LOCAL E-GOVERNMENT IN BRITTANY, THE POWER OF COGNITIVE ALIGNMENT

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The state of the art literature about e-administration adoption claims that there is a process of adoption of IT, unfolded through several stages. Our hypothesis is that IT adoption instead, as much as any strong organizational process, looks very much like a diffusion process through thresholds. As a matter of fact, although the usage of computer is already well established, connectivity is far from diffused because it requires competences that are not acquired progressively. In front of strong resistance, a trigger factor has to be present which provokes a cognitive and organizational alignment, which may be very spectacular in small municipalities. This alignment quickly makes the variegated usages of IT mutually reinforcing.

We verify our theoretical hypothesis through a statistical analysis of an inquiry on local government in Brittany. We end up with a typology of IT adoption among municipalities which reveals a fairly large class of advanced adopters among the smallest municipalities. The statistical study does not confirm the maturation cycle hypothesis, because of the existence of both a very large number of non adopters, but also a significant group of early adopters, which statistically speaking, should not have been so advanced in their usage. Therefore the statistical analysis is complemented by a series of case studies on smallest municipalities among these statistical exceptions. These interviews confirm the "cognitive alignment" hypothesis of IT adoption.

Adoption of Information Technology (IT) by public administration is, under the buzzword « e-government », on the political agenda since many years now. A rather influential paper has been Layne & Lee's model of "maturation cycle". It has triggered a vast array of literature, both aiming at improving and challenging this model. It has been at the source of a political representation of and action about how e-government should evolve. This normative view has probably missed the real context of small local authorities. Prolonging the Layne and Lee's model maturation cycle, we claim that a "cognitive alignment" has to be established inside the local government in order to overcome the resistances in front of ICT adoption.

We have conducted an inquiry of a sample of more than 450 Breton municipalities, completed by interviews with some of them. The purpose of the inquiry was to identify the degree of maturation of ICT adoption for e-government, and to get information about the effective use of ICT to better perform administrative tasks. The inquiry thus provides both effectiveness (e-government) and efficiency (e-administration) data. It has been completed by interviews with municipalities which were, from a statistical point of view, unlikely to be early adopters. We explain where these statistical exceptions come from, and confirm our theoretical hypothesis.

The paper is organized as follows: in the first paragraph we give a quick account of the literature. Then we present our own model of ICT adoption by municipalities. We give the results of our statistical analysis in the third paragraph and a report on the interviews in the last one. The conclusion gives some clues for further research.

1. E-administration: a matter of cycle?

In an influential paper, Layne and Lee [5] suggest that IT adoption by municipalities is following a four stages path. They posit that in stage one, initial efforts of state governments are focused on establishing an on-line presence (information). This is achieved through the development of a website and the provision of electronic forms, which can thus be downloaded by citizens. In the second stage, e-government initiatives focus on connecting the internal government information system to on-line interfaces in order to allow citizens to

interact and even transact electronically with it (transactions). As the quantity of these e-transactions increase, governments will be pressed to integrate the states' or local systems with their own web interfaces, or in some cases, to build on-line interfaces directly connected to their functional intranet. Thus integration may happen in two ways: vertical and horizontal. Vertical integration refers to connections of local, state and federal governments to provide an online service for the citizen, through a one stop shopping interface. In contrast, horizontal integration is defined as integration inside a given administration of different departments in order to provide online to the citizen the most complex services, encompassing several tasks. Vertical integration will be attained before horizontal integration. Hence, the phase of horizontal integration with central government is Lay and Lee's phase 3, while horizontal integration in order to provide one-stop-shopping to the citizen is stage 4.

Another typology is the ASPA-UN (American Society for Public Administration & United Nations, 2001) model, close to Layne and Lee. Both Layne and Lee and ASPA-UN can be interpreted as descriptive "maturation models" (Brown [2]). This framework later influenced several authors such as Andersen and Henriksen [1], Moon [6], Reddick [11]. Interesting is Moon's model which establishes a five stages model: information dissemination, two ways communication (request and response), service and financial transactions, vertical and horizontal integration (similar to Layne and Lee's), and political participation (electronic voting). It emphasizes the diversity of interactions that governments may have with citizens. Andersen and Henriksen [1] suggest that the focus should be centred on activity of government on one hand, and citizen on the other hand. They also propose a four stages model with "cultivation" (phase 1), "extension" (phase 2), maturity (phase 3) and "revolution" (phase 4). From our point of view the Layne and Lee's maturation model and its follow-ups are fairly descriptive: they are more or less a kind of roadmap which identifies the more and more complex tasks performed electronically by governments. They bring signposts on the road to digitization of government tasks.

Critics of the maturation model have emphasized that IT adoption seems, in that perspective, an efficiency issue, ICT being supposed to help governments to better perform their task, as much as in business. Some authors (e.g. Andersen and Henriksen [1]) claim that the real issue is that of effectiveness not efficiency, namely to provide better services to the citizen.

Another line of critics stems from the management perspective. Ebbers and van Dijk [3] drawing from the innovation process literature, emphasize the non linear nature of the adoption process because of internal resistance. They construct indicators of support and resistance, to measure the likelihood of diffusion. Our claim is that the diffusion process is the consequence of a "cognitive alignment", necessary to generalize IT in organizations. Both their organizational features and missions at some point determine why the organization decides to change and to adopt ICT. The "stages" identified by Layne and Lee may be the learning curve of their adoption path. We develop this conception in the next section.

The maturation cycle model does not envisage the possibility for governments to be stuck either in a non adoption attitude, or in the first stage (to simplify, web presence and an email address). The seemingly inevitable succession of stages does not permit to think about the factors which move a government from one stage to another. Nivaes [7], drawing on the literature referring to New Public Management approaches, shows that public innovation and diffusion may be triggered by 1) external factors (socio-economic development, demographic or economic factors) 2) the political system characteristics (the party system, political actors or lobbies), 3) the administrative system characteristics (federal or unitary, administrative culture and decision making) 4) system dynamics : a public sector reform could harness a

local government with the capacity of deciding to adopt ICT. In section three we will propose alternative factors. But before, let us present our own reference framework.

2.   Cognitive alignment : an alternative explanation?

Nonaka and Takeushi [8] have given a model of "spontaneous" (that is, not planned) innovation which gives some clues about the process of "cognitive alignment" necessary in the adoption of ICT. In a nutshell, an individual at the origin of the innovation communicates first with close friends and colleagues in the organization and this helps him or her to formalize and improve the original concept. Then, the innovation has to be codified in order to be supported by the hierarchy, while competing with other ideas. When deployed successfully the innovation is internalized in the minds of its adopters, who refer to it in a pure tacit way. Hence tacit and codified knowledge have both to be created along the diffusion path. To obtain a cognitive alignment through different vectors of communication (codified and tacit knowledge transmission) becomes both a challenge and a necessity.

 ICT adoption is an innovation. People have to learn to work and to coordinate themselves differently. For example connectivity (such as e.g. the management of a website) requires competences that are not naturally and progressively acquired by anybody, but still have to be shared within the organization. Hence a trigger factor has to be present, which may help people to overcome their reluctance and anxiety in front of the expected effort they have to produce to implement the organizational innovation: the variety of missions and tasks of a local government, the organizational layout, the transitory position of decision makers (the elected council has to think permanently to the next election), all of these elements make it difficult to progressively adopt ICT. This is the resistance mentioned by Ebbers and Van Dijk. Hence the innovator has to create the conditions for a "cognitive alignment" inside the organisation.

When we refer precisely to local governments, the relevance of the cognitive alignment model appears naturally. As said before, local administrations do handle a lot of tasks, ranging from celebrating marriages or organizing elections, to providing legal documents such as identity cards, keeping the civil status or land registries, distributing school canteen vouchers and social aid, and so on. Referring to Hiller and Belanger [4] we can classify their tasks between services to the citizen (including information services), involvement in the democratic process, financial relationships (mainly levying taxes) and public procurement. It is not clear whether there is a single introduction strategy for ICT: is it better to begin with information services and to end up with democratic participation services (electronic voting)? Or G2B (Government to Business) relationship is a priority on the agenda? There is scope for path dependant diffusion strategies which may depend on both context and persons.

The big bunch of activities of local authorities may be performed in small cities or villages, by a tiny number of elected persons assisted by a few local civil servants. In France indeed, municipalities are in most cases very small, covering no more than several hundreds of inhabitants. In Brittany, with a population of a little more than 3 millions inhabitants, there are more than 1200 municipalities. With such dispersion, some economies of scale may be lost in the administrative processes. Therefore local associations of municipalities have been set up ("communautés de communes"). Altogether the missions, tasks and organizational layout of local governments deeply rooted in the day to day life of the city, involve a small number of persons whose tacit knowledge and coordination procedures may be difficult to translate into digitally controlled procedures.

Our core research hypothesis therefore, is that, within the context of local governments, IT adoption is more the consequence of cognitive alignment of local civil servants and elected persons alike, than the one of careful planning by decision makers intertwined with their capacity to overcome internal resistance and to follow the maturation cycle. To test this hypothesis we rely both on a statistical analysis and on interviews with very small municipalities at the forefront of IT adoption.

3. Data analysis of e-administration in Brittany

Marsouin[1] (through its observatory Opsis) produced a mail inquiry concerning e-government in 2005, repeated in 2007. In between, Internet diffusion (particularly broadband diffusion) has brought the focus on understanding the drivers of usage. We got a 38% return rate in 2007 (477 responses). Answers were prominently coming from secretary-general, secretaries, a few from mayors. Our sample is representative of both the main administrative areas and the size of the cities in Brittany.

E-government is an ill-defined concept (Yildiz [13]). Attempts have been made to split it into different categories. We already have mentioned Hiller and Bellanger [4] typology. Reddick [11] relying on this typology distinguish between G2C (services to the citizen, relationship within the democratic process –e.g. voting line-). We suggest instead three dimensions:

•   Impact on public decision: that is both the use of IT to help better collective decision by elected persons and better control by the citizen. This aspect refers to the fact that the complexity and variety of decisions taken by local councils stretch the elected members' capabilities and often lead to a cognitive overload. Citizen may exert their control power (council's assemblies are public, but only informed citizen may be interested in attending the assemblies)

•   Digital exchanges with citizens. This is more or less akin to Reddick's G2C and refers to effectiveness of public authorities.

•   Impact on administrative tasks: software assisted tasks, collaborative tools. This view relies on the efficiency issue at the core of the New Public Management.

ICT and public decision

Our 2007 survey shows that if nearly all (98%) the town-halls are connected through a permanent connection, for citizens the situation is much less favourable. Only one out of two municipalities provides public access points to them: hence not everybody can get an electronic access to public decisions, even through a public access point. Moreover, one town out of two receives "complaints of citizens which estimate that they do not get correctly an ADSL/the broadband private connection."

The representatives (and specially the mayor) have not a large use of ICT at work. A minority only (one third) has a connection to the Internet services of their administration. And their use of the office automation tools still remains very weak: only 13% of mayors and 20% of secretary-general often or occasionally use slide shows at their meetings (commissions,

boards …). In the same vein, 82% of municipalities never disseminate an electronic version of the preparatory documents before each regular session of the City Council. Without having electronic documents, it is useless to have this information published on the municipality's website, if it does exist. The lack of interest by representatives may be a result of low perceived benefits of ICT compared to their costs. In small municipalities the informal circulation of information among the few administrative people may seem sufficient. As a result expectations are low: one municipality out of two having a low usage does not ask for an assistance to access to ICT. But the reverse is true for those who feel a lack of ICT investment.

A better use of IT tools by the local administration is explained[2] by the size of the town, its wealth, the level of equipment deployed given the size of the city, and the age of the mayor! Moon [6] and Reddick [10] have already documented the importance of the city's size and wealth. But Internet usage is also a generation issue, even for elected persons.

Altogether, the public decision making and control processes is not really improved by ICT in many Breton municipalities Most mayors except perhaps those of the new generation are not convinced of the impact of ICT because they don't use them in their day to day activity. For this to change, one has to expect for a trigger factor or for an innovator (possibly the mayor or the secretary general, if he or she get acquainted with the use of ICT for his or her tasks).

ICT and digital citizenship

As seen above, "digital local public life" (i.e. the direct relations between the council and citizens) have to be split into two types corresponding to stages one and two in the maturity cycle model: communication (the town hall to citizens and vice versa) and transactions.

The ICT enthusiasts have highlighted electronic voting as the ultimate form of democracy, and electronic forms down and uploading as tools for transparency and sustainable development (for the economy of paper).

Presently electronic interactions are not, for local administrations, as good as paper interactions. For example while almost all municipalities have an email address, this information is not mentioned in their bulletin or official addresses to citizens for 21% of municipalities. The large majority of Breton municipalities does not envision communication by mail as a standard practice of interaction. And when this exists, it is far from certain that the emails are received by the right people. Moreover, only 16% of municipalities routinely accuse receipt of an email from citizens, something which is totally unconceivable for traditional mail (letters).

Similarly, a municipality out of three does not have a referring person (an editor in a way), rubber stamping the contents put on the website. Even more astonishing, one has to know that only 40% of Breton municipalities have a website. This contrasts with the US figures where Reddick [11] reports an 80% rate. And while the websites are richer now, there is no clear editorial policy and content vary widely from one site to another. Finally, while 45% of municipalities update their website daily or weekly, 31% do it monthly and 22% less often or never. Under these conditions, it is not surprising to find a low level of electronic communication between the municipality and citizens: the forums and chats with councillors

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[2] Through a logistic regression model

are the exceptions (respectively on 3% and 19% of websites). Electronic geographic information systems or GIS (useful for example for getting access to the land register) are uncommon (17%) at a time when Google Maps or the the French IGN (Institut Géographique National) provide accurate aerial photographs and detailed plans of the entire French territory.

The variety of services available on Breton municipalities' websites shows that even for a communication purpose, the level of diffusion of advanced web functionalities is very low[3]. In particular the so called "web 2.0" tools (syndication to other websites, discussion forums, interactions with the members of the council) are not yet at hand. True the inquiry is from 2007 and Web 2.0 has got a momentum since then. But on the whole, two ways communications (stage 2 in Moon maturity model) has still to reach reasonable levels in Brittany, particularly, because 60% of municipalities still do not even have a website.

In synthesis, no more than 10 to 15% of towns of Brittany consider their electronic interactions with citizens as important as their traditional interactions (via paper or orally). It follows that the transparency and ease of access to information offered by the Internet are a myth in this region.

Breton municipalities still do not consider transactions, in particular up and downloading of forms, as a perfect substitute to paper. Besides the low number (11%) of municipalities equipped with certificates (electronic signatures), few have software applications to facilitate the administrative life of citizens, whether for urban planning (GIS, 37%), social policies (registration in the schools canteens), links to the fiscal administration (potentially possible through a national platform called "Helios"). However, many up and downloads of forms are monitored by the central government (identity cards, tax payment online, electronic communications with civil engineering department), so that the municipalities are just an intermediary. Facing this same challenge, municipalities do not react in the same way.

A logistic regression identifies the factors explaining this heterogeneity. The size of the municipality is by far the primary cause of diversity, followed by the presence of human resources dedicated to ICT and the fact that the town is a tourist destination. These factors confirm previous analyses such as Moon's [6]. Less relevant seem the age of the mayor, the wealth of the city, or ICT investment (the latter being surprising). From this regression we do not find big surprises. Structural factors (size, location of the city) give the main explanation. But the presence of ICT resources is a hint for the complexity of the task of organizing interactions and transactions with the citizens. Since electronic interactions have not the same value as the traditional (written) ones for the municipalities, digitization probably remains a second order objective, at least in Brittany.

ICT and public management

ICT harness municipalities with the benefits of rapid circulation, processing and storage of information. Because of the subsequent shuffle in organisations, there is a possible reluctance of the staff to adopt new technologies; this is Ebbers and Van Dijk point. And the more complex is the organization the more likely is this to happen.

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[3] Content of websites (percentages providing the item in parentheses: Agenda (80%), contacts adresses, schedules (97%), public tenders (29%), agenda of the Council (35%), forums (3%),FAQ (2%), e-mailing lists (21%), maps, online GIS (17%), syndication (9%) downlable city journal (58%).
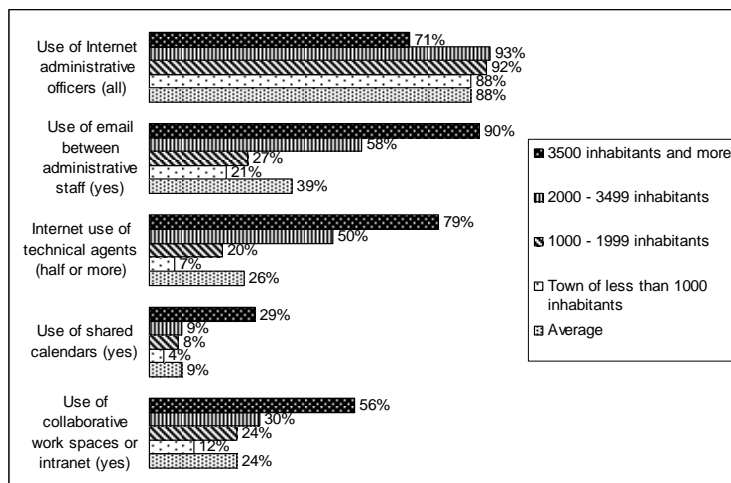
Picture 1: Use of productivity tools and municipality's size

If key management applications are now well used, more specific software is not completely known, not to say used (including electronic land registers). But very banal uses (email) are seldom adopted, even to communicate inside the administrative staff. Again, exchanges are prominently oral, because in a small city with only two or three administrative officers, e-mails may not find their place anyway. The use of more complex productivity tools (shared agenda, collaborative work spaces) is limited to a minority of probably large cities.

There are several explanatory factors to the strong disparity of uses: the size of the town but also economic conditions or location urban area, tourist city and average income in the city); but also ICT-related elements: the membership in an ICT project, a real motivation to use ICT, the existence of human resources dedicated to ICT (may it be a person or a whole department). The point now is whether we can identify the key factors of this divide.

Identifying the origins of the divide

Many Breton municipalities have not yet grasped the benefits of digitization, but some small municipalities with limited means are far ahead in the adoption of ICT. Conversely, despite the wide availability of personal computers, these are not very much used by politicians in local governments. And more worrisome is the strong lack of interest in ICT in municipalities poorly equipped or having low usage. Laggards will likely continue to be laggards because they do not seem interested in the adoption of ICT. This casts some doubts about the inevitability of the "maturation cycle".

The large number of "laggards" may be at first sight a feature of Brittany. However in general Brittany stays very close to the national or European average. More significant seems the elements identified in our survey: the difficulty to formalize an information which is loose and tacit, the lack of interest, or even more a reluctance of the council vis à vis ICT. To give just a number: 30% of mayors and 42% of their counsellors express a negative impression of the impact of digitization upon their work. This confirms the Ebbers and Van Dijk's hypothesis of resistance. The hypothesis of "cognitive alignment" may provide a clue to

overcome it. To verify this we have used classification methods to construct a typology of municipalities which reveals five profiles[4] regarding e-government:

- Group 1: Its members have no website and limit their use of email to exchanges among the administrative staff, access usual productivity applications but not those specific of the local government. Most of them have no or limited ICT dedicated human resources. This large group (50% of towns) represents the "left out" of the digital world, not having entered the first stage in the maturation cycle.

- Group 2 (14% of the sample) includes the municipalities with emerging uses. Their modest adoption of ICT is revealed through the use of email by elected representatives but not of other digital tools. This seems the first step to close the gap.

- Group 3 represents only 10% of municipalities, featured by use of ICT by the mayor (usually younger than 60 years) and by some councillors including e-mail, and writing digital presentations in the City Council. This familiarity with ICT is shown by the availability of an ICT policy and substantial financial resources. They are "users in transition."

- Group 4 concerns 17% of municipalities with a usage of ICT for both internal and external goals, they mobilize the full range of digital tools (certificates, electronic calls for tender, websites). They have significant financial income, are often tourist areas, the elected representatives are driving forces, the size of the city is fairly large. These municipalities build a group of "experienced users"

- Group 5 is the smallest group: 7% of the towns. They use advanced ICT tools particularly for productivity (including collaboration tools and shared agendas). They declared their participation in an ICT project, the cities of this category are, not surprisingly, large or very large, often in tourist areas, with large income, and even a young mayor. These are the "advanced users".

The picture seems rather bleak: 14% of Breton municipalities are in a state of development of e-government which is no more than having a website, while 50% do not even have one. This result contrasts with say, the US situation (Norris and Moon [9]) where 88% of local authorities report a website in 2002. But at that date, most municipalities, even in the US, did not have transaction related services.

The results can be interpreted according to two families of use: those related to the internal activity of the town council (tools of e-administration, enhancing productivity and performance such as relations between elected officials and administrative personnel, operation of administrative services) and those related to their external electronic communication (tools for local government and citizenship).

To some extent, ICT adoption for the purpose of effectiveness (better services to the citizen) is correlated with ICT adoption for efficiency (what we call internal usages). Hence it may be misleading to oppose the two concepts. In fact the real issue is ICT adoption as an innovation which may be translated in both efficiency and effectiveness. Also, implementing this innovation requires resources and cognitive alignment. In fact we have correlated the presence

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[4] Methodologically speaking, each class has formed a joint intra-class difference (within the same class) minimized, so many common characteristics while maximizing inter-class difference

of both a referring representative and an administrative resource to operate the IT infrastructure, with the typology above. This exercise shows that on average only 7% of municipalities have both a referring representative and an administrative IT resource, but this proportion raises to 25% when it comes to Group 5 (the most advanced municipalities) while being less than 1% for the "laggards" (Group 1). For us, having both a referring representative and an administrative resource is a sign of cognitive alignment, as well as organizational transformation: both elected persons and civil servants are committed to ICT adoption. The correlation shows that this is really the case.

Given the impact of city size on ICT adoption, we have attempted to eliminate this factor which is purely structural; hence, we have built up a classification in the population of cities with less than 2000 inhabitants. The new typology is now:

- A new small group of outsiders (3% of towns) where the agents do not even have an email. These town councils include a majority of elder councillors.

- A more consistent core group (79%), confirming that most lingering municipalities are small and represent 80% of Breton towns under 2000 inhabitants. This underscores, if necessary, the need for a public action to help their adoption of ICT (including their elected representatives).

- A class consisting of former groups 2 and 3 (7%), representing a group of users in transition.

- And more surprising, a non negligible group of municipalities which are advanced users (11%) relatively more important in the small municipalities population than on average. In a nutshell, a small Breton town out of ten has been able to demonstrate its ability to "master ICT". Being an advanced user is not the privilege of large cities. These villages have

The existence of a consistent group of advanced ICT users among very small municipalities suggest that the determinism lying behind the maturity cycle does not work. We feel instead that the cognitive alignment explanation is better. IT adoption does not seem to follow a linear maturation cycle and some particular events may suddenly provoke a quick involvement of municipalities supposed to be under unfavourable conditions. A casual look at some of the members of the group of early adopters among very small municipalities fully confirms this.

4. Interview with successful adopters

The city of Kernascleden (379 inhabitants, Morbihan) is one of the tiniest. At the origin of its presence on Internet is a British citizen, pensioning in that city and former computer scientist. He decided to open the website of the village, not only bringing Kernascleden in the phase 1 of Layne and Lee's classification, but also expanding the interactivity by offering the opportunity to put online the municipality's information sheet, thereby providing regular information to the population. Within a so small village there are only three clerks: a secretary and two technical agents. The secretary now tries to send mails to the mayor. Also, tourists send mails to obtain information about visit hours for the small village chapel. The modest involvement of the municipality is proportional to the amount of information that this village has to put on the Internet. The mayor has only recently got a connection at home, and the action of an outsider does not call for his personal investment: the volunteer continues to update the website. But at least there is no longer a resistance of this village.

Langrolay (831 inhabitants, Côtes d'Armor) has also a website. The decision has been taken in 2002 by the local group of municipalities ("communauté de communes"). It was a collective decision. They needed an external service provider and chose to share the project, the experiences, the decisions and the costs. As the maintenance is outsourced, it creates difficulties because of a lack of homogeneity of information provided by each municipality and the difficulty to design a common architecture. Furthermore, the cities would like to update on their own some pages of the website. It does not seem, in that perspective, that there is a full cognitive alignment inside the "communauté de communes".

Ploeven (474 inhabitants, Finistère), has a website since 2005. The case illustrates a difficulty to maintain an effort in a small village, when a key person moves away and is replaced by a less computer literate individual. The former administrative agent had a full time job to get information about his village. He was fond of history and managed to have the information collected onto a website. His aim was to highlight the touristic and patrimonial value of the village. Now that the website is up and running, the mayor and his council have asked the new secretary, who is only part-time and without any experience to pass information internally. For instance, the agenda and documents for the monthly meeting are sent through email. The secretary has also learned how to insert the municipal information sheet in the website. This internal adoption of ICT by the council makes the municipality ripe to move to stage 2 of the maturation model. However, updating the content is not done regularly. Also the mayor would like to have an online booking system for the presbytery used for social events. Although he is aware of the necessity to extend the use of Internet, this is not considered as a priority, due to the lack of resources, both human and material. A similar example is provided by Tourch (875 inhabitants, Finistère); in that case however, two clerks have been trained and an external support is contracted with a private firm.

In Treffendel (1206 inhabitants Ille et Vilaine)), the cognitive alignment has come from a joint reflection by the municipality and the associations. As a result, a volunteer of an association has created the website, with regular updating from the civil servant and the associations. This volunteer acts as a trigger factor for this municipality.

Ile d'Arz (254 inhabitants, an island), has one of the best practise of ICT among all Breton cities, whatever their size. Here the cognitive alignment has been reached when a computer engineer, later elected in the city council, has improved a previous version of the website, adding plenty of functionalities (RSS threads, forms up and downloading, most read articles, chats, etc.) A special commission has been instituted within the Council, headed by the webmaster. All the elected persons are web surfers and communicate through mails. The case is interesting in the sense that the web presence has been created by a previous coalition but completely transformed by the new one, winner of the following election. In the new team, a computer scientist has set himself the task to reduce the costs by internalizing functions previously outsourced, and through a large usage of open source software. He also invited his elected fellows to use mail, shared calendars and other collaborative work tools. He also set up some "Web 2.0" tools. This elected person has acted as an innovator in the Nonaka and Takeushi sense, convincing his teammates to adopt ICT.

5. Conclusion

In this paper, we have discussed the validity of the maturation cycle model. We have provided both casual and empirical evidence of its limitation and proposed an alternative model of interpretation of the diffusion process, cognitive alignment. The empirical evidence shows

that maturation is far from obvious in most local governments in Brittany (and probably in France). Most municipalities are stuck in a state of "non presence" (they do not even have a website), while a significant part of very small municipalities, supposed to be "laggards" are indeed very active. The empirical evidence also shows that there is a correlation between efficiency and effectiveness, two concepts often opposed in the literature. ICT adoption is a whole and may not be so easily split into "stages".

Casual evidence shows that the hypothesis of a cognitive alignment is necessary to understand the diffusion of ICT in small municipalities. It also explains the relationship between effectiveness and efficiency, the innovator creating a "learning curve" effect in the local government. Further research will enable to refine this concept and provide more empirical evidence.

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