Open source software - Is it real treatment for public sector's software needs?

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"There are two sides to every question."
Protagoras, Greek philosopher (485 BC - 421 BC)

ABSTRACT

Open source software history takes as long as computer program history. Programmers at the beginning of computing used to programming for free software model and history now just reached back to (the root) community model. One can say: "There is no new under the Sun." But the raised question is about the suitability and usability of these software products for public sector. There are advantages as well as disadvantages… "The coins always have more than one side." There are many initiatives for using OSS in governmental work, but the real success has not come out yet. The research tries to set-up a theory and quantifies the advantages of OSS against the proprietary software (based on social, technical and economic approaches) thereby contribute to the academia and practice. The difficulty of the research is its complexity. None of above mentioned factors can be examined alone. There is close correlation between these factors. At this stage in this research have the main goals to focus on political and economical influences of OSS and to make a theoretical model for an economically reasonable decision for public sector. This paper examines the reasons why was raised the question about using free software in public sector and try to answer the question why are suitable if suitable these software for public sector.

1   BACKGROUND OF PUBLIC SECTOR'S SOFTWARE NEEDS

Industrial nations are undergoing dramatic economic and social transformation. This transformation is characterized by the rapid growing amount of information, wide-ranging implications of Information Communication Technology (ICT) and their impact on the whole economy and the growth of global competition. The societies are in transition to the "Knowledge Society". ICTs changed the World and the societies. ICTs can provide higher life standard for people. Opposite the higher standard there is the digital divide. The 'digital divide' is an umbrella term. Commonly understand the gap between ICT 'haves' and 'have-nots'. Generally, it has two main approaches. One focuses mainly on actual connectivity – infrastructure and access. Worldwide, the gap between those who have access to the Internet and those who do not is enormous. According to the Neilsen/Netratings study as of the first quarter of 2001, only 6% of the World's population had access to the Internet. Of that 6%, 41% comprised of people living in the United States (US) and Canada. 2 Another approach beyond connectivity is the ICT literacy and skills linked to access that does not mean only access to infrastructure, but it has financial, cognitive institutional and political and social cohesion aspects. In reality, many divides exist: both the internal country divides, as well as divides across countries. Today, governments, business, international and nongovernmental organizations have numerous initiatives to eliminate the ICT-related inequities, not just the result of economic differences in access to technologies, but also in cultural capacity and political will to apply these technologies for development impact. The economy can not eliminate the gap alone, so "intervention" of governments is needed. Around the world number of programs exist to manage this problem. National intellectual capital and innovation are based on human resources that is why so important to strengthen the equality by the governments. Government has special obligations as to protect the integrity, confidentiality and accessibility of public information, to protect the privacy of its citizens, to educate the "next generation", to creation job and careful management of budget. Government's functions and operations can only handle by using software applications. The software that is used by governments and controls, handles, transmits the citizens' personal data have to be transparent to protect citizens rights to privacy.

The reason why this paper examines the governemnts role is the size of Public Authorities that are quite different around in the each country from a small villages to a big city. Similar patterns, but different needs. The size determines the role and needs of different PA's. They also have common difficulties and dilemmas (e.g. they have to change data with other authorities and the central government) and different local "problem". The solutions differ for each PA's depend on their demand. Insted of making solution of islands it's time to thinking holistic. Top-down planning for bottom-up problem that means the government has to make a common guidlene and a common interface. The solutions to new challenges require new approaches just as knowledge mapping and knowledge management within the governmental work.

1.1   Roles of the Governments

The Digital Economy transforms governments and also the role of the governments mainly in those areas where the economy is most affected by changes of ICTs, and where the markets would not meet the requirements of social and economical stability. Governments play important roles in creating the proper environment for ICT development, and also have a significant leading role as users of these technologies by creating new modes of behavior in the public at large.

The 3 major levels at which governmental functions can significantly be affected (and generally improved) by ICT:

- e-Government (Policy coordination, Policy implementation, Public service delivery);

- e-Administration (Policy development, Organizational activities, Knowledge management);

- e-Governance (Democratic processes, Open government, Transparent decision-making). [2], [5]
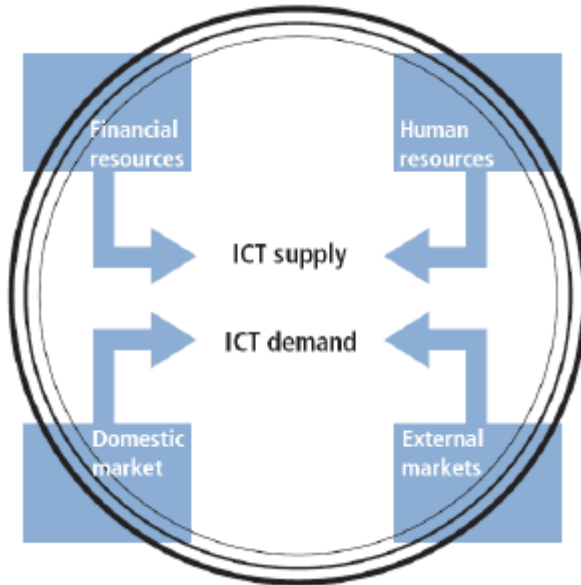

Graph 1. The modern paradigm of Indirect Government influence in ICT,
Source: Bruno Lanvin: Leaders and Facilitators

1.2 Policy implication for democracy

These days when the countries are globally networked, but the democracy not equal whole of the World remarkable the study by Christopher R. Kedzie from 1995. He examines the interrelation between democracy and interconnectivity. He found that interconnectivity consistently emerged as a powerful predictor of democracy. His second perception: "None of the traditional variables which measure and guide foreign assistance policies with respect to promoting democracy seem to cause the desired effect." Figure 1 and Figure 2 show the results of his empirical work. 3 Nowadays China offers the best example of a country whose economic success appears in part to be the result of the government's ability to compartmentalize the types of information that receive wider currency—increasingly promoting more open access to economic information while keeping tight control on what is deemed "political". And China is one of the most active advocate of Linux, as well as it has own Linux distribution named Red Flag.
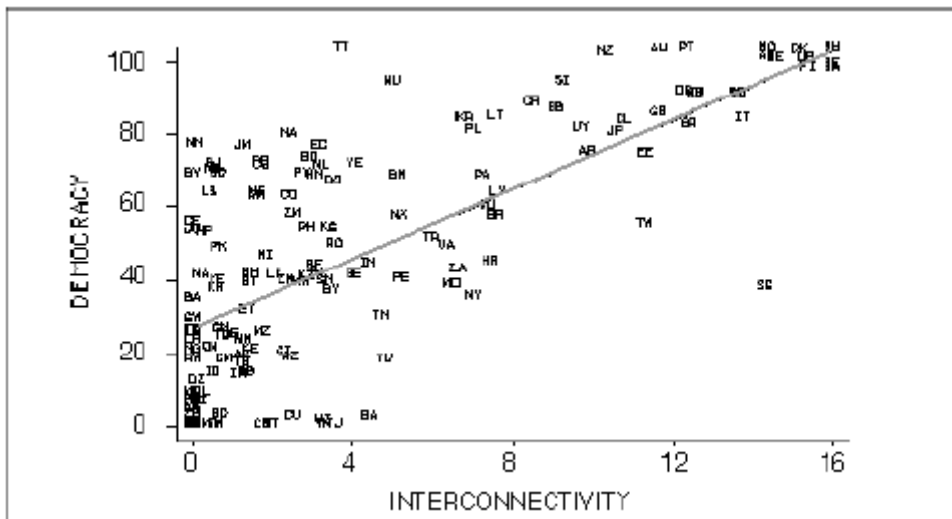
Graph 2. Relationship between democracy and interconnectivity
Source: Christopher R. Kedzie: Democracy and Network Interconnectivity3
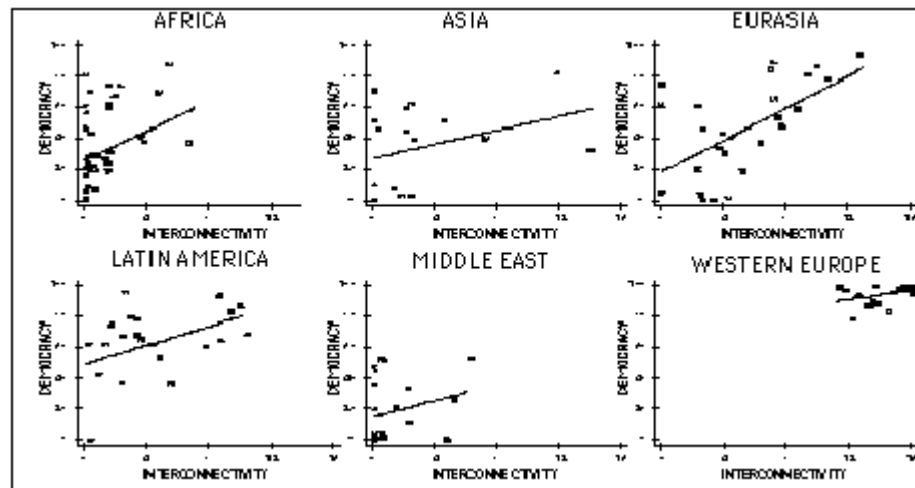
Graph 3. Regional Regressions
Source: Christopher R. Kedzie: Democracy and Network Interconnectivity3

2   OPEN SOURCE SOFTWARE

"Not enough knowledge exists, however, in the critical area of policy formation: the impact of policy choices on open source, and the effect of open source on available policy options and government actions is not well known. The support action builds on the FLOSS project to fill in important gaps in the understanding of open source with a focus on specific gaps in the policy application domain." European Union funded research the FLOSS-POLS will work on three specific tracks: evaluating government policy on open source, understanding gender issues in open source, modeling open source as a system for collaborative problem-solving.

Nowadays the information environment is extraordinary complex and fragile. Modern society is increasingly vulnerable by technologically economically infrastructure telecommunications, energy (see: NY blowout), and transportation. The infrastructure and information systems can be attacked, destroyed, disrupted, and corrupted by single individuals or small groups. It is not absolutely necessary to destroy the infrastructure, or one of its elements physically, it can be disrupted by electronically and almost anonymously. The software became as much important as the hardware, meantime hardly anyone watches the programmers…. And in case when the program is proprietary nobody can take a look inside the program and its mechanism. (Or somebody can do this even it would be illegal…)

Free and open source software gives the user the freedom to use, copy, distribute, examine, change and improve the software. Richard Stallman says that "The fundamental difference between the two movements is in their values, their ways of looking at the world". The term "Free Software" stresses freedom from control by another. Another Free Software advocate Eben Moglen said: "Who controls the software, controls life." This means the organisations and governements also controlled by software provider… The quiestion rasised and emerged by expert is justifiable: Is it right after 9/11 that dramatically and radically changed the world and the relations between IT and governments and also the relations between governments and citizens? The security turns into the most important factor for governments and for the citizens. Opposite the security the privacy and trust became most important things for the citizens and this caused that conflicts appeared between governments and the citizens. Government and political leaders must find out the balance the needs to security and the rights for privacy.

2.1   Keywords: transparency and interoperability

Michel Sapin, the Minister of Public Services in France stated: Next generation e-Government has two requirements: interoperability and transparency. These are the two strengths of open source software."

The only solution in this case is the transparency, not only in governmental working process but also within the software that is used by governments and controls, handles, transmits the citizens' personal date. Microsoft the world's leading proprietary software developer and vendor had been adopted yet the open source method for example Windows Update for updates and patches. Microsoft "Government Security Program" (GSP) is just a similar model when the governments that joined the agreement can take a look-in to the source code of selected Microsoft products. Transparency means that anybody can see and can examine the source code. Probably in first insatance it seems the end-user cannot gain direct benefit from it if he or she is not a computer expert. The experts and the 'community' examines the programs, so the end user can trust this kind software products due to not only the producer and the software vendor see the operating the software.

Interoperability is also the key issue about software that are using in public sector. The interoperability of information systems is necessary in order to facilitate cooperation between (government) organizations and to coordinate business processes within and between organizations. Later all consumers lose their freedom of choice and are herded into using the same product for the sake of interoperability. EU has 25 member states, with different public administrations depend on each countries. These administrations and governments have to interact wit each other, so the different proprietary software products some case suitable to change data wit each other. This causes higher transactional cost and much more amount invested. The open source products care about the standards both of de facto and open standards that assure the interchange data between them. Open Standards are in the field of ICT for the benefit of the interoperability of information systems. Standards may be open or closed. An open standard has been published and adopted on the basis of an open decision-making procedure.

2.2 Aspects of OSS

Open source software has many aspects and related issues to governmental tasks, goals and responsibilities that influence the usability in different fields. Political aspects contain freedom and equality, digital endurance, digital heritage and stimulation of innovation. There is not need to reinvent the wheel. Economical Aspects have the cost reduction and the market health. As it was mentioned earlier governments sometimes have to make intervention into the market on behalf of common good. Social Aspects mean the role of OSS to make equality and eliminate the digital divide. Managerial and/or Technical Aspects mean the quality of the products: stability and reliability. Legal Aspects mean licensing model and liability.

"The copyright law, by default, do not allow for redistribution (nor even use) of software. The only way that redistribution can be done is by granting specific permission in a license." The license is the contract between the User and the Licensor. Open Source licenses are more permitted than Free Software licenses. OSS licenses have two types, non-permissive and permissive. The Free Software licenses do not allow "closing" the source code while the permissive licenses permit the creation of proprietary development. "There are dozens of OSS/FS licenses, but nearly all OSS/FS software uses one of the four major licenses: the GNU General Public License (GPL), the GNU Lesser (or Library) General Public License (LGPL), the MIT (aka X11) license, and the BSD-new license. Indeed the Open Source Initiative refers to these four licenses as the classic open source licenses. The GPL and LGPL are termed "copylefting" licenses, that is, why these licenses are designed to prevent the code from becoming proprietary." GPL was on probe in Germany and found it is legal in Euorpe.

2.3 Why should be considered to use OSS?

The main issue is the dependency, which means that the public sector highly depend on software suppliers. There is no choice for software vendor. How can avoid becoming dependent on a single or a few suppliers? The answer is open source software. There are more than one suppliers, or software vendors. Dependency is in close correlation with security and the Security is linked to Privacy. A point of view: "Who controls software controls the life [and organization]." One can ask: "Is it allowable that any public authorities i.e. government can depend on and controlled by any software vendors?" In case of desktop operating system on Microsoft? Microsoft is working hard to increase customer dependency. The software that is used by governments and controls, handles, transmits the citizens' personal data have to be transparent to protect citizens rights to privacy. Open Source do this, because the source code anytime can be checked, and audited. Hardly anyone watches the programmers…. so nobody knows what the programs do if the source code is closed. This is an enormous security risk for governments. In case of e-voting "The Council of Europe Committee of Ministers agreed the first international legal text on e-voting in elections and referendums. The legal and technical guidelines of the Council of Europe indicate how to build, run and supervise e-voting systems to ensure that results are as reliable as those delivered by traditional paper-based methods. The Council's recommendation emphasizes the need for new voting methods to meet the principles of universal and equal suffrage, free and secret ballots and for the systems to be secure, transparent and accountable." Open source is feasible for this recommendation due to it is secure, transparent and accountable.[9]

Data dungeon can be only avoided by using open standards. The government is responsible for storing a large amount of data in name of the public (i.e. birth certificates, tax records, social insurance records). Data dungeon means if the data store in closed format by proprietary software the information will be hard available and restore for many decades to come. Since Open Source Software and Open Standards give the source, the way in which information is stored is publicly known or at least traceable.[11]

Only Total Cost of Ownership (TCO) shows the real cost of the software. The purchased software will usually remain the property of the supplier; the consumer pays for the right to use the software. TCO extremely sensitive to the set of assumptions people make. All costs have to divide into two large groups, direct and indirect costs. The measurement is hard, because the indirect cost can hardly be budgeted. However it requires more serious examination this research issue.

The countable technical parameters are Reliability, Performance and Scalability of the systems. These parameters can be comparable due to the same technical analyses.

2.4 E-government solution based on OSS

Number and type of open source policies and legislations are considered by national, regional, or local governments around the world. It looks at whether the policy or legislation mandated the use of OSS, expressed a preference for OSS, encouraged its use or commissioned research into OSS. While purchase of OSS could indicate a policy decision that has not been publicly articulated, it could also be simple a decision made on the basis of price or product.

3 CONCLUSION

ICTs have changed the economy and the societies around the world. These changes influence the everyday life in that way ICTs can provide higher standard of life for people. The governments faced new challenges so they had to establish National Information Strategy to make capital out of new opportunities. To use and interact with ICTs a software is needed. No software is perfect. Both proprietary and OSS software are made by people. The most relevant differences are between them, that OSS is developed and assured by group of users and the source code is available for public. This makes this software so desirable for governments and government agencies. The source code is verifiable and modifiable so it is secure. Recent years the governments' tasks expand to build Information Society and e-government services. The secure and trustworthy services must be based on reliable software systems. Since the proprietary software can not be verified according to unavailable closed source code by security, these conditions can be accomplished only by OSS software. In the public sector many software handle and forward the citizens' personal data because in this case 100% security is needed to prevent citizens' privacy. The trends show that many governments choose the Open Source Software due to different strategy consideration. OSS can be considered both a great opportunity and an important resource. OSS has already started to modify the rules in the information technology industry, which will produce enormous changes in further Open source software - Is it real treatment for public sector's software needs? years. Lack of computer literacy is cause delay to

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spread the open source software due to the employees and policy makers don't want to make another choice. The latest and important issue how the software patent will effect on Open Source Software and all in all on software industry, and how will influence the governments' software procurement and using?

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