

Fostering multi-stakeholder collaboration through co-production and rewarding

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Abstract. This paper describes a digital tool to foster sustainable engagement of stakeholders in collaborative processes, namely Collaborative Environment. A distinguishing aspect of the tool is its co-production model-based project management and its emphasis on reusability. The paper also reasons on how this tool should be effectively complemented to realize long-run and effective stakeholder collaboration, which is essential in bringing about social innovation.

Keywords: Co-production, microservices, sustainable development.

1 Introduction

Much effort has been spent by the EU and National Governments in developing regulations and procedures for the interoperability and re-use of software to enable the EU Digital single market [1, 2] and bring the Ubiquitous Computing vision into the everyday life of citizens and public administrations by innovating how public services are created. However, these “top-down”, i. e. government-pushed, approaches often fail to involve important stakeholders such as citizens and third sector organizations (TSO), thus creating outcomes that are technically sound but lack transparency and trust.

On the other hand, many examples of successful “Do It Yourself Government” [3] (Citizen to Citizen, C2C), where non-governmental actors such as TSOs carry out activities in place of the local administration (as in CAPS initiative [4]) have arisen in the last few years. Still, these approaches to service creation suffer from several breaking limitations, i.e., sustainability, accountability, and legitimacy.

Government scholars claim that *co-production* [5] might be the key to evolve towards more citizen-centric and sustainable public services, merging the benefits of top-down and bottom-up approaches. Co-production is defined as the process in which

services are jointly designed and/or delivered by public authorities and other stakeholders. Besides, a co-production approach empowers stakeholders and, hence, should lead them to feel motivated to partake throughout the process. co-production

This paper, describes our efforts [6] towards a digital co-production environment to democratize the collaborative co-design and co-delivery of public services and to boost the reuse of a continuous growing plethora of public services' building blocks, named as INTERLINKERS. Besides, it declares the need to complement co-production with auditing and rewarding mechanisms for long-term effective engagement of coproducers.

The structure of the paper is as follows. Section 2 frames the research in the context of related work. Section 3 describes the INTERLINK Collaborative Environment, a tool to foster co-production and the exploitation of reusable service building blocks. Section 4 concludes this paper disserting about possible solutions persuading users to be motivated to take part in collaborative processes for a long while.

2 Related Work

The INTERLINK H2020 project [7] builds on previous work to boost co-production of public services by fostering reuse of: a) existing open-source regulation-conformant, disruptive-technology based, software tools; and b) increasable growing online knowledge resources to support the different tasks within a co-production process. Although there are a few successful, mostly commercial, platforms that foster collaboration such as Podio [7], Microsoft Sharepoint [8], Notion.so [9], Trello[10], Google workspace[11], INTERLINK collaborative environment includes similar features on team and work management but differentiates in its adoption of co-production model-based project management and its reusability driving approach leveraged on the INTERLINKER concept, i.e. digital and non-digital reusable service enablers.

Persuading users to be actively motivated to take part in collaboration processes in a sustainable manner is complex. Past research efforts have used gamification approaches [12] to address this issue. Others have explored trusted registration mechanisms based on Blockchain [13] which provide social recognition and rewarding as an incentive to encourage long run collaboration of communities towards common objectives. The immutability of the nodes participating in a Blockchain dApp[14] encourages honesty, as a contributor who attempts to upload an invalid record of an action will be exposed to the scrutiny of all the network users. This paper reflects on how INTERLINK may incorporate contribution valorisation mechanisms in the form of tokens to incentivise and reward coproducers.

3 INTERLINK Collaborative Environment

The INTERLINK project [6] is designed to provide digital tools to guide public-private networks of stakeholders through co-production.

For that, INTERLINK identified a four sub-phase co-production process [15] (see Fig. 1) which is typically followed by coproducers (citizens, businesses, public authorities or research organizations). Each sub-phase is characterized by various problems

to solve, decisions to take, tasks to perform. For each of them, INTERLINK Collaborative Environment provides supporting functions and reusable INTERLINKERS.

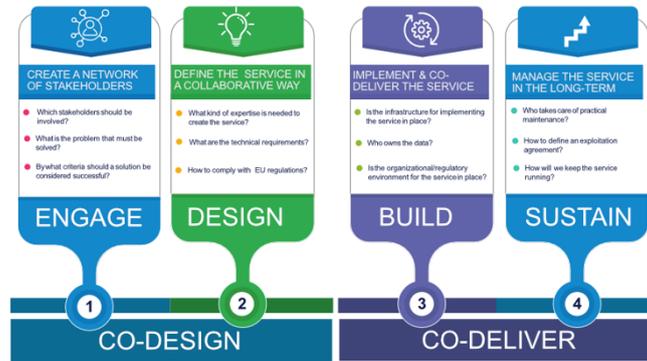


Fig. 1. Generic co-production/co-production model in INTERLINK.

3.1 Collaboration enablers: INTERLINKERS

INTERLINKERS are common building blocks, provided as software tools (*software INTERLINKER*) or in the form of knowledge offered digitally (*knowledge INTERLINKER*), that make available interoperable, re-usable, EU-compliant, standardized functionality for public service co-production management. They can be applied to the following purposes:

- *To guide co-production*: These are co-production enablers that guide and support teams in the collaborative execution of the co-production initiatives, like for example: tools for ideas crowdsourcing and collaborative decision making; tools for document sharing and file management; tools for team management. But also, knowledge resources like guidelines to perform stakeholders analysis, guidelines and materials for workshops for service design, or templates for business plans.
- *To build capacity*: These are partnership tools and knowledge resources, which tackle the legal, social, and business aspects to make co-delivered public services viable and feasible in time. For example: guidelines on GDPR for data protection; information sheets and consent forms; guidelines on the acquisition and reuse of software for public administrations.
- *To support the implementation/delivery of the public service*: These are reusable software and guidelines that help assemble the service, e.g., EU-compliant registration and authentication components or loyalty and rewards components.

Following a design pattern similar to the one in Research Object Crates (RO-CRATE) [16], INTERLINK has defined an extensible declarative model, based on JSON Schemas, to easily define new either knowledge or software INTERLINKERS.

Fig. 2 depicts the corresponding RESTful API methods to be provided by every software INTERLINKER to be neatly integrated with the collaborative environment. Notice that apart from methods required to integrate a co-production INTERLINKER with

the collaborative environment (*integrable* section) custom endpoints may be defined by each INTERLINKER, e.g. for GoogleDrive the endpoint */api/v1/assets/empty*. Observe that the main role of a software INTERLINKER is to generate and manage *assets* (or resources), e.g. a requirements spec document, which helps a coproducer team to make progress within a co-production process. Besides, notice that there is a method (*sync_users*) to ensure that users in the collaborative environment are aligned with users in the external environment behind, e.g. Google Drive.

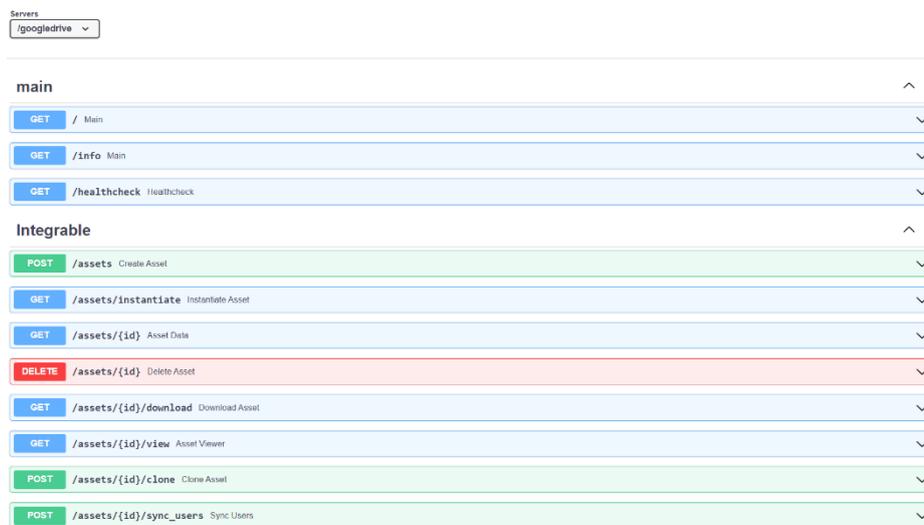


Fig. 2. INTERLINK API to be integrable in collaborative environment

The INTERLINKER catalogue provides a one-stop-shop for know-how enabling co-production. It integrates general purpose collaborative tools like the already mentioned GoogleDrive, Etherpad[17] or Loomio[18]. It has been further populated with knowledge and software INTERLINKERs leveraging resources generated in previous EU projects (WeLive, Silearning.eu or servicedesigntools.org), social innovation initiatives, and service design best practices. Some resources have been adapted to the specific needs of co-production; others are being created from scratch.

3.2 Co-production guidance through Collaborative Environment

The INTERLINK Collaborative Environment offers the following core functionalities: a) *team and project management*; b) *guide for co-production process*; c) *recommendation of INTERLINKERs* most suitable to the problem profiles represented by the chosen co-production task; d) *INTERLINKER selection and registry of use* (displaying result of using the enabler, e.g. instantiation of a Business Plan) and e) *catalogue* to be able to browse, filter and select INTERLINKERs.

The guide to co-production is based on a general model of the co-production process that represents the suggested steps in a tree, where co-production phases (engage,

design, build, sustain in Fig.1) are expanded into objectives, and actionable tasks (as shown in the central pane in Fig. 3). Notice that new co-production models can be defined which are tuned to the specifics of a co-production process and provide step-by-step guidance on the sequence of activities to be performed collaboratively, e.g. a Hackathon organization and celebration. Fig. 3 also depicts the INTERLINKERs recommendation capability of the collaborative environment. By making use of the button “*Instantiate task resource through recommended INTELINKER*”, the system recommends those INTERLINKERs most suitable for the task in hand, e.g. a “*Business Model Canvas*” would be recommended for the “*Business model specification*” task.

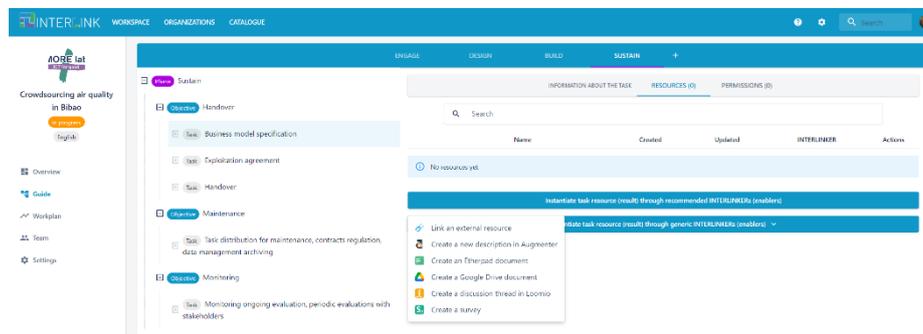


Fig. 3. INTERLINKERs instantiated out of recommendation or custom-made in a process.

4 Conclusion and further work on rewards integration

This paper has shown a tool to foster *co-production* by supporting its materialization through flexible and customizable process configurations through which co-producer teams are guided and have access to a plethora of reusable enablers, i.e. INTERLINKERs, that ease their progress in the co-production of novel public services.

However, there is a clear gap to make co-production more sustainable. Using social recognition and rewarding as an incentive to encourage active long run participation and collaboration of communities in common objectives might be a solution. If it is hard to assemble a coproducers team and encourage them to complete a whole co-production process driving into a new public service, it is even harder to guarantee that they are willing to deploy, maintain and even exploit, i.e. sustain, such a service. Consequently, in future work, we plan to extend INTERLINK Collaborative Environment with a Blockchain-based mechanism [12] to award points for co-production actions over co-production tree tasks carried out by users, which are then turned into tokens and might be converted into ownership shares of the resulting co-production artefact. Co-production brings clear benefits to each stakeholder type. Still, for it to be feasible and sustainable, those actively partaking in co-production must be recognised and rewarded. In other words, there is a need to assign value to activities around co-production. Value is mainly provided by those building and deploying the service, but also by those sponsoring or contributing, under a fee, in it. Hence, there is a clear need to work on the economic value of co-production, i.e. the concept of *co-production economy*.

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