MECHATRONIC TECHNOLOGIES USED IN INFO-DOCUMENTARY STRUCTURES AUTOMATISATION

TEHNOLOGII MECATRONICE UTILIZATE ÎN AUTOMATIZAREA STRUCTURILOR DE INFORMARE-DOCUMENTARE

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Rezumat: *pornind de la necesitatea de a regândi locul, rolul şi scopul bibliotecilor şi a bibliotecarilor în relaţia informaţie -beneficiar, autorii acestui articol fac o analiză asupra posibilităţii de implementare a cîtorva modalităţi realizabile * pentru restructurarea activităţii şi reorganizarea factorilor cheie şi a metodelor de lucru din cadrul sistemelor de informare-documentare.*

Cuvinte cheie: *mecatronică, sisteme de automatizare, automatizarea bibliotecii*

Abstract*: starting from the necessity of re-thinking the place, the role and the purpose of the library institution and of the librarian in the relation information – beneficiary, the team of authors make up an analysis with respect to the possibilities of implementing several feasible and state-of-art modalities for restructuring the activity and for reorganizing the key factors and the working methods within the info-documentary systems.*

Keywords*: mechatronics, automation systems, library automation*

1. CONSIDERATIONS ABOUT THE INFORMATIONAL SUPPORT

The compliance with the principles of the Bologna process depends to a high extent on ensuring a qualitative informational support. These principles may be implemented by well informed people, who know to appreciate, to manipulate, to search, to use the information. The libraries possess important key factors for training these abilities. The importance of the informational dimension of the European university area may be justified by resorting to the following phenomena: *quality* (its indissoluble connection with the access to information and informational culture, priority direction of action in the educational policy of the European Union) and *integration, globalization of education* (imposes training specialists in compliance with the educational standards of the developed countries or defined on the level of the European Union) (figure 1).

Through the attributions and functions it accomplishes, the university Library covers both the informative dimension and the formative dimension of education. It influences the dynamics of education; it determines the quality of the learning processes.

The mission of university library is to support the study program, offering resources, services, informational technologies to the beneficiaries and supporting them in searching, selecting, using information. Beside the informational, patrimonial, library, communicative function, within the university community a library stands likewise for an important cultural agent.

Under the new conditions, there is necessary to rethink the place, role, mission of the library institution and of the librarian in the relation information – beneficiary, as well to restructure the activity, to reorganize the key factors and the working methods.

Computer Revolution (the second industrial revolution) marked the leap from an

industrialized to an informational society, generating a wave of upgrades in technology and education. Mechatronics is the result of natural evolution in technological development.

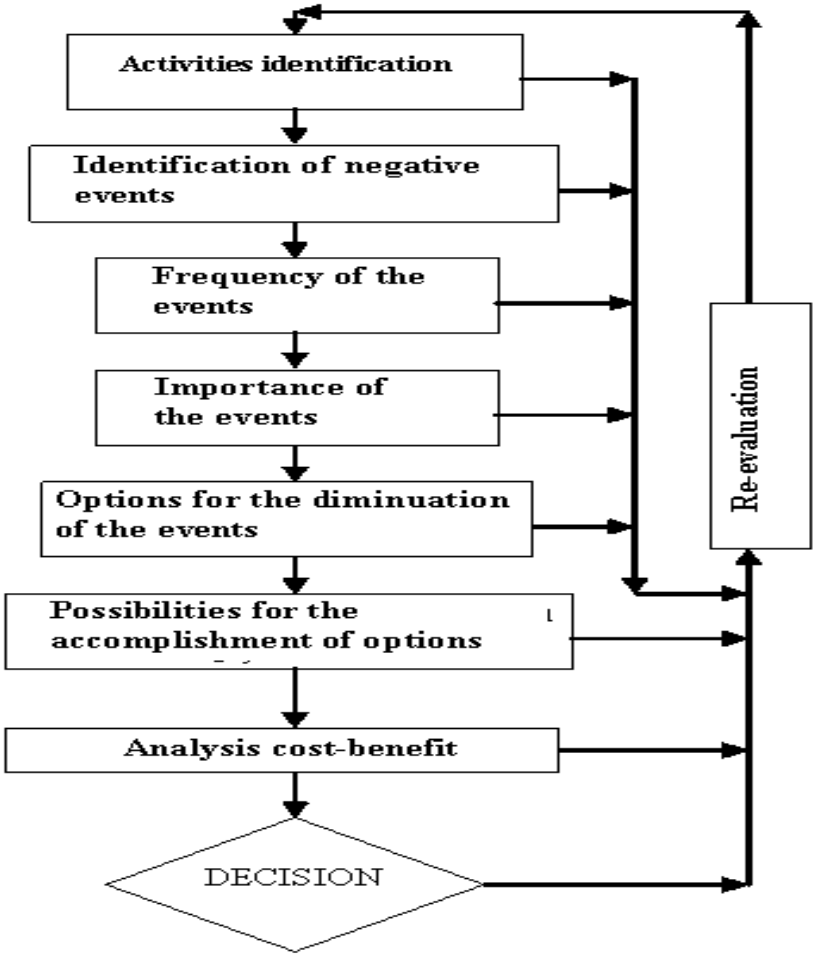

Figure 1: The evaluation of the informatical support

Currently, worldwide, mechatronics has a powerful development. Defined as the synergetic integration of mechanical precision with electronics, informatics and systematic thinking with the aim of developing and manufacturing intelligent products, it is the result of computer revolution and it is the gateway for the transition from advanced industrialized society to information society.

The impact of mechatronics technology exceeds the economic sphere, the essential social, cultural and others. The future of technological development in Romania will increasingly call upon and depend on mechatronics expertise to provide equipment and specialised skills that will not only add value to the finished products, but do it quickly, accurately, economically and in large volumes.

The library activities aim at offering quality services in a systematic, permanent, complex, coordinated manner. Within the enhancement processes, there is compulsory their characterization both from the qualitative standpoint and from the standpoint of the economic efficiency. The team of authors sets out to analyze and to outline the feasible modalities for restructuring and for organizing the activity and the working methods within the free access department. The free access to the shelf offers wide possibilities for searching and accessing the information. From this very reason, the reader (especially the novice one) may feel frustrated because of the avalanche of information, not being able to determine which is the most adequate source for his/her request.

At the same time, free access to the shelf stands for a challenge, being decisive in rousing the users' curiosity for the information. Localizing a concrete document, with the librarian's help or for oneself, the user detects in his/her close vicinity supplementary sources, for which he/she has not been oriented.

The principle of the generalized access to the shelf has to become a custom for the Libraries, despite the negative phenomena associated to this one. Let's allow the reader to touch the book, turn over its leaves, borrow it, let's teach them to love it, let's take all safety measures and no one will destroy the copies any longer!

In conceiving a feasible management and safety system, a particular importance is played by the assessment of the events and of the risks which characterize the free access activity. To achieve this, there was carried out the analysis according to the logical scheme presented in figure 1.

The results of the analysis enhanced clear directions in which we may act for obtaining a structure with free access to the shelf of high feasibility.

A first direction aims at using a feasible security system based on video cameras, on motion sensors, on intelligent access equipment and intelligent management devices, in real time, for the books on the shelves. The security system has likewise to be provided with safety elements against the floods and the fire.

The second direction aimed at for the good organization of the free access service implies ensuring a good counseling for the users, their information and their instruction with respect to the procedures specific to free access. In this respect, communication between the librarian and the user becomes very close. Its efficacy depends on the attitude of the person involved in the direct relation with the beneficiary, which has to be adequate to his/her work The librarian's role is decisive in forming the readers' abilities as regards detecting, accessing and using information.

Another direction of action aims at ensuring a feasible informatics network that should contribute to the good functioning of the free access system (figure 2). From the correlation of the three directions of action, there may be passed to the professional restructuring of the free access service (figures 3 and 4).

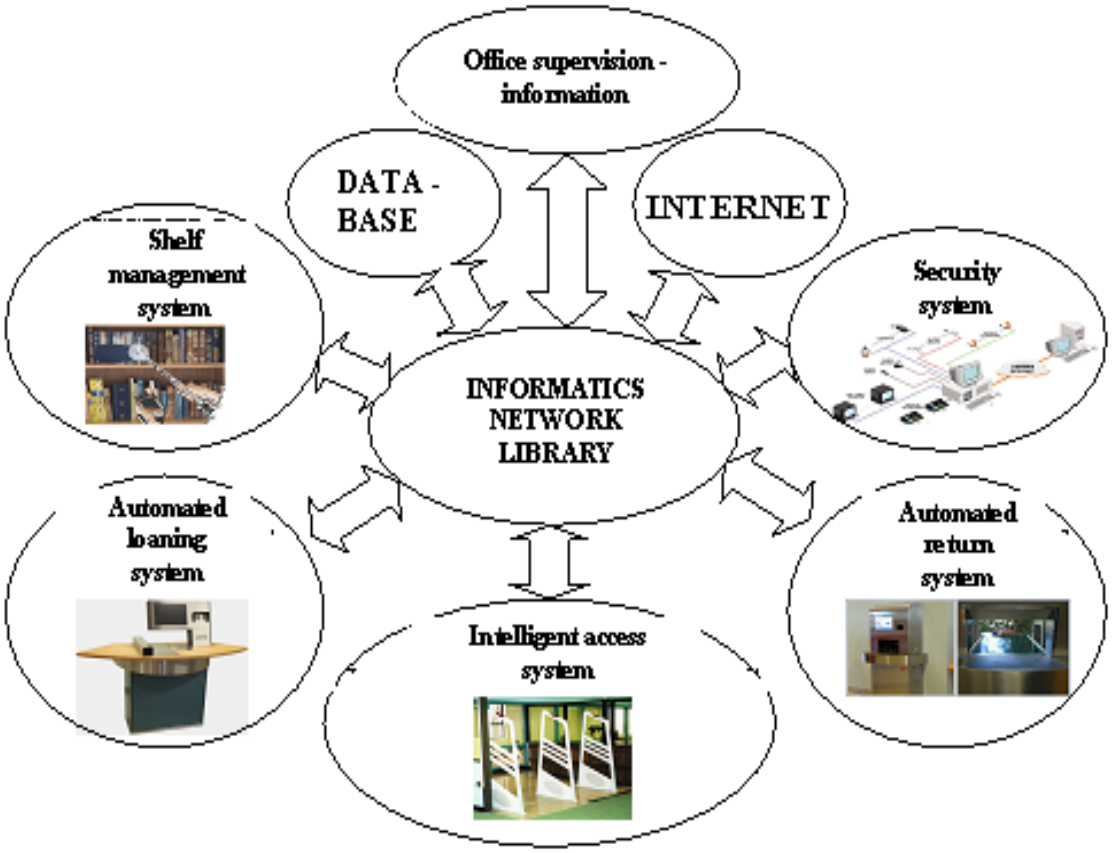

Figure 2: The informatics library

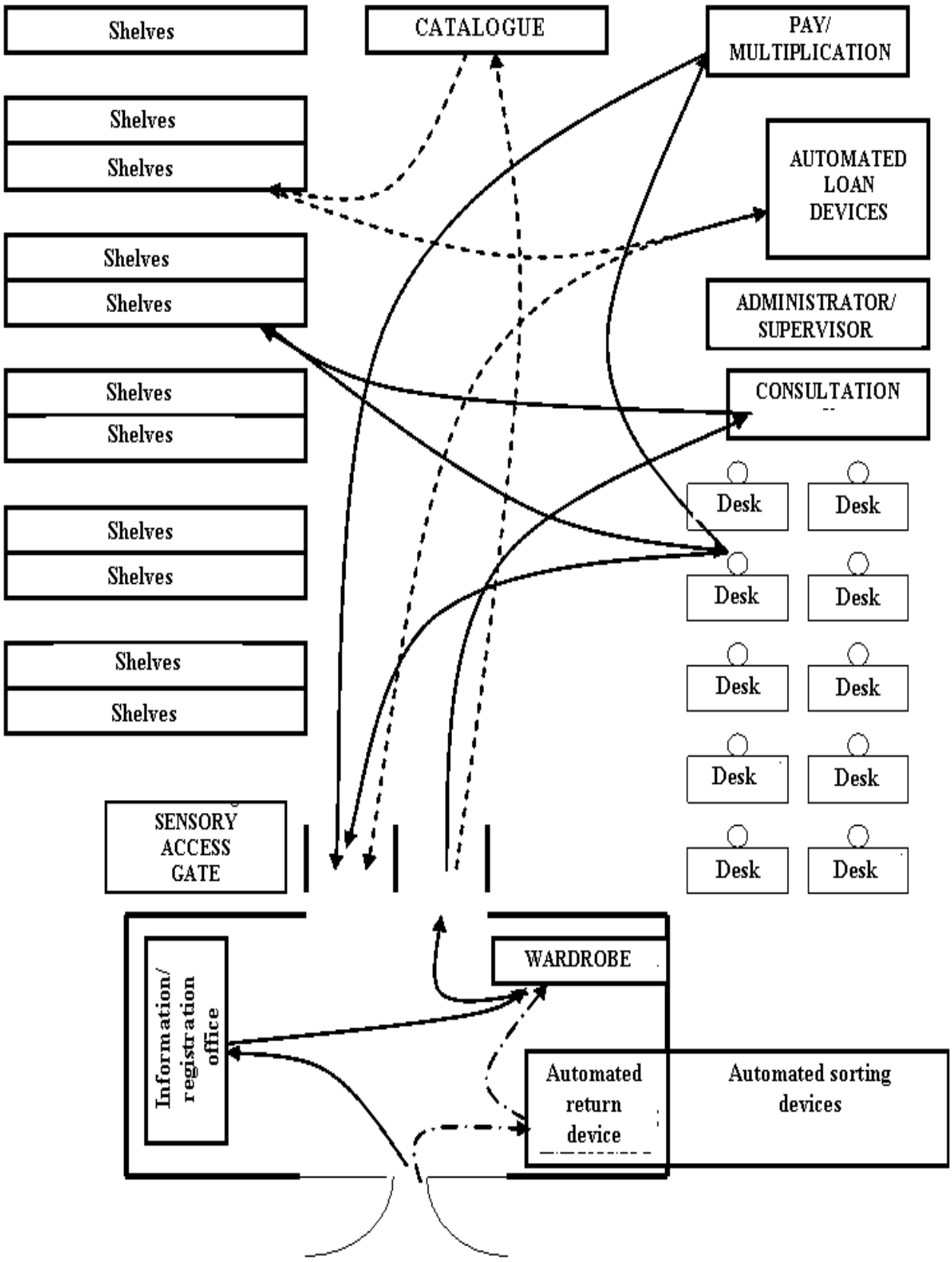

Figure 3: The complex organization, of the loaning and automated systems for the book return and sorting.

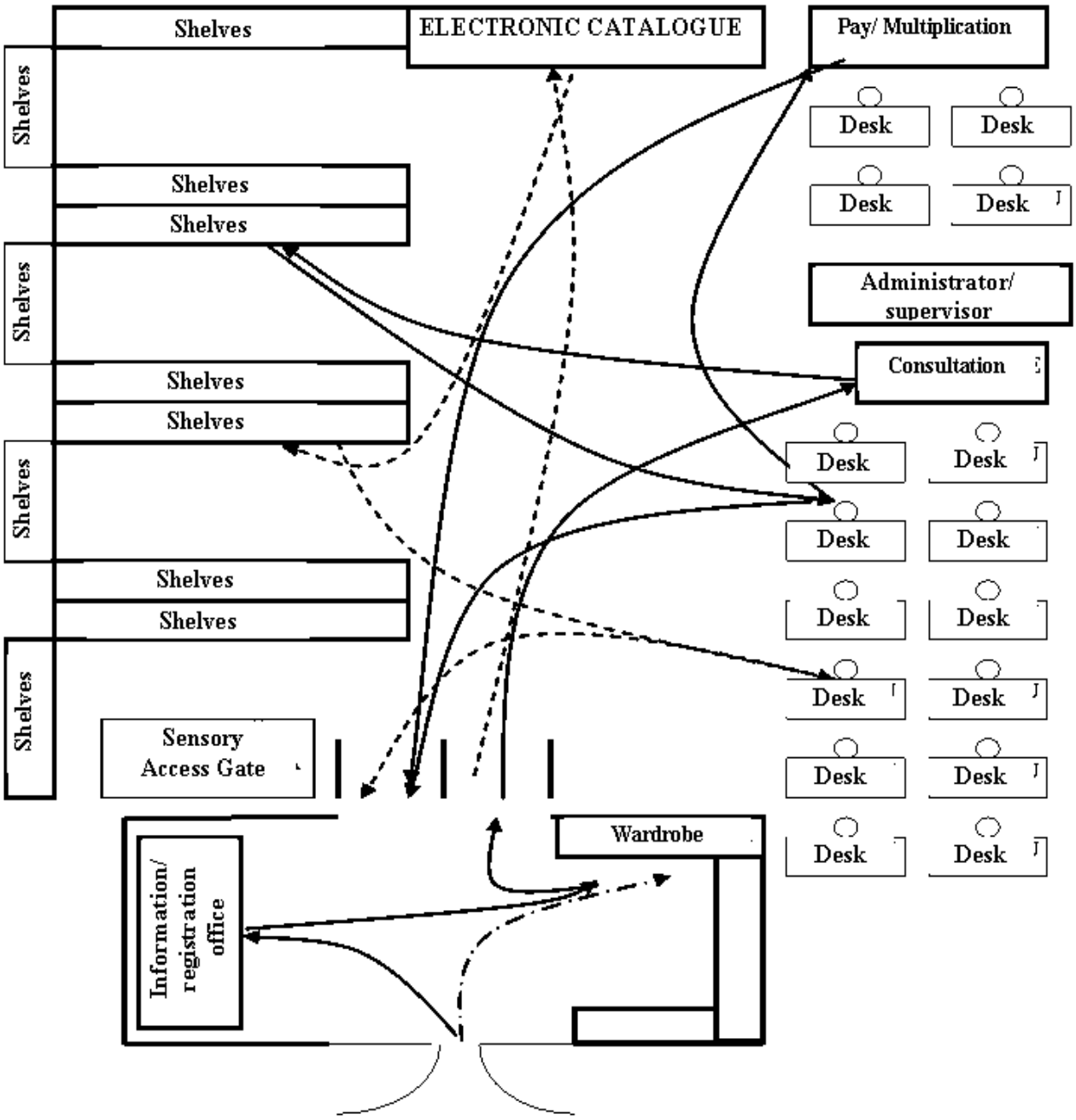

Figure 4: Free access service when there are not used the automated systems for loan/return

In case there are not used the automated systems for loan/return, the free access service may be organized (figure 4). Free access stands for a state-of-art method, which ensures wide possibilities for searching and accessing information, but which imposes at the same time a new mentality, a radical change in the librarian's traditional image. Free access to the shelf contributes to training and educating the users, through developing skills such as: responsibility, self-organization and capacity of orienting oneself within the information.

2. MECHATRONIC SYSTEMS FOR THE PUBLICATION TRANSPORT

Mechatronic systems used within the libraries are: State-of-art systems used within the libraries, Access gate and Intelligent identification systems.

In general, the state-of-art systems used within the libraries are the safety systems:

- metal detecting gates;
- access control with proximity cards;
- video supervision devices;

- anti-fire systems.

In order to define the operation of publications dosing and transport there are some requirements: knowledge of the volume to be portioned; establishing a control parameter; transporting of the product. During the construction of dosing systems an important step consists of choosing technical solutions that will be used: devices, sensors, operating principles of functioning and methods of manufacture.

The intelligent solutions for the publication transport within the libraries were created both because simply the number of publications rises every year and because during the last years there have begun to appear multimedia publications (figures 5, 7, 8). The conveying belts with a wide using range are resorted to in different fields of activity such as: sorting centers, piece assembly lines etc.

The solution chosen for transporting the publications within the libraries is a scraper conveyer which has the role to offer a better yield within the activity, a better organization and efficiency within the libraries, and to put at the user's disposal the desired book without his/her entering into contact with the staff of the library (see figure 5).

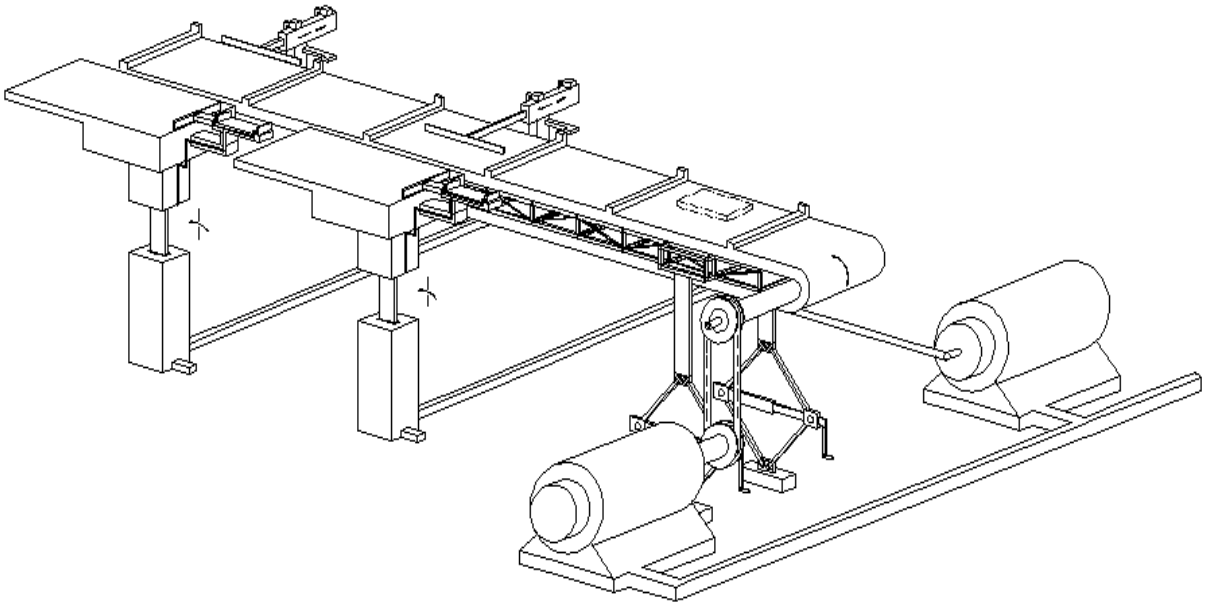

Figure 5: The publication conveyor belt

The system comprises a conveyer belt on which there are set the scrapers that are applied on the conveyer belts through heat vulcanization (figure 6). They may be of different shapes and dimensions: - in \"V\" continuous; - in \"V\" interrupted; and - transversal.The use of the belts as active elements of the conveyers is in connection with several advantages they display:

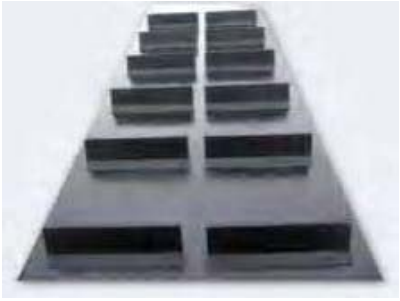

Figure 6: The scrapper covering belt

- a very wide range of different dimensions which offer the possibility of making the best choice – in a concrete situation;

- the possibility of an easy and safe setting of the different supplementary elements;

- the possibility of enveloping on gears with a small number of teeth and hence the necessity of a more reduced driving moment.

They may have any disposal on the upward side. The belts comply with all criteria of hygiene and low bacteriologic risk, in accordance with the Romanian standards and norms and with those of CE.

The positioning of the publication on the belt is done at one of the two ends. At that moment, an optic reader records the barcode imprinted on the scraper margin (figures 7). Through the graphical interface of the PC application, the user can set certain parameters

of dosing and controlling its phases: start, stop, reset batch process. Optimization of the process, in terms of speed and accuracy of dosing and transport is achieved by controlling the movement and the characteristics of the publications to be dosed.

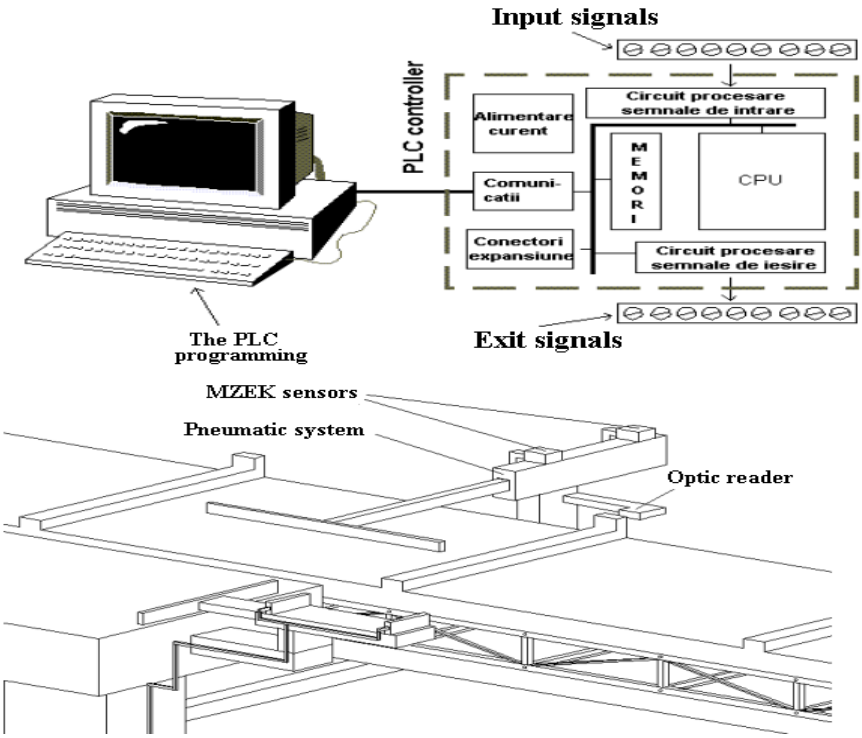

Figure 7: System of book moving along the belt.

Figure 8: Publication transport system

3. CONCLUSIONS

In the context of technological boom, especially in terms of increased computing power and automation, the dosing and transport phase plays an important role in all automatised processes. In conditions of a full automation of batch processes the aim has been pursuing improvement in terms of time and accuracy of dosing and transport.

For the modern libraries, the mechatronic systems used in the publication transport represent a viable solution to increase the efficiency in the identifying, arranging and storing of the publications.

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