Maritime Training on Information Technology Applications towards a Safer and more Secured Sea

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Abstract

Ships construction today and in the future carries modern techniques, equipment and systems depends on information technology which requires a higher degree of training on information technology to the crew of the ships so that they can deal with modern devices and programs. Ships movement, process of transporting goods, container terminals and E-Port Logistics are dealt through electronic management systems. This paper shows the importance of training the crew on information technology so that they can deal with modern devices, programs and electronic management systems in order to safer seas and also the safety of ships, passengers and cargo. Due to the distance and the difficulty of presence of seafarers in regular training, E-learning is appropriate method of training for seafarers in the fields of modern technology. This paper also shows the importance of training the crew on information technology so that they can deal with e-learning as the modern methods of learning depend on information technology.

Keywords: Information Technology, Maritime Training, Ships Technology,

, containers terminals, E-Port Logistics, E-learning

1 Introduction

The ships being construction today and in the future carry complex and technically demanding equipment and systems. They also carry automatic equipment, systems, procedures and processes, than ever before. Presently there is a need for crew to have a higher degree of different and diverse competences than those expected in the past.

The equipment and systems carried onboard include the "hardware" of computers, and safety management systems and the "software" of programs that provide charts, maintenance and engine room monitoring [Anastasia Varsami, 2010].

Yet there seems to be little, if any, provision for structured information or training in most of these areas. It is often purely luck rather than judgment that finds seafarers provided with training in any of the advanced equipment or systems that are fitted on the ship [Judy Zolkiewski1, 2003]. Frequently the use or maintenance of the intricate and complex

equipment is left to chance or the ability and inclination of the seafarers to read a manual. Training seafarers required extra skills areas such as IT.

2 Development of ships' technology

The construction of ships is progressing with Electronic systems, also is equipped with a passenger tracking information system and computers for crew members to report the status of ship operations.

2.1 Automation, Control and Electronics

Most engine and machinery control functions are carried out using a main engine control system. The main plant machinery is monitored using a dual CPU-based system. The ship performance monitoring assembly includes computer work station.

2.2 Onboard Systems

The supply of navigation and automation systems will continue to benefit from the IT improvements and economies that come with the continued development of microchip technology.

2.3 Planned maintenance programs

Allow the ships routine and emergency maintenance schedule and work to be identified and recorded. Many carry out automatic feedback to the management offices and provide automatic component and spare part ordering.

3 Technologies in Management

Many software companies provide database programs that can be tailored to fit a ship operators management needs. Most carry the fundamental aspects of management, finance, technical, personnel, purchasing and operations. Many can be used to provide integration with shipboard system such as budget and planned maintenance.

Example, to warn the operator of a vessel approaching a certain area, or the approach of unknown vessels. In addition, with the ship emulator, the operator can plan the ships route and determine required course changes.

3.1 Information

IT provides a vast amount of electronic information such as IMO regulations, database of every kind of ancillary organisation in the shipping industry in any part of the world, regular up-dates of chart corrections for electronic charts, maintenance manuals and spare part catalogues, etc. Web sites provide instant access to information on the most recent documentation from IMO, national governments, port state control and many more areas.

3.2 Improved Communications

Satellite communications from geostationary and low level orbits can provide instant communications between the ship and shore, whether management office, shore authority or Vessel Traffic Services.

3.3 Control

Many current ship operators, owners or managers have also taken an IT route to provide better management; they have ships producing daily data that records almost every facet of shipboard operations, navigation, maintenance and cargo. This is transmitted to the ship's management office for analysis and comment. As the cost of IT and communications reduce, it is probable that over the next decade more owners will see this as a way of providing a "due diligence" control and "management" over their ships and will increase their use of onboard systems.

3.4 IT Developments

The continued growth of IT and communications are guaranteed, although it is hard to estimate the proportion of operating ships that have access to a computer at present and impossible to estimate how many will be using them in the future, what is certain is that more ships will be presented with computers to make things "easier" for them to operate. If done correctly, the introduction of computerisation should provide data that is of immense use, especially in safety operations where incidents and accidents can be analysed to identify trends and prevent similar events occurring.

In general, IT provides a wide range of solutions to perceived problems in the shipping industry and much is being done electronically to provide up-to-date information through DVD and web sites. This can only increase, though whether the ship's crew or the office personnel can deal with an increase in the information overload that is experienced today is to be taken into consideration.

4 Vessel Traffic Management Information Systems

The Vessel Traffic Management and Information System (VTMIS) employs a variety of hardware and software modules that collect, integrate, assess and display sensor data in a manner that provides a comprehensive representation of the vessel traffic situation to VTS Operators. Whether the requirement is for surveillance of coastal areas, large ports, small ports, rivers or offshore installations a VTMIS can be supplied to meet that need.

The purpose of a VTMIS is to provide the operator with a clear and concise real-time portrayal of vessel movements. The information provided by the VTMIS must allow the operator to:

- Enhance safety of life and property.
- Reduce the risk associated with marine operations.
- Enhance efficiency of vessel movements and port marine resources.

5 Container Terminal Planning

Containers come into the terminals via ships. A container port must be planned by software applications to satisfy prompt accommodation of ships with minimum waiting time in port, and with maximum use of berth facilities.

The development of new container ships of large capacities, modern technologies, and the introduction of container port automatic appliances at port terminals through their specialization are considered to be the basic features of modern container transport trends [Nam-Kyu Park ,2009].

6- E-Port Logistics

Today, business is global and 24x7, Customer demands are ever increasing. And businesses are under great pressure to effectively manage the physical movement and storage of goods across complex supply chains. This may mean goods being moved by one or multiple modes of transport - by air, sea and/or road. In many cases they may require the services of many different stakeholders. - All of which need to be coordinated by an efficient logistics provider.

Safe and dependable transport and logistics solutions that's e-Port's promise. Large enough to fulfill complex global requirements and flexible enough to handle smaller operations- e-Port believes in delivering comprehensive, cost effective and professional range of freight forwarding services- shipping, logistics, transport and warehouse management- the way we want.

Uncovering efficiencies to stay ahead of competition, e-Port focuses on advanced technology, process consistency and exacting quality standards to minimize inventory costs and maximize the supply chain. It gives us the flexibility, scalability, cost savings, and lower liabilities that contribute to growth and value creation.

With an unbeatable combination - competitive edge combined with the economical and logistical advantages e-Port offers comprehensive, safe and reliable logistics services .

Employing people across its network e-Port works round-the-clock to ensure that all consignments are handled safely, efficiently, effectively and reach their destinations well on time.

6.1 Advantages of E-Port Logistics

Cost-Effective deals for imports and exports.

End-to-End services

Multi-modal transport operators

Streamlined, automated processes across operations to improve business efficiency.

Enhanced visibility of key information allowing more informed decision making.

Improved customer service.

Improved financial control.

6.2 E-Port Infrastructure

E-Port has a transparent system that allows us to check the inventory, initiate instructions and make requests to collaborate throughout the supply chain process to maximize profits.

E-Port also provides facilities to electronically link the various plants and offices to create a highly efficient information platform for focused collaboration. With e-Port we are fully equipped to meet the new challenges of an increasingly competitive global market.

6.3 E-Port Team

Ports Management today carries modern techniques and systems depend on information technology which requires a higher degree of training on information technology to the Team of the ports so that they can deal with electronic management systems in order to the safety of ships, passengers and cargo.

7 What is Information Technology?

As a concept, it has evolved from the basic usage of computers and processing of information in any industry. The Information Technology Association of America (ITAA) defines Information Technology as "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware."

Information Technology or IT mainly deals with computer applications. The common work environment today is totally dependent on computers. This has led to the need to develop and consistently upgrade dedicated computer software like project management

software, for a number of related requirements. These include storage and protection of content, processing and transmitting of dedicated information and the secured retrieval of information, when and as required. IT promotes computing technology, covering everything from installing applications to developing databases

The information technology industry consists of computers, communication mediums, peripherals, electronics-related organizations, softwares and services. Usage of information technology for the completion of tasks in any organization, speeds up the processing and information mobility, and also improves the reliability and integrity of information.

7.1 The most common components of Information Technology

Computers: Computers are very important in order to store and process data. Depending on the size, cost and processing ability, computers are divided into four categories. They are mainframes, supercomputer, minicomputers and microcomputers (desktops or personal computers).

Servers: A server is a combination of hardware and software, and is used to provide services to the client computers. These services generally include storage and retrieval of information. A standalone computer can also act as a server, provided it's running on server operating system.

Database Management Systems (DBMS): Database Management System is basically a set of software programs which manages the storage and retrieval and organizes the information in a computer. This information is in the form of a database and is managed with the help of softwares. The DBMS accepts requests from the application program and instructs the operating system to transfer the appropriate data. There are various departments to monitor the flow of information, which include System Administrators, IT Managers and Database Administrators.

Networking: A computer network is a collection of computers and peripherals connected to each other through different modes. These modes can be wired or wireless. The network allows computers to communicate with each other (share information and resources like printers, scanners, etc.).

Network Security and Cryptography: Network security is one of the most important aspects of information technology. It consists of all the provisions made in an underlying computer network, in order to prevent unauthorized usage of information. It also includes implementing the policies adopted by the government and the applicable cyber laws. It is

also helpful in providing protection from computer hacking at the cyber boundaries of an organization.

8 E-learning

E-learning is commonly referred to the intentional use of networked information and communications technology in teaching and learning. As the letter "E" in e-learning stands for the word "electronic". E-learning process is delivered via information technology environment.

Because E-learning is not constrained by geographic considerations, it offers opportunities in situations where traditional education has difficulty operating e.g. seafarers on a ship. Students with scheduling or distance problems can benefit, because distance education can be more flexible in terms of time and can be delivered virtually anywhere.

CBT (Computer-Based Training) has been used as synonym to E-learning

8.1 Computer Based Training (CBT)

Computer Based Training, a type of education in which the student learns by loading special training programs on a computer. CBT is especially effective for training people to use computer applications

9 Information Technology in education?

Information technology is used for storing, protecting, processing, securing, transmitting, receiving and retrieving information. The primary importance of information technology in education is that various learning resources can be accessed instantly, by students as well as teachers, at their convenience. Learners can also adopt multimedia approach and collaborative learning. The information is authentic and the latest updated information is available. Multiple communication approaches like chats, forums, e-mails, etc. can be adopted by them. Students can access the on-line libraries and distance learning is also possible. Information technology has proved to be a significant employer. Many people with knowledge of computers have got jobs in the field of information technology and have successfully made it into a career. It has helped in finding cures for many diseases thereby serving mankind in more ways than one. Different kind of softwares is provided for hearing and visually impaired people which aids them in their passion for learning new things and gathering information.

9.1 Impact of Technology on Education

Technology plays a vital role in every sphere of life and education is no exception, many of the complex and critical processes can be carried out with ease and efficiency with the

help of modern technology. The fields of education and industry have undergone a major change and sure, they have changed for the better.

Computers and the Internet technology have revolutionized the field of education. In fact, with the onset of computers in education, it has become easier for the teachers to render knowledge and for the students to grasp it. The computer technology is used to add a fun-element to education. And it goes without saying that the Internet has endowed education with interactivity.

The computers offer an interactive audio-visual media. PowerPoint presentations and animation software can be used to render information to the students in an interactive manner, result in inviting greater interest from the students. Moreover, these softwares serve as visual aids to the teachers. Overhead projectors and screens facilitate a simultaneous viewing of information by a large number of students. These audio-visual teaching aids have brought about marked improvements in student attendance and attentiveness.

The web is a huge information base. The Internet can be used an effective tool for acquiring knowledge. All a web user needs to do is to key in search queries to search engines, which are prompt to present him/her with millions of search results. There are several informative websites and web directories that offer information on a wide variety of subjects. Students can use the Internet to gain all additional information they need to enhance their knowledge base.

Today, computer education is a part of school and college curricula. Considering the wide range of applications of the computer technology, it is necessary for each one of us to befriend computers. Considering the advantages of the Internet technology, it is important for each of us to gain a basic knowledge of Internet access and connectivity.

 Online education and distance learning have given a new dimension to the field of education and higher learning. Today, students do not necessarily need to be physically present in classrooms. Many educational institutes offer online courses to their students. Most of the schools and colleges offer online assignment submission facilities. Students can submit their homework and test assignments through the Internet. Many universities offer online education programs wherein the students can interact with their teachers over the web, access reference material from the University website and earn degrees online!

9.2 The Advantages of Information Technology in Education

- **Access to variety of learning resources**

IT aids plenty of resources to enhance the teaching skills and learning ability. With the help of IT now it is easy to provide audio visual education. The learning resources are being widens and widen..

- **Immediacy to information**

IT has provided immediacy to education. Now in the year of computers and web networks the pace of imparting knowledge is very fast and one can be educated anywhere at any time.

- **Collaborative learning**

Now IT has made it easy to study as well as teach in groups or in clusters. With online we can be unite together to do the desired task.

- **Multimedia approach to education**

Audio-Visual Education, planning, preparation, and use of devices and materials that involve sight, sound, or both, for educational purposes. The growth of audio-visual education has reflected developments in both technology and learning theory.

- **Online library**

Internets support thousands of different kinds of operational and experimental services one of which is online library. We can get plenty of data on this online library.

CONCLUSIONS

Seafarers training should be taken into account the training of seafarers on information technology so they can deal with modern technologies in the shipbuilding industry in order to the seas safer in additional co-operation must be encouraged between marine training establishments, seafarers and industry employers, including ship and equipment builders, to ensure that relevant training is provided for ships' operation and shore employment and relevant, and up-to-date information, is provided to Trainees.

Technology is used in ships today must be taught and every effort should be taken to ensure that the syllabi of qualifications and examinations are upgraded at frequent intervals.

Due to the distance and the difficulty of presence on a regular basis, the e-learning is appropriate method of education and training of seafarers in the fields of modern technology and to be able to respond to this type of education that requires the training of seafarers on information technology.

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