E-Government Evolution Priorities from a Web 2.0 Perspective: An Exploratory Field Study

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Abstract
Integrating Web 2.0 technologies in e-government creates opportunities to improve online public services quality and potentially can contribute to achieve e-government strategic objectives. This paper presents and analyzes results from an exploratory field study conducted recently with experts and practitioners of e-government services in France. Our objective is to identify e-government development trends and to study the actual impact of Web 2.0 on these trends. Using an enriched Delphi method, six proposals emerged as highly relevant; they serve as a basis to analyze the actual development of e-government in France. Our analysis exploits recent official reports handed to the government concerning the future of public e-services. Our findings highlight G2C critical issues such as digital identity and data authentication, and reveal important questions in terms of G2B and G2G services. Furthermore, Web 2.0 potential seems insufficiently acknowledged by public authorities. This work contributes to a better understanding of e-governments’ future in France, and is a first step in understanding public organizations’ transformation and the emergence of the government 2.0 concept.

1. Introduction
All around the world, significant advances are being made in e-government. According to the UN e-Government Survey 2010 [1], citizens are benefiting from more advanced e-service delivery, better access to information, more efficient government management and improved interactions with governments. However, enormous challenges still remain in development of e-government. Practitioners and researchers report many inherently complex situations that require multidisciplinary perspective analyses and investigations, and the future of e-government is a recurrent theme [2][3][4][5].

The EC benchmark’s five-stage maturity model [6] suggests that targetization is the next step in e-government development. The current objective is to provide online services customized to match users’ profiles and requirements, and to personalize the relationships users have with public institutions. The emergence of Web 2.0 and rise of social networks have revealed new perspectives that challenge public institutions. These institutions are particularly attentive to the possibilities of taking advantage of these tools in the context of e-government.

This trend towards Web 2.0 usage in e-government is particularly visible in recent official reports and studies made to governmental organizations (e.g. in France [7][8] and in Australia [9]). The primary direction identified to develop e-government is to improve interactions between government and users. The underlying idea is to involve users in improving public services through such activities as online user assessment of governmental services and publication of the results. The term e-government 2.0 points to specific applications of social networks and Web 2.0 in the sphere of public services [10]. Many benefits are expected, such as a better match between public services and citizens' expectations, greater adoption of online services by citizens, and better control of costs and delays in new services implementation.

Governments face the same challenges as companies when it comes to mastering Web 2.0 technologies and establishing adequate usage. The move towards e-government 2.0 is a huge risk and there are multiple driving factors that raise many questions at the governmental level. Little academic work has focused explicitly on these issues so far, and the research presented in this paper is a contribution to fill this gap.

The research questions addressed in this paper are the following: “What are the most important and relevant topics to be explored for e-government development in France?” and “How Web 2.0 possibilities are actually impacting these topics and the corresponding public initiatives?” The method adopted for this study is based on a dual approach: a qualitative study with an enriched Delphi method together with a quantitative study through an online survey based on the qualitative study results. Twenty French experts in e-government participated in a half-day brainstorming session to reflect collectively on the development of e-
government 2.0. This session resulted in 29 preliminary proposals out of which we developed a questionnaire and administered a survey with sixty e-government practitioners. The practitioners had a wide consensus regarding six of the proposals. We analyze and discuss them in relation to the research state of the art, and with reference to two reports handed to the French government and made by an expert group led by representative Frank Riester [7][8].

The rest of this paper is structured as follows: Section 2 briefly describes what Web 2.0 is and how it is considered in an e-government context. It also presents some related works and summarizes the content of aforementioned Riester reports. Section 3 describes the research method that has been used. Results are presented in section 4. Section 5 discusses in more detail the six proposals deemed most relevant by practitioners. The conclusion discusses contributions limitations and future research directions.

2. Background and related works

New uses for information and knowledge-sharing have emerged with the advent of Web 2.0 technologies, giving rise to the Enterprise 2.0 concept [11]. Enterprise 2.0 refers to "the use of Web 2.0, emergent social software platforms within companies, or between companies and their partners or customers" as defined initially by McAfee [12]. Web 2.0 technologies (also called Social Media [13]) are intuitive, user-friendly, social centered, flexible and less formal than traditional information systems. Used initially in the private arena, they are increasingly disseminated within professional spheres, regardless of organization type or field of activities. They are a good opportunity for organizations to improve best practices' sharing, and to encourage open innovation.

Given these trends, business models and governance modes must necessarily adapt and sometimes be rethought. Public organizations are not immune to these developments, and the e-government 2.0 concept refers to specific applications of social media in the sphere of public services [10]. However, research output on emerging issues of e-government 2.0 is quite limited [14]. U.S. President Barak Obama’s views in favor of open and collaborative government generated some academic work: In [15] for example, the author offers an in-depth historical analysis of presidential directives’ implications. In the same vein, the annual meeting of the Gov2.0 Summit has brought together figures from the U.S. administration and some researchers to discuss experiments, problems and questions concerning e-government 2.0 implementation since 2009. Few recent academic publications tackle explicitly e-government 2.0 and the problems it raises: in [16], specific applications of the concept in the process management field; in [17], the adoption of e-government 2.0 by citizens; or in [18], factors that promote openness, collaboration and citizen participation.

In France, two recent reports were recently mandated by the government in order to elaborate a strategy for e-government development. Led by representative Frank Riester, an expert group developed a set of 25 proposals in a first report delivered in February 2010, and a second report delivered in September 2011 containing another set of 15 proposals [7][8]. Both reports adopted an identical organization according to three general themes (table 1). Second report focused more on social networks and web 2.0, and contained 3 proposals already mentioned in the first report (not reported in table 1).

<table>
<thead>
<tr>
<th>Table 1. Synopsis of Riester reports [7][8].</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riester report n°1 (02/2010)</td>
</tr>
<tr>
<td>Provide simple and consistent access to public online services</td>
</tr>
<tr>
<td>7 proposals to enhance readability, simplicity and coherence of available online services</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Provide more personalized services</td>
</tr>
<tr>
<td>11 proposals to realize administrative procedures fully online, and to develop new online services that meet users’ primary expectations</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Give users possibility to improve online services and to innovate</td>
</tr>
<tr>
<td>7 proposals to systematically assess online services by end-users, and to exploit the potential of social media to improve the digital relationship with users</td>
</tr>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

Within the French scientific community, no research to our knowledge has addressed the issues raised by these proposals or the perspectives they offer for e-government. It is the aim of this study to explore these issues.

3. Research method

Our study relies on a two stage qualitative and quantitative approach. In the first step, we used a Delphi approach, enriched by the use of the thinkLets-based modeling [19]. Twenty French e-government experts participated in Dec. 2010 in a Focus Expert Group [20] through an electronic brainstorming. In the second step, we used a quantitative approach based on an online survey [21].
3.1. The enriched Delphi approach

Delphi studies are regularly used in Information Systems studies when a consensus needs to be achieved among domain experts on a topic where idea generation is required [22]. While Delphi studies are normally survey-based, we used a Group Support Systems (GSS) and a well-structured facilitation process based on the use of thinkLets [19]. ThinkLets are pre-packaged thinking activities (facilitation techniques) that create predictable, repeatable patterns of collaboration among people working toward a goal. They facilitate information emergence and sharing among participants and assist the facilitators in controlling the reflection process to converge on relevant proposals. They are used to streamline collaboration during brainstorming sessions, rapid decision-making, creativity etc. [23].

3.1.1. The Focus Group sample. In December 2010, a number of organizations were invited to a research seminar at the authors’ institution to discuss issues related to the use of Web 2.0 technologies in the context of e-government. The participants were selected based on a diverse set of characteristics, including organizational type, area of activities, their profile, education, work experience, job etc. Twenty people, from 16 different organizations in France (ranging in size from less than 5 to more than 50 000,000 employees; 8 public-sector organizations, 6 private-sector firms and 2 associations; from different areas of activities: Ministry, Central Purchasing, Local government, service firm, research center, telecom company, University, Association etc.), agreed to participate in the Focus Group. Seventeen were male; three were female. Participant age ranged from 30-35 to 56-59 years; the average age was 46 years. Work experience ranged from less than 4 years to 15-20 years, with an average of 10 years. All participants had earned either MSc/MBA or PhD degrees. Their educational backgrounds included Public or Business Administration, Political Science, Computer Science, Law, Management, and geography. All participants were knowledge workers in leadership positions, e.g. top management, innovation, R&D, IT department, project management, and higher education.

3.1.2. Issues and themes discussed. Regarding the themes to be brainstormed, we relied on the results of the eGovernment RTD 2020 project [2]. The purpose of this collective work, carried out at European level, was to define future research topics in the e-government area. One of its main outcomes is a series of 13 research topics analyzed and classified by importance according to the perception of the expert group.

After analyzing the RTD project's 13 proposed topics, we have summarized four key topics for the evolution of e-government:

- **Performance and Governance**, i.e. effectiveness and efficiency of government operations, return on investment, value creation, etc.
- **Investment and Infrastructure**, i.e. technical infrastructure development, data exchange formats, authentication protocols, etc.
- **Information Quality**, i.e. public information and its various dimensions such as dissemination, confidentiality, traceability, security, personal digital identity, data privacy and protection, etc.
- **Roles and Relationships**, i.e. citizens’ and companies’ participation in content building and innovation in terms of services, stakeholders’ accountability, copyright, etc.

3.1.3. The brainstorming process. It consisted of several activities during a 180 minute period. A summarized agenda and research process follows:

- 60-minute introductions were necessary: (i) to explain the expected outcomes of the brainstorming session; (ii) to put into perspective some elements of the first aforementioned Riester report [7]; (iii) to present the thinkLets-based modeling method and explain the facilitation process using the GSS interface; and (iv) to introduce and briefly explain the session’s four topics of discussion.

- Participants were then asked to anonymously generate proposals and suggestions around the four predefined topics of discussion. They could submit as many proposals as they wished for each topic, according to their expertise. During this process, each participant could read and be inspired by the other participants' contributions.

- Participants were then assigned to four subgroups and asked to reduce, clarify and organize collectively generated proposals for one of the four topics. The goal is to converge on similar statements, remove non-related ones, and reword those that were insufficiently clear.

- Participants rejoined as a whole group, and each subgroup facilitator presented and explained to the whole group which proposals were selected for their respective topic.

- Participants were then asked to individually and anonymously rate the relevance of each proposal on a 10-point Likert-type scale.

- The voting scores were then presented to all participants in a raw format to stimulate a discussion of the results (proposal by proposal), and to allow the reformulation of proposals when necessary, to clarify ratings' standard deviations and to create a collective consensus.
Participants were finally asked to rate the consolidated proposals once again.

3.2. The online survey

In the following step, we conducted a quantitative survey that exposed practitioners of e-government services to the proposals and asked for their advice. The questionnaire, on which the survey is based, relies on exactly these proposals derived from the brainstorming. The questionnaire was pretested with an expert in online surveys and administered on the web. The survey was conducted between March and September 2011. Beyond invitations sent to a set of e-government practitioners the authors personally knew (~30 persons), the survey was diffused through two mailing-lists in the field of e-government in France:
- ARTESI, a public agency linked to the Paris Ile-de-France region, it provides assistance and help to local administration in terms of internet usage and e-government implementation (~2500 subscribers).
- OEAP-DMP, a participatory working group linked to the Ministry of Economy and Finance, it centralize and diffuse knowledge and best practices in terms of G2G services, e-procurement and document digitalization (~500 subscribers).

The number of participants in the survey was 60 and their demographics are shown in the table 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>60</td>
</tr>
<tr>
<td>Organizations represented</td>
<td>60</td>
</tr>
<tr>
<td>Organization size</td>
<td>&lt;5 (16.7%), 10-50 (16.7%), 1000-5000 (8.3%), 5000-50000 (8.3%), &gt; 50000 (23.3%)</td>
</tr>
<tr>
<td>Organization Types</td>
<td>46.7% public-sector organizations, 50% private-sector firms and 3.3% associations</td>
</tr>
<tr>
<td>Age of participants</td>
<td>&lt;30 (5%), 36-40 (16.7%), 46-50 (15%), 50-55 (20%), &gt;60 (15%)</td>
</tr>
<tr>
<td>Average Age</td>
<td>47</td>
</tr>
<tr>
<td>Education Level</td>
<td>18.3% Bachelor, 70% Master, 11.7% PhD</td>
</tr>
<tr>
<td>Education Type</td>
<td>21.7% Management, 18.3% Law, 48.3% Computer science, 26.7% others</td>
</tr>
</tbody>
</table>

4. Results

At the first stage of brainstorming, a total of 153 proposals were produced across the four themes. In accordance with the brainstorming process, they were reduced to a maximum of 10 proposals for each theme. The result is 29 proposals that have been retained for the four topics. These proposals are not shown here; they have been presented in previous work [24]. We will present in this section only the proposals that gained the highest score at the online survey.

In order to identify proposals that have been ranked as most relevant, we used a double selection: first according to the average score, and then according to the practitioners’ level of general agreement. Figure 1 introduces the average scores obtained for each proposal. In the survey, the voter is invited to give for every proposal a score \( m \) between 10 (very relevant) and 1 (not relevant). By considering 8 as minimal average score for a proposal to be considered as highly relevant, we make a first selection of 10 proposals.

![Image](image1.png) Fig. 1. Average scores for all proposals

To refine this first selection, we look at the level of general agreement within the voters concerning shortlisted proposals. For every proposal \( P_i \) (i=1..29), we define the level of general agreement \( L(P_i) \) as a percentage (in comparison with the total of the voters) of the number held concurrently by polls \( V_i^m \) having considered proposal \( P_i \) as being highly relevant (i.e. having an average score \( \geq 8 \)):

\[
L(P_i) = \frac{\sum_{m=8}^{10} V_i^m}{\sum V_i^m}
\]

where

- \( L(P_i) \) Level of general agreement for proposal \( P_i \)
- \( V_i^m \) Number of polls having granted the score \( m \) for proposal \( P_i \)
- \( \sum V_i^m \) Total number of polls for proposal \( P_i \) (equal to the size of the sample, i.e. 60)

The measure \( L(P_i) \) expresses the agreement within the sample concerning the relevance of proposal \( P_i \). For the first proposal for instance, the number of voters having given a score of 8, 9 or 10 are respectively 10, 12 and 26. This gives a level of general agreement equal to 80% and expresses that 80% of the users considered this proposal as being highly relevant. Figure 2 presents the level of general agreement for each of the proposals of Focus Group.
Table 3. Proposals considered as the most relevant according to the practitioners’ online survey.

<table>
<thead>
<tr>
<th>Proposal</th>
<th>Average score</th>
<th>Level of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Federate digital identity to facilitate access to all services</td>
<td>8,35</td>
<td>80,0%</td>
</tr>
<tr>
<td>2. Develop and organize access to public data</td>
<td>8,58</td>
<td>85,0%</td>
</tr>
<tr>
<td>9. Impose the use of an (already existing) single digital certificate format to ensure interoperability, relying mainly on a public consultation</td>
<td>8,76</td>
<td>81,5%</td>
</tr>
<tr>
<td>14. Before launching a new public call for tenders for a new software development project, systematically use the possibilities of Web 2.0 to check if such software development has not already been made in another jurisdiction, or if similar or identical software applications are not already available on the market</td>
<td>8,27</td>
<td>75,0%</td>
</tr>
<tr>
<td>18. Clearly distinguish between two different situations: one where anonymity will prevail, and the other where it is essential for the user to have a reliable digital identity to access more personalized services</td>
<td>8,54</td>
<td>78,3%</td>
</tr>
<tr>
<td>29. Establish a single point of contact, a harmonized HCI, and a single information file with tracking and traceability for each citizen</td>
<td>8,07</td>
<td>76,7%</td>
</tr>
</tbody>
</table>

To identify the most relevant proposals, we consider the level of general agreement for the ten shortlisted proposals. We discard those for which the level of general agreement is less than 75%. Four proposals initially shortlisted with an average score $\geq 8$ are discarded (showed in dotted line in figure 2).

Fig.2. Level of general agreement on relevance for all proposals

The final outcome of this double selection is presented in table 3. These proposals acquired an average score $\geq 8$ and were considered by at least three quarters of the practitioners (i.e. 45 out of 60) as being highly relevant for e-government development in general, and for e-government 2.0 in particular.

5. Results analysis and discussion

The six resulting proposals correspond to five fundamental issues in e-government development. They will be discussed in detail in the following subsections. Each proposal is first explained in light of actual state of the art, and we report any ongoing project in France to which it is related. Second, the result is confronted with the contents of Riester reports (c.f. table 1). Table 4 resumes this discussion, and highlights challenges and research issues raised by these proposals. Finally, subsection 5.6 outlines the outcomes of this analysis in term of public strategy for e-government development in France.

5.1. Digital identity

A secure and reliable digital identity system is recognized as an essential component for e-government development [2]. Proposals No. 1 and No. 18 are both related to digital identity issues. However, they are complementary and contradictory at the same time. On the one hand, and for the sake of rationality and efficiency, it is essential to offer the user a unique identifier when interacting with various government entities. On the other hand, it seems necessary in certain circumstances to preserve the user’s anonymity so as not to inhibit user’s creativity and responsiveness. Such a limitation is contrary to the principles of 2.0 systems. For example when it comes to giving an opinion on the performance level of a public service, the user may indeed wish to remain anonymous.

In the absence of a unique identifier and the inability to interact in an anonymous manner, the user on one hand have to deal with multiple identifiers to access various services, and on the other hand, may create fictitious identities in order to preserve anonymity. This situation creates complexity and cognitive overhead and increases the risk of fraud and data redundancy [25]. Technically, it is however quite possible for a unique identifier to be certified by a public authority to permit access to all online public services. For example, Facebook and Google platforms have recently made it possible to use their respective identifiers to connect to sites using their Facebook Connect and Google Open Social identification APIs (Application Programming Interfaces). For public systems, unique identification raises a fundamental question regarding the centralization of identification
data in relation to the multitudes of public bodies likely to create and manipulate identifiers [25]. In a centralized logic similar to that of Facebook and Google, all services would connect to a single system which manages connection data and which grants access permissions.

Establishing such an architecture depends on whether or not a unique identifier conceptually (i.e. which information) and administratively (i.e. how is it processed) is defined for each citizen in the country's administration [26]. If such key identifier exists (as is the case in some European countries), a centralized authentication system would be transparent to the user. He would continue to use his unique identifier and would manage a single password. If such a unique identifier does not exist (as is the case in France), the implementation is more complex as it requires gradual replacement of multiple logins by a single login.

In France, the portal service-public.fr is being developed in order to federate access to all public services (e.g. social security, income declaration) using a single login. For ethical reasons and to prevent the crossing of data and thus protect citizens privacy [27][25], the choice was made to create a new specific identifier for this portal. The initiative is however left to the user to gradually replace the different identifiers of service-public.fr affiliate services.

The choice made by service-public.fr concerning the optional nature of unique identification may be surprising, but it is in line with the respect of citizens' privacy. Indeed, several studies have demonstrated the reluctance of citizens to adopt unique identification systems. The users' adoption is often delayed by concerns about control and/or making use of the data for spying [28]. And the case of unique identification project in Britain which failed for similar reasons after years of negotiations and effort should be carefully studied and analyzed [29].

Beyond unique identifiers, social networks development has accentuated the need for anonymity [30]. An experimental system has for example been tested in Belgium to allow anonymous and authenticated signing of petitions [31]. Although unique digital identifiers' issue is mentioned in Riester first report (proposal No 5), it is not relayed in the second report, and anonymity and privacy issues are not mentioned at all.

5.2. Public and open data

Government and various public instances own and manage a huge amount of information: mapping of resources (land, rail, road ...), all kinds of statistics (economic, sociological ...), etc. Beyond personal information, this mass of data should be made public and accessible. This is advocated by proposal No. 2. The goals are to promote greater transparency in government operations, to improve information sharing between public institutions, and finally, to make this information available to the private sector in order to develop and to propose new value-added services [32].

The movement towards open public data in the world was strongly influenced by American president pronouncements for transparent and collaborative government [33]. In France, public data opening and third party service provision are indeed among the Riester first report proposals (proposal no. 22). It led to the establishment by the Prime Minister of the mission Etalab in February 2011. Etalab is responsible for creating a single intergovernmental portal data.gouv.fr to collect and to make all French State public information available freely [34]. This portal provides raw data in usable formats, and offers opportunities to the developers' community and contractors to reuse and to propose innovative and application services.

The opening of public data is a new ongoing e-government initiative which is in its infancy. The dissemination and exploitation of public data raise questions of interoperability (data sources are multiple and different), of business model choices (how to build services with added value?), of quality (what level of quality for obtained services?), etc, [35].

5.3. Digital signature and exchange authentication

Proposal no. 9 concerns a huge undertaking in e-government in France. Launched on January 1st, 2005, public e-procurement requires new infrastructure and significant changes to the procurement process. It poses serious problems of adoption, standardization and interoperability [36][37][38]. In a survey conducted in 2008 in France [39], digital signatures were recognized as an essential challenge facing e-procurement diffusion. For a company, this is a major obstacle when it comes to respond to a public call for tender, it is also an obstacle for a public institution when it comes to process responses and to establish contracts. This also explains that documents' digitalization and electronic signatures are among priority projects according to a survey conducted in 2010 to local authorities [40].

For companies, electronic platforms multiplicity and heterogeneity have multiplied the digital certificates they must manipulate. While a single digital certificate format has already been defined and suggested by the state, Focus Group proposal no. 9 suggests that the use of this certificate is progressively imposed by the state and that public consultation would accompany this measure. The goal is to address
the problem of digital signatures interoperability, and to create a strong consensus, to discuss the implementation modalities for this measure and to share best practices.

Greater involvement of the state is thus considered essential in order to meet digital signatures interoperability requirements defined by the European Commission authorities [41]. Public authorities' involvement is also necessary to clarify the practical implementation of digital signatures. A recent law case has for example invalidated "block" signatures (i.e. one single signature for a zip container) for a public call for tender responses, requiring that each container's document should be signed separately [42].

As both Riester reports are primarily focused on the relationship with the citizen, the topic of e-procurement is not included. With this proposal, the Focus Group emphasizes digital signature particular importance for companies. However, a similar issue for citizens can be raised. Indeed, citizens are also required to use digital certificates to authenticate certain online transactions with public authorities, as is the case for example for the income annual declaration. The use of digital certificates for citizen-government exchanges' authentication complements therefore the complex issue of users identification discussed earlier.

### 5.4 Information sharing and knowledge dissemination

Proposal no. 14 is typical of what can be done with Web 2.0. Before a public authority launches a call for tender concerning software development or acquisition, it is proposed to take advantage of information sharing opportunities (made possible by the social network) to discover any identical or similar software applications that could have been developed in another jurisdiction. This could for example be an exchange forum for public institutions' IT departments where such information can be searched and shared. It could also be a repository that would reference all applications developed or under development in public institutions around the country. Collaborative tools (e.g. social bookmarking) can be used to enrich such a repository.

This proposal makes full sense. Indeed, the French State annual expenditures in terms of computer equipment are of the order of several billion Euros, and there is a clear costs reduction and resources pooling strategy. However, public organizations' bureaucratic nature tends to not facilitate such sharing. Some studies have explored, in different work contexts, factors that encourage knowledge sharing [43][44]. Web 2.0 offers new opportunities that are beginning to be experienced in business [45].

As Riester reports focus on end-user and on simplification of digital relationship with citizens, the issue of knowledge sharing between public agents and authorities is not mentioned in these reports.

### 5.5. Access and interaction homogenization

Proposal no. 29 is at the heart of the relationship with the citizen. It is similar to several proposals from the first Riester report which focuses on online services simplification and on making access to public services clear and coherent. Traceability approaches are indirectly mentioned through storing administration-citizen history of exchanges, and by giving the possibility for citizens to track online its records status. Government immediate response to these proposals lies in the development of service-public.fr portal mentioned above. This portal is expected to offer a genuine simplification of citizen-administration online interactions together with data and process centralization.

From a research perspective, the importance of citizens' inclusion in the definition of online public services has been emphasized in e-government early years [46]. It was found that cost reduction and process optimization imperatives tend to take precedence over user satisfaction and insurance of online services adoption [47]. Nevertheless, giving priority consideration to citizens is a growing trend, and several recent research studies relate various projects in which citizen-centered methods are studied and tested [48][49][50].

### 5.6. Public strategy outcomes

From the previous analysis, we can highlight the following characteristics of the actual French public strategy in terms of e-government:

- **Riester reports** (c.f. table 1) are clearly centered on G2C services, and main focus is on enhancing and simplifying citizen-administration interaction.
- The long term fundamental issue of unique digital identity is bypassed through the proposal of an optional identifier for administrative processes (i.e. service-public.fr portal). This can seriously hinder further development of banking and payment services, and might limit the interoperability (at the European level) of future national identity cards [51]. It also limits future possibilities for developing a single combined solution for citizen identification and data authentication.
- As the Riester reports are G2C centered, we claim that there is a need for a similar governmental prospection effort at the companies' level concerning priorities for G2B service development.
Table 4. Synthesis of results analysis and discussion.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Practitioners selected proposal (c.f. table 3)</th>
<th>Riester reports position</th>
<th>Actual public initiatives</th>
<th>E-government challenges and research issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital identity</td>
<td>1 and 18</td>
<td>Partly mentioned in report 1</td>
<td>- service-public.fr portal</td>
<td>- Infrastructure and process interoperability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- End-user adoption and trust</td>
<td>- Anonymous access provision</td>
</tr>
<tr>
<td>Public and open data</td>
<td>2</td>
<td>Partly mentioned in report 1</td>
<td>- etatlab portal</td>
<td>- Format interoperability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- data.gouv.fr portal</td>
<td>- Business models</td>
</tr>
<tr>
<td>Digital signature and exchange authentication</td>
<td>9</td>
<td>-</td>
<td>- public think tank OEAP (Observatoire Economique de l'Achat Public [52])</td>
<td>- Juridical implementation issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Infrastructure and process interoperability</td>
</tr>
<tr>
<td>Information sharing and knowledge dissemination</td>
<td>14</td>
<td>-</td>
<td>- local initiatives (e.g. e-bourgogne.fr)</td>
<td>- Linking citizen identification with data authentication issues</td>
</tr>
<tr>
<td>Access and interaction homogenization</td>
<td>29</td>
<td>Fully mentioned in both reports</td>
<td>- service-public.fr portal</td>
<td>- Citizen centered design</td>
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<td>- Elicitation of best practices</td>
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- Web 2.0 possibilities are not fully acknowledged by public authorities, particularly when it comes to internal processes and to public agents working practices. Indeed, there are multiple possibilities to develop social networking usages and to gain crucial advances in terms of knowledge sharing, best practices dissemination and cost reduction.
- For both G2C and G2B services, technical infrastructures and juridical frameworks for data authentication are still insufficiently mature.

6. Conclusion and perspectives

Based on a qualitative and a quantitative study with e-government experts and practitioners in France, we sought in this paper to identify most relevant issues for e-government evolution. The results are five main issues for e-government development. By analyzing these proposals, the state of actual public initiatives and what governmental experts are proposing (i.e. Riester reports), we have answered our first research question and showed that focus is on G2C services, and that there is a need at the governmental level for more prospection in terms of G2B and G2G services.

Concerning the second research question and how Web 2.0 possibilities are actually impacting government initiatives and priorities, our analysis tends to show that Web 2.0 possibilities are insufficiently taken into account. Indeed, Web 2.0 issues showed up in only two proposals (i.e. citizen anonymity preservation and best practices diffusion). Although Riester reports focus on end-user participatory evaluation of e-services, the problem of identity and anonymity in Web 2.0 context are not directly tackled. Knowledge diffusion and best practices sharing inside public organizations can easily profit from Web 2.0, there is however no clear public policy and there are – to our knowledge – no public initiatives in this direction. Open data is in fact the only recent government initiative towards Web 2.0.

The originality of the work presented here lies in confronting governmental points of view with those of experts and practitioners. Because multiple directions are possible for e-government development, our study fills an important gap in highlighting critical issues to be given highest priority. Indeed, beyond G2C online services optimization, our study indicates that Web 2.0 opportunities should be better acknowledged and that development of electronic identity infrastructures is still not considered as a strategic issue for e-government future development. These results are consistent with similar exploratory research works conducted elsewhere (e.g. [2], [4], [15], [51]).

Limitations. The analysis conducted in this research work has two main limitations. First, it is limited by the amount of knowledge the authors have access to in terms of public strategy and e-government initiatives. Indeed, our analysis relies heavily on two official reports recently handed to the French government, and on an extended – although incomplete – knowledge of e-government development in France. There are possibly other e-government initiatives that can be related to issues discussed in this paper. The second limitation concerns possible bias in the sampling method. Our analysis is based on a set of proposals considered as relevant by a small – although significant – sample of e-government practitioners. The composition of this sample (in terms of users' knowledge and usage of e-government) depends directly on the specific set of users that were invited to participate through mailing lists. Furthermore, the elicited proposals resulted from only one Focus Group.
Future work. In a study conducted in the Netherlands somewhat similar to ours in terms of questioning and investigation method, it was shown that for the same strategic direction, there are multiple and varied implementation approaches to Web 2.0 technologies in public bodies [53]. Indeed, especially across a large country like France, there is a wide range of methods and approaches to implement proposals such as those included in this study and those from Riester reports. Many issues that were raised by practitioners and discussed in this paper can be broken down into projects and initiatives that should be studied more in depth to better understand them, to elicit best practices and to disseminate successful implementation patterns. This is the future research direction we will develop through establishing an observatory of e-government 2.0 practices in French public institutions.

7. References


