The D-BEST based Service Portfolio Configuration for Incubator Ecosystems

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Abstract

The configuration and organization of a service portfolio when different organizations or service providers are involved is far from being trivial. This is specifically the case in incubator ecosystems, where different competences and providers are involved to effectively prepare startups to go to a very competitive market. This paper describes the experience of the REACH Data Incubator for organizing its service portfolio, and how the D-BEST service model was applied to implement its catalogue. This work presents the needs that motivated the use of a service model, how the services were organized, and which advantages and drawbacks were found during the development and application of the service model.

Keywords

Service catalogue, service model, service portfolio configuration, incubation services

1. Introduction

In the context of *networked organizations* [1], such as Digital Innovation Hubs [2] or Incubation ecosystems, a key activity is the design and configuration of the service portfolio. This service portfolio aggregates, and enhances in some cases, a wide, diverse, and complementary range of services from different providers, which are selected and organized according to the mission and value proposition of the networked organization. For instance, in the case of an incubation ecosystem, such as the REACH Incubator [3], the service portfolio involves technology training and support services, business development services, and access to finance services, with the goal of preparing their customers (entrepreneurs and startups) to face a very competitive market.

The configuration of networked organization service portfolios could be very complex, because depending on the number of service providers involved, and the service offer that each provider might bring to the portfolio, the number of services included could be large and difficult to manage. There might be different types of services, with different requirements and outcomes, and different ways of being classified. Then, an important decision to take is how to organize such a large service portfolio in a way that is easily browsable and accessible by their target customers, but also that facilitates agreement with all the involved service providers.

This paper describes the REACH experience for configuring and deploying its service portfolio, and how the Data-based Business-Ecosystem-Skills-Technology (D-BEST) model [4] was applied in the context of an incubator ecosystem. This work presents the needs that motivated the use of a service model, how the services were organized and why, and which advantages and drawbacks were found during the development and application of the service model.

This paper is structured as follows. Next section introduces the REACH Incubator and the REACH Service Catalogue, and the need that motivated the use of the D-BEST Service Model. Then, section 3 presents a short overview of the D-BEST service model. Section 4 presents how the D-BEST model was applied to implement the REACH Service Catalogue. Finally, section 5 presents the conclusions of the work and further steps.

2. REACH Incubator and the service catalogue

REACH [3] is a European incubator for data-fuelled start-ups & SMEs, that aims to facilitate the development of trusted and secure innovative solutions based on industrial and personal data. The REACH incubation ecosystem is composed of Data Providers, Start Ups & SMEs, Investors and Digital Innovation Hubs. For Start Ups and SMEs, as incubated companies, REACH provides different services and assets, such as:

1. A big data infrastructure available to launch data analytics jobs and deploy the Minimum Viable Products (MVPs) or applications,
2. A network of data providers which propose their business challenges and offer secure and controlled access to their proprietary datasets to use when targeting these challenges,
3. Access to digital and business skills, in form of data mentoring and business coaching to help companies to develop their experiments and turn them into market-ready solutions,
4. Ready-to-use tools and state-of-the-art technologies for increasing trust and security in data sharing and exchange (blockchain, data anonymisation and minimization components, and tools for the development of trusted-by-design applications),
5. Promotion and showcasing of solutions developed by the subgrantees.

To provide a single and integrated access point to the all the assets described above, one of the first activities to be done when starting REACH Incubator was to design and deliver the *REACH Service Catalogue*. It was conceived as an online portfolio that could showcase all the services to be provided by the REACH incubation programme, both to prospective applicants and to those that would be selected to participate in the programme. Among the different requirements to be addressed, the key ones, from a market perspective, were the following: (1) to facilitate visibility and access to the complete service offer; (2) to be easily browsable, facilitating navigation and discovery; (3) to facilitate a clear service description. Therefore, during the design stage of the involved teams, the question was: *How to organize and describe the service offer as to facilitate quick browsing, easy understanding, and communication*?

A first attempt of organizing the REACH service offer is shown in Figure 1. Services were organized around three types of services, according to major groups of services in Incubation Ecosystems, but then the issue was that all the tree main dimensions of services (Technology, Business and Finance) were integrated and fuzzy with training and skills activities. Furthermore, the data services were strictly connected with the technology one, while the ecosystem services seemed to be integrated into the Finance dimension.

Type of service		Service offer
	Technology training and support	Big Data technological trends, Big Data ecosystem, Data Science and Machine Learning, Big Data stack tools, Privacy-by design solution development, Data anonymisation and protection, Blockchain applications and solutions design, Continuous Integration & Development.
	Business development, training, and mentoring	Idea generation and materialisation, Business plan definition, Business canvas design, Communication and pitching, Business scaling up, Data legislation.
	Access to finance	Training and mentoring on Fundraising strategies, public funding opportunities, Investor pitch guidance; Matchmaking with investors, Access to investor forums and networks.

Figure 1: Summary of the REACH service offer, organized by Type of Service

To this end, service taxonomies are a powerful tool to organize, label, and manage services, since, as a taxonomy, provide features such as consistency, clarity, simplicity, alignment, and reuse. However, the issue turned out to decide which service taxonomy to use, as no standardised taxonomy for the incubation ecosystem domain was identified at this point. After looking up to different service portfolios and taxonomies closer to the domain of Incubation Ecosystems, the D-BEST service model was identified as a good candidate to be adopted, for the reasons explained in section 3.

3. D-BEST reference model: a service taxonomy for DIHs

The D-BEST reference model is a service taxonomy that derives from the I4MS Ecosystem-Technology-Business (ETB) service model [5]. The D-BEST [4] is an exhaustive and complete service reference model that is being used by different DIHs and DIH networks across Europe to organise their service offer in a consistent way. Some examples are *DIHNET* (https://dihnet.eu), *DIH4CPS (*http://dih4cps.eu*)*, or *DIH4INDUSTRY (*https://dih4industry.eu/), among others. The D-BEST service model defines 5 macro-classes on which the services are organised: (1) *Ecosystem*, covering communication and community building activities; (2) *Technology* covering hardware/software development/support activities; (3) *Business*, for business development, planning and access to financial pools; (4) *Skills* for maturity assessment, human up-skilling and training; and (5) *Data,* bringing capabilities and support for data acquisition and sensing, processing & analysis, decision-making, data sharing.

4. Application of D-BEST to describe REACH services

Although the D-BEST Service Model is defined for DIH service portfolios, or DIH Networks, it could be easily applied to/adopted in Incubation Ecosystems, since some of the incubation services are already covered by the categories provided by the model. Therefore, the service taxonomy proposed by the D-BEST reference model was adopted to implement the REACH Service Catalogue with the aim of facilitating the exploration and identification of services in a consistent way to other European service catalogues that are being developed and implemented by DIHs and DIH Networks. As a result, the REACH Service Catalogue is accessible as a web page (Figure 1), implemented as a single-page client-side web application, to facilitate delivering lightweight and responsive contents for different devices (desktop, mobile, tablets). The REACH service offer is implemented in a database, which is used by the backend to dynamically generate the list of services that are shown to the user. This design decision facilitates the updating of the service offer and the descriptions without the need to changing the user interface, thus facilitating service portfolio updating.

Even if the REACH service catalogue has been grounded based on the D-BEST reference model, the user has the possibility to look for specific services using a set of different filters: not only the D-BEST service classification (i.e., the macro-classes (1st level) and types (2nd level) of services of the reference model), but also the service providers (i.e., the list of providers belonging to the REACH network), the service outputs (i.e., consultancy, events, funding, network empowerment, sharing of ideas, sharing of physical assets, support technological business management, technology, training), and/or the incubation stages (i.e., explore, experiment, evolve, expose).

In total, 76 incubation services were included in the first version of the REACH Service Portfolio. The Table 1 presents the number of services that were instantiated per REACH incubation stage (1st column), per D-BEST macro-class (2nd and 3rd column), and type of service (4th & 5th columns).

It can be observed that most of the offer is organized around the Experiment stage, where the MVP development efforts are located, and thus the services are supporting the technical development. This differs from the last stages, where the focus is the go-to-market, and thus the services are organized around business development.
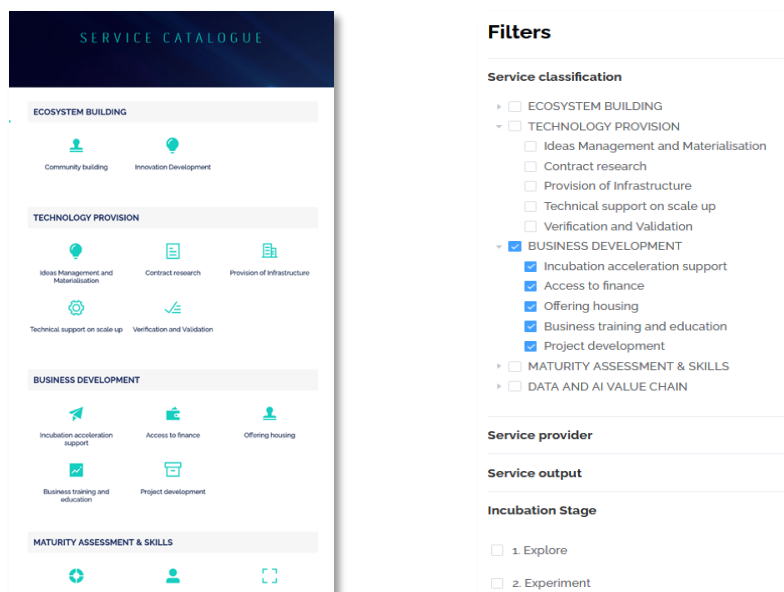
Figure 2: REACH Service Catalogue: list of service categories (left), and example of filters (right)

Table 1
Number of services that were instantiated

Stage	Macro-classes	Nº services	Types of services involved	#
1. Explore (#7)	**Business development**	2	Business training and education	2
	Data and AI value chain	2	Data sharing	2
	Ecosystem building	2	Community building	1
			Innovation Development	1
	Maturity assessment & skills	1	Skills Improvement	1
2. Experiment (#52)	**Business development**	10	Access to finance	5
			Business training and education	2
			Incubation acceleration support	3
	Data and AI value chain	20	Data acquisition and sensing	2
			Data processing & analysis	8
			Data sharing	10
	Maturity assessment & skills	1	Skills Improvement	1
	Technology provision	21	Contract research	1
			Ideas Management & Materialization	2
			Provision of Infrastructure	9
			Technical support on scale up	8
			Verification & Validation	1
3. Evolve (#12)	**Business development**	6	Access to finance	5
			Project development	1
	Ecosystem building	6	Community building	6
4. Expose (#5)	**Business development**	4	Access to finance	4
	Ecosystem building	1	Community building	1

5. Results & conclusions

This paper presented a first attempt of applying the D-BEST reference model, usually applied to configure the service portfolio of a DIH or a DIH network, to an incubation ecosystem. Within

REACH, the D-BEST service model turned out to be successful also in this domain, triggering a better management of the value proposition offered by the different service providers of the incubator, and also facilitating the understanding of which kind of services were more useful in each stage of the incubation process. Indeed, the incubation stages (i.e., explore, experiment, evolve, expose) can be used as incubation path templates to be adopted within the D-BEST based DIH Customer Journey (CJ) analysis method [6] to develop the typical paths of the incubated companies through the support of the REACH ecosystem.

A drawback that was observed during the application of D-BEST is that some services could be classified under more than a macro-class or service category. For instance, the service "Access to Big Data Stack tools" could be classified as "Data and AI > Data processing & analysis", since it provides data storage and data analytics infrastructure, but also as "Technology provision > Provision of infrastructure". This adds complexity both to the implementation of the service database (many-to-many relationships) and to the collection of data (the service provider might miss selecting categories). This was addressed by classifying the service on the closest category to the target domain, i. e. the "Data" macro-class. Another drawback is that the "Ecosystem building" macro-class was originally designed to classify DIH- or network- building services. In the incubation context, this macro-class has been used to classify services oriented towards the development of the network and positioning of the incubated company (thus supporting its go-to-market): access to brokerage/B2B meetings, access to relevant events, marketing & communication, etc.

6. Acknowledgements

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