The implementation of information communicating technology in modern marketing

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DOI: https://doi.org/10.33545/27076636.2022.v3.i1a.47

Abstract
What businesses need is a vision and the right technology solution to exploit the numerous opportunities present in this ever-changing business world. This research work is about how Information Communication Technology (ICT) is implemented in Marketing and can enhance the strategic advantage of one business over the others in a turbulent Marketing environment. To achieve the full benefits of ICT in business today, two fundamental factors applied. These are:
1. The effective use of Information Communication Technology will become increasingly important to the long-term success of virtually all businesses.
2. The adoption and the implementation of effective and efficient Information system depend critically on the level of technological competition in the entire business environment and the level of technology in the country as a whole.

Enhancing this leadership role of Information Technology is not easy for many businesses, but success depends on the fact that adopters of the concept participate effectively in its implementation process. The research work is solely committed to how Information Communication Technology (ICT) is being applied in Marketing and the benefits businesses would be getting if they adopt the concept wholeheartedly and implement it effectively with the right business layout.

Keywords: technology, implementation, communication, information, computers, marketing, modern

Introduction
Since the advent of computers after the World War II and personal computers in the 1980's, management perception of value and use of information have changed significantly. Even the terms are undergoing continuous transformation. Information has become a very important element in marketing decision modern times. Marketing management needs accurate, relevant, reliable, and timely information for effective decision in order to survive in this dynamic and turbulent marketing environment. Information management is therefore not choice but a prerequisite in marketing management. However, management information in every organization has become herculean task for organizational members. For this reason, technologies and systems have been developed to solve this information management dilemma. This has brought the popular jargons such as information technology, Information Communication Technology (ICT), among others.

The continuing raising of information communication technologies is now revealing the information concepts. Those have been made possible as a result of ICT infrastructures such as computers, fibre optics, telecommunication devices, the internet, satellite technology, cellular technology, etc. As the amount of information available to every human been has increased drastically, the total cost of developing it (collecting, processing, recording, storing, and delivering) has also increased as well, though the unit cost per bit of information processed has decreased considerably. Information Communication Technology will become increasingly vital to the long-term success of virtually every forward-looking organization.

Definitions
1. Application- The practical use of something, especially a theory, discovery, etc.
2. Communication - The activity or process of expressing ideas and feelings or giving people information. It is a method of sending information through a particular medium from one source to another.
3. Information - It is a data placed in a meaningful and useful context for an end user understanding.
4. Technology - The use of scientific knowledge in practical ways in an industry or a systematic application of scientific knowledge to a new product, process, or service. It can also be viewed as the methods, processes, systems and skills used to perform resources (input) to a product (output).

5. Marketing - Social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others. – Kotler A managerial process responsible for identifying, anticipating, and satisfying customer requirements profitably. – CIM

6. ICT - A Scientific or advanced way of sending message, expressing feeling, or ideas using a scientific medium.

Research question
As far as we believe and appreciate the fact that ICT presents major Opportunities for management to gain competitive advantage in modern marketing, it behooves all organizations both small and large to adopt the concept of ICT in order to survive in this turbulent and never-static business environment.

The last decade will be remembered for many events, but high on the list will be the commercial development of the Information Communications Technology. The popular press and academic journals have written volumes on this important topic. We have witnessed the ICT explosion and the subsequent bust, all in the compressed time frame. ICT is generally said to be growing at a faster pace worldwide compelling the world to become a small global village accessible by everybody in it.

However, regardless of the major benefits associated with ICT application, most businesses in Ghana do not see the need to adopt it for effective and efficient management. Some complain of the fact that it is expensive to come by while others just want to go with their traditional systems of management and administration. It is against this background that this study is being conducted to bring to light the value of Information Communication Technology in marketing.

Objectives of the study
The following are the objectives of this study:

- To identify the importance of ICT in marketing.
- To ascertain the impact of ICT in operations management.
- To identify the kind of ICT infrastructure being currently used in marketing.
- To identify the possible problem facing ICT adoption in marketing.
- To report and give recommendation on the research findings.

Methodology
The study will review published information from newspapers, magazines, books and some secondary sources. This will help to prepare a comprehensive report based on the information gotten.

Significance of the study
Information Communication Technology has come to stay as information forms the basis of management decision in every organization. It is therefore imperative that any business executive of today need to have basic knowledge of the application of ICT in their operations. Information Communication Technology is applicable in various fields of study.

In marketing, it is used in sales management, promotions, distribution and product development among others. This study will therefore reveal the current application and changes in the use of ICT in marketing today.

Among other things, this study will educate marketing institutions and companies on the importance of installing ICT systems for effective and efficient operations management.

It is hoped that this study will contribute immensely to organizations which depend on ICT, to see the impact it can have on their operations. Moreover, this study will be beneficial to small and medium scale enterprises as well as entrepreneurs who want to apply ICT in their business.

Finally, this research will be relevant to students and other learning individuals who will want to know the latest use of ICT in marketing.

Limitations of the study
In the course of carrying out the research, the researcher also encountered some problems in obtaining the secondary data needed. Some of the obstacles were as follows:

Management and employees were much concerned with their busy business transactions and as a result were not willing to respond to the researchers calls. There were also delays in getting back the responses to the secondary data required. The financial strength of the researcher could not support the research to the maximum as a lot of travels had to be made before laying hands on the required data needed for the study.

Finally, the whole processes involved in collecting, analyzing, and processing the needed data in well-structured information for decision making are very costly and time consuming on the part of researcher. Moving from campus to the area of study for collection of secondary data was costly and time consuming which limit the researchers’ ability to get much information.

Literature review
Introduction
Many firms that are marketing-oriented and were early entrants into business-to-business cyberspace marketing are now committed to the concept of eventually using the Information Communication Technology (ICT) to manage all aspects of the customer transaction process from initial enquiries through the post-purchase Support. Information Communication Technology is not applied only in marketing but also in every industry. In view of this, we shall see its application in construction. The construction industry has seen a major transformation due to the introduction and the adoption of information communication technology. This can be evident in the high usage of computers and other telecommunication devises in areas including management and administration, operation of construction machinery, acquisition and processing of data relevant for fieldwork and many more.

Computers as a central piece of the technology can help in almost every aspect for example, operations, of construction engineering and management. For instance estimation, stimulation safety, structural analysis, direct field application like data collection and also in robotics As much...
as accuracy and efficiency are needed in construction, the application of information communication technology should be a must and must be applied in the following areas under construction management and administration.

**Accounting and Payroll**
In well-established construction companies, computers and other Information Communication devices are mostly seen first in the accounting department. Therefore it is not surprising that the management of Account and Finance Department maintain control not only of the money related functions but also the computers and the other information communication devices. Centralized control of the computers and other devises evolve in most firms even as information system burst throughout the Organisation, but accounting payroll System generally have remained among the most important in the business. In Some organizations they directly integrate with other functions, such as cost control and material procurement. The basic functions of the accounting system are to maintain the general ledger accounts, permits development of financial reports such as profit and loss accounts and balance sheet. The most difficult part of a contractors accounting system is often the payroll. This is due to specialty in trades and the numerous geographical jurisdictions that are encountered even in the operations of smaller, medium and large firms. The differences in wage rates, fringe benefits, taxes, work schedules and other factors quickly become enormous and require frequent updating. Most types of insurance payments are also linked to this payroll system. Information Communication Technology is also applicable in the manufacturing industry. It helps in the planning and control of the manufacturing cycles in a concept referred to as the Computer Integrated Manufacturing (CIM). Computer Integrated Manufacturing (CIM) is an overall concept which stresses that the goals of computer use in factory automation must be to accomplish the following objectives.

- **Automation**: Computer Integrated Manufacturing (CIM) must be able to automate the production process and the business functions that support them with computers and robotics.
- **Simplicity**: Computer Integrated Manufacturing must be able to simplify product design, production process, and factory organisation as basis for automation and integration to bring about effectiveness and efficiency.
- **Integration**: Computer Integrated Manufacturing must be able to integrate all production and Support processes using computers and other. Thus, Computers are simplifying, telecommunications network. Automating and integrating many or the activities needed to produce products of all kinds in the manufacturing department. For instance, Computer-Aided Engineering (CAE), Computer-Aided Designing (RD Computer Aided-Manufacturing (CAM), and Computer-Aided Processing Planning (CAPP) are integrated to bring about efficiency and effectiveness in the production of goods in the manufacturing department. This could be accomplished by maintaining and controlling the production process in the factory and also by directly controlling a physical process, a machine tool, or a machine with human-like capabilities.

**Benefits of computer integrated manufacturing (CIM)**
It improves customer service by drastically reducing out-of-stock situation and producing high quality product that better meet customer requirement. This is because as most functions in the manufacturing department are automated, inventory system is well managed to make sure there are available raw material for production at all times. Moreover, CIM also helps to design prototypes electronically before actual production which enables customers to see how the product will look like for their acceptance before production thereby helping meet customer specification.

1. **Improved utilisation of production facilities**, higher productivity and better-quality control resulting from monitoring, feedback, evaluation and control of factory operations. Having automated manufacturing system simplifies monitoring, feedback and control procedures which can result in quality control and management in the manufacturing process.
2. **Reduced Investment in production inventories and facilities** through work simplification, Just-In-Time (JIT) inventory policies and better planning and control of production. The installation of Computers Integrated Manufacturing System helps in maintaining a minimum inventory and facilitates Just-In-Time (JIT) supply chain management as suppliers of raw materials and other inventories are supplied only when needed. This therefore cuts down the cost of securing larger warehouses for storage thereby reducing investment in inventory facilities.
3. **Increased efficiency through work specification and automation**, better production schedule planning, and better balancing of production workload to production capacity.

Computer-Aided Engineering (CAE) Manufacturing helps Engineers to use computer-aided engineering systems to stimulate, analyse, and evaluate the models of product design methods. This function depends heavily on the use of computers to perform the necessary analysis and design and it is known as Computer-Aided Process Planning. Computer-aided design packages and engineering workstations are the software and hardware resources that make computer-aided engineering possible. Engineers use these high-powered computing and advanced graphics workstations for the design and testing of products, facilities and processes input is by light pen, joystick, or keyboard, with CAD package refining an engineer's initial drawings. Output is constructed in two-or-three dimensional graphics that can be rotated to display all sides of the object being designed. The engineer can zoom in far close-up view of a specific part and even make parts of the product appear to move as they would in normal operation. Machine Control. It is the use of a computer to control the actions of machine. The control tool in factories is typically numerical control application though it also refers to the control of typesetting machines weaving machines, and other industrial machinery.

Numerical control computer programmes for machine tools convert geometric data from engineering drawings and machinery instructions from process planning into activities of a machine tool. Machine controls may involve the use of special-purpose microcomputers called programmable logic controllers (PLCs). Specially equipped personal computers that can withstand a factory environment are being used to develop and install numerical control programmes in PLCs.
This analysis helps the engineers fine-tune machine performance.

Process Controls. It is the use of computer to control an ongoing physical process. Process control Computers are used to control physical process in petroleum refineries cement plants control computer requires the use of special sensing devices that measure physical phenomena Such as temperature of pressure changes. This is converted to digital form by analogue to digital converters and relayed to computers for processing. Process control software uses mathematical methods or models to analyse the data generated by the ongoing process and compare them to standard.

The computer then directs the control of the process by advertising control devices such as thermostat values, switches, etc. In addition, periodic and on demand reports analysing the performance of the production process can be produced.

The growth and widespread use of the Internet and the World Wide Web have had a strong impact on human resource management. Some of the effects include the ability to immediately access up-to-the minute information, conduct recruiting, interviewing and hiring online, and take advantage of web-based training/development and performance appraisals

**Accessing Information**

Many managers are tapping into the vast amounts of information available on the web through sites such as that of the society for Human Resource Management. This comprehensive site provides current human resource news, a member directory, and the Human Resource Magazine, as well as links to other human resource sites through topic searches such as compensation and benefits, labour relations, training publications, and diversity.

**Implementation of information Communication technology (ICT) in marketing management**

**3.0 ICT in selling and sales management**

Information Communication Technology plays a very significant role in selling9and sales management from prospecting to closing sales and the management of sales force and sales activities. ICT’s roles in prospecting cannot be underestimated. Online directories are abundant worldwide for easy access. One can access these online sources of prospect to download contacts for sales presentation. With a personal computer and an internet access these relevant information can be accessed for effective sales planning. The telephone also plays a major role where it IS used to screen these prospects and schedule appointments before a customized sales presentation is held with them. The availability of digital equipments Such as laptop computers and digital projectors has been good news to salesmen. The use of this equipment enable salespersons to provide both Visual and verbal presentation. The product (pictures) can be displayed on the screen for prospect to see, which man more sales impact than just telling the prospect the nature of the product. This has enabled the salesperson to make visual presentation for heavy equipment that cannot be carried to the point of presentation.

Order processing has been made more effective and efficient with the use of ICT systems. Systems such as the Electronic Point of Sale (EPOS), Electronic Data Interchange (EDI) and Electronic Funds Transfer at Point of Sale (EFTPOS) are the most commonly used. Retailing business has been revolutionized by EPOS systems. Products will usually have a barcode on them and that barcode is passed over a scanner by the salesperson. The barcode holds information onstock item identification, price and store location, amongst other things. When the purchase is complete the stock account for the customer will be updated, the difference between the selling and cost price will be recorded to furnish profit on the item and if needs be, the item will be automatically replenished by the EPOS system triggering a re-order. This feature of EPOS system enables marketers to handle minimum stock for efficient and effective stock management. It also These provides instant information on sales and marketing for decisions. Information may include sales by stock item, sales by department, sales by store, fast-moving stock item, hourly or daily sales, sales by Customer, inventory level, profitability and mode of payment among others. These information help in taking effective sales and marketing decisions based on facts not by instinct.

However, payment for the product and services purchased is an obvious and vital set of processes in electronic commerce transactions. But payment simple, because of the near-anonymous electronic nature of transactions take place between networked computer system of buyers and sellers, and the many security Issue involved. Electronic commerce payment processes are a complex because of the wide variety of debit and credit alternatives and financial institutions and intermediaries’ involved. Therefore a variety of electronic payment systems have evolved over time.

Most electronic commerce system on the web involving business and consumers depend on credit card payment processes. But many business-to-business ecommerce systems rely on more complex payment processes based on the use of purchase orders. However, both types of e-commerce typically use an electronic shopping cart process, which enables customers to select products from website catalogue displays and put them temporary in a virtual shopping basket for later checkout and processing.

Electronic Funds Transfer (EFT) Systems are a major form of electronic payment systems in banking and retailing industries. EFT systems use a variety of information technologies to capture and process money and credit transfers between banks and businesses and their customers. For instance, banking networks support teller terminals at all Bank offices and Automated Teller Machines (ATMs) at locations throughout the world. Banks credit card companies, and other businesses may support pay-by-phone and web bill payment services, which enable customers to use their telephones and networked personal computers to electronically pay bills. In addition, most point-of-sale terminals in retail stores are networked to bank EFT systems. This makes it possible for you to use a credit or debit card to instantly pay for products and services at the point-of-purchase.

Customer relationship management is an inevitable marketing activity which brings about customer loyalty. The need to build mutual relationship with customers has brought the automation of marketing activities to this effect Customer Relationship Management (CRM) software provides automated support to this purpose.

Automating relationships with customers might sound like the worst kind of dehumanizing computer applications. A
more realistic understanding, though, is that in modern circumstances, where much commercial interactions inevitably has to be electronic rather than face-to-face, CRM software helps companies to treat their customers more as an individual than would otherwise be possible. The essence of CRM software is to integrate the various contacts which a company has with a customer or sales leads, so that a coherent history of the company's dealings with that person is available whenever a new interaction occurs.

A particular customer may be in contact at different times via a company representative visiting the customer's site, via a phone call to a call centre or to a specific member of company staff, via e-mail or the web. The company may have separate product ranges produced and marketed by different divisions, and the same customer may buy from separate divisions at different times. The CRM system assembles information that enables whoever deals with the customer on a given occasion, wherever he works in the company and whatever the channel of contact, to interact with the customer intelligently and knowledgeably. It cuts out the need for the customer to rehearse much of the background repeatedly in successive calls. When a past purchaser of the company's product phones for advice or support, CRM arms the Customer Service Representative with information about that customer's product. The will enable the customer to move directly to asking about the problem rather than wasting time establishing the background. The proportion of support queries resolved by a single call increases. CRM is crucial for individualising the material shown to a customer who visits the company websites - we have seen that this sort of individualisation is one of the chief marketing advantages of the web. The concept of the CRM is to make it easy for customers to do business with the organisation anyway they want at any time. Through any channel, in any language or currency and to make customers feel that they are dealing with a single, unified organisation that recognizes them at every touch point.

CRM IS not only relevant to sales and customers support functions. It is used in marketing also, for instance to select customers to whom a new product likely to be of interest and avoid annoying the entire customer base by repeated bombarding them with publicity releases about irrelevant products. And it provides data for analytics - discovering generalisation about the preferences and needs of different categories of customers, which may help guide decisions about new product development, for instance.

Increasingly, Information Communication Technology Systems are providing facilities for sales force automation. In many companies, the sales force is being provided with notebook computers that connect them to the internet, their company intranets or other networks. This not only increases the productivity of sales people, but dramatically speeds up the capture and analysis of sales data from the field to marketing managers at company headquarters. In return, it allows marketing and sales managers to improve the support they provide to their salespeople. Therefore, many companies are viewing sales force automation as a way to gain a strategic advantage in sales productivity and marketing responsiveness.

ICT has also gained wide popularity in sales forecasting. The basic functions of sales forecasting can be grouped into the two categories of short-range forecasting and long-range forecasting. Short-range forecasting deals with forecast of sales for periods up to one year, whereas long-range forecasting is concerned with sales forecasts for a year or more into the future. Maiko Managers use systems like INFOSCAN to capture market research data, historical sales data, and promotion plans, and to manipulate statistical forecasting models to generate short-range and long-range sales forecasts. "What-if-Analysis" features of spreadsheets applications such as Microsoft Excel enable marketers to manipulate sales figure and prices to identify their resultant effects.

ICT in new product development

A manufacturing information system supports the production or operations functions that include all activities concerned with planning and control of the processes involved in producing goods and services. Thus, the operations function is concerned with the management of the operational processes and systems of all business firms. Information Systems used for operations management and transaction processing support all firms that must plan, monitor, and control inventories, purchases, and flow of goods and services.

New product development first begins with an idea. ICT plays a major role in the Information Communication generation of the product development idea. Technology Infrastructure helps in the research and development process to come out with a new feasible product idea. The availability of different modes of communication helps customers to send feedbacks to the companies involved. These feedbacks may include suggestions for product improvement or complaints about the product used. These information flow from customer marketers helps to generate ideas for a new product development.

One of the stages where ICT plays a major role in new product development is the prototype development. It is common to find product pictures which do not realistically exist on the market these days. Auto Computer Aided Design Facilities helps to design digitally the form a product should be developed. These prototypes can be presented to the customer for verification before actual production. This therefore helps in cost control in research and development as the prototype will not be developed physically.

In this digital age, ICT plays an important role in the production or manufacturing process itself. A variety of manufacturing information systems are used to support Computer-integrated Manufacturing (CIM). CIM is an overall concept that stresses that the objectives of computer-based system in manufacturing must be to simplify, automate and integrate all production processes. The overall goal of CIM and such manufacturing information systems are to create a flexible, agile, manufacturing process that efficiently produces products of the highest quality. Thus, CIM supports the concepts of flexible manufacturing systems, agile manufacturing, and total quality management. Implementing such manufacturing concepts enables a company to quickly respond to and fulfill customer requirements with high quality products and services.

Manufacturing information Systems help companies simplify, auto integrate many of the activities needed to produce products of all kind For instance Computers are used to help engineers design better products using both Computer-Aided Engineering (CAE) and Computer-Aided Design (CAD)systems, and better production processes with computer-aided processes planning hey are also used to help
Information Communication Technology also helps to increase the business hours of entities. Instead of the usual working hours, ICT enables the market to sell products all hours and days long with the help of online marketing e-commerce system. This systems also help to market products to anybody everywhere anytime with the click of a button.

Although the benefits of Information Communication Technology in marketing are numerous, there are also drawbacks or disadvantages. The activities of hacker and crackers, who steal secret codes to access information or make transactions illegally is one of the major challenges of ICT in marketing.

The threat of virus infection which may cause havoc to the marketing information system is also one major problem facing ICT in marketing management. A computer virus may cause a data loss which may affect the smooth operation of an e-commerce system efficiently and effectively.

However, despite these threats in the application of ICT in marketing, it is still advantageous and valuable to employ ICT systems in marketing. This is the only sure way one can stay competitive in the world of business. Failure to plan for these ICT system benefits is planning to fail in this turbulent and dynamic business environment.

Recommendations
It is highly recommended that businesses employ Information communication Technology in their marketing activities as this will bring about efficiency and effectiveness in their daily operation. It is advised that all organisational members understand the role or in marketing to ensure a smooth implementation of ICT infrastructure in an organisation setting for administration, marketing and operations as a whole. Management should lead in the implementation of the ICT system and provides quality training to its staff to effectively use the facilities.

Information Communication Technology should be highly adopted in marketing research as it provides a convenient platform tofather and process marketing information for effective decision. It can also help gather competitor intelligence information conveniently.

Moreover, the issues of virus infection to TC system and activities of hackers should be given a serious consideration. There should be stringent firewall security systems to ensure illegal access to data. Anti-virus software should also be installed and van frequently to prevent virus attack on the information systems.

In general, despite the risk involved in ICT systems, it is highly recommended that both profit-making and non-profit organisation realise the numerous value of Information Technology in Marketing and apply it in their operation of an effective and efficient results.

References