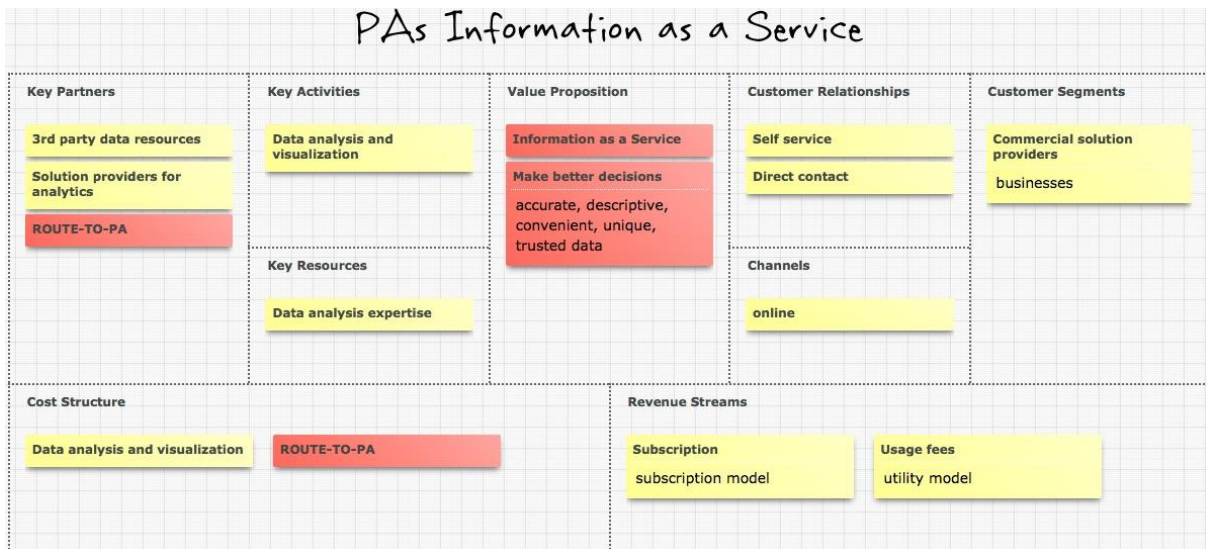


Figure 9: ROUTE-TO-PA Information as a Service business model

6 CONCLUSIONS

In this document, we started our review by presenting the ROUTE-TO-PA main technical outcomes and we identified some of the ROUTE-TO-PA main competitors presenting also their business models. Some of the competitors offer an online open data platform for free and they charge only private accounts. Others are completely open source but they do make revenues by charging for supporting services etc. Others follow a completely proprietary model and they charge their customised solutions.

Since ROUTE-TO-PA is completely open source, we continued our review by looking in the literature for open source business models and strategies that helped us better define our business model and will help us better prepare for the ROUTE-TO-PA exploitation plan. In our literature review we also looked at business strategies and revenue models for public sector open data providers. Based on the literature review we can argue that there is no ideal business strategy for open source software and for open data providers. The strategy depends on the particular circumstances and on the needs of the company that wishes to make money out of open source or open data.

All the above helped us better define the ROUTE-TO-PA business model that will be used to prepare the ROUTE-TO-PA exploitation plan. The suggested business model uses the Lean canvas methodology to define the customers of ROUTE-TO-PA (public administrations). The business model identifies the problem that the customers have, and explains how ROUTE-TO-PA solves these specific problems. The unique value proposition of ROUTE-TO-PA is in the centre of the Lean canvas and describes how ROUTE-TO-PA creates value. The business model presented here is a good starting point for preparing the plan for the sustainability of the ROUTE-TO-PA open source platform.

Last but not least we also presented business models that can be used by public administrations that wish to install ROUTE-TO-PA.

The review and the results of this deliverable will be used in preparing the ROUTE-TO-PA business and exploitation plan.

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APPENDICES

APPENDIX 1: ALTERNATIVE OPEN SOURCE BUSINESS MODELS

The following section provides a list of some of the most common alternative forms of open source business models repeatedly described in numerous published articles:

Proprietary Software Model

In this model, a company offers a more closed, proprietary licensed version of a similar open source software solution. This protects them against some of the risks associated with developing products that use open source GPL licensed software.

Premium Software Model

In this model, a company sells premium commercial software add-on modules or applications in conjunction with the open source software product, often packaging both together, e.g. Jaspersoft.

Hybrid Model

There is a related, hybrid model in which a vendor forks a non-copyleft software project then adds closed-source additions to it and sells the resulting software. After a fixed time period, the company may release the patches or enhancements back upstream under the same open source license as the rest of the codebase.

Platform Integration Services

With the introduction of service-oriented architecture, many companies no longer buy software from one particular vendor. They build software using components from different vendors and integrate them to best meet their unique business needs. There are numerous risks and issues that need to be considered when mixing and matching open source with proprietary products.

Hardware Integration Model

In this model, hardware companies may bundle open source software into their product. The software is free, you just buy the box it runs in., e.g. Android smartphones. This may allow the hardware company to significantly lower the cost of their products.

Indirect Services & Accessories

Companies may choose to provide indirect services and accessories for open source systems. This may include providing news and information, selling books, marketing, training materials, hardware accessories, t-shirts, e.g. O'Reilly Associates, Open Health News.

Non-Profit Business Models

Many non-profit organizations are not interested in making huge profits from their free and open source software (FOSS) solutions, but are interested in simply creating and distributing high quality, free software and solutions that will be of benefit to as many people as possible. However, they often need some level of funding to support their efforts. Many open source software projects are supported by a "sugar daddy", e.g. Firefox has Google; Eclipse has IBM; and VistA has the VA.

Independent Contractors/Developers

A growing number of programmers in the open source software community offer their services as independent contractors to develop, install, maintain, or enhance open source software for others. You'll run across many of them on SourceForge, GitHub, or particular community web sites, e.g. Drupal, Wordpress.

Public Domain Model

Governments or other non-governmental organizations may develop software internally or hire a contractor for custom in-house modifications to software, then release that code under an open-source license.

Defensive Business Model/Strategy

Some companies may choose to pursue an open source business strategy or model to gain access to innovative new ideas, software code, or to reduce software development costs and timeframes. It also allows them to take a portion of market share for services and support for popular open source solutions. It may also allow them to join a community and break a monopolistic hold a company may have on a particular area, e.g. web browsers, server software, etc.

Selling user data

Collecting data about usability, user feedback, user preferences, etc., developers can leverage that knowledge to develop better applications and features. Developers could instrument applications like they do today with advertising frameworks to provide data. FOSS apps could use the framework to use the provided data to fund app development.

Software certification

Software can be provided under a FOSS license, but requires certification to use a branding mark or claim to be interoperable. In one variation, original equipment manufacturers (OEM) might use the certified software in their hardware devices. In another variation, the project owners register service marks (for example “Moodle”) around the world, then create a trust- and royalty-based scheme where only licensed partners can use the software or project name in their promotions and service descriptions. The mark becomes a standard for those looking for support services (e.g. hosting, development, training, etc.).

Open core

A provider (often also the creator) releases FOSS software and along with it, they sell proprietary extensions that provide enhanced capabilities. Examples include operating system or database extensions, or distinct software linked with FOSS libraries.

Consortium

Organizations with a collective need or vision collectively choose and fund priority FOSS projects to enhance. The main direction of the FOSS project is governed by a specific steering committee which can set the objectives, priority, etc. of the project. Membership to that steering committee incurs a fee that is paid by companies who have an interest in influencing the project direction.

SaaS without distribution of server software

The core software is server-based FOSS. Customers subscribe to the online service often with freemium pricing, that is, a free offering plus one or more paid offerings with added features. There might or might not be a FOSS desktop or mobile component. In this model, the server-side software is not distributed at all, being based on a FOSS license that does not require distribution of server-side software. (Note: “SaaS with distribution of server software” is described as a distinct business model.)

Corporate development without distribution

Organizations (both non-profit and commercial) pay full-time or part-time developers to customize and extend FOSS for their own organizational needs; they keep these modifications internal without distributing them (either because they are too organization-specific to be generalized, or for proprietary reasons). Consulting companies or independent software vendors might use FOSS inside custom projects delivered to customers. This can be used to accelerate development, or to lower costs of production of the end product. (Note: “Corporate development and distribution” is described as a distinct business model.)

Packaged suite

A company chooses a set of FOSS, integrates or aggregates this set of software, and then sells, supports or distributes the complete package, either as FOSS or maybe non-FOSS, or as software as a service. The editorial work adds value by preselecting from a large pool of similar FOSS those that work well together, or that offer a good user experience. Users pay for the convenience of the integration.

Reverse bounty

The project owner or even an individual developer proposes a defined amount of development work and a budget for implementation. An interested developer takes up the challenge and is paid on completion of the defined work.

Stipends

Some organizations (both non-profit and commercial) sponsor the development of FOSS projects for general societal benefit through grants and stipends. This kind of FOSS development normally occurs with small, tightly-knit teams, rather than mass collaboration.

Research or academic project

A FOSS project is initiated with the primary goal of fostering research or building a teaching tool.

Market disruption

The project owner initiates a project or an interested corporate developer injects code into an existing project in order to undercut a competitor, change the competitive landscape, establish a de facto standard, or push a technology in a direction that is favorable to their business. The development of a FOSS product is meant to erode or devalue competitor market share or is used as a bulwark against potential competitors. The created FOSS project aims to undercut competitive pricing or separate a competitor from a community.

Proprietary with FOSS extensions

A proprietary product has an API/SDK for people to build extensions upon. The proprietary software might be distributed for a price or at no charge. The API permits and might encourage FOSS extensions, and a community might arise that develops and shares the extensions, which enhance the value of the proprietary core software.

Delayed FOSS

Enhanced versions of a FOSS product are maintained with proprietary licenses until the developer has obtained return on investment; only then is the enhanced version released as FOSS. A new enhanced version is likewise made proprietary and then later released as FOSS. This model refers to products that repeatedly employ this model, not to discontinued products that are then “donated to the community”. In a variation of this model, all code is released at once for anyone to use, first under a non-FOSS licence and only later moved to a FOSS license.

Auxiliary non-software services

Events and other services related to FOSS are used to generate income. People might register and pay to attend a conference, and exhibitors pay to demonstrate their products. The event is sponsored by an independent third-party, not by a creator of FOSS. This model might also involve the sale of books about FOSS and other similar services.

Corporate strategic partnerships

A FOSS vendor provides preferred marketing opportunities to selected for-profit vendors that allow them to approach its membership with a business offer, with the FOSS vendor receiving a share of any revenue generated.

Commercial buy-out

FOSS developers manage somehow to sustain themselves in the early period. Then, when the product’s potential is proven, the product or company is either sold to a commercial enterprise or an IPO is launched to make the company public and bring in investment funds. Strictly speaking, this model is combined with other business models: an initial model for launching and developing the FOSS, and then a subsequent model after the buy-out applied by the new owners. This model description refers only to the intermediate buy-out or IPO stage.

FOSS buy-out

Funds are raised (via crowdfunding or other methods) to purchase the rights to an existing proprietary software product; the software is subsequently released as FOSS, usually under the stewardship of a non-profit foundation. This is basically the exception to Delayed FOSS and the reverse of a Commercial buy-out.

Government mandate and funding

The government mandates the use of particular FOSS and funds its development. This would effectively be taxpayer funding.

Student classroom development

Schools work with FOSS projects to keep a stream of contributions going by requiring contributions as part of a course curriculum. Students gain experience working with FOSS community.

APPENDIX 2: OPEN DATA MARKET SIZE

Based on a study published by the European Commission (2015), for 2016, the direct market size of Open Data was expected to be 55.3 bn EUR for the EU 28+. Between 2016 and 2020, the market size is expected to increase by 36.9%, to a value of 75.7 bn EUR in 2020, including inflation corrections. For the period 2016-2020, the cumulative direct market size is estimated at 325 bn EUR.

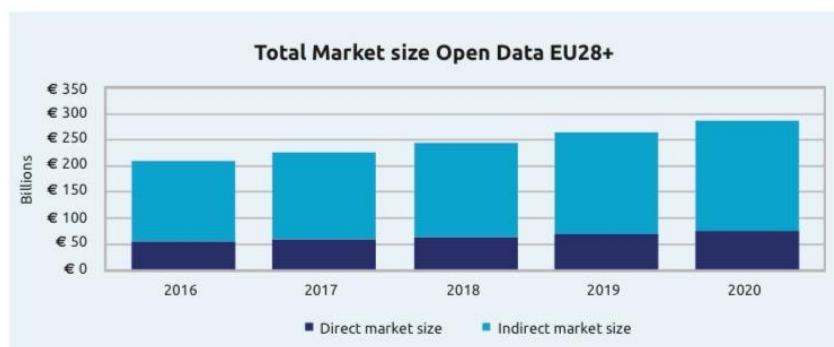


Figure 10: Open data total market size

Source: European Commission (2015)



Figure 11: Direct market size per sector

Source: European Commission (2015)

In 2016, there were 75,000 Open Data jobs within the EU 28+ private sector. By 2020, this number is forecasted to increase to just under 100,000 Open Data jobs. This represents a 32% growth over a 5-year period. Thus, in the period 2016-2020, almost **25,000 new direct Open Data jobs will be created**.

Based on the forecasted EU28+ GDP for 2020, whilst taking into account the countries' respective government expenditure averages, the cost savings per country can be calculated. The accumulated cost savings for the EU28+ in 2020 are forecasted to equal 1.7 bn EUR.

APPENDIX 3: MINI WORKSHOPS ON IDENTIFYING ROUTE-TO-PA VALUE

Two mini exploitation workshops were held in two different project meetings with the aim to identify the value that ROUTE-TO-PA brings and to brainstorm on the potential ROUTE-TO-PA business models:

1st mini workshop

Date: 2 December 2015 (in Paris during the 3rd project meeting)

Aim: to identify the value of ROUTE-TO-PA

Participants: All project partners participated in this mini workshop.

Methodology used: Ortelio presented the methodology for the project's exploitation plan and for the workshop.

At first a number of questions were posed to the audience (What is the value that ROUTE-TO-PA generates? Why should a Public Administration use ROUTE-TO-PA? Who else could potentially benefit from ROUTE-TO-PA? etc.).

A general discussion followed and then Ortelio distributed a number of questionnaires (See figures below). The so-called “Value proposition template” was given to all participants. Contributions were gathered by Ortelio and a general discussion followed.

Ad-Lib

Value Proposition

Template

Ad-libs are a great way to quickly shape alternative directions for your value proposition. They force you to pinpoint how exactly you are going to creating value. Prototype three to five different directions by filling out the blanks in the ad-lib below.

OBJECTIVE

Quickly shape potential value proposition directions.

OUTCOME

Alternative prototypes in the form of "pitchable" sentences

Our

Products and Services

help(s)

Customer Segment

who want to

Jobs to be done

by

verb (e.g., reducing, avoiding)

and a customer pain

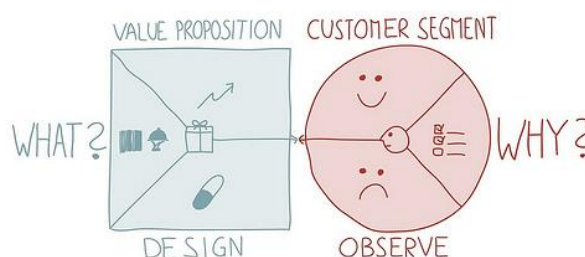
and

verb (e.g., increasing, enabling)

and a customer gain

(unlike

competing value proposition



Results: Though we were at the early stages of the project, a number of good ideas were reported about the value of ROUTE-TO-PA. Ortelio, as organiser of the workshop gathered all contributions and used them as input to begin understanding the added value that ROUTE-TO-PA brings to the public sector and open data community. At the end, these value propositions were discussed again during various project meetings and were proved essential for preparing the ROUTE-TO-PA business model.

2nd mini workshop

Date: 15 May 2017 (in Dublin during the 7th project meeting)

Aim: To present the term business model to the audience. To better elaborate on the value of ROUTE-TO-PA and to brainstorm on the potential ROUTE-TO-PA business models.

Participants: All project partners participated in this mini workshop.

Methodology used: Four groups (4-5 people in each group) in three consecutive rounds of discussions started drawing ideas on the ROUTE-TO-PA business models (potential customers, value to these customers etc.).

Results: The discussions helped us better define the target of our business model and of our business plan. Some results:

- Focus on Public Administrations as the main customer segment that could potentially pay to use the ROUTE-TO-PA service.
- Prepare a business model and a business plan for the whole ROUTE-TO-PA platform and not for each component, as the integration of different components bring the added value.
- Bear in mind the difficulties that different PAs have in using ROUTE-TO-PA and in paying to use ROUTE-TO-PA (organisational issues, financial problems etc.).
- Focus on open source business models and how we can generate value from them.

Photos of the workshop:



APPENDIX 4: COMMON EXPLOITATION BOOSTER EVENT

The Common Exploitation Booster event was organised by the Directorate General for Communications Networks, Content and Technology (CONNECT) and the Research Executive Agency (REA) on the 24th of October 2017 in Brussels. Five INSO projects had the opportunity to pitch their outcomes. In ROUTE-TO-PA we prepared a pitching presentation to showcase the ROUTE-TO-PA business model. Before, during and after the event we received consultation and support for preparing and for improving our business model from business consultants / experts. The event proved to very interesting and important for selecting and better defining our business model.

