Access Control and Management in B2C Model of Electronic Commerce

Irina Noninska

Abstract: The paper discusses main characteristics and functionality of “Business-to-Consumer” model of electronic commerce (e-commerce). All participants in this model are divided into separate groups according to their participation in the business processes. As a result a hierarchical structure with four levels is proposed, which is intended to realize access control of the users and transactions management. It is a part of the Business Management System in B2C model and could be implemented for customizing, analysis of Web sites, planning and development of data security according to the new tendencies in e-business and contemporary computer technologies.

Key words: Model “Business-to-Consumer” (B2C), e-Commerce, Access Control

INTRODUCTION
There exist three basic models which can present all processes and main characteristics of different e-commerce systems: “Business-to-Business” (B2B), “Business-to-Consumer” (B2C) and “Consumer-to-Consumer” (C2C). Some new models are designed in order to define how a Government takes part in electronic transactions, such as “Business-to-Government” (B2G), “Government-to-Citizens” (G2C) and “Government-to-Government” (G2G) [1,2]. Recently, the B2C direction is the most perspective and successfully implemented part of e-commerce because business of all types are rapidly moving toward electronic communication via the Internet. Moreover the retail trade, which is closely connected with consumers' demands plays a prominent part in today's e-commerce. Key characteristics of a B2C system could be defined on the basis of real-world shopping experience and specific requirements of the Internet. All transactions take place across the open network, hence the customers have unrestricted access. As soon as users make payments mainly by using credit cards, the B2C systems are obliged to employ algorithms for credit cards identification and verification [3]. A business-to-consumer Web site should not only be easy to use, but also should offer partners some benefits as low cost and data security. It should be user-friendly in design and have to deliver the required information with minimal wait time, as well [4,5].

The paper discusses basic characteristics of B2C model and main requirements for B2C Web site e-commerce design. An approach for access control of the users is proposed which could be implemented for transactions management in B2C model and helps analysis of of B2C Web sites.

B2C MODEL – CHARACTERISTICS AND FUNCTIONALITY
The B2C model represents two types of electronic partners – trade companies and customers. It is designed to organize direct purchases on the Web by end users. The scheme of B2C model is shown in fig.1.

![Fig. 1. Functional scheme of B2C model](image-url)
The left part of the scheme consists of two main components. The first is a trade company, which deals with small business customers. It must design the product catalog and makes it available to users on Internet. For that purpose a management system is organized that realizes all business processes and is closely connected with Internet. This business management system is the second component, which is used also for managing human resources and business infrastructure as a whole. The other business opportunity, which could be offered by the left part in fig.1 is support of services for customers. The basic activities of a typical business are: design, production, marketing, delivery and support of goods. All they add cost and value to the product or service and form the so called “value chain”. Hence, the efficiency of e-commerce by using B2C model depends on the Business management system.

The right part of the scheme includes consumer and an Inside management system, which is intended to organize data exchange between a consumer and its partners. This management system, in contrast to the Business management system is not closely connected with Internet. It is an intermediate component of the right part, which have to be designed to complete the B2C structure. Hence, the business processes concerning consumers in B2C model could be realized only by using the Inside management system. The Administrator of the system receives necessary information from a trade company and after it processing could input obtained data into the Inside management system in order to realize the corresponding business processes.

**ACCESS CONTROL IN B2C MODEL**

One of the most important requirements for business processes and their management in B2C model is concerned to security features that control Web site access for customers, e-partners, operators and administrators. A successful Web site should not only deliver users the data, which they require, but it should also be secure and restricted to business partners. An approach for access control in a B2C e-commerce model is proposed bellow. The purpose is to realize security functions for the model as a part of the Business management system.

All participants in B2C e-commerce model could be divided into several groups according to their participation in business processes. As shown in fig.2, they construct a hierarchical structure with 4 levels. The first level (the lower one) is occupied by common users – CONSUMERS. They can require and obtain information, products and services from Web sites by using electronic catalogs, electronic documents and electronic payment systems. These processes are managed and performed by the Inside management system. Thus, the second level is occupied by the mangers of consumers' part in B2C model. They use a database (DB) which is structured in order to store the information for all users, registered in the system. As soon as the consumers from the first level have no any rights except using different Web sites, the level MANAGERS is responsible for tracing the consumers’ operations. All data are stored in DB and are used for reports and graphics concerned to Web site utilization. The proposed scheme provides five types of forms and reports, as follows:

- General report – it includes parameters, chosen for analysis of the Web sites as a whole: total number of the users; number of users per day/week/month, etc.; most usable browser, Operating system, etc.; classification of the regular users; users-visitors ratio;
- Reports with general time characteristics – they include data concerning frequency of users’ visits and the most visited times – hour, day, month, etc.;
- Reports with statistical data: frequency of visits for the last month, for the last year and since the time of Web site design;
- Forms with new registered Web sites and Web sites revocation list;
• Forms with registered users and their requirements.

Actualized data from these forms and reports are sent to the SYSTEM ADMINISTRATOR from the next higher level to manage the processes in B2C model e-commerce. The level 3 which is designed by using the approach, described in [6] deals mainly with access rules and access methods of the system. They are defined by the SECURITY ADMINISTRATOR that is responsible for restricted access to Web sites, consumers’ access rights, his passwords and all security functions, as shown in fig.2. All they are used to protect defined data, information structures, transactions or Web sites as a whole. The System Administrator uses a DB with passwords of regular consumers, their requirements and access rights. It processes and stores information concerning special regimes intended to serve chosen consumers and Web sites and is able to register any violation in journal files. Hence the System Administrator realizes a flexible connection between definite requirements of the security system (level 4) and the rest components of the B2C model. The Security Administrator coordinates all security processes and is responsible for access control and management of the system as a whole. This main component of B2C model could realize planning and development according to the new trends in e-business and contemporary computer technologies.

The proposed scheme could be implemented at the root of the system which includes also modules for: analysis of Web sites, creating and transmitting purchase orders, customizing, etc. It is closely connected with a system for dynamic access control. In this way a B2C model becomes more flexible and useful for both – trade companies and consumers.

CONCLUSION

There are many differences between providing customers electronic access via a private network and an open network, such as the Internet. One of the most essential is information flowing – over the Internet it is accessible to everyone connected to the network. Therefore transactions performed during a secure session over the Internet are
substantially less secure than transactions performed over a private network. In order to involve more customers in e-commerce via the Internet, it is of great importance to complete existing structures with security functions. This is one of the directions which have to be developed to make a B2C model of e-commerce practical and available not only for big trade companies, but for small-scale business, as well.

REFERENCES

ABOUT THE AUTHOR
Assist. Prof. Irina Noninska, PhD, Department of Computer Systems, Technical University-Sofia, Phone: +359 02 965-34-71, E-mail: irno@tu-sofia.bg.