



DESIGNING FEATURES OF ARCHITECTURE FOR ELECTRONIC CONTENT COMMERCE SYSTEMS

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Abstract

The article analyzes and summarizes the tools, information technologies and software of basic task analysis in electronic content-commerce systems. The functional scheme of electronic content-commerce systems are developing, using the module of information resources processing. The paper provides detailed descriptions of modular architecture elements, of the electronic content-commerce systems functioning, their objectives and principles of implementation. The article also explores the major functional elements of the system and presents the electronic content-commerce systems scheme of the most significant mechanisms. In the paper are analyzed sequence methods and models of information resource processing in electronic content-commerce systems. It also allocates the basic laws of the transition from commercial content formation to its implementation. Created formal model of electronic content-commerce systems allows to implement phases of the commercial content life cycle. For this purpose is developed a formal model of information resources processing in electronic content-commerce systems, allowing us to create a generalized typical architecture of electronic content-commerce systems. The paper shows generalized typical architecture of electronic content-commerce systems, which helped implement the processes of commercial content formation, management and realization.

Keywords: *information resources, content, content management system, content life cycle, electronic content commerce system*

1. INTRODUCTION

Main task of electronic content-commerce systems (ECCS) is to facilitate the information resources work of the moderators, authors,

analysts and administrators. The main goal of ECCS functioning is to improve the information resources functionality for users of the content. ECCS selected topical issues range in a content set from various external sources for moderators and authors according to their ranking through the commercial content formation subsystem. The author creates a commercial content according to automatically matched information

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analysis from various sources of actual content. He also updates the other sources addresses in the subsystem of commercial content formation. Analyst analyzes the target audience activity and ECCS functioning. As a result he develops new rules of statistics and dynamics analyzing of the commercial content lifecycle through commercial content support subsystem. These rules can increase the target audience range; the number of visitors; the unique visitor's number; repeated visits; the number of visits from search engines; direct visits number; regional visits number; thematic visits number, etc.

Basic infrastructure of electronic content commerce system (ECCS) is extended by more dynamic applications (interactive features): simple request form and content formation based on JavaScript for browser; API for Web-server (NSAPI and ISAPI), which allows the browser to execute the application on the Web-server; dynamic processing servers that convert content from database in HTML-pages (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). Effective use of database management system (DBMS) requires the following in architecture WebOLTP: support unstable loads with tracking properties such as queues and priorities request; high-speed connection of the application to DBMS; applications queue and resource management as a the total amount reducing means of resources

in system order to achieve of stable performance within online transactions; securing, such as authorization (compliance) for WebOLTP-specific applications; distributed processing of query, taking into account various types of data in WebOLTP environment pages (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). WebOLTP is managed dialog of requests processing (Online Transaction Processing OLTP), where the Web is an access means pages (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). These applications are suitable for data viewing, but also for operational content processing in real-time, such as banking transactions, orders taking and analysis, interactive work with clients (Berko, Vysotska, & Pasichnyk, 2009).

2. PROBLEMS COMMUNICATION WITH IMPORTANT SCIENTIFIC AND PRACTICAL TASKS

The purpose of the article is modeling of information resources processing in ECCS. This allows general approach to design, construction and implementation of similar systems. Such problems solving promotes methods generalization and standardization of information resources processing in ECCS using stages of commercial content formation, management and support. This helps to reduce the construction time for a typical e-business systems building.

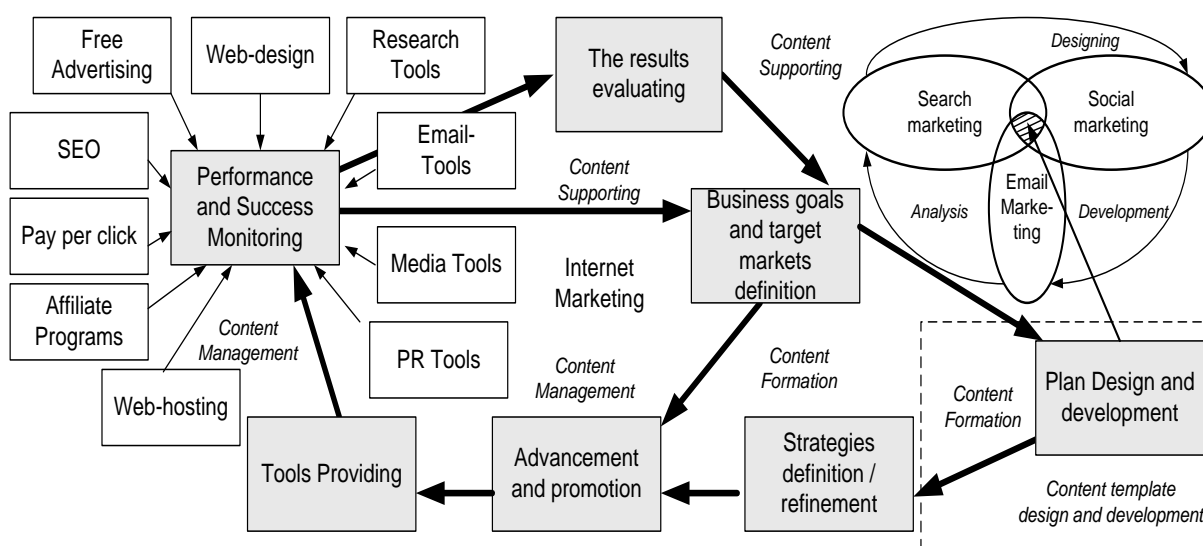


Fig. 1. Mechanisms application scheme of Internet marketing in electronic content commerce systems

Such systems implementation allows to reduce time in the production of its own commercial content, to analyze outdoor commercial content derived from external sources, to analyze the dynamics of content lifecycle, to analyze the statistics of the ECCS functioning, to analyze the statistics of user activity of information resources in the ECCS, to increase the target audience of information resources and to expand the feature set in ECCS. The result of modeling and development of information resources processing in ECCS is a set of functional requirements and standardized specifications for similar systems creating. The purpose of these requirements is to provide a generalized approach for ECCS developing as an online newspaper, online magazine, online publishing, distance learning, online shop for content selling in the form of electronic books, photos, videos, audio and more. The requirements standardization for the ECCS construction provides a generalized approach creating for developers of such systems. This reduces the time for such systems design and

implementation with the phase avoidance of the respective project development.

3. RECENT RESEARCH AND PUBLICATIONS ANALYSIS

The process of ECCS designing and creating is an iterative as Internet marketing result (Fig. 1). The unsettled question is the best technology selecting for WebOLTP-architecture design and for business logic the implementation and management at the intermediate level (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). Here are the basic requirements for intermediate level software (Berko, Vysotska, & Pasichnyk, 2009): scale and performance when working with large number of users, sessions, transactions and connections with database; high performance connections of browser and back-end data store; support of rapid development and deployment WebOLTP-applications at an intermediate level; synchronous and asynchronous management of transaction through transaction servers of ECCS (Fig. 2).

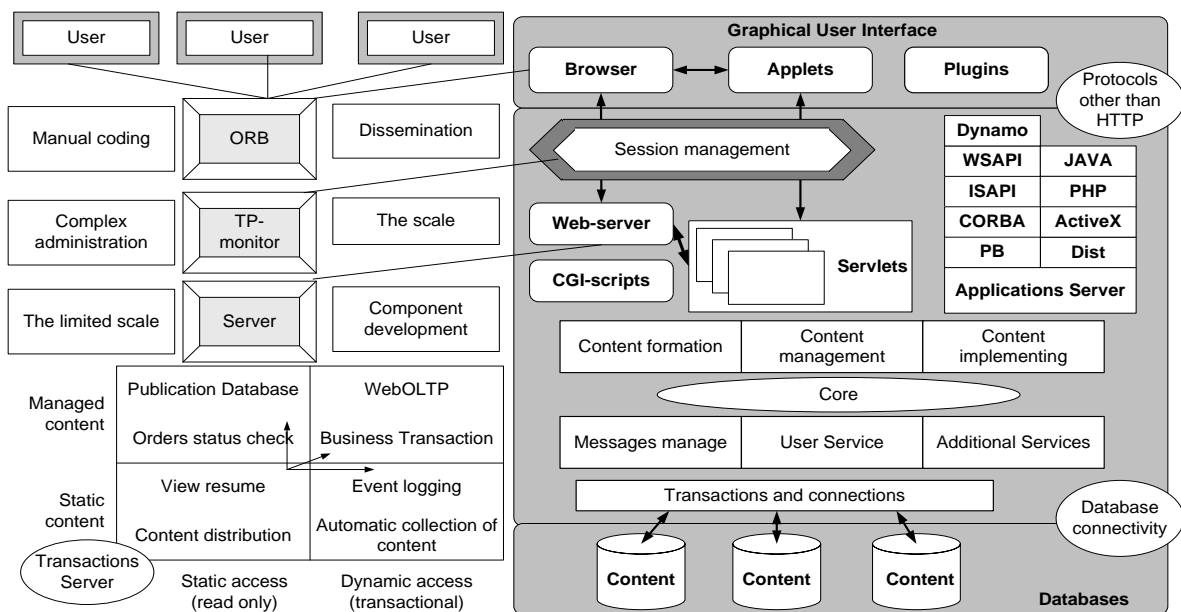


Fig.2. Basic infrastructure of electronic content commerce system

It contains a number of stages (from a plan analysis, design and development to a prototype build and experimental tests). This process begins with the specifications and layout formation, content template creation, content formation and its subsequent placement of

structures according to information resources (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), (Bolshakova, et al., 2011), (Korneev, Hareev, Vasyutyn, & Reich, 2000), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, Osnovy intehratsii informatsyonyh potokov, 2006). In the initial

stages (before the functional requirements defining and the development process beginning) are involved regular users in the process through poll letters, alternative design and prototyping of varying degrees of readiness. Without much effort the valuable information are collected.

Transactions servers of ECCS is characterized by the following properties: they support built-in capabilities of transaction management; they provide a mechanism to execute and servlets management; they support the challenges of distributed objects for communication in multi-applications; they support rapid development tools of software for the intermediate level, including component development (Bereza, Kozak, & Levchenko, 2002) (Berko, Vysotska, & Pasichnyk, 2009). Basic indicators of connectivity include: generalized multiprotocol support for browsers and other network clients (HTTP, TDS for fast processing of content and protocol CORBA IIOP); connectivity with main DBMS, including Sybase SQL Server and SQL Anywhere, Oracle and MS SQL Server through ODBC, JDBC and Sybase Open Client standard; connectivity with the mainframe and other content sources through production of data access; high-speed connectivity with Java for applets and servlets; high-speed exchange of totals samples between all levels; efficient HTTP-tunneling to ensure compatibility with firewall (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009).

Content distribution systems are implemented by client-server model, because the vast majority of operations carried on the server (Berko, Vysotska, & Pasichnyk, 2009). This makes universal ECCS. The process of data transferring between the client and the server and the user interface of these data presentation are based on generally accepted international standards. This allows the use of information technology and software with different architectures and different methodologies for information resources processing, such as regular expressions. Structural elements of software and information technology to ECCS build (Berko, Vysotska, & Pasichnyk, 2009): communication protocols between client and server (HTTP, FTP, IIOP); HTTP- server integration with content source (CGI, Perl, PHP

and specialized API); hypertext capabilities implementation (HTML, WML, XML, XHTML, JavaScript); multimedia features implementation (Flash, audio/video formats, VRML); communication implementation and online interaction (POP, UDP, SMTP); payments support (PHP, Java); content management systems and services (CMS, CMIS); network management protocol for network OSI (CMIP); mobile access and computing organization (GPRS, EDGE, UMTS, WAP); distributed objects implementation and development (CORBA, COM, DCOM, EML, ORB); data storage and processing (file systems, operating systems, database management systems, systems for group work).

4. PROBLEMS SELECTION

Full-featured ECCS is characterized complex system of interrelated operations (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), methods and techniques that form the technological process in such systems (Fig. 3).

New platform of the Internet development significantly reduces the loss risk, content duplication or re-creation of the search/find impossibility (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). The control means of content versions ensures that the Internet portals content will not be lost or accidentally overwritten (Berko, Vysotska, & Pasichnyk, 2009). Editors can easily find the required version of the content and/or information resource. In business processes chaos and delays are not acceptable. A business process building based on user roles and groups implies their independence from delays of individuals' execution (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). Roles and the processing of various information resources (eg, pictures and legal documents) are usually quite different.

Theme actuality consists of rapid prevalence of Internet access; active development of e-business; information products/services set expanding; demand for information products/services growing; theoretical justification methods; lack of information resources processing; a need for software

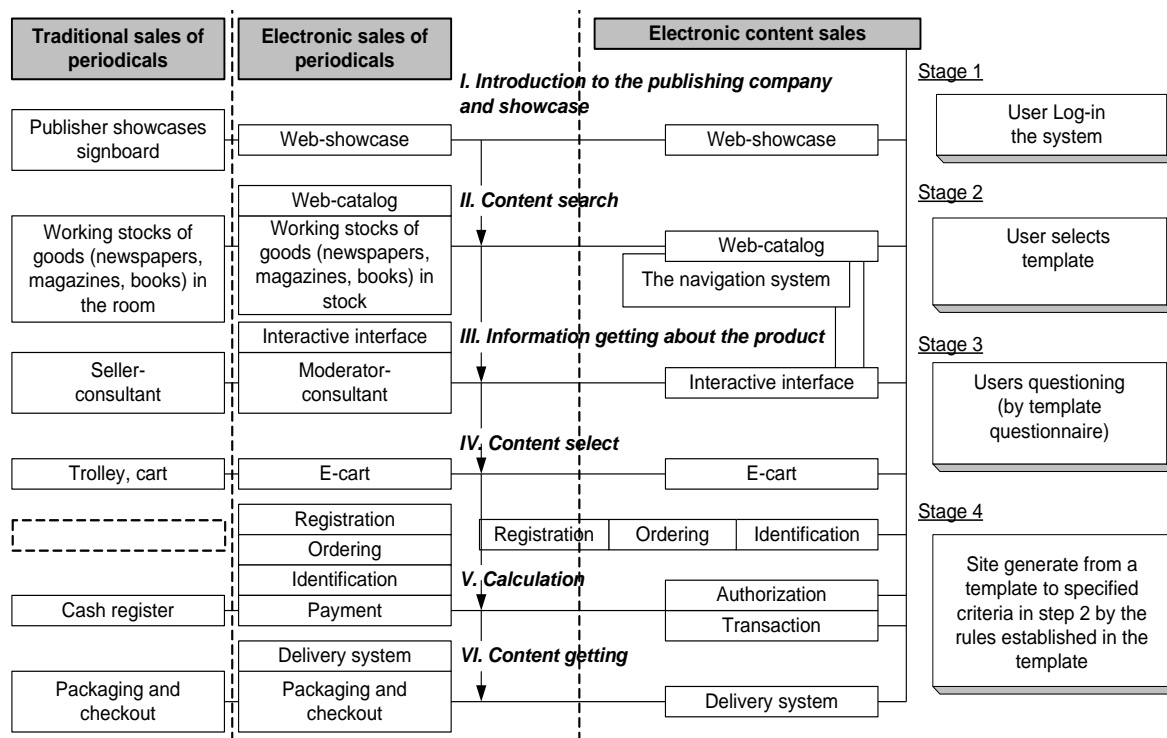


Fig.3. Processphasesand stagesof the e-commerce systemsoperation

unification for information resources processing and active development of research in e-business of Google, AIIM, CM Professionals organization, EMC, IBM, Microsoft Alfresco, Open Text, Oracle, SAP corporations, and (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Hartman, 2006), (Boiko, 2005), (Doyle, 2005), (Hackos, 2002), (Halverson, 2009), (McGovern, & Norton, 2001), (McKeever, 2003), (Nakano, 2002), (Rockley & Cooper, 2002), (Stone, 2003), (Vysotska & Chyrun, 2011).

5. GOALS FORMULATION

The aim of ECCS creation is to establish a common approach to design, construction and implementation of similar systems. The project implementation promotes methods generalization of information resources processing in ECCS through the stages of commercial content formation, management and maintenance of the time reduction in typical e-business systems building. The project implementation of ECCS development is aimed at: time reduction in the production of its own commercial content (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009); external commercial content analysis from other sources (Berko, Vysotska, & Pasichnyk, 2009),

(Bolshakova, et al., 2011), (Braychevskyy & Lande, 2005), (Korneev, Hareev, Vasyutyn, & Reich, 2000), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, 2006), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012), (Fedorchuk, 2005); the dynamics analysis of the commercial content lifecycle (Berko, Vysotska, & Pasichnyk, 2009) (Bolshakova, et al., 2011), (Braychevskyy & Lande, 2005), (Korneev, Hareev, Vasyutyn, & Reich, 2000), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, 2006), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012), (Fedorchuk, 2005); the statistical analysis of ECCS functioning (Clifton, 2009), (Sovetov & Yakovlev, 1998); statistical analysis of users activities of information resources in the ECCS (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), (Clifton, 2009); the target audience increasing of information resources (Berko, Vysotska, & Pasichnyk, 2009), (Sovetov & Yakovlev, 1998) and the functional possibilities expanding of the ECCS (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), (Sovetov & Yakovlev, 1998).

The project drafting result of ECCS construction is a set of functional requirements and standardized specifications for the similar

systems creation (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), (Sovetov & Yakovlev, 1998). The purpose of these requirements is to provide a generalized approach for ECCS developing as online newspaper, online magazine, online publishing, distance learning systems, online shop for content selling in the form of e-books, photos, video, audio, etc. (Berko, Vysotska, & Pasichnyk, 2009). Functional requirements standardization for ECCS building provides a generalized approach creating such systems in order to reduce time in process of such systems implementation and introduction with the phase avoiding of the respective project development. (Bereza, Kozak, & Levchenko, 2002) (Berko, Vysotska, & Pasichnyk, 2009)

The aim is to build a model of the information resources processing in ECCS to the functional requirements which determine the subsystems of commercial content formation, management and support. Accordingly, this involves each of the actions that implement these subsystems. These action models must combine and synthesize them into a single coherent model. It should describe the requirements for the ECCS functioning in general.

6. RESEARCH RESULTS ANALYSIS

ECCS technology supports full or partial automation of business process. Content and tasks are transferred to the appropriate action from one participant to another according to the procedural rules set. ECCS describes, creates and manages the workflow (business process) using the software. It interprets the process description and interacts with workflow participants. Also, it causes a relevant software applications and tools as required. ECCS automates the business process rather than function. It implements the interaction rules of the process participants. These aspects are the main centers of losses due to its vagueness. This article is intended to create a common functional requirements and standardized specifications for the ECCS development. This is done by the stages optimizing of information resources processing in similar systems (Fig. 4). Functional requirements are developed for the subsystems of content formation, management and maintenance facilitates in the realization of typical architecture for ECCS.

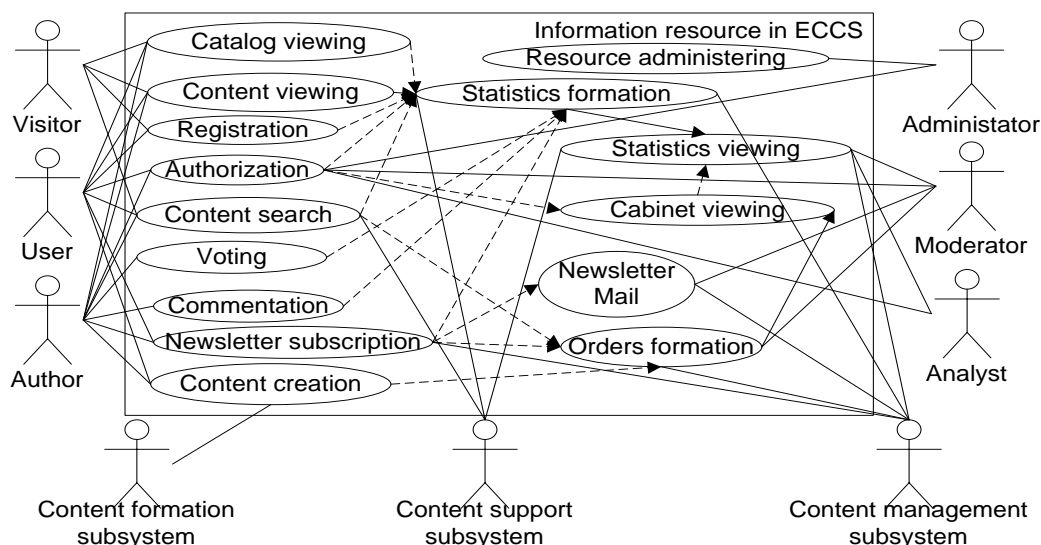


Fig.4. Use of Case Diagram for the development of project of electronic content commerce system

The process of official content management in e-business sold on the developing concept of their own ECCS. User and/or moderator must pass a certain number of steps to obtain the desired

content (articles, books, etc.) with the desired parameters. This steps implement a sequence of information resource management process (Fig. 5).

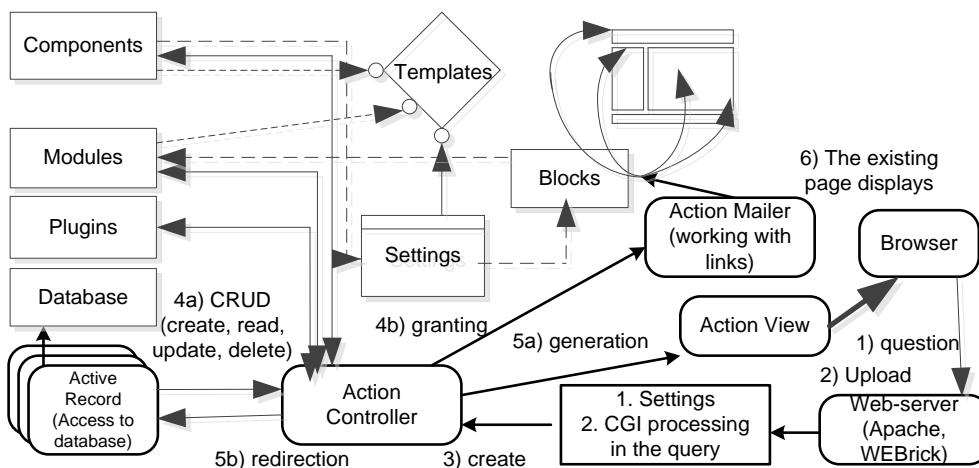


Fig.5. Diagram of content management diagram in electronic content commerce system

Stages of the content management process:

- | | | | |
|---|---|--|---|
| 1. URL-request with GET-parameter | 6. beginning of HTML-document structure formation | 11. request for cyclic processing of query | 16. completion of HTML-document formation |
| 2. page code receiving with GET-parameter | 7. the header forming query | 12. menu items output | 17. the process of content implementation |
| 3. CPO (current page object) initialization | 8. output in <title> title from CPO | 13. method invocation of content publishing from CPO | 18. content image recording |
| 4. request for record receiving with source | 9. start of content publishing | 14. query for content formation | 19. page output |
| 5. query of fields initialization for recording | 10. request for records receiving | 15. process of content formation | 20. pages viewing |

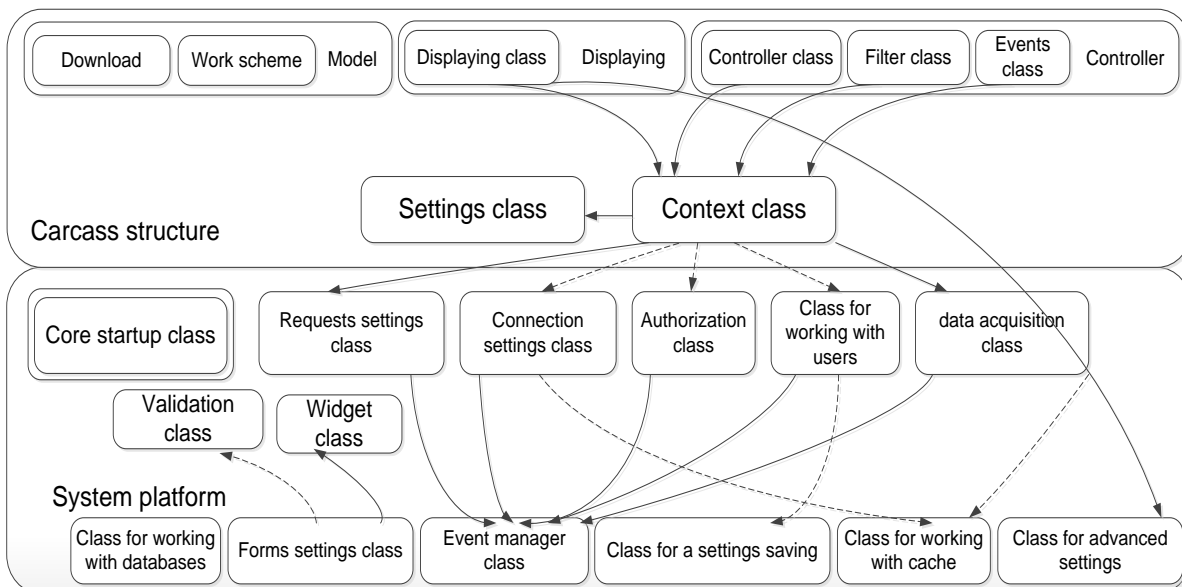


Fig.6. Diagram of the core structure in the electronic content commerce system

ECCS is actively used for the e-business implementation in information services with the active use of the Internet technology advantages. ECCS is designed to provide information services as Internet newspapers, online magazines, online

publishing, online markets for content and more. The ECCS can be applied to services of publishers, newspapers, magazines, news agencies, educational institutions, firms of software development or sales content without

carrier. The logical model of ECCS must not be changed until the events in the real world change. The necessary information is searched through the DBMS in the database based on physical models of data. Since the specified access is carried out by a particular DBMS, then the models should be described by data description language in this DBMS.

Fig. 6 shows the created abstract objects with properties and methods. Interaction with objects is realized through encapsulation. For this, there are implemented interface methods in classes that are designed for specific manipulations within the object of its data and properties. The database is implemented in an environment of MySQL. System administration is the administrative part. Access to it is limited and it is implemented by using login and password. In this part moderators make adjustments in the structure of the information resource, modify the content, change the static pages content, exercise messages mailing and content sharing between the parties of the business process, analyze visits to the ECCS and demand for thematic content. Software system administrator has unrestricted access to all parts and all the functionality in ECCS.

In Fig. 7 is presented database structure in ECCS with the basic set of entities. The main relevant components of database in ECCS are: attachments (new connected relevant), categories (information on the category to settings select), content types (information about content types settings), email_messages (messages email), file_blocks (information about uploaded files), group_sections (information about section structure of content group), group_types (information about number and types of content groups), groups (information about content group), html_blocks (information about Web-templates), page_routes (information about content in Web- templates), pages (information about created Web-pages), sites (information about the Web site structure), users (information about users and their preferences).

Template groups are intended for an interface creation between the user and the system. It contains HTML-pages layouts and/or their individual components using operators. ECCS transmits data of parser in representation of the desired content to the user. So, it executes the command to one or another template display. Parser replaces operators on the values of thematic content when the template is processing.

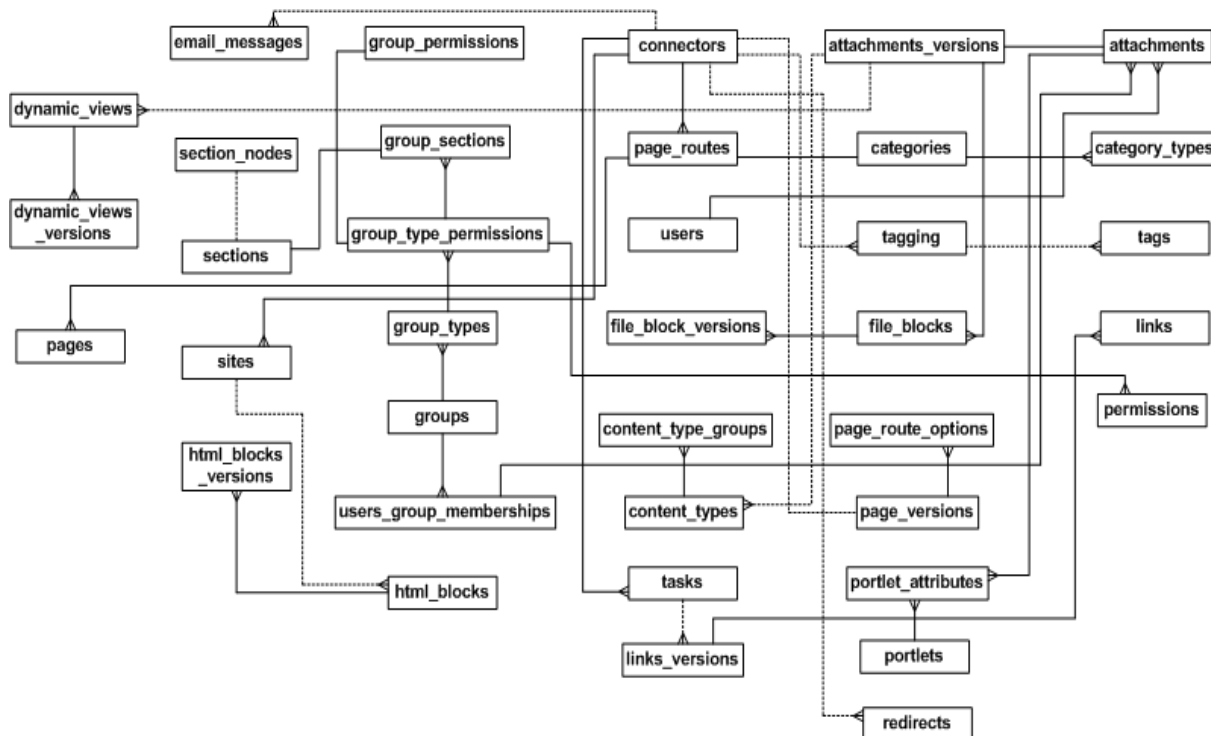


Fig.7. The database structure of the electronic content commerce system

ECCS design process is interactive. It flows from analysis to prototype and test trials creation. ECCS developing is concentrated on business goals solving and the needs of end users. Initially moderators analyze the end-users needs through poll letters, alternatives design and varying degrees prototypes to the functional requirements defining and the development process beginning. They also gather valuable operational / commercial content. At the same time it gives the people a sense of participation in the design process and their trust is won.

The moderators determine information about work groups, past/future conferences and all members of the community. Reactions of the users provide a clear and simple architecture of information resource and ECCS. There are several classes of information resource users (characters) in the ECCS: regular/potential customers/consumers, working groups managers, moderators, commercial content authors, ECCS operation analytics and administrators that define information resource design, ECCS structure and decision-making in

typical systems. The next step is to identify important operational content and how it relates to the main classes of users. Further on, it is necessary to create the content architecture of the information resource in ECCS, its hierarchy, presentation methods and interaction methods of each user class with this content. For example, the conference content includes the agenda and session question, these questions planning, conference topics and issues.

During the analysis they form additional functionality ECCS. For example, to support of active community added discussions and comments form on the information resources content, support for the contextual reverse reaction and interact interaction with users, use of the unique, but neutral brand or visual identity of proper e-business. Since the information resource is a neutral place of interaction between different users, strongly pronounced visual connection to the competitive and/or well-known company or environment causes adverse reactions.

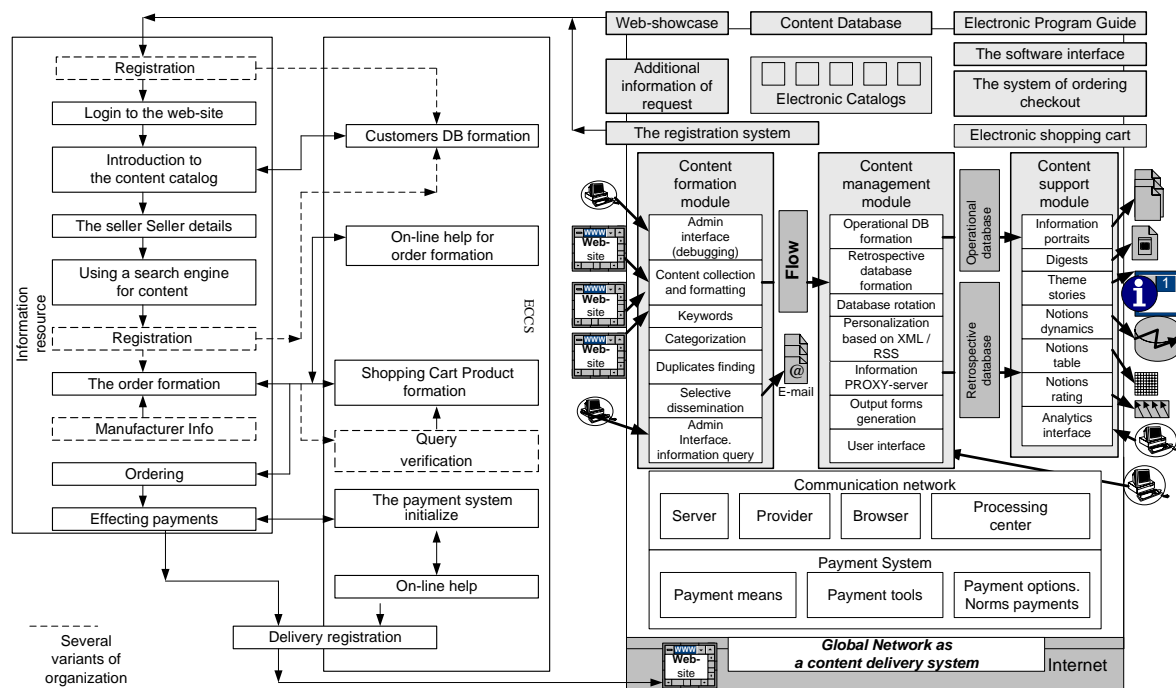


Fig. 8. Interaction scheme between the components in electronic content commerce systems

The main component of the project is the information architecture development. The first need is to define basic requirements for the project (access to content about the conference

or the audience) through monitoring users' performance and success. By users' response form the information architecture of the site (Fig. 8) according to the system type of content

trading. The main classes of users/personage site (clients, working group's managers and administrators) define information resources design and decision making process. They also determine important content and its connection with the main users' classes. Next moderators create site content architecture by electronic catalogs, its hierarchy, representation methods and each user's class interaction with this information (eg, conference data include topics and issues on the agenda and session planning of these issues).

There are several requirements for the ECCS development environment: the ability to make changes to the code and test amendments autonomously. After changes testing this code should be fully or partially accessible to the

group of developers, moderators, administrators and/or working groups managers according to the degree of confidence in them. This interactive cycle of developing makes using a remote version control system CVS. It allows synchronizing with team members of developing and manages the source code database of sharing. Centralized environment creates development and testing work to optimize code with other members of the group (time should be spend on code writing and testing, not on files and other system resources managing). The CMS model choice affects the need to use other tools. For example, in the case of Joomla! this means PHP, HTML and Cascading Style Sheets (CSS) using to develop pages and MYSQL for database.

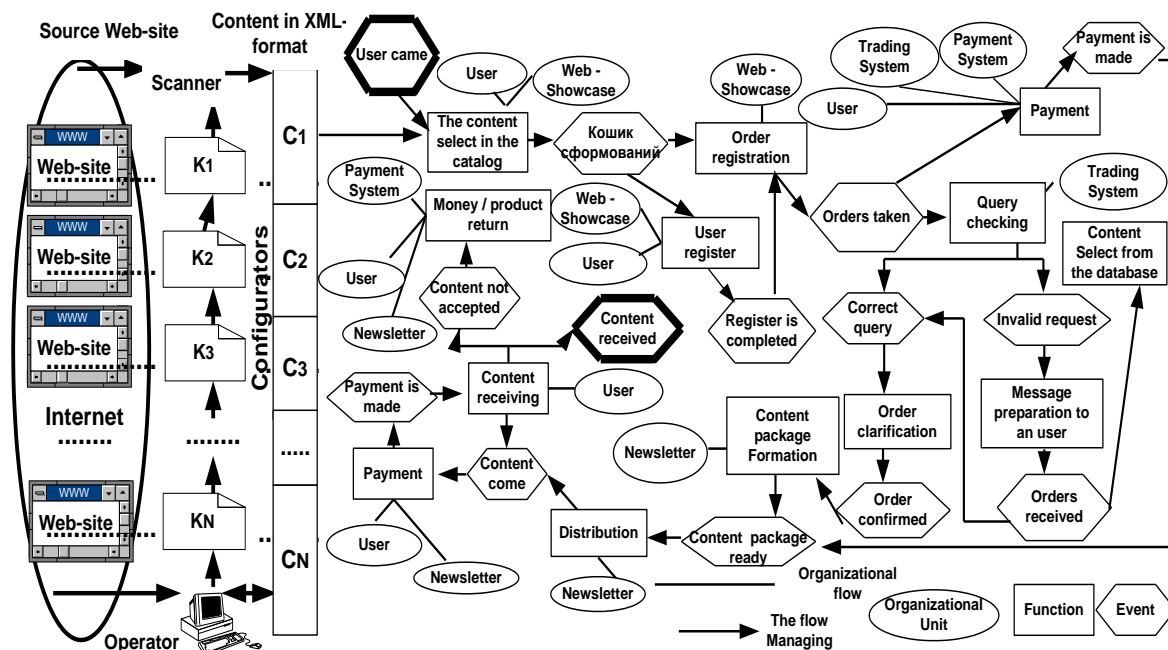


Fig. 9. General scheme of content management

ECCS management complex structure is implemented as three-tier client/server architecture. The content processing carried under the "client/server applications – databases". Request processed applications server. It communicates with the database and payment system at the same time. It also communicates content with relevant systems when connected to the business process of the organization. ECCS is a Web-showcase and trade system set (front-systems and back office). The main functions of ECCS are information of a

user, orders processing, payments, statistical data collection and analysis. Program complex of ECCS forms interface with user and functional capabilities of the system, based on the company needs. A potential user has the opportunity at any time to get answers to any question (after-sale service provided, consultation with features payment, etc.) that accompanies the buying/selling process. Registration/authorization occurs before/after choosing the content. In the first case a registry entry for regular users in ECCS. They are

realized by a special scheme of service and cost. Ability to register after the content selection allows the user to remain anonymous and saves time. The system secures the personally identifiable information user. Secure channel is used (SSL protocols or SET) for data transfer. ECCS receives complete content about visitors to the Web-site. This allows building in accordance with its marketing system.

Electronic catalogs are classified as common (supports a wide list of different items), commercial (focus on the characteristics of the market, suppliers, competitors) and specialized (dedicated to a narrow topic). In Fig. 9 a typical diagram of information resources processing in the ECCS is presented. The user/buyer fills in the form after content selecting, indicating payment/delivery method. Interaction is carried out over a secure SSL channel to personal content protect. The content gathered about the customer goes to the ECCS after the order formation and user registration. Then the system initiates a request to the payment system. In ECCS are formed delivery orderings after the notification on the on-line payments implementation.

CMS can collect statistical information up to analyze and to use it efficiently (find the position on the site, best for advertising information; automate the advertising campaign progress). Additional content publication is implemented using a single server of applications (publications area) and databases. ECCS uses information technology in the interaction with trading companies and retail buyers. It also provides sales and full lifecycle of commercial content. Workers composition in ECCS are much wider. It includes users (sellers, customers), financial institution numbers (the issuing bank, the seller/buyer bank, esquire bank), computer centers, etc. Users perform primarily natural persons as well as agencies, social institutions, other customers (legal entities). ECCS is to support content the lifecycle (Table 1).

Sellers in the ECCS are different organizational forms of trading content. Communication networks form providers, servers, processing centers and more. Delivery system form the corresponding exchange channels and Internet resources. All components interact in a system of relationships. This guarantee the ECCS

stability and reliability. Important elements of ECCS are the organizational forms of electronic content-commerce. They have a single focus – process providing of retail sale. But they differ in composition, structure, purpose of ECCS. Web-showcase belongs to the common organizational forms of content selling. It serves as an independent component or a part of ECCS. Web-showcase is a tool to attract customers and does not provide the full cycle of goods sale. This task performs the ECCS, which provides full range of interactively content purchase/sale through the Web an electronic catalog using. Electronic catalogs – a directory of content searchable for characteristics as name, designation, date, category, etc.; systematic content set of available navigation system).

Table 1. Content lifecycle classification

| № | Stages of information resources processing | | |
|---|--|---|--|
| | Content formation | Content management | Content supporting |
| 1 | Content collection/creation (data collecting from different Web-sites and formatting). | Content developing (databases formation, their rotation and access ensuring). | Content structuring (content themes identify, notions relationship tables build). |
| 2 | Content systematization (key words and notions identification, duplication, automatic categorization). | Content analysis (personalization and statistical analysis of users work). | Content moderation (information portraits and digests formation). |
| 3 | Content distribution (moderators ranking and selective distribution of content). | Content presentation (searches providing in the database, output forms generation, interaction with other databases). | Content generalization (notions ratings calculated, new events identifying, them tracking and clustering). |

ECCS provides the catalog review, content categories choice, ordering, mutual implementation, the order tracking. ECCS is a hardware-software component for the operation: Web-showcase (front office) on the Web-server, e-catalogs, payment system, modules of content formation, management and support. Web-showcase has the active content, is static in

ordinary HTML-files or dynamic display of content from the database. Web-showcase contains information about the name, profile, status of ECCS owner, content and services range, payment means, discounts, warranties, terms of content delivery.

The process of processing information resources implemented as follows *content formation* → *content management* → *content support*.

$$S = \left\langle \begin{array}{l} X, \text{Formation,} \\ C, \text{Management,} \\ \text{Realization, } Y \end{array} \right\rangle,$$

$X = \{x_1, x_2, \dots, x_{n_x}\}$ – input data set, *Formation* – the operator of content formation, $C = \{c_1, c_2, \dots, c_{n_c}\}$ – content set, *Management* – the operator of content management, *Realization* – operator of commercial content support and $Y = \{y_1, y_2, \dots, y_{n_y}\}$ – set of output data. Input variables x_i are independent and content set c_j and output y_k are dependent. Stage of content formation is described by the operator $c_j(x_i, t) = \text{Formation}(U_F, x_i, t, \Delta t)$ in terms $U_F = \{u_{f_1}, u_{f_2}, \dots, u_{f_m}\}$. Stage of content management is described by the operator $c_j(q_l, t) = \text{Management}(U_M, q_l, t, \Delta t)$ when user requests prompted $Q = \{q_1, q_2, \dots, q_{n_q}\}$ with terms $U = \{u_{f_1}, u_{f_2}, \dots, u_{f_m}\}$. Content support stage is described as $y_k(t + \Delta t) = \text{Realization}(U_R, c_j, q_l, t, \Delta t)$ under conditions $U_R = \{u_{r_1}, u_{r_2}, \dots, u_{r_z}\}$. Thus, the efficient and adequate model establishment of the content formation, management and support, enables a uniform standardized approach for ECCS construction. This task performing, in turn, will greatly simplify and accelerate such systems creation and implementation.

Information resource in ECCS is a data plural with a properties set that are object to technology action for their transformation into content. The result of the same technology applying can be another information source. Content in information technology is formalized information and knowledge that placed in the

system environment. And, in contrast to the data, they are no detailed specification of their properties, methods of formalization and regulation. The one important problem of the ECCS construction and operation is different data convert (by nature, meaning and origin) in a consistent, centralized information resource. The procedure for information resources forming and using in ECCS determines data selection methods from primary sources, their fixation and filtering, conversion to the specified format for content create and location in the database. The content value determines its attractiveness to the consumer. Content integrating makes an attractive information resource and applications integration – useful. ECCS use does not require software installation. Moderators are using a browser for content editing and information resource administration. Intuitive interface and work simplicity with system facilitates the information resources management and reduce the further cost of content support. ECCS includes the following features: fast updates and search of content in information resources; data collect about permanent/potential customers; questionnaires creation and editing; visiting analysis of information resource.

A set building of formal models provides problem solving of the basic processes research, analyze and describe of information resources processing in ECCS. The purpose of each model is the manipulation, actions and transformations specification performed by a commercial content. The main processes in ECCS (modeling which is described in this paper) are commercial content the formation, management and implementation.

ECCS model is universal and easy to describe of typical systems operation. Models of information resources processing allow standardize of basic system functions as the content formation, management and realization. Based on the developed models, in particular, solve the problem of a typical architecture building of ECCS. Also for typical systems and their components form the specification of functional and non-functional requirements such as interaction means with the end user. In turn, in ECCS implement the procedures for content analysis, statistical data collection and processing of information resources visit. Models

of content the formation, management and implementation allow to simplify the process of ECCS designing through methods unification and standardization of information resources processing.

CONCLUSIONS

The authors develop software tools of the content formation, content management and content support. Design and implementation are the software of developed ECCS for the electronic content commerce organization with modules using information resources processing. General recommendations are elaborated for architecture design of electronic content commerce systems. They are different phases in more detail and the modules availability of information resources processing from the existing systems. This made it possible

to efficiently implement information resources processing at the developer level (time and resources decrease to the development, the quality improve of the electronic content commerce systems). The modules of architecture are elaborated in the electronic content commerce systems for the stages of realization of the commercial content lifecycle. The Authors have developed and implemented a software application of commercial content formation, management and support to achieve the effect of the work at the owner level (profitability improving, interest users increasing) and user level (clarity, the interface simplification, standardization, choice expanding) of the electronic content commerce systems.

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