

Smart Government

Toward an Innovative Concept of a “One-Stop Shop” for Interactive Online Services

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Abstract—The number of available online services, their effectiveness and usage level and their level of interaction are important indicators of the “smartness” level of e-government. Increasing these indicators has positive effects not only in terms of time and effort spent by citizens and enterprises to access and use the services provided by the administration but also by triggering the optimization process of the back offices of the administration. The Municipality of Trento is launching an innovation project aimed at increasing the number, usage and interaction level of online services with the objective of moving all relevant services and processes managed by the Trento administration online. This approach is based on the innovative concept of a “one-stop shop” for interactive online services, which the Municipality wants to define and implement with the help of the Trento innovation ecosystem; going beyond the classical concept of a unique access point, Trento wants to deliver a single access point to online services that is *simple, trusted, complete, connected* and *open* to better serve the innovation needs of this core enabler of the smart city.

Index Terms—Smart Government, On-Line Services, Interactive Services, Unique Access Point, Participation.

I. INTRODUCTION

During the past twenty years, Italy, as well as other European and extra-European countries, began a silent but irreversible process within the public administration sector: renewing existing structures and services in light of usability, efficiency, and transparency is a primary goal of all projects that lie under the wide-ranging label of “e-government.” The dawning of this initiative may be traced back to legislative decree 39/1993 and to a set of guidelines at the EU level [1] [2]; but at the national level, the concept was later developed into quite different actions and directions—from digital alphabetization of public servants to the adoption of electronic ID cards, from the creation of Internet portals to the expansion of the e-procurement model [3][4]. Such a strategy was needed to (a) offer citizens (i.e., users of public services) the same

qualitative standards that they might receive in the private sector; (b) rationalize costs and investments; (c) improve the organization of public administrations at each governance level; and (d) most importantly, facilitate transparency and accountability of public institutions to promote citizens’ participation in public life [5]. The term *e-government* thus implies the application of new technologies to transactions between citizens and public administrations to make them swifter and more efficient [6].

Despite its relatively long history, e-government is still a priority at the European [7], national and local levels. The Italian Agency for the Digital Agenda suggests that the 2014–2020 policy for public administration should tackle the challenge of building a new type of common good by deploying technological and immaterial infrastructures to enable better interaction between the administration and citizens [8]. The integration of information is aimed at producing inclusion, improving citizens’ wellbeing and promoting social innovation. In the Province of Trento, e-government has been a priority during the past 15 years, but digitalization of services is still an important item in the regional strategic priorities to improve the quality of life in the territory [9].

“*Innovation in the relations between the administration and citizens and enterprises*” is also a priority for the Municipality of Trento. In particular, incrementing the number and interactivity level of online services is recognized as a mandatory objective—both to reduce the time and effort of citizens and enterprises in the interaction with the administration and to accompany the process of making the public administration (front office and back office) more efficient.

As will be discussed in this paper (see Section II), Trento has performed some important steps toward this objective during recent years. These steps have been focused more on an efficient management of the Municipality back office and on the definition and/or deployment of important enablers for

online services (e.g., support for open data, electronic payment); still, the number of online services is very limited. The Municipality of Trento is launching an aggressive plan to increase the number and interactivity of the available online services with the goal of realizing a unique access point, or “one-stop shop,” for all online services offered by Trento. The plan foresees the reuse of available solutions already adopted by Italian cities similar to Trento, the incremental adoption of this solution for all relevant services and processes, and the “opening up” of this solution and its integration with other systems and solutions—both adopted by the Municipality and developed by third parties.

This context offers a challenging opportunity to launch an innovative project that goes beyond the boundaries of the Municipality of Trento and engages the entire local innovation ecosystem for the identification, development, experimentation and adoption of innovative solutions—technical, methodological and organizational—to increase the speed and effectiveness of this digitalization process. In this paper (see Section III), we will define the goal and approach that we intend to follow to face this challenge. We will also identify and discuss priorities that need to be faced and areas in which we expect important innovative contributions; the definitions of tangible objectives (by “tangible,” we mean both measurable and clearly beneficial for the users); the promotion of a strong participation of all stakeholders at all levels (both outside and inside the municipality administration) and throughout all steps of the digitalization process; and the adoption of open platforms, standards and APIs to enable a continuous evolution of the solution, its integration with other systems of the Trento IT landscape, the engagement of third parties in the online service development and improvement process, and the exportation to other municipalities and territories. The paper will also specifically address the problem of citizens’ engagement and propose an approach to achieve this engagement (see Section IV).

II. CURRENT SITUATION IN TRENTO

Trento is consistently ranked among Italian cities with the best quality of life and the highest potential for innovation, has many ICT-related institutions and research centers, and enjoys the strong support and commitment of local authorities (municipality, province, valley communities) who enact new forms of collaboration and the creation of a proactive innovation ecosystem. These circumstances nourish an environment that has become increasingly rich in skills, knowledge and infrastructures. Trento is the ideal context to develop services that not only address the citizens’ demands but also can be codesigned with them. Moreover, Trento strives to become more than “just a lab” for these services; innovative prototypes are being created and tested, but ultimately, they are supposed to be used by citizens in their daily lives to solve real problems. The city is therefore a natural environment in which the offering of services meets the actual demand.

A. Indicators

The ideal situation just depicted, as well as its high potential for innovation in the area of e-government, has yet to be fully transformed into concrete advantages for citizens.

The situation outlined by the *Between Smart City Index*—an initiative that aims at measuring the “smartness” levels of the capital cities in the 116 Italian provinces [10]—identifies “Smart Government” as an area in which the Municipality of Trento still has wide room for improvement (see Figure 1). In particular, the level of adoption of interactive online services is very low, with the exception of online services related to the civil registry.¹

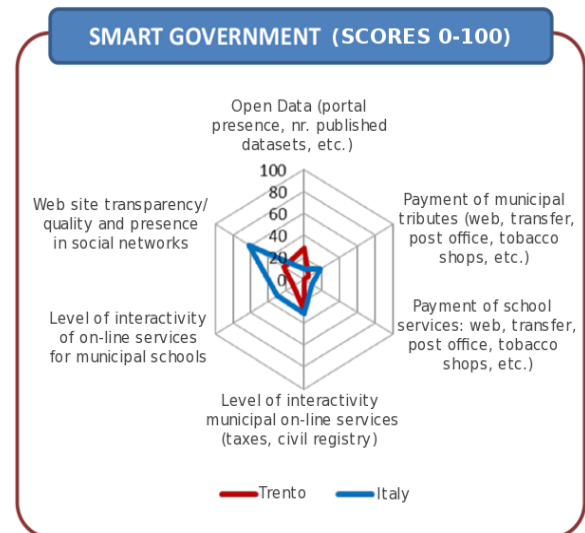


Figure 1- *Between Smart City Index for Trento [10]*

This situation occurs because even if “innovation in the relations between the public body and citizens and enterprises” is a continuing priority for the Municipality, its activities so far have been focused on the efficient management of the back-office processes rather than on putting in place and utilizing online front offices to provide services to citizens.

The Municipality has achieved important results that serve as foundations and enabling factors for the delivery of online services. First, the Municipality has achieved important results with regard to providing *open data*: Trento makes its own datasets available on its website in a specific section dedicated to open data. These data are also published on the regional government’s website (dati.trentino.it), based on CKAN. Another functionality is near completion that allows the web portal of the regional government to automatically acquire the datasets published on the Municipality website; this approach

¹ It is useful to remember that there are other important rankings on the “smartness” levels of Italian cities. Another well-known Italian ranking is edited by Forum PA [11]. In 2014, Trento was 13th among the capital cities of Italian provinces; it was first in 2013. In 2014, the ranking system was changed by introducing a specific KPI for smartness: Trento was 4th in the standard evaluation and 21st in the specific “smart” evaluation. Trento is on top in the environment KPIs and in 10th place for governance.

will allow sensible increases in the number of visible datasets. Furthermore, all structured data existing in the Municipality website are made available in JSON format at suitable end points; all useful information on the website (e.g., events, venues, public rooms, city regulations and resolutions, call for tenders, contests) will hence be accessible as open data. (For more information on the open data initiative of the Municipality of Trento, the reader can refer to [12].)

Another important enabler is the possibility of *electronic payments*. In addition to the already available services that allow payments through bank transfers, automatic cash machines and notice payment forms (MAV), the Municipality of Trento is actively participating in the regional working group on electronic payments and micro-payments, which aims to provide a unique payment gateway for all administrations in the region. This gateway, which is to be compatible with the future national node for payments, will offer the possibility to decouple the taxes or services to be paid from the payment means; citizens will have the possibility to choose their own payment instrument, thus increasing concurrency and reducing transaction costs. This process is complex and slow-moving, but it has already made the “EasyPay” system of Trentino Riscossioni (the regional tax collecting agency) available to Trento and the other local administrations.

In regard to *citizens’ participation*, the voice of the citizens found its space through “SensoRcivico,” a system to receive and manage warnings and suggestions from citizens, and through “Aiutaci a migliorare” (“Help us improve”), a system available in all pages except the homepage of the Municipality’s web portal. Regarding the presence of the Municipality of Trento on social networks, specific profiles have been created, and professionals have been chosen to constantly update them, both at a general communication level and for specific thematic communication areas (e.g., youth policies).

Finally, with regard to *online services*, the Municipality of Trento has been mainly working on systems that provide citizens with information. Some specific APPs that provide information on Trento’s tourism, mobility and waste management policies have already been released or will soon be made available. “Trento—Il Comune in tasca” (“Trento—The Municipality in your pocket”) has more than 4000 downloads; “Viaggia Trento” (“Travel Trento”) has more than 4000 downloads; “100% Riciclo” (“100% Recycling”) is under development. Further information services are provided through the “ComunWEB” project (structured open site) and “coSMoS” (a solution for receiving information via SMS as answers to questions posed in a user’s native language). All of these projects were realized in collaboration with Consorzio dei Comuni Trentini, the Regional Associations of Municipalities.

In terms of *interactive online services*—i.e., services that allow a bidirectional relation between citizens/enterprises and the administration to manage online procedures with virtual access—the coverage is very limited. Online services are available in the domain of economic activities (e.g., SUAP—productive activities’ one-stop shop) to issue civil registry forms and register with nursery schools. As discussed in the

following paragraphs, this is an area in which the Municipality of Trento intends to invest more.

B. Current plan

An important target of the Municipality of Trento toward smarter government is to increase the number and usage of interactive online services. The ultimate goal is to realize a one-stop shop or unique access point that offers integrated and facilitated access to all of the various services offered by the Municipality and that assists citizens and enterprises in finding answers to their own needs.

To achieve this goal, the first preliminary step is to install and set up a system based on a standardized model for online service delivery. This first step is part of a wider plan that foresees an incremental adoption of the system for the management of all main procedures of the Municipality and a progressive deployment on an integrated approach for the Municipality services based on a comprehensive vision of citizens’ needs and the capability to manage different access points to the services.

A set of technical requirements for the online service delivery system have been identified:

- easy access and use by citizens and enterprises, fulfilling all legal obligations concerning usability;
- easy management by the public officers;
- editable forms that allow the following:
 - advanced controls on fields, also by interfacing with internal and external databases;
 - definition of forms as composition of structured parts (atoms) that are reusable and easy to insert into the construction of new forms;
- integration with back-office systems and compatibility with the protocol system of the City;
- integration with existing payment portals, mobile wallet systems and micro-payment systems; integration with the future national node for payments;
- support for simplified methods of authentication; integration with the future SPID (Public Digital Identity System).

In addition to these technical requirements, other objectives for the project include the following:

- promoting the widespread use of electronic payments and micro-payments for city services and the services of agencies acting on behalf of the city;
- exploiting usage data from the online one-stop shop as a source of information on citizens and services; these data will be aggregated and made available for data analytics;
- spreading the solutions and models designed for Trento to the entire regional territory and the national market.

To accelerate the realization the first step of the plan (i.e., to set up an online one-stop shop model and solution), the Municipality of Trento decided to build on the experience of another municipality that has been working in this area—the city of Bergamo.

C. “Smart” reuse of the Bergamo system

Bergamo is a town in northern Italy that is similar in some ways to Trento. Some years ago, the Municipality of Bergamo wanted to promote digitalization. In this scope, Bergamo has developed a web portal (<http://territorio.comune.bergamo.it/>) that offers a wide range of interactive online services, mainly focused on themes of productive activities, building, environment, mobility and land planning.

First, the web portal has the ambition to be the virtual place where citizens and stakeholders can find all information they need in the most simple, clear and immediate way. In addition, the online users, after a strong authentication via CRS/CNS (Carta Regionale/Nazionale dei Servizi – Regional/National Service Card), can access a personal section of the portal where they can perform the following tasks:

- fill in the “smart” application forms and submit instances and requests to many offices of the public administration;
- check the status of requests already submitted;
- proceed to the payment of amounts related to instances.

Among the interesting components of the Bergamo system are the application forms, which support “smart” behavior and adaptation:

- they have a dynamic behavior based on the user’s choices;
- the contents are validated in terms of completeness, integrity and correctness of data types;
- connections to external data sources allow the pre-filling of some information or dynamic validations;
- digital signatures are automatically verified.

These features lead to a double benefit. Citizens have access to online services that provide an easy, safe and formally correct way to interact with local administrations; the back offices of the administration avoid a set of inspections and have access to native digital data.

The web portal is built on Drupal, the well-known, open-source and widespread content management platform. The functionality of the “smart” application forms are provided by a set of custom Drupal modules.

The plan for Trento foresees the adoption of the system used by Bergamo to manage in a preliminary and experimental way a limited range of procedures—some linked to specific economic domains (i.e., building and environment sectors), and others to the collectivity (i.e., social housing, registration to schools). At the end of the experimental activity, the Municipality will evaluate the outcomes and evolution of the project and—in the case of a positive outcome—will spread this model to all local procedures.

In parallel with the activation of a new online service linked to a specific procedure, the Municipality of Trento will activate a parallel project regarding the analysis of back-office processes beyond the procedure. In this way, the Municipality will have the chance to reshape and redefine the existing processes in terms of solutions offered by the new technologies. In this context, Trento is committed to activate a direct dialogue with all stakeholders involved in the process—external users (citizens, enterprises), internal users (both those

managing the procedure and those partially involved or using data and/or final outcomes) and external bodies.

D. Toward an innovative online service delivery system

This plan of the Municipality of Trento for implementing online services offers interesting elements of innovation:

- the adopted solution that is in itself “smart” because it offers advanced functionalities for managing application forms;
- the approach of reusing a solution already tested by Bergamo, which offers important possibilities to build on top of previous experiences, best practices and lessons learned;
- the concept of exploiting the process of offering new interactive online services as a way to improve the procedures associated with the delivery of these services by exploiting the data generated by the use of these services and engaging citizens and external bodies in participatory design activities.

The goal of the Municipality of Trento, however, is more ambitious. Indeed, the process of digitalizing services offers many additional opportunities of innovation, which the Municipality intends to pursue in collaboration with all actors in the local innovation ecosystem, as we will discuss in Section III.

III. INNOVATING THE DELIVERY ON ONLINE SERVICES

As discussed above, the Municipality of Trento considers the delivery of interactive online services to be a significant step toward the goal of realizing a smarter city. For this reason, Trento aims at catalyzing around this goal the interests and projects of research and innovation bodies to accelerate the digitalization process and increase its effectiveness, impact and innovation content.

In this section, we describe the innovation project that Trento is launching in the context of interactive online services. We first introduce the goal of the project, then we discuss the approach and overview some relevant ongoing activities that can be seen as precursors to the innovation project we are describing in this paper. We conclude by describing the proposed strategy to achieve the goal.

A. Goal

The main goal of the innovation project is the following:

*Increase the number and interactivity of online services...
... to reduce time spent in line by citizens and enterprises
... and to increase the efficiency of the administration.*

This goal is pursued to address two needs. The first is to reduce the time citizens and enterprises spend in line to request a service or fulfill a procedure managed by the Municipality. The second is to promote a more efficient organization (both in the front and back offices) of the administration.

The level of success in the achievement of this goal should be measured not only in terms of the number of interactive services made available but also in their capability to

significantly reduce the time spent in line by the users and to improve the efficiency of the administration.

B. Approach

The approach adopted by the innovation project is to promote the novel concept of a one-stop shop for online services. Traditionally, this concept is meant to offer to citizens and enterprises a unique access point to online services. What users want, however, is not just the availability of a *single* access point but rather a *simple* place where they can easily and quickly find and use the services that interest them. Additionally, the unique access point should be *trusted*—i.e., citizens must be confident in the services they use and in their timely, reliable, and secure delivery. It must also be *complete*—i.e., users should be assisted and accompanied during the entire service usage process. It must be *connected*—i.e., it must be integrated with existing systems and repositories to simplify and automatize, as much as possible, the delivery of services while supporting the integration of services to facilitate the reuse of information, thereby relieving users from the burden of providing information that is already available to the Municipality. Finally, the unique access point must be *open* to support extensions and integration with other services as well as a contextualized user experience (the technological enablers to achieve openness will be discussed below in “Open platforms and standards”).

The adopted approach is hence based on the novel concept of a one-stop shop for online services that revises and innovates the concept of unique access points:

Form a Single Access Point to a ...
 ... *Simple Access Point*
 ... *Trusted Access Point*
 ... *Complete Access Point*
 ... *Connected Access Point*
 ... *Open Access Point*

In the following subsection, we illustrate the priorities that must be addressed to realize this novel concept.

C. Priorities

1) Define tangible objectives

Society currently faces unprecedented challenges such as the economic crisis, the growing demand for services in the poorest sections of society, the growth and aging of the population, and important transformations in the environment (e.g., climate change) whose effects in society are still largely unclear. To face these major challenges, we must foster community building of capacity and promote a culture of accountability in the fields of both public finance and social policies. Digitalization of services offers an opportunity to apply this concept.

The *relevance of the targets* becomes a crucial point because the process of tuning and choosing them could promote an inclusive multi-stakeholder societal ecosystem rather than create conflicts between citizens who perceive that

their needs are “on target” while those of others are outside. It is important to remark that the relevance of targets cannot be checked only at definition time; it has to be continuously reassessed to consider changes in the social, economic and environmental context. In this frame, communities should have the chance to contribute to every phase of the plan-do-check-action model as a continuous democracy practice (see the next paragraph on participation). It is, however, a primary responsibility of the administration to define tangible and measurable objectives for their actions.

With regard to the specific case of online services, a strong and concrete example of a tangible objective is the goal defined by the administration of Trento: *to reduce by 50% the time spent (and thus wasted) in queues* by citizens and enterprises. Other tangible objectives should be defined and specified at a finer granularity; examples include the involvement of an increasing number of citizens and other bodies (associations, other stakeholders) in the process of participatory democracy or an increased adoption of electronic payment and the reduction of transaction costs in this payment channel. Their definition is part of the elaboration of the project.

2) Foster participation

As already recognized by the Municipality of Trento, participation is an important factor in the success of the one-stop shop online service. Participation is not limited to the users of the online services but must involve all stakeholders at all levels, including the managers and officers in the public administration together with research institutions, the university, and schools; they are indeed key players to engage for ensuring the effectiveness and efficiency of the implemented activities. The role of the Municipality is fundamental to achieve a high level of participation. It is indeed the responsibility of the administration to involve all relevant stakeholders and encourage interaction, exchange and discussion; to avoid individual initiatives; and to realize a form of governance in the participation process that is flexible, transparent, inclusive and not too formal.

To achieve a satisfactory level of participation is a complex and multitask process that involves many skills and procedures; Figure 2, for instance, lists the ten issues into which the concept of “participation” has been translated during a workshop on e-government promoted by the Municipality of Trento in December 2014.

1. *Promote social co-design; people should drive change*
2. *Put real people inside the work (procedure)*
3. *Empower people to contribute*
4. *Design tools for participation feedback*
5. *Take a picture of the reality through social storytelling*
6. *Aim for little-by-little improvements*
7. *Develop a framework pattern to evaluate public actions*
8. *Get more active people online: education and awareness*
9. *Stress the importance of civic and digital lifelong education*
10. *Involve students: university as a lab, creating new citizens*

Figure 2- Participation issues

We remark that the ultimate goal is to enable and empower people to participate and co-design the Trento of tomorrow; “people should drive the change” is a very strong statement underlying a serious bottom-up approach. Participation is hence an objective with a broader scope than just promoting online services or e-government. We discuss some guidelines to foster participation that, while being of general applicability and broad scope, are intended to be adopted specifically for the development of the one-stop shop online service.

Participation requires building a “*cultural ecosystem*” because the first problem for the development of smart cities is the cultural gap that citizens and administrators must bridge to develop an enabling ecosystem by exploiting disparate approaches such as Education 2.0, facilitation skills in participative planning (the basic concept of co-design), the creation of effective social network interaction, and the development of dedicated software for gathering proposals and suggestions directly from the people in a priority-based framework. We believe that Trento can benefit from some of the experiences gained in Guadalajara, such as those dedicated to smart city MOOCs (massive open online courses) and the living labs network.

Gamification [13],[14] is an increasingly important learning modality that could provide an important “nudge” (as defined by Richard Thaler and Cass Sustein’s work [15]) to the learning process. The role of gamification is potentially much broader as witnessed by several examples of using gamification strategies in the context of e-government. For instance, the administration of San Jose in the Santa Clara Valley, California (a city with almost 1 million inhabitants) has a long tradition of participatory budgets based on gamification tools. The adoption of this approach is growing around the world in both private and public environments. The challenge for Trento is to exploit elements, rules and techniques of gamification to help make the online service design and delivery process more engaging at all levels and in all phases of the plan-do-check-action cycle.

The last important activity that needs to be performed is to *increase trust*. Lack of trust is indeed an obstacle for the use of online services; work must be done to ensure that users (both citizens and enterprises) trust the online services together with the administration delivering them. In this respect, the different technological attitudes of users must be confronted with the available IT solutions to decrease the digital divide. Furthermore, all technological and organizational obstacles (e.g., problems in authentication, difficulties in performing electronic payments, complexity in the process or in the forms) should be analyzed and eventually removed to increase the level of trust. Finally, actions to increase transparency, promote communication campaigns, etc., should be performed to convince users to trust the services available through the unique access point.

We observe that while trust is an important aspect for participation, the reverse also holds—i.e., participation can greatly contribute to increase the level of trust. In this context, it is important to emphasize again that all stakeholders should be part of the participatory design process; trust should be

built in two directions, from citizens and users toward the administration as well as from the administration toward the citizens, users and other third parties involved in the digitalization process.

3) *Open platform and standards*

From a technological point of view, open services and platforms are the starting point for developing the unique access point with the characteristics discussed above. By running online, the unique access point can make its facilities available to users over the Internet via several interfaces such as an HTML file presented in a web browser or via a web API (application programming interface). The openness of the platforms and services allows for their reuse and integration. In this way, it should be possible to integrate heterogeneous but related services for e-government such as those for user authentication and authorization; for the public administration at the local, regional, and national levels; for online payments; for mobility; and for the family.

Orthogonal to the use of the open service paradigm, we suggest the adoption of a conceptual model for developing an infrastructure for e-government solutions divided into three layers:

- the *information layer* contains the digital information, comprising both structured (e.g., census data) and unstructured data (e.g., press releases);
- the *platform layer* is composed of the systems and hardware that process the data in the information layer (e.g., services supporting critical IT functions such as budget management or mobile devices);
- the *presentation layer* defines how the government and/or the private sector deliver government information digitally—e.g., through portals or mobile applications.

We believe that the platform layer is where next-generation e-government solutions can produce significant advances compared to those currently available. The key is to design portals, services, and APIs that are not only open but also easy to use. The latter means that these solutions (in particular, APIs) should be made public with a set of realistic use cases that illustrate their main functionalities and high-quality documentation to give users a how-to guide for their exploitation. This observation holds in both scenarios considered above—i.e., sharing information within government institutions and between the government and the citizens, possibly with different levels of access to the available information. This last issue raises the need for designing technological solutions in the platform layer with security as one of the main criteria, given the sensitivity of a large part of the data maintained by governmental agencies. If properly designed, the solutions available in the platform layer will ultimately help develop and deliver digital services and manage data in flexible and innovative ways while lowering costs and reducing duplication. Indeed, besides developing open services and APIs, it is important (in addition to providing good documentation and use cases) to actively disseminate lessons learned from early adopters, use common standards and architectures, participate in open source communities, and adopt shared government-wide solutions.

We believe that open APIs can also become key enablers for citizen participation. Ideally, an API is a self-service, one-to-many, reusable interface whose goal is to allow a wide variety of (possibly unknown) users to exploit it and create added value from the processing of the information accessed through the API for purposes that were not foreseen by its designers. From this perspective, APIs not only support the traditional activities of restructuring and extending internal systems to cope with new projects in a uniform manner but also provide opportunities to generate new ways to involve citizens in the e-government processes. With the ability to access data via APIs, citizens may create novel applications that process data to satisfy their needs.

D. Ongoing innovation activities

In the Trento region, several activities and projects are currently running whose experience can be capitalized and reused for the design and implementation of the unique access point described above. Here, we briefly describe some that are more related to the issues of citizen participation, measuring the performance of organizations, and trust-enhancing technologies.

- *ComunWEB* aims at the realization of a uniform portal for the Municipalities and Valley Communities of the Trento region. This portal is able to collect, aggregate, organize and expose data, contents and services of the public administration to better satisfy the needs of citizens and enterprises that access the resources available on the net through different modalities and channels. The ComunWEB portal is currently used by a large number of local public administrations in the Trento region, including the Municipality of Trento.
- *MyWEB* is an innovative portal through which citizens can access services and information from the public administration. MyWEB works by applying a citizen profile, which is used to customize the services and information available on the portal; e.g., families with children of distinct ages are interested in gathering information about maternity or high school. The citizen profile supports conversational (rather than transactional) interactions with the portal, thereby emphasizing the process of acquiring information or using the service for a particular purpose rather than focusing on separate exchanges. This approach has significantly contributed to create a lively community of citizens around the portal.
- *PROMO* is a collaborative platform to model business processes of organizations and establish links between processes and real-world events, such as the submission of a request for a service. The main novelty of PROMO is its capability to monitor the performance of the organization and measure the differences between the designed plan of activities and how these are actually carried out. Reports on the evaluation of performance are then presented in different formats to business process designers through an administrative dashboard or a notification mechanism, thereby allowing organizations to quickly adapt to the real and evolving needs of users. This

type of activity is beneficial to increase the confidence and trust of the users in the dependability of the services offered.

- *FIDES* aims to define a technical blueprint for a federated and interoperable identity management platform and is compliant with current regulations, such as eIDAS and Data Protection, as well as the most relevant national legislations, such as SPID (Sistema Pubblico per l'Identità Digitale, the Italian public system for digital identity). The ultimate goal is to define suitable guidelines for a privacy-preserving identity infrastructure service provider that can be used by citizens and enterprises to securely access the available online services provided by the public administration. This goal is a fundamental part of the technological infrastructure supporting the one-stop shop that will allow users to log in once and gain access to all services without being prompted to log in again at each one of them.
- *WE-LIVE* is a European (H2020) project aimed at implementing a new concept of public administration based on citizen co-created mobile urban services. The project wants to transform the current e-government approach by facilitating a more open model of design, production and delivery of public services by leveraging collaboration between public administrations, citizens and entrepreneurs. The project, started at the beginning of 2015, sees the participation of Trento as a partner and pilot city.

E. Strategy

The project is organized in three phases:

- **PHASE 1: PILOT**
The goal of this step is to pilot an existing solution (e.g., the Bergamo system) to deploy the initial version of the online service delivery system. This solution will be adopted for a selected initial set of procedures and services.
In this phase, the approach will be assessed with respect to the openness and adoption of the standard. In addition, participation and governance models will be defined. Initial priorities for service integration of a set of target (tangible) objectives and KPIs will also be produced.
- **PHASE 2: SCALE UP**
The goal is to increase the number of covered procedures and services with the long-term objective of covering all relevant procedures/services.
In this phase, the participation and governance models will be applied to ensure the engagement of all relevant stakeholders; trust building will also be a goal of this step. Tangible objectives and KPIs will be continually monitored and revised.
- **PHASE 3: OPEN**
The goal of this phase is to evolve the solution and integrate it with other platforms and solutions (payment, authentication, dashboard, participation, etc.). In this phase, the goal is also to open the platform to third-party

development. Reuse of the solution in other administrations will also be fostered in this phase.

The driving principle for the prioritization of the activities in the different phases is tangible “quick win” results for long-term, high-impact goals. Indeed, short-term results that are perceived as important by all stakeholders facilitate the engagement in the early phases; however, long-term, high-impact results ensure the impact, effectiveness and sustainability of the overall project.

IV. ENGAGEMENT OF CITIZENS

A. Scenario

The rapid transformation of economies and societies has led to growing social polarization and divergence among individuals, communities and regions. The changing demand for different types of skills in working life has created both structural unemployment and skill bottlenecks in certain sectors and occupations. At the same time, the growing uncertainty, complexity and choice have created life management problems for the citizens of advanced societies regardless of their socioeconomic and educational background. In addition, the short-term profit-orientation, high-pressure performance measurement and the emphasis on external monetary incentives have tended to make working life more stressful and less meaningful. As a result, many people feel powerless. They need new types of skills, support and empowerment to live better lives in today’s challenging society. In the past, support for everyday life was often available in the neighborhood or local community from family members, relatives, friends or neighbors. The local communities not only provided necessary domestic help but also built and maintained the local public goods and common pool resources, such as roads, mills, and irrigation systems, as well as forests, fisheries and pastures. During the postwar decades, however, industrialized societies became more individualized, mobile and market-oriented. The role of the public sector grew, and it took responsibility for many public goods and services previously provided by local communities and cooperative networks. As a result, the role of local community-based solutions became marginalized relative to markets and the public sector, and the latter took over the provision of many public goods and common pool resources (e.g., knowledge, roads, parks, security). However, there is a growing need for more customized public goods and services in today’s highly specialized, differentiated, and individualized society. People are also seeking opportunities for meaningful participation, cooperation and co-production that would better meet their social needs. Welfare states have difficulties in adjusting their “universal services” to these new needs. “One size” no longer “fits all” in the production of public goods and services. The fiscal problems of governments also leave more room for local initiatives and community-based solutions. Moreover, people today have both the will and the skills to directly participate in the development and production of local public goods and services that shape their living environments. In the future,

community-based solutions can play an increasingly prominent role in societal governance.

B. Toward an evolutionary policy-making process

If we look at the system-level effects, we can focus on risks and opportunities. The risks we have to face involve transformational and structural system failures:

- lack of strategic intelligence capacity (foresight, evaluation, benchmarking, etc.);
- lack of shared reflexive processes (dialogue among key stakeholders);
- lack of shared vision about the direction and goal of the transformation process;
- lack of coherence in policy portfolio and local activities;
- lack of understanding and foresight about user needs and wellbeing;
- lack of vertical, horizontal, and timing coordination among interdependent policy measures;
- lack of experiments and policy options;
- lack of political courage to make the required decisions;

as well as the following:

- lack of appropriate physical or knowledge infrastructure;
- absence or shortcomings in formal or informal institutional rules (laws, regulations, standards, norms, values);
- strong social ties that bind (lock in) to old structures, or ties too weak for interaction and knowledge exchange;
- lack of appropriate capabilities or resources for adaptation or utilizing opportunities.

The other side shows us the opportunities: if we try to look at these challenges from the *Connected Intelligence* [16] perspective, we can come to imagine new system-level strategies that need to be fed by civism. These strategies not only make it technically easy for all actors to join the systemic solution; they also make it attractive to do so. Such strategies involve, for example, the following:

- developing and communicating a shared vision for platform evolution.
- building consensus among a small group of influential firms for the vision and new initiatives.
- identifying and targeting system bottlenecks.
- distributing tools and enabling technologies to help outside firms develop complements fitting the vision.
- highlighting business opportunities and helping leading firms stimulate the market in different areas.
- facilitating multi-firm initiatives to reduce system bottlenecks and promote new standards, interfaces, and applications.

An enabler for an evolutionary approach to policy making is the stewardship role of government. This framework combines strategic intelligence activities with the evolutionary approach of niche creation, variation, selection and growth. Pushing toward this type of societal challenge and transformation in economics requires the achievement of irreversible improvements in dominant human economic behaviors and activities through embodied skills and higher

quality standards. If we want to step into a social cohesion path, we must look at these practices also from the enterprise point of view. Individual organizations can maximize the value of impact metrics by integrating them with financial and operational metrics to inform both day-to-day decision making and longer-term strategic planning. Multiple enterprises in a sector can collaborate to demonstrate collective scale, channel resources to the most impactful and efficient activities, and start building a base of evidence about what works around a shared learning agenda. The practice of measuring impact has come a long way, but we have yet to realize its potential in creating value for individual enterprises and society at large.

C. Participatory and community-based governance model

Using this connected intelligence lens and starting from the “smart community” point of view described before, to engage the citizens in a long-term smart city initiative, first of all we must clearly draft the process through which they are invited to contribute and then describe each action step by step, with its different target, KPIs and metrics.

There are various benefits in the more participatory and community-based governance arrangements (peer-to-peer networks, cooperatives, public-private-people partnerships, etc.) in today’s society. They achieve the following:

- build on local assets and knowledge instead of focusing on problems (“asset-based” approach);
- develop individual skills, strong relationships, trust and social cohesion;
- make citizens active subjects and enlist their internal motivation and energy;
- encourage local experimentation and innovation (new combinations of diverse knowledge);
- promote wellbeing by satisfying participants’ social and psychological needs;
- provide effective and cost-efficient local governance solutions to collective goods problems;
- strengthen democracy by adding an active local and participatory layer.

To achieve our goals with strong citizen engagement, we must overcome top-down schemes of interaction and practice a “permanent beta test” participatory and community-based governance model. Our governance multi-stakeholder model spreads through four phases:

1) PLAN

- Define
 - the stakeholders and engage them
 - the problems to be faced
- Co-design emerging solutions

2) DO (and measure)

- INPUT: resources needed
- OUTPUT: facts and figures, the activities performed in numbers
- CHANGE: description (impact narratives), from the output to the outcomes

3) CHECK

- What is the “dead weight”? (something that we have not considered while measuring impact)

- What is the real impact of the action/project? (measure SROI ratio)

4) ACTION

- Write a final report to be delivered to every stakeholder; open to new calls

D. Metrics

There are seven important issues in relation to the assessment of social innovation:

- Why is social innovation assessment important?
- Who is or should be measuring the impact?
- How is social innovation impact measurement currently interpreted in existing research, policies and practice?
- Which methods are most commonly adopted?
- What are the implications of using these methods and tools?
- What are the main deficiencies of these methods and tools?
- Where could the method be most usefully applied?

The acceptance of quantitative results emerges as a common school of thought. The transfer of qualitative results into understandable data can prove to be a complicated task that needs specialization. However, there are methods that ascertain qualitative results (e.g., quality of life indicators, wellbeing indicators). These tools that can measure social innovation are not to be considered as a rulebook but rather as a stepping stone—a way to follow the assessment process of an intervention.

There are two main categories that can be measured—the outputs and the impact. The outputs are the tangible products of the social intervention process and are easy to measure. Conversely, the impacts are the effects that are delayed in time and are shown as direct or indirect results of the intervention. They are harder to observe, follow and assess and can be abstract or even intangible. Impacts appear in many forms and types:

- Social capital: specific benefits that flow from trust, reciprocity, information and cooperation within a social network.
- Social value: the measurement of importance or desirability of something to someone.
- Social worth: tacit, measurable and objective value of an impact based on a monetary scale (e.g., the expenditure of man-hours).
- Awareness.
- Increased participation: willingness to accept new methods or practices that are a social innovation principle either for the common good or on a personal level.

E. KPIs (qualitative and quantitative)

- Renewing our understanding of wellbeing: periodic surveys for every age target.
- Investing in human capital: increase % digital inclusion; enforce funds; lower % functional analphabetism).
- Empowering individuals and communities: strengthen neighborhood collaboration.

- Realizing the potential of the elderly: increase the % of individuals satisfied with their lives; measure the % experiencing degenerative sickness.
- Developing coherent, sociable, and low-carbon living environments: increase the % eco-transport.
- Building new business ecosystems (helping public-private initiatives and supporting impact financing).
- Pursuing resource efficiency and non-material growth:
 - reduce the % material and energy intensity of goods or services,
 - increase the use of renewable resources,
 - increase the recyclability of materials,
 - increase the durability of products,
 - reduce the dispersion of toxic materials,
 - increase the service intensity of production.
- Embracing all stakeholders of the firm (putting participation inside the management of the business to lower the conflict of capital work).
- Improving economic competitiveness: benchmark analysis and leverage the % firm internationalization.
- Learning a more sustainable culture: periodical surveys to measure cultural behaviors.
- Strengthening resilience (the increasing prevalence of “black swans” (N.N. Taleb strong metaphor) and X-events suggests that resilience—the capacity of a system to bounce back or even benefit from an unexpected shock—is increasingly important for sustainability in today’s unpredictable world).

V. CONCLUSIONS

In this paper, we have presented the current situation of the Trento municipality regarding the delivery of interactive online services, a cornerstone of the municipality’s e-government plan and strategy toward a smarter city. We have identified the limits of the current situation and discussed the current plan that Trento is deploying to increase the number and level of interaction in the offered online services. We have discussed that this digitalization process offer a unique opportunity to launch an innovation project that goes beyond the boundaries of the Municipality of Trento, engages the entire local innovation ecosystem, and aims to deliver innovative solutions—technical, methodological and organizational—to increase the speed and effectiveness of online service delivery. This innovation project is based on the novel concept of a one-stop shop for online services; going beyond the classical concept of a unique access point, Trento wants to offer to citizens and enterprises a *single* access point that is also—most importantly—*simple, trusted, complete, connected and open*. The next steps of this innovation project concern the deployment of an initial solution that supports online service delivery and that reuses existing solutions already adopted by Italian municipalities. With this enabler in place, the project will activate participatory design activities to accompany the process of bringing online services and

procedures and ensure the engagement of all involved stakeholders. It will also foster the technical evolution of the solution by the adoption of open architectures, APIs and standards as a way to enable third parties to integrate innovative components to support the fast, robust and efficient delivery of online services.

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