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INTRODUCTION OF INFORMATION TECHNOLOGIES IN SUPPLY CHAIN MANAGEMENT

Abstract: The article addresses the development of mobile applications designed to automate business processes in logistics. It examines the challenges associated with optimizing the workflow, finding the critical path of multiple supply chains, as well as the possibility for sales agent to quickly track the location of goods online.

Key words: supply chain, customer relationship management system, automated business processes, mobile application, critical path, cost reduction.

Nowadays trade and commerce are the main types of enterprise employing the majority of the workforce. Thus, trading companies have to work with large amounts of data connected with suppliers and buyers, to take into account a considerable number of aspects related to sales, delivery and communication with contractors. Therefore, modern agents need an information system that will support commercial solutions and automate the process of paperwork.

Many programs have an aim of supporting the work of commercial agents. The majority of them use the iOS operating system, which has created the need to develop similar programs for the Android platform. The distinguishing feature of the proposed application is the function of automatic determination of delivery date with the minimal time and costs taking into consideration the client's preferences. In addition, the application allows controlling and managing the work of agents by automating paperwork, gathering and keeping large volumes of sales and shipping data. Moreover, the devised information system will provide the opportunity to visualize the ratio of interests of suppliers and buyers, and determine the best delivery path.

The purpose of this article is to explore the possibility of creating and implementing the information system that will ensure efficient interaction of counterparties on the market, optimize the documentation processes by showing the movement and shipment of goods and by automating the optimal path search to meet suppliers' and buyers' needs.

To achieve the goal, the following tasks are to be performed:

1. Statistics analysis
2. Analysis of the suggestions of the main stakeholders
3. Application relevance examination
4. Establishing the functionality of the application taking the statistical data and user preferences into account
5. Identification of the optimal technology for the application

To analyze the current situation, the following applications have been selected: "1C: Orders"," SupeRep", "My price list", "Ring-It-Up", "Orders-sales manager" [1]. To assess the above applications, we have chosen five main indicators that reflect their core functionality:

1. formation and provision of primary documents and a variety of consolidated documents;
2. informing about orders and jobs;
3. accessing the product database;
4. using the database of contractors;
5. using own built-in instant messenger

Based on feedback from users, the applications were rated according to the indicators on the scale. The results are presented in Figure 1 below.

Having studied the opportunities of the existing apps, we determined that their functionality can be extended. For example, it is possible to add the function of tracking the current position of goods and choosing the most optimal path based on two metrics: delivery time and cost. In addition, all five programs were developed using the operating system iOS, so there is a need to integrate them into other platforms so that you can use these applications on other operating systems.
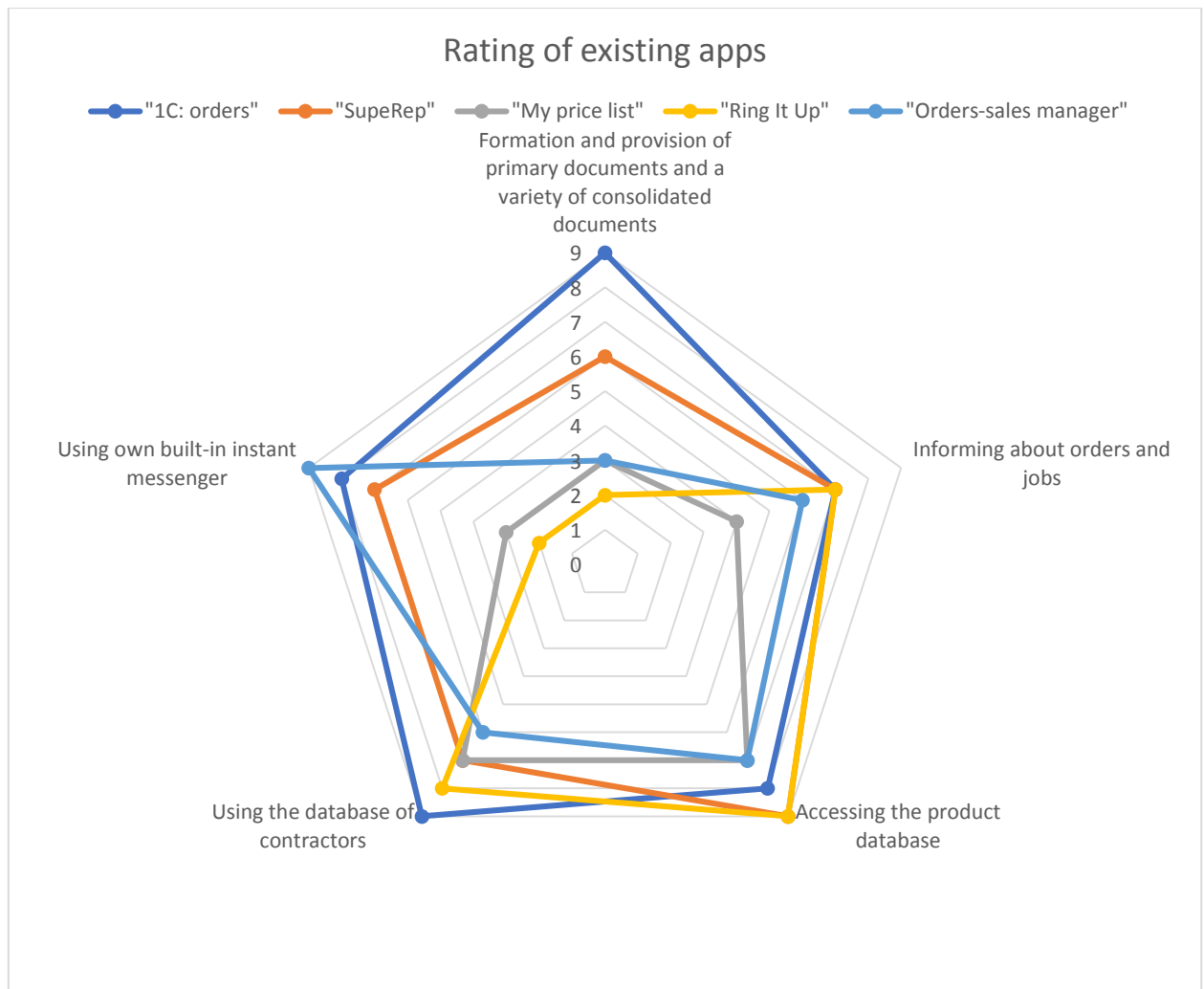
Figure1 - Existing applications

To determine the sets of functions, we have chosen the next types of users [2]:

    −   providers;

    −   sales agents;

    −   buyers.

We described the functions that the program will provide for each kind of users to satisfy their needs (Figure 1).

The application functionality will be built on the requirements of the users (Figure 2). Thus, it is proposed to create three models of user behavior. Each of them will provide the necessary services for each user. The following are the main functional requirements of the system, which will

    −   provide user registration function granting users different permissions within the system;

    −   ensure the collection of user data;

Free storehouses

Tracking the status of current orders

Access to the users directory

Customers' orders vs suppliers' proposals visual correlation

Access to the information about

Goods in stock

immediate data sorting

Access to the customers' database

Multiple queries execution

Path tracking of goods

Building networking models to optimize delivery

Responding to customer queries from the Customer Feedback Book

Sales agent

Generating shipping documents

Instant messaging

Generating entry documents

Creating and editing a product catalog

Exchanging order forms with sales agents

Supplier

Buyer

Access to the Customer Feedback Book

Exchange forms of entry with sales agent
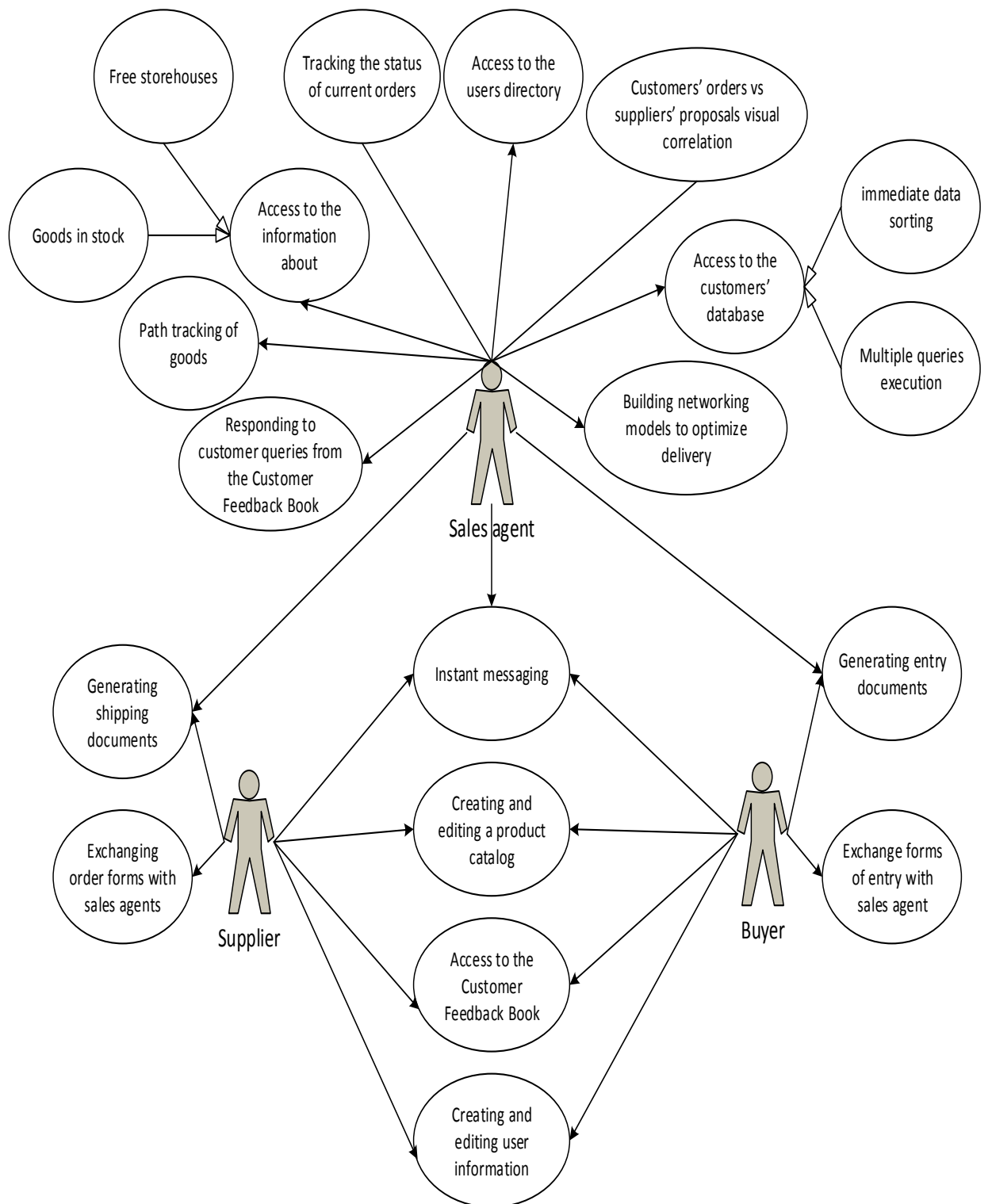
Creating and editing user information

Figure 2 - Requirements of users

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- automate document generation for transactions [3];
- provide the exchange of messages between the users;
- provide the ability to create, edit and view product catalogues;
- provide the option to collect user feedback;
- be able to track the status of current orders;
- be able to track goods in transit [4].
- visualize the ratio of buyers' and suppliers' demand and supply
- build models to select the critical path for delivery according to one of the parameters: time or cost
- present the database in the user-friendly format so that data can be sorted and issued quickly
- display relevant information about the availability of the goods in warehouses.

Figure 3 gives an example of how the designed program can be used, namely the process of execution of an order by a sales agent. It clearly shows how the program operates at every step in the process to facilitate the work of the sale's agent.

We propose creating native applications because they have a nice interface and uninterrupted interaction with the mobile operating system. Native applications are also much ahead of both the hybrid and web-based security applications. They require minimal resources: a camera, a microphone, an accelerometer, a player and other devices. In addition, in the course of the application design, it is planned to use the libraries of asynchronous communication with the Robospice + Retrofit server, the JSON data exchange format and the Jackson library for convenient mapping of JSON to models implemented in Java, asynchronous loading and caching of images using Glide [5].

The proposed mobile application will automate much of the routine sales agent's work, speed up the process of formation and execution of orders; reduce costs associated with delivery and workforce, and increase the income of the trading agent and their competitiveness.
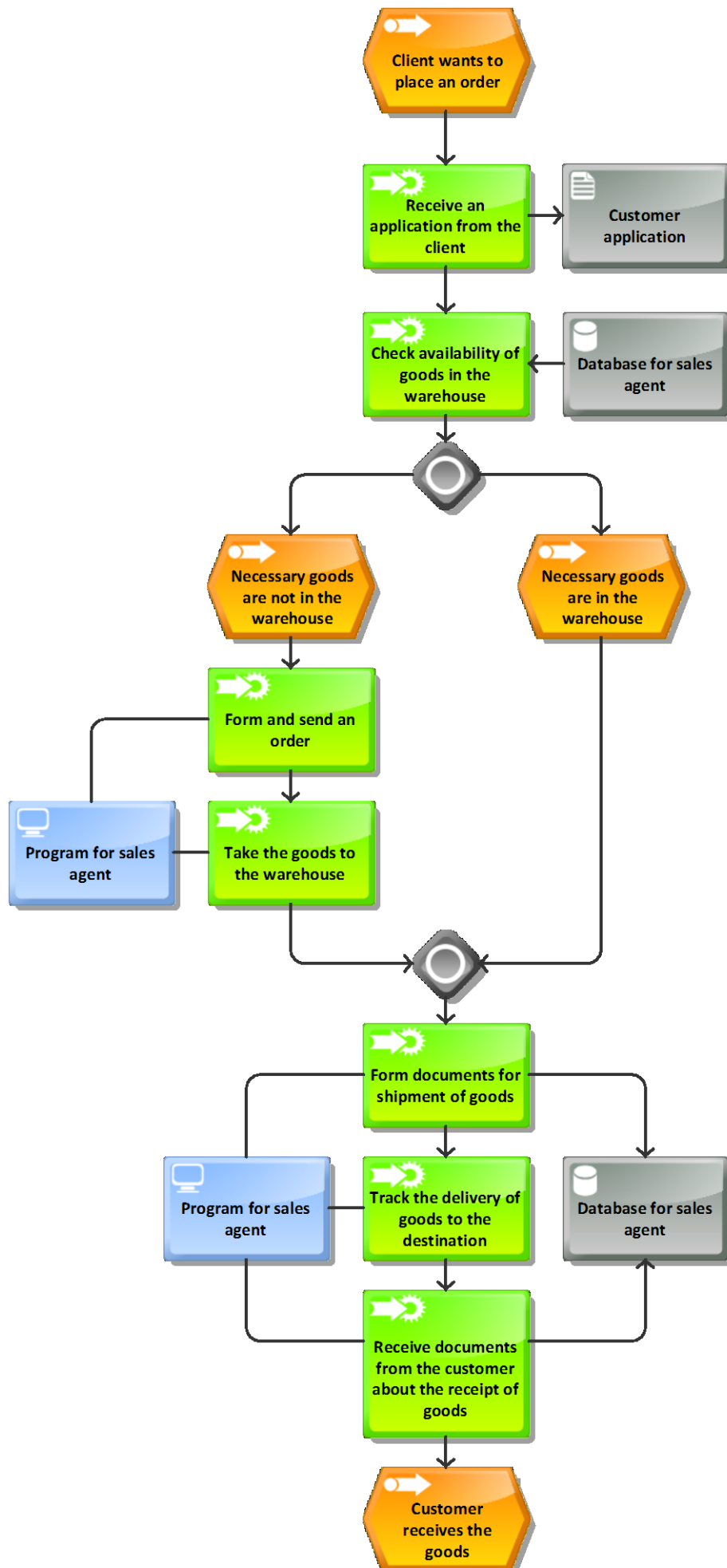
Figure 3 - A sample order execution

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ВНЕДРЕНИЕ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ В УПРАВЛЕНИЕ ПОСТАВКАМИ

Аннотация: статья посвящена разработке мобильного приложения, предназначенного для автоматизации бизнес-процессов в логистике. В данной работе рассматриваются задачи, связанные с оптимизацией документооборота, нахождения критического пути из множества сетей поставок, а также возможности торгового агента оперативно отслеживать местоположение товаров в режиме онлайн.

Ключевые слова: цепи поставок, система управления взаимоотношениями с клиентами, автоматизация бизнес-процессов, мобильное приложение, критический путь, сокращение издержек.

СПИСОК ЛИТЕРАТУРЫ:

1. 8 приложений для управления продажами [электронныйресурс]. - URL:http://zillion.net/ruри/blog/1122/8-prilozhienii-dlia-upravlieniia-prodazhami (дата обращения 20.10.2017).

2. Documentation for the shipment and acceptance of goods [электронный ресурс]. - URL: https://e-kontur.ru/enquiry/129 (дата обращения 21.10.2017).

3. GPS-monitoring of the current situation [электронный ресурс]. - URL: https://mobi-c.ru/gps-kontrol-sotrudnikov.html (дата обращения: 25.10.2017).

4. Mobile application development technologies [электронный ресурс]. - URL:http://group-global.org/ru/publication/63343-tehnologii-sozdaniya-mobilnyh-prilozheniy(дата обращения: 20.10.2017).

5. The main intermediaries in the B2B market and their characteristics [электронный ресурс]. - URL:

https://studme.org/84419/marketing/osnovnye_posredniki_b2b-rynke_harakteristika (дата обращения 25.10.2017).