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THE IMPACT OF ICT ON THE CLEARING OF GOODS AT GHANA PORTS: A STUDY OF TEMA AND TAKORADI PORTS

Komi Agbesi

Department of Computer Science, ACCRA Polytechnic
GHANA.

agbesikomi@yahoo.com

ABSTRACT

The emerging requirements for freight transportation lead the logistic sector to focus on the implementation of integrated information systems to improve the provided services (Caris et al., 2008). Therefore, it is imperative to develop and integrate new security solutions related to customs operations. Modern ICT tools help to produce, manipulate, store, communicate, and disseminate information. Moreover, ICT makes possible to know the state of the system in real time and therefore to manage and change on-line paths, vehicle flows, orders and deliveries. The population for the study was basically the management staff, administrative and Information Communication Technology staff at the Tema Ports, with a sample size of 60. The questionnaire was the main instrument used for the completion of the work. Some of the findings suggested that moderate impact of ICT signifies that ICT is re-shaping the logistics system from traditional methods to modern logistics. Also ICT has been more progressive and contribute in increasing the efficiency of urban goods transport. Recommendation made suggested that Government needs to promote a sharing of knowledge about the use and the role of ICT in logistics with the private sector by facilitating a demonstration of technological solutions, experiments and diffusing best practices that requires national, regional, and international approaches that adapt to the international developments in the industry itself.

Keywords: Information and Communication Technology, information, ports, applications

INTRODUCTION

The emerging requirements for freight transportation lead the logistic sector to focus on the implementation of integrated information systems to improve the provided services (Caris *et al.,* 2008). Therefore, it is imperative to develop and integrate new security solutions related to customs operations. It is widely recognized that the application of Information and Communication Technology (ICT) in logistics has been promoted as a means to enhance logistics competitiveness (Feng & Yuan, 2006). ICT is considered a primary "enabling tool" for the safe and efficient freight transportation systems (Giannopoulos, 2004).

Recently, practitioners and researchers are attracted by the key problem of using effectively and efficiently the latest developments of ICT tools for freight transportation management. In particular, the modern ICT tools help to produce, manipulate, store, communicate, and disseminate information. Moreover, ICT makes possible to know the state of the system in real time and therefore to manage and change on-line paths, vehicle flows, orders and deliveries. In order to operate such choices, there is a need of suitable decision modules based on detailed models that can track the state changes of the various system components and determine performance indices typical of the tactical and real time management, such as utilization, traffic indices and delivery delays (Ramstedt & Woxenius, 2006; Xu & Hancock, 2004).

In recognition of the pivotal role that ICT plays in modern customs administration, there needs to be a contribution in proposing an innovative ICT based solution that takes into account the high priority on the selection and implementation of appropriate and effective technological solutions for customs and security operations. Nonetheless, the fundamental and distinctive assumption of this work is that the introduction of new technology without a paradigm change does not completely solve the system anomalies and bottlenecks of the current situation (De Wulf & Sokol, 2004).

The study therefore seeks to deal with the multiple decision problems concerning the impact of ICT on the clearing of Goods at Ghana Ports, with a case study of the Tema and Takoradi Ports. This research will address the problems and criticalities related to the Customs Clearance (CC) operations with regards to goods that enter the Ports and how they intend to deal with it when using ICT systems. In order to overcome the detected anomalies and bottlenecks that usually happen at the Ports, some innovative solutions need to be proposed on the basis of the application of ICT to perform the clearing of goods operations. The procedures related to customs activities have a strong impact on the overall logistic chain because they affect the performance of the whole systems in terms of efficiency and time-spending. Therefore, the study will deal with what impact the Information Communication Technology (ICT) can have on the clearing of goods at Ghana Ports, focusing on the two major ports in Ghana.

STATEMENT OF THE PROBLEM

The activities of port operations however transcend the domain of physical expansion and construction. It includes a number of tasks such as information and documentation of cargo, which comprise the value of the cargo, the vessel that ferried it and points of origin and destination. Information concerning the interested parties such as the agents, freight forwarders, shipping companies, banks, insurance companies, port authority as well as government controlled agencies are essential. The aforementioned documentation that is done in port operations brings to bare the issue of how Information Communication Technology (ICT) involved impacts on the clearing of goods at the Ports (Ghana Ports Harbours Authority, 2006).

Port inefficiencies usually result from the fact that port operations were not computerized or automated with modern ICT systems and all activities ranging from provision of information to documentation, processing and clearance were done manually. This led to serious delay of clearance of cargo containing goods. The declarants could use at least one day just to retrieve containers for examination. Before this could even be done, there would have been several delays with regard to the documentation and processing of information in the form of submission of manifests by shipping agents, declaration of entries by Declarants, payment and confirmation by banks and clearance by the CEPS and Immigration officials. The litany of these processes that had to be followed in order to clear cargo resulted in numerous complaints and frustrations by importers concerning the clearance of their goods on time (Bainiah, 2008).

OBJECTIVES OF THE STUDY

The study seeks to achieve the following objectives of the study: to identify the form of technology being used to clear goods at the Tema ports; assess the impact on the use of ICT systems for the clearing of goods at the ports; identify the likely challenges associated with the use of the ICT system for the clearing of goods at the ports; make recommendations for the use of modern ICT systems to clear goods at the ports.

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RESEARCH METHDOLOGY

Purposive sampling technique method was used in sampling sixty (60) respondents, who were given structured questionnaires consisting of a combination of open and closed ended questions concerning the impact of ICT on the clearing of goods at Ghana Ports with the focus on Tema Ports. The respondents included the management, administrative and ICT staff at the Tema Ports. The collected data was inputted into EXCEL application analysed and summarized using frequency tables and charts.

RESULTS AND DISCUSSION

On the field of study, there were sixty (60) respondents made up of 26, 34 males and females respectively. This presented as follows table 1.

Table 1. Gender of respondent

Variable	*Frequency*	*Percentage*
Male	26	43.3
Female	34	56.7
Total	60	100

From the table above, 26 male respondents at the ports represents 43.3% whiles 34 female respondents represents 56.7%. It is obvious that females were more than males at these ports-Tema and Takoradi.

Among these respondents at the ports, information obtained on the field of study reports that, their ages range from eighteen (18) through to fifty-six (56) or more than. The table 2 depicts the age distribution (groups) of the respondent at the ports.

Table 2. Age Distribution of Respondents

Variable	*Frequency*	*Percentage*
18-25	5	8.3
26 – 35	12	20
36 – 45	22	36.7
46 – 55	11	18.3
56 – above	10	16.7
Total	60	100

From the illustration, the ages of the respondents are grouped; it also reports the number of respondents in each group of age and that of their percentage. Records show that the highest age groups are 26-35 years, 36-45 years, and 46-55 with a percentage of 20%, 36.7% and 18.3% respectively.

On the field of studies, at the ports, we needed to identify the chain of command – organizational chart (structure) which depicts the flow of information from the top management to those on the field. The table below gives the grades of the respondents and their frequencies.

Table 3. Grade of Respondents

Variable	*Frequency*	*Percentage*
Top management	15	25
Administrative	22	36.7
Junior staff	13	21.6
Field staff	10	16.7
Total	60	100

The illustration above shows the position of the respondents at the two ports, considering the number of respondents in each level; it is easy to tell that almost every section at the ports may need the ICT for easy and effective movement of goods and transferring of information communication. Moreover, since proper records are needed to be kept from the top management down to the field staff.

Table 4. Access to Information

Variables	*Frequency*	*Percentage*
Yes	51	85
No	9	15
Total	60	100

The above table shows the various percentages of assessment of information in the various departments at the ports. From the field of study, data gathered reports that about 85% representing 51 people from the various departments get access to relevant information through the use of ICT. However, about 9 respondent representing 15% do not get access to information. The majority who has access to information through the use of ICT appreciate the effectiveness of easy flow of information from one department to the other. In addition, their financial reports are easily and adequately prepared on time.

ICT has enable communication and sharing of information among staffs and management to be very easy, and some also indicated that ICT has reduce labor, for instance the number of messengers has been reduced.

Table 5. Reputation of the Ports

Variable	*Frequency*	*Percentage*
Strongly Agree	11	18.3
Agree	25	41.7
Neutral	18	30
Disagree	6	10
Strongly Disagree	–	–
Total	60	100

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Table 5 shows the number of respondents and their responds if the ICT has really help and brought any development among the various departments at the ports.

From the table, about 25 respondents representing 41.7% of the total workers readily agreed that the ICT has improved the reputation of the ports. About 18 respondents presenting 30% were not optimism (neutral). While 11 respondents representing 18.3% totally agreed that the introduction of the ICT has really improved the reputation of the ports.

Table 6. Communication

Variables	*Frequency*	*Percentage*
Yes	51	85
The No	8	13.3
Sometimes	1	1.7
Total	60	100

Table 6 reports the flow of information between the ports and their clients. Data gathered indicated that, ICT has enabled communication between the ports and its clients. On the other hand, few respondents (13.3%) expressed their view that, ICT has not improved enhance communication at all, while 1.7% indicated that, it brings about both advantages and disadvantage sharing information since it is mechanically and electronically used facility. Despite these majority 85% concluded that, ICT enable communication to ports' clients, and has actually help the ports and their clients.

Table 7. ICT training after employment

Variables	*Frequency*	*Percentage*
Yes	51	85
No	9	15
Total	60	100

The above table displays the training on ICT offered to employees of the ports. 85% of the respondents concluded that they had ICT training after being employed, while 15% also gave their view that, they did not receive any ICT training after they were employed. Majority of these 15% respondents said that, they already have knowledge in ICT.

Table 8. Expertise in the use of the following

Variable	*Excellent*	*Very good*	*Good*	*Fair*	*None*
Using computers and managing files	25%	30%	40%	5%	-
Spreadsheets	10%	37%	23%	15%	5%
E-mailing	79%	11%	5%	5%	
Internet browsing	91%	9%			
Database management	5%	85%	8%	--	2%

Data gathered from the respondents' shows that the ICT is mainly used for internet browsing, and data management as indicated by 91% and 85% respondents respectively. Some respondents also indicated that, the ICT are used in e-mailing and the use of database management of files.

Table 9. Internet Software Used

Variables	*Yes*	*No*	*Sometimes*
Microsoft internet explorer	57%	12%	31%
Netscape navigator	--	--	--
Opera	--	--	--
Mozilla	79%	2%	19%

Table 9 displays the internet software used at the two ports. Data sourced from the respondents indicates that, Microsoft internet explorer and Mozilla are most used by the two ports.

Table 10. Use of ICT

Variable	*Very often*	*Often*	*Sometimes*	*Never*
Finding information on work-related materials	62%	33%	8%	12%
Communicating with fellow employees	89%	9%	2%	--
Communicating with customers	--	48%	2%	50%
Communicating with other companies	32%	38%	15%	15%
Preparing reports	69%	28%	2%	1%

Table 10 illustrates the frequent use of ICT at the two ports. Data sourced from the respondents concludes that, ICT is mostly used in finding or accessing information on work-related materials, as indicated by 62%. 89% also said that, they used it in communicating with fellow employees, and 32% also responded that, it is used in communicating with other companies. 69% also gave their view that, they use it in preparing their reports. 48% often used it in communicating with customers, 33% used it in accessing information on work-related materials, while 38% also used it in communicating with other companies.

Table 11. Computer Based System

Variable	*Longer than 3 years*	*Last 3 Years*	*Next 3 years*	*Not Considered*
Invoicing & accounting	100%			
Passenger manifest transfer	89%			
Cargo manifest transfer	75%	15%		
Customs control & clearance	100%			
Container & cargo monitoring	100%			
Berthing & docking control	100%			
Sailing schedules	100%			
Security services	100%			
Estimated & actual arrival/depart times	100%			

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Table 11 illustrates the computer based systems that are placed or system which has been considered to be put in place. Data gathered from the respondents concluded that, they have all the computer based systems for those factors in place.

Moreover, respondents were asked to state the challenges facing the organization, and major challenges that were sourced from the respondents include: costs of implementing new software and hardware solutions; funding for new ICT developments; no available space for docking big vessels; corruption among top management

Table 12. ICT System of the Two Ports

Variables	*Frequency*	*Percentage*
Online banking	45	75
Electronic money transfer	15	25
Total	60	100

Table 12 represents the ICT system currently used by the two ports. Data gathered from the respondents indicated that, online banking is frequently used by the bank for its daily operations. It also uses the electronic money transfer for its interbank payment system to other organizations or customers.

Table 13. How important is e-Business to the Organizations

Variables	*Frequency*	*Percentage*
Essential	45	75
Important	9	15
Not important	5	8.3
Don't know	1	1.7
Total	60	100

Table 13 displays the importance of e-Business to the ports. 75% respondents indicate that, e-Business is essential to the organization, while 15% also respondents that, e-Business is important to the ports. 8.3% rates e-Business not to be important to the port, while 1.7% also had no idea to the important of e-Business to the port.

Table 14. Benefit of e-Business

Variables	*Frequency*	*Percentage*
Reduced cost	Yes (51), No (9)	85, 15
Increase turnover	Yes (45), No (15)	75, 25
Increase efficiency	Yes (51), No (9)	85, 15
Increase profits	Yes (44), No (16)	73.3, 26.7

Table 14 illustrates the benefits of e-Business to the ports. Data sourced from the respondents concludes that, e-Business reduced cost, as indicated by 85% of the respondents, 75% also gave the view that, it increased turnover, and 85% respondents also gave the view that, it increased the efficiency of the ports. 73.3% respondents also indicated that, e-Business increased the ports profits.

CONCLUSION

ICT is used for several purposes, such as reducing transactions costs and supporting the collaboration and coordination of activities through information sharing among organizations. A number of case study evidence from the world leading companies has demonstrated the importance and success of the ICT tools in achieving network efficiencies. This article considered the ICT capability at Tema and Takoradi. The results show that while external communication and information sharing needs are recognized in a number of sample firms, small logistics providers yet seek better coordination of internal functions within the company.

Furthermore, ICT can improve the customization of services provided by these companies. The survey results put in evidence that this can be reachable if these companies will overcome the barriers for technological investment

RECOMMENDATIONS

1. Government needs to promote a sharing of knowledge about the use and the role of ICT in logistics with the private sector by facilitating a demonstration of technological solutions, experiments and diffusing best practices that requires international, national approaches that adapt to the international developments in the industry itself.
2. Policies makers need to keep up with rapid development of ICT used by the private entities and develop a stable communications framework that is conducive to logistics planning and to support the research and development in the port.
3. Adopt analysis method, performance measure, and evaluation criteria in monitoring the developments of ICT in the port. This could identify and propose mitigating measures to prevent the negative impacts of the technology in environment and social aspect.
4. Strengthen public participation in the policy formulation for ICT used in logistics through conducting public hearing and consultation. Governments, regional organizations, and the private sector need to cooperate to set the right frameworks for investments and services.
5. Expand innovative public and private financing methods in generating finance and building skills for the development of ICT capacities. Human and financial capital building should be fundamental elements of the strategies of the public and private sectors in the development of e-logistics. Training and education policies, together with adequate financing are also important for e-logistics to play its full role in the process of regional economic combination.
6. For more consistent and reliable findings and policy basis recommendations, future studies should consider bigger samples from the different ICT logistics users. This can be done through coordination and cooperation with the company's association, direct coordination with private firms, and the different government agencies tasked to handle freight logistics.

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