RE-ORIENTING INFORMATION SYSTEMS FOR CUSTOMER-CENTRIC SERVICE: THE CASE OF THE GREEK MINISTRY OF FINANCE

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ABSTRACT

Governments are employing modern information and communication technologies to better serve society. Raising the effectiveness of government as well as the quality of the civil service is obviously not only a matter of new technologies. It involves clear vision for the objectives, business process reengineering, business strategies for the information technology and a sense of an educational role for society. Information Systems (IS) need to be capable to support internal work within a government's boundaries, serve the customers through digital interfaces and leverage digital relationships among social partners. To implement such a system, preparatory work is required in two axes: organization and technology. The former refers to business process reengineering initiatives and the latter to building 'extrovert' information systems. A new public information management philosophy underlies this significant revamping of the value propositions made to customers. The ongoing enrichment of the Ministry's Internet interfaces follows a sound business logic, which is explained by means of an extended model based on the ICDT one. The key-enabling factor of all these advances is the re-orientation of information systems for customer-centric service.

1.   INTRODUCTION

The story of the impact of Information and Communication Technologies (ICTs) in the field of Government is much the same as with companies, although the timing differs. Companies have been exploiting for long the ever-increasing capabilities of ICTs in order to satisfy their customers. Now, "people know how easy it is to do business over the Internet [with ICTs in general] and they are demanding the same level of service from government that they have come to expect from the private sector" (NSchoeniger, 2000b). However, the public sector is deterministically following the same path with the private sector: from the pursuit of efficiency to effectiveness and from the use of ICTs by the same old structures to a complete internal transformation for maximum leverage. New management paradigms for the public sector as well as challenges and innovations incurred by the advent and intelligent use of ICTs in governance have been put forward by several researchers e.g. (LSchedler, 2000), (CBellamy, 1998), (OSnellen, 1998). Moreover, the digitization of the social interactions and, subsequently, of the governance functions has given birth to ideas about the e-transformation of democracy (HGrossman, 1995), (IHague, 1999), citizenship (EFriedland, 1996), nationhood (BBarrett, 1997) etc.

The progress towards the information society demands that governments not only formulate the appropriate legal and regulatory environment so as "to allow free-market forces to assert themselves unhampered by excessive government regulation" (RZwass, 1998) but also to transform themselves into lean and nimble organizations in order to accomplish their governance role. This role is supported by a structure that can be described by the pyramid metaphor as shown in the figure below.
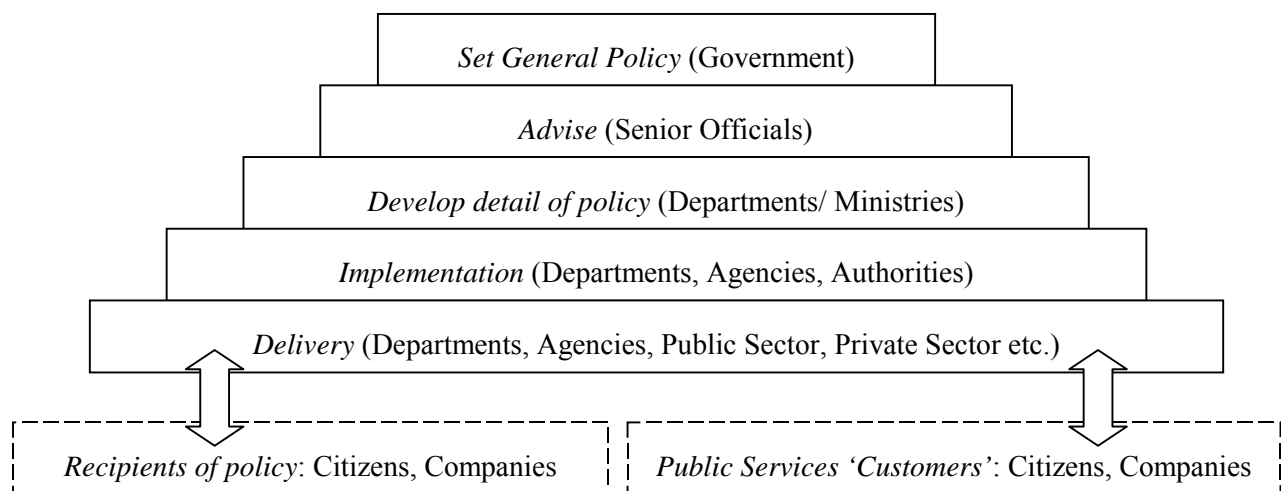

Figure-1 The pyramid of government (adapted from figure 3-1, page 19, (SPOST,1998)).

In this pyramid, "information flows vertically, being 'multiplied' as it flows down and 'refined' as it flows up the pyramid. To date this process has almost exclusively been based on the movement of paper" (SPOST, 1998). Replacing the paper flows between the pyramid of government and the recipients of policy as well as between the public/civil service 'customers' and the pyramid of government with modern ICTs is major requirement for governments entering into the digital age.

The seamless cooperation between a government and its partners, social actors and counterparts is definitely not only an issue of electronic interfaces but also, most importantly, a question of high quality and reliable services. Without underestimating the value of offering governmental services

through a plethora of electronic delivery channels that are accessible to the public as well as the user-friendliness of these electronic interfaces, the big issue still lies in the area of strategy and planning. The core questions that need to be carefully answered relate to the business strategies to be pursued, the information management philosophy / mentality that underlies the ICT investments, the preparatory steps that have to been taken and finally a prioritization scheme for the types of services that must be offered via the Internet in particular.

All governments face questions like these in their effort to prepare themselves for the requirements of a digital economy and of an information society, and, therefore, it is worth analyzing further those issues, to possibly arrive at best practices and lessons to be learnt. Setting such a target, the best way of approaching this research topic is a case study (DCornford, 1996). In this paper, the case of the General Secretariat of Information Systems (GSIS) of the Greek Ministry of Finance (MoF) is scrutinized to reveal the new public information management philosophy and the business strategy followed. This particular case has been selected due to its success record indicated by the increasing user acceptance rates, that is the level of assimilation that these services enjoy by their 'customers'. The paper analyzes the basic milestones of the core project for re-orienting IS towards customer-centric service as well as the underlying, implicit business strategy followed. The presentation approach of this case analysis took into consideration that "the validity of an extrapolation from an individual case or cases depends [...] on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them" (QWalsham, 1993).

2.   INFORMATION MANAGEMENT PHILOSOPHY

Being the treasurer and the financial controller of the government, the Ministry of Finance frequently interacts for a variety of reasons with all the social partners that are involved in any sense of economic activity. Therefore, the effective use of ICTs by the Ministry of Finance has a significant impact on the adoption of advanced technologies by both the recipients of the governmental policy as well as the 'customers' of the civil service. Within the huge edifice of this Ministry, the General Secretariat of Information Systems is the administrative structure that deals with all issues pertaining to ICTs both for internal administration and civil service purposes.

The business mission of the General Secretariat of Information Systems of the Greek Ministry of Finance (MoF) is described by the following statement:
- to deploy and operate information systems for taxation, customs, and other business areas,
- to formulate and implement the overall MoF's Information Technology strategy,
- to contribute to MoF's administrative modernization with particular emphasis to quality of service and respect to the citizen as customer.

Accruing from this mission are the strategic objectives:
- to develop technological infrastructure and manage information content, thereby providing quality services to the citizens and enterprises, for all their transactions through the MoF,
- to utilize new technologies, introducing innovative and advanced services and products, for the citizens', enterprises' and public sector's benefit in Greece and in the European Union,
- to take advantage of the opportunities that create added value to the Greek economy by using the know-how of its human resources to contribute to compliance of the law by facilitating efficient, effective and transparent communication between the citizens and the MoF.

As a bottom line, the core business of the General Secretariat is to handle information. This does not come as a surprise, since "government is deeply involved in the information sector, either as a primary producer or repackager of information – economic and social statistics, maps, weather, agriculture, export opportunities, health" (JKent, Lesson No.17). Therefore, an appropriate information management strategy has to be in place, whose philosophy and mentality must be diffused into all the

decision-making layers so that ICT planning, prioritisation and investments are aligned with the vision about the relation between government policies and the public information and ICTs.

Regarding the function of a government and the role of the civil service in particular, the vision of the political leadership of the General Secretariat is that governmental policies are developed with a view to offer services to social recipients aiming at their prosperity, and achieve and sustain economic development. This vision statement is in congruence with the Greek government's broad strategy for e-commerce stating that "the vision behind the actions on electronic commerce aims at making Greece an equal and strong partner in the international commercial environment. The use of electronic commerce technologies and practices can give Greek firms competitive advantages, with as a consequence the increase in productivity and international competitiveness for the whole country" (GGreek Prime Minister's Office, 1999). The means to this end is the management of a set of public resources in terms of optimal exploitation and preservation. Refining those principles in the context of the General Secretariat's application field, a set of conclusions can be derived in which the whole philosophy and mentality about the public information and the ICTs is epitomized.

a. A pubic information system processes and manages not only public resources but also part of the public 'information treasure'.

b. First and foremost objective of the operation of Public Information Systems is to support effectively the mission of the government and the civil service, and to leverage the role that the government has chosen to play within the society, according to its political stance.

c. Within the framework of the above foundational objective, the administration and management of the public information treasure must be optimised for maximum quality of service, taking for granted the time, money and people availability restrictions.

Emphasizing the exploitation of the public information treasure instead of passively responding to social partners' requests shapes a new philosophy in public information management, where a proactive attitude against customer expectations prevails over the usual reacting way of carrying out civil service work. The outcome of this paradigm shift of public administration mentality is interpreted into action in two areas:

➢ the first is to offer services seamlessly and reliably through a variety of electronic channels at the customer's choice, and

➢ the second is to re-orient the Ministry's, once internally focused only, information systems to a customer-centric services provider.

If technology is eroding the methods of interpersonal communication, social actors interaction and economic and commercial activity by gradually becoming their mediating and facilitating factor, then governments have little other choice than to establish ICTs as interfaces with their customers. Although the use of the customer notion is not semantically correct, it is used in the e-government literature to underpin the fact that governments have started considering their citizens as customers who can opt out for another 'government service provider'. Hence the need to keep them satisfied. Traditional management theory literature says that customer satisfaction and loyalty can be achieved if the customer can recognize the value proposition and perceive a particular offering as meeting his/her current and/or latent requirements. The value proposition has to do with the product/service itself as well as with the delivery channel. Starting from the latter, governmental ICTs must be designed around customer needs and, even more, as though they were to be operated by the customers themselves.

To build customer-centric information systems, technology innovations presuppose an organizational 'shake-up' so that business processes get streamlined and customer value- driven operations are established. The next paragraph describes some milestones of the modernization roadmap as well as the main system, which constitutes the backbone of a multi-purpose ICT platform for the MoF.

3.   THE MODERNIZATION ROADMAP

The customer orientation and the underlying ICTs to deliver high-quality customer-oriented service has been based on a simple modernization roadmap consisting of four key milestones:

- Business process streamlining and re-engineering initiatives
- Reversion of "introvert" orientation, failing to place emphasis on direct G2C and G2B service provision.
- Design and construct a central IT which will function as the "digital nervous system" (FGates, 1999) for the MoF and all the interconnected with MoF parties
- Develop several electronic interfaces for customers using the phone, fax and web.

Outdated business processes have been overhauled and regulatory amendments were necessary to prepare the civil service from an organizational point of view for the introduction of new ICTs. The classical "don't automate, obliterate" principle of M. Hammer was applied to wherever possible so that the ICT investments would ultimately support the government-to-business (G2B) and government-to-citizen (G2C) type of requirements. The G2B vision can be articulated as follows: "Government support and assistance should be anywhere and anytime available to aid the businesses succeed, facilitate their every contact with the State and regulate the environment for a healthy electronic market economy" (PStamoulis, 2000). Similarly, the G2C vision is that "government support and assistance should be anywhere any anytime available to aid the citizen as a valuable customer, reflecting the fact that a government respects the citizen" [ibid]. To achieve those targets, scattered information must be interlinked and cleansed, and IT islands must be transformed into service providing networked information systems. As a result of the business process reengineering initiatives, the interconnection of information and systems islands allowed for the functional integration among various workflows having an avalanche effect on the ICTs exploitation as well as on augmenting the added value of the public information treasure. Thus, the two pillars of the customer-centric reorientation, i.e. organizational and technological changes, allowed the formulation and implementation of an IT strategy along four axes:

1. Development of management / executive information systems to support the political and operational layers of decision-making.
2. Creation of access–points for citizens, businesses and agencies both for the supported services and the stored content of the MoF's information systems
3. Physical and functional interconnection of the sectional and departmental information systems to allow communication and cooperation and to enforce uniformity to the produced digital content.
4. Operational integration of information systems functionality and digital content with the respective infrastructures of: a. institutional partners (banking system, pension funds, professional bodies etc.), b. public authority agencies (national statistical service, ministries, local authorities etc.), c. European Union's institutions.

The outcome of this strategy is a 6-year IT project called TAXIS (Taxation Information System – the word taxis in Greek means order), initiated by MoF. TAXIS, which represents one of MoF's strategic IT investments with an overall budget of approx. 60 MECU contributed by national and EU funds, has provided IT support to the central tax authorities, located in Athens, as well as to local tax agencies, located all over Greece, for carrying out tax filing, calculation and payment transactions with citizens and businesses. Now in the final year of its deployment, TAXIS is based on a 3-tier data and application architecture over a virtual private WAN to serve over 90% of tax payers and 95% of taxation transactions, with an objective of 100% for next year.

TAXIS has been envisioned as the digital nervous system upon which all the services of the internal administration of the Ministry and those of the external relationships of the Ministry can be incarnated. Upon it, the deployment of an MIS shell to support MoF's policy-monitoring and policy-making requirements will be based, as well as the enhancement of TAXIS WAN with integrated

data/voice/image services in order to support all of MoF's internal communication requirements. It will also provide backbone network services to all of MoF's IT projects (e.g. Customs Information System). Apart from that, TAXIS WAN infrastructure and TAXIS database informational content can be exploited for offering network services to other public administration (PA) agencies as well as deploying cross-PA horizontal co-operation schemes.

4. INFORMATION SYSTEMS FOR CUSTOMER-CENTRIC SERVICE

The initial master plan of TAXIS was drafted in 1995. Although the deployment of TAXIS has been complemented by a number of internal business process streamlining and re-engineering initiatives aiming at better quality of service for citizens and businesses, it has become in the last two years evident that the original conception of this project, dating back in 1995 when IT support for MoF's internal business functions was urgently needed, suffers from a strong "introvert" orientation, failing to place emphasis on direct government-to-citizen and government-to-business service provision. This fact, combined with the expansion of Internet and the web as global communication and transaction infrastructures for an emerging digital economy, has led GSIS to the strategic conception of making some "popular" internal TAXIS services directly available to the citizen and business tax-payer communities, thus providing the "missing interface" for extending an internal IS for introvert functions to IT support for extrovert services.

This conception has resulted in the TAXISnet project, whose services are directly accessible to the public in the form of a web site (www.taxisnet.gr). A process/data flow example is indicatively shown in Exhibit 1. TAXISnet offers a web-based interface from which server-side applications initiate transactions in order to provide user services. For security purposes, data retrievals for TAXISnet transactions are performed upon an off-line-maintained replica of involved TAXIS database tables, whereas data updates are replicated off-line to the TAXIS database.

As far as software architecture is concerned, TAXISnet applications have been developed from re-usable TAXIS application components, whereas the aforementioned technical architecture requires a minimal amount of re-engineering in the original TAXIS applications and database schema. Therefore, the need for application software modifications or any other architectural adjustments has been minimized, thus also minimizing implementation time and costs.

After a short initial, fully electronic, registration procedure, TAXISnet users receive electronic credentials that enable them to access the full range of TAXISnet services. Now in the second semester of its pilot phase, TAXISnet offers e-filing services for VAT forms with an objective for enabling VAT e-payments via established banking system infrastructures within the next 6 months. Further development plans for TAXISnet include (i) e-filing services for all major tax forms, (ii) deployment of TAXISnet services in Internet-enabled public kiosks and (iii) integration with other national and European e-government services. Table 1 shows measurable results regarding the user penetration of the GSIS e-services.

e-VAT service (available through TAXISnet since 5/ 2000, figures as of 15/2/2001)	
• filed forms	60,000
• registered users	60,000 (approx. 50%)
• registration rate	approx. 300/day
e-IncomeTax service (available through TAXISnet since 5/2001, figures as of 10/3/2001)	
• filed forms	1,000
• registered users	80,000

e-Certificates service (available through TAXISphone since 5/2000, figures as of 15/2/2001)	
• issued certificates	44,000
• registered agencies	2,900 (approx. 43%)
• registration rate	approx. 300/month
e-IncomeTaxInfo service (available through TAXISnet, TAXISphone between 5–12/2000)	
• info requests	4,000,000 (approx. 40%)
• request rate	Approx. 17,000/day
e-Awareness service (available through GSIS web site since September 1997)	
• request rate	approx. 2,000/month
• registered users	2,500

Table 1. Figures on user penetration of GSIS electronic services.

The nowadays-observed electronic access points 'obsession' should not distract the decisions-makers from focusing on the provision of seamless and integrated channel-independent services. Not only there are services that cannot yet be offered fully online, but also it is for customer convenience to choose whatever channel s/he would like to use each time to do business with the Ministry. Therefore, "governments need a 'clicks and mortar' model. It is now cleat the new economy isn't synonymous with the electronic channel, but involves the intelligent pairing of online and offline assets. This is not just because some may not have access to or be reluctant to use on-line channels, but because the same consumers may prefer to use different channels at different times of different purposes (e.g. counselling, appeals). The data available through these channels need to be identical and equally current. This implies that all channels need to be feeding into and drawing from the same information base – what we call channel transparency." (JKent, Lesson No.3). To achieve this, TAXIS as the digital nervous system of the Ministry is of paramount importance. The ultimate goal of channel transparency is regarded as an ongoing task of continuous improvement of the business process, the organizational procedures and the information systems functionality.

In its current status, TAXISnet offers 24x7 service availability and real-time response for all transactions, plus on-line FAQs and email-based help desk services for registered and prospective users. The main customer segments addressed by TAXISnet are individual citizens, with emphasis on remote regions, accountants and private businesses, with emphasis on SMEs. According to recent estimations, TAXISnet services are currently (June 2000) used by approx. 15% of Internet-enabled VAT-liable citizens and businesses, with a projected penetration of 35% for December 2000 and 50% for December 2001.

Operational exploitation has involved a small number of legal issues, mainly relating to authenticity of e-communication respondents and validity of e-VAT forms; these have already been resolved by appropriate regulatory acts and lightweight technical measures. No major cultural obstacles, on the other hand, have discouraged end-users. As the current end-user penetration levels and rate testify, e-working habits as well as a trust-and-confidence culture have already been established by a sufficient number of citizens and businesses, who now act as a critical mass for maintaining the "success momentum" and attracting new users to the service.

The main comparative advantages of TAXISnet, with respect to internal IT support for paper-based transactions, include (a) elimination of paper work and physical transport, (b) continuous service availability, reduced response time and a substantial decrease of errors, and (c) open API specifications for integration of TAXISnet service calls into third-party commercial software products

(office automation packages, ERP systems etc.) A key issue in the deployment of TAXISnet services has been the minimization of additional technical know-how and economic investments required on behalf of end-users; since all TAXISnet applications run server-side, only an Internet-enabled computer and a browser (most probably already available to end-users) are needed to access the full range of TAXISnet services.

VAT e-submission (at any time)

1.   user → submits credentials → log-in procedure

2a.   (log-in failed):   log-in procedure → warning → user

2b.   (log-in procedure successful):

   1.   log-in procedure → user credentials → submission procedure initiates

      2.   user → declaration information → submission procedure particulars

      3.   submission procedure → declaration information → data validation

      4a.   (data validation failed): data validation procedure → info message → user

      4b.   (data validation successful):

         1.   data validation procedure → confirmation prompt → user

         2.   user → confirmation → data validation procedure

         3.   data validation procedure → declaration data → VAT e-declaration form filing

         4.   data validation procedure → filing receipt → user

Exhibit-1: A process/data flow example

Building open-to-customer ICTs is inextricably interwoven with potential security threats. A number of security servers have been deployed to safeguard the flow of messages from and to TAXISnet. Servers are protcted by firewalls and their are connected to leased lines which form a secure virtual private network. Digital certificates of 1024 bits are included into the user credentials.

This technical architecture has proven in practice to be a stable and effective solution as far as system security, data encryption and user authentication is concerned. It should be noted that no security or authentication problems have been observed thus far. The establishment of these technical infrastructures is followed by detailed procedures for detective, preventive and corrective actions. Counter-measures systematically check for intrusion patterns and organize dummy security attacks aiming at identifying possible security shortcomings. With particular reference to user authentication, it is also noted that digital signatures are planned for the near future (end 2001), in accordance with progress of the national legislation framework of Greece.

5.   USING THE ICDT MODEL TO EXPLAIN THE INTERNET BUSINESS STRATEGY

The modernization projects in conjunction with the TAXIS infrastructure and the TAXISnet access point form the appropriate foundations for the MoF to get involved into e-government initiatives. Having prepared the grounds for e-government initiatives, the question of an appropriate strategy rises again. According to international best practice, "governments should take a building block approach to

e-government. […] Start with rudimentary, easily understandable processes. Then coordinate those activities into an overarching strategic vision for how e-government will serve citizens, businesses and other agencies" (MSchoeniger, 2000a). The leadership of the General Secretariat has endorsed these recommendations and followed a step-wise approach that facilitates rapid penetration of e-government technologies into society.

To explain the Internet 'business' strategy of the GSIS, the ICDT model will be used, named after the information, communication, distribution, transaction concepts, which define four types of virtual spaces, according the model (AAngehrn, 1997). To each of these spaces, some TAXISnet services can be attributed, showing the diversity of offered services that cover the whole range of the virtual space.

a. Virtual Information Space
  o Publication of documents, deadlines, announcements, various calls etc.

b. Virtual Communication Space
  o Communication with the Ministry via e-mail
  o E-clearing announcement
  o Input: your tax registration number
  o Output: payable/refundable amount of money

c. Virtual Distribution Space
  o deployment of TAXISnet services in Internet-enabled public kiosks
  o distribution of taxation account statements directly to requesters, whether it be banks, public notaries, public authority agencies, businesses or citizens.

d. Virtual Transaction Space
  o short, fully electronic, registration procedure
  o receipt of electronic credentials to access the full range of TAXISnet services.
  o e-filing services for all major tax forms
  o e-submission of the VAT statement
  o e-declaration of professionals and businesses that collect VAT on behalf of the State
  o Now in the second semester of its pilot phase, TAXISnet offers e-filing services for VAT forms with an objective for enabling VAT e-payments via established banking system infrastructures within the next 6 months.

Sequencing and prioritizing the services gradually offered to the customers is not a trivial issue. On the contrary, appropriate planning can have a 'pedagogical' impact on the potential users or already subscribers, in the sense that it educates them to deepen their relationship with the MoF via electronic interfaces in order to reap the benefits of an increasing value proposition to them. If the virtual space of an Internet business (the word 'business' is used here as synonymous to 'activity') is represented with a circle and the four quadrants represent one of the virtual information, communication, distribution and transaction spaces according to the aforementioned ICDT model (AAngehrn, 1997), then the process of adding value to the Internet access point for the MoF customers can be depicted as a spiral model that unwinds around this circle towards more valuable propositions to customers.

Strategy deployment and services development according to this spiral model comply with the aforementioned best practice statement which called for launching "rudimentary, easily understandable processes" to educate the customers and 'create the habit' of direct interfacing with the Ministry, and "then coordinate those activities into an overarching strategic vision for how e-government will serve citizens, businesses and other agencies". Intentionally or not, the General Secretariat has taken this route and was proved very successful.

Despite the relatively small number of today's available services through Internet every new TAXISnet service introduces new content to each of the four virtual spaces. Assessing the current status of the offered services, GSIS believes that as far as the Internet business strategy is concerned,

success must be attributed to the population of all four spaces towards the direction of augmenting value propositions to the customers. It is a wonderful coincidence that the real life proves the concept of the spiral model and vice-versa. Indicators of the successful approach in re-orienting IS for customer-centric service include customer registration numbers, system usability rates, number of transactions performed, and above all, the use of the whole ICDT circle offerings, wherever applicable, meaning that customers have discovered the real value of integrated virtual services. It is outside the scope of this paper to present statistical evidence of this success.
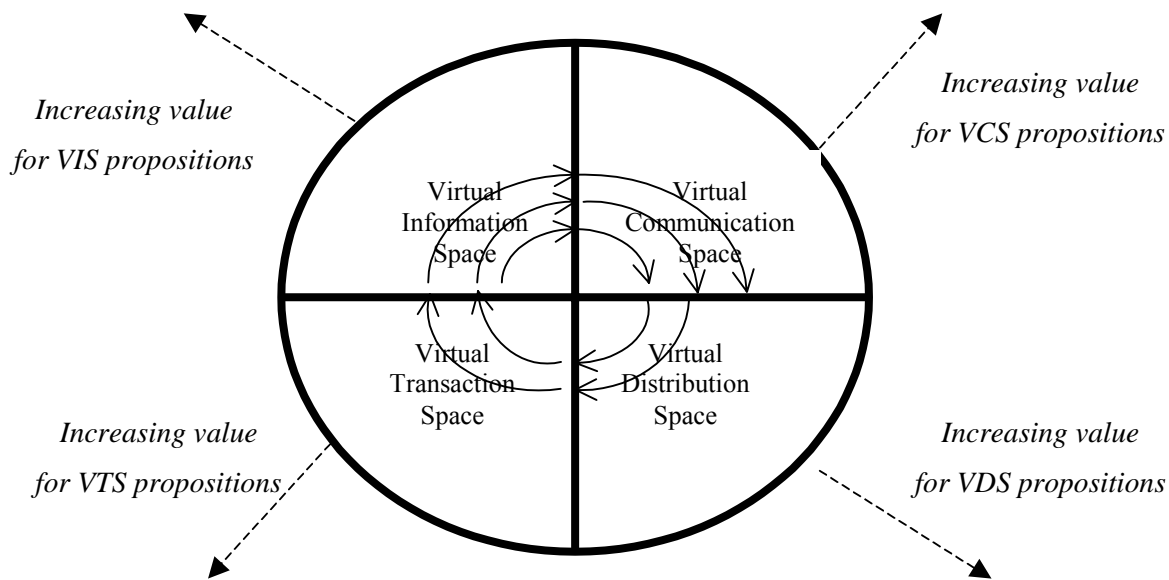

Figure –2: a spiral model of adding value in the virtual space (adapted and extended from fig.1 (AAngehrn, 1997))

6. CONCLUSIONS

An independent observer can identify some prevailing trends such as "the ever-growing information and technology share of government budgets, the rapid pace of technology change, growing globalization, more multicentered government organizations, rising public expectations, and growing emphasis on measuring performance" (KMorin, 1999) that makes one right to say that e-government is not a subject for the agenda of the future. It is almost here as an everyday reality that must be shaped in a visionary, firmly and systematic manner. The Greek Ministry of Finance, which is analyzed in this case study, identified the necessity of clearly articulating its policy and objectives. The General Secretariat of Information Systems developed the business strategies to be adopted, implements extrovert information systems and enriches the digital interfaces connecting it with to the social partners. The use of the virtual spaces spiral model shows that the GSIS's approach uses a theoretically proven way of penetrating its potential customers base. Putting networking at the heart of all relevant business activities, synergies at the horizontal level – across social structures – inside and outside government's boundaries can be established and effectively supported.

Thus, the GSIS is actively seeking co-operation with third-party stakeholders in order to establish single-stop integrated services to citizens living and businesses operating in Greece. In this respect, GSIS is interested in launching "horizontal e-service initiatives" in co-operation with:

a. "e-service partners" (regional, national or European public administration agencies, sectoral professional bodies and bodies somehow representative of affected citizens)

b. "e-service enablers" (banking system institutions, Internet, telecommunication as well as postal service providers, secure infrastructure providers including trusted third parties and certification authorities)

c. "e-service facilitators" (including promotion, dissemination and awareness channels)

d. "e-service practicians" (including existing e-service schemes as well as best e-practice centers).

Pursuing these synergies, the GSIS is acting as a 'centre of excellence' for the public administration, spreading the word and enabling the appropriate infrastructures for e-government initiatives to deploy. The key decision that pushed a significant part of the civil service towards the e-governmet and eEurope mentality was the re-orientation of re-orientation of information systems for customer-centric service.

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