

*information resource, content analysis,
content monitoring, content search, electronic content commerce systems*

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INFORMATION RESOURCES ANALYSIS IN ELECTRONIC CONTENT COMMERCE SYSTEMS

Abstract

The article is dedicated to the development of unified methods and software tools for processing information resources in the electronic content commerce systems. A new detailed classification of electronic commerce systems and electronic content commerce systems is proposed. A formal model and generalized typical architecture of electronic content commerce systems are declared. Architecture and models of electronic content commerce systems are built.

1. INTRODUCTION

Active development of the Internet has increased the need for operational data production/strategic design and implementation of new forms of information services [1]. Documented information prepared in accordance with the needs of the users of an information product or commercial content, and the main object of processes of electronic content commerce [1–2, 12–13, 20]. Issues of design, creation, implementation and maintenance of electronic content commerce system (ECCS) is relevant, taking into account such factors as the lack of theoretical justification of standardized methods and the need for the standardization of software tools to process information resources.

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There is a mismatch between the methods and means of the processing of information resources and the principles of ECCS [1, 5]. A practical factor in the processing of information resources in ECCS linked to the problem of growing volumes of content in the Internet, the rapid development of electronic business, the rapid spread availability of the Internet, expanding the set of information products and services, the demand for commercial content [1]. Principles and techniques of electronic content Commerce is used when creating the online stores (selling eBooks, Software, video, music, movies, picture), systems on-line (Newspapers, magazines, e-learning, publishing houses) and off-line distribution of content (copywriting services, Marketing Services Shop, RSS Subscription Extension), cloud storage and cloud computing [1]. Work in this area is the world's leading manufacturers of means of processing of information resources as Apple, Google, Intel, Microsoft, and Amazon. The theoretical factor processing of information resources in electronic content Commerce is associated with the development of methods and means of formation, management and maintenance of content. In the scientific papers of Lande D. researched and developed mathematical models of electronic information flows [4, 14–15]. Zipf G. proposed an empirical law distribution of word frequencies in natural language [14–15]. Authors are described the content lifecycle in the works [3, 6–7, 10–11, 16–19, 21–25]. Kaiser J., Glaser, Lasswell H., Holsti O. will founded and developed methodology content analysis [9, 20]. EMC Corporation, IBM, Microsoft, Alfresco, Open Text, Oracle and SAP have developed specifications Content Management Interoperability Services for Web services interface that enables interoperability between content management systems e-business [8].

The aim of this work is to develop methods and software tools for the processing of information resources to improve the efficiency of electronic content commerce through the increased sales volume of commercial content.

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2. CONTENT PROCESSING

2.1. Content features

The content has several interpretations according to the direction of application [1]. In the field of computer science content is information create content (e.g., texts, graphics, multimedia) information resource; the set of all values

and quantities, which operates an information system; some generalized notion of data without predetermined patterns [1–2, 20]. Accordingly, the information resource is a collection of structured and/or unstructured arrays of content in the information system, for example, libraries, archives, repositories, collections, websites, handbooks, dictionaries, banks/bases/data warehouses, systems e-commerce etc. [1]. The market of content distribution provides the technological process of preparation of the operational content available through information resources and dependent on perception, display, and conservation of its values. To study and solve a range of tasks moderators information systems formalize, analyze, format and structure the content. Structuring process is the definition of a unit of content, methods and the order of their combination with each other and the formation of large content items from small [1–2, 14–15, 20]. Formed the content entered in database/data warehouse, where determine its direction and subject matter, for example, electronic publications with a large coefficient of demand from visitors and users of the information resource (Fig. 1). Structured content is concentrated, for example, in ERP/CRM and unstructured content in e-mail, working papers of arbitrary format and tools to ensure teamwork and stored, for example, ECMS [1].

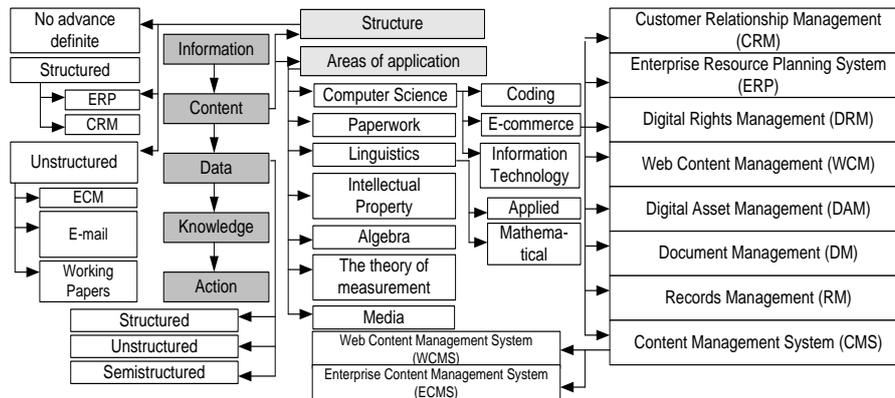


Fig.1. Classification patterns and directions for use content [source: own study]

2.2. Content lifecycle

Content lifecycle is a complex process, which passes the content while driving through different stages or phases of a publication with a set of properties, such as collaboration, records management, digital assets, and for other various IT [1-3, 6-8, 10-11, 16-25]. Existing toolkits for e-Commerce gives the administrator or the moderator system various options for management of content (form, formalize, organize, add, edit, delete), but not solve the problem of automatic processing of information resources. Therefore, for the implementation of the life cycle of content, you need a Toolkit that implements

the automatic processes of content formation, administration and support [1, 2, 20]. The content is characterized by the time of renewal or modification and has a set of specific properties (Fig. 2). The amount of content measured in units of the amount of information (bits/byte). The quantity and quality of content is describing the degree of user's interest in information resources, where he is placed [1, 5]. **Web content** is the content, text, visual, audio or a part of the experience of the medium [1, 5]. Economic content is an element of the economic activity of the subject of the e-business (Fig. 3). Content market on the basis of the Internet with the it knowledge management are the means that contribute to the functioning of e-business with the proliferation of commercial content and the growth of its profitability for the subjects of e-commerce [1–2].

2.3. Commercial Content features

Commercial content is the object of purchase/sale between the participants of e-commerce [1-2, 20], for example, information blocks, which are divided into syndicates (exchange rates, weather block), other announcements of topics/resources (with reference), reference information (holiday dates, event announcement, timetable), entertainment information (the joke of the day), advertising, buttons and links media partners, the statistics button. Managing business processes is an important stage in the life cycle of commercial content. To determine the relevance/accuracy of commercial content (the latest information on a particular issue) it is necessary to clearly manage business processes through workflow (automation processes control the flow of work in information systems).

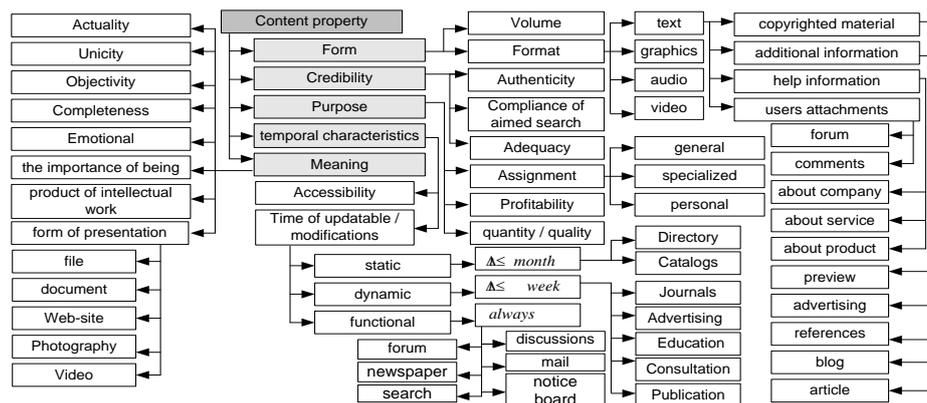


Fig. 2. The main properties of the content [source: own study]

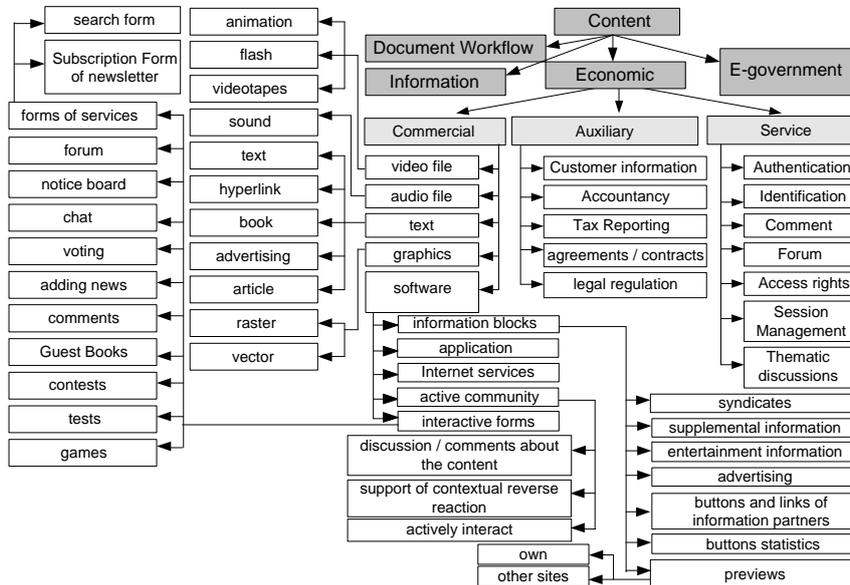


Fig. 3. Classification of commercial content [source: own study]

2.4. Electronic content commerce system

E-Commerce is a special case e-business, for which commercial content is a valuable asset (Fig. 4-5, Table 1). For fast business growth account effective policies e-Commerce: protection of intellectual property; interactive trust (protection and privacy of content); free/open trade; active investments in its infrastructure [1].

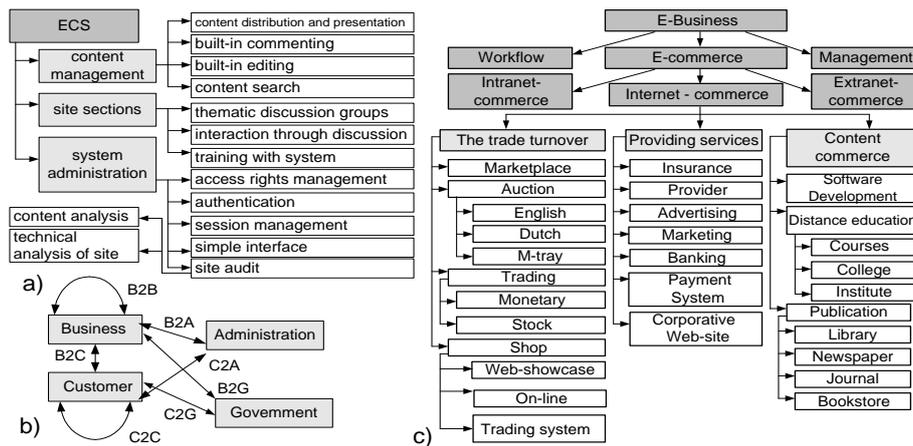


Fig. 4. a) Functions; b) the relationship and c) the typology of ECCS [source: own study]

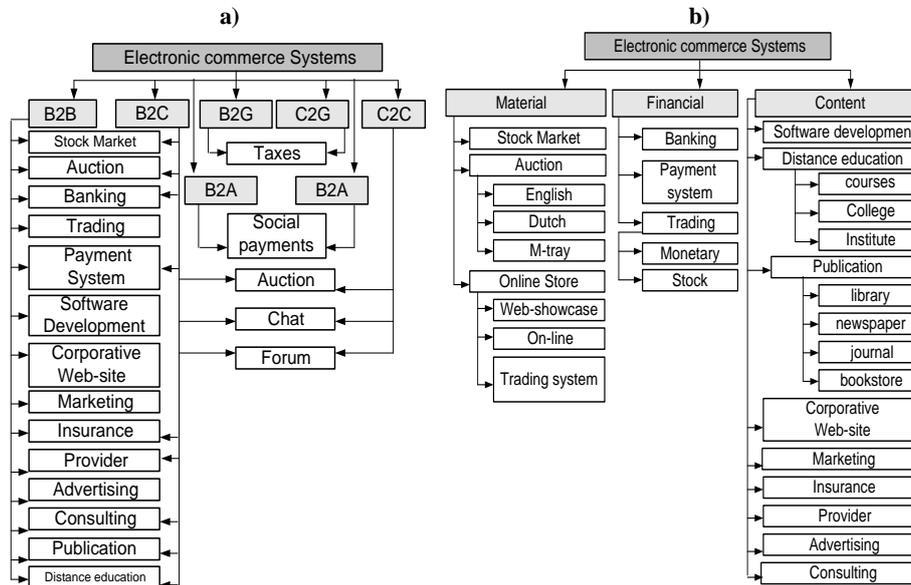


Fig. 5. (a) Category and (b) the business processes of e-commerce systems [source: own study]

Tab. 1. E-commerce categories [1]

Type	Category	The definition
B2B	Business-to-Business	business transactions between the companies;
B2C	Business-to-Customer	electronic retail trade;
B2A	Business-to-Administration	administrative workflow;
B2G	Business-to-Government	transactions between companies and government agencies;
C2A	Customer-to-Administration	interaction with the administration (social benefits);
C2G	Customer-to-Government	interaction with government agencies (e.g., taxes);
C2C	Customer-to-Customer	commercial activity between individuals.

1. All forms of trade goods/services through electronic means, including the Internet, which gives you the opportunity to develop new markets, but the question of information security and intellectual property [1] that solves Digital legal management.

2. A wide range of interactive methods of conducting is the delivery/sale to consumers of goods/services.

3. Any form of business transactions, where the parties interact through it, and not in the process of physical exchange/contact. For example, an electronic data interchange, EDI – a processes set for content creating, processing, managing, transmitting, receiving, storing, use and destruction, which are carried out with integrity and with confirmation of the fact of its receipt [1].

4. The use of electronic communications and technologies, the electronic data to establish and modify relationships, value creation between organizations and individuals.

5. Doing business online in the following areas: direct sales of goods and services; banking and billing (payment system); the safe placement of content; corporate procurement.

To implement ECS is difficult because of such problems as cost, value, safety, interoperability [1]. The Internet provides alternative and complementary way of doing e-business, but ECS must be integrated with other systems to avoid duplication of functionality and maintaining their applicability, current work and reliability. When the ability of the ECS is automatically share content business reaches reduction of cost, improved performance, and increase agility-chains of added value.

2.5. The system of electronic content commerce

The system of electronic content commerce, ECCS is an information system automated support of processes of processing of information resources e-Commerce and promote the commercial content in global markets (Fig. 6, a) [1].

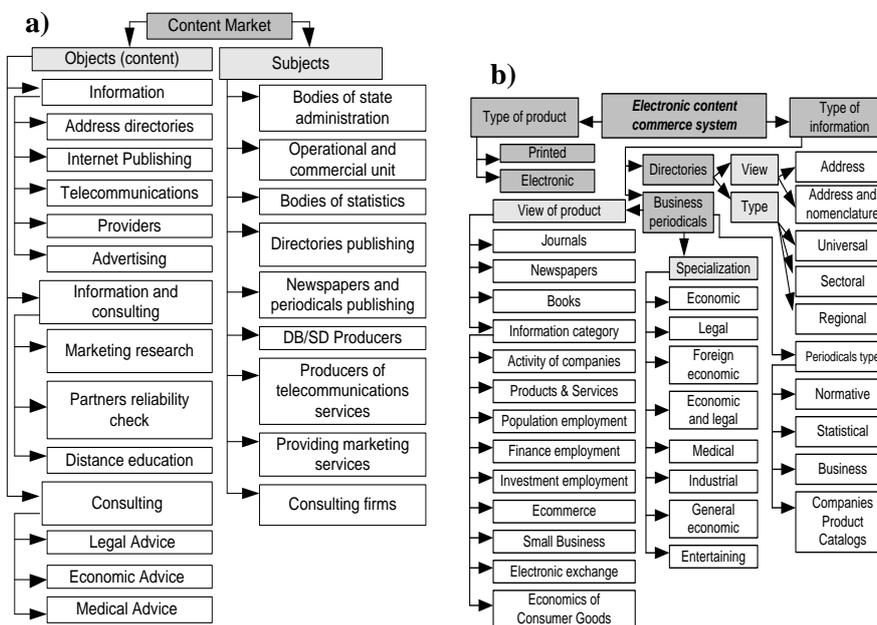


Fig. 6. ECCS classification by type (a) business and b) commercial content [source: own study]

3. PROCESSES IN ELECTRONIC CONTENT COMMERCE SYSTEM

Prospects of development of ECCS due to a combination of economic, social, technology, legal factors, significant among which are the multifunctional of the Internet; economic liberalization and the globalization of the economy; organizational and technical availability and economic efficiency of e-commerce for market participants. Depending on the range of content, level of information technology, status, way of creating ECCS divided into universal/specialized/independent/niche; the elements of traditional publishing; corporate, private and rented. Content is an important factor of reference e-business with such features: a significant increase in the demand for content; the introduction of a fundamentally new technology through the rapid development of e-commerce; the rapid expansion of the software to create ECCS. The number of content streams is considerably greater than the movement of goods in industrial enterprises (Fig. 7) [1].

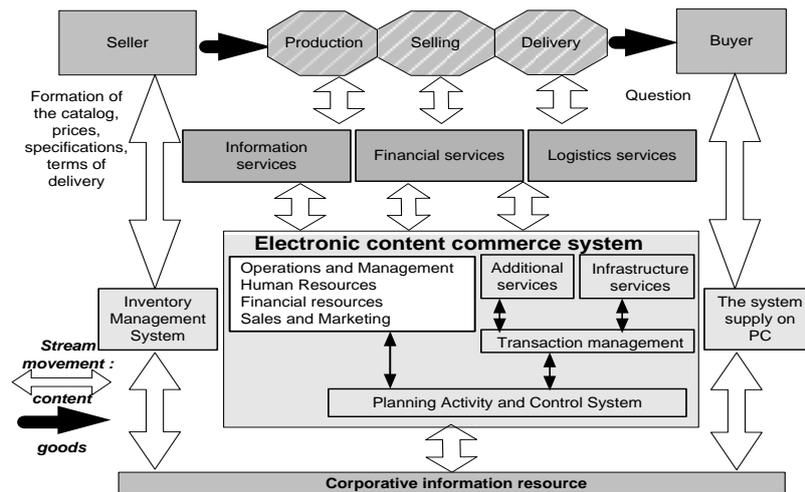


Fig. 7. Flow schematic content in ECCS [1-2]

The consumers of content satisfy the information needs in these ways: visit the information resources or database/data warehouse; periodically receive content by e-mail; connect to specialized systems/networks. Among the tasks of providing content highlight the insolvency of debtors, increased cost, minimization of tax payments, sales of products on the market. The main areas of research is the methods improvement and development of strategic planning e-business; introduction of quality management systems, personnel and content name flows and e-commerce technologies. Content consist of easily formalized and automated procedures (Fig. 8) at [1-2, 14-15, 20].

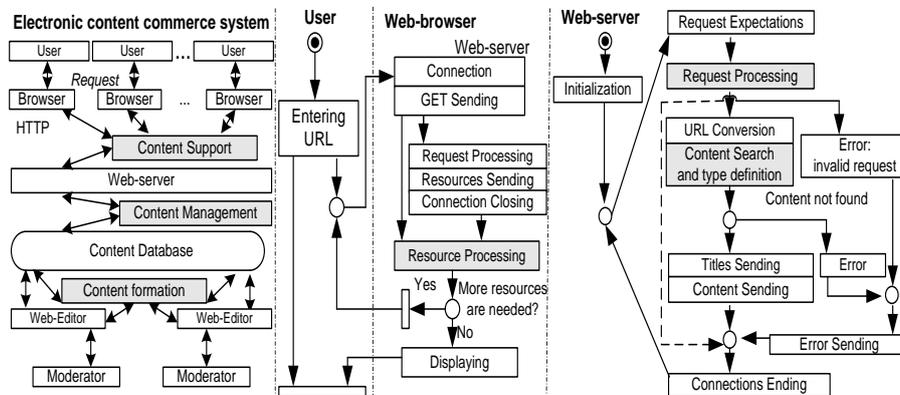


Fig. 8. The scheme of functioning of system of e-Commerce [1–2]

The core of the process of content sharing is ECCS. Processing of information resources in ECCS is a powerful and effective means of conducting e-business. ECCS is the main effective tool of e-commerce to implement practically any operations on the resource through a user-friendly interface (tab. 2) [1]. Information resource in ECCS is the link between users and the system (tab. 3). Administration system provides processing of information resources in ECCS (settings routines, administration of users/groups, management communication). ECCS mounts to information resources in a variety of applications, such as advertising, search engine optimization and special programs.

Tab. 2. Tools classification of electronic content commerce systems [1–2]

Name	Definition
Corporate website	Information page/resource data about the company, project, content, type of activity, proposals for cooperation, which has a hierarchical structure and the optimum scheme of the functioning (Berko et al., 2009).
Internet publishing	The sort of online shop where the goods for sale – urgent for some time, thematic content, classified and presented at the information resources.
Provider	Providing access to the Internet and information services.
Internet advertising	Commercial promotion of consumer qualities of goods for the purpose of increasing demand.
Distance education	Courses on the profile or e-learning (where the content is a lot of knowledge) followed by production of a document about the study course in their field or specialty.
Content portal	A complex system for managing business processes and content name flows of the company created on the basis of the corporate information resource and is integrated with ECCS.
Internet marketing	Management system production/marketing activities of the enterprises/companies, based on a comprehensive analysis of the market, study/demand forecasting, pricing, advertising, coordination of planning and funding, creating new types of content, and the like.

Name	Definition
Software development	Design, development and maintenance in the on-line mode via the Internet.
Subscribe to content	The subsystem of automatic thematic subscribe to newsletter content.
Content distribution	The electronic subsystem periodic distribution of content among users.
Web-showcase (information resource)	Allows you to organize the trade only to order; does not allow to establish trade via the Internet; does not reduce operating expenses and for the maintenance of the state; clumsy and inflexible solutions for managing and organizing marketing activities; inefficient and unprofitable trade organization.
The content management system	Allows you to establish trade via the Internet; reduces operating costs and in staff; clumsy, but flexible solution from the point of view of management and organization of marketing campaigns; ineffective and inefficient organization of trade.
The system of electronic content Commerce	Allows you to establish trade via the Internet; reduces operating costs and in staff; effective and flexible solution from the point of view of management and organization of marketing campaigns; efficient and cost-effective organization of trade; the creation of more one-off costs in comparison with Web content management system showcase.

Tab. 3. Information resource components of electronic content commerce systems [1]

Name	Appointment
The menu constructor	Management of various types of menus and adding new paragraphs; creating a submenu in unlimited quantities; easy to edit the name of the menu; delete, copy or move menu.
The content editor	Edit the content of any page in accordance with the needs; the introduction of content pages manually in the field or by copying from another editor; format the content in accordance with the requirements, insert graphics, links, flash movies on the page.
Linking pages	Prelingually page to any other, after which this page has the same content; the abolition of linking and restore the original content.
Manage pages	Setting the page title, keywords, meta tags, the date of publication; the abolition of the date of publication; if necessary, hide pages from the menu, which is accessible only with a direct link to it.
Pages	Set the content of the information resource to the user. Used for HTML markup and consist of many fragments of the body (the main content and sidebar (sidebar navigation)).
Snippets	Code snippets with content that is contained in several places information resource.
Layout	Theme General layout is responsible for page design and issue of the pages in any desired way, for example, to generate the body and sidebar of the page, or generates only the body element for page version for printing.

Internet marketing involves the use of strategies and directions of traditional direct response marketing and special areas of research that apply to e-business the Internet space. Internet marketing is not only the trade of content, but also information space, software, business models and so forth [1]. Google, Yahoo, and MSN lifted to a new level and have segmented the market

of Internet advertising, offering e-business services for local advertising. Through automation of the process of audience research is increasing, and costs are reduced. The number of streams of content is more than the movement of goods in industrial enterprises. A major proportion of the content consists of easily formalized and automated procedures. The main problem is the lack of a common approach to process modelling, design and development of ECCS.

Model of ECCS filed as:

$$S = \langle X, Q, C, V, H, Function, T, Z, Y \rangle, \quad (1)$$

where: $X = \{x_1, x_2, \dots, x_{n_x}\}$ – a lot of content from various sources,
 $Q = \{q_1, q_2, \dots, q_{n_q}\}$ – many of the requests for information of users,
 $C = \{c_1, c_2, \dots, c_{n_c}\}$ – many commercial content,
 $V = \{v_1, v_2, \dots, v_{n_v}\}$ – the terms set of tracking content and external influences of the environment on the system,
 $H = \{h_1, h_2, \dots, h_{n_h}\}$ – the conditions set of content management,
 $Z = \{z_1, z_2, \dots, z_{n_z}\}$ – the set of components of an information resource,
 $T = \{t_1, t_2, \dots, t_{n_t}\}$ – the time of transaction and content management,
 $Y = \{y_1, y_2, \dots, y_{n_y}\}$ – a set of output characteristics of the system,
Function – the operator of the formation of the output data of ECCS.

The process of content S management system describe the operator

$$y_j(t_p + \Delta t) = Function(x_i, q_d, c_r, v_l, h_k, t_p, z_w), \quad (2)$$

where: x_i – the visitor/user to the content management system [5].

The value of $y_j = \{a_1, a_2, \dots, a_g\}$, where a_1 is the number of visits for the time period Δt , a_2 is the average time of visit information resource (min:s) over a period of time Δt , a_3 is the bounce rate (%) over a period of time Δt , a_4 is achieved the target of the search, a_5 is dynamics content (%), a_6 is number of page views a_7 is number of page views per visit, a_8 is new visits (%), a_9 is absolutely unique visitors, a_{10} is source of traffic, in %, etc [5]. Influence quantities x_i, q_d, c_r, v_l, h_k on values z_w and y_j as a result the ECCS are unknown and unexplored [1, 5]. The model does not reveal the links between inputs, content, output and processing of information resources in the system. This justifies the purpose, relevance, appropriateness and direction of the study.

The main steps involved in processing of information resources in electronic content commerce is the formation, administration and support of content that have the following bundles $content \rightarrow content\ formation \rightarrow database \rightarrow content\ management \rightarrow information\ resource\ or\ a\ user\ request \rightarrow content\ management \rightarrow information\ resource \rightarrow support\ content \rightarrow database$. ECCS Model filed as

$$S = \langle X, Q, Formation, H, C, V, Management, Support, Z, T, Y \rangle, \quad (3)$$

where: X – a lot of content from various sources,
 Q – many user requests,
 $Formation$ – the operator of the formation of content,
 H – a number of conditions of formation and management of content,
 C – a lot of commercial content,
 V – terms set of tracking content and external influences on system,
 $Management$ – operator content management,
 $Support$ – operator support content
 Z – the set of components of an information resource,
 T – the time of the information resources transaction and processing,
 Y – many of the statistical data of the system.

The operator of a profit-content is display commercial content to a new state that differs from the previous introduction of a new piece of content that complements its previous state. The operator in the management of commercial content is display commercial content to a new state that differs respectively from the previous values of the governing parameters (relevance, completeness, relevance, authenticity, credibility) that meet pre-specified requirements. The operator of the commercial content – display commercial content in a collection of values, which form as a result of analysis, monitoring, evaluation, user interaction, search engines and other information resources, which is the basis for making decisions regarding the formation and management of content. Stage of formation of the content described by the operator $Formation$ of the type $c_r = Formation(u_f, x_i, t_p)$, where u_f is conditions set of content formation $u_f = \{u_1(x_i), \dots, u_{n_v}(x_i)\}$. The contents are as follows:

$$c_r = \left\{ \bigcup_f u_f \mid (x_i \in X) \wedge (\exists u_f \in U) U = U_{x_i} \vee U_{x_i}^-, i = \overline{1, m}, f = \overline{1, n} \right\}.$$

Stage content management is described by the operator $Management$ of the type $z_w = Management(q_d, c_r, h_k, t_p)$, where Q is multiple requests, H is multiple conditions of electrical commercial content management $H = \{h_1(c_{i+1}, q_d), \dots, h_{n_H}(c_{i+n_H}, q_d)\}$. Content management filed as

$$z_w = \left\{ \bigcup_{k=1}^{n_H} h_k(c_{i+1}, q_d) \left| \begin{array}{l} (c_{i+k} \in C) \wedge (q_d \in Q) \wedge (h_k \in H_q), \\ H = H_{q_d} \vee \overline{H_{q_d}}, i = \overline{1, n_C}, d = \overline{1, n_Q}, k = \overline{1, n_H} \end{array} \right. \right\}.$$

Stage accompany content is described by the operator *Support* of the type $y(t_p + \Delta t) = \text{Support}(v_l, h_k, c_r, z_w, t_p, \Delta t)$, where v_l is the set of terms of tracking content and the effects of the environment on the system, that is $v_l = (v_1(q_i, h_k, c_r, z_w, t_p), \dots, v_{n_V}(q_i, h_k, c_r, z_w, t_p))$. Output implemented

$$y_j = \left\{ \bigcup_l v_l \left| \begin{array}{l} (\exists q_d \in Q) \wedge (\exists z_w \in Z) \wedge (\forall v_l \in V) \wedge (\forall (c_r \wedge q_d) \in h_k), \\ V = V_{q_d} \vee \overline{V_{q_d}}, d = \overline{1, n_Q}, l = \overline{1, n_V}, w = \overline{1, n_Z}, r = \overline{1, n_C}, k = \overline{1, n_H} \end{array} \right. \right\}.$$

Content formation is a set of measures ensuring control data from various sources to create commercial content with a set of values, such as relevance, reliability, uniqueness, completeness, accuracy, and the like. Content management is the complex measures of the values support of the defining parameters of content, relevance, completeness, relevance, authenticity, validity of certain requirements by a set of criteria. Content support is a set of measures to ensure the functioning of the system of electronic content Commerce according to certain requirements and any further changes to these requirements. For full featured ECCS characterized by a complex system of interrelated operations, methods, techniques, presented in Fig. 9.

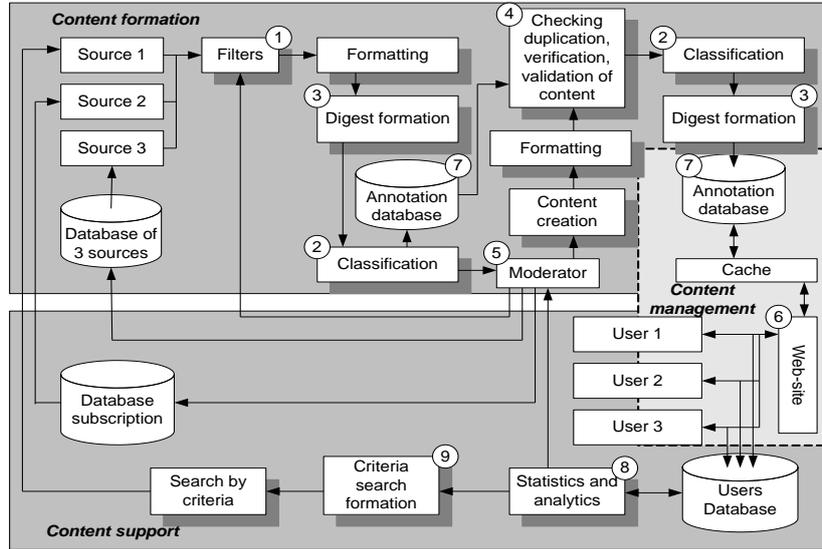


Fig. 9. Methods of processing information resources in ECCS [source: own study]

As a result of the analysis of functioning of system of electronic content commerce S and maintenance of the content C is set $Y = \{Y_P, Y_T, Y_C, Y_R\}$ according to the conditions $V = \{V_P, V_T, V_C, V_R\}$, where $Y_P = Y_{Pc} \vee Y_{Pq}$ – is a subset of information portraits content Y_{Pc} and users Y_{Pq} , Y_T – a subset of the thematic subjects of the content Y_C – is a subset of the tables of the relationship of content Y_R – is a subset of the ratings of the content $V_P = V_{Pc} \vee V_{Pq}$ – the set of conditions of formation of information portraits, V_T – many terms of the identification of thematic subjects, V_C – many of the terms of the construction of tables of the relationship of content, V_R – lots of options, content rating calculation. A lot of information portraits commercial content Y_{Pc} is served as $Y_{Pc} = \text{BuInfPort}(V_{Pc}, C, H, Q, T)$, and the many portraits of users Y_{Pq} represented as $Y_{Pq} = \text{BuInfPort}(V_{Pq}, Q, H, Z, T)$, where $V_P = V_{Pc} \vee V_{Pq}$ – is the set of conditions of formation of portraits, BuInfPort – is the operator of the formation of portraits $Y_P = Y_{Pc} \vee Y_{Pq}$. The variety of thematic subjects of content Y_T is represented as $Y_T = \text{IdThemTop}(C, H, Q, V_T, T)$, where V_T – is the set of terms identifying the subjects of the content, IdThemTop – the definition statement of the thematic subjects of the content Y_T . Multiple tables of the relationship of content Y_C is represented as $Y_C = \text{ConCorrTabConc}(C, V_C, T)$, where V_C – is the number of conditions for construction of tables of interconnection, ConCorrTabConc – operator of the construction of tables of the relationship. Many ratings of commercial content Y_{Rc} submitted as $Y_{Rc} = \text{CalRankConc}(C, Q, H, Y_C, V_{Rc}, \text{Spam}, \text{Tonality}, T)$, but many of the ratings served as moderators Y_{Rm} , submitted as $Y_{Rm} = \text{CalRankConc}(C, Q, H, Y_C, V_{Rm}, T)$, where $V_R = V_{Rc} \vee V_{Rm}$ – many parameters for the calculation of ratings of content, $\text{Tonality}(Q^+, Q^0, Q^-, T, H)$ is a key criterion of the content, $\text{Spam}(Q, T)$ is the definition statement filtering comments, CalRankConc – statement of rating content and moderators $Y_R = Y_{Rc} \vee Y_{Rm}$. Many source statistics Y are presented as $Y = \{Y_P, Y_T, Y_C, Y_R\} = \text{Support}(V, C, Q, H, Z, T, \Delta T)$, or

$$Y = \{Y_P, Y_T, Y_C, Y_R\} = \text{Support}(V_P, V_T, V_C, V_R, C, Q, H, Z, T, \Delta T),$$

where $Y_P = Y_{Pc} \vee Y_{Pq}$ is a subset of information portraits content and users, Y_T is a subset of the thematic subjects of the content, Y_C is a subset of the tables of the relationship of content, $Y_R = Y_{Rc} \vee Y_{Rm}$ is a subset of content ratings and moderators, Support – operator support content.

Subsystem of development of commercial content is implemented in the form of complexes, the content monitoring to collect content from a variety of data sources that enable the creation of a content database in accordance with the information needs of users. As a result of harvesting and primary processing of the content is reduced to the format, classified according to certain categories and he is credited with the handles keyword. This facilitates the implementation of process management commercial content. Tasks of subsystem content management: formation, rotation of databases and access thereto; creating operational and historical databases; personalization of the user experience, storage of personal user requests and sources, statistics of work; provision of search in databases; generation of output forms; information exchange with other databases; creation of an information resource. The subsystem of management of commercial content is implemented by caching (view subsystem generates the page once, and it is several times faster loads from the cache, which is updated automatically after a certain period of time or when changes are made in certain sections of the information resource, or manually by the administrator) or the formation of information blocks (save blocks at the editing stage of the information resource and page Assembly of these blocks at the request of the relevant page by the user). Subsystem support content provides for the formation of information portraits; identifying a thematic scenes of content; creation of a table of the relationship of content; content rating calculation, identification of new developments in content streams, tracking, and clustering. Analysis of the results of the commercial content allows determining the reasons for the formation of the target audience on the set of characteristics of functioning of ECCS. Adjusting thematic set of commercial content, its uniqueness, efficiency of its formation and adequate management of them according to individual needs regular user, you can simulate the boundaries of the target social audience and the number of unique visitors from search engines.

4. RESEARCH RESULTS ANALYSIS

There are posted software of developed systems implementation with subsystems of information resources processing (Tables 4, 5) in e-business organization over the Online Newspaper (ON) and Online Journal (OJ). Fig. 11–12 presents the work results of the developed systems in the form of graphs. So the all stages presence of the commercial content lifecycle significantly increases the visits and unique users amount of information resources.

Tab. 4. The results of systems operation [source: own study]

№	Web-resource	Address	Type
1	Fotoghalereja-vysocjkykh	fotoghalereja-vysocjkykh.com	OJ
2	Vgolos	vgolos.com.ua	ON
3	Tatjana	tatjana.in.ua	OJ
4	Presstime	presstime.com.ua	ON
5	AutoChip	www.autochip.vn.ua	OJ
6	Kursyvalyu	kursyvalyut.com	ON
7	Good morning	dobryjranok.com	ON
8	Information for Businesses	goodmorningua.com	OJ
9	LvivSchoolNumber3	зшшзльвів.in.ua	OJ
10	Victana	victana.lviv.ua	OJ

Tab. 5. The results of systems operation in the time period from 10.2010 to 03.2014 [source: own study]

Characteristic	1	2	3	4	5	6	7	8	9	10
Content formation	30	100	10	40	20	90	70	60	0	50
Content management	90	100	50	80	30	40	60	20	0	70
Content supporting	30	100	10	40	20	50	80	60	0	70
Uniqueness content	100	80	100	70	30	20	50	40	100	60
Average visit duration	4:41	2:14	3:56	2:04	1:51	1:02	2:27	8:12	0:46	4:15
Denial Rate(%)	56,14	71,90	53,15	83,08	55,67	82,92	68,15	48,0	97,02	32,92
Conversion Rate	7,83	0	0	0	12,51	0	0	0	0	0
Pages / Visit	4,54	1,93	3,96	1,67	2,59	1,59	2,17	3,24	1,67	5,78
New Visits	65,45	41,68	52,57	39,88	73,88	82,39	57,23	28,0	97,32	42,86
Returning Visit	34,55	58,32	47,43	60,12	26,12	17,61	42,77	72,0	2,68	57,14

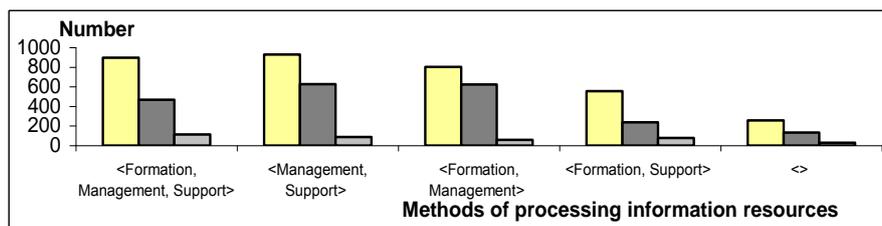


Fig. 11. Statistical analysis of the “Fotoghalereja-vysocjkykh” functioning (1 – Number of all visits, 2 – Number of visits of permanent users, 3 – Number of implementing content) [source: own study]

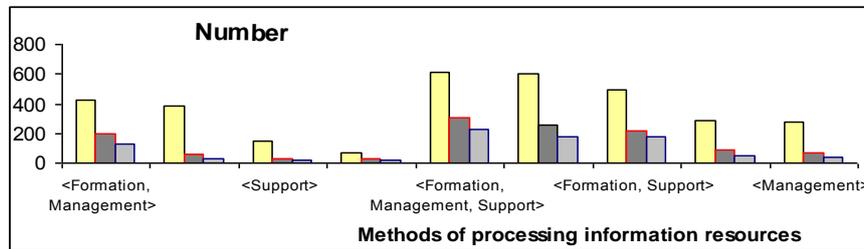


Fig.12. Statistical analysis of functioning «Victana» (1 –resources visiting of the target audience, 2 –resources visiting by permanent users, 3 – content implementation of permanent users) [source: own study]

Service keeping statistics visits Web-resource allows us to estimate the increase in sales of commercial content which depending directly proportional increase in the number of visits an Web-resource, the number of permanent users, the prospects of marketing events (Fig. 13). The subsystems presence of content creation, management and support in ECCS increases sales volume of content to the permanent user at 9%, active involvement of unique visitors, prospective users and expand the limits of the target and regional audience by 11%, viewed pages by 11%, visiting time and Web-resources by 9%. The results are the ECCS development in the form of online newspaper and online magazine with the subsystems of content formation, management and support.

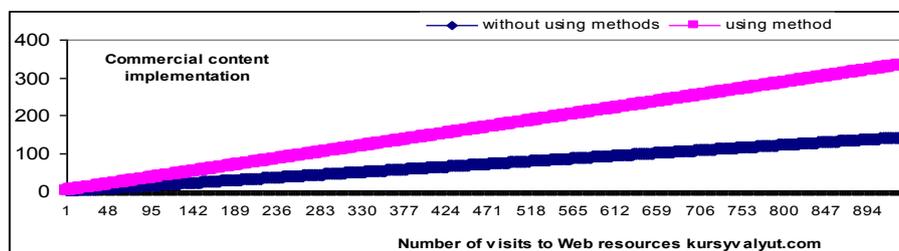


Fig. 13. Regressive analysis of increased sales of commercial content [source: own study]

5. CONCLUSIONS

In the solution of urgent scientific task of the research and development of methods and means of processing of information resources ECCS using the developed classification, mathematical software and the generalized architecture of ECCS are proposed. Researched and improved classification of ECCS based on the analysis and evaluation of such systems, which allowed defining, refining and justifying their choice of functionality for the design lifecycle of commercial content. Developed a method for the generation of commercial content

by improving its life cycle to define requirements manage the flow of commercial content, which allowed to automate the collection of data from various sources, identify duplication and formatting of the commercial content, the definition of key words and the formation of the digests, of the sampling distribution of commercial content to improve its life cycle and requirements definition stream management commercial content. Improved method of managing the commercial content based on the results of its formation and analysis of system performance to determine the values of the parameters in the management of commercial content, relevance, aging, completeness, accuracy, relevance, authenticity, authenticity. Rosalina method commercial content based on the statistical analysis of the functioning of ECCS to change the values of control parameters and requirements of development of commercial content, which increased the sales volume of commercial content to the permanent user by 9%.

Improved structure of ECCS based on the analysis of processes of processing of information resources, non-existing presence of subsystems of content formation, management and support that gave way to the stages of the life cycle of commercial content and to develop recommendations for the design of typical systems. In work the problem of developing methods and software for creating, administering and maintenance of information products in the form of a theoretically grounded concept by automating the processing of information resources in ECCS to increase sales of permanent content to the user, the active involvement of potential users and the expansion of the boundaries of the target audience. A new approach to application and implementation of business processes is formulated for the construction of systems of electronic content commerce. A complex method of content formation, the operational method of content management and complex method of commercial content support are developed. Software tools of content formation, management and support are developed. Designing and implementation Methods of electronic content commerce systems on the example of online newspapers, which reflects the results of theoretical research, are developed.

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