

Implementation of Itella mail Logistics System in Ghana Postal Services

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<p>Abstract</p> <p>Information technology is one of the major drivers of innovation, economic growth and social change. The emergence of Information and Communication Technology (ICT) has led to a paradigm shift in the Postal Services industry, where innovation has become a competitive tool in the logistics chain process. Unlike the traditional way of receiving, sorting and delivering letters by human, the modern real-time based practical approach brings the public faster and more reliable services.</p> <p>To respond to this change, this thesis aims to explore the inefficiencies in the Ghana Post postal system, identifies bottlenecks and adapt the Finnish system of Itella logistics modern approach as problem solution in improving the Ghana Post postal system. The primary data collection method used to gather data for this thesis was a qualitative method. The method of enquiry was an open-ended questions and face to face interview. The interview was analyzed through a SWOT analysis tool to identify strengths, weaknesses, threats and opportunities.</p> <p>The main findings of the thesis are that, there is a mismatch of Itella system with Ghana Post Company system. The technology used in the Itella system makes it impossible at the moment to adapt it into the Ghana Post system. It is very advanced system. This makes the two systems incompatible due lack of resources on the side of Ghana Post. But there are many ideas that Ghana Post can learn from Itella to improve their current system. One recommended services were the IPost service that Itella provides to their customers that enables them to post letters electronically which provides zero carbon footprint. Also the Smart Post services that provide self-service to customers is an interesting service that could be transferred. The limitation of this study is that, time could not permit the study to explore all the current improvements of Ghana Post due to time constraint.</p>			
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Dedication

This final thesis is dedicated to the almighty God for how far he has brought me.

Special dedication goes to Leena Suonio the wife of my supervisor Jukka Suonio and my daughter Leena Tetteh. With the love of my heart I warmly dedicate this to you.

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Introduction

1.1 Motivation of the thesis

This thesis work is chosen mainly to show my concern about my home country Ghana. In Ghana, there are many business sectors and industries which are managed by the state and no one takes the personal responsibility of those companies if they are not performing well which will eventually lead to folding up. Due to my interest and area of studying, I decided to choose Ghana Postal Services to get it upgraded and to be efficient as the other postal services in advanced countries. My current work and location have really helped me in having a good decision to choose Itella Corporation (Finnish Postal Services) as my guide. Although Itella cannot be perfect in all, that's why the research will be carried out to detect and correct its short-comings so that the target company will not be experiencing the same problem in future. The objective is to explore the inefficiencies in the Ghana Post Company postal logistics system. The rationale behind this objective is to identify bottlenecks in the postal value-chain and adapt the Finnish system of Itella logistics modern approach as problem solution in improving the Ghana Post Company postal system. The practical implication is to improve the system for Ghana Post to maintain its competitive edge at the market in Ghana as a public sector industry. This improvement will help the company to respond to the paradigm shift in the postal industry where innovation has become a competitive tool in the logistics chain process. To investigate the problems to help the thesis in recommending solutions and a more efficient approach, the need to understand the current situation in Ghana Post is very imperative. This is discussed in the subsequent sections. The problem statement followed by the need of the project and the methodology used to collect data for the thesis.

1.2 Background information of Ghana Postal Service

The postal system in Ghana is owned and operated by the Government. They come under the Ministry of Communications. The Ghana postal system provides a letter and parcel service both nationally and internationally as well as a courier and registered mail service. The company aims to provide the best security that is reasonably possible for items that are posted with them. Development of the postal services took off in 1854 as part of the colonial administration. In 1995, the Ghana Postal Service was established as the Ghana Postal Services Corporation. Since 1998, the company has been known as the Ghana Post Company Limited. Ghana Post makes a very significant contribution

to the national development of Ghana in areas of business and trade, employment, support for government organizations and revenue for the government. The Expedited Mail Services (EMS) commenced in 1990 to supplement the universal mail delivery and to deliver business mail with great efficiency on an ad hoc and contract basis. The company now operates an Instant Money Transfer (IMT) services. It is an electronic money transfer service, which provides fast, convenient, safe and reliable means of sending money to beneficiaries anywhere in Ghana (Ghana News Agency 2005). The company has about 400 post offices in all the 10 regions in Ghana. Ghana Post has a market share of 85% of domestic courier services in Ghana.

As part of its growth strategy, the company seeks to diversify its activities by taking advantage of its infrastructure and network and therefore invites partners to facilitate its growth. The company investment plan seeks to electronically connect its mail delivery network. It is the company's mission to provide prompt, efficient, reliable and secure communication and financial services and products to domestic and foreign customers at competitive rates.

Some of the services provided by the company include: Aero-gram or Air mail, Registered Mail, Express Mail, Economy Air/Surface Mail, Parcel Post, Philately Service, Bureau Fax, Business Reply Service, International Business Reply Service, Sales of Passport Forms, Western Union Money Transfer, Money Order, Postal Order, Letter Box Rental, Transit Service and News Paper Registration.

Ghana Post has a mission which is to satisfy the domestic and foreign customers with passion, by giving them a reliable and secure communication with good networking system. In doing so their vision is to become an efficient business oriented organization and satisfy the needs of customers and stake holders. Ghana Post has branches throughout the country and the company has several competitors. Some of the competitors are Antrak Express Ltd, Expert Couriers, FedEx, Universal Express, Aramex International Courier, Excel Courier Gh. Ltd, Eda Express Service, City Toll Ltd, World Express International Ltd, Rapid Air Courier Ltd, Racing links Express, DHL (Gh) Ltd, T-Tanic Cargo Services, Fastrack Courier Services, Lands 24 Diplomatic Cargo Services, Royalbird Express, GSM Courier and Services, Kwick Parcel Ltd, Dune concierge services, Kaya Errands and Delivery Services, Surprise Market Delivery, Speedlink Travel and Freight Ltd, EMS, Federal Express (Gh) Ltd, Runners Delivery Ltd, IPS Worldwide Express, FedEx, IGIT Parcel Services, Kwik Dine, Lifeline Courier Express, Packet Express, Platinum House, Racinng Link Express and Rapid Express Courier, SDV Ghana Ltd Sky and Net Express Ltd, T&T and Express UPS.

1.3 Challenges in Postal Services

Information technology is one of the major drivers of innovation, economic growth and social change. The emergence of Information and Communication Technology (ICT) has led to a paradigm shift in the Postal Services industry, where innovation has become a competitive tool in the logistics chain process. Unlike the traditional way of receiving, sorting and delivering letters by human, the modern real-time based practical approach brings the public faster and more reliable services. This practical and modern approach can be easily achieved by linking new convergence postal logistics technologies into the traditional postal business. Jeong-Hyun, Park et al (2006) discovered that, this approach facilitates competitiveness and enhance global commerce and spurs innovation in the postal logistics system.

In spite of this advancement in the postal logistics industry, brought together by information technology, automation technology, and logistics operation technology, Ghana Post Company's operations still remain obsolete in this modern age. There are inefficiencies in their operations and management. These inefficiencies have been attributed by the general public to the emergence of the internet, telecommunication and other social media which offer a simpler platform for communication. The public opinion, in my view, is not the major problem confronting the company. From my experience and exposure to the Finnish Itella Logistics system, their inefficiencies are due to lack of modern postal logistics approach.

My arguments stem from the fact that, the Scandinavian countries that come top of the lists of 86.7% Internet penetration compared to their population still have a functional and profitable postal system. (OECD Information Technology Outlook, 2008.) The Internet penetration in Africa is only estimated to be 10.9% and the public claimed that, the Internet is the cause of the low patronage of Ghana Postal services (Jean-Francois and Jean, 2010). As I have already underlined, it is lack of innovation and poor delivery of services that have resorted to this. It is argued that if a letter from Ghana to Europe takes 4 days and an extra one (1) day to get to its final destination but a letter from Europe to Ghana takes about 5 to 14 days to get to its final destination, then it clearly demonstrates the inefficiencies of their postal logistics system (Adjetey, 2005).

In a research, McFarland (2010) et al. discovered that the two main streams of ICT model that prioritizes an organization need two main drivers, the institutional and technology drivers. According to the authors, "institutional driver comprises of the knowledge sharing and overall collaboration that involved in operating an organization. Whilst technological drivers serve as the emerging technologies that allow the

implementation of computerized based information systems". The interaction of these two streams is what drives the efficiency of a modern organizational operation. (McFarland et.al, 2010). The modern approach of sorting, tracking and delivering of post in a real time is a critical reform instrument for Ghana Post. Therefore this project aims to find out the inefficiencies in the Ghana postal system and suggest an approach in improving the existing system through the implementation of Itella Logistics Systems into Ghana Post model to spur innovation and competitiveness in their system.

1.4 Need for the Project

With the advent of new and emerging technologies, reinstating the operation and approach of Ghana Post with an innovative and modern postal logistics system, will spur innovation and competitiveness. This will be a competitive advantage for both companies due to Ghana Post's higher percentage market share in the country. As the formal Minister of Communication and Technology, Albert Kan-Dapaah emphasized, replicating the Finnish Itella system in their business model will better position them in the market. It will not only "liberate the sector from unwarranted controls and threats of obsolescence but also set the sector on course for competition and reliance on the forces of the market to define its destiny" (Ghana News Agency 9 June 2005.) This collaboration will not only benefit Ghana Post Company but Itella Logistics as well. The breakthrough will also open other markets for Itella in other African countries using Ghana as a model of replication. This will lead to economic development for both Finland and Ghana and open doors for other Finnish industries in similar sectors. These open doors will bring credibility to Itella Logistics in the international arena.

1.5 Methodology and research plan

The primary data collection method used in gathering data for this thesis is qualitative method with open-ended interview questions as method of enquiry. This method of enquiry was found to be appropriate for this study because it allows interviewees to contribute as much detailed information as possible and it also allows the researcher to ask probing questions as a means of follow-up. (Turner, 2010.)

The theoretical part of this thesis was based on the analysis of secondary research material that gave a firm theoretical background for the study. The interviewees are analyzed through a SWOT analysis tool to identify strength and weaknesses as well as opportunities for Ghana Post. This allows the thesis in identifying bottlenecks and

suggesting an improvement system for Ghana post. Because this thesis requires adaptation of the Finnish postal system into an existing working system, the need to find out employees and management resistance to this change was an important part of the thesis. This was helpful in adopting an approach for the implementation in the recommendation chapter. Other external factors likely to affect the implementation were also analyzed in the SWOT matrix.

2 Information on the case company

2.1 Country information about Ghana

Ghana is a country in West Africa on the Gulf of Guinea. It shares borders with Togo, Burkina Faso and Cote d'Ivoire. The country is known for being the 2nd largest cocoa producer in the world as well as its incredible ethnic diversity. Ghana currently has more than 100 different ethnic groups of which its population is over 24 million (July 2010 estimate). History has it that Ghana migrated from the ancient kingdoms of the western Sudan (the area of Mauritania and Mali) and the Country was named Gold Coast before Independence. The Gold Coast was renamed Ghana when the country gained Independence from the British rule in 6th March, 1957 (Briney, 2010).

Ghana has a diverse and rich resource base and economist reports have it that the Country has one of the highest GDP per capita in Africa. The country remains somehow dependent on international financial and technical assistance. It also depends on the activities of the extensive Ghanaian Diaspora. The major sources of foreign exchange in Ghana are gold, timber, cocoa, diamond, bauxite, and manganese exports. In 2007, an oilfield which is reported to contain up to 3 billion barrels ($480 \times 10^6 \text{ m}^3$) of light oil was discovered in the country. The exploration of the oil is ongoing and it is believed by expert that it will boost the country's economy if well managed. Domestically, Ghana's economy revolves around the services industry which accounts for 48.5% of GDP and employs 28% of the work force. On the negative side of the economy is that public sector wages increases and the commitment to regional peacekeeping have led to continued inflationary deficit financing, depreciation of the Cedi and rising public discontent with Ghana's austerity measures. World Bank reports that Ghana's per capital income has barely doubled over the past 45 years yet economists claim that the country remains one of the more economically sound countries in Africa (CNN, 2009 and By Neubauer, 2010).

2.1.1 Doing business in Ghana

Ghana has many ethnic languages but the official language in the country is English, due to the British influence. In Ghana, the use of "We" is very popular and it is use in business and also every day's language. The frequent usage of the word "Please" is used in both formal and informal discussions because they considered it as one the morale ethics. The Chief Executive Officer of Intercom Programming and Manufacturing

Company, report that as soon as you arrived in Ghana the first greetings from an Immigration officer at the airport is "AKWAABA" meaning you are welcome. According to him this greeting continues throughout your stay in the country. He also reports that the warm Ghanaian handshake with a snap on your middle finger clicking your heart has become the African handshake which has become the culture of the people. One unacceptable greeting in Ghana is the use of left hand. The people found it very offensive and disrespectful especially the elderly people.

Maintaining eye contact which is popular in Finland is completely opposite in Ghana. Ghanaian likes to listen than to look and maintaining eye contact normally happens on certain instances because it has completely difference meaning to the society. The society is not familiar with the act of looking straight into the eyes during discussing but shying away from it does not mean any hidden agenda from a Ghanaian and the society to the society it is a sign of respect (Buah, 2010.)

2.1.2 Investment atmosphere in Ghana

Ghana is not the only good place to do business in Africa there are many countries in Africa as a good investment place. However what makes the country a good place for Itella or Finnish companies is that the country supports every feasible venture and encourages small and medium scale ventures in all sectors of the economies. The economic and democratic development and global participation in global peace keeping has won the country recognition by many countries. Buah (2010) report that In 2009, the Finnish Ambassador to Ghana, Anneli Vuorinen paid a courtesy call to the President of Ghana and expressed Finland's willingness in doing business with Ghana. According the adviser to the Commonwealth Business Council Baroness Lynda Chalker, "the government's renewed commitment to good governance and development of the private sector makes the country the best investment destination." Buah (2010) further report that Baroness Lynda Chalker revealed that Ghana is "the most stable, peaceful, secure and most reliable place to do business in Africa today". This assertion is reflected in the country's score in the 2009 Global peace Index.

Out of 140 countries, according to the author the Global Index ranked Ghana 52 and 40th in the 2008 and 2009 peace index and among the first five countries in Africa identified by the Institute of Economics and Peace in the 2009 ranking.

2.2 About Finland

Finland is a parliamentary republic country since 1919. Finland became an independent state in 1917 from Russia and became a member of the European Union in 1995. The country has a population of about 5.2 million and the capital city is Helsinki which has about 559,700 residents. The country is globally known by its quality of education (OECD PISA survey). Finland is an advanced industrial economy where metal engineering and electronics industries contribute to 50% of export revenues for the country and forest products contribute to 30%.

Finland is said to be 'the most on-line nation in the world' with more mobile phones and Internet connections per capital than any other country. In 2006 Finland won the Eurovision song contest with the highest points and the country is also known for its love for ice hockey. Finland's industrialisation transformation started in the 19th century with the harnessing of forest resources. Forest is still Finland's most important raw material resource even though the engineering and high technology industries led by Nokia have been the leading branches of manufacturing. Besides Nokia, Valmet (paper machines) UPM-Kymmene (pulp and paper) are important industrial companies that contribute significantly to the Finnish economy. The most important export product today in Finland is the mobile phone and Finland is one of the few European countries whose exports exceed imports in data and communications technology (Executive planet website, 2012)

Education is an important economic builder in the country and Finns are highly educated. There are 21 higher institutions in the country, with a total student population of around 158 000 of whom 52% are women. 66% of the population have completed post primary education and 17% have a university degree or equivalent qualification. The country R&D expenditure is very high but the output is a great success for the country. It is reported that R&D expenditure in relation to GDP has risen continuously and reached 3.6 % of GDP in 2004.

In Finland everyone irrespective of age or status shares the same basic rights and advantages. The country highly valued democracy and equality with little noticeable differences between social classes. This is normally noticed in certain modesty at homes, behaviour and company facilities. Organisations or companies are often flat and not hierarchic, and the general notion of equality also prevails. Finns are normally not opened in expressing emotions unless among close friends or relatives and given distance or privacy is important in the culture. They are used to working in individualistic way and people are used to working alone. Team working is becoming more common

and interest for social and communication skills is growing. In Finland, family, friends and nature are important thing in life. (Executive Planet website, 2012).

2.3 Itella Logistics Corporation

Itella Logistics is one of the leading operators in the Northern Europe and Russia. Its services cover all forms of logistics from freight forwarding and parcel services to contract logistics. Itella Logistics' goal is to provide the best service in the logistics industry in which local presence, global service offering and logistics know how is the key. It is one the most efficient service businesses in Europe and their customers are satisfied by information and service flow management by:

- Offering their customers solutions that will make them excel among their competitors and successful business running.
- Providing daily mail services throughout Finland
- Updating their customers by providing them latest news in their geographical locations.

This company is owned by the state of Finland and provides work for about 29,000 professionals and its net sales is 1,8 M€ in 2010. About 96 percent of its net sales is from business customers who include the media, trade and services industries in Europe and Russia. Itella has three business groups; Itella Mail Communication, Itella Information and Itella Logistics. Itella's contract logistics solutions are based on an understanding of the customers business and providing comprehensive logistics solutions on that basis. Itella logistics offering includes tailor-made solutions covering multiple countries, standardized easy-to-start solutions as well as outsourcing of warehousing operations. (Itella logistics website, 2012.)

2.4 Procedure of sorting in Postal Industry

The processing facilities found in post offices have mail sorting equipment that can handle standard letter-size mail. The order of mail delivery route is reported to central processing facilities. The individual addresses on the mails are input into the sorting equipment computer in the order in which they are delivered. On daily basis, letter-size mail is sent through the sorting equipment to place it into delivery order for individual mail carriers. The pre-sorted mail is placed in mail trays and delivered every morning along with parcels and unsorted mails to every post office. The pre-sorted mail can be

taken by mail carriers directly to the street to be delivered to various receivers of the mail. Individual carriers may place this mail into their sorting case along with larger pieces to avoid working from several trays while driving.

2.4.1 The mail case

Each individual mail route has a case set up where a carrier sorts mail pieces into the order in which they will be delivered. The mail case is similar to bookshelves placed in a U pattern surrounding the mail carrier. The shelves are divided into small slots 1 to 2 inches wide. Each slot has an address for each customer address that mail route serves, usually between 250 and 700 mailboxes. The carrier memorizes the order of the route and the location of each mini mailbox on the case. The carrier places mail pieces into this case each morning in delivery order. When all the mail for the day is in the case, the carrier pulls the mail back down and places into trays for transport and delivery that day. About half of the established route time is spent casing mail, and the other half is spent delivering mail. For example, a carrier with an 8hour mail route with 550 individual mailboxes to deliver would spend 3 to 4 hours casing the mail and the remaining 4 to 5 hours delivering the mail.

2.5 SWOT Analysis

SWOT analysis is a tool for strategic planning process. According to Lozano and Valles (2007) "SWOT analysis is widely recognized and it constitutes an Important basis for learning about the situation and for designing future procedures which can be seen necessary for thinking in a strategic way". Nikolaou and Evangelinos (2010) emphasize that despite the importance of SWOT in strategic planning, it still has both merits and demerits. One known merit of SWOT is that, it is a simple tool which does not require any technical knowledge or support but one it demerits is that it is too simplistic, static and subjective. This disadvantage has influence on transparency on results derived from the analysis. SWOT stands for Strength, Weakness, Opportunity, and Threat. SW describes present and internal factors and OT is future and external factors. Strengths are those resources which can be utilized and weaknesses are those which must be improved. Opportunities and threats must be known approximately. The diagram below shows the SWOT matrix.

	Strengths	Weaknesses
Opportunities	S-O strategies	W-O strategies
Threats	S-T strategies	W-T strategies

Figure 1. SWOT matrix (Quick MBA, 1999-2000)

SWOT analysis has been a choice for many managers for a long time because it is very simple and portrays importance of sound strategy formulation, which is matching the business opportunities and threats with its strengths and weaknesses. SWOT analysis can be made effective through the accurate internal analysis identification of specific strengths and weaknesses around which the sound strategy can be built to deal with the situation and re-main competitive (coursework4 you website, 2012).

The implication of SWOT is that the internal strengths and weaknesses, compared to the external opportunities and threats can give you an idea about the condition and potential of your business. The best approach in making it an effective strategic tool for your organization is to use your strengths to take advantage of the opportunities ahead and reduce the harm that may be encountered if it becomes a reality. The true value of the SWOT analysis is in bringing this information together in assessing the most promising opportunities, and the most crucial issues (Berry, 20th April, 2012).

2.6 Supply chain management and postal logistics system

Due to the penetration of the internet, companies nowadays are in the speed of improving their organizational system to remain competitive in order to compete in the 21st century global market. Companies worldwide are now trying to improve their agility level with the aim of being flexible in responding to meet the changing market requirements. This has made Supply Chain Management (SCM) a global operations strategy in this 21st century in achieving organizational competitiveness (Ngai and Gunasekarana, 2004). Supply chain management is defined by Lambert et al. (1998) as “the integration of key business processes from end users through original suppliers that provides products, services, and information and hence adds value for customers and

other stakeholders”. A basic example of supply chain management is shown in Figure 2. It constitutes packaging, logistics, distribution, and consumption.



Figure 2. Basic supply chain model (Cheston, 2011)

Packaging involves wrapping the product or preparing the goods for transport, warehousing, logistics, sale, and end use. After packaging, the product is delivered, tracked and confirmed. This is done through a logistics system. Cheston (2011) termed this process the flow of goods from one point to another (i.e. from the point of origin to the point of consumption received by the customer). But before the customer receives the product, a channel is needed to distribute the goods to ensure efficient and safe delivery. Depending on which channel you choose, it can be done through air, sea or road. This is called the distribution system. When the channel has been sorted, the product is finally delivered to the customers for consumption (Cheston, 2011). To ensure effective management of the supply chain, the need to incorporate Information management system in, is imperative for businesses to save time and money on material management. Ngai and Gunasekarana (2004) underlined that successful strategic information systems are not easy to implement in supply chain management because it requires significant major changes. This is due to the fact that, businesses operate internally and with external partners.

2.7 Logistics process in express delivery service

Unlike other logistics systems, logistic in postal delivery is highly rooted on express delivery services depending on the choice of the customers or the type of services the customers' choses. But it usually focuses on speed, safety and accuracy. This goal can

be fulfilled through developing a logistics system with land, sea and air networked to expedite the service. But to optimize the process in ensuring efficient delivery of service, it is very important to cooperate with other companies to expedite your service to maintain maximum customer satisfaction. Full customer satisfaction is also offered in postal delivery service by saving the customers time. In this case the service begins from the customer's door. This process increases the width and depth of the service, but also gives the highest requirements to the logistics system.

In express logistics delivery system, the services have the following specialties: (Zhu, 2010).

- Each parcel has its own process and different speed. So, there are some nodes to sort these different parcels in the logistics process.
- Due to different customer requirements for different goods, the system handle large amount of information.
- The geographic location of distribution centers, post offices and warehouses is not concentrated.
- Expanding the logistics service in new areas is always needed.
- The location of each branch office is far away from other offices, which sometimes leads to difficulty in managing the service.
- To cut the costs, express service companies do not use direct transport from sender to receiver. They operate some logistics hub in which parcels of many customers are concentrated.
- Door-to-door services need more staff and increase workload.

2.7.1 Information management in logistics system

Information is managed in supply chain and logistics system by using information technology to help to gather, store and analyze unprecedented amount of data. It also facilitates planning at the strategic level and operational level due to data sharing and analysis. This is because all members in the supply chain have access to one data through a common hub (Samuyiwa and Adewoye, 2010). In postal systems, postal companies fulfil demands through information network. The network helps them to supervise packages and trace each package. They do this by making nodes in the process and fed the system with data of each node. This helps them to detect any problem associated with the system. The information network is connected to the internet. When a parcel is received from a customer, the working personnel at the post

office record the initial data that is delivering information and weight of the package. Barcode is used to gather this data to the local computers before the information is transferred into the main server. Due to safety reasons, the information stored into the local computer is not allowed to stay except the basic information about the parcel and payment which is also transfer to another computer that handles the financial issues. This computer is also connected to main server as well. (Zhu, 2010)

2.7.2 Distribution and delivery

One of the distribution and delivery methods is the Spoke-hub distribution which has become popular among many postal logistics companies. Well renowned known and successful postal logistics companies like UPS, Federal Ex-press and EMS have been implementing the spoke-hub distribution system to expedite their distribution and delivery and help them remain competitive. The cost effective of the system has made it significant for these companies to implement the system. This is because the method of distribution reduces transportation costs, improves cycle times, and reduces inventory. This significant cost savings can result from improving their distribution processes. (OSPF Hub-And-Spoke Technology White Paper, 6th April, 2012). The spoke-hub distribution system (also known as hub and spoke network) arranges the logistics network like a bicycle's wheel. It actually got its name from a bicycle wheel. It consists of a number of spokes which extend outward from a central hub. In this system a location is selected to be a hub. The path that leads from points of origin and point of destination are considered spokes. Hudson (2003) explains that, in the centre of this system is a hub which connects many nodes linked by spokes, and the goods are transported following the spokes. In the system, all parcels are sent firstly to the hub and then they are delivered to another hub at the last point where parcels will be fetched and the process continues till the point of destination. These firms and many other companies are now realizing that significant cost savings can result from improving their distribution processes. Figure 3 shows a diagram of spoke and hub network.

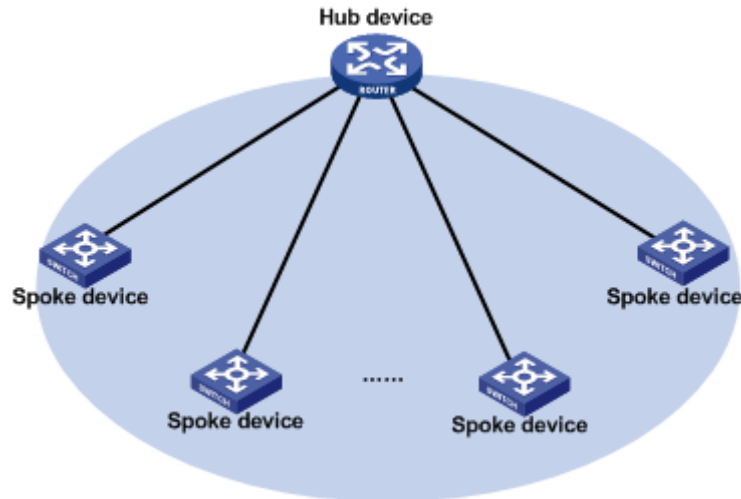


Figure 3. Spoke and hub network (OSPF Hub-And-Spoke Technology White Paper, 6th April, 2012)

2.7.3 Transportation channel and warehousing

In choosing a distribution channel for postal delivery, most express delivery service companies prefer using air, land and sea depending on the type of goods being transported. Preferably, most express logistics companies prefer using air transport in long distance delivery, especially in cross-border delivery. The air channel delivery has dominated most express companies because it is very fast and efficient. Many large express delivery companies like DHL and FedEx own their airplanes and airlines and usually set trans-shipment centers in airports. These trans-shipment centers at the airports are in charge of picking the goods and transferring. When the goods are at the receiving centers after transportation, the goods are kept in warehouse and dispatch to their various destination points. (Zhu, 2010)

Warehousing plays an important role in logistics activities. The following are six important role warehousing plays in logistics activities. (Zhu, 2010)

- a) Storing goods: Warehousing helps to store goods in a safe place to prevent it from damaging.
- b) Control circulation: Warehousing can be divided into long-term and short-term. The term decides the circulation, else the market situation tells whether companies should store goods or let them go into circulation.

- c) Amount management: Managing large amount of products in warehousing is important for express delivery services. This is because the warehouse should balance the total amount of goods in and out so that clients can decide at each time the amount of goods to fetch from the warehouse.
- d) Quality management: Quality management is one important responsibility in warehousing because the quality of the goods does not change during storage.
- e) Point to connect two steps: Because warehouse makes goods stop, it leaves enough space and time to combine two steps as a buffer.
- f) Business intermediary: Warehouse owner can use the asset in warehouse to do business and accelerate the circulation. In developing warehousing, more types of services can be researched to increase the products' value-adding, reducing costs and making the whole logistics chain efficient.

2.7.4 Material handling Principles

This section of the thesis explains the material handling principles. It discusses the various methods used in the material handling process including the various technology and automation methods use. The section underlines ten (10) key principles of material handling and proceeds by explaining the Radio Frequency Identification (RFID) method use in postal logistics system in tracking parcels movement. The merits and demerits of this identification system are explained in the chapter from two broad categories- i.e. Active and Passive RFID.

Material handling systems are primarily hardware systems that transport material from one stage to the other in a facility through areas such as processing, manufacture, assembly, and distribution. Material movement is a paramount feature within every factory or warehouse, its essence is noticed; before, during and after processing. The cost of material movement is estimated to be anywhere from 50% to 90% of overall factory cost with an average around 25%. Typically, material movement does not add any extra value to the manufacturing process however; it has proven to be an imperative process in the making and finishing of a product.

According to the Material Handling Industry of America, material handling could be practised under ten principles. These include; Planning, Standardization, Work, Ergonomics, Unit Load, Space Utilization, System, Automation, Environmental, and Life Cycle (Taylor, 2009).

1. Planning

A material handling plan is an irrefutable course of action that particularise the material, moves and the method of handling in advance before it is carried out. In order to develop a sound material handling plan, four key aspects are requires to be considered.

- Effective communication between designers and users is very essential in developing the plans for operations and equipments. For large-scale material handling projects, a team including all stakeholders is required.
- Long-term goals as well as short-term goals requirements should be incorporated in the organizational material handling plan.
- Existing methods and problems must be the base of the plan, subject to current physical and economic constraints, hence meeting organizational requirements and goals.
- The plan should be built with some degree of flexibility so as to assimilate sudden changes in processes.

2. Standardization

Standardization is a means of attaining consistence in the material handling methods, equipment, controls and software without forfeiting needed flexibility, modularity, and throughput. Material handling methods and equipment standardization facilitates in the cutting down of variety and customization. Standardization therefore becomes a benefit so long as overall performance objectives can be achieved. The key aspects of achieving standardization are as follows:

- The planner needs to choose methods and equipment that can carry out a number of diverse tasks under a variety of operating conditions and prognosticate changing future requirements. The methods and equipment can therefore be standardized at a stipulated time ensuring flexibility. For example, the conveyor system in Figure 4 can carry different sizes of parcels.



Figure 4. Conveyor system for carrying parcels (Taylor, 2009)

- Standardization is applicable widely in material handling methods, such as the sizes of containers and other characteristics, as well as operating procedures and equipment.
- Standardization, flexibility and modularity needs to complement each other, thus providing compatibility.

3. Work

Material handling work defines the equality of product of material handling flow (volume, weight, or count per unit of time) and distance moved. Minimization is required without sacrificing productivity or the level of service needed of the operation. The work can be optimized from three aspects:

- Combine, shorten, or eliminate unnecessary moves to alleviate work. For example, in dual command storage and retrieval cycles, two commands, storage or retrieval, are executed in one trip so it has less work than single storage and retrieval cycles.
- Considerations can be made for each pick-up and set-down or placing material in and out of storage as distinct moves and components of distance moved.
- Efficient layouts and methods facilitate the simplification and the reduction of material handling work.

4 Ergonomics

The science that explores the adaptation to work and working conditions to suit the abilities of a worker can be termed as ergonomics. Designing of safe and effective material handling operations is an important aspect for recognizing human capabilities and limitations. However, in order to eliminate continuous and manual labour stresses, suitable equipment must be selected to enhance effective operation of end users.

Specially designed and manufactured equipment for material handling happens to be much more costly as compared to a standardized equipment of the same functionality. On the other hand, using standard equipment could result in fatigue, promote injury occurring situation to workers and also result in manual errors and low operating efficiency. It is therefore a necessity to opt for specialized equipment to minimize breakdown cost and potential damages and injury.

Moreover, in material handling systems, ergonomic workplace design and layout modification needs much attention with in relation to the human physical characteristics. For example, in the figure below, the workplace design on the left does not provide toe space for the worker, requiring him or her to bend forward.

This working posture can result in fatigue and injury. The modified workplace with toe space depicts to be more comfortable for the worker because his or her body is in an erect position (see picture below).

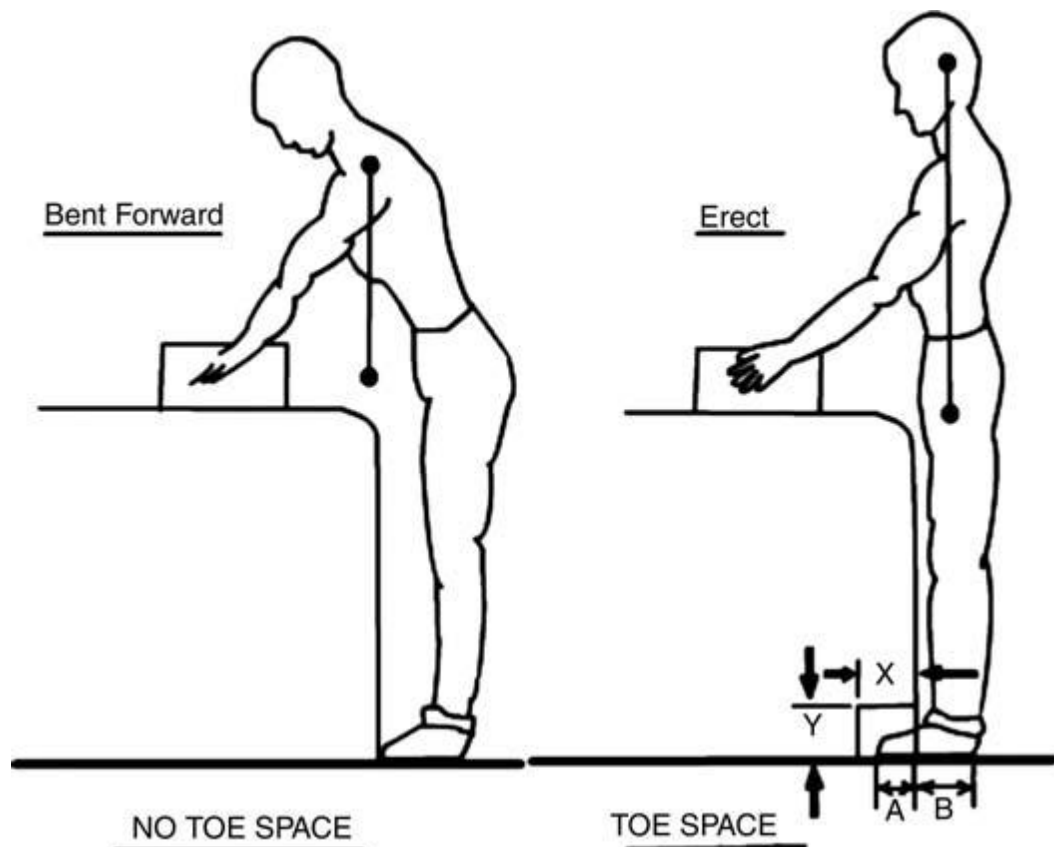


Figure 5. Work place Economics (Taylor, 2009)

Ergonomics principle encompasses both physical and mental tasks. For example, a plain, illegible and simple type font should be chosen preferentially in instances when a printed label or message needs to be read easily and swiftly. Vague designs and complex font may result in errors, especially when read in haste. Aesthetic fonts are poor options. Obviously, extremes like “Old English” should never be used. In one word, keep it simple. Safety must be prioritized in workplace and in equipment design.

5. Unit Load

A unit load describes a load that can be stored or transported as a single entity at a unit time, irrespective of the number of individual items that make up the load. The following key aspects are deceptive when unit load is used in material flow: total cost, holding cost and transportation cost, unit load size.

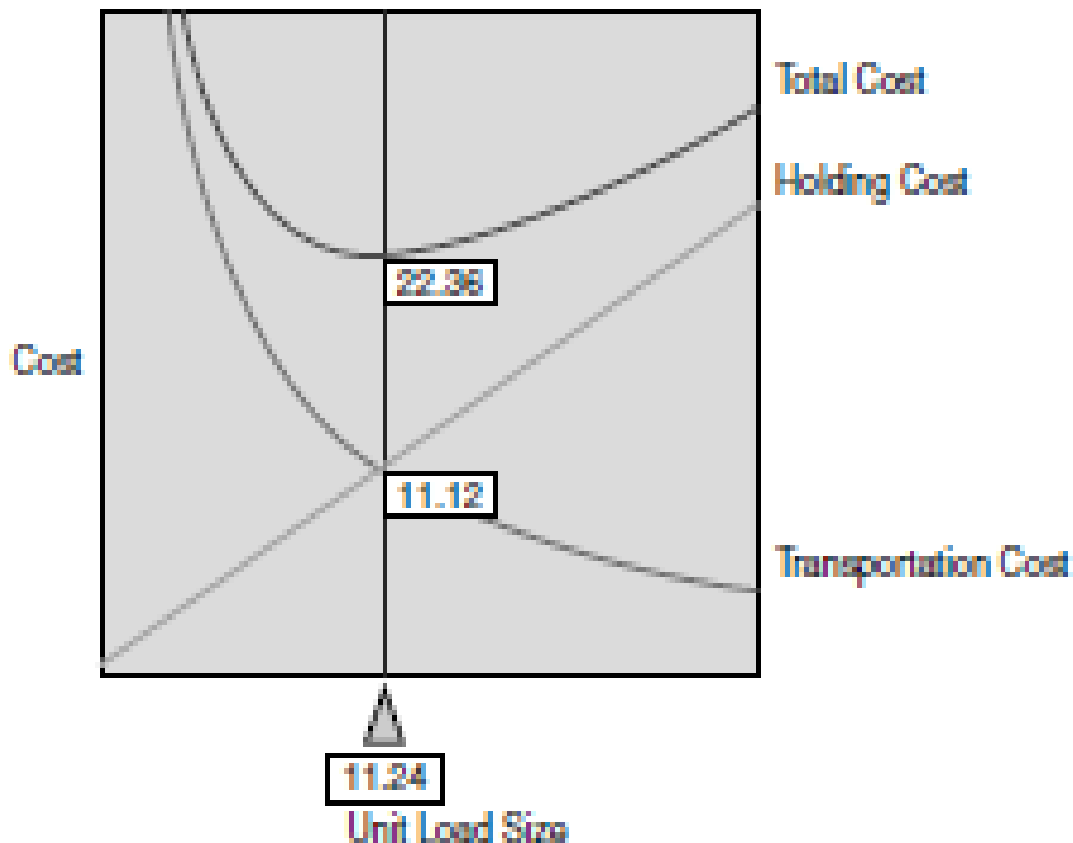


Figure 6. Trade-off between unit load and inventory costs (Taylor, 2009).

The collection and movement of unit load requires less effort and work as compared to moving many items one at a time. On the other hand, the above statement does not mean bigger unit load size is always better. However, as the unit load size increases, the total transportation cost decreases considerably. This depreciation is off-set by the increase in the cost of inventory as shown in figure 7 above.

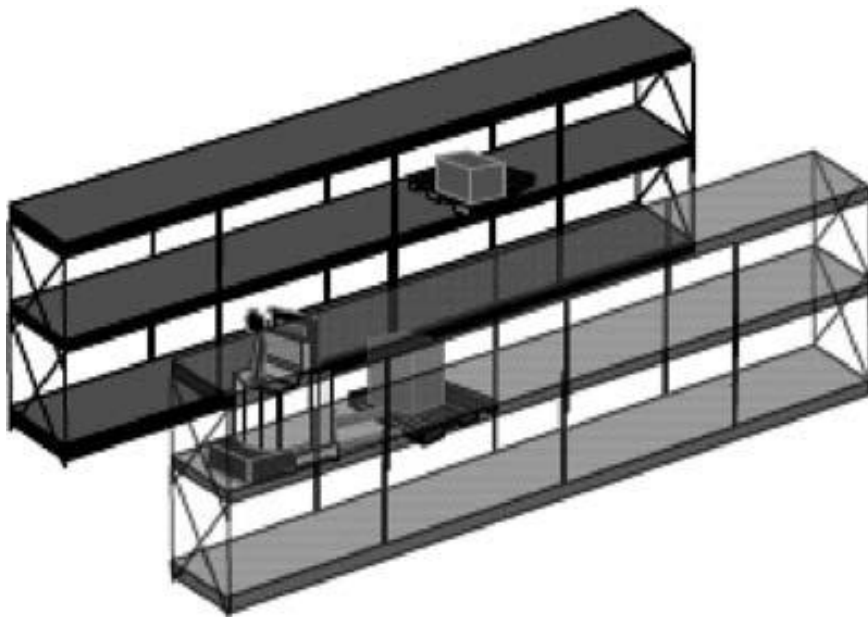
As materials and products move via various stages of manufacturing and the resulting distribution channels, the load size and composition experiences some change. Large unit loads constituting of raw materials become smaller in units after been manufactured into finished goods. During the manufacturing process, smaller unit loads becomes itemized, hence yielding less in process inventory and shorter item throughput time. Smaller unit loads prove to be consistent with manufacturing strategies, thus embracing operational aims such as flexibility, continuous flow, and just-in-time delivery.

6. Space Utilization

A good material handling system improves the effectiveness and efficiency of all the available space.

There are three key points for this principle.

- In work environment, eschew cluttered, unorganized spaces and blocked aisles. For example, blocked aisles add more material flow work. In Figure below, the product on the floor will determine the root path of the forklift, hence alters the directional movement of the forklift to pick the product on the shelf using a longer material flow path, while the storage in Figure (below) will result in inefficient use of vertical storage space (called honeycombing loss).



Retrieving material in blocked aisles.

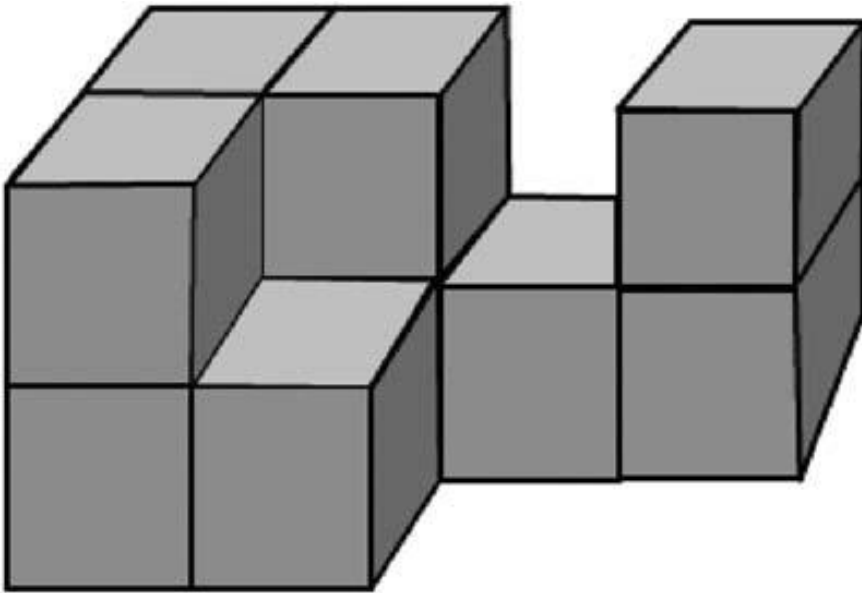


Figure 8. Retrieving material in blocked aisles (upper picture) and honeycombing loss (lower picture), (Taylor, 2009).

- The objective of maximizing storage density must be in equilibrium against accessibility and selectivity in storage areas. If items are going to be in the warehouse for a long time, storage density is an essential consideration. If items enter and leave the warehouse frequently, their accessibility and selectivity are important. If the storage density is too high to access or choose the stored product, high storage density may not be proficient.
- A Cube per Order Index (COI) storage system is often used in a warehouse. COI is a storage policy in which each item is apportioned warehouse space based on the ratio of its storage space requirements (its cube) to the number of storage/retrieval transactions for that item. Items are listed in a no decreasing order of their COI ratios. The first item on the list is apportioned to the indispensable number of storage spaces that are in proximity to the input/output (I/O) point; the second item is apportioned to the required number of storage spaces that are next in proximity to the I/O point, and so on.

7 Systems

A system can be defined as the accrument of mutually beneficial entities that interact with each other. The main components of the supply chain include suppliers,

manufacturers, distributions, and customers. The activities to reinforce material handling both within and outside a facility need to be integrated into a unified material handling system. The key aspects of the system principle are:

- At all stages of production and transportation, lessen inventory levels as much as possible.
- Even though high inventory permits a company to provide a higher customer service level, it can also hide out the production problems which, from a long-term point of view, will be a detriment to the company's operations. These problems can eventually result in low productivity and high product cost.
- Information flow and physical material flow should be unified and treated as concurrent activities. The information flow typically follows material flow.
- Materials must be easily identified in order to control their movement throughout the supply chain.
- Customer requirements must be met with regards to quantity, quality, and on-time delivery and others must be filled accurately.

8 Automation

In material flow system, automation means using electro-mechanical devices, electronics and computer-based systems with the result of coupling multiple operations to operate and control production and service activities. These automated devices and systems are often controlled by programmed instructions. Automation facilitates equipment or systems operation with little or no operator intervention. It improves safety, operational efficiency, consistency, and predictability, while increasing system responsiveness. Automation also lessens operating costs. In order for automation to perform the functions of material flow system properly, the following key aspects should be considered:

- Before installing mechanized or automated systems, pre-existing processes and methods should be simplified
- For effective unification of material flow and information management, computerized material handling systems where appropriate should be considered.
- Items must have features that accommodate mechanization in order to automate handling.
- Treat all interface issues in the situation as critical to successful automation.

9 Environmental

In material handling, the environmental principles involve designing material handling methods, and choosing and operating equipment in a manner that conserves natural resources and minimizes adverse effects on the environment as a result of material handling activities.

The following three key aspects need to be considered:

- Design containers, pallets, and other products used in material handling so they are reusable and/ or biodegradable. For example, use recyclable pallets.
- By-products of material handling should be considered in the system design.
- Hazardous material handling should give special handling care.

10 Life Cycle

Life cycle costs include all financial in-flows that occur between the time money is invested or spent on the material handling equipment or method until its disposal or end of life. The key aspects of life cycle are;

- Life cycle costs in material handling system: capital investment; installation, setup, and equipment programming; training, system testing, and acceptance; operating, maintenance, and repair; and recycle, resale, and disposal.
- Plan for preventive, predictive, and periodic maintenance of equipment. Include the estimated cost of maintenance and spare parts in the economic analysis. There are three types of equipment failures that occur over the equipment's useful life. Early failures when the product is being debugged, constant failures associated with the normal use of equipment, and increasing failure rate during the wear-out stage, when products fail due to aging and fatigue. A sound maintenance program will postpone the wear-out period and extend the useful life of equipment. Maintenance cost should be considered in the life cycle.
- A long-range plan for equipment replacement should be made.
- Additionally, to measurable cost, other elements of a strategic or competitive nature should be quantified when feasible.

Design and operation of material handling system are vital with respect to the above 10 principles. Most are qualitative in nature and needs the industrial engineer to employ these principles when designing, analyzing, and operating material handling systems.

2.8 RFID in the field of postal logistics

RFID is the acronym of Radio-Frequency IDentification. It refers to a small electronic device that consists of a small chip and an antenna. The chip is capable of carrying 2,000 bytes of data or less. The functionalities of RFID device is the same as bar code or a magnetic strip on the back of a credit card or ATM card. It offers a unique identifier for an object. Just as barcode and magnet strip, RFID also serves as scanning to retrieve the identifying information. The basic principle behind RFID systems is the item is marked with tags. These tags consist of transponders that emit messages readable by specialized RFID readers. Most RFID tags retain some sort of identification number; for example a customer number or product code. A reader retrieves information about the ID number from a database, and acts upon it accordingly. RFID tags can also carry writable memory, which can retain information for transfer to various RFID readers in diverse locations. This information can track the movement of the tagged item or product, making that information accessible to each reader. RFID tags fall into two general categories, active and passive, depending on their source of electrical power.

Active RFID tags contain their own power source, usually an on-board battery. Passive tags receive its power from the signal of an external reader. RFID readers also come in active and passive forms, depending on the type of tag they read. Active RFID is a form of automatic identification characterised by the use of ID tags which are self-powered. They have their own battery, and typically emit a signal at a predefined rate, usually with an interval of about one second between transmissions (Weinstein, 2005).

2.8.1 Advantages of Active RFID tags versus Passive RFID tags

There are many benefits of active RFID tags. It includes range and independence from surroundings.

- **Range:** An active RFID tag can typically be read at a range of 100 metres, compared to passive tags, where the read range varies according to the frequency of the tag. For Low frequency tags, range can be less than an inch. For High frequency tags, range can be to a twelve inches. For Ultra-high frequency (UHF) tags, range can be up to twenty feet. But long range is not always a good thing. In systems where the tag is used as a locator, range can be intentionally reduced, and this is often done by reducing the "gain" of the reader.

Effect of surroundings and orientation: With regards to orientation of the tag, active RFID tends to be less critical than for passive RFID tags, and the tag is less affected by its surroundings, particularly the proximity of water or metals. Testing of systems using active tags can be problematic. When testing is been conducted, a tin box is use to shield unwanted tags and make them unavailable to the reader. This is fine when testing for passive RFID Tags, but when testing many active RFID tags, it can be read even when placed in a tin box with a closed lid. In theory this is not possible, but if the lid is less than a perfect fit, enough signal leaks through to give a reading. This has obvious implications in real world deployments, meaning that an accidental partial screening of a tag can be accommodated without the tag being unreadable (Weinstein, 2005).

2.8.2 Disadvantages of Active RFID tags versus Passive RFID tags

The disadvantages of Active RFID tags versus Passive RFID tags include cost, size, life, operating temperature range.

- Cost: Depending on type, manufacturer and quantity, as a general guide assume that an active RFID tag cost higher than passive RFID.
- Size: Active RFID tags are generally larger than their passive counterparts.
- Life: The life of an active RFID tag is limited by the battery. Manufacturers claim typically five years. In many cases the battery cannot be changed, and the tag must be discarded at end of life. The upside of this approach is that reliability is increased. Most systems have the ability to determine the status of the battery in each tag. Often, battery condition is transmitted along with the regular beacon signal. The life of a passive RFID tag, in contrast, is theoretically unlimited, determined only by the reliability of the components.

Temperature Range: The strength of the Active RFID tag comes from it's on board battery, but in some circumstances that can also be a weakness. At extreme low temperatures the chemical reaction of the battery is slowed, and the tag becomes unresponsive. Normal performance generally resumes when the tag is warmed. Depending on the design, tags can work down to minus twenty degrees Celsius.

2.8.3 Applications

Active RFID tags are commonly used for tracking high value assets over a large area. They might be used for tracking vehicles in a lot, or for tracking valuable items or important equipment within a building. They are particularly useful when items need to be tightly controlled. Another application that this study considers is the Postal logistics system. In Postal system RFID does the following:

- **Mail Office:** A mail office can perform parcel registration through issuing an RFID tag and label printing sends parcel issue data such as a postal code and address automatically using an RFID reader with an Internet connection to a postal logistics system through a local server. The mail office also receives mail trace data such as parcel processing and delivery data from a local server after the registered parcel has moved to the mail centre.
- **Mail Collection & Distribution Centre:** A mail centre performs RFID tag recognition at docks and has a sorting machine for the auto-sorting, sending, and arrival processing of parcels and pallets sends RFID tag recognition data of the parcels and pallets, such as mail centre code and parcel processing data, automatically using an RFID reader with an Internet connection to a postal logistics system through a local server. The mail centre also receives mail trace data such as parcel processing and delivery data from the local server after the parcels and pallets have moved to the delivery office.
- **Delivery Office:** A delivery office performs RFID tag recognition for the delivery of parcels and a tag data reset for the reuse preparation of parcel and pallet tags sends RFID tag recognition data of the parcels and pallets, such as delivery office code, delivery person's ID, and delivery data automatically using a hand-held RFID reader with wireless LAN and Code Division Multiple Access (CDMA) connection to a postal logistics system through a local server. The delivery office also receives processing data such as parcel registration and sorting data from the local server after the sorted parcels have moved to the delivery office.
- **Monitoring Centre:** The monitoring centre can do a real-time trace and tracking of parcel processing and pallet management through a local server and postal logistics system. The monitoring centre can also examine the number of parcels registered in real time, the number of pallets with parcels moved among mail centres, and the number of empty pallets stored in each mail centre. This is also essential for the efficient use of parcel and pallet management, customer service

parcel activity, and for knowing which mail centre has difficulties with parcel processing and pallet management (Hyun Park and Heung Park, 2006).

3 Problem analysis and steps taken

3.1 Determining Ghana postal services shortcomings

The step taken in analyzing the problem at Ghana Post for this present study was guided by the principle of change management and the principles of leading change and innovation in an organization. The reason why this was necessary in the analysis was because Ghana Post has an existing system which has worked over many years and has gone through a series of improvement. Therefore to propose an improvement through adaption of the Itella logistics process approach in mail handling, management and delivery, the need to assess the environment, the existing resources, and employees and management resistant to this new change was necessary. It is when these are known that the implementation of the existing system can be done successfully. This approach was helpful in developing the SWOT tool for the thesis to uncover the strength, weaknesses, opportunity and threat of the proposed idea in Ghana. As mentioned in the change management literature, managing change in any organization requires an analysis of perspectives of both individual and the organization.

At the individual level, experts explain that, the need to understand how individuals like employees make the change successfully are very important in implementing any new idea in an organization. According to the Change Management Learning Center in USA report, an organization does not change but individuals in the organization do. It is further stressed that when carrying out a project in an organization to bring improvement or change, it is not the size of the project that matters but it is the success. This means that the success of the project lies in the employee doing their work differently, multiplied across by all of the employees impacted by the change. Therefore understanding and appreciating how one person makes a change successfully helps to achieve the success of the goal behind any change in an organization (Prosci and ADKAR, 2011)

At the organizational level, the authors explain that, because change happens from one person at a time, the need to seek out processes and tools that can be used to facilitate this change is very important at the organizational level. They mention that tools, such as communication and training, are the most significant tools when no structured approach is applied. At the organizational level the need to scale up the approach is always important in making it an effective tool to improve existing processes. Guided by this theoretical perspective, the assessment of Ghana Post was done through a qualitative research. This approach was chosen because the study was interested in understanding the need and benefit of the proposed Itella logistics system in Ghana

Postal Company. In so doing, the shortcomings of Ghana Post emerged out of the data analysis. Through this approach ten (open) ended interview questions were sent to Ghana Post. The choice of the open ended questions allowed the interviewees to contribute as much detailed information as possible. For ethical reasons and anonymity of the informants, the informants were not asked to disclose all their demographic information due to cultural reasons. But their experience and position were important to help the validity of the findings. The interview questions were structured to make analysis to be easier. It was analyzed through different lenses which were grouped under five themes (Figure 9).

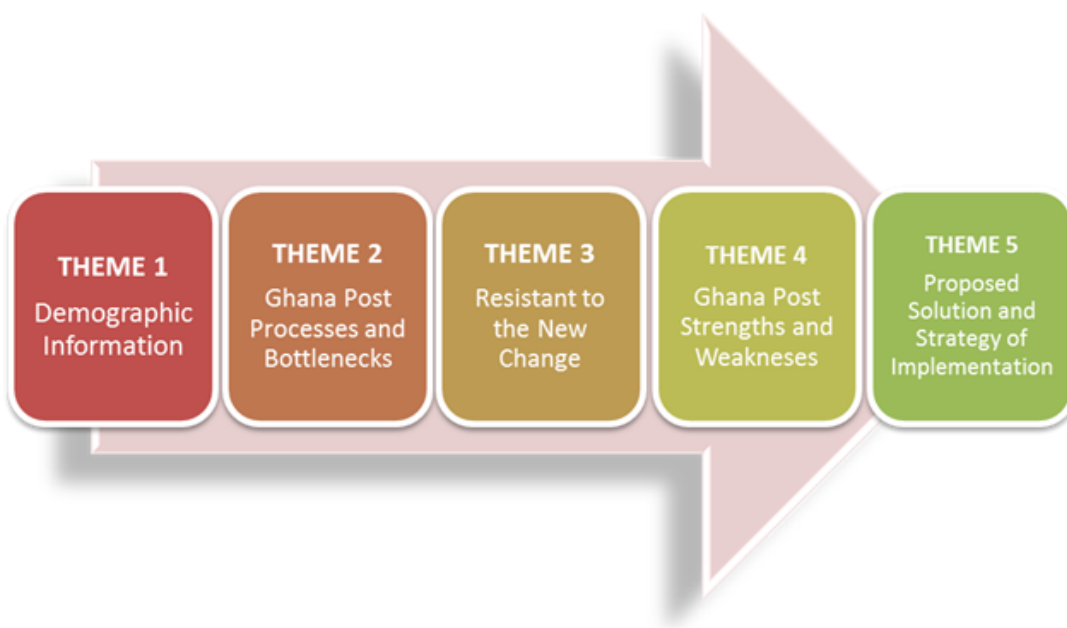


Figure 9. Theme of the analysis of the problem through the interview

3.2 Analyze the problems by determining the source of the mentioned problems

As it was explained in the previous chapter, the shortcomings of Ghana Post were analyzed under five main themes (see Figure 5). Under theme 1 the interviewees were asked to give information of their position and the number of years they have worked in the company. Through the analysis it was observed that the average year of the respondents in working for Ghana Post is 7 years. Most of the interviewees were found to be at the supervisory/or managerial level positions. This was very good for the analysis since it gave confidence for the richness of information. This was important because Marshal (1998) says that in qualitative research some interviewees are recognized as richer than others. According to the author, some informants are more

likely to provide insight and understanding for the researcher since people at top level in organizations have good insight about the company. In culture like Ghana, this target informant at the firm level was necessary because of the power distance culture found in Hofstede's Power Distance matrix (Basabe and Ros, 2005).

Under theme 2 the interviewees were asked to describe the procedure and processes in which the mail is collected, handle, process and dispatch in the logistics chain. Through this, it came out from the analysis that everything is done manually at the local levels with no automated system to facilitate the process. This was found to be one of the bottlenecks even though the interviewees claimed that they are able to expedite action. They describe their manual process as efficient and their ability to deliver the letters on time was a proof of their efficiency. But this study asserts that in this Information and Communication Technology (ICT) age, innovation has become a necessity in postal system. Innovation and automated system in postal system now serve as competitive tools in the supply chain. Therefore this study contends that the need for such innovation to be implemented at the local level in Ghana Post is seen as important for efficient delivery and provision of services both at the local and regional level. Unlike the traditional way of receiving, sorting and delivering letters by human, the modern real-time based practical approach has brought the public faster and more reliable services and the need for Ghana Post to catch up with the speed of technology deemed important for the company. Also the motivation and skills of the employees were asked in the interview and it became evident that Ghana Post employees lack motivation despite their industriousness because the condition of service in the company is conducive. In summary, the main bottlenecks identified in the processes are collated in the SWOT analysis with propose improvement as the main conclusion which will be discussed in detail in chapters 3.2.1 and 3.2.2.

In analyzing the received information under theme (3), it emerged that despite lack of motivation by Ghana Post employees they are open to innovation and change in the company. Among all the people interviewed each responded positive to the implementation of the new system. This is seen as strength for the company in embracing change to improve their existing system. Management employees who were interviewed also responded positive to the change and improvement of the existing system. It was found that it is the wish of management to improve service delivery; therefore the informant stressed that the management would not oppose to any changes should the need arise. At the employees' level, it became evident that employees would not be resistant to the implementation of the new system either, if the necessary training is conducted before the introduction of the changes is implemented. This was also found

to be strength for the company. In collating this information, theme 4 and theme 5 is further discussed in chapters 3.2.1 and 3.2.2

3.2.1 SWOT Analysis of each company

SWOT means strength, weakness and opportunity and threat. In SWOT strength and weakness are internal challenges and opportunity and threat are external challenges. In analyzing the strength and weaknesses of Ghana Post the following emerged as strength, weaknesses, opportunity and threat in Ghana Post. (See the SWOT below.)

TABLE1. Sample SWOT Analysis

S	W
<ul style="list-style-type: none"> ▪ Commitment of staff to duties ▪ Readiness to adopt to any changes and the way work is done ▪ Market share ▪ Government support ▪ Long tradition in the market 	<ul style="list-style-type: none"> ▪ Lack of training due to financial constraint ▪ Low level of salary ▪ Lack of motivation ▪ Lack of ICT facilities in the company
O	T
<ul style="list-style-type: none"> ▪ Government support ▪ Large market share since they operate on all the 10 regions in Ghana 	<ul style="list-style-type: none"> ▪ External competition since there are so many competitors in the Postal Market in Ghana ▪ Fuel cost in Ghana ▪ Technological advancement in the Postal industry

3.2.2 Some important ideas that can be adapted from Itella to Ghana Postal Service

To know which idea can be adapted from Itella system to Ghana Postal Service, it was important for the study to first understand Itella's system and identify the drivers of their competitive advantage. This motivated the study to interview Itella Logistics. Through the interview, it became evident that Itella's main strength that facilitates their service delivery lies in their internal resources and capabilities that the company combines with other stakeholders to deliver efficient and modern mail service to their customers. These ways of pulling resources together to create value for a firm are recommendable by many researchers as a way of unlocking new sources of competitive advantage for a company (Prahalad and Ramaswamy, 2004). These resources are grouped under four main themes as shown below:

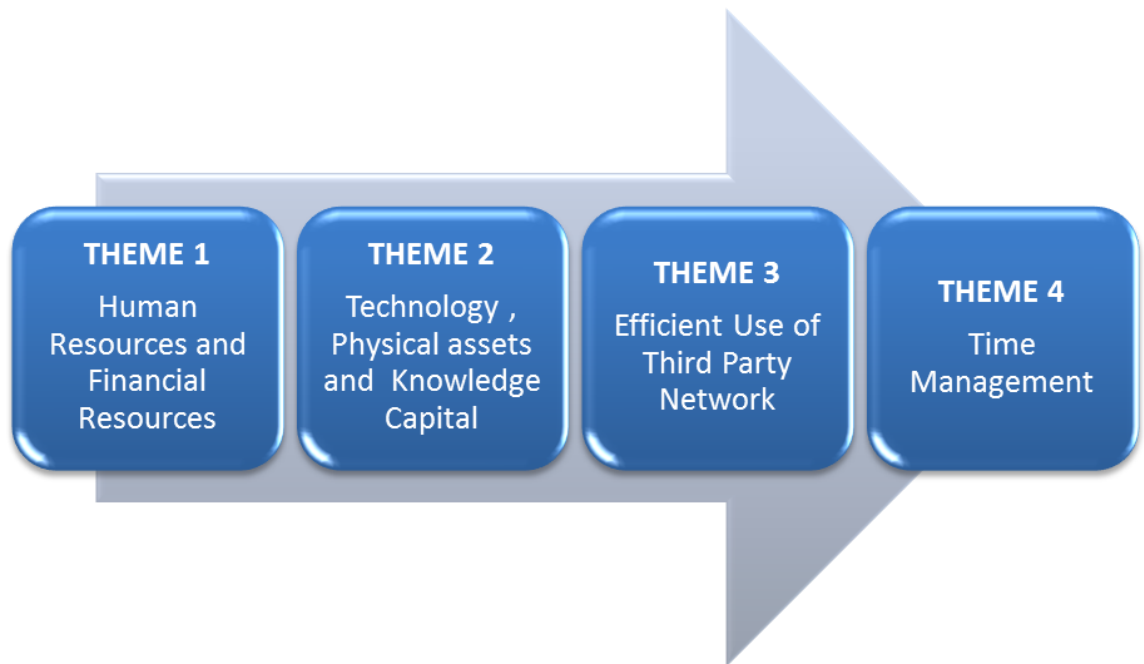


Figure 10. Resources driving Itella's competitive advantage in their efficient service delivery

Theme 1: Human Resources and Financial Resources

Human resource (HR) is used in business to refer to the people who work for a company. Studies show that the people who work for a company are considered to be an asset for the company. It is like financial resources and material resources of the company, such as buildings, machinery and other equipment. Studies explain that a company is more likely to be successful if the company manages all these resources well, as well as the people who work for the company. Human resource researchers

further state that the people who work for a firm influence the organizational performance in today's competitive environment (Barney and Wright, 1997). Schuler and MacMillan (2006) add that, human resource is very critical to an organisational growth and prosperity in gaining and retaining competitive advantage. This competitive advantage can be achieved if the company capitalize on their superior human resource management. Human resources provide the firm with resources that provide value that cannot be easily imitated by other organizations or competitors. But this involves developing the employees who are skilled and motivated to deliver high quality products and services. It also involves managing the culture of the company to encourage teamwork and trust. These resources are the driving force of Itella's efficient service delivery. Itella has the financial capacity and they have utilize these resources to attract motivated and numerous staff who works for the company in different functions that contribute to the overall efficiency of the company.

Itella sorting centre has a total of one thousand five hundred (1,500) employees, of which one thousand two hundred (1,200) are mail handlers. Work is done in three shifts every day of the whole year. 60% of the employees are full-time employees and 40% are temporary employees (Itella's company presentation)

Theme 2 and 3: Technology, Physical assets and Knowledge Capital and Network

Itella's geographical location in a developed country like Finland gives them advantage to attract well knowledgeable people because of the countries level of development in technology especially information technology and automation in the country. Itella is exposed to modern technologies and this gives them advantage to constantly explore new ways of doing things with the help of Information Technology. The company mail handling process incorporates both manual and automatic sorting. To speed up with sorting and handling to keep it time scheduled, Itella has four main production units. These production units are: Reception, Additional Value services, Letter sorting and Heavy production. Their letter collection, sorting procedure and transportation are shown in Figures 11 and 13.

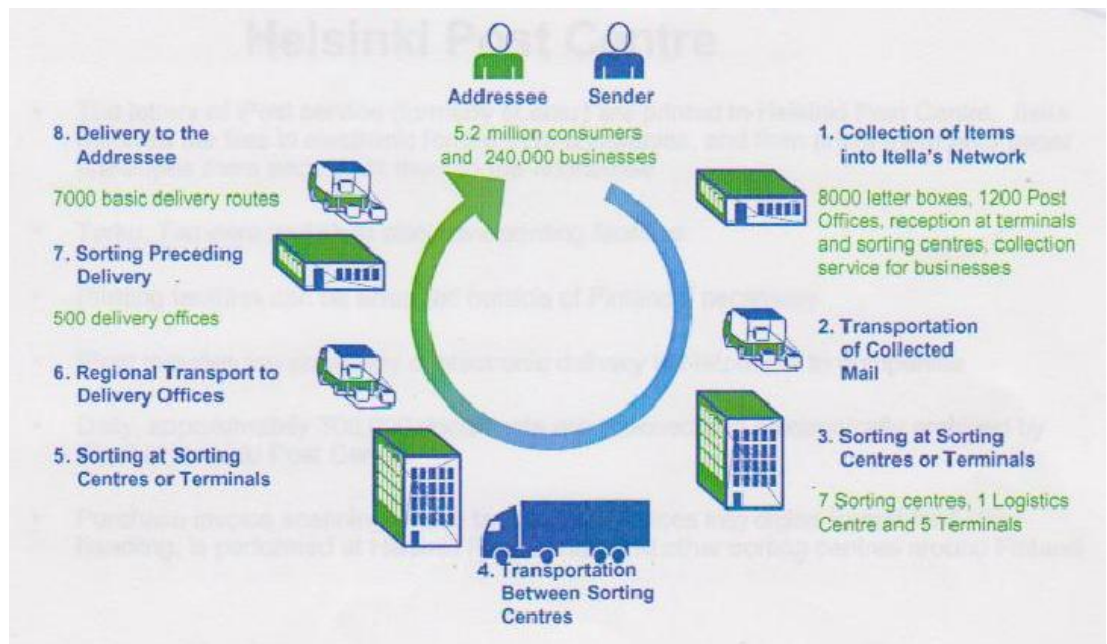


Figure 11. Mail transportation procedure of Itella (Itella's presentation)

The work output per day in mail handling and delivery is encouraging. Itella reports that "in the whole of Finland, approximately 3.5 million of outgoing letters are handled daily". During one day at the sorting centre the following are handled:

- **Letters**
 - Outgoing sorting: appr. 1.9 million items
 - Incoming sorting: appr. 1.0 million items
 - Large, so-called Maxi Letters: appr. 37,000 items
 - 80% of this mail is sorted by machine
- **Newspapers, bulk letters, magazines etc**
 - Bundles appr. 82,000 items
 - Newspapers appr. 1 million
 - Bulk letters appr. 0.9 million
 - Incoming newspapers appr. 0.5 million
 - Incoming bulk letters appr. 0.3 million
 - Bulk letters and newspapers sorted individually appr. 100,000

Figure 12. Summary of daily mail handled per day by Itella Logistics (Itella company presentation)

They have the physical assets (machines and logistics) and the resources to do these in an on-going daily basis with continuous improvement of their system and technology to increase efficiency of their service. According to Itella report, it can be seen that, their

resources enable them to adopt holistic approach in their business. Their operation entity report shows the following functions:

- Reception: checks incoming mail and direct it to the correct sorting process
- Machine Sorting: sorting of large mail volumes for outgoing and incoming letters in the area.
- Manual Sorting of letters: mail that cannot be machined-sorted
- Bundle Sorting: sorts bundled newspapers and direct mail, and also directs mail to onward transportation
- Additional services: handling of mail which includes additional services bought by the customer, for instance, reply mail services and major customer postal codes.

Below the picture shows the method of sorting (Figure 8)

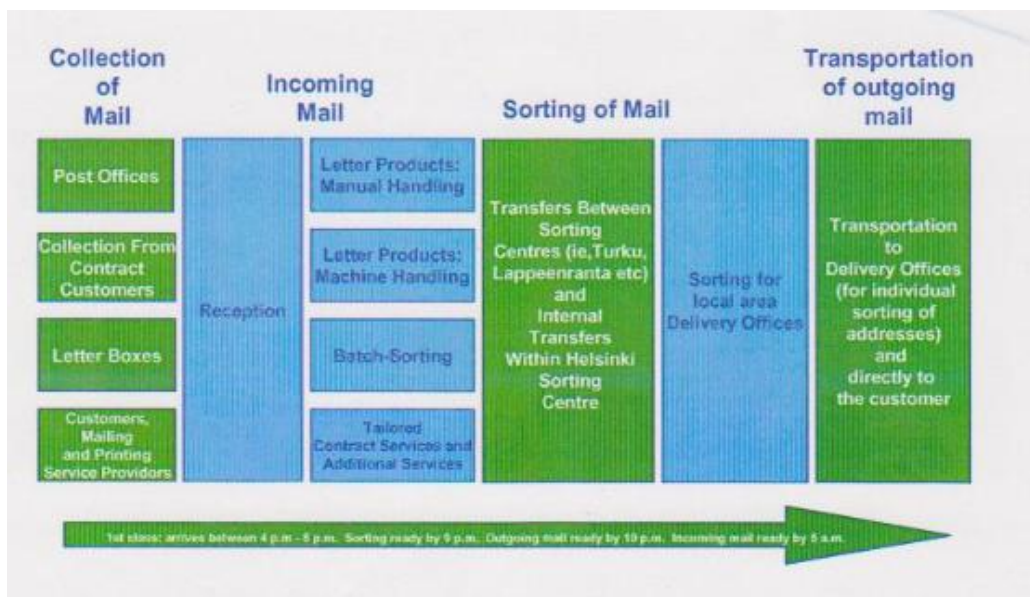


Figure 13. Process of the sorting centre (Itella's company's presentation)

Itella's sorting procedure is done at different terminals at the pre-sorting stage and the main sorting is done at Helsinki sorting centres. The sorting combines both manual process and automation. But the manual process forms very low percentage of the process. The major part of the sorting is done by machines. They have enormous facilities that facilitate the process. At Helsinki sorting centre, Itella's mail sorting facilities covers a wide area (four times the size of football field) and has been in operation for 34 years (1978 to 2012). The equipment found at the main sorting centre includes:

- Pre-sorting and cancelling machine
- Facer Canceller Machine for small letters

- 9 sorting machines for large letters
- Conveyor system, approximately 2 km in length
- 5 small letter sorting machines

Itella reports that those facilities at Helsinki Post Centre are constantly modified and built to correspond with operations that are in place at the current time. This is an indication that Itella is at the speed of technology in the mail logistics industry. This is a good reputation for Itella as a company of being constantly finding new ways to meet their customer needs.

Other services found at Helsinki Post Centre include: information logistics printing, digitising service and logistic transport services. The information logistics printing service is an internet post (IPost) system that saves company a great deal of time from printing their letters and making it ready for Itella's collection. It is an ecological in the broader sense, because the service allows companies to send their letters electronically to Itella with the receivers address. Itella then prints it at their office, encloses it in an envelope and delivers it to the receiver. The service is also available in Turku, Tampere and Oulu. The service is not for local companies alone but available for other customers outside Finland. With this service Itella is able to streamline the lead time of delivery having the letter to be delivered to the receipt at NetPosti so that the service provides zero carbon footprint.

Another interesting technology and service provided by Itella to their customers is the SmartPOST service. The service was acquired by Itella in 2010 through agreement with SmartPOST OÜ, based in Estonia. The SmartPOST is an innovative service concept in Estonia, where parcel sending and delivery are based on self-servicing parcel terminals and doing business online (Itella Press release 2010, 2012). The service allows customers to order a product from an online store. The customer is then notified of the parcel's arrival by an SMS and may conveniently pick up the parcel from the SmartPOST parcel point the customer has selected. More information about Smart Post may be found on Itella website. The overall efficiency of Itella's service is the efficient use of time, commitment to improving facilities and using a third party network where necessary.

3.3 Suggested solutions and transfer of Itella ideas

There are many ideas that can be adapted into Ghana Post system through technology transfer to improve the existing facilities at Ghana Post. Technology transfer is the term

“used to describe the processes by which technological knowledge moves within or between organisations. International technology transfer refers to the way in which this occurs between countries” (WACC, 2012). According to the Graduate School of Research at Saint Mary’s University, technology transfer process typically consists of the following process:

- Identifying new technologies
- Protecting technologies through patents and copyrights
- Forming development and commercialization strategies such as marketing and licensing to existing private sector companies or creating new start-up companies based on the technology.

The technological knowledge that is transferred can take different forms. It can be embodied in services, people in a company, plant facility and organisational arrangement. This means that the knowledge being transferred can be both tacit and explicit knowledge.

From all indication one truth that emerged from the interview and the analysis of the entire information gathered, indicates that the Ghana Post system is fragmented at the moment. Fragmentation here does not mean that Ghana Postal system is totally messed up. It means it is very difficult for Itella to scale up their current system to Ghana Post. According to the interview it can be done in countries where the street address system is working and used by the country. In the case of Ghana Post, it is due to many reasons but few can be mentioned like lack of infrastructure and lack of the use of street address in its postal system. This means that there is little knowledge that can be adapted into the Ghana Post system. In my personal observation, the Smart Post service and the IPost service can be adapted into Ghana Post system. This service can be provided to companies that use the street address option in Ghana as a special service provided by Ghana Post to corporation and individuals. This will also mean that, Ghana Post will need to restructure its organisational structure and incorporate modern approach into the system and improve its logistics system. This is necessary because one interesting finding that emerged from the interview is that, for the past years Itella has been in operation, there are only few instances where they have had problem with logistics. When even this happens, Itella is able to detect the problem in their information system and dispatch an immediately available vehicle to solve the situation. This means that Itella is committed to ensuring that the parcels get to the customer in time as planned in the corporate strategy.

Whilst much cannot be adapted from Itella’s system at this crucial time, this study believes that Ghana Post can still consult Itella for possible lean management advice to

improve their system. Technology is not the only thing that can be transferred because it takes organisational culture to lead change and innovation in an organisation which goes along to affect the competitiveness of the organisation.

4 Summary and Conclusion

The aim of the thesis was to explore the inefficiencies in the Ghana Post Company system and suggest an approach in improving the existing system of Ghana Post through the implementation of Itella Logistics Systems to spur innovation and competitiveness in their system. The thesis was carried out in an unofficial collaboration with Itella and Ghana Post even though for ethical reason, the permission was asked from my supervisor before conducting interviews. Also for ethical reason, the names of the interviewees are not disclosed in the analysis. Therefore, their identities still remain anonymous in the thesis.

The method used to collect data was an open interview questionnaire sent to Ghana Post due to distance since the study was time bound. That of Itella was face to face interview which allowed the study to dig deeply into the Itella system to enable objective conclusion and recommendation to be made to avoid personal bias which is a limitation of the validity of the thesis. The thesis was structured into four main structures which allowed the thesis to cover all the information needed to achieve the objective of the thesis.

The main findings of the thesis are that, there is a mismatch of Itella system with Ghana Post Company system. The level of technology used in the Itella system makes it impossible at the moment to adapt it into the Ghana Post system. The two systems are incompatible. The reason is that, the infrastructure in Ghana and the fragmentation of the address system used in Ghana is a limiting factor. All these contribute to the inefficiencies of Ghana Post. The way the city planners have designed the country made it very difficult for any serious changes with regards to technology to be carried out. It needs hard work and restructuring. This means that the founding fathers of the Ghana Postal system should have adopted the street address system from the initial stage when the company began its operation in the public sector. This is what has gone a long to affect the generation of Ghana Post in this century.

In spite of this, in my personal opinion it is not too late for Ghana Post to seek advice from Itella Logistic on how to improve the existing infrastructure and facilities to some level that will improve their situation. From all indication, there are many basic ideas that Ghana Post can learn from Itella Logistics.

In conclusion, I will recommend that Ghana Post should invest in the operating logistics to facilitate effective delivery process. All staff should be motivated enough through

training and also financially. The Government should assist the company to improve on its logistical challenges. When this is done, the basic improvement from the end of Ghana Post, couple with the advance knowledge transfer services from Itella's end, will lift the standard of Ghana Post service to some optimum level which will enable the company to do better and progress gradually.

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