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THEORY OF MENTAL SCHEME IN THE STUDY OF THE EVOLUTION OF BOOK AS A PUBLICATION GENRE

Introduction

In scientific electronic publishing, after the period of the possibly close adjustment to the model of a printed publication[2], changes are made which can be termed the deconstruction of a traditional document, consisting in fundamentally modifying the relationship between research data, the scientific publication created on their basis, and the metadata associated with both files. The up to now existing distinction between research data, publication based on them, and metadata for publication representation is no longer relevant. Copying and emulation of solutions designed for print is not enough now. Static model of publication as a closed text in an immutable document (e.g. a PDF article or a scanned book) is subject to a general change. The changes go towards applying a dynamic publishing model, understood as richly contextualized aggregations of electronic objects (textual, audial, visual and other).

Electronic publications, including e-books, offer more opportunities to readers than traditional publications. They may be referred to as proto-publications, which mean that the electronic text is potential until the person who accesses it makes it really substantial or materialized it in a specific way (Guedon, 1994, p. 20). We can expand this idea by saying that the text does not exist without the user, only copying action to disk and displaying on the screen (download) of the information retrieved "creates" the cybertext. It is composed of constantly changing parts, modules included in the database, which can reach the scope of entire Internet. Another reader-user of the

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[2] There are well known models of e-book readers, where visual simulation of the pile of pages was designed or pages can be turned over like in printed book.

database, or even the same user at another time, will receive another text. Changes in electronic documents based on the contents of dynamic data-bases may be influenced by such factors of the reading context, as outside temperature, stock quotes, etc. Document like this, as it is the result of sci-entific or technical progress, should be treated as the scientific publication (Kircz, 2001, p. 269). It follows that the text of an e-book can be composed of any text module, coming from different sources, in a dynamic way, thereby becoming indefinitely extensible. These two features of e-text: modularity and extensibility, make it extremely difficult to determine its limits.

1.   Printed and electronic book: main features

The description and valuation of the changes in the publishing pro-cesses that is caused by the digitization of this processes, is a frequent issue of debates. These discussions can serve as an illustration of the state of mind of their authors and the evolution in their perception of physical and intellectual objects, such as publications, including e-books. Let's look at the opinions expressed in this regard by several authors, whose views were considered representative for scientific investigations.

Roger Chartier believes that the changes resulting from the digitization of publishing process can be presented in three groups: modifications of the discourse order, order of reasoning, and order of ownership relations (Chartier, 2004, p. 138). First group modifications are the reason for the strongest break with traditional rules, as the relationships between infor-mation objects (such as the book), the genres of text, and the ways in which they are used are transformed. The discourse order is subject to three kinds of discontinuities: it introduces new techniques for fixing and spreading of the writing, inspires the creation of new relationships with the text, and introduces new forms of text organization. This is a revolution that, for the first time in history, brings together changes in the technologies used to reproduce the text, in the medium of writing, and in the use and percep-tion of the text. The computer screen allows the merged presentation to the reader of the different types of texts. All texts, regardless of their genre, are created and used with the same medium, taking on a very similar form, with the final effect often determined by the reader. As a result, the percep-tion of separate works is more difficult. The reading process becomes dis-continuous, the reader passes to fragments that for some reason interest him/her, omitting the rest of them. The electronic reading environment can be compared to the collection (database) of snippets and exceptions, each of which could be composed of any whole.

The order of reasoning is understood as the organization of arguments and a set of criteria that the reader can use to agree (or not agree) with the arguments of the author. In the electronic text environment, the author

may use logic of argument that does not need to be linear or deductive. This environment allows an open, fragmented, relational articulation of inference, supported by an increasing number of hypertext links. The reader can judge the value of such argumentation based on many information objects (texts, graphics, sound), if only available in electronic version. In such a situation, the reader does not have to trust the author and his/her written words, reader may even repeat his/her research, for example, looking at the digitized library, archives and museums objects.

The order of ownership includes both law, in the sense of the regulations, namely copyright law, and in the textual sense, as a set of characteristics and rules specific to each genre of text. Electronic text is much more variable, modifiable and open than traditional. The reader can freely intervene in any place without leaving a trace. Consequently, this leads to a reduction in the author's role and his/her responsibility for the text.

The next author, Sebastian Kotuła (2017, p. 151), lists the components of the semiotic book scheme, which are both physical and symbolic, such as organization, meaning, content. It is about printed book, but from the description of these parts we can infer the differences in the schema of the electronic book as well. These elements form a system consisting of: a cover, consolidating of a one-side jointed cardboard block, optionally a dust cover, a lining cover and a head cap. At the semiotic level he distinguishes statement of responsibility (mainly the author, but also the other responsibilities, like editor, translator, illustrator and others), indication of the title, issuing body and imprint, and, perhaps first of all, the main part of the book (main text and paratext: informative, auxiliary and supplementary texts, table of contents, bibliography, indexes, etc.).

The author also points to the concept of "bookness" (Kotuła, 2013, p. 62), according to which the book is an object consisting of appropriately structured abstract text, a material medium (a paper card codex) and the ability to be read - the sensory perception of a text such understood, materialized on such a defined medium. The components of these three elements imply the presence of further features:

- Organization of the text: its order, title, information and auxiliary elements, colophon, method of materialization;
- Materiality: bibliological processes, social circulation, form of codex, coherent structure, social context;
- Reception and reading: content (message, meaning), symbolic codes, narrative form, social functions, sensory reception (not just appearance, but also touch, smell).

Kotuła believes that in the digital environment borrowing elements of printed book culture happened. First came the text and elements like the content of books and related methods and tools for information management, such as bibliographies and catalogues. Later it was borrowed the way of

organizing text and content using relational linking of parts and references, which resulted in a hypertext form[3]. Web pages, created in this form, may contain metadata elements that are analogous to the semiotic layer of the book. Web pages can also be an interface to textual resources and their content: books, libraries, catalogues and bibliographies, and anything else (not just textual). As a metaphor for the basic element of the book's text organization, it has become the main schema and unit of networked information.

The basis for the distinction of electronic publications in the views expressed above is generally the form of publication (printed/electronic); the other characteristics are derived from this distinction. The concept of "format as a process" (Seeber, 2015, p. 23) is an interesting answer to the question on the differences in the characteristics of printed and electronic publications. According to it, differences between publications are not due to the use of different media (paper/digital), but they arise from the diversity of processes that allow the creation and use of information. It is materialized in a variety of formats, but the critical issues related to the value of information and its potential use, i.e. the communication objective are more important than the physical packaging of the information object. What counts is the author's idea and its execution (how, when, by whom and for whom realized), as well as the reader's need and its satisfaction. The processes of information creation come from different needs, motivations, values, conventions and practices. This means that the correct division into printed and electronic publications should result from differences in the purposes of creating and internalizing information – achieved by both authors and readers, as well as by various types of intermediaries, including librarians.

Changes, described by cited and other authors dealing with similar subjects may indicate transformations in publishing (processes that are part of the surrounding reality) leading to the emergence of new text genres (modifications of mental schemata). In this way new technologies can simultaneously be treated as an effect and cause of changes in the social processes, the common actions of people which are always accompanied by communication activities.

2. Theory of text genres

Gregory Bateson, an American cybernetist, psychologist and cultural anthropologist, wrote about a special kind of messages that allows people to understand other messages by creating a context for the communication

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[3] We can draw attention to hypertextuality as the principal feature of each text, also printed (see Aarseth, 2014, p. 13). Intertextual relations occur between texts and within the text also in the print environment, for example in the form of bibliographic references and indexes. The electronic environment makes possible their multiplication and exposition. So hypertext is not a phenomenon typical for e-books only.

process (Bateson, 1996, p. 155). To the basic message, bearing information about the world, the meta-message is added, containing information about the message, allowing it to be identified. Understanding the meta-message requires taking into account the context of the action, part of which is the communication process. Without this context it is not possible to communicate effectively because there is no general and adequate access to the information communicated and the intentions of participants in the process. One of the tools for building meta-messages are the text genres.

The text genre is, according to Charles Bazerman (1988, pp. 6-7), a collection of features which, among the great diversity of literary and functional texts, allow to find their common ground in their functionalities and to observe the uniformity of applied solutions. This allows genres to be a tool for recognizing similar textual objects among their great diversity. The notion of text genre is used from antiquity; the first views on this subject are derived from Aristotle. Up until the twentieth century, research in this field was concerned primarily with defining genres by presenting a set of repetitive features or by building the possibly complete typology of literary genres. It was only in the twentieth century that there was a need for a similar approach to non-literary texts recognized, which led to the creation of a new field of study, namely linguistic genology (Gajda, 2009, p. 135).

A well-known representative of the American school of genology, where the text genres are studied as a social phenomenon, is Carolyn Miller, a professor of rhetoric at North Carolina State University. She defines the text genre as „typified rhetorical action, based in recurrent situations" (Miller, 1984, p. 159). This way she understands genres as types of actions rather than types of forms of texts. The typification of rhetorical activities results in the conventionalization of the texts used in these activities and the documents materializing them. The resultant genres are characterized by the repetition of formal and content elements (features). The recurrence of typical social situations (such as writing a book) creates standard textual forms that support typical activities (e.g., promotion for a degree) in a given situation. Hence, the emergence of a new genre is always relevant to the existence of a social situation, specifically the rhetorical action, which helps to give meaning to the circumstances of this rhetorical situation.

Treating a genre as a situation always associated with a specific social action brings attention to the relationships between the rhetorical action and the context in which it is realized. The genre is then treated as a rhetorical tool to connect what is private (intent) to what is public (requirements). Gathering knowledge on a genre is more than learning the patterns of form or methods of achieving one's own goals; in this way, knowledge is gained about available and achievable social goals. This makes us more aware of the situations in which we participate, and the potential for mistakes and success in cooperation with others (Miller, 1984, p. 165).

With the emergence of new rhetorical situations new genres are being created. These situations can arise in response to the use of new communication technologies. Nowadays, one of the reasons for activating such processes is the transition from traditional publishing to electronic publishing. As a result, electronic texts are being circulated in one of the electronic genres (cybergenres). They arise as a result of the evolution of traditional genres, over time acquiring more and more distinct characteristics. The accumulation of these peculiarities results in the emergence of new genres, with new features not found in print, supporting new communication objectives (Shepherd, Watters, 1998, p. 101).

According to Misha Vaughan and Andrew Dillon (Vaughan, Dillon, 1998, p. 562) experiences is gained in the interaction with textual information (written and verbal). A genre is, therefore, an element of knowledge, allowing for effective perception of information. Such understanding of the text genres and the manner in which they function is connected with the problem of mental schemata.

3. Mental schemata

The rest of the article deals with changes occurring in text genres on the example of e-books, as a result of the use of new publishing technologies. They will be presented from the individual mental processes of communicating individuals' point of view, which means the need to take into account the dynamic states of their minds. Studying these processes is problematic, because the brain, and in particular its product – the mind, still represents a very difficult area for researchers to study. There are, however, theories about the processing of knowledge in the mind.

According to Richard Anderson (1977, p. 2), knowledge in the human mind is incorporated into abstract structures called cognitive schemata. They contain general knowledge, that is, they represent what is generally considered true for a particular class of things, events or situations, and concepts representing them, which specific occurrences usually differ in details. These structures also serve to represent relationships between parts of the schemata (Anderson, Pearson, 1988, p. 10). It is generally believed that schemata are hierarchically built, consisting of „compartments" for the components of the coded concept. Its encoding consists in filling the compartments in the schemata with specific features (attributes) of the concept. Part of the structured knowledge is the self-proclaimed limitation of the ability to fill individual compartments. These constraints must be quite flexible to allow for the representation of different variants of a concept or event. Schemata are similarly understood in cognitive grammar, especially at the semantic level (Taylor, 2007, pp 145-146).

Schemata are structured knowledge, because they indicate the typical relationship between its components. In addition, they function on different levels of abstraction and can build hierarchical structures (Rumelhart, Ortony, 1977, p. 102), which means that schemata can consist of subschemata. It is assumed that in the cognitive processes it is possible to use the main schemata without taking into account the knowledge contained in the subordinate schemata. On the other hand, when necessary, the meaning represented in all sub-schemata can be taken into account, which allows for a deeper interpretation.

4. Representation of mental structures using frames

A proper understanding of the evolution of genres, as concepts coded in mental schemata, allows for psychological research on the human categorization of concepts conducted from a cognitive-historical perspective. These studies are based on the premise that in many cases people do not represent concepts by using a set of necessary and sufficient conditions (as in classical definitions). This view, expressed by Wittgenstein (1972), means that it is impossible to define exact limits of the concept. Instead, their representations are built by using a prototype copy (ideal specimen) and the associated bunch of concepts, selected on the basis of similarities and differences (family resemblance – Rosch, 1973, p. 330) to the features of the prototype, which together form the category. According to Lawrence Barsalou, prototypes are built into human working memory, but the information contained in prototypes is based on knowledge stored in long-term memory (Barsalou, 1987, p. 114). The categories, distinguished on the basis of their prototype differences, form a contrasting set. Concepts have graded structure, from better (more similar to prototype) to worse occurrences. Categories have a hierarchical structure, resulting from the taxonomic properties of concepts.

Empirical studies show that the features of concepts that are the basis for determining similarity are organized into complex structures, perhaps based on intuitive mental theories created in connection with concepts. In those research some types of mental schemata are used, called frames. Frame's creation is based on several important principles:

• They are a hierarchical structure of features, created on the basis of attribute-value relationships, where features at the level of value are more specific than more general attributes;

• Frames retain structural invariants, i.e., the stability of the relationship between attributes;

• Frames contain constraints, i.e., correlations between values expressing different attributes describing reality, in the sense of ontological knowledge (about existing things) and knowledge of the regularities (nature of things);

• Frames are recursive; each node in the frame can be expanded to form a further frame containing nodes representing concepts. Hence, the frame not only represents the concept, but its elements (nodes) are also concepts.

Hanne Andersen, Peter Barker and Xiang Chen in their book deal with conceptual representations of concepts using "dynamic frames". They are frames which are used to represent concepts (Andersen, Barker, Chen, 2006, p. 42). Representation of concepts using prototypes can allow description of dynamics of creation and modification of concepts. Creating a conceptual frame may require a great deal of knowledge, but in a specific situation only a small part of it is used to make a prototype. The particular part of knowledge that will be used in a particular situation depends on people's cultural and theoretical stereotypes. This means that even people with similar knowledge structures (they are never identical) can create different prototypes for the same concept because of the use of different stereotypes.

Frame is a hierarchical structure of nodes[4]. Representation of a concept in a frame is accomplished by specifying its attributes at a given node level. The next, lower level represents the possible values of these attributes. It follows that the representation of a concept with a frame always places its features on two distinct levels. In any frame, values are always bound to a particular attribute, and each attribute must have the appropriate, active values, so that not all features in the parent (superior) concepts are equally functional. The abstract, full frame of the concept represents all information related to this concept in a given community, similar to an encyclopedia article. However, individuals are using their own frames, representing their individual knowledge, and do not need to know its complete content in order to successfully use it.

According to the cited authors, the world filled by the objects and other elements is ordered by the relation of similarity or lack of similarity between the objects. Using the frames we can graphically represent the creation of classes of concepts based on the relation of similarity and its absence. This implies the possibility of taking into account the concept of family resemblance and points to the compatibility of the frames with that principle, which is considered a common feature of concepts. This relationship is not directly represented within the frames; it can be recognized by opposing values, which the attribute can take. Two groups of objects labeled with concepts are similar if they have the same value for the specified object attribute, and are different if they have different values for the same attribute.

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[4] The described structure of the frames is similar to neural networks, where relations between objects and their properties are described in the form of triple: object-relation-property, or subject-predicate-object like in RDF (McClelland, Rogers, 2003).

It seems frames correctly model many of the important traits of human cognitive processes. They can be considered as cognitive mechanisms used by people to obtain information from the environment, to transform it into knowledge, to store in memory and to use, among other things, for the externalization of knowledge in the form of information. As cognitive mechanisms allowing presentation of the possibilities of realization processes like transformation information → knowledge → information in the human cognitive system, the frames can be treated as models explaining the conceptual change[5].

Frames are dynamic structures, so the mechanisms that allow their evolution play an important role. It is about ways of making changes in conceptual structures. The description of the conceptual change must explain the impact of this process on ontological knowledge and the knowledge of regularities, implicitly available in the conceptual framework. For this aim Andersen, Barker, and Chen distinguish the incommensurability relationship that exists between the existing conceptual structure and the elements of reality that force preparation of a new structure to replace the former (Andersen, Baker, Chen, 2006, p. 65).

The conceptual structure consists of concepts connected by a hierarchical generic relationship. The stable conceptual structure is characterized by the following principles, known from the classical logical division: the no-overlap of scopes of concepts (there can not be common part, ambiguous places, and concepts must be mutually excluded), completeness (sum of partial ranges is equal to primary range – empty spaces, undefined are forbidden) and the inheritance of the principle of division (the concept at the lower level of the hierarchy inherits the features of the concept at a higher level). If these rules are violated, anomalies in the conceptual structure arise, leading to incommensurability.

The anomalies force conclusions discordant with expectations for what exists in the surrounding world and the characteristics of existing objects and phenomena. These conclusions allow better description of reality, more strongly related to experience. It is hard to draw such conclusions because of the difficulty to see a phenomenon or object that we did not suspect because of the lack of a category that would allow it to be classified. Only after the category is formulated, an anomaly can be considered an existing phenomenon or object. Previously, it has been considered as a "non-matching element" (Andersen, Barker, Chen, 2006, p. 69). After the deviation is considered, the next step is the cognitive process of solving the abnormality encompassed the anomaly location and construction of a new hypothesis that takes the irregularity into account or removes it, for example by creating a new category.

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[5] Conceptual change is the process by which concepts and relationships between them change in the individual's life or in the course of history.

Disturbance of the hierarchy rules can be eliminated by changing attribute value constraints or by introducing new (sub) concepts. There are many ways to choose, because it is possible to limit the value of different attributes based on different views about their importance. In this case, a different categorization of the same object implies the existence of differences in the conceptual structures of the persons implementing the process. The differences arise because of environmental differences, in cases where people with different experiences and knowledge differ in understanding the scope of the concept. It follows that the understanding of concept is not universal, differences must be agreed upon in communication processes, and the meanings may change with time and place (Hjørland, 2015, p. 123).

Frames define taxonomies, structures existing in the conceptual field. It follows that revolutionary conceptual changes, which are characterized by a loss of commensurability, can be represented as contradictions between the pre- and post-transition frames. Taxonomies and frames are freely modified, without limitation. Some concepts change their places in categories, which are also redefined. Other concepts appear or disappear. The incommensurability is perceived between conceptual structures, or patterns of concepts, rather than individual concepts.

So the extent and scope of changes depends on the status of the conceptual structure that changes, and on the pace and completeness of these processes. Incommensurability occurs when changes in attribute-value sets cause new relationships of similarity and differences (contrast sets) between objects. The level of incommensurability depends on the volume of the changes, the place occupied by the modified concepts in the conceptual hierarchy, and whether the changes require modification or elimination of constraints.

The frame of the superordinate concept determines the conceptual field of its subordinate concepts. It defines possible combinations of values using structural invariance and attribute and value constraints, thereby specifying allowed subordinate concepts. Hence removing some of the constraints from the frame allows the creation of new value combinations and change subordinate contrast sets. It is a taxonomic change, of an evolutionary rather than a revolutionary nature (Chen, Andersen, Barker, 1998, p. 15). There is a new taxonomy come into being, different from the previous, but there are no significant differences between them. All objects classified by the old taxonomy, in the new taxonomy are still separated by the same boundaries.

We can, however, imagine a larger number of anomalies, for example if a new object has common features with one of the previously classified objects. This results in some significant changes in the taxonomy. There may be, for example, the need to create a new attribute with its values. As a result, the need for constraints on attributes and values arise. Concepts can be rearranged in terms of similarity and differences (contrast set). Newly

grouped concepts form a separate subordinate frame. These changes cause a mismatch between the two taxonomies, including the breach of the principle of disconnection. This disruption can cause communication problems between communities using different taxonomies (old and new).

5. Representation of the evolution of the book genre using frames

From the point of view of the evolution of the text genres, it is important to state that they are a kind of specialized structures, cognitive schemata or mental patterns (Gajda, 2009, p. 138) used in linguistic communication. They are used during knowledge externalization to form of communicative information and during information internalization, resulting in modifications of knowledge (cognitive schemata). This conversion, in the first case, consists in translating the information sender's mental schema into corresponding textual information conventions, which then complements the recipient's mental schema (Carley, Palmquist, 1992, p. 603). These structures perform, therefore, the role of knowledge organization systems (Nahotko, 2014, p. 36). The analysis of genres means the study of ways of acquiring, codifying and modifying people's knowledge through communication (Andersen, 2008, p. 350). In this respect, two complementary paths of research (analysis) are possible: by examining textual conventions (genres) we arrive at knowledge structures, or by analyzing conceptual schemata (knowledge) we obtain the ability to describe genres. The frames described later represent this second approach.

Some of the mental schemata that function in cognitive processes of man refer to the genres of text used by him, treated as any other concepts. As with all mental schemata, they can be represented by frames. For describing changes in text genres, it is important to know the mechanisms that allow for the evolution of the frames. In this sense, two situations: the use of genres within the existing conceptual structure without changing it, and the creation of new genres related to the modification of the existing conceptual structure should be distinguished. These changes happened in second situation may vary from small changes in conceptual structure to deep, revolutionary changes, due to fundamental modifications that affect large areas of these structures. The nature and extent of the change depends on whether the categories represented have been modified in a way requiring reclassification of existing entities in a previously impossible way. As has already been stated, revolutionary changes always break the rules of hierarchical relations represented in the conceptual structure.

Let's imagine the situation before the emergence of new genres of electronic documents. Figure 1 shows a partial representation[6] of the "book"

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[6] The representations shown in Figures 1, 2 and 3 are partial, since they do not contain all the possible attributes and values of the concepts explained because of the readability of the drawings.
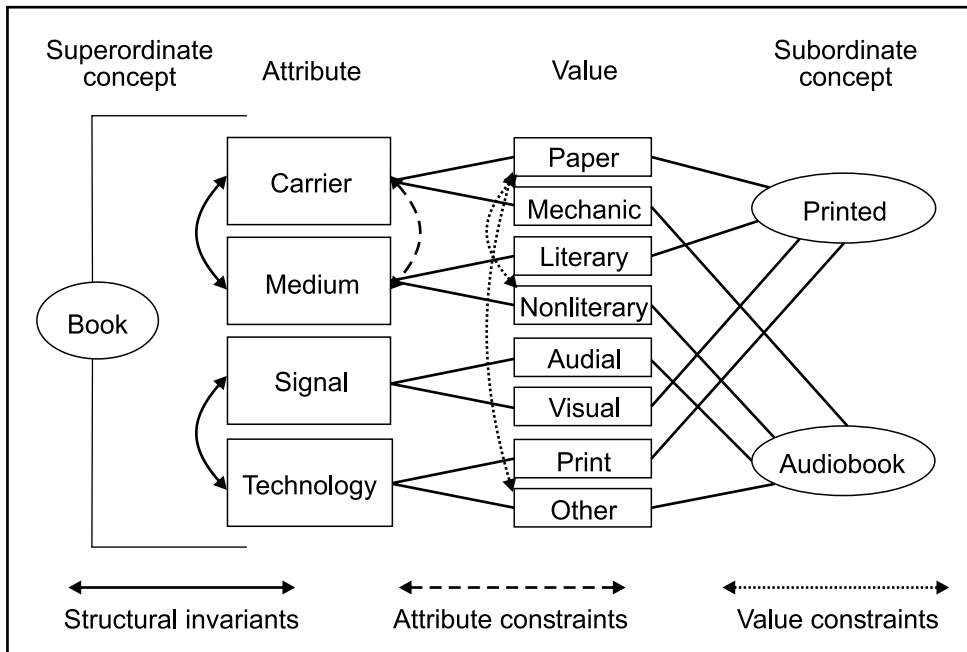
Fig. 1. Partial frame of "book" concept. Source: own study

concept using the frame model. Attributes of the concept have been chosen in such a way that they may constitute a criterion of division based on content and form, ie the main characteristics of the genres, distinguished in the literature discussed in the previous sections of the article. Genre features in the frame are divided into two groups: attributes and their values. Each of the attributes is bound inextricably with the specified values. Between the attributes, structured constants reflecting various types of relationships (for example, part-whole) between them were assigned, pointing to the actual (existing in reality) limitations of these attributes. For example, every document is fixed on some carrier, which results in the use of the appropriate medium of information. Between the values of different attributes, there are also constraints that define relationships between them. For example, if a document is a literary one, it is fixed on a paper carrier. Due to the different values of the presented attributes, the subordinate concepts "printed book" and "audio book" are distinguished. This change was considered a relatively non-disruptive, evolutionary change.

Even at this point, the problem of prototypes and the different degree of similarity to the prototype of the objects belonging to the genre is evident. We can imagine literary (text) documents, fixed on a carrier different

than paper, but such a document will be distinctly different from the pro-
totype text printed document. Likewise, at least some of the non-literary
documents may be preserved on paper in the form of a codex (e.g., photo
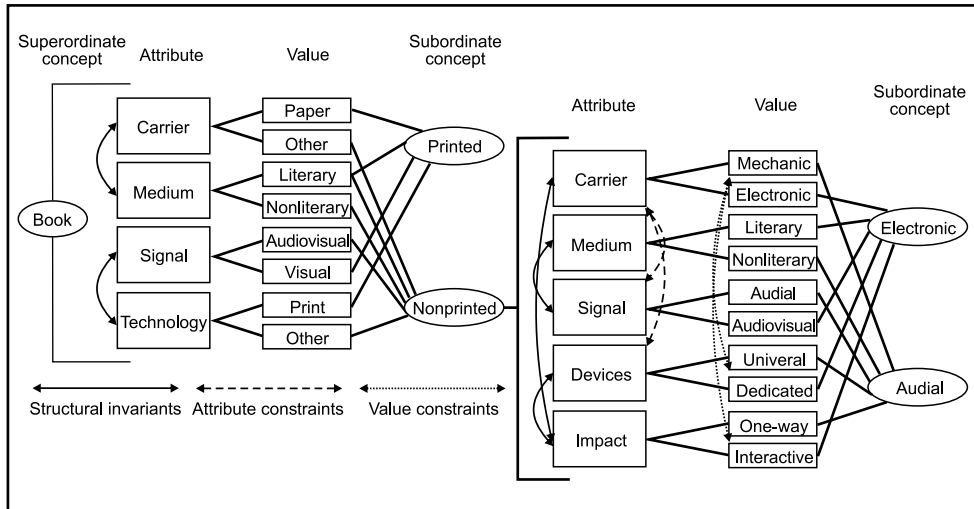albums), which are therefore considered books.

Fig. 2. Partial frame of "book" concept after revolutionary change. Source: own study

Figure 2 also shows the use of conceptual frames; this time it is a rep-
resentation of revolutionary changes in science resulting from the emer-
gence of a new electronic genre (electronic book). In this case, it turned out
that the new genres have common attributes with audial genres (audio-
book), but they have no common attributes with printable genres. This
anomaly causes several important taxonomic changes. In order to express
the changes, several attributes have been added to the "book" frame with
the corresponding values. This has led to the need to modify structural
invariants and attributes and their values constraints. Due to common
attributes, non-printed genres were separated and placed together, which
means they are treated as one class of similarity. A new class of "non-
printed book" was introduced, which together with the "printed book" class
creates a new contrast set. In order to indicate the differences between the
audiobook and the electronic book genres, a new subordinate layer, cor-
responding to the "unprinted" frame, was created.

These changes cause a mismatch between two taxonomies. After the
described changes, the concept "audiobook" of old taxonomy refers to
objects "non-printed" in the new taxonomy, applied to both analogue audi-

obooks and e-books. This can cause communication problems between people using different taxonomies.

After a revolutionary change there will come another transitions, more evolutionary in their nature, to better utilize the features of the new communication medium. One of the manifestations of these changes is the creation of the so-called enhanced publication. It is defined as dynamic, versionable, identifiable compound object that combine electronic publication text (narration part) with remotely enabled or embedded research data, supplemental materials, post-publication data, database records, and metadata (Bardi, Manghi, 2014, p. 242). The enhanced book is therefore a complex electronic object, described by an identifier and descriptive metadata. The components are: a mandatory narrative part, containing a textual description of the research and a set of related auxiliary parts. The latter are different in each application, both for the implementation type and method. They may be:

• Embedded parts, such as expanding the publication to include additional audial and / or visual materials;

• Parts of the structured text, e.g., expanding the publication with structured text components, prepared by the publisher;

• Reference sections, such as an enhancing publication with a set of URL references to external objects;

• Executable parts, e.g., enhancing the publication with parts containing software and data, enabling the described experiment to be carried out again by a reader;

• Generated parts, such as enhancing the publication with tables, that can be dynamically modified in response to changes in the research data provided.

The use of Linked Open Data (LOD) technology in developed publications causes fading of the differences between research data, publication text that contains the data and the metadata created on the basis of that writing.

Figure 3 shows the partial frame of the term "electronic book" in the course of further evolution. As a result of the increased use of possibilities offered by electronic publishing technologies, the term "electronic traditional book" (named "scanned") and "electronic enhanced book" have been distinguished. The latter was distinguished on the basis of the attributes and their values described in the literature of the subject. They point to the main features of the newly created electronic publication.

Conclusions

The frames model allows for observation of the trends of continuous change, in terms of concept scopes, that can be treated as a pattern of
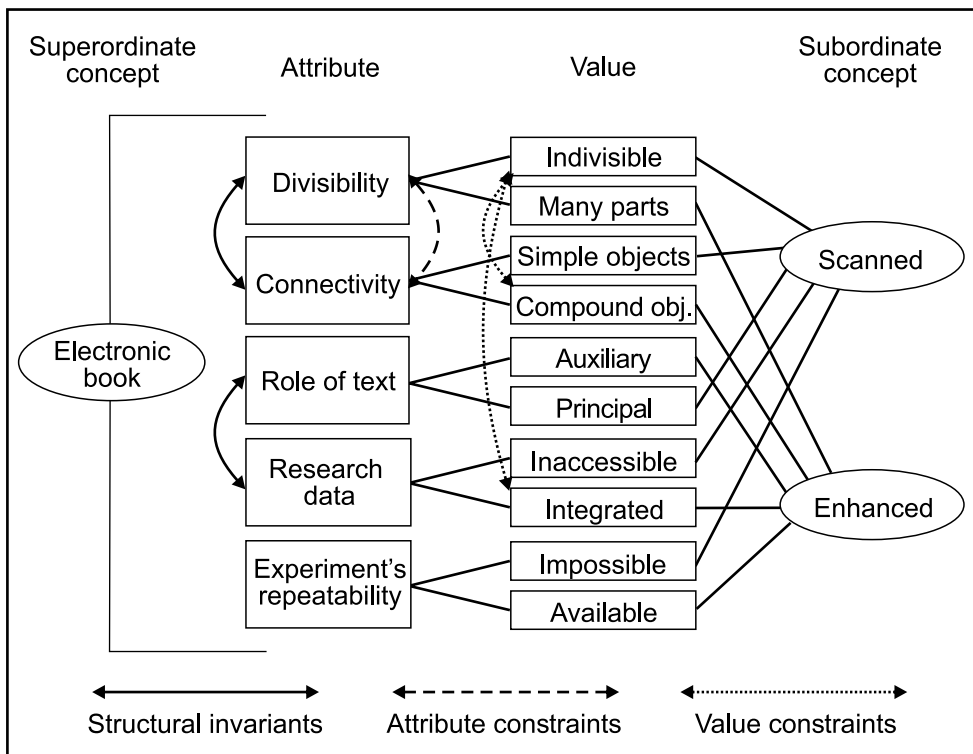
Fig. 3. Partial frame of "electronic book" concept during evolution. Source: own study

change in specific areas of science. Genres of publication (information) in the article were treated as a kind of concepts with its own frames. This model also provides the possibility of creating different types of discontinuities (anomalies) in the conceptual system. These anomalies are the result of detecting changes in reality that are not compatible with existing mental schemata. In the case of weak constraints for concepts, a single anomaly is not capable of causing instantaneous taxonomic change. At this point, making a conceptual change in science requires the accumulation of anomalies (Chen, Andersen, Barker, 1998, p. 17). In a situation of revolutionary change, which causes the emergence of a new paradigm of scientific publishing, modifications of mental schemata can be much deeper. As a result, at the beginning of the process of change, early electronic text genres emulate the behavior of pre-existing genres in the new electronic environment. In consequence, as a result of better matching to new environmental conditions, new genres are distinguished, which do not have their counterparts in the world of print. These genres better reflect the

communication objectives of the new information exchange environment. Simultaneously, the semantic distance between the concepts is increased and new boundaries arise between them.

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Marek Nahotko
Theory of mental schemata in the study of the evolution of book as a publication genre

Abstract

In recent years, electronic publishing has been rapidly expanding. Most genres of publications, including books, become digital genres (cybergenres). This raises questions about the future of publishing, in particular, the question of whether new cybergenres will replace traditional genres, or rather hybridization of publishing will take place; they are

questions about relations between old and new genres. In the paper the theory of publication genres has been used to find answers to these questions. Genres are treated as mental schemata which conceptual content can be represented by a frame. By applying the frames model it is possible to present a concept representation in the mind, including the concept of a book. The mechanisms that allow for the evolution of schemata are important because they are used to make changes in the genres of texts. In this article it is dealt with the changes that occur in text genres, mostly books, as a result of the use of new publishing technologies. They are described from the side of individual mental processes taking place in the minds of communicating persons.

Key words: mental schemata, text genres, electronic books, frames theory

Marek Nahotko

Teoria schematów mentalnych w badaniu ewolucji książki jako gatunku publikacji

Streszczenie

W ostatnich latach szybko rozwija się publikowanie elektroniczne. Kolejne gatunki publikacji, w tym książki, stają się gatunkami cyfrowymi (cybergatunkami). To powoduje pytania o przyszłość publikowania, w szczególności, pytanie o to, czy nowe cybergatunki zastąpią gatunki tradycyjne, czy też nastąpi hybrydyzacja publikowania, a więc o relacje pomiędzy gatunkami starymi i nowymi. W poszukiwaniu odpowiedzi na te pytania w artykule wykorzystana została teoria gatunków publikacji. Gatunki traktowane są jako schematy mentalne, których zawartość pojęciowa może być reprezentowana przy pomocy ram. Stosując ramy możliwe jest przedstawienie reprezentacji pojęcia w umyśle, w tym pojęcia książki. Ważne są mechanizmy pozwalające na ewolucję schematów, gdyż one właśnie służą tworzeniu zmian w gatunkach tekstów. W artykule przedstawiono zmiany zachodzące w gatunkach tekstów, głównie książek, w wyniku stosowania nowych technologii publikowania. Są one opisane od strony indywidualnych procesów mentalnych odbywających się w umysłach komunikujących się jednostek.

Słowa kluczowe: schematy mentalne, gatunki tekstu, książka elektroniczna, teoria ram