Critical Review Of Courier Service Management System With Empasis To Its Relevance If Adopted In Nigeria

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Abstract—**Courier Service Delivery Management System is useful for small and large scale courier services for improving their services and increasing sales and services by using web based portal. Users can book courier, know about arrival of packages, closing and opening timings, customer support and feedback system for completing work in less time. At present most of the large scale courier services in developed countries use this technology. Existing Courier Service Companies in developing nations like Nigeria work on the manual management method which is a time consuming process. Hence, the aim of this work is to design and implement a National Courier Management System capable of enhancing customer deliveries by features such as speed, security, tracking etc. from specific towns or cities, to regional and national services. The Courier Service Delivery Management System will be divided into two users that are the 'Administrators' and 'Customers'. This work will be built and implemented using a three tier application design approach. The design of the graphical user interface will be designed with Hypertext Mark-UP Language (HTML); MySql is the database of choice while PHP language will be used to connect the user to the information on the database. The Methodology will be based on SDLC (Systems Development Life Cycle) Waterfall model. The phases are Planning, Analysis, Design and Implementation. The expected output is to be interactive web-based, that will solve the problems of the manual system of record management.**

Keywords—courier management

Introduction

Courier is a special messenger, especially one carrying diplomatic correspondence. A courier is a person who makes arrangements for or accompanies a group of travelers on a journey or tour (William, 2009). In ancient history runners and homing pigeons and riders on horseback were used to deliver timely messages. Before there were mechanized courier services foot messengers physically ran miles to their destinations. To this day there are marathons directly related to actual historical messenger routes. In the Middle Ages, royal courts maintained their own messengers who were paid little more than common laborers. In cities, there are often bicycle couriers or motorcycle couriers but for consignments requiring delivery over greater distance networks, this may often include lorries, railways and aircraft. Many companies who operate under a Just-In-Time or "JIT" inventory method often utilize on-board couriers. On-board couriers are individuals who can travel at a moment's notice anywhere in the world, usually via commercial airlines. While this type of service is the second costliest—general aviation charters are far more expensive—companies analyze the cost of service to engage an on-board courier versus the "cost" the company will realize should the product not arrive by a specified time (i.e. an assembly line stopping, untimely court filing, lost sales from product or components missing a delivery deadline, organ transplants) (Small, 1990).

Package delivery or parcel delivery is the delivery of shipping containers, parcels, or high value mail as single shipments. The service is provided by most postal systems, express mail, private package delivery services, and less than truckload shipping carriers. Continued growth of business-to-consumer (b2c) e-commerce has increased demand for low-cost package shipping services. Demand for inexpensive parcel shipping is especially intense for online and catalog retailers. These merchants, many of whom primarily ship low-cost goods, face consumers resistant to paying exorbitant shipping costs (often driven up by fuel surcharges, residential delivery fees, etc.) for package delivery to their homes. As a result, package shipping consolidators step in to combine low-cost "last-mile delivery" strengths of the US Postal Service with the technological and operational capabilities generally associated with private carriers. Large parcel carriers, such as United Parcel Service (UPS) and FedEx, often include an array of accessorial charges (like fuel and residential delivery surcharges) in addition to their standard fees. The US Postal Service (USPS) offers low-cost options for small package delivery to the home, such as Parcel Select and Parcel Post. However, many merchants prefer low-cost

shipping options without sacrificing visibility of their parcels while in transit ("track and trace"). The US Postal Service does offer a limited "Delivery Confirmation" for even their lowest-cost package delivery services, but more robust tracking is currently only available for Express Mail service and some international services (Smithsonian Institution Libraries, 2004). Delivery system is any means or process for conveying a product or service to a recipient (Dictionary, 2013).

Home Delivery Management is an eService for home delivery businesses. Many of the boring, but mandatory, administrative tasks that are part of the business are automatically performed by the management side of the eService. When your customers come on-line to modify their orders, it feeds automatically to the management functions. Your product requirements will reflect the very latest of each order change (Homedeliverymanagement, 2014). A courier delivers messages, packages, and mail. Couriers are distinguished from ordinary mail services by features such as speed, security, tracking, signature, specialization and individualization of express services, and swift delivery times, which are optional for most everyday mail services. As a premium service, couriers are usually more expensive than standard mail services, and their use is typically restricted to packages where one or more of these features are considered important enough to warrant the cost (Carola, 2012)

Courier services operate on all scales, from within specific towns or cities, to regional, national and global services. Large courier companies include DHL, FedEx, EMS International, TNT, UPS, and Aramex. These offer services worldwide, typically via a hub and spoke model. A courier service is a company that offers special deliveries of packages, money, documents or information. These services usually boast faster delivery times than any alternative method of transporting documents, and many businesses rely on them. The idea of couriers has been around almost as long as civilization, with rulers in antiquity using them as a means to make new laws and edicts known throughout their lands. In the modern age of international business, this type of service has become a keystone of enterprise, even as emerging technologies such as the fax machine and Internet have rendered them less useful in some areas (McGuigan, 2013)

Smaller courier services are common, particularly in cities. This type of service finds its niche in smaller packages and documents that need to be transported from one location in a city to another as quickly as possible. Couriers in these companies often ride bicycles or motorcycles in order to achieve the shortest turnaround times from pickup to delivery. Indeed, the bicycle messenger, whizzing through crowded traffic at unbelievable speeds with a satchel over one shoulder, has become a symbol of the youthful daredevilry of city life. In recent years, with the emergence of more sophisticated communications technologies and a

harsh price competitiveness, the number of bicycle couriers in most cities has decreased significantly, but the market remains strong for those who continue to work (Foster, 2013)

Managing information of a Courier Delivery Services faces a number of problems which are highlighted below:

- Customers expecting their deliveries cannot track their progress in real time

- Maintaining the manual system of records management is expensive as a lot of stationary and other equipments are involved

- Searching through the records for any particular delivery information is a time consuming process

- Over time, the availability of storage space for keeping the delivery records for reference purposes becomes a limited

- A lot of time and effort is spent on the manual tracking of and recording of deliveries.

This review will enhance customers' deliveries by tracking their progress in real time. To make it easier for the administrators of the system easily add, update, view and manage information on the online courier management system. This study will adequately reduce the stress encountered by customers in tracking the progress of the deliveries in real time and to enhance the flexibility, accountability, efficiency and reliability of the online courier service and delivery management system.

Courier Services are companies that transport and deliver documents, packages, and larger shipments of products, although traditionally they specialized in the rapid delivery of such items as legal documents that required signatures. They Provide services to companies and individuals who need rapid service, accountability, and tracking that regular mail does not accommodate. Major courier services that performed these functions in the early 2000s included commercial delivery services, the U.S. Postal Service, and bicycle messenger services. Courier services began during the late nineteenth and early twentieth centuries, with small companies in a handful of cities across the United States. When few homes had telephones, personal messages had to be carried by hand. Some early companies provided delivery of luggage and other packages(Side, 1992).

With the rise of large retail and department stores in the early twentieth century, package delivery services became even more popular. The scale of such services grew over the next several decades. Although fuel and rubber shortages during World War II caused a decline in the courier industry, the use of air freight by courier services after the war allowed for wider markets. Courier services became multifaceted and competitive after 1970 because of the increasingly far-flung nature of business operations in the international economy,

the popularity of mail-order retailing, and rising postal rates. Courier services overlapped other forms of transport, such as trucking, and the differences became less distinct. Commercial delivery services, once a supplement to the U.S. Postal Service, competed with the government operated mail system. The Postal Service responded with greater emphasis on its overnight Express Mail delivery and two-day Priority Mail service. The growth and diversification of the delivery industry raised regulatory issues. Companies that delivered by plane or truck were often governed by separate laws regarding rates and other aspects of their operations. In the late 1980s the document delivery business faced new competition with the development of fax machines and Electronic Mail. The need for physical delivery of some items remained, however, and the delivery industry was bolstered By the continuing growth of the global marketplace. Some delivery companies began to branch out and offer new services to their clients. These included "logistics," or support, services to help clients increase efficiency by electronically tracking materials used in manufacturing and assisting with processing sales orders and shipments (Side, 1992). Among the oldest and largest U.S. private delivery companies is United Parcel Service (UPS), founded in Seattle, Washington, as the American Messenger Company in 1907. Originally a local parcel delivery service for department stores, UPS expanded and established a large network to ship and deliver packages. In the early 2000s, UPS was the largest carrier for e-commerce, shipping on-line purchases to customers worldwide. In 1999, UPS shareholders voted to make 10 percent of the company stock available to the public. Another major company, Federal Express, founded by entrepreneur Frederick W. Smith in the early 1970s, pioneered large-scale overnight delivery by air, using its own fleet of planes and a central terminal (originally in Memphis, Tenn.) to sort and reroute items. Both the large commercial courier services and the U.S. Postal Service have increased the speed of national and international package delivery due to the advent of wide-body airplanes that can carry an increased amount of freight. Yet, bicycle messenger services provide an invaluable and timeless service for small-scale, local delivery. Bike messengers were used as early as the late nineteenth century for rapid delivery of Western Union telegrams and government documents. During the 1980s bicycle messenger services became a particularly popular way to deliver items quickly within cities. Their numbers declined slightly with the advent of fax machines and e-mail, but in the early twenty-first century their services remained important links between businesses in large cities like New York and Washington, D.C., as well as in smaller cities throughout the world (Side, 1992).

TYPES OF COURIER SERVICES

Same-day Deliveries: Within 24 hours, the items are sent and received. Either online or by phone, they can collect your parcel and drive straight to the destination, with only your item on the vehicle. Think of the convenience it brings that is similar to having a personal driver take you anywhere. Companies that sign up for this usually transact with legal matters, or where paperwork and contracts have to be prepared, signed, and handled fast to meet the day's deadline. If timeliness is what you require, then this kind of service suits you (Peoplesdeliveryservice, 2007).

Next-Day Deliveries: Your parcel is designated to the entity's branch and from there, it will be sent out through one of their fleet. Such an option is cheaper since the carrier works on a mass volume basis. If you would like to save on labour costs, go for this type of carting.

International Services: One or two people personally travel to the destination and deliver the shipment. These international couriers add a more personal touch. They don't have to send an item overnight, but they do get to take a paid trip at a moment's notice anywhere. So if you're looking for someone to watch over a fragile overseas package, choose this kind of service (Peoplesdeliveryservice, 2007).

United Parcel Service (UPS): United Parcel Service of North America, Inc., typically referred to as UPS, is the largest shipment/logistics company in the world. The American global package delivery company is headquartered in Sandy Springs, Georgia, United States in Greater Atlanta. It delivers more than 15 million packages a day to more than 6.1 million customers in more than 220 countries and territories around the world. UPS is known for its brown trucks (hence the company nickname "Brown"). UPS also operates its own airline (IATA: 5X, ICAO: UPS, Call sign: UPS) based in Louisville, Kentucky(United Parcel Service, 2009).

DHL Express: DHL Express is a division of the German logistics company Deutsche Post DHL providing international express mail services. Deutsche Post is the world's largest logistics company operating around the world. DHL is a world market leader in sea and air mail. Originally founded in 1969 to deliver documents between San Francisco and Honolulu, the company expanded its service throughout the world by the late 1970s. The company was primarily interested in offshore and inter-continental deliveries, but the success of FedEx prompted their own intra-U.S. expansion starting in 1983. DHL aggressively expanded to countries that could not be served by any other delivery service, including the Soviet Union, Eastern Bloc, Iraq, Iran, China, Vietnam and North Korea. In 1998, Deutsche Post began to acquire shares in DHL. It finally reached majority ownership in 2001, and completed the purchase in 2002. Deutsche Post then effectively absorbed DHL into its Express division, while expanding the use of the DHL brand to other Deutsche Post divisions, business units and subsidiaries. Today, DHL Express shares its well-known DHL brand with other Deutsche Post business

units, such as DHL Global Forwarding and DHL Supply Chain (Aaron, 2008).

TNT Express: TNT Express N.V. is an international courier delivery services company with headquarters in Hoofddorp, Netherlands. The firm has fully owned operations in 63 countries and delivers documents, parcels and pieces of freight to over 200 countries. The company recorded sales of over €7.1 billion in 2012. The name TNT is short for Thomas Nationwide Transport, after Ken Thomas, an Australian businessman who, in 1946, set up his own transport business with just a single truck (Steinglass, 2011). Its major competitors include United Parcel Service, FedEx and DHL. TNT Express aircraft operate under the IATA code of TAY (TNT Airways). On March 19, 2012, United Parcel Service announced its intention to acquire TNT Express for USD 6.7B. However, the deal fell through in January 2013 after it was announced that UPS had failed to obtain permission from the European Commission and as such had been blocked on competition grounds (USA Today, 2012).

## METHODOLOGY AND SYSTEM ANALYSIS

Methodology is "a set of general principles that guide a practitioner or manager to the choice of the particular method suited to a specific task or project" (Bennett, 2002). A system development methodology is a very formal and precise system development process that defines a set of activities, method, best practices, deliverables and automated tools for system developers and project managers used in developing and maintaining most or all information systems and software" (Whitten 2001).

Structured System Analysis and Design Methodology (SSAD)

The most common approach to this SDLC is structured methodology based on Waterfall model. It adopts a formal step-by-step approach to the SDLC phases, in which the activities of one phase must be completed before moving to the next phase and at the completion of each activity or phase, a document that must be approved by the stakeholders will be produced before moving to the next activity or phase of the SDLC, see figure 1.0 The structured approach looks at a system from a top-down view. The center of the structured approach is the process model, which depicts the business processes of a system, and the primary model that presents the processes is the data-flow diagram (DFD). The DFDs and their associated data dictionary contain information about the systems components (inputs, outputs, processes, and data storage) that need to be designed and ultimately built.

### SYSTEM ARCHITECTURE OF THE NEW SYSTEM

The System Architecture describes the overall view of the components of the new system. The System Architecture for the Courier Service Delivery Management System is shown below:
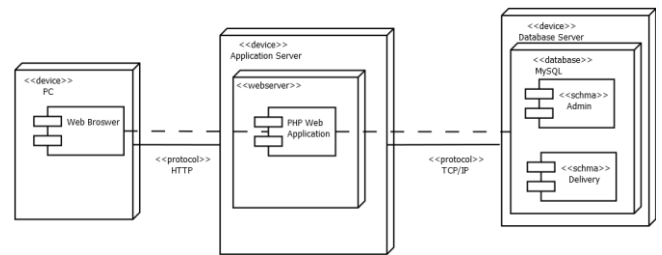
DATAFLOW DIAGRAM

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects. Often they are a preliminary step used to create an overview of the system which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design).

The Dataflow diagram for the Courier Service Packaging and Delivery Management System is shown below:
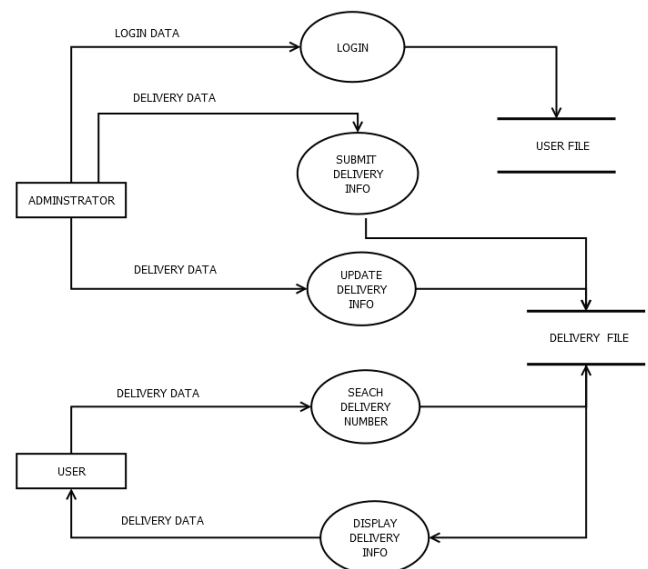
Program Module Specification

The program module specification describes the specification of what the program would do to enhance good design guide during the process. As it concerns this particular online courier management system, it describes different activities involved in the program modules. The classifications of the modules are described below.

There are total of four modules in this system specified according to their functions. They include:

1. **Administrators Login Module:** This area enables the administrator to login into the admin area either to add, delete, update or make any adjustments to the database of the system.

2. **Customer Delivery Module:** The customer Delivery Modules helps the customer to track the progress of his or her delivery and also to check the delivery status of their parcels.

3.   **Update Delivery form Module:** The update delivery form enables the administrator to update or edit the already existing information that needs to be amended.

4.   **Add Parcel form Module:** The Add Parcel form Module enables the administrator to add parcel information that is not already on the system.

Add Parcel form Design

Below is the module design of the Add Parcel form which can be accessed after the administrator has successfully gain access into the system. The add parcel form enables the administrator to add parcel information that is not already existing into the system. The module also includes the Submit Button which the administrator clicks to add the information. The system reports **"THE DELIVERY INFORMATION HAS BEEN ADDED SUCCESSFULLY"**

Update Delivery form Design

Below is the module design of the update delivery form which can be accessed after the administrator has successfully gain access into the system. The update delivery form enables the administrator to update or edit the already existing information to the current required information. The module also includes a Submit Button that the administrator clicks after making the required or necessary corrections to the system to effect the changes. The system will report **"THE DELIVERY INFORMATION HAS BEEN UPDATED SUCCESSFULLY"**

CONCLUSION

A courier delivers messages, packages, and mail. Couriers are distinguished from ordinary mail services by features such as speed, security, tracking, signature, specialization and individualization of express services, and swift delivery times, which are optional for most everyday mail services. As a premium service, couriers are usually more expensive than standard mail services, and their use is typically restricted to packages where one or more of these features are considered important enough to warrant the cost.

The aim of this research project is to design and implement a Courier Service Packaging and Delivery Management System that will automate the process of delivery tracking and monitoring for the recipients of the deliveries.

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