

Fostering Innovation Through Coopetition: The *E015 Digital Ecosystem*

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Abstract. Expo Milano 2015 is expecting to welcome millions of people from around the globe. They will visit the Universal Exposition and use local services provided by public and private organizations. Thus, this event is a major opportunity to introduce innovation in all aspects of urban life. The *E015 digital ecosystem* is a multi-stakeholder service-based environment enabling the realization and integration of advanced digital services made available before, during and also after the Expo by different stakeholders. E015 operates since 2013 and aims to become one of the legacies that the Expo will leave to Milan and to the European public and private system after the event.

1 Introduction

In 2015 the city of Milan is hosting the Universal Exposition [1]. This event represents a major opportunity to introduce digital innovation in all aspects of life and mobility: infrastructures, transport, cultural and social life, accommodation, services and facilities etc. Information Technology plays a key role in pursuing this goal, since it enables the creation of new functional and operational paradigms supporting the daily life of citizens and organizations. In fact, digital technologies can change the way the different stakeholders of a *smart territory* can effectively interact and cooperate.

The *E015 digital ecosystem* [2] was developed to support Expo Milano 2015 in tackling this challenge. E015 is a multi-stakeholder service environment enabling and fostering digital interoperability between organizations and companies, mainly in support of the realization of the smart territory concept. It aims to be neutral, multi-lateral, regulated, lightweight, extensible and scalable.

E015 enables new approaches to the design and implementation of advanced digital services. It provides members with lightweight participation guidelines and a set of shared and consolidated technical standards, processes and policies to develop their products – i.e., services, end-user applications and glossaries – and interoperate with other members. Membership is free, and it is open to everybody: organizations, companies and individuals.

E015 was promoted and founded in 2010 by major Italian associations of industries and companies – Confindustria, the Chamber of Commerce of Milan,

Confcommercio, Assolombarda and Unione del Commercio. In 2011, the public utility Expo 2015 S.p.A. became full partner of the initiative and operator of the ecosystem technical infrastructure, under the scientific coordination of CEFRIEL. As the result of the convergent efforts of various actors operating in the Milan Urban Area, pilot initiatives to test E015 were started by six large companies, i.e., the major national and regional transport players – SEA, ATM, Trenitalia, Trenord, Milano Serravalle - Milano Tangenziali, Infoblu - Autostrade per l'Italia. This led to the realization of a number of real-time services focused on the Milan Urban Area mobility domain: traffic information and camera views on ring roads; status and timetables of railway services, public transport and flights in Malpensa and Linate airports; status and availability of car parking and bike sharing stations. Such services were then leveraged by different end-user applications available as mobile apps, Web sites, info kiosks etc.

At the time of writing, E015 counts about 500 members and a steadily increasing number of services, end-user applications and shared glossaries covering several domains: mobility and travel, accommodation, cultural heritage, food and beverage, news and events etc. (the current full set of E015 assets can be browsed via the public Web site [2]).

The remainder of this paper briefly illustrates the E015 reference model, business perspective and achievements.

2 E015 Reference Model

E015 is an open API ecosystem [3]. It exploits the notion of API economy [6], which provides full, bidirectional and direct interoperability among autonomous distributed applications that access and exploit shared data-driven services. Ecosystem participants can publish their services (APIs), in terms of both functionalities and usage policies, to share their data assets through standard Web service interfaces. Other participants can then discover such services and leverage them, according to the respective usage policies, for building new value-added services or new integrated applications for end-users, thus contributing to the growth of the ecosystem. The interoperability model is based on open standards.

E015 participants can play one or more of these roles (see Fig. 1):

- **Service Providers** publish part of their own information assets in the ecosystem through APIs, so that other participants can use them for building value-added services as well as end-user applications.
- **End-User Application Providers** realize Web sites, mobile apps, information kiosks etc. providing end-users with value-added contents and functions by integrating the information provided in real-time through the ecosystem services and using shared glossaries.
- **Glossary Providers** propose standard ways to represent information in the ecosystem by means of taxonomies, ontologies etc. so that participants can rely on a set of shared and consolidated data models – i.e., the E015 “common language” – for developing their software products and for interoperating with other participants.

A number of **central infrastructural components** are in place to support the operations of the ecosystem, in particular: the main Web portal and interaction environment, the registry, a lightweight service monitoring component. The E015 architectural design is modular and extensible, so that existing components can be enhanced or new ones can be added in order to fulfill new business or technical needs and requirements. E.g., new evolution trends are currently being addressed, such as semantic interoperability and digital identity federation.

The ecosystem addresses governance both at the technical and the strategic level. In particular, it relies on the following internal roles:

- The **Technical Management Board** is in charge of managing the technical and procedural aspects of E015, e.g.: maintain, evolve and disseminate technical specifications and process guidelines; manage central infrastructural components; provide technical and procedural support to participants; monitor the availability of services.
- The **Governance Board** is in charge of long-term governance and strategic evolution of E015, e.g.: management of communication and relationship at national and international level; planning and management of long-term ecosystem evolution.

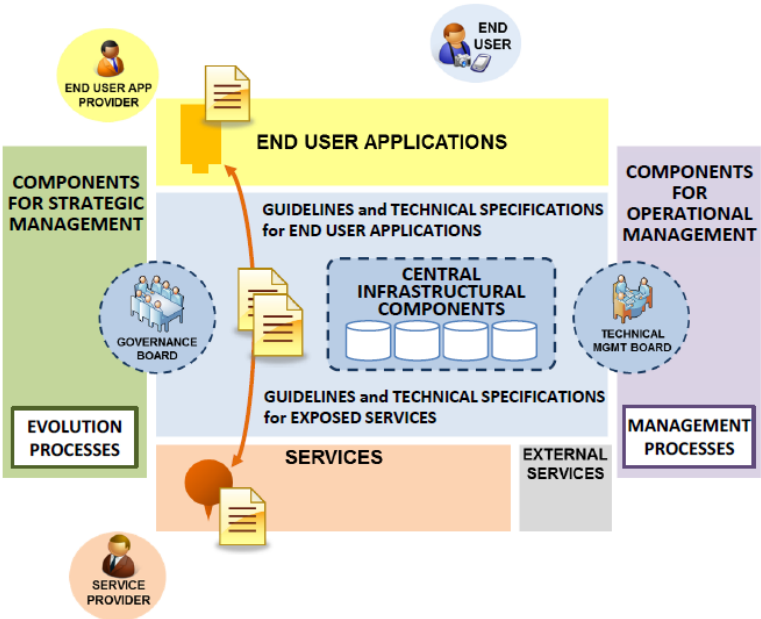


Fig. 1. High-level view of the E015 reference model

3 Coopetition in the Business Ecosystem

The “smartness” of a city or a territory derives from its ability of meeting, interacting, combining information, exploiting individual assets and pieces of knowledge in non-conventional ways, involving communities and stakeholders in an open participatory processes. This is why the founding principles of E015 are [3]: open standards, application mashup, and *coopetition*, i.e., cooperative competition – cooperation in the definition of the common architecture, standards, policies and governing processes; competition in the development of services and applications offered to the public [4].

Since the ecosystem opening in 2013, an exponentially increasing number of actors – among SMEs, large industrial companies, research institutions and public authorities – have joined E015 and are contributing services, end-user applications and glossaries. E015 thus represents an open innovation [5] process enabling new kinds of Public-Private Partnerships, and supporting new forms of institutional governance that better allow for service and information delivery.

4 Conclusion

The *E015 digital ecosystem* is enabling the creation of an innovative value chain involving private companies and public bodies by allowing rapid integration of data and services. Its current success and achievements are due to the open participatory process and coopetition model. Future development of the initiative will reinforce the capability of involving new stakeholders and citizens in the process of digital innovation. The E015 initiative will remain active and operational beyond the Expo Milano 2015 event.

Moreover, CEFRIEL is helping replicating and adapting the E015-like “ecosystem approach” to different contexts and domains, in particular: smart cities and communities, within the *Connecting Digital Cities* EIT ICT Labs Activity, and the air cargo supply chain of the Malpensa airport.

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