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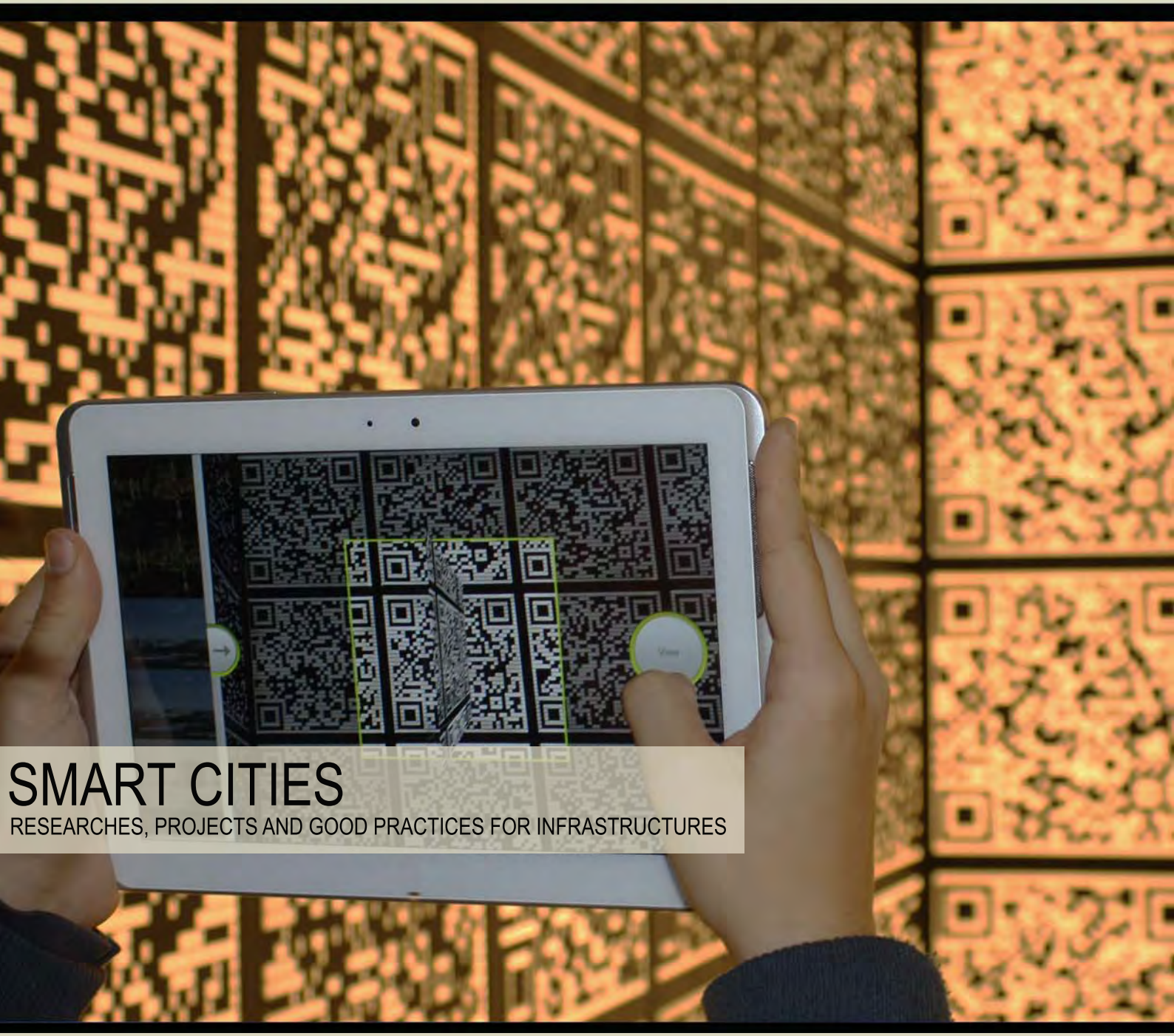

SMART CITIES

RESEARCHES, PROJECTS AND GOOD PRACTICES FOR INFRASTRUCTURES

Vol.6 n.3 December 2013

print ISSN 1970-9889 e-ISSN 1970-9870
University of Naples Federico II

TeMA Journal of
Land Use, Mobility and Environment

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3 (2013)

Published by
Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"

TeMA is realised by CAB - Center for Libraries at “Federico II” University of Naples using Open Journal System

Editor-in-chief: Rocco Papa
print ISSN 1970-9889 | on line ISSN 1970-9870
Lycence: Cancelleria del Tribunale di Napoli, n° 6 of 29/01/2008

Editorial correspondence
Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"
Piazzale Tecchio, 80
80125 Naples
web: www.tema.unina.it
e-mail: redazione.tema@unina.it

TeMA Journal of Land Use, Mobility and Environment

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TeMA
Journal of
Land Use, Mobility and Environment

TeMA 3 (2013) 293-309
print ISSN 1970-9889, e- ISSN 1970-9870
DOI: 10.6092/1970-9870/1931

review paper. received 29 September 2013, accepted 30 November 2013
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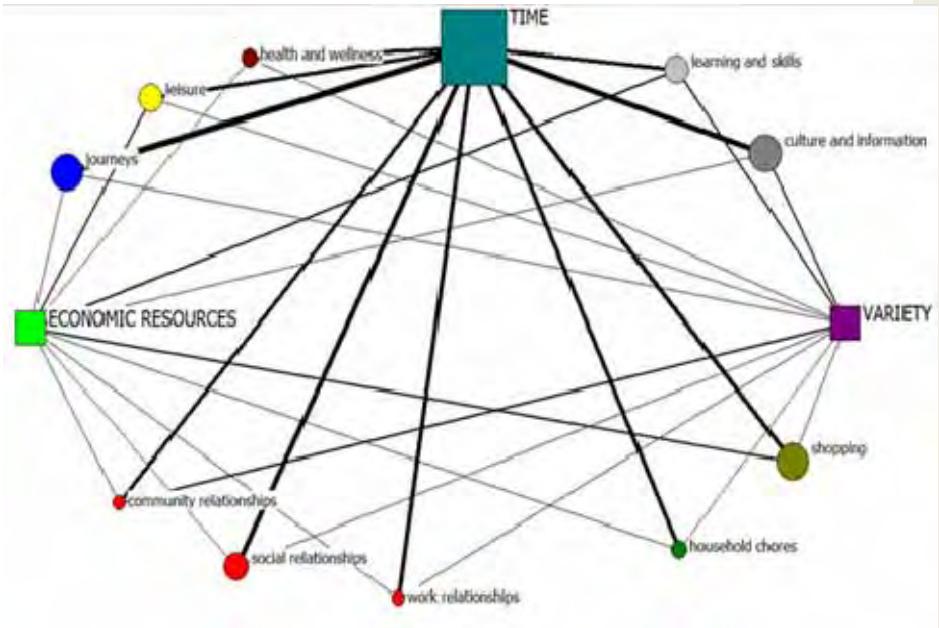


COLLECTING DISTRIBUTED KNOWLEDGE for COMMUNITY'S SMART CHANGES

SYLVIE OCCELLI, ALESSANDRO SCIULLO

IRES- Istituto di Ricerche Economico Sociali del Piemonte, Via Nizza 18, 10125 Turin, Italy
e-mail: occelli@ires.piemonte.it, sciullo@ires.piemonte.it

ABSTRACT

The paper deals with the role of ICT in innovating government's and the whole process of "policy production process".
By enhancing the connections between various governmental and social organizations, ICT supported knowledge flow s and the associated Socio Technical System may be a vehicle to support innovation in the public sector. In fact, they would enable governments to better cope with the uncertainties of a complex environment.
The MIDA Project carried out in the territory of Asti Province (Piedmont) can be considered as an attempt to engage in building such as a system.
The Project uses a crowd sourcing approach and it involves citizens in collecting data concerning broadband coverage, Internet access and usages.
From a research standpoint, MIDA represented an opportunity to test the role of Internet as a dynamic collaborative environment where statistically relevant data and interpreted information could be merged.
In terms of policy, the project stood as an opportunity for the local government to engage itself in a new policy approach to grasp people's needs and improve service delivery.

KEYWORDS:
policy innovation, socio technical system, crowd-sourcing, collective learning.

1 INTRODUCTION

1.1 BACKGROUND: PUBLIC SECTOR ON THE MOVE

This paper is concerned with ICT supported knowledge and its role to spur innovation in government and the whole policy production process. Lately a main shift has taken place in ICT government programs as these are evolving from being narrowly defined as a technology to enhance the efficiency of transactions through ICT applications, to a system approach facilitating the linkages between the various government departments and social organizations (Occelli, 2102a).

ICT supported knowledge flows accompanying and/or underlying these linkages (what in the literature has been popularized as Socio Technical Systems). Indeed, they have a foundational role in establishing (new) infrastructure for policy activity and service delivery. Moreover, they help achieving greater openness and transparency in the government transformations, while reinforcing resilience in the transformation processes (see Maier-Rabler and Huber, 2011, Davoudi, 2012). ICT supported knowledge flows (STS), in fact, are a main vehicle for empowering changes (sustaining innovation) in the public sector, while enabling government organizations to better cope with the uncertainties of a complex environment (see Nograsek, 2011, Witworth, 2009). Ultimately, they are a crucial determinant in establishing the smartness of today cities and local communities (IBM, 2013, Nim and Pardo, 2011).

1.2 THE STUDY CONTEXT AND MOTIVATIONS

The above arguments are also true for Piedmont, where since 2005 an observatory has been established, the Piedmont ICT Observatory (PICTO), with the aim to accompany and monitor the deployment of the 2005-2009 broadband programme in the region. As this came to a completion in 2010, a number of thorny questions became apparent, concerning the role of ICT in supporting the regional smart growth as required by the Europe 2020 strategy. Among them, how to properly leverage the cascade of changes produced by broadband/Internet and how to address the new types of digital divides likely to be caused by an increasing demand variety of higher performance broadband services.

It became apparent therefore that PICTO's earlier concern to provide a pertinent observation lens of ICT spreading in the region, needed to be extended to better account for the technology impacts as agents and organizations appropriate of ICT in social practices and transform their original functions.

In 2012, the collaboration with the Asti Province provided an opportunity to address some of these issues. Situated in the central hilly part of Piedmont, Asti is a relatively small area (220.000 inhabitants), mostly rural, where, in spite (or because) of forms of digital divides persisting, awareness over the potential of broadband has increased over time. To better target future ICT policy initiatives in the area, the local government decided to engage in what back then was unique experiment within the Italian context. With the scientific support of PICTO and the institutional endorsement of the R&D Department of the Piedmont Region, it launched a project (Monitoring Ict Digital Divide in Asti, the so called MIDA project) which directly involved citizens in the data collecting activity concerning broadband coverage, Internet access and usages.

Notwithstanding a shared interest by all supporters for testing in vivo an innovative approach, different objectives motivated the experiment:

a) an overarching policy goal to have more reliable (and geo-referenced) information about the quality of broadband services at municipal and sub-municipal level (as required by the European Digital Agenda);

b) a management purpose associated with the need to establish a platform for information exchange between citizens and governmental bodies allowing for quicker service delivery at sub-regional level (as hoped for by national e-government initiatives);

c) a research interest, stimulated mainly by the opportunity to explore a new type of approach for collecting information about ICT equipment and usage.

This paper gives an account of the main results of the MIDA project, focusing in particular on those more oriented at addressing some research issues which are also

- data vs. knowledge issue, that is the possibility to collect more relevant data, better understand the available ones, give meaning to them and use the more performing information for relevant action;
- involving recipients of a policy initiative at the early stage of a policy;
- investigating new kind of knowledge, and namely the possibility to connect quantitative and qualitative information.

To fulfil these purposes, the paper has been organised in four sections.

Section two gives an overview of the main challenges government organizations are confronted with for making their activities more open, efficient and effectives. In section three the context of the study is introduced and the Asti situation briefly outlined. Section four recalls the project design and discusses its main results. Finally, some general remarks and suggestions for future research are outlined in section five.

2. A CHANGING GOVERNMENT ENVIRONMENT

Notwithstanding considerable progress has been made over the last decade, the impact of ICT applications in policy practices has been limited or, at least, their results in terms of public service effectiveness and efficiency have not matched the expectations.

The reasons are manifold and can be attributed to various factors such as: i) the difficulties in keeping up with the rapid pace of technological improvements; ii) the lack of resources and competences to comply with ICT regulative frameworks; iii) the inertia in the overall government organization.

In Piedmont, some of these questions have been regularly investigated since 2005, when an observatory was established, the Piedmont ICT Observatory (PICTO), to accompany and monitor the deployment of the 2005-2009 broadband programme in the region.

When the programme came to a completion in 2010, a number of thorny questions arose.

First, as observed in other countries (see for example Centeno, van Revel and Burgleman, 2005, Navarra and Cornford, 2007) some shortcomings in the currently implemented approaches became apparent as most regional e-government programs turned out to be too narrowly conceived. Being mainly aimed at enhancing the efficiency of transactions through ICT applications, they paid little attention at the relational capability of ICT applications, i.e. how their usage could enhance the linking among the different government departments and between institutions and citizens. In addition, most of the programs proved unable to keep the pace with the technological advancement and exploit the potential of new applications, such as those based on web 2.0 and social networks.

Second, it was understood that fresh opportunities existed in the role ICT could play in supporting the regional/local growth paths as required by the Europe 2020 strategy, i.e. by properly leveraging the cascade of changes produced by broadband/Internet and addressing the new types of digital divides likely to be caused by an increasing demand of diverse and higher performance broadband services.

More generally, the questioning gives ground to the idea that in order to get full advantage of technology, government organizations have to re-mould themselves and namely to change their working while better

adapting to the context (see Australian Government Department of Innovation, Industry, Science and Research, 2011, OASIS, 2011, Occelli, 2012a, Scholl, 2003, Swederberg and Douglas, 2003). That is it is becoming increasingly apparent that (also) government organizations have to engage in a co-evolving process of mutual adaptation (see for example Middleton-Kelly, 2011, Gill-Garcia, 2012), whereby reflection about it is itself part of the process (Occelli, 2006, 2008).

In Piedmont as well as in Italy, the issue has been generally overlooked as other questions related to the efficiency of public administration, the steady reduction in public funding and the viscosity of inter-institutional relationships were considered as more prominent.

Indeed, considering innovation as a way to empower changes has never been a main concern in the public sector (see NESTA, 2008), mainly because: a. the fact that in the public sector most transformations are imposed by legislation or political changes, b. the weakness of ecological forces of competition and the risky aversion attitude in the public sector and c. the difficulty to have clear indications of the benefits yielded by the outcomes of the programs, in term of public value.

The mandatory nature of many e-government initiatives, is also a major explanation for the ICT diffusion trend observed in the local authorities of Piedmont, where progress in the last decade has taken place with boots and straps according to legislation (see PICTO, 2012).

Recently, some weak signals revealed by PICTO findings suggest that new possibilities may exist. As the socio technical infrastructure implemented by the regional broadband program consolidates and more open and transparent government websites are created, new opportunities exist for (ICT based) information delivery and creation. Indeed, they can support more comprehensive, robust, and socially oriented e-government programs. Information about the whole as well as the different components of service production process turns out to be one of the main drives for innovative changes in government organizations to take place. It is an essential ingredient for achieving cost effectiveness, and, up to a certain point, to increase variety in the service bundles and their delivery alternatives.

As widely documented in the literature (see Berra, 2007, Castells, 2004, van Dijk and Winters-van Beek, 2009, Wellman, 2003, Whitworth, 2009) ICT networks are crucial enablers for these processes because: a) they facilitate the valuable connection between the internal and external observation lens of the different actors involved in government programs, b) they facilitate the inclusion of service users as a main information source in reference to the service performance and expectation and c) they make it possible to create (adapt) new so-called Socio Technical Systems, through which those programs are implemented in situated context.

3. THE PIEDMONT REGIONAL CONTEXT AND THE ASTI PROVINCE

3.1 ICT PENETRATION IN THE REGION

With the completion of the five-year regional broadband programme in 2010 the skeleton of a region wide socio technical infrastructure was established in Piedmont. Its impact on the penetration of the Internet and web related services has been noticeable, although the development of e-government services depended very much on the evolution of the national agenda and were led by the Italian public administration laws.

To date, almost all municipalities and government offices in the region are now equipped with the basic ICT infrastructures and services (broadband, certified e-mail, digital signature and institutional websites). The interactivity level of online services, however, is still low and limited to the provision of fill-in forms to prompt administrative procedures. The most widespread online service is population registry self-certification,

followed by property tax payment, which is also the most widely available among the transactional services. ICT presence is the highest in core administrative back office services, such as taxes, demographics and financial services. These services are often managed inside the administration (CRC-PICTO, 2012).

One municipality out of four perceives ICT equipment cost as the main barrier to ICT penetration in the organization, Fig.1.

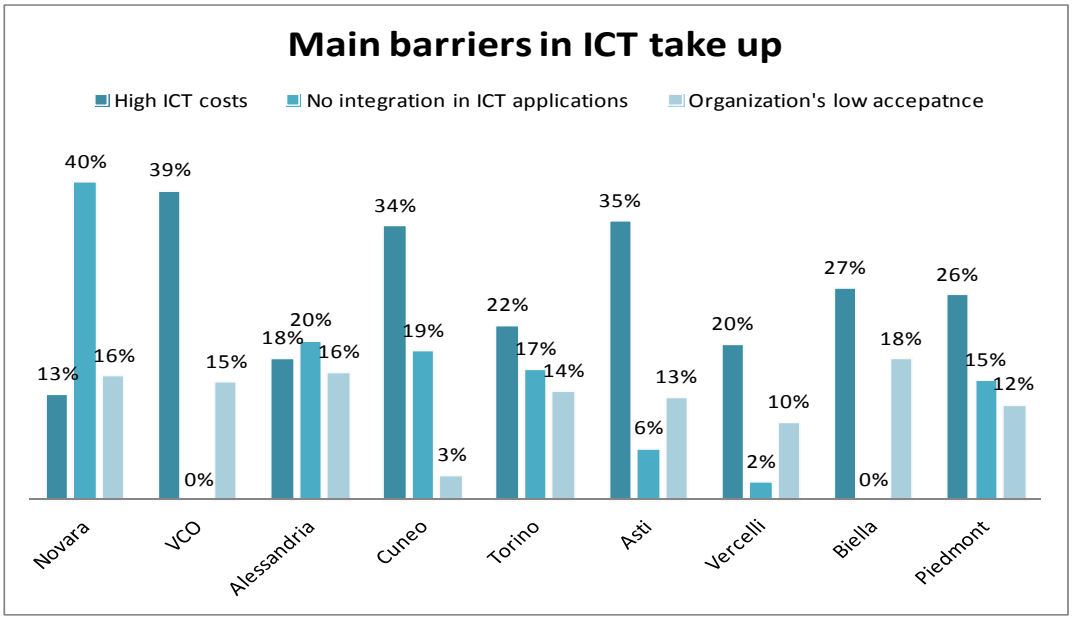


Figure 1 Main barriers in ICT take up by municipalities in Piedmont province, 2011

Additional difficulties emerge in the low capability to exploit, or at least to properly handle, the cascade of changes produced by the ICT usages.

In 2011, the PICTO survey on ICT diffusion among local authorities investigated some of these aspects[1] and reported on:

the front-office oriented action domains, such as better understanding the users' needs, improving the quality of service and promoting new functionalities in service delivery;

the back-office oriented changes, meant at improving service accessibility interoperability and personnel's ICT skills and competence, simplifying access procedures and norm revision.

Results show that, so far, awareness by local authorities on the possibilities offered by ICT to design service upgrading and/or upgrade existing functionalities is still low.

[1] A sample of 189 municipalities, out of 1206, were surveyed. The questionnaire investigated all the back office activities and for some of them assessed some main underlying dimensions, such as costs, skills of the employees, quality of services, functionality, etc.(see, PICTO-CRC, 2012).

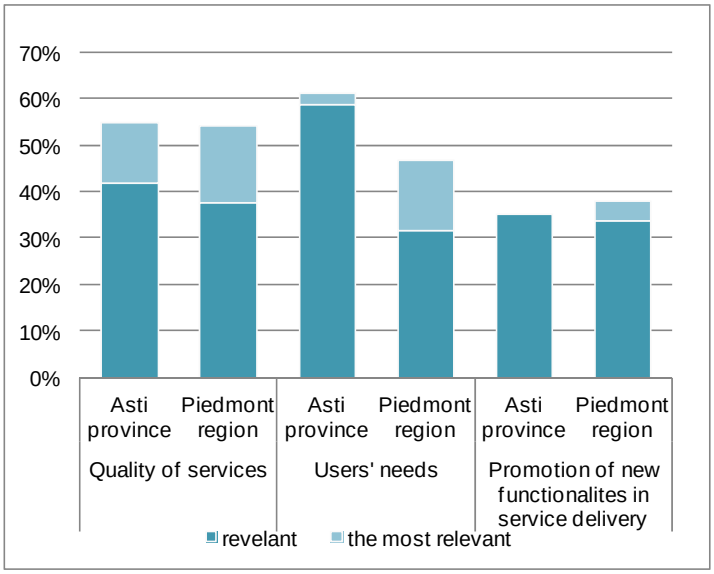


Figure 2 Main action domains for improving online service for citizens by municipalities in the Piedmont region and Asti province, 2011

As for the action domains, only half of the municipalities considered the quality of service and users' needs as important (or the most important) domains for action, Fig.2. Compared with the regional profile, the Asti province showed a greater concern for having better insights into users' need.

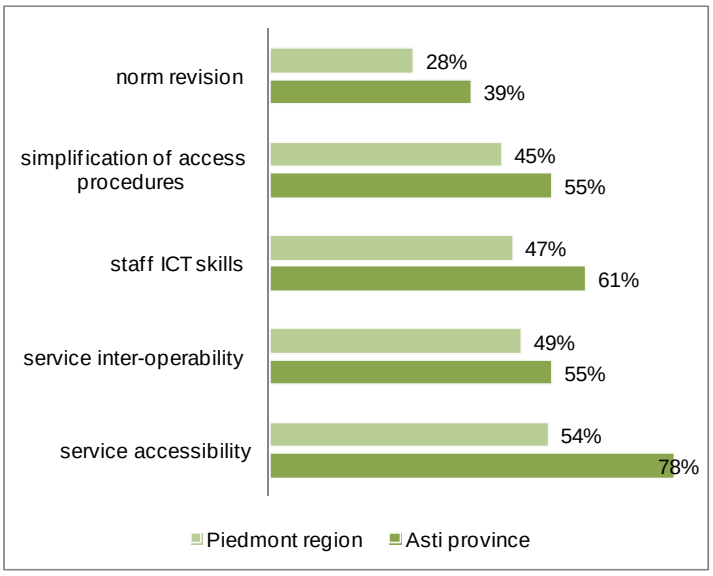


Figure 3 Main target areas for improving online service for citizens, by the Piedmont region and Asti province

Requirements for back-office changes were however more evident.

About half of the municipalities reported that the majority of the existing services needed to be improved, Fig.3.

In particular, service accessibility and inter-operability were identified as a main area of improvement, whereas revision of norms and regulation were regarded as the least important.
As shown in Fig. 3, with respect to these aspects, the Asti province showed a relatively higher sensitivity than the region as a whole.

4. ENGAGING CITIZENS IN KNOWLEDGE BUILDING IN THE ASTI PROVINCE

4.1 THE PROJECT DESIGN

It is against this background that, in order to better assess broadband needs in the area, the local government decided to launch the MIDA (Monitoring Ict Divide Asti) Project .
Taking inspiration from a crowdsourcing approach (see, Goodchild 2007), the population of Asti aged between 15 and 74 was invited to participate to a wide information gathering activity to assess the quality of their broadband connections and investigate their *daily practices* in ICT usages. People were asked:
to send via mobile phone SMS, geo-referenced information about the quality of home/places broadband access;
to answer a web questionnaire investigating the availability of broadband services and Internet utilizations. Designed according to the data collection protocol and used for implementing the EU Digital Agenda Indicators, the questionnaire also tries to elucidate the perceptions of the benefits obtained by individuals in using ~~the~~ Internet in their daily practices. As the nature of internet use has changed over time, the question wording was meant to reflect new behaviours;
to tell the story of what they consider as their most positive Internet experience.
Launched in mid September 2012, the data gathering campaign lasted about one month and a half and had ended by October. Real time information about the data gathering progress was provided by the Asti Province website, Fig.4.

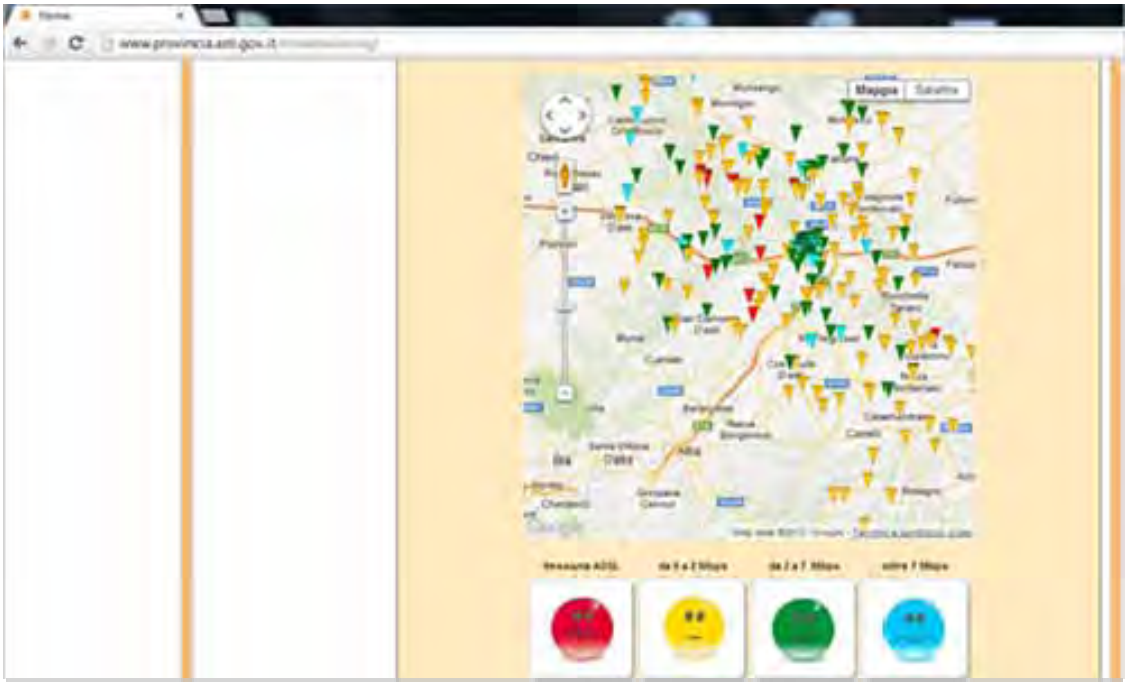


Figure 4 The MIDA webpage with the results of the data gathering activity during the survey

3.2 THE PROJECT RESULTS

Notwithstanding the efforts made by the Asti province to promote the initiative through the local media and schools, the participation to the project was below expectations. Only three hundred and a half people sent the information about the broadband access. Two out of three also answered to the online questionnaire. Very few offered their successful stories about using Internet.

The reasons of this low participation are manifold, but can be justified according to the following explanations.

The first has to do with the general climate of uncertainty, which because of the turmoil in the economy, in Piedmont as in rest of the country, is affecting most of the social practices. This situation did not allow for an innovative project such as MIDA to catalyse the citizens' interest. Indeed, as reliability in governmental action has been progressively declining over the last months, the project was unable to be regarded as attractive by citizens.

A second explanation has to do with the fact that the enthusiasm and expectations of the promoters for this kind of initiative were most likely too high compared with the real interests of people. To some extent, this also suggests that there is a sort of dis-alignment between how experts interpret e-government problems/solutions and how people perceive using e-government services.

Finally, the existence of inertia and/or socio-cultural barriers to change is an additional factor, which was probably underestimated, and might have prevented people' participation.

A partial support to this explanation is offered by the results of the ICT diffusion survey carried out by the Italian National Bureau of Statistics in 2011, Fig.5. This last shows that, compared with other Italian regions, Piedmont is not among those most advanced in using ICT for communication and e-government.

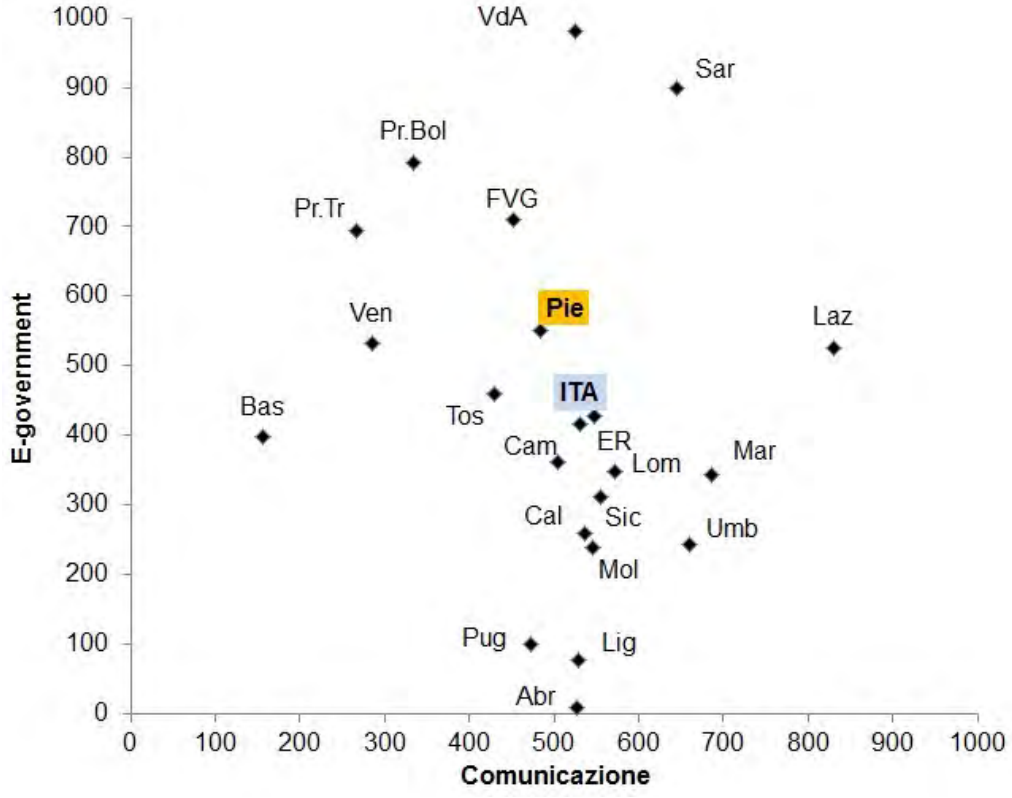


Figure 5 A joint analysis of ICT for communicating and using e-government services by citizens in Italian regions, 2011 (*)

(*) Averages values of normalised elementary indicators (see PICTO, 2013, chapter 4)

Not unexpectedly, the MIDA respondent profile is only partially representative of the resident population. A larger majority made of young (one out five was 20 year old) and adult population (about 30% was aged between 40-50). 80% of respondents belonged to households with a low or medium income; households with 3 or more components were over represented (80%). One respondent out of four had a high education level, and this proportion was significantly larger compared with the average in the area. Students accounted for 23% of the respondents, and 60% were employees mostly in clerical professions.

On the whole, the respondent profile reveals features generally associated with a certain propensity to adopt ICT and engage in their use. Actually, almost all the respondents to the MIDA questionnaire were Internet users.

In the following, attention is focused on the profile of Internet utilizations on the perception of the benefits accrued to individuals in using the web in their daily practices.

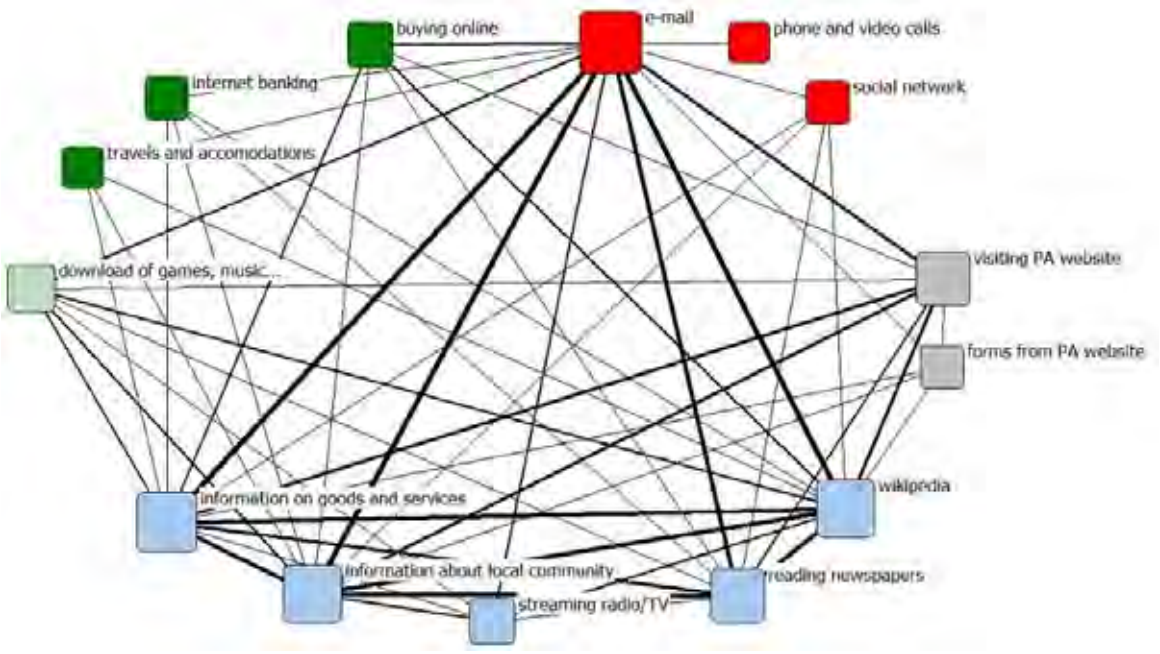
Table 1 shows the list of Internet uses, which have been investigated in the MIDA project. It also provides a measure of the relative importance of each usage (degree) which results from an application of a Social Network Analysis meant to analyse the connections among the different usages.

Fig.6 graphically shows the network of the overall connections. Not unexpectedly, e-mail and online payment to PA are the most and least popular utilization of the web, respectively. The former, in particular, is more strongly connected with the search of information (about goods, service and local community) the use of Wikipedia and the access to online newspaper.

A high connectivity is also exposed between visiting PA websites and using the web for information search.

Rank	Internet usage	Degree	Rank	Use	Degree
1	e-mail	59,5	13	forms from PA site	39,7
2	Wikipedia	58,0	14	phone and video calls	39,5
3	information about local community	57,3	15	upload of texts, pictures	39,1
4	Information about goods and services	57,2	16	Forum	34,7
5	reading newspapers	54,8	17	selling online	26,8
6	visiting PA website	50,6	18	sending filled forms to PA site	23,5
7	download of games, music	47,6	19	gaming online	23,3
8	buying online	46,8	20	creation of websites and blog	19,9
9	streaming radio/TV	45,6	21	adding contents in wiki-like sites	19,4
10	social network	43,5	22	job searching	15,9
11	Internet banking	43,3	23	E-learning	15,8
12	travels and accommodations	41,1	24	payment online to PA	13,3

Table 1 List of Internet usages by relative importance within the network of Internet usages for the MIDA respondents (*)
(*) The degree value is normalised according to the tie maximum value.



Tie statistics: min 8; max 157; average (density) 59,9; standard deviation 35,2

Figure 6 Network of Internet usages for the MIDA respondents (*)
(*) Only ties above the average plus ½ standard deviation are shown.

To investigate the benefits of using Internet, it was asked to citizens to choose whether in undertaking their social practices, the positive impact in using the web was a result of: a) relaxed time constraints (time saving), b) reduced costs of carrying out an activity (economic resources) or c) access to a wider range of alternatives in carrying out a certain activity (variety of alternatives).

For more than 60% of the respondents, the most significant impact was felt with regard to time savings, while the other two constraints accounted for about a similar share (20%). Overall, this impact was relatively more important for adults (between 50 and 60 years).

The graph of Fig.7 details the results by social practices. It shows that time savings (TIME) has had a positive impact above all on journeys and socio-cultural activities. Not unexpectedly, shopping and learning activities are relatively more sensitive to a greater availability of economic resources (ECONOMIC RESOURCES).

Having the opportunity to access a greater variety of alternatives (VARIETY) is perceived to have a relatively higher positive impact on the relationships with the local community.

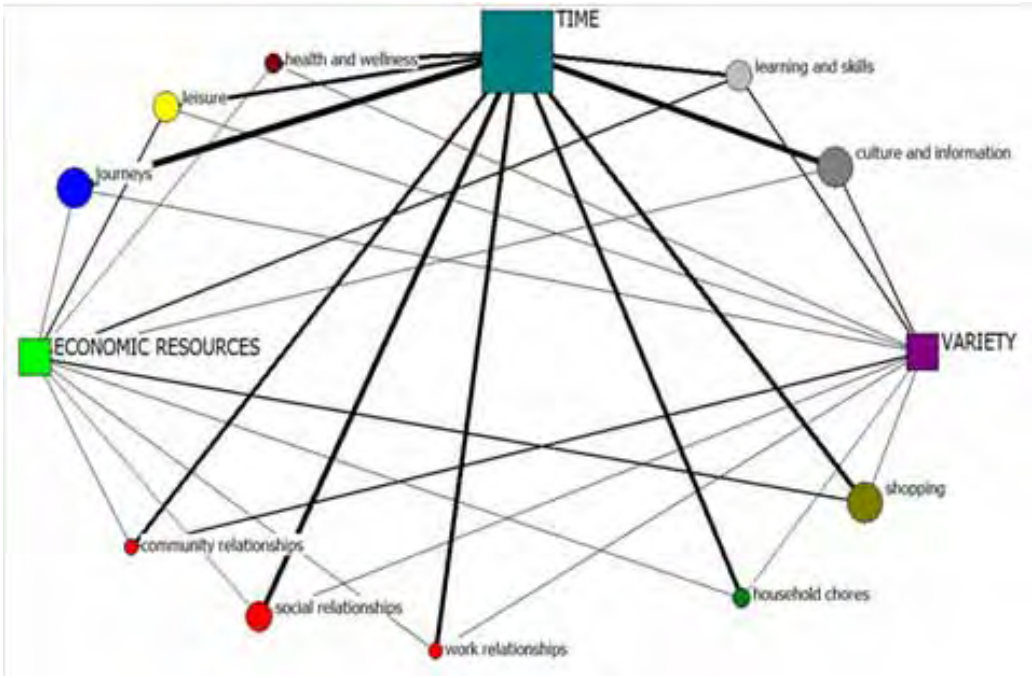


Figure 7 Perceived benefits of Internet usages in relaxing time and cost constraints and in increasing alternative variety, in carrying out (a set of) social practices for the MIDA respondents

The MIDA questionnaire gave also the possibility to probe into a domain never addressed in earlier PICTO surveys, concerning the relationships between patterns of Internet usages, such as those described in Fig. 6, and the perceived benefits of these usages, as revealed by Fig.7.

To address the issue, a cluster analysis was carried out considering the whole set of Internet usages (see Tab.1) which identified 4 groups of Internet users, whose profile is described in Tab.2 and Fig.8.

On the whole, the results give support to well known findings about the existence of positive relationships between certain socio-demographic features (such as high education level, younger age, and larger household size) and higher rates in the utilization of Internet services. This is clearly apparent in Cluster 1 and 2 which account for the respondent groups where Internet utilization is more widespread. The former consists of a relatively larger share of younger population. The latter concentrates the larger majority of individuals who use e-government services.

The other groups concentrate on individuals who have a lower familiarity with the web. Interestingly in cluster 3 women and men are more equally distributed; the age profile is polarized towards the young and older age brackets. Cluster 4 has the lowest percentage of graduates and the highest share of retired people.

	Gender		Age groups						Occupational Status			Large household	Graduate
	F	M	< 20	20-29	30-39	40-49	50-59	>= 60	employed	student	retired		
Cl_1	10%	90%	13%	43%	33%	10%	0%	0%	57%	37%	0%	53%	40%
Cl_2	29%	71%	12%	7%	31%	24%	21%	5%	76%	17%	5%	41%	33%
Cl_3	50%	50%	24	6%	16%	29%	16%	8%	53%	24%	6%	39%	22%
Cl_4	39%	61%	11%	11%	11%	36%	25%	7%	68%	18%	11%	46%	14%
Total	34%	66%	16%	15%	23%	25%	16%	5%	63%	23%	5%	44%	28%

Table 2 Socio-demographic profile of MIDA respondent groups

A comparison of the profile of Internet usages across the clusters, Fig. 8, suggests that MIDA respondents can be distinguished in two larger population groups accounting for a similar share of individuals: a group where the propensity to use the web for information and e-government is more widespread (Cluster 1 and 2) and a group where the appropriation of the Internet is relatively lower (Cluster 3 and 4).

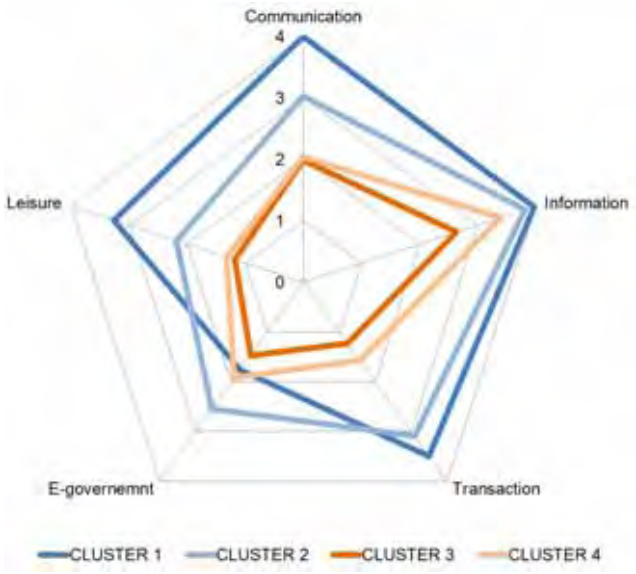


Figure 8 Profiles of Internet usages in groups of MIDA respondents

Note : Figure 8 presents average (range 0-4) of the following Internet usages:
COMMUNICATION: e-mail, phone and video calls, social network, forum.
INFORMATION: reading newspapers, search for information on goods and services, search for information about local community, streaming radio/TV.
TRANSACTION: buying online, reservation of travels and accommodations, selling online, Internet banking.
E-GOVERNMENT: visiting PA website, download of forms from PA website, sending filled forms to PA, payment online to PA.
LEISURE: download of games, images, music, movies, gaming online, upload of texts/ pictures/music/video, uploading contents into wiki-like websites

Not unexpectedly, the advantages resulting from Internet utilization are not uniform across the different population groups, Fig.9. Although the benefits of time savings are those most widely perceived in all

groups, those depending on the possibility to access a wider set of alternatives are more apparent in Cluster 1, which concentrates individuals with a higher propensity to exploit the web.
Economic benefits are more appreciated by the individuals in Cluster 3.

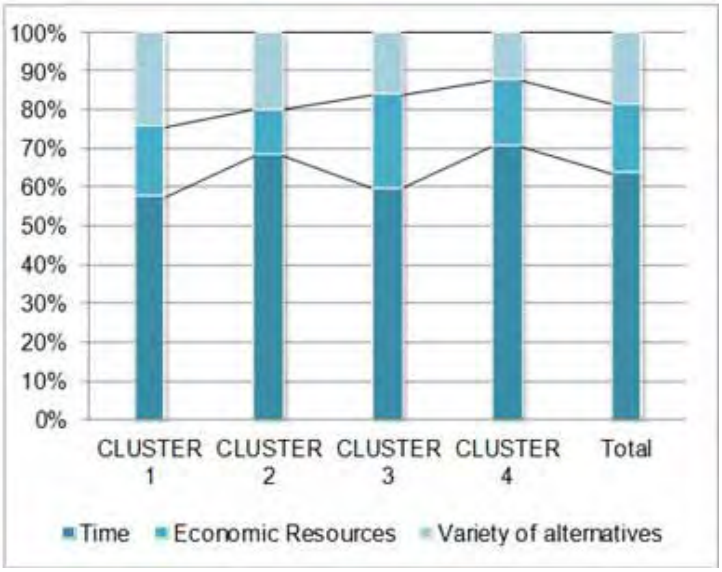


Figure 9 Perceived benefits of Internet usages on relaxing time and cost constraints and on increasing alternative variety in the groups of MIDA respondents

When analyzing the time benefits accrued to the different social practices, some further differences can be detected across the groups, Fig. 10.
For respondents in Cluster 1, shopping, leisure and household chores are the social practices, which most take advantage from time savings. Reducing travel time in daily journeys is a benefit widely perceived by all the other clusters.
Time savings in accessing cultural activities and information is particularly appreciated by people in Cluster 4.

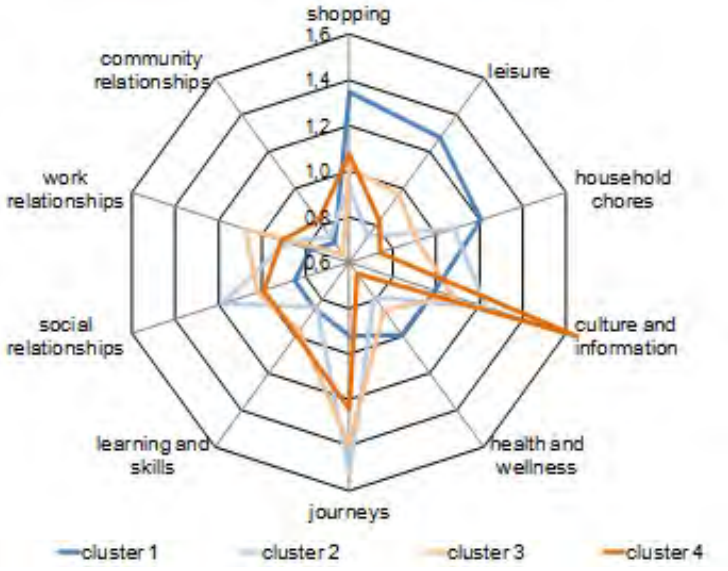


Figure 10 Perceptions of time savings for the social practices, within the groups of MIDA respondents (*)
(*) Index values are computed as the ratio between the percentages of the answers "yes to time benefit" for each activity and the total share of these yes answers in each cluster.

The results of this study support the claim that the more people use the Internet, the wider the benefits accrued to them in their social practices. Although this is not unexpected on a conceptual ground, the MIDA project gave the opportunity, at least for the Piedmont region, to support it on an empirical basis.
An additional aspect is gauged by the benefit profile observed in Cluster 1 (see Fig. 9), where Internet utilization is more widespread. As in the other clusters, it points out that by reducing economic costs and time constraints, Internet usages can help people to engage in their daily practices more efficiently and effectively.
Furthermore, it also suggests that by providing access to a wider range of alternatives, Internet usages are also a way for empowering individuals in their undertaking, i.e. helping them to establish new patterns of relationships (Quitney Anderson and Rainie, 2010) and new types of socio technical systems which on their turn make it possible to engage into social practices in novel ways (Whitworth and Witworth, 2010).

5. CONCLUDING REMARKS

This study gives evidence that a local government has a main role to play in prompting community transformation processes, and engage in smart community building (Nam and Pardo, 2012). Involving citizens in providing information/perceptions about their digital divides and Internet usages has a twofold advantage. It gives local government more detailed information in order to better and timely tailor policy interventions and it gives citizens an opportunity to understand what the contents of the policy interventions are likely to be about. Whenever the knowledge flows can be maintained and nurtured over time, a collective learning process may take place and help guiding the community's transformation processes.
The MIDA project carried out in Piedmont region has been an attempt to address the issue by directly involving citizens in gathering data and creating more significant information for steering e-government policy.
Although not wholly successful in terms of participation, the project had a number of positive outcomes.
First, it has been an opportunity to test the role of Internet as a dynamic collaborative environment in which diverse information, opinions, experiences, and skills can be grouped to provide substantial resources, in contrast to the currently used static information delivery platform Goodchild, 2007, Flanagin and Metzger, 2008). As widely emphasized in the new Socio Technical System literature, the essential premise is that given efficient means of information sharing and participation, collective benefits is likely to emerge from aggregated individual contributions (Berra, 2007, McIntyire, 2003, Wellman, Quan-Haase, Boase and Chen, 2003,Whitworth and Whitworh, 2010, Occelli, 2012b).
Second, by giving the possibility to connect statistically relevant data and interpreted information, the approach underlying MIDA project paves the ways to the production of enriched, and more *sensible* information. For PICTO, the project has been an opportunity for testing an information tool to implement such an approach. The web page created by the province administration to show in real time some results of the experience (see Fig.4) has been an effort in the direction: it shortened the *time to the public* (the final users) of the products of the data gathering process.
Finally, in terms of implications of the MIDA experience for policy innovation, two aspects can be mentioned which will deserve further attention in future research. The first one is that the involvement of citizens in providing information/perceptions about their (digital) needs gives local governments unprecedented possibilities to improve service delivery and tailor more timely policy interventions. This however requires to enhance the ability of government in managing information and communication, whereby both implies better technical competence and an increased attention at the quality of citizen-government relationships. For

citizens, moreover, their direct involvement by government gives them an opportunity to grasp what the contents of the policy interventions are likely to be about. The positive outcome of the latter, however, crucially depends on the people's willingness to participate. With regard to this the MIDA project was not fully successful. The experience gained however suggests that deeper attention should be paid to how better align the understanding experts and decision-makers have about e-government problems/solutions and the views people build up from their perceptions about using e-government services. This calls for a more comprehensive approach to e-government processes, where the scientific, technological, institutional and social dimensions could be integrated (Gil-Garcia, 2012, Inguaggiato and Occelli, 2012, Rhodes, Murphy, Muir and Murray, 2011).

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IMAGES SOURCES

Figg. 1,2,3: Piedmont ICT Observatory

Fig. 4 : MIDA Project website

Fig. 5: developed by PICTO on ISTAT data

Fig. 6,7,8,9,10 : results of MIDA project

TABLE SOURCES

Table 1,2 : results of MIDA project

AUTHORS' PROFILE

Sylvie Occelli

She holds a laurea in Architecture and Regional Planning. In 1987 she joined started working for the Institute for of the Socio-Economic Research Institute of Piedmont and she is currently leading a research unit aimed at fostering innovation in public administrations. She has published in various fields of regional science, ranging from housing, transportation, mobility urban modeling and spatial analysis. Current research interests include: road safety policy, ICT and regional development and the role of model-based activity as a way to support modernization in policy practices.

Alessandro Sciullo

After graduating in Political Science, in 2003 he obtained a master's degree in Public Policy Analysis. Since then he has worked part in several research projects aimed to support organizational improvement in different Italian governmental bodies. His main research interests are in the field of public administration, ICT diffusion and use among social actors, innovation networks and the relationships between university and enterprises.