THE MOBILE ORDERING SYSTEM WITH THE PDA END THE MOBILE PHONE

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ABSTRACT

The work goal was to create an effective tool for supplying companies sales representatives to make their activities easier and more effective. It represents the communication improvement and acceleration between the branch and the salesman, the limiting of human factor influence on the order processing regarding errors, the acceleration of order processing, live offer related to the stock inventory, and last but not least, the quicker information feed for the customers and for salesmen.
Keywords: mobile ordering system, PDA, mobile phone

1. INTRODUCTION

The Razat Style Ltd. products distribution is carried out by menus of the ROE method (Remote Order Entry). Sales representatives visit their customers and generate new orders which are transferred to the central office then. There takes place the order processing in the stock information system and goods forwarding to the customers. Sales representatives do not use any computing device. They exclusively use the "pen and paper" method. There is no unified products catalogue according that representatives would offer goods. The web pages as an alternative offer for pertinent parties concerned are man-made and its updating is depending therefore on the human factor. The proposed solution is not a replacement of the current information system (onward abbreviated as IS) but exclusively its superstructure implementing the new way of entering and processing orders. The proposed system will be mentioned as Mobile Ordering System (MOS) thereinafter. Data are moved ahead to current IS for further processing according to the current procedures via data interface. The proposed system should replace the current "pen and paper" way of accepting orders.

2. BASIC RESOURCES

2.1. Operational System Pocket PC 2002

Comparing the user interface graphic design between older operational systems Windows CE and Pocket PC 2002, we can relate the comparison to the difference between Windows 98 and Windows XP [Trnečka, 2003]. The similar comparison would result from encapsulated technologies here the differences are not so evident at a glance but they are all the more significant. The new operational system is much more sophisticated in terms of graphics and in colour what will contribute to the better control and the user comfort. The new Microsoft technology namely provides the users with more technological possibilities especially in wireless connection in the range from local networks (802.11a,b,g) and personal networks (Bluetooth) till remote networks (CDPD, CDMA, GSM or by means of duplex solutions using existing operator networks). The Pocket PC 2002 accompanying software includes also the new Server ActiveSync technology which enables the direct server synchronization of mail, calendar and contact between Pocket PC 2002 based equipment and Exchange 2000 servers. The ActiveSync Server is supplied as a Microsoft Mobile Information 2002 Server component and its design support the fixed and wireless interconnections.

2.2. Communication Tool PDA Compaq iPAQ 3870

- Processor: 206 MHz Intel strong ARM 32-bit
- Memory: ROM 64 MB, RAM 64 MB
- Display: HR/TFT LCD 240 x 320, 65000 colours, adaptation according to the surrounding light conditions
- External Memory: Slot for the SD memory card
- Battery: Lithium Polymer type – capacity of about   14 hours of operation
- Weight: 190g

Supplied Software: iPAQ Task Manager, IBM via voice command and control, iPresenter PowerPoint Converter for Pocket PC, Dashboard Encryption, Java VM, eWallet, Sega Game Pack, Vegas Game Pack, iPAQ Reference Guide... Communication Possibilities: Integrated Bluetooth technology, Mini Docking Station connection via serial interface or USB interface or the IrDA port with 115kbs.

2.3. Development Tools

Microsoft® eMbedded Visual Tools 3.0 is a complete development environment for applications and software components for platforms marked as Windows Powered, for instance for the class Pocket PC devices. The successor of that development environment is Microsoft eMbedded Visual C++ 4.0. The big advantage is represented with eMbedded Visual Tools 3.0 autonomy what means that we do not need any other development environment, for Visual Studio or the newest Visual Studio .NET version. The component part of eMbedded Visual Tools 3.0 installation are Software Development Kit supporting modules aimed at the device we are developing the application for. We keep the modules for Pocket PC and Handheld PC at our disposal. It is possible to extend the installation with the modules for the platform Smartphone 2002 and Pocket PC 2002. These modules are supplied in the form of SDK (Software Development Kit). We can separate the eMbedded Visual Tools 3.0 development environment in two almost independent blocks:

- eMbedded Visual C++ 3.0,
- eMbedded Visual Basic 3.0

3. COMMUNICATION SYSTEM

3.1. Application Server

The application server is built up on the Linux platform and all its software accessories are free of charge. We have chosen that policy because of MOS implementation cost reduction. The other reason for such policy was the fact that individual users are not supposed to access application server so that the user-friendliness of the operational system and application program is not so important. The whole user side of the server servicing is solved via web interface. The user can access it from any computer connected to the Internet. We have selected the MySQL database system for data holding on the application server [Ľacko, 2003]. It is a wide-spread data server above all in the area of web applications and it is fully adequate for our needs. The application itself is written in the PHP 4 programming language which is frequently used for such application development and moreover, it is free of charge even for the commercial use.

3.2. Client Terminals

The reason for the Pocket PC 2002 platform selection was its simple intuitive operating, its effortless accessibility and its consequent extensibility. We also had a respect to a fact that the Razat Style Ltd. Company uses the Microsoft operational systems so that its sales force does not need to get into a new user interface. Last but not least argument for our decision making was the experience and abilities of the realization team and the platform program set-out. The programming tool eMbedded Visual Tools 3.0 was chosen for the MOS client part programming [Krčmář, 2003]. This comprehensive tool offers enough means for the MOS client part realization. As mentioned hereinbefore, it includes two programming languages each of them designated for different area of application. eMbedded Visual Basic 3.0 did serve as a very quick tool for the user interface creation and for establishing accesses to the local database. Nevertheless as revealed itself during the project processing, it has its disadvantage in speed of application when dealing with higher data volumes, for instance during searching the

catalogue or its listing on the screen. That problem was solved with the help of individual program code parts optimization and reducing the set of processed data in one moment. We also used the language eMbedded Visual C++ 3.0 namely for the creation of quick functions not included in Visual Basic and for the module for data synchronization with the application server. That module is not a part of client terminals basic application. The external application triggered from the main application and running independently on it serves for that purpose.

4. PRACTICAL SOLUTION

4.1. Application Server

It was necessary to create a separate data storage area for MOS because the current IS is a locked program system without any intervention possibility for the development team. There was composed a store mechanism for remote access in the data storage area from mobile terminals for bidirectional data synchronization – recording the up-to-date catalogue and clients address list in terminal and transfer of new orders and new clients from the terminal to the application server. There is a "front-end" component with simple intuitive interface (web application) at the application server. This component facilitates process with stored data. The stored data process means mainly orders browsing, new clients added to the system by the sales representative approval, review, summary report and statistics generation, user accounts administration, catalogue browsing and relevant picture to the catalogue items allocation. Only users with official account on the application server have access to that application. The authorization process asks for user name and password. Each user has his particular role influencing his rights according to the data access. The sales representative creates in this application his personalized catalogue with his own description for individual items. Data access is possible from any computer with web browser installed and with the Internet connected.
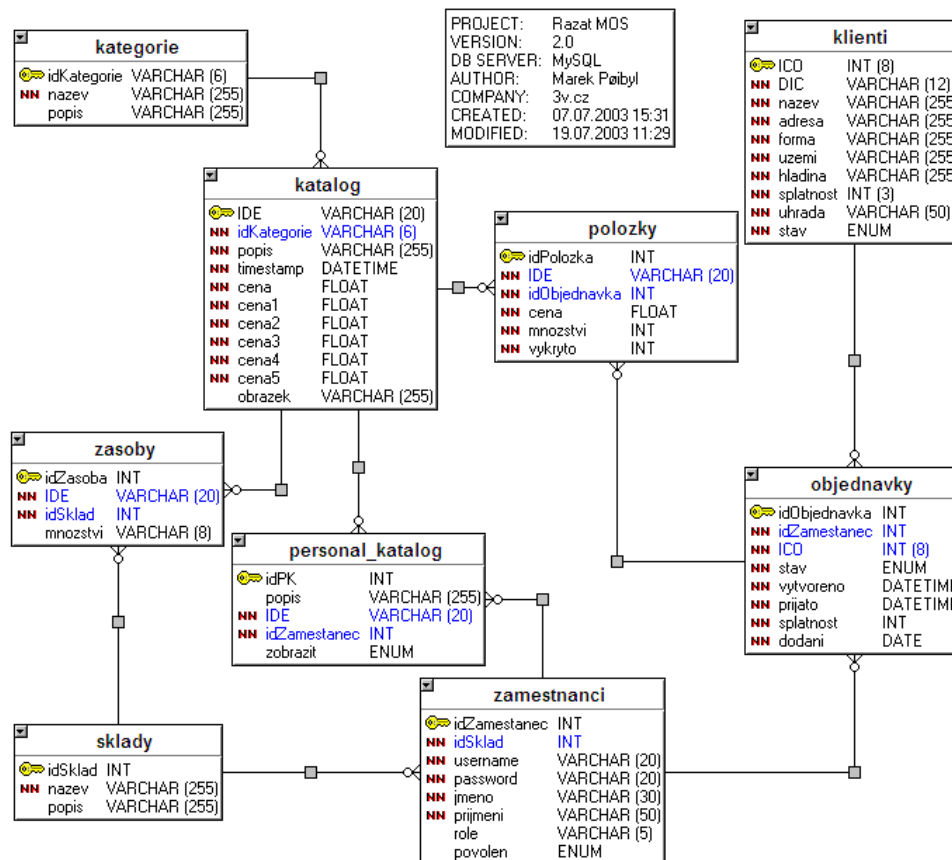

Figure 1. E-R diagram.

4.2. Client Terminals

Each member of sales force is equipped with a pocket computer of class Pocket PC with relevant user software and with a mobile phone supporting the fast data transfer based on the GPRS technology. There is an actual branch stock state stored in the client terminal. The branch is related to its client address book and state is related to the time of terminal record. The sales representative has possibility to update the stock state and client address book via a secure connection to the application server or directly via intranet at the branch site at any time. The orders are recorded directly in the PDA and then locally stored. Only one order at most can be related to the particular client from the address book. That order can be in the semi-finished state for later editing. The finished orders are marked as closed and it is not possible to edit them any more. Any sale representative can send new created orders for processing to the application server from anywhere and at any time providing there is the GSM signal coverage. Only finished orders no semi-finished orders are sent to the server. The successfully transferred orders are deleted from the terminal. The application offers the addition of a new client in the address book. The information about new clients is sent together with new orders related to those clients. Pocket PC serves also as an offer catalogue for presentation at the client site. The application facilitates the items searching according to various criteria and also creation of filtered catalogues. The application offers also the possibility to download the relevant picture to the particular item from the application server. There is an export function for the catalogue in various data format (CSV, XML and HTML) in the software as well and it makes it possible to store the exported catalogue in the client computer [Bradley, 2000]. The application start in the PDA is secured with the access password.

4.3. Data Converter

There was necessary to create a component "Data Converter" as an extension of IS which ensures the data exchange between the current IS and MOS. The data transfer from IS to MOS includes the stock actual state export, customer address book export and accepted and processed orders export. The export is limited only on data relevant for orders creation. The data transfer from MOS to IS includes the insertion of newly accepted orders from sales representatives and from new clients.

5. CONCLUSION

There was a remarkable increase in the accuracy and speed of orders processing after the MOS system implementation. The big asset of the new MOS system is an immediate possibility for a sales representative to find out the actual goods stock state and accommodate the count and price for individual article. That MOS system quality represents the financial advantage not only for the Razat Style Company but even for their customers. It has also proved that the PDA article presentation saves often time and money consuming paper catalogue printing and distribution in case of improvements and innovations. With the new MOS system, the innovations can reach the customer much earlier and for the more reasonable price.

6. ACKNOWLEDGEMENTS

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