

IMPORTANCE OF THE GOVERNMENT AND BUSINESS INTERACTION IN A WEB ENVIRONMENT – EXAMPLE OF PUBLIC PROCUREMENT IN UKRAINE

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Abstract. With the establishment of the global information society, effective public administration is impossible without modern technological foundation that can provide information interaction between the branches of government, businesses and the citizens of the state. This research aims to highlight the importance of the adaptation of the government functions to the information society. To support the aim of the paper, the economic evaluation of the public procurement in Ukraine was performed. The results of the analysis indicate the possible positive impact from implementation of the e-government initiative on the one hand, and the necessity of partnership relations between government and private sector on the other.

Key words: electronic business, electronic government, e-procurement, government-to-business, information and communication technology.

Introduction

Development of Information and Communication Technology (ICT) brought our society to the point where different applications can be used in practically every area of life. These applications shape private lives, work, public administration and interactions among all mentioned spheres. The impacts of ICT on our private lives and businesses have been covered in the media to details while, at the same time, significant and far-reaching changes that ICT has on the government receives less attention. Technological development is also becoming increasingly important on a microeconomic level. And one of the tools of these microeconomic changes is electronic government (e-government). While e-government initiatives have three areas of attention – interactions of state to state (government to government, G2G), state to business (government to business, G2B), and state to citizens (government to citizens, G2C) – we will concentrate on G2B interaction, as a necessary support system for economic development of the country.

The research is presented in following manner: the definition of government to business electronic interactions is reviewed based on the theoretical findings; the evaluation of the e-procurement project in Ukraine helps to estimate the implementation of e-government initiatives from economic point of view; conclusions states the necessity of joint public-private collaborations in terms of funding and development of e-government initiatives.

1. Literature review of government to business electronic interactions

E-government in the modern sense includes not only the network infrastructure of executive power, but, in general, whole infrastructure of the authorities. The definition of e-government was proposed by many researchers and international organizations like World Bank (World Bank 2015), European Commission (EC European Commission 2015), Organisation for Economic Co-operation and Development (OECD 2015) and United Nations Organisation (UNDESA 2014). Nevertheless, all definitions describe different approaches they all unify the use of information and communication technologies for improvement of the efficiency of traditional government functions and services.

Electronic business is a wide term used to describe various business activities that are facilitated via the use of ICT (Schneider 2004). E-business typically occurs in the commercial sphere, but also an equally important part of online business transactions is business interactions with government. This category of interaction is known as government-to-business (G2B). The main objective of G2B interactions is use of electronic means to satisfy the service needs of businesses (Siau and Shen 2003).

In general, G2B can be described as professional affairs conducted between regional, municipal or federal governing bodies and businesses. Through the years different examples of G2B interaction has developed. One of them is electronic data interchange, which represents a standardized method for documents sharing. Electronic data interchange (EDI) technology made possible creation of other services like electronic procurement, which use EDI for transactions between businesses and governments. Benefits gained from implementing of these initiatives include reduced transactions costs and increased operational efficiency. Another example of G2B interaction is implementing of electronic taxation. Just as e-procurement, the aim of electronic taxation implementation can be explained by achieving mentioned benefits, but also it is the required respond of government to online business development. Although, government's inability to expedite the collection of taxes from web purchases still remains a global issue. The introduction of e-government policies can provide solutions to online taxation challenges by implementing direct interaction between the government and business' stakeholders.

Additionally, to mentioned applications, e-commerce system should be implemented as support for buying and selling goods and services over the internet. This system could be created on the base of already existing web-portals and became trusted hub where all operations and transactions can safely be done. Moreover, this web hub can be used as an instrument of supervision of online financial activity.

In the context of International Business, G2B implies the use of Internet to facilitate foreign direct investments. With its help, the relevant information to respective investors and transactional services can be provided for the purposes of cost reduction and information transparency.

It has been mentioned that e-government has the potential to reduce the time and money which are spent by businesses and governments during their interaction (Bhatnagar and Singh 2010). Most effective ways of efficiency increase and cost reduction are:

- Providing information on single window basis. The access to necessary information, services has to be offered on unified web-portals. These portals are recommended to administrate by central government institution as a higher supervise body.
- Simplifying reporting requirement and reducing the number of forms. With implementing open databases and introducing regulations on e-services, the way that businesses report to government authorities can be simplified by reducing number of forms and their complexity.
- Easier “user-friendly” making transactions (paying fees, obtaining permits). As online transactions are the most important and used online services beside information ones, it is important to make the process of transaction maintaining as convenient as possible.
- Both side interaction. G2B interaction understands not only government to business direction services. The feedback is also required. This feedback can be done in form of recommendation, complain, proposal etc.

To show how government and businesses can benefit from web interaction we will analyze e-procurement project in Ukraine which is not only expected to bring economic benefits but also could provide the necessary technological infrastructure for other government services as it implies use of electronic transaction system, control of electronic payments, and in general development of e-commerce as its core functions.

2. Methodology of evaluation of the e-procurement project in Ukraine

A model of the Ukraine e-Procurement system should be designed as a consumer-oriented public service platform by considering the current organization for operating management, the structure of the operating system

and the features of the system. From the buyer's perspective, all public procurement information should be available through a single window. In general, model must be designed by focusing on supporting the users through reducing of required expenses for e-procurement.

Our calculations will be based on recommendations finalized through cooperation between the Public Procurement Service of Korea and the Ministry of Economic Development and Trade of Ukraine, and the Antimonopoly Committee of Ukraine in 2013 (Public Procurement Service The Republic of Korea 2013). Their report proposed a solid analysis of state, and proposed plan of development of public procurement system in Ukraine. It describes an introduction strategy of electronic public procurement containing medium-term implementation plan (3-year roadmap) and cost-to-benefit analysis based on Korea's experience in implementing its own e-Procurement system. Their economic analysis is focused on calculation of costs and benefits for government and users. For our purposes we will use their information regarding costs of implementation and types of benefits as they express the better service providing. Nevertheless, our value added to their findings will be including into calculations information regarding costs of users, terminal value of investments, possible benefits from corruption mitigation, and impact of Ukrainian hryvnia depreciation during end of 2014 - beginning of 2015. Most of the improvements follow the impacts mentioned in the first chapter (costs of users, evaluation of corruption), terminal value measurement were added to follow the Cost to Benefit methodology. As the project is evaluated in US dollars, we will have to adjust calculations due to the depreciation of Ukrainian hryvnia from USD/UAH 13, to USD/UAH 21. Also, the Feasibility report implies achieving 100% of benefits in 3 years. We concerns, that taking into account the hard political-economic situation in Ukraine, it would hard to follow the proposed pace, and it will be needed 6 years to fully achieve the benefits.

Establishment of e-procurement system should be prepared and planned throughout all areas (institutional, required funds, cooperation of each institute, etc.). The implementing of e-Procurement proposed to be done in 3 phases:

- Business Process Re-engineering/Information Strategy Planning (BPR/ISP) consulting. Implementing of e-bidding and e-shopping mall system as a basis for introduction of e-procurement system;
- Establishment of e-procurement system with e-contract system;
- Introducing e-payment system to complete the establishment of the e-procurement system.

The evaluation of e-procurement project in Ukraine will be done with application of Cost-to-Benefit analysis.

3. Results of the evaluation of the e-procurement project in Ukraine

3.1. Estimation of project costs

The costs should be classified into: consulting cost, development cost and equipment purchasing cost, operation and maintenance cost and training cost by phases of e-procurement system. The cost for the introduction of the e-procurement system was estimated in accordance with a guideline for software-related project cost estimates that was developed by the Korea Software Industry Association. Operation and maintenance cost is equal to 15% of development cost and equipment purchasing cost. Training cost is equal to 10% of consulting, development and equipment purchasing cost during first year and 7% during next one due to significant devaluation of Ukrainian Hryvnia. Cost evaluation is done with the assumption that e-procurement users have sufficient computer technology and internet connection.

It has been estimated that a total of 9,412,617.8 USD will be needed for the phased introduction of the e-procurement system, including BPR/ISP consulting cost, development and service cost, equipment purchasing cost, etc. (Table 1).

Table 1. Estimation of e-procurement project costs

Categories	Details	Estimated Cost (in USD)				
		Year 1	Year 2	Year 3	Total 1-3 year	Year 3+
Consulting	BPR/ISP	831,600	665,280	665,280	2,162,160	
Development	Software Development, etc.	1,365,560	897,368	702,288	2,965,216	
Equipment	Network, Hardware, Software, etc.	1,360,000	544,000	408,000	2,312,000	
Operation and Maintenance	Operation Management and Maintenance (15% of development and equipment)	408,834	216,205	166,543	791,582	166,543
Training	Capacity Building Program, etc. (10%/7% of consulting, development and equipment)	355,716	147,465	124,290	627,471	124,290
Personnel	Salary of 28 administrative staff and 52 workers of Web Portal	223,027.2	165,580.8	165,580.8	554,188.8	165,580.8
Total		4,544,737.2	2,635,898.8	2,231,981.8	9,412,617.8	456,413.8

Source: Author's calculations based on Feasibility Study on Implementing e-Procurement in Ukraine.

3.2. Estimation of project benefits

The economic benefits that can be expected by introducing an e-procurement system in Ukraine can be divided into: cost reduction effect followed by increased work efficiency (internally); cost reduction effect at the public service improvement (externally). The cost reduction effect is applied both for the procuring entity and participant as external benefits in the case of e-procurement system introduction.

By internal work efficiency we will understand economic benefits for public authority represented by Ministry of Economic Development and Trade of Ukraine (MEDTU) as a regulator and Web Portal Agency (State Company Zovnishtorgvydav Ukrainy), an affiliated institution under MEDTU responsible for administration of the procurement web portal (Ukrainian Public Procurement 2015).

Initial information for our calculations is described below:

- Average income of Ukrainian worker was 233 USD/month in 2014, and 173 USD/month in 2015 (State Statistics Committee of Ukraine 2015);
- Daily average working hours: 8 hours; number of monthly/annual working days: fixed as 22 days and 264 days;
- Based on the conditions mentioned above, the average hourly pay for workers is fixed as 1.32 USD (in 2014) and 0.98 USD (in 2015).

Based on analysis, the effects resulting from increased internal work efficiency of MEDTU of Ukraine have been quantitatively calculated. As a result, in 2014 productivity was increased by 9,786 USD, and starting from 2015 it is expected to increase productivity by around 7,266 USD per year (Table 2).

Table 2. Effects of increased efficiency of MEDTU of Ukraine

	Indicator	2014	2015
1	Number of officials related to public procurement administration	28 people	28 people
2	Estimated time reduction per worker (per day)	1 hour	1 hour
3	Average hourly pay for workers (USD/hour)	1.32	0.98
4	Yearly estimated cost reduction (USD/year) (1) × (2) × (3) × (working days per year)	9,786	7,266

Source: Author's calculations based on official web portal of Public Procurement.

Based on analysis, the effects of the increased internal work efficiency of Web Portal Agency have been quantitatively calculated. As a result, in 2014 productivity was increased by 54,362.9 USD, and starting from 2015 it is expected to increase productivity by around 40,360.3 USD per year (Table 3).

Table 3. Effects of increased efficiency of Web Portal Agency

	Indicator	2014	2015
1	Number of workers expected to use e-Procurement system	52 people	52 people
2	Estimated time reduction per worker (per day)	3 hour	3 hour
3	Average hourly pay for workers (USD/hour)	1.32	0.98
4	Yearly estimated cost reduction (USD/year) (1) × (2) × (3) × (working days per year)	54,362.9	40,360.3

Source: Author's calculations based on official web portal of Public Procurement.

Based on analysis, the effects resulting from increased work efficiency of procuring entities related to public procurement have been quantitatively calculated. As a result, in 2014 productivity was increased by 1,001,695.2 USD, and starting from 2015 it is expected to increase productivity by around 743,682.8 USD per year (Table 4).

Table 4. Effects of increased efficiency of Procuring Entities

	Indicator	2014	2015
1	Yearly number of contracts (in 2014)	189,715	189,715
2	Estimated time reduction per worker (per day)	4 hour	4 hour
3	Average hourly pay for workers (USD/hour)	1.32	0.98
4	Yearly estimated cost reduction (USD/year) (1) × (2) × (3)	1,001,695.2	743,682.8

Source: Author's calculations based on official web portal of Public Procurement.

Based on the analysis, the effects of cost reduction for participants have been quantitatively calculated. As a result, in 2014 productivity was increased by 13,621,537.0 USD, and starting from 2015 it is expected to increase productivity by around 9,808,265.5 USD per year (Table 5).

Table 5. Effects of cost reduction of participants

	Indicator	2014	2015
1	Yearly number of contracts (in 2012)	189,715	189,715
2	Estimated yearly number of biddings (in 2012) (1) × 2 (minimum participants for bidding)	379,430	379,430
3	Estimated time reduction for documentation, etc. (at once)	0.5 hours	0.5 hours
4	Average hourly pay for workers (USD/hour)	1.32	0.98
A	Yearly estimated cost reduction (USD/year) (2) × (3) × (4)	250,423.8	185,920.7
5	Usage of A4 size paper per bidding (sheet)	250	250
6	A4 size paper cost per pack (1 pack = 500 sheets)	3 USD	2 USD
B	Yearly documentation cost for bidding (USD/year) (2) × (paper cost per bidding)	569,145.0	379,430.0
7	Yearly number of visits to procuring entities (1) × 3 (one for bidding of 2 participants + one for contract)	569,145	569,145

8	Yearly number of visits to certificate issuance authorities (2) × 2(one for tax payment +one for results of public procurement)	758,860	758,860
9	Transportation expenses for visits (at once)	7 USD	5 USD
10	Estimated time reduction for visits (at once)	2 hours	2 hours
C	Yearly visit cost for procuring entities and institutes (USD/year) (transportation expenses) + (labor costs) = $\{(7) + (8)\} \times (9) + \{(7) + (8)\} \times (10) \times (4)$	12,801,968.2	9,242,914.8
D	Total (A+B+C)	13,621,537.0	9,808,265.5

Source: Author's calculations based on official web portal of Public Procurement.

The total of all benefits calculated previously are 14,687,381.1 USD in 2014 and 10,599,574.6 USD from 2015, organized as in the following Table 6.

Table 6. Economic value of e-procurement project in Ukraine by 4 Indices

Index	Economic Value in 2014 (USD)	Economic Value from 2015 (USD)
Effects of increased efficiency of MEDTU of Ukraine	9,786.0	7,266.0
Effects of increased efficiency of Web Portal Agency	54,362.9	40,360.3
Effects of increased efficiency of procuring entities	1,001,695.2	743,682.8
Effects of cost reduction of participants	13,621,537.0	9,808,265.5
Total	14,687,381.1	10,599,574.6

Source: Author's calculations.

3.3. Cost to benefit analysis

With estimated current and future costs and benefits the Cost to Benefit Analysis will be applied to our findings. A social discount rate of 11% is to be applied to calculate the present value of total investment costs and total investment benefits. Generally, a social discount rate of 6-7% for public investment businesses is applied in developed countries, including the USA, the UK, etc. Social discount rate of 7-10% is applied in developing countries. But taking into account Ukrainian government bonds' interesting rate (up to 9.75%), low international credit rating (CCC by S&P, Ca by Moody's) and hard political economic situation in Ukraine a social discount rate of 11% was applied in this research.

Table 7. Summary of evaluation of the e-procurement project in Ukraine

Index	Value of Index
Total Economic Benefits (USD)	24,604,929.3
Total Investment Costs (USD)	9,880,203.9
Benefit ratio compared to total cost (Benefit-Cost Ratio)	2.49
Net Present Value (USD)	14,724,725.4
Return on Investment (%)	149.03%

Source: Author's calculations.

Based on the NPV analysis, higher economic benefits can be expected with the introduction of the e-procurement system – NPV is equal to USD 14.7 million; benefit ratio compared to total cost 2.49; return on investment 149.03%.

Conclusions

Despite such positive economic results from e-procurement project, its complex implementation could be postponed by lack of sufficient financial resources. Moreover, the benefits for government institutions are much lower than for the end users. This brings us to the point where the model of joint public-private funding of e-government initiatives takes its place. Unless, the necessity of proposed model should be highlighted via public discussions, experts' overview, introducing strategies and guaranteed social responsibility.

The overviewed e-procurement project is not implemented in Ukraine because of the volunteer initiative Prozorro (Prozorro 2015). Project is based on free help of IT-specialists and initial investments of USD 35,000 were done by partner trading platforms which are the first point of vendor interaction. In June investment from private equity fund (Western NIS Enterprise Fund (WN-ISEF) of 50 000 USD were received. Project is meant to test electronic public procurements on so-called up to threshold procurements – amount of goods up to UAH100,000 and services up to UAH 1 mil, + tenders of Ministry of Infrastructure and Ministry of Defense that make procurements under simplified procedure, which does not prohibit e-procurements. Legally, Prozorro is now a project of the international organization Transparency International, which specializes in combating corruption worldwide.

Summing up, government and businesses face similar technological and regulatory challenges. And their collaboration will result in synergic effect from mutual efforts. Government will be deeply involved and be able to better understand the business's needs. This should reflect on government strategies. They should concentrate efforts on abolishing old laws and regulations that limit e-business. The government will need to joint venture the private sector to outsource services, especially ICT. This will increase cooperation of both sectors. Each sector will understand better the needs of the other. The two sectors will come closer to the concept of partnership.

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