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# POTENTIAL OF MOBILE APPLICATIONS AIDING LOGISTIC PROCESSES

## Abstract:

This paper aims to give an overview of the potential which mobile applications have in aiding special logistic processes like warehouse management, fleet control and tracking, document handling, etc. In the previous decades industrial solutions dominated the software market. These solutions were highly reliable but also very expensive and not flexible in respect of implementing modification needs. The sudden evolution of mobile technology made it possible to apply cheap or even free applications to aid logistic processes. This paper deals with the main advantages of using mobile apps in supporting certain processes which are usually the cost factor, flexibility and easy system migration possibilities.

## Keywords:

mobile applications, logistic processes, process management

**JEL Classification:** M11, M15

## Introduction

According to the GSMA report (GSMA, 2015) now half of the world's population (3.6 billion people) has a mobile subscription. The report predicts that by 2020 the number of subscriptions will grow by additional 1 billion. 3G coverage will reach 86% of the world's entire population. The pace of 4G developments is much higher than as of the 3G deployments. Mobile applications have become the part of people's everyday life, thousands of dedicated apps are developed even for marginal (sometimes useless e.g.: "smile counter app") civil activities. The obvious cause of this popularity is the relatively low development costs, the cheap devices and the worldwide market accessible on all the devices. In general the development cost is relatively affordable for an individual. Of course the development cost depends on the skills of the developer and the complexity of the application. As known mobile applications are not developed for only personal use but the evolution of the technology resulted in a breakthrough in industrial IT systems as well. There is a wide range of mobile apps, software packages that can be useful aid for logistic processes within companies. These applications are linked to or part of the corporate ERP systems in many cases.

This paper tends to give an overview of the opportunities in developing logistic process aiding mobile applications at small and medium size companies.

### 1 Evolution of IT system in logistic networks

The mobile industry explosion resulted in the deployment of different mobile telecommunications technology networks (GSMA Report, 2015). Figure 1 shows that by 2020 the spread of 4G networks will be so significant that the quick and reliable industrial transfer of big data can be achieved on the territory of developed countries.

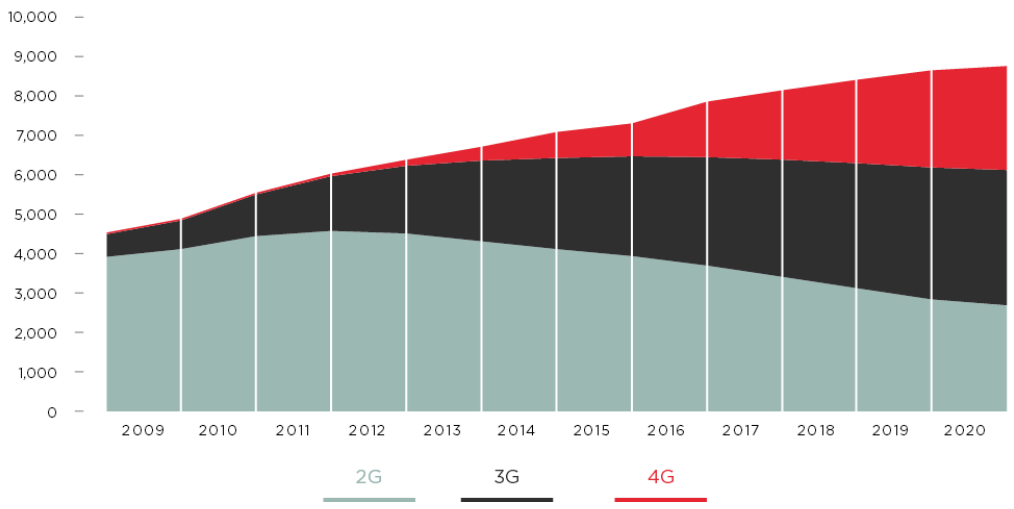


Figure 1. Spread of telecommunication technologies GSMA Report 2015)

The evolution of equipment also met the goal to being able to handle data management in industry/logistics. Fix workstations started to be lighter and lighter, phones became small computers and the functions of industrial PDAs also expanded (Figure 2.). Finally we got to the birth of 2 in 1 mobile computers with touchscreens. This evolution made it possible to eliminate the time and distance gap between physical processes and information management.

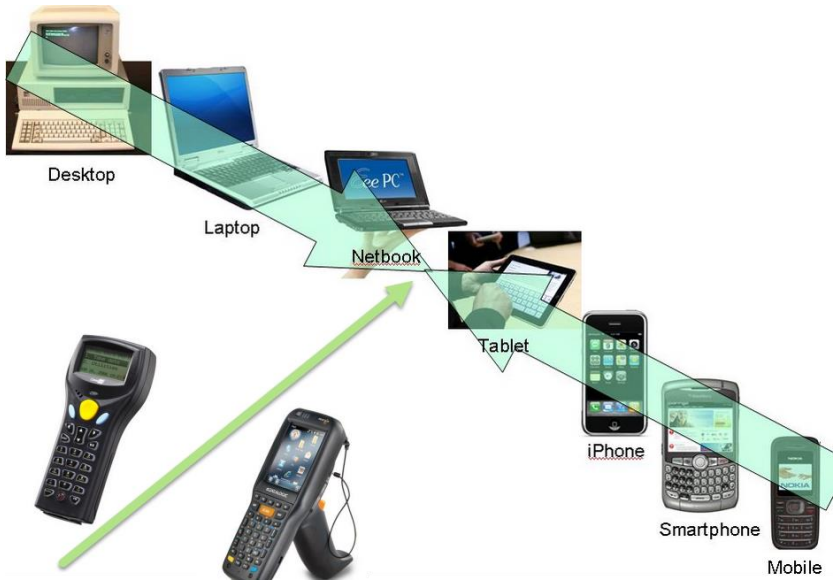


Figure 2. Evolution of mobile equipment (source: mobilecomputingproject.wordpress.com)

## 2 Evolution of logistic applications

ERP systems evolved from isolated accounting applications and since the 2000s they are capable of controlling not only single companies but entire supply chains. The main idea of ERP is to eliminate redundancy in the IT system and being able to integrate the data management of all corporate activities and functions. In the first place - as shown on Figure 3. - isolated applications for aiding logistic processes emerged and slowly merged with other functions (e.g.: warehouse management functions merged with purchasing) (Ballou et al, 2006).

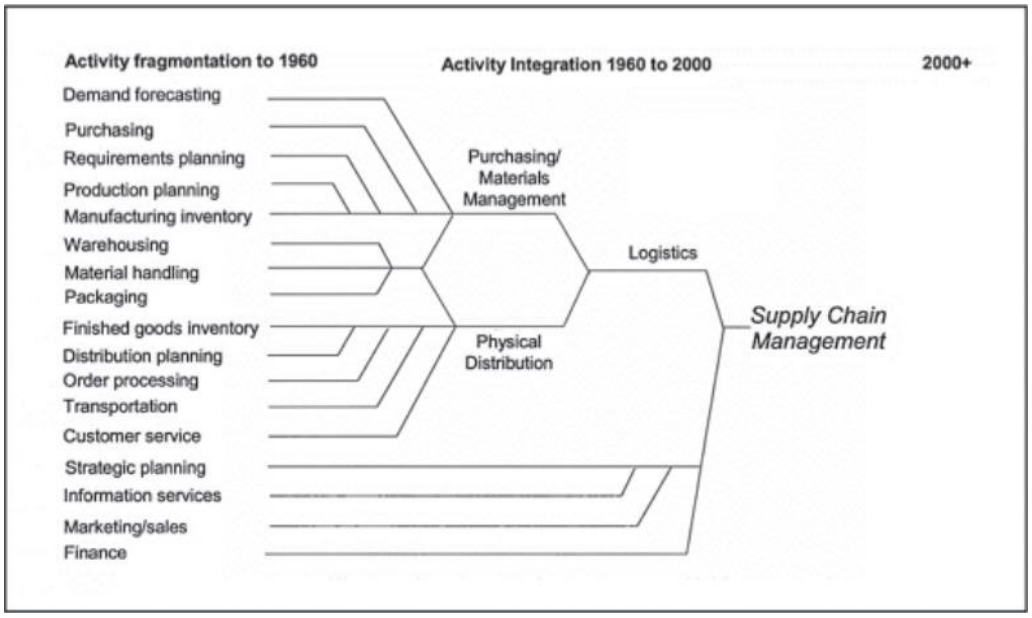


Figure 3. Evolution of supply chains (Ballou et al, 2006)

Su and Yang demonstrated that firm competences of SCM in planning and control process integration are positively impacted by operational, business process and management, and strategic IT planning benefits of ERP (Su and Yang, 2010, p456). The ERP 2.0 tools ensure the user-friendly connection between users and the “huge mass” of data (Grabot et al., 2014, 976). However in many cases ERP providers cannot focus on side professional activities so that the company needs to apply side applications provided by experts of the specific field (e.g.: Daghfous and Barkhi, 2009, p588). These isolated solutions can be usually linked to the ERP but with a certain deployment cost and in several cases the full data integration (redundancy elimination) is not achieved. Mobile apps help to achieve the concept described by (Bauer et al, 2014) transparent, clear, holistic visualization of logistic system.

There are several benefits of using mobile apps in logistics. One of them is the coordination of off-premises processes like delivery, responsibility takeover, construction management, asset management. Both the business partners and employees benefit from the customer experience.

The main processes in which data collection and management is crucial and isolated mobile applications are often used are the following

- Inventory and warehouse management:
  A lot of features and potential support the application of mobile technology: bar-code scanning, signature recognition, GPS coordinates, cloud storage, etc.
- Fleet tracking
  GPS tracking, transaction log, connection with on board devices
- Freight tracking
- Transport/goods tracking: booking, delivery time, driver contact, etc.
- Other transportation related functions (recording driving and rest time, document handling, fuel consumption registration, etc.)
- On-the-spot data collection and data mining (inventory transaction logging, timesheet entries, delivery status modification). GPS location, timestamps support the tracking and productivity checks.
- Data collection of various activities in order to measure efficiency, cost price, etc.
- Project management
- Production planning
- Report/query/KPI generation (e.g.: Wang et al, 2014) (Ying et al, 2014)
- CRM – booking, purchasing, invoicing, sales, quotations, etc.

Figure 4 shows the main processes of a manufacturing company. If this company is under a certain employee size and the transactions are under a certain number the processes can be managed with isolated mobile apps. Of course an integrated ERP system with mobile terminals is far more effective, safe and usable. With isolated apps and software there will be data redundancy and instable operations but according to my consultant experiences it is the way how micro companies mostly work.

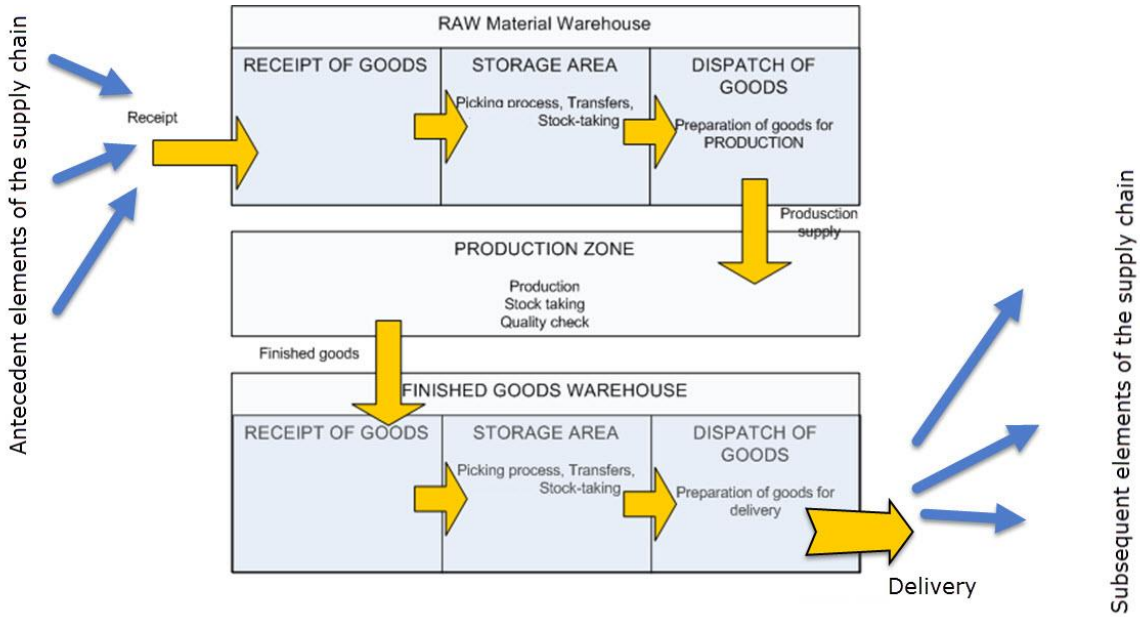


Figure 4. Processes within a production plant (source: own)

The logistic processes to be handled by IT system are determined by the size and profile of the company. Under a certain company size it may not worth to develop a fully integrated and customized ERP system.

Several apps support the resource and asset management, time scheduling. Sole traders or very small companies usually lack the background or potential to improve their IT infrastructure in a sophisticated way while operating complex logistic and other business processes (i.e.: sole trader courier, drivers). Table 1. shows the (1-irrelevant/less important, 2 -neutral, 3 – important). Starting to use a mobile app or dedicated software for a core activity means lower risk for a micro company or sole trader because of the few number of transactions. It is obvious that the risk of delayed deployment or malfunction is higher at bigger companies.

| | | Weight of consideration aspect | | | | |
|---|---|---|---|---|---|---|
| | **Employees** | **Setup costs** | **Working hours of deployment** | **Leadtime of deployment** | **Risk of setup** | **Affect on core activity** |
| ERP integration | | | | | | |
| Sole trader | 1 | not used | not used | not used | not used | not used |
| Micro business | 1 - 9 | 3 | 2 | 2 | 2 | 2 |
| Small business | 10 - 49 | 3 | 2 | 2 | 2 | 2 |
| Medium-size business | 50 - 249 | 3 | 3 | 3 | 3 | 3 |
| Large companies | 250 - | 2 | 3 | 3 | 3 | 3 |
| Dedicated application with company customization | | | | | | |
| Sole trader | 1 | 3 | 1 | 2 | 2 | 3 |
| Micro business | 1 - 9 | 3 | 1 | 2 | 2 | 3 |
| Small business | 10 - 49 | 2 | 2 | 2 | 2 | 3 |
| Medium-size business | 50 - 249 | 1 | 2 | 3 | 3 | 3 |
| Large companies | 250 - | 1 | 2 | 3 | 3 | 3 |
| Non-customized apps and dedicated softwares | | | | | | |
| Sole trader | 1 | 3 | 3 | 2 | 2 | 3 |
| Micro business | 1 - 9 | 3 | 3 | 2 | 2 | 3 |
| Small business | 10 - 49 | 2 | 3 | 2 | 2 | 2 |
| Medium-size business | 50 - 249 | 1 | 2 | 3 | 3 | 2 |
| Large companies | 250 - | not used on company level | not used on company level | not used on company level | not used on company level | not used on company level |

Table 1.: Importance of different types of applications per company size (source: own)

## 3 Conclusion

The explosion like evolution of telecommunication, mobile technology and IT equipment caused a sudden change in logistic IT infrastructure too. Cheap and quickly applicable mobile apps can solve the logistic management at certain levels. The application of ERP systems is only beneficial above certain company size and process complexity.

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