

# Towards e-business in bookkeeping agencies: perceptions, problems and efficiency

**Stjepan Vidačić**

Faculty of Organization and Informatics  
University of Zagreb  
Pavlinska 2, 42000 Varaždin, Croatia  
svidacic@foi.hr

**Igor Pihir**

Faculty of Organization and Informatics  
University of Zagreb  
Pavlinska 2, 42000 Varaždin, Croatia  
ipihir@foi.hr

**Abstract.** *Bookkeeping agencies (BAs) that serve a large number of clients constantly strive to increase their productivity and business efficiency. In order to achieve such goals, higher levels of information and communication technology (ICT) implementation are needed in the communication between BAs and their clients, which can be achieved by implementing web technologies and e-business.*

*In this paper, the results of the research, conducted in selected referential BA with a large clientele (342) were presented, while both the employees and the clients were studied. The goal of this research was to confirm hypothesis that the implementation of web technology and e-business is mutually acceptable and beneficial for BAs and their clients alike. In paper, process models and calculations of possible effects of e-business implementation were also presented.*

**Keywords.** bookkeeping agency, e-business, web technologies, e-business effects, perception.

## 1 Introduction

Today's bookkeeping agencies are faced with a 'Min-Max' problem, meaning that the principle on which they base their business model lies in providing quality bookkeeping services to as many clients as possible with the help of the smallest number of employees possible. Studies show the necessity of organizing their internal processes and a redistribution of employees' workload in a way that promotes greater efficiency [1].

Also, there is a need to increase the efficiency of client-oriented and public-administration-oriented communication processes by integrating parts of the business process involving partners with the implementation of B2B or B2G e-business models. [2, 9]. Increases in work productivity and process efficacy demand higher levels of automation of the rules of journalizing and financial posting of the documents in BA's information system [3] and a high level of e-business activities with banks and various government bodies (tax, pensions, health departments,

etc.). This communication with different government bodies has mostly already been prescribed and established through the application of web services, i.e., by implementing a B2G e-business model whose use has been determined by legislative acts and decrees [4], [5], [6].

One problem that continues to arise in the context of relatively high client fluctuations within the realm of small and medium enterprises (SMEs) is how to enhance (automatize) the communication with clients (other enterprises) or, in other words, how to establish higher levels of e-business transactions that would enhance the business process and the quality of service in the area of B2B bookkeeping and consulting [2, 9]. To accelerate this communication between enterprises, Hoyer [7] suggests the development of collaborative process models to facilitate the process of connecting the business processes of those business partners that are introducing certain e-business modalities.

Notwithstanding the availability and accessibility of Internet and web technologies that different web applications allow for, this problem is not simple and the classic form of communication between bookkeeping agencies and their clients are hard to change for at least two reasons.

The first problem is the inertia of the clients themselves and their reluctance to change the conventional forms of communication with bookkeeping agencies (such as delivering paper documentation and demanding ad hoc information on their current business activities).

The second problem concerns the bookkeeping agency itself, which, under the guise of „responsibility for client data and service prices“ shows reluctance to exchange the practice of processing client documentation in paper form for electronic processing. Also, bookkeeping agencies tend not to allow their clients to enter certain data directly into the agency's database, or to open their records to clients, which would considerably shrink the volume of unnecessary client-to-BA and BA-to-client communication about clients' current business affairs. Using these assumptions as a starting

point, first goal in this paper was to analyze and present the research results concerning the problems with and the perception of the two-way communication process (of an e-business model) in both groups of BA information system users (BA clients and BA employees), which implies the validity of the need to change the existing conventional communication model.

The second goal of this paper is to design a new process model with higher-level of e-business between a bookkeeping agency and its clients. Its application may significantly enhance and rationalize the business activities of both BAs and their clients, while simultaneously increasing the competitiveness of a particular BA in the bookkeeping market.

The third goal is to define the conceptual model of an integrated information system of bookkeeping agencies, based on the top ICT features and our suggested e-businesses model.

Based on the mentioned proposed and partially implemented IS, with the option of conducting e-business with clients and the accessibility of their business data on the Internet, the possible future direct effects of implementing an e-business for BAs were calculated and the advantages for their clients were defined. In conclusion, certain key processes in which the implementation of e-business practices can be continued and the benefits of an integrated information system for BAs and their clients, as well as increased applications of e-business in the previously neglected area of BAs' B2B clients were pointed out.

## 2 Researching current and new e-business opportunities of bookkeeping agencies

In order for bookkeeping agencies to focus more strongly on developing and upgrading their internal information systems, as well as to allow the implementation of e-business with their clients, it is necessary to determine the existence of true technological capacities and of the genuine interest in making business changes, both at the level of BA employees and the level of BA clients.

With the goal of recognizing the problems and acquainting ourselves with the perception about the two-way communication (of an e-business) existing in the BA itself and among its clients, the research was conducted in both of these groups. Two questionnaires were created to examine the perception and to examine the processes that are currently taking place in the BA among its employees and clients. One of Croatia's larger bookkeeping agencies was selected for this research, between BA with more than 10 employees and more than 100 clients, in accordance with the principles of case study method [8].

The case study was conducted on a representative bookkeeping agency with 15 employees that offers bookkeeping services to 342 clients (mostly SMEs and craftsmen). The questions used in the surveys were mostly closed-ended, except for the several open-ended questions dealing with the volume and forms of communication with clients, and those asking about the changes that employees/clients would like to suggest.

All available employees were surveyed (n=11) out of a total of 15 BA employees (two were on a sick leave and two others were auxiliary workers without clients). As for the clients, the questionnaires were sent to a group of 100 clients, out of a total of 342 SMEs, and 18% valid questionnaires (n=18) were obtained. Based on the survey results and the application of business process modelling method in accordance with BPMN 2.0 [9], [10], the current and future business processes were modelled using BizAgi [11] and the computational models were created for calculating the possible costs of implementing an e-business and the potential savings in its future implementation, according to TD ABC method [12], [13].

## 3 Research results

The research results were divided into three parts. The first part consist of a conceptual model of the future integrated information system of BAs, which facilitates the implementation of internal processes, but also offers an interconnectedness towards the client's processes. It also enables the establishment of a higher level of e-business. The second set of results pertains to the perception and the potential problems of introducing an e-business model and the two-way communication with both groups of users of bookkeeping agencies' information systems (BA clients and BA employees), which points to the validity of changing the existing conventional model of communication. The third part comprises the process models and the results of calculating process costs and the potential savings that the introduction of e-business could bring.

### 3.1 Conceptual model of an integrated IS of a bookkeeping agency IS-a

In the case study, the basic structure of BA's IS consists of a single business database containing all clients data, a standard Windows client/server data entry and processing application at the BA level (FINKSQL) and a new web application (BA\_WebServis) for the entry and retrieval of data from the BA's database by the client (Figure 1).

The integrated IS shown in Figure 1 would provide the basic functionalities that already exist within the bookkeeping agency's IS described in

Table 1, which forms the basis of BA information system.

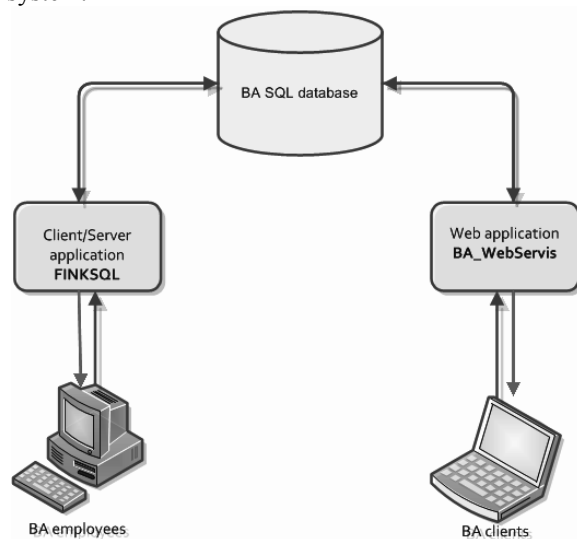


Figure 1. Conceptual model of BA's IS

Table 1. Functionalities of client/server application

No.	Functionality description
1	Set of rules for automatic journalizing of documents in financial posting
2	Data entry module for purchase invoices (PI) and automatic posting—generating financial entries
3	Data entry module for sales invoices (SI) and automatic posting - generating financial entries
4	Automatic processing module for bank statement files and the generation of financial entries for posting
5	Module for automatic generation of VAT forms
6	System of various business data reviews

Table 2. Web application functionalities

No.	Functionality description
1	Review and retrieval of tax forms (VAT) for a given period
2	Review and retrieval of PIs that pertain to selected VAT form
3	Review and retrieval of SIs that pertain to selected VAT form
4	Review and retrieval of the list of open customer accounts
5	Graphic presentation of business activities in past 12 months (income, costs, profit)
6	Online data entry on PIs and web upload of PDF files of scanned receipts
7	Online data entry on SIs and the upload of PDF files of scanned receipts to BA's web page

On the other hand, future web system's new functionalities offer different possibilities for improving BA processes, which are listed in Table 2.

The main point of the proposed conceptual model of BA's IS lies in the integration of the two mentioned applications: the application for BA clients, BA\_WebServis, becomes an interface of the main client/server application FINKSQL, which operates in the local network.

Possible effects of this integration include:

- Increased expediency in processing and posting of BA clients' business data due to psychological effects on BA employees;
- A new, active role of BA clients because of the option of web document delivery and 24-hour online access to their business data;
- Cutting the travel and communication costs that appear due to direct two-way communication between BA and its clients;
- Creating considerable time surpluses that allow for more work to be done in a BA with fewer employees;
- Increased client satisfaction due to more efficacious and modern ways of using bookkeeping services.

Given the defined expectations and functionalities of the current and future new system, the perceptions of both client groups were studied and the potential problems were examined of introducing such an e-business system into practice.

### 3.2 Perception and potential problems of introducing e-business

By analyzing the survey results of both the employees and the clients of selected BA, insights were gained into the perceptions of both sides concerning the time savings and the acceptability of web communication with the BA.

When asked: *Do you think that the introduction of e-business practices between the BA and its clients would save a lot of time or provide higher quality information about the state of clients' businesses?* BA employees answered unanimously with a *Yes* (100%). Conversely, BA clients' answer to the same question was mostly negative, with 59% saying *No* and only 41% saying *Yes*. This shows that the employees recognize e-business potentials, whereas the clients show a certain degree of distrust towards the benefits that its implementation and use might bring to them. Although 41% of clients expected savings, it can be assumed that they belong to a more technology-oriented group of clients, or, according to the survey, those clients who have the need for information from the BA more frequently. Also, if the time needed to come to the BA is considered, it can be seen that the clients who answered *Yes* (41%) and expect time savings from e-business implementation are generally those people who spend more time to come to the BA. This means that these clients have their headquarters further away from the group of clients that said *No*

and sees no significant savings in e-business implementation.

When asked: *Would you seek the information about your business matters on BA's web pages if they were available?* 72% of the clients answered *Yes* and 28% answered *No*. The employees answered a similar and equivalent question: *Do you think it is a good idea to enable clients to have direct Internet access to their business data contained in BA's IS without the requirement to contact the BA?* They answered *Yes* (100%). These answers reveal the openness that the BA clients in this case study have for the new ways of communication and new technologies, and also their open-minded support for e-business implementation.

Surveyed employees and clients gave similar answers to a group of questions pertaining to employees, their ability to satisfy client needs and the speed with which they answer client queries. Only answer times varied, ranging from one hour to one day.

When asked: *Do you manage to operatively satisfy all client requests in a day?* employees offered estimations of their own performance, which indicated that 55% always managed, 27% managed sometimes, and 18% rarely managed to satisfy all client requests for information in the same day. Therefore, it can be seen that 45% (27% + 18%) of employees are not able to answer all client requests in the course of a working day. This may change if some of those requests could be answered without wasting employees' time by applying the e-business and enabling web access to clients' data in BA's IS.

When asked: *On average, how long does a client wait for you to answer a telephone request/how long does it take to give feedback/to send the requested information?* employees answered: one hour (54%), part of a day (38%) and one day—meaning the next workday (8%). Clients answered a similar question about the efficiency of obtaining information from the BA: *On average, how long do you wait for BA to answer your request/to provide feedback/requested information?* The clients answered: one hour (42%), part of a day (47%) and one day (11%).

Based on these numbers, it can be seen that both groups estimate the amounts of time needed to get feedback or an answer as roughly the same and that these times range from an hour to a day. Nevertheless, if we consider the fact that an average employee takes around 11 phone calls and receives 9 e-mail requests in the course of an 8-hour workday, great amount of time is spent and wasted on these activities.

When asked to estimate the ten requests that clients most frequently make, the employees listed the following items: a list of outstanding balances (unpaid or uncollected bills), claims balance, debt balance, VAT obligations, and access/insight into certain ingoings or outgoing. These types of information or requests represent the most common client issues that the BA deals with. E-business system could provide

an easy Internet access to these data and therefore considerably reduce the pressure that clients make on BAs. According to employee estimations, the number of such requests reaches approximately 50% of the total number of requests. It is estimated that around 50% of the clients would be able and willing to use the web system in the future, judging from the levels of its acceptance expressed in clients' answers to relevant questions. In this way, the total number of telephone or e-mail requests would be reduced for about 25%. Furthermore, by analyzing the survey data pertaining to average duration of BA processes and activities, as well as those of the clients, potential time savings could be determined for the BA and the clients alike. Clients would thus avoid the waste of their time on making phone calls and writing e-mails, as well as the time spent in waiting for BA's answer (ranging from one hour to one day). Answering time would practically be reduced to BA web system's feedback in real time.

The research also included studying the dynamics of delivering documents for posting to BA, and the acceptability of sending scanned receipts to BA as digital PDF (portable data format) documents instead of using paper.

The possibility of clients entering their own data, from their own accounts was also examined. Since this type of functionality has not yet been activated in the case study, the surveys and the obtained answers were analyzed to reach certain conclusions. Thus, it was observed that 55% of employees found PDFs more acceptable than paper. Also, 82% supported the idea of clients themselves entering certain basic data into BA's IS. After entering the data, they would scan the receipts and send them to the web system as PDF documents. So, the employees would no longer enter all the data but they would actually only control the process of entering data into BA's IS.

When it comes to clients, 78% of them do not think it is a problem to scan their receipts and send them to BA in a digital format (PDF), while 22% consider this to be a problem. On the other hand, the clients are divided over the possibility of entering parts of their accounts into BA's IS. 53% find this problematic, while 47% do not, which suggests that they are basically not enthusiastic about the idea of personally entering their data into the information system of their bookkeeping agency. Judging from their comments, this appears to them as doing the bookkeeping agency's job, while paying for it at the same time.

Concerning the topic of payments and savings, it was investigated how satisfied the clients were with their BA. They were also asked if they thought that the introduction of e-business should make the service prices rise, fall or stay the same. According to the answers from the sample, the clients are satisfied and think their bookkeeping agency deserves an average grade of 4.83 (on a scale of 1 to 5, with 5 as the highest score), with a standard deviation of 0.38. This

shows high levels of satisfaction with the services rendered up to present day, which means that the eventual rises or falls in prices due to e-business should not influence clients' perception.

When asked: *Do you think that the prices for the services provided by this bookkeeping agency should increase, decrease or stay the same after the introduction of e-business model?* 0% of the clients think the prices should increase (which is a typical client response), 44% think the prices should decrease and 56% think they should stay the same. This reveals that the clients expect the implementation of e-business to have some effect on the BA and that it could make the prices go down, or at least stay the same. In the following subchapter, the processes taking place before and after the implementation of e-business are described, and the savings and benefits for the BA and its clients are calculated.

### 3.3 Process models and potential savings of e-business implementation in BAs

In order to meet the expectations set up by the BA and its clients, identified in the conclusion of the case study (Section 3.1), existing BA business models need to be supplemented with the new possibilities made

available through the implementation of web technology.

Existing basic classic process models (AS-IS) (see Figure 2) and improved process models (TO-BE) with the addition of an e-business model (see Figure 3). The models were constructed according to BPMN 2.0 [9] and they represent an example of collaborative models, in which the client process is clearly presented, followed by the BA process.

In the TO-BE model, the active role of BA is diminished and taken over by a web system instead of BA employees. This completely excludes the employees from the new process, who no more need to waste their time on client requests for the delivery of business reports or information. At the same time, the client is able to obtain the needed information instantly and without waiting, unlike before.

TO-BE models in Figure 3 indicate the most important benefits and savings that the new, e-business model offers, primarily the notion of relaxation: i.e., the abolition of classic reporting process of requesting and providing information about the client's business situation, set upon the relation of client-BA.

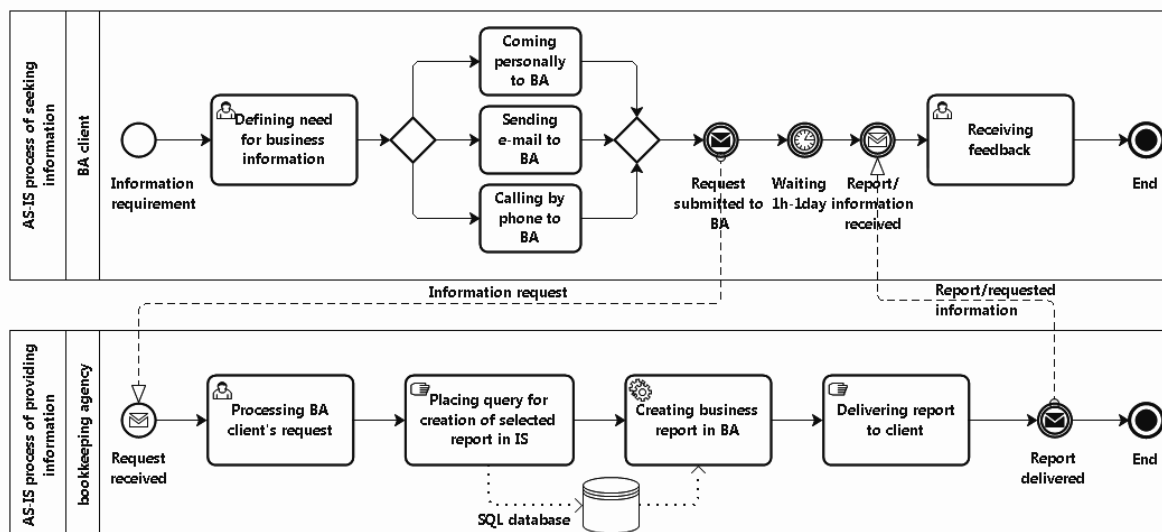


Figure 2. AS-IS process models for BA and for client

Now clients take up a new position: temporally unrestricted ability to acquire web reports about their businesses in real time. In view of the number of clients and the possibilities for further use of AS-IS processes to acquire some additional information or such information that cannot be automatized, such as advice, AS-IS processes will still be used. However, their application is expected to drop by about 50%, which means that the effects of implementing this e-business model refer only to those requests that come through the system.

According to survey data analysis, the employees of this bookkeeping agency usually handle roughly 31 clients and take about 11 phone calls daily (10.55 calls/day on average; stand. dev. 2.46), in which their clients request personal business information. A standard call lasts five minutes (5:05 minutes on average; stand. dev. 2:18 minutes). Also, they usually receive 9 e-mail messages a day (8.82 e-mails/day on average; stand. dev. 4:24 minutes) and spend about 17 minutes on writing e-mail replies (16:52 minutes on average; stand. dev. 18:08 minutes).

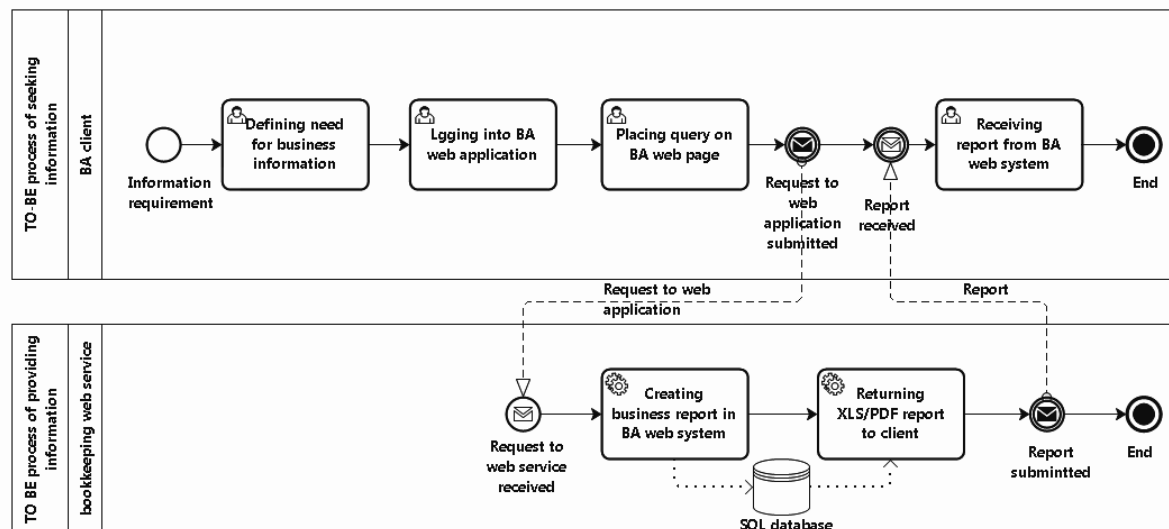


Figure 3. TO-BE process models for BA and for client

By applying the TD ABC method [12], [13] to assess the activities of BA clients and employees, the following calculations of BA employees' time savings were obtained:

- 11 calls/day x 5 min/call equals 55 minutes a day spent on making phone calls to clients and taking clients' calls

- 9 e-mails/day x 17 minutes/e-mail equals 153 minutes a day of answering e-mail requests, which, in combination with the telephone calls, yields 3.5 hours/day of responding to clients' requests per employee. When we look at the total of all employees, this amounts to  $153 \times 11 = 2288$  minutes a day (38 working hours daily) or 839 working hours a month (in 22 workdays), which results in allocating 4.7 workers a month just for the task of managing client requests (calculated according to 176 hours/month per worker).

If we take into account that approximately 50% of clients can and will use the web system in the future (72%, according to the survey) for the purpose of accessing their own business information (50% of which are available and suitable for sending to clients through the web), we could reduce the total number of client requests for 25%. By doing this, 209 working hours a month could be saved directly, which equals 1.2 in employee terms. In this way, merely by establishing the web system and by clients' independent data retrieval from the IS, BA clients would save up the amount of time equal to one employee to their bookkeeping service.

If web application is considered as investment, BAs next question should be: How development and maintenance of web application (e-business) will be funded and paid? In this case development of web application with client's direct access to the information of interest would be funded through increase of regular monthly payments for IT services and its yearly costs increase would be less than half of

the expected savings of one employee annual salary. It could be pointed out that, since BA clients do not expect rise in price of service (one of the survey conclusion, section 3.2.) even if web/e-business application will offer much better quality and time savings, BA could choose one of the following funding sources as an option:

1. One employee less in BA (one monthly salary) - in pessimistic scenario it is shown one employee less could be needed if web application is introduced

2. Decrease profit / or possible new clients with one free employee to do it, also implying new revenues; profit stay the same or even increase

3. Cut costs in some other activities/resources.

On the other hand, the clients would have direct access to the information of interest to them and they would not have to wait from one hour to one day for the feedback from their BA.

This clearly demonstrates that the effects of introducing an e-business would have a significant and immediate impact and save time for both the BA and the clients.

## 4 Conclusion

Generally, most business systems are reluctant to make significant changes to their information systems that have been working steadily and reliably. Their usual reasons involve costs, risks and potentially negative results of such projects, which are not so uncommon.

Nevertheless, bookkeeping agencies could increase their productivity and efficiency, and achieve considerable savings in time and money by activating the web system and by making the data in their IS open and accessible to clients. The implementation of an e-business would then allow for the needs and preferences of their clients to be met more quickly and conveniently, while simultaneously enhancing the

quality of bookkeeping services and the business and organizational practices of the agencies that provide them.

The research has confirmed the hypothesis that the joint application of web technology and an e-business model is mutually beneficial and brings significant positive effects for both the BA and its clients. Clients are mostly interested and they perceive the introduced e-business practices as an advantage and a way of cutting the costs for both parties.

On the one hand, the new e-business model puts BA clients in an active online position by giving them the opportunity to operatively use their business data, stored in the BA database. On the other hand, it puts the pressure off BA's employees, by sparing them the unnecessary daily communication with their clients. Conversely, at the same time it puts them under constant stress of being monitored on the web by the clients they work for.

From the point of view of BAs, this is a great organizational and technological internal regulator that automatically ensures the daily accuracy and promptness of posting their clients' business data, which is their core activity. Finally, on the basis of this paper and the experience that the authors gained in the process of creating the described information system, it can be said that the modern bookkeeping agencies have no alternative but to rely on their extensive e-business models and the consequent increased business efficacy in order to remain successful and competitive.

## References

- [1] Author.. A Conference Article. In *Proceedings of a Fine Conference*, pages, 2009.
- [2] Realini, A. F. G2G E-Government: the Big Challenge for Europe. *Master thesis*, University of Zurich, 2004.
- [3] Author.. A Conference Article. In *Proceedings of a Fine Conference*, pages, 2006.
- [4] Pravilnika o porezu na dohodak (NN 79/13), [http://www.porezna-uprava.hr/hr\\_propisi/layouts/in2.vuk.sp.propisi.intranet/propisi.aspx?id=pro1472](http://www.porezna-uprava.hr/hr_propisi/layouts/in2.vuk.sp.propisi.intranet/propisi.aspx?id=pro1472), downloaded April, 1<sup>st</sup> 2015.
- [5] Pravilnik o porezu na dodanu vrijednost (NN 79/13, 85/13-ispravak, 160/13, 35/14, 157/14), [http://www.porezna-uprava.hr/hr\\_propisi/layout/s/in2.vuk.sp.propisi.intranet/propisi.aspx?id=pro1472](http://www.porezna-uprava.hr/hr_propisi/layout/s/in2.vuk.sp.propisi.intranet/propisi.aspx?id=pro1472), downloaded April, 1<sup>st</sup> 2015.
- [6] Zakon o prikupljanju podataka po osiguranicima o doprinosima za obvezna mirovinska osiguranja (NN 177/04; 90/11), <http://regos.hr/default.aspx?id=967>, downloaded April, 1<sup>st</sup> 2015.
- [7] Hoyer, V. Modeling Collaborative e-Business Processes in SME environments. *Journal of Information Science and Technology*, 5(2):46-59, 2008.
- [8] Yin, R. K. *Case study research: Design and Methods*, Second Edition. SAGE Publications, SAD, 1994.
- [9] OMG. *Business Process Model and Notation BPMN 2.0*. <http://www.bpmn.org/>. downloaded April, 1<sup>st</sup> 2015.
- [10] Silver, B. *BPMN Method & Style*, 2nd edition. Cody-Cassidy Press, 2011.
- [11] BizAgi. *BizAgi Process Modeler*, 2015. <http://www.bizagi.com/en/bpm-suite/bpm-products/modeler>, downloaded April, 1<sup>st</sup> 2015.
- [12] Kaplan, R.S; Anderson, S.R. *Time-Driven Activity-Based Costing: A Simpler and More Powerful Path to Higher Profits*. Harvard Business School Press, 2007.
- [13] Stouthuysen, K at all. Time-driven activity-based costing for a library acquisition process: A study in a Belgian University. *Library Collections, Acquisitions, & Technical Services*, 34:83-91, 2010.