ICT Enablement of Administrative Processes in Croatian Seaports

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Abstract

Croatian seaports traditionally conduct the port business based on paper documents, which slows down business and administrative processes and increases costs. Author plans to research the prior work and research which has been conducted on the topic of the electronic data interchange in seaports, to analyze the current business processes and procedures (mainly the document flow) related to the arrival and departure of ships in Croatian seaports, and to propose an integral model of electronic data and document/message interchange among the stakeholders in Croatian Port Communities. In the thesis, the most important documents in seaport administrative operations will be identified and analyzed, and phases of ICT enablement of the Port Community will be determined.

Keywords: ICT Enablement, Croatian seaports, Port Community Systems

1 Introduction

Croatian seaports have to continuously improve their operations, both commercial and administrative, in order not only to optimize their business but also to achieve sustainable growth in cargo volumes. They need to optimize every aspect of their business, in other words minimize costs and increase revenue through the rational management of business processes. The usage of information technology as a tool for conducting electronic business (with special emphasis on the electronic exchange of data and messages within the seaport systems) will ensure the efficient connection of different segments of business processes that take place among the various stakeholders of seaport operations.

A large number of companies (or Port Community Members – PCM) conduct their business in Croatian seaports, and in order to maintain the coordination of work plans in the seaport, and to facilitate the administrative procedures, the so-called "coordination meetings" are being held on a daily basis. Paper documents which are exchanged between the PCM and the necessity of physical presence during the "coordination meetings" considerably slows down the business processes and produces higher costs. Modern transport and logistics environment therefore calls for investments in an integral IT solution implementation – a Port Community System (PCS), in order to maintain effective communication among the PCM, as a basis of seaport competitiveness.
In the doctoral thesis, the author plans to explore the various aspects of e-business in the seaports and the role that e-business presents in companies (stakeholders) that operate within the seaport environment in the Republic of Croatia, mainly public bodies which take part in administrative procedures (ministries). The author will analyze in detail the administrative procedures related to the arrival and departure of ships to and from Croatian seaports, will build several models and simulate several administrative processes, and will propose a new model of ICT enablement and business process reengineering for seaport administrative procedures, which will be directly applicable for Croatian seaports.

2 Problem description
Prospering seaports in neighboring countries have all implemented some form of information system for electronic exchange of data and messages in the port environment, or Port Community System, some of them more than 20 years ago. This suggests that timely investments in the development of an integral information system for electronic data and message interchange, with the possibility of integrating existing information systems of some "larger" stakeholders (ministries, terminal operators) in port operations and the possibility of integration of "smaller" stakeholders that do not have their own information systems (agents, freight forwarders), is a prerequisite for achieving and maintaining the Croatian seaport competitiveness [Tijan, 2011].

The author plans to review the administrative procedures and the current approach to e-business in Croatian seaports and to propose an appropriate solution - an integral model of e-business/electronic data interchange in order to rationalize the operations of Croatian seaports.

3 Research questions
Several questions have to be addressed while writing the doctoral thesis, among which the most important are:

- Who are the main stakeholders and what are the main processes and documents in Croatian seaports, with special emphasis on administrative processes?
- To what extent are e-business and electronic data/message interchange present in Croatian seaports?
- How to transform administrative processes in seaports by using e-business/electronic data/message interchange, with the goal of rationalizing and optimizing operations and increasing efficiency through increased synergy among the stakeholders in the seaport business?
- How to improve the effectiveness and efficiency of Croatian seaports by using electronic data interchange, and new methods of e-business, or so-called ICT enablement?

4 Research background and prior work
The topic of Port Community Systems and the practical application in Croatian seaports is insufficiently being researched. Regarding Croatian researchers, it should be noted that [Čišić, 1999] researched the use of electronic documents in logistics and found out that when compared to conventional “paper” documents, financial savings of 38.79% in document flow
can be obtained in the field of transportation, leading to possible savings from 0.81% to 1.41% of gross national income.

In another research, [Perić Hadžić, 2008.] concluded that Croatian seaports do not yet apply e-business procedures, but gradually develop their own information systems, which can contribute to long-term development and facilitation of implementation of e-business. She believes that in order to achieve sustainable growth and development of seaports, the construction of an adequate management information system is necessary, resulting with the use of electronic business for the purpose of rationalization of seaport management functions, and active involvement in global transport and economic trends.

[Perić Hadžić, 2008.] also emphasizes that communication between the stakeholders involved in seaport services is crucial for the rational management of the seaport system. Such communication and transactions (documentation required for the seaport services) must be carried out electronically. She notes that Croatian seaports are characterized by the classic, mainly paper-based methods of communication. For this reason, she sees the necessity for a transition to an electronic form of information or document exchange, in order to rationalize the management of seaports.

[Komadina, Čišić and Kesić, 1999] analyzed communication, coordination and inter-organization links in the logistics transportation system and showed that significant savings can be achieved by the use of e-business. [Ristov and Krile, 2010] researched the usage of application software for tracking and monitoring of containers and cargo plans, and realized that in order to increase efficiency and safety and to reduce the possible errors it is necessary to introduce integral IT systems in seaports, with appropriate software packages.

Regarding the global research of seaport e-business, and systems for electronic data interchange among the stakeholders in the port business, [Fleming, 1987] pioneered the research and determined the importance of a systematic approach by regulatory authorities in U.S. ports to improve coordination in seaport systems. [Jafari, Mohammad Taghavifard, Rouhani and Moalagh, 2010] explored the development of e-business in the world’s leading container ports and reached the conclusion that in order to succeed and to achieve the best possible quality of port services, the access to accurate information, which is achieved by applying information technologies, is of utmost importance.

[Lee, 2000] researched electronic data interchange in container logistics and came to the conclusion that the use of electronic data exchange really speeds up communication, allows better control over the flow of data, reduces the volume of human labor and costs, which allows higher levels of service, greater efficiency and improved relationships with business partners.

[Bollo and Stumm, 1998] studied the transition from classic EDI (Electronic Data Interchange) to Internet-based data interchange technology. For many years EDI was considered expensive but effective way for rapid and secure exchange of information in transport activities. Today, Internet solutions and ebXML (Electronic Business using eXtensible Markup Language) standards offer business opportunities that are in many ways complementary to EDI technology, without the intent of replacing the EDI technology.

[Kia, Shayan and Ghotb, 2000] explored the importance of information technologies and their role in improving the operating systems for cargo handling. They have developed a computer simulation to compare two different operating systems, the container terminal equipped with systems for electronic data interchange in relation to the terminal without such system.
[Smit, 2004] analyzed the information systems in the ports of Antwerp, Rotterdam and Hamburg, and based on the analysis, developed three models: Bilateral Information Model (BIM), Centralized Information Model (CIM) and the Decentralized Information Model (DIM) in seaports.

Based on more than 150 collected and processed resources that were available, it is evident that some of the questions regarding the research topic have only been partially researched and presented to the public. Moreover, in the available literature, it was not possible to find information regarding the business process reengineering in Croatian seaports, the application of integral systems for electronic interchange of data and messages in Croatian seaports, and the effects such systems would have on the operation of Croatian seaports.

5 Research method/approach

After identifying and analyzing the administrative business processes in Croatian seaports (the processes related to the arrival and departure of vessels) and documents (42 documents or forms and 6 certificates) that appear in administrative seaport procedures, a data analysis has been performed in order to determine the repetition of data entry and bottlenecks in administrative processes.

"As-is" situation was presented and analyzed, and "to-be" situation was proposed, based on integral ICT systems for electronic data and document interchange (Port Community Systems). The "to-be" situation will be proposed in two steps: the first step will only include the ICT enablement of current administrative processes, and the second step will include business process reengineering (reduction or even removal of several printed forms or documents).

Relevant stakeholders in three largest Croatian seaports were surveyed with the intent of assessing their knowledge of e-business, the level of its active use and the attitude towards integrated information systems for electronic interchange of data and messages. They also provided the numerical data which was used in the simulation of the administrative process of vessels’ arrival to the port.

The simulation was conducted on three models: the first model depicting the actual administrative process, the second model depicting the ICT enabled administrative process, and the third model depicting the reengineered process, with some of the documents removed due to being obsolete or redundant.

6 Expected results and contribution

So far the role of e-business in modern enterprises, especially stakeholders in port business was defined and seaport activities in Croatia were analyzed with special emphasis on networked information technology and e-business/electronic data and administrative document and message interchange. A new model of e-business was defined - an integral model of electronic data and message interchange, with the purpose of increasing the efficiency of administrative procedures in seaport business in Croatia (and seaports in general).

Based on the analysis, the research could have a significant impact on improving the business indicators of various public and private stakeholders in seaport operations (ie increase
revenues, reduce costs...), as well as Croatian seaports in general. The future research should be expanded to include the commercial procedures, along with the administrative procedures.

In the final version, the thesis will show the actual data that reflect the current state of Croatian seaport activities, and will analyze the obstacles that have to be removed in order to successfully implement advanced systems for e-business/electronic data and message interchange (Port Community Systems) and successfully reengineer the administrative seaport processes.

7 Conclusion

The opportunities that e-business brings should not be ignored by seaports, because of well-proven advantages of e-business in maximizing profit and reducing costs. ICT enablement or e-business implementation in Croatian seaports is a large infrastructural investment. It should eventually result in substantial savings, by reducing the time necessary for coordination, by reducing paper documentation and by reducing the occurrence of errors, and should definitely increase the competitiveness of Croatian seaports.

Based on the analysis of existing administrative procedures in the Croatian seaport environment, it is necessary to establish a modern and efficient integral model of e-business with special emphasis on the electronic exchange of data and messages. Research results could be used by stakeholders in Croatian seaports who wish to streamline their administrative procedures, and adapted research results could be used by current and future stakeholders involved in commercial port operations - concessionaires. Research results could mainly be used by government authorities (customs, police, Port Authority...), since they are the key stakeholders in administrative seaport procedures. The thesis will attempt to prove that the deployment and management of an integral system for e-business/electronic data and message interchange (Port Community System) is a prerequisite for the advancement of Croatian seaports in today's market environment.

By evolving and leaving behind the stage of internal communication among the PCM (characterized by paper documents and uncomputerized daily coordination of seaport activities), the ICT enablement and PCS implementation in Croatian seaports will result in greater efficiency in communication, as well as in better coordination of seaport operations.

Literature


