

visibility in transit

by Christopher Thomas

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Module- international logistics

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**Assignment task- Using case studies
critically evaluate the application of
asset tracking technologies in the
movement of goods and people.**

1.0 Introduction

Before discussing asset tracking the report will discuss how the rise of technology mainly the internet helped fuel asset tracking, and how transmission control protocol and internet protocol (TCP/IP) help shape the internet that is used today, and as discussed by SearchNetworking (2018) what advantages it brought. Moving forward in time a few decades, and the introduction of broadband, which Doherty et al (2016) explains has had a positive effect on the economy, not to mention the time saved on activities which before broadband would have taken considerably longer.

When thinking of tracking most members of society one hundred years ago would think of an animal. To have the ability to track and also the ability to determine it where it going (Dictionary.cambridge.org, 2018), nonetheless in today's society the term can be used freely Kosmas (2014) suggests some of it applications today such as parcel tracking, and what advantages a company would have.

The next section of the report focuses on what technologies can be used as a solution to asset tracking. Both barcode and radio frequency technologies have been used by many companies, and the both have elements which make them look appealing. McCarthy (2004) explains one limitation of the barcode is the amount of data it can hold RFID has no such issues, but if price is a concern the barcode has the advantage.

The first case study will look at a company that need to adapt to changes in legislation to remain competitive in the marketplace. Vertassets.blob.core.windows.net (2018) explains it is very important for their customers to have full transparency of the movement of good, and vital information in regards to the product, which is delivered by a global positing system Just like other technologies like RFID and the barcode GPS is not completely error free. Smith (2007) has one such limitation of GPS, that being the location of the satellites. The report will explain how satellite location can affect the system. (E-education.psu.edu, 2018) also explains how the earths can have an influence on the delay of data from the satellites.

Finally, the report will look into a company that noticed a need for GPS, and chose to be proactive (Vertasets.blob.core.windows.net, 2018), also what advantages can be expected, and how to deal with concerns from employees.

2.0 The evolution of technology

Before the report look further into asset tracking it is important to understand how the technology has changed over the decades. When looking at technology that aided asset tracking you need look no further than the development of internet, and more crucially broadband. (Naughton, 2016) explains that the very existence of the internet goes back as far as the Second World War, but Vannevar Bush had written a paper in 1939 which did not get published until 1945. The paper is seen to be the first indication of the internet.

2.1 TCP/IP

The next milestone came when The Advanced Research Projects Agency Network (ARPANET) a branch of the American department of defense could be seen as kick starting the internet that we have today when they ordered that all host systems are to run off Transmission Control Protocol and Internet Protocol (TCP/IP). The introduction of the protocols changed how data was exchanged over the internet. (SearchNetworking, 2018) explains that TCP/IP has many advantages, such as being not being controlled by any company it is nonproprietary, this being the case the protocols are easily customized toward the needs of the user no matter what operating system, hardware or network that is being used. The system was also safe guarded, in the event of any failure the device would be automatically recovered.

2.2 Broadband

(Enabulele, 2008) believes that the development of broadband has modernized the way we think about the internet, and it is the cornerstone of our economy as we know it today. This is shown by (Doherty et al., 2016) who explains that through the development of the internet and more importantly broadband comes many positive effects such as economic benefits, and especially within a small-medium enterprise (SME)

it has had a positive impact on performance within the company. Through the development of broadband companies are focusing on becoming more integrated by sharing information, and also look towards the customer to improve their experience through improving customer services. There is no doubt that broadband has improved society, but what improvements can a SME expect to see. (Doherty et al., 2016) describes how broadband has helped reduce the amount of paper being used within the organisation, but more importantly it has reduced time needed to perform tasks increasing productivity. One manager was quoted saying;

“It makes my job a lot easier and it is far more efficient. It means that if someone wants to know something that I need to look up the Internet for, it takes me two seconds, instead of waiting for 5 minutes for the information to upload” (Doherty et al., 2016)

3.0 Asset tracking

As discovered in (Dictionary.cambridge.org, 2018) the noun track refers to being able to follow the movements of something that being a person or materials, and ultimately plot its course. (Kosmas, 2014) explains in the modern world the word track has many meanings, it could be used to describe one's ability to track a parcel for delivery, in addition it could also help an individual within the film industry locate a person of interest by tracking their career. Asset tracking within the logistics sector gives the decision makers the knowledge to make adjustment, and have visibility through the supply chain. On the other hand, in recent years the demand from the customer to have full transparency while their item is being shipped (Vertassets.blob.core.windows.net, 2018). Furthermore, without item level visibility the logistic company would have little knowledge of the key aspects such as good delivered to wrong location and damaged goods. (Vertassets.blob.core.windows.net, 2018) explains that with the development of technology companies can disregard unnecessary losses through damage claims and lost items decreasing the amount resources needed, ultimately providing the customers with an improved customer service within the company.

Item level visibility when it comes to freight tracking can be as simple as placing a barcode on a container. With the barcode placed on the container the client is able to track the progress of the container at certain points of the trip, as long as it has been scanned, this can be done on the internet by entering a unique consignment number. Without this technology the client will solely have to depend on the freight forwarder for progression reports, which requires communication from both parties (Rushton, Croucher and Baker, 2006). It could be said that the freight forwarder could be utilising their time better if all containers were fitted with barcode technology.

4.0 Barcode technology

One advantage of using barcode technology is that it is reasonably priced in comparison to other options such as radio frequency identification, and being so simple to use can be one of the factors of its success. Today barcode technology can be gathered from a handheld device, which has shown to have many advantages including quality control (McCathie, 2004). In comparison to entering the code manually a scanner is definitely more efficient. A well-known designer of the technology claims that for every one million barcodes read only one will be unreadable. McCathie (2004) also discovered another important failing with the barcode in regards to environment of the code. When scanning the code, it is important that all the code is visible and relatively clean for easy scanning, this can be a problem throughout the supply chain where care for the packaging is often forgotten. It is not only the barcode that need to maintained to a good standard the reading device should have clean and clear optics to successfully achieve a productive scan rate. This method is often used in home delivery so that managers can check progression of deliveries, nonetheless barcode can only give the user so much information such as a pallet identification code, or a product code (Rushton, Croucher and Baker, 2006).



5.0 Radio frequency identification (RFID)

RFID according to (Pena-Sanchez, 2005) is enabling companies to change their strategy and become more competitive within the logistics sector by implementing the item tracking technology. A RFID tag is comprised of microchip, and an antenna for data exchange, and like barcodes it is used as an identification tool, and is able to relay more information than the barcode. Unlike the barcode RFID tags have different applications according to the value of good that's need to be tracked. (Pena-Sanchez, 2005) explains that there are three types of tag; firstly, an active tag which is powered by a battery and admits a signal to the receiver. secondly is a passive tag, which is not powered by a battery instead it draws it power from the RFID reader which produces an electromagnet wave which powers the tag. finally, a semi-passive tag which is a mixture of the other two tag, it has a battery to power the tag, but it also draws power from the reader. With the active, and the semi-passive tag not relaying on a power source to be close by they can be scanned over a greater distance nonetheless they are more expensive that a passive tag, and generally only used on valuable items.

McCathie (2004) believes that The application of RFID can greatly help a company reduce its cost through reducing the amount of labor required needed for barcode technology, and more efficient management of its assets. Both Pena-Sanchez (2005), and McCathie (2004) believe that even though RFID has many advantages the lack of standardization throughout the world is holding it back. The technology is supported by the International Organisation for Standardisation (ISO), which may stop companies from investing with the risk of the standards changing, and then needing to buy the standardised equipment. This is no longer a fear with the introduction of ISO 17365:2013 (2018) which now set the standard of tags within the supply chain.

6.0 Global positioning systems (GPS)

A GPS can be used to precisely locate where on the earth someone or something is. This is done by multiple satellites exchanging data, and then measuring the distance to the user's antenna. By doing this an accurate position will be given (Patents.google.com, 2018).

7.0 Case study 1-Andlauer Transportation Services (ATS)

ATS are a company that transport temperature sensitive pharmaceutical goods, and after changes in legislation it was required by law that they should monitor the temperature of the goods, as well as the location of the truck in real time, this will ensure that goods are delivered in a timely manner without damage (Vertassets.blob.core.windows.net, 2018). The study reveals that many of ATS customers rely on accurate readings of temperature in fact it is very vital to their operations. They complied with legislation by seeking advice from complete innovations an industry leader in asset tracking. ATS were provided with a system which used both automatic vehicle location technology (AVL) and GPS. The solution also provides the company with more information in-transit such as full temperature management, and alarm notification. It is also important that that data get sent directly to the customer for full transparency in the supply chain.

The system that is now in place does not only cover the transportation of the good, but also the warehouse. In fact, twenty-two sensors capture information which will also timestamp the good, so that if a problem did arise regarding poor temperature management they could reassure the customer with valuable evidence to suggest otherwise. As discovered in (Waters and Rinsler, 2010) the customer would be concerned about the quality of good that will be received that is why risk management is very important. In regards to the case study it could be said that ATS's customers have good risk management process in place. With their decision to use ATS as a supplier they would have helped mitigate some of the risk in certain areas such as any issues concerning any quality complications, and the ability to provide temperature reading through the full process by having good traceability of the product. Waters and Rinsler (2010) also explain

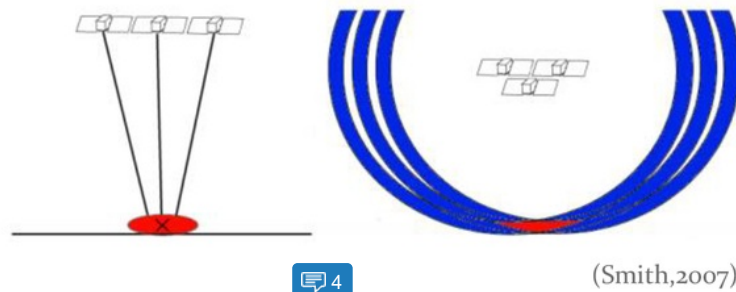
that cost reduction will happen when a company removes non value added time, such as labor requirements. For example, before the technology was utilized the company would have needed a number of employees to fulfill their obligation concerning temperature reading, on the other hand that cost has now disappeared through the implementation of the sensors, employees can be used elsewhere on value added process.

The case study did not specify the monetary cost of the service, nonetheless they pointed out that their return on investment was significantly positive for the company. They described two specific advantages, one being the full integration of the system between the GPS and engine information, which can be used to better understand fuel economy, and more importantly having the ability to assess the drivers to determine if extra training is needed. Secondly with the technology in place the company can now assure current customers and future ones of their ability to comply with all legislative requirements, which has given them a strong advantage against other companies in the industry.

8.o Limitations of GPS

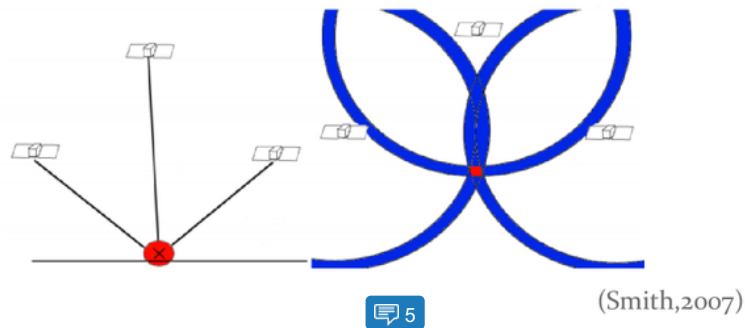
Even though many companies such as ATS are now using GPS as a resourceful tool it is not without its potential problems. Smith (2007) explains that the accuracy of the technology depends entirely on the position of the satellites as shown in image one the satellites used are all above the signal, which could be thought as a good result, but not when it comes to targeting an exact location, because all of the satellites are above they will all produce results going in the same direction.

(image one)



On contrast image two when the satellites are more spread out they each have their own measurement improving the overall accuracy.

(image two)



In regards to satellite accuracy one might think add more satellite, but of course who will pay for such an equipment. Is it a case of it good enough? It's possible.

Where accuracy can be improved by simply adding more satellites the atmosphere can also have a great impact on accuracy of GPS (E-education.psu.edu, 2018) suggests that the earths Troposphere which is the closest part of the atmosphere to earth. As discussed the position of the satellites have a big impact on accurate data. They explain that whichever single travels the shortest path through the troposphere will be least delayed. When discussing satellite location, it was important for them to be more spaced out rather than clustered above the signal to get a more precise reading please refer to images one and two. When the satellites are at an elevation angle to earth of 90 degrees' delay is kept at minimum having only traveled only 2.4 meters through the troposphere, on contrast at a 10-degree angle there will be a delay of 20 meters. It should be noted that there are models in place to account for any delay but they are not 100% accurate.

9.0 Case study 2-Professional Transportation, inc (PTI)

PTI is a provider of third party services to railroad companies. One of it task is to transport employees from one train to another efficiently to mitigate against any delays. large Train companies have spared no expense in regards to crew management systems, but the smaller companies simply do not have the budget to implement significant changes (Vertassets.blob.core.windows.net,

2018). The case study points out that if the small companies are unwilling to adjustment to automated tracking they risk being put out of business. PTI are a company which did not sit around and wait for its competitors to get an advantage. During 2006 PTI identified changes were needed, that why they took the decision to put together a GPS project team. They state that not only have it increased efficiencies and reduced errors, it's also aiding customers to reduce waiting times. When they chose the company to supply their need, it did not come without conflict from the employees, some believing that big brother is always watching, which could make them feel that they are not trusted. To diffuse any conflict good practice would be to discuss any changes to any process, and explain how it's going to improve efficiency and keep the driver safe monitoring speed, also the ability to report accidents immediately (Vertassets.blob.core.windows.net, 2018). By adopting the technology, gone are the days where a phone call would have to be made to locate a driver, now it's as simple as looking at a screen. The system has also helped reduce fuel costs as well as reduce driving miles.

10.0 Conclusion

As shown in the report the role that technology has played in the rise of asset tracking cannot be denied. Firstly, through the Americans adoption of TCP/IP which gave the user the ability to exchange data over the internet, but more importantly the government started to standardised all of their system towards TCP/IP (SearchNetworking, 2018). Even though the introduction of the protocols seeded the internet we have today it simply cannot take all of the credit. The internet today is often taken as right not a privilege, but it is hard to disagree with Enabulele (2008) who describes broadband as the cornerstone of our economy.

Through the development of technology, the opportunity for companies to utilize the ability is being seen, as explained when discussing both RFID and the barcode both have advantages and limitations. One company maybe cost conscious and the cheapness suits their plan, but as discovered the code often get difficult to read due to the environment. It could be said the report discovered more advantages for RFID, and with it now being standardised it could well drive the price down with more companies adopting it.

Both of the case studies in this report made the decision to utilize the technology of GPS, one company made the change due to changes in legislation, the other wanted to be proactive and secure its customers (Vertassets.blob.core.windows.net, 2018). Both companies have seen a vast improvement in the reduction of labor hours and other benefits, also not to be forgotten ATS stated that the impact of the system has had a significant positive return on investment, which is important for shareholders.

It is important to understand that every form of technology has some limitations, as discussed in the report regarding barcode and RFID. GPS is no different Smith (2007) explained how the placement of satellites can have an impact on the accuracy. Not only the position of the satellites, but also the angle is important for it effects the delay of the signal as (E-education.psu.edu, 2018) explained.

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FINAL GRADE

64/100

GENERAL COMMENTS

Instructor

Using case studies critically evaluate the application of asset tracking technologies in the movement of goods and people.

Your submission should be in the form of a report with a target word count of 2,750 words (+/- 10%).

Assessment criteria:

Critically evaluate the extent to which the logistics industry have adopted joined up information technology solutions with regard to the movement of goods and material.

Word Count 3117

Interesting assignment, but lacked the critical evaluation element which dropped your marks, you need to be more careful. You need to deliver what the assignment is asking for. Never the less. Good effort well done.

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Comment 1

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Comment 2

goods



Comment 3

Walter & Rinsly (2010)

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Comment 4

The image is what?? (Title)

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Comment 5

Image title

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Comment 6

Incorrect reference: It is ISO 17365-2003 xxxxxxxxxxxxxx

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Comment 7

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