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# The Government's Role in Improving Electronic Commerce Adoption

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**Abstract-** Electronic commerce has been introduced to the business community at a very fast pace. The Internet's ease of use in particular resulted to a rapid growth of electronic transactions in a spontaneous manner. Governments world-wide are anxious to control this new means and have to balance between international co-operation and care for specific national needs. In this paper we examine the role of governments in the implementation of a national electronic commerce strategy. We argue that public authorities need to consider key stakeholders in the electronic commerce market and apply different strategies to different stakeholder groups.

## I. INTRODUCTION

The rapid expansion of network technologies enables easier communication not only among business partners but also between companies and their end-consumers. The ease of use and connectivity to the web has captured the attention of the consumers resulting in the rapid growth of electronic transactions. Almost every citizen today is part of the electronic commerce society and can exchange information with anyone in the globe.

Despite the intensive advertisement about the new electronic commerce technologies and practices and the obvious advantages that these offer to businesses, electronic commerce hasn't been adopted in full and it is believed that it hasn't reached its full potential.

For example business to business transactions that use mainly EDI, the adoption of the technology has been slower than expected, even though it has been introduced to the business community since the early 1970's [1]. The high implementation cost and the need for high skilled designers and developers are reported as the main reasons for the modest level of EDI diffusion [2]. Additionally, the low developed technological infrastructure and the lack of legislation framework have been obstacles in EDI adoption in certain national settings (e.g. [3]).

Governments world-wide have shown the intention to incrementally replace traditional systems of data manipulation with electronic ones. Using electronic commerce technologies, they try to streamline the delivery

of their services to the public, serving the citizens through diverse channels. However, the public sector is mostly lacking behind the private sector with some exceptions in countries such as Denmark, the Netherlands, Singapore (e.g. [4-6]).

Although the use of the Internet is growing rapidly and the number of web servers connected to the Net are multiplying fast (e.g. [7, 8]), the Internet has not been deemed to have reached the critical mass of consumers needed to justify electronic businesses [8]. Small and medium size enterprises in the European region, in particular don't seem to have realised the potential of the new medium and seem reluctant to use the new technologies. According to Pickup [9], 64% of the UK's small businesses do not use the web. Investments on electronic commerce have various results, including reports on many abandoned electronic commerce implementations [10]. Whilst the projections about the future of the business-to-consumer electronic commerce vary widely, there is no doubt that the market is growing quickly.

According to OECD [10], the most frequently reported barriers for the electronic commerce adoption by small and medium size enterprises are:

- Lack of awareness. Companies don't seem to have a general understanding about the new electronic commerce business opportunities and they find it difficult to access information about cost, human resources, specific industry sector needs.
- Uncertainty about the benefits of electronic commerce. Companies are not easily convinced about the benefits of electronic commerce use. They need to have fast results with a low cost investment
- Concerns about lack of human resources and skills. Small companies usually lack in-house expertise and are concerned about the necessity of major changes in their internal business practices.
- Set-up costs and pricing issues. One of the main concerns of the managers is the direct initial cost and longer term impacts for maintenance, training,

consultancy and communication. Access to funding resources is also a very important issue.

- Concerns about security. Security is a key issue in electronic commerce adoption. Although the technology seems to be mature, the uncertainty about the use of on-line transactions seems to be a barrier that will be difficult to lower in the next years.

One of the main reasons reported for the relatively low electronic commerce adoption is the lack of trust about security issues related to on-line transactions. Trust is a key issue and its existence among the business community and the end-consumers will increase the probability of trading partners willingness to expand their interorganisational relationships (e.g. [11-14]). This lack of trust about electronic commerce today, can be attributed in part to the lack of awareness about the possible risks and corresponding remedies related to electronic transactions.

It seems imperative for companies today to realise the benefits of the electronic commerce technologies and act as early adopters, exploiting the rising business opportunities. It is obvious that the governments have a vital role in this procedure as their decisions can influence the evolution of the electronic commerce adoption.

The paper examines the government intervention in the diffusion of electronic commerce and is structured as follows. In the next section we examine the role of the government in IT-related innovations during the last decades. In section three we investigate how national governments may use existing intervention measures to apply their strategies in electronic commerce. Section four introduces the stakeholder notion in the context of national electronic commerce strategies and identifies the groups of stakeholders acting in the electronic commerce market. In section five we draw a web of strategies and stakeholders in order to describe the impact of national electronic commerce strategies on the key stakeholder groups. The paper concludes with implications for the governments about electronic commerce strategies.

## II. THE ROLE OF THE GOVERNMENT

The issue of government's influence on technical innovation dates back to the nineteenth century, where the administration intervention was in contrast with the general *laissez-faire* economic philosophy. Later governments started to get more involved in the field and today there is no doubt that the government market has an important influence on industrial innovation [15].

Japan was the first country where in the 1960s, the government had the main responsibility to encourage the introduction of new technologies and design a long-term technology policy [16]. Later (mainly in 1970s and 1980s), the governments in Western Europe and North America worked along the same patterns in government intervention but following different conceptions of competitive advantage. Finally in the 1990s, there is a broad agreement in the literature about the vital role of public administration in the diffusion of new technologies (e.g. [17-20]).

In the case of electronic commerce, although there is a tendency to move from *localisation* to *globalisation*, the national governments of the technologically most advanced countries have announced their 'electronic commerce policies' (e.g. [21, 22]).

Seeing electronic commerce as a new technological innovation that has the potential to change not only the business process but also the everyday life of the end-consumer, we argue that governments are powerful entities that can speed up the adoption of electronic commerce. Their collaboration with other important stakeholders in the electronic commerce market can help dismantling the barriers to global electronic commerce adoption.

## III. NATIONAL STRATEGIES AND MEASURES

Damsgaard & Lyytinen [2] have used the demand-pull and supply push theory [23] in government intervention for the diffusion of EDI. They argue that governments can either be influential or regulatory. Combining the two modes of intervention with the two types of driving forces six main government strategies are defined:

- Knowledge building
- Knowledge deployment
- Subsidy
- Mobilisation
- Innovation directive
- Standard setting

Using the combination of technology 'supply' and market 'demand' factors as well, Rothwell and Zegveld [15] define a wide range of policy measures and tools that the public authorities can use in their effort to diffuse the new technologies in the best way. These are:

1. Public enterprise, e.g. innovation by publicity owned industries, setting up of new industries, pioneering use of new technologies by public corporations, participation in private enterprise.

2. Scientific and technical, e.g. research laboratories, support for research associations, learned societies, professional associations, and research grants.

3. Education, e.g. general education, universities, technical education, apprenticeship schemes, continuing and further education, retraining.

4. Information, e.g. information networks and centres, libraries, advisory and consultancy services, databases, liaison services.

5. Financial, e.g. grants, loans, subsidies, financial sharing arrangements, provision of equipment, buildings or services, loan guarantees, export credits, etc.

6. Taxation, e.g. company, personal, indirect and payroll taxation, tax allowances.

7. Legal and regulatory, e.g. patents, environmental and health regulations, inspectorates, monopoly regulations.

8. Political, e.g. planning regional policies, honours or awards for innovation, encouragement of mergers or joint consortia, public consultation.

9. Procurement, e.g. central or local government purchases and contracts, public corporations, R&D contracts, prototype purchases.

10. Public services, e.g. purchases, maintenance, supervision and innovation in health service, public building, construction, transport and telecommunications.

11. Commercial, e.g. trade agreements, tariffs, currency regulations.

12. Overseas agent, e.g. deference sales organisations.

In the next paragraphs we examine how these policy measures may be used in the six government strategies defined by Damsgaard & Lyytinen in the electronic commerce environment.

The strategies of *knowledge building* and *knowledge deployment* refer to financial support for research and development (R&D) and disperse of new knowledge to individuals and organisations so that they are able to use the new emerging technology correspondingly. These strategies may be best applied with the use of *scientific and technical*, *education* and *information* measures.

Governments in Europe and US support the effort to enhance the awareness and confidence of citizens and companies in electronic commerce and the development of relevant skills and network literacy [24].

Entities that can be supported for this action from the administration are research institutes in university or in industrial environment. Additionally, the complexity and the cross-discipline nature of electronic commerce make the universities another key player in the implementation of an advanced research and development policy.

*Subsidy* can be direct, with financial support to all actors involved in the electronic commerce innovation, or indirect, with support for infrastructure building and establishment of favourable charging mechanisms for network services. *Mobilisation* expresses the intention of the government to make organisations/individuals to perceive innovation, the potential benefit of the in the 'right' way and understand the best practice for adopting it and encouraging them to do so. The measures that may support those strategies are *financial*, *procurement*, *political* and *public enterprise*.

In the advanced technologically countries today subsidy has moved from the traditional direct financial companies' support to more complex schemes. Private subsidy, mainly through the banking sector and venture capital companies, is highly recommended even in less technologically mature countries (e.g. [25]).

Procurement is an important market that the governments can use for electronic commerce diffusion. According to DTI [22] governments are very important players in the market for goods and services. It is estimated that public purchasing amounts to 11% of the European GDP. Doing the public procurement transactions electronically, governments could set an example of electronic commerce use. The European commission has set a target of 25% of public procurement transactions to take place electronically by 2003, while the UK government has announced targets of procuring 90% of routine goods electronically by 2000/2001. The telecommunications market is another significant area for electronic commerce. It is obvious that without the widespread availability of speedy access infrastructure in affordable price, electronic commerce will never reach its full potential. The power that the administration has to either control or liberate the telecom market is very important for electronic commerce adoption. Finally the governments can play an important role by either acting as Trusted Third Parties or by participating at the set up of such entities [26].

*Innovation directives* are norms that regulate the production or use of innovation in the governmental regime. *Standard setting* refers to the formalisation of

practices and limitation of options for organisations participating in the technology innovation. In the case of electronic commerce standard setting can be expanded to include other regulatory measures such as tax regulation and we will be referred to *regulation setting* in the rest of the paper. Mechanisms that can support those strategies are *public services, taxation, legal and regulatory, commercial*.

Through electronic commerce governments may simplify the delivery of their services to the public, offering better services to the citizens [27]. The UK government [22] for example targets to make 25% of government services available on-line by 2001.

Concerning tax regulation in electronic commerce, the lack of clear and fixed geographic lines of transit in the Internet environment makes the administration of tariffs for products and services a difficult task. Public authorities in Europe and USA [21, 22] agree that no new taxes should be imposed on electronic commerce. The broad principles that are usually reported with respect to the taxation of electronic commerce are neutrality, certainty and transparency, effectiveness and efficiency. Finally, legal issues are probably the most talked about subjects in the cyberspace. The legal and regulatory framework in electronic commerce includes intellectual property protection, privacy and security. There is a lot of research on the field with examination of techniques such as digital signatures, public and private key encryption, digital money and the like (e.g. [14, 28, 29]). The role of the World Trade Organisation (WTO) and the Organisation for Economic Co-operation and Development (OECD) is essential for the achievement of global consensus on fiscal issues [30].

The *overseas agent* measure refers to the role of the government as an 'overseas salesman for its nations goods'. This role of the government fades out in the cyberspace where the international nature of the Internet decreases the need for overseas advertisement. However, governments are still concerned with ensuring that their country is not 'left behind' in the adoption of electronic commerce and are often keen to be seen as exemplars of innovation adoption. Thus the overseas agent measure is implicit in all the national strategies discussed above.

#### IV. KEY STAKEHOLDERS IN NATIONAL ELECTRONIC COMMERCE STRATEGIES

The importance of considering the stakeholders acting in the electronic commerce environment is clear in the

'Joint EU-US statement on electronic commerce' [24] published on 5<sup>th</sup> December 1997. It is stated that 'Global electronic commerce should take into account *the interests of all stakeholders* in particular of consumers, libraries, schools and other public institutions, as well as the need to ensure the widest use possible of new technologies'.

Although the term stakeholders is rarely used in electronic commerce literature there is extensive reference to the "players" [8] taking part to the electronic marketplace. Terms that are usually used and refer to particular sets of interest groups are: global customers, trading partners, electronic commerce experts, information technology vendors, Internet providers, competitors, government, trusted third parties etc. [31-33].

We argue that is very important for governments to have a holistic view of the stakeholders acting in the field of electronic commerce. In this way they can be sensitive to the specific needs of different interest groups, they can be more effective in the application of their strategies and act proactively in a rapid technologically changing environment. We use stakeholder theory as a basis for our analysis, as it has been proposed as a powerful method for the examination of the impact of different viewpoints of participants in an organisational situation (e.g., [34, 35]), as well as in the interorganisational information systems literature [36].

The most obvious stakeholder in the electronic commerce market from our perspective is the *government*. It has the difficult task of balancing the application of international directives with the consideration of specific national needs.

As electronic commerce is an international phenomenon it is important to stress the role of *international organisations*. Their influence is very important especially in setting international standards and global commercial codes, security measures and so on. Governments have to consider their directives very seriously if they want their states to exist harmoniously in the new global environment. Such organisations are for example the Organisation for Economic Co-operation and Development (OECD), the International Chamber of Commerce (ICC), the World Intellectual Property Organisation (WIPO), the International Organisation for Standardisation (ISO), the International Electrotechnical Commission (IEC), the International Telecommunications Union (ITU), the World Trade Organisation (WTO).

Individuals acting as *consumers* or *citizens* are very important stakeholders that have to be considered. Special policies like intellectual property protections and privacy

issues are essential to build confidence about electronic commerce for them.

Another important group of stakeholders that is usually the target of the government policies is small or large *companies*. Small and medium size enterprises in particular have attracted a lot of attention, especially at a European policy level.

Another stakeholder group that plays a vital role in the new electronic commerce market is those organisations that can influence companies in their decision to adopt electronic commerce. These can be technology providers offering hardware or software solutions or services such as user authentication. They are referred to the literature as Internet service providers, Network service providers, Trusted Third Parties, Internet policy makers [26, 37]. In the same group we also include professional bodies that can influence companies or individuals such as chambers of commerce, workers associations and educational institutes. We note these organisations as *policy intermediaries* in this paper because they act between government and companies or citizens. The term should not be confused with the one used to describe companies that exist between providers and end consumers in the added value chain (e.g. [38]).

Apart from the key players in the electronic commerce market, other entities can play a supportive role in the implementation of a national strategy. The traditional *media* (press, radio, and television) for example can influence at a great scale the consumers about the use of new technologies and promote the opportunities of the new medium to companies and individuals. Additionally, it is imperative for governments to include *politicians* across the national ideological spectrum in the decision-making procedures about national strategies. It is not rare that conflicting political interests lead to problematic national strategies implementations (e.g. [39]).

## V. EXTENDED AGENDA FOR ELECTRONIC COMMERCE NATIONAL STRATEGIES

Policy makers at a national level have to work in a complex environment, where they should consider on the one hand the directives given from international organisations and on the other hand to cater for the specific national needs.

Figure 1 depicts the web of groups of stakeholders in the electronic commerce market in conjunction with the strategies governments can find useful to influence beneficiaries (companies or individuals).

The numbers represent the six strategies in the following order: (1) Knowledge building (2) Knowledge deployment (3) Subsidy (4) Mobilisation (5) Innovation directive (6) Regulation setting.

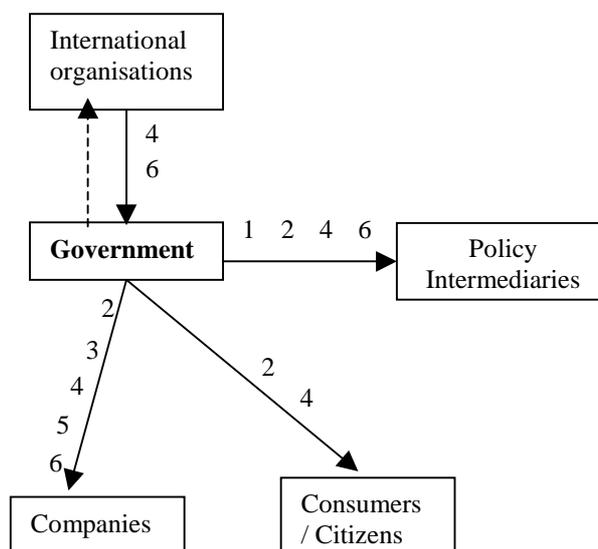


Fig. 1: Impact of national electronic commerce strategies on the key stakeholder groups

In the next paragraphs we describe the impact of the national strategies to each of the stakeholder groups.

*Government-International organisations.* As electronic commerce exceeds national boundaries and involves trading partners across the globe, there is an obvious need for a global legal and regulatory framework. Governments can and usually advised to follow international standards (*regulation setting*) and get information for ‘best practices’ (*mobilisation*) from organisations working in international level. It is interesting, for example, to note how the European Union tries to develop a consensus on electronic commerce policies and offer a solid directive to its countries-members [40]. Even powerful governments are willing to co-operate in international level for issues such as taxation [21]. The influence in some cases is mutual. There are examples of governments that play a vital role in the

definition of national standards having strong influence to entities such as OECD and G8 (e.g. [21, 22, 41]).

*Government-Policy intermediaries.* The policy intermediaries can be divided into four categories. Hardware/software/network vendors (such as ISPs), service providers (such as TTPs), professional bodies (such as chambers of commerce) and educational institutes. This group of stakeholders is very important for suggesting appropriate implementations of an electronic commerce policy. The key element that characterises this group is its direct link with companies, the main beneficiaries of public strategies. Specifically, governments can apply *knowledge building* strategies to educational institutes by supporting research in the electronic commerce field. Additionally, the universities can support the *knowledge deployment* strategy by offering education about the use of new technologies to companies and individuals. Strategy that can be also supported by professional bodies that can offer information and consultancy services in national or regional levels. The *mobilisation* strategy can also be supported by professional bodies since small companies have the tendency to ask for advice from local authorities such as local chambers of commerce or trade associations. Finally, government can apply the strategy of *regulation setting* by inviting or even impose to software/hardware vendors and trusted third parties to use selected standards in their offered products/services.

*Government-Companies.* Companies are usually the direct beneficiaries on an electronic commerce strategy. Governments try to persuade enterprises to invest in new technologies and take advantage of the opportunities the new means can offer. Small and medium size enterprises (SMEs) in particular attract special attention since they represent a significant part of the world economy. In the European Union, for example, exist 18 million SMEs. They employ 66% of the workforce and are responsible for 55% of turnover. They represent 99.8% of all enterprises excluding those in the agricultural and non-market sectors [42]. The governments may use a great number of the strategies at hand to influence companies and help them in the implementation of electronic commerce technologies and practices. Companies have first to be aware of the new technologies (*knowledge deployment*), get financial support for their investment on new technologies (*subsidy*), use technology in the 'best way' (*mobilisation*), get examples of electronic commerce use (*information directive*) and finally follow given from the government standards (*regulation setting*).

*Government-Consumers/Citizens.* Individuals acting as consumers (such as customers of virtual stores) or citizens (as users of on line government services) are in need of information. Governments can use traditional means such as the media to make the wide audience aware about the usefulness of the new medium and build confidence in electronic commerce transactions. *Knowledge deployment* and *mobilisation* are the strategies that can best fit government's intention to create awareness about electronic commerce, as well as about the rights of individuals in this new environment.

## VI. CONCLUSIONS

Governments should recognise the unique qualities of the Internet and the new electronic commerce environment. It is obvious that existing strategies and regulatory frameworks have to be reconsidered or even substituted by new ones.

Public authorities today have to act in a fast changing environment where international co-operation is imperative while there is necessity to deal with special national demands. The consideration of the widest spectrum of agencies and actors in the market can be very useful for the implementation of a successful electronic commerce strategy. Different groups of stakeholders should be treated differently according to their specific needs. In this paper we proposed a framework with different electronic commerce strategies as they can be applied to different stakeholder groups.

Further research in the area may include the investigation of electronic commerce policies implemented in variant national settings in comparison with the proposed framework. Alternatively, we could move the focus of the research from national governments to multinational organisations. We believe that the results of an extensive research in the field can be useful to policy makers in national or international level.

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