

Virtual Organization in Libraries: necessity or luxury of the future?

Dr Anthi Katsirikou,

Library Director, Technical University of Crete, Campus, 73100 Chania, Greece.

Email: anthi@library.tuc.gr

Professor George Bokos,

Ionion University, Dept. of LIS and Archives Science, Palaia Anaktora - Plateia

Eleutherias, 49100 Corfu – Greece.

Email: gbokos@ionio.gr

Abstract

Virtual organization is a recent way of work and work-flow organization between organizations or between departments within an organization. The principles, the tools and the type of organization, could be applied to library organization as well as to libraries' cooperation and coordination.

This paper examines first the similarities and the differences between VO and LIS organization, attempting to identify possible common organization elements.

The paper suggests that the fields in which VO in libraries could be applied are organizational synergies between libraries, consortia, scholarly communication, benchmarking etc.

Consequently, the new roles and the necessary skills of librarians, and, accordingly, the demands for changes and adaptation in their education or continuing education curricula are highlighted.

Keywords: Library Management, Virtual Organization, Library Cooperation, Library and Information Science Education.

Introduction

Two interesting definitions of the virtual¹ organization² have emerged from the relevant discussions of specialists in the field: The first:

A Virtual Organization is a temporary network³ of independent institutions, enterprises of specialized individuals that through the use of information and communication⁴ technology spontaneously unite to utilize an apparent competitive advantage. They integrate vertically⁵, bring their core competencies and act to all appearances as a single organizational unit.

And the second:

A Virtual Organization is an identifiable group of people or organizations that makes substantially more use of information and communication technologies than physical presence to interact, conduct business and operate together, in order to achieve their objectives.⁶

¹ See Mowshowitz (1994), p. 268 defines: «The virtuality is on of unconventional social configurations whose structures and functions are highly dependent on computer based information technology. These configurations differ from conventional ones in being unconstrained by familiar spatial and temporal boundaries. Such absence of constraint gives rise to offices and classrooms “without walls” embracing activities distributed over space and conducted asynchronously as well as synchronously. In addition, it facilitates the structuring of corporations with amorphous boundaries, both internal (between units) and external (between the company and the outside world). These virtual corporations are characterized by ever-shifting job responsibilities and authority structures that permit extraordinary flexibility in modes of functioning and responsiveness to the environment.»

² Strausak (1998), p. 9 and 12.

³ See Larsen (1999), p. 20, the network definition: «The most general use of the term “network” is for the structures of ties among the actors in a social system. These actors may be roles, individual persons, organizations, industries, or even nation states. Their ties may be based on conversation, affection, friendship, kinship, authority, economic exchange, information exchange, or anything else that forms the basis of a relation. Thus in this broad sense, the structure of any social organization can be thought of as a network. A particular network may depend on one or more of the following types of relational content: 1. Communication content- the exchange of information among entities, 2. Exchange content- the flow of goods or services among units, or 3. Normative content- shared expectations that network member units have of one another based on some social feature. Networks also may develop to enable members to actuate increased political, social or economic power and to legitimate new social structures. Thus networks may vary greatly by purpose or function as well as by level.»

⁴ See also p. 13, about the description of Post- Bureaucratic Organization: «1. Transformation- by means of information technology- of paper into electronic records. 2. computer-mediated communication replacing human communications as a means of conducting the primary activities of the organization and maintaining organization coherence. 3. The implosion of bureaucracy with the eradication of specialized tasks replaced by cross- functionality. 4. the networking of individuals from technically separate firms (such as suppliers, customers, and even competitors) to the extent that clear external boundaries of the organization become difficult to establish in practice.»

⁵ See also Strausak (1998), p. 10, where is clarified that «Vertical integration does not imply that there is a hierarchical structure to a Virtual organization but rather refers to the way the Virtual organizations form to optimise the value chain. They form vertically across industries to create a best of everything organization in order to meet requirements and demands of the business environment.»

⁶ See also Larsen and McInerney (2002), p. 446, Holland (1998), p. 55 and Mowshowitz (1994), p. 272 who emphasises on goals. Bultje and van Wijk (1998), p. 17 conclude that: «A Virtual Organization is

A third definition describes the culture of the virtual organization: The virtual organization is the name given to any organization, which is continually evolving, redefining and reinventing itself for practical business purposes.⁷ Mowshowitz (1994)⁸ described it as follows:

The essence of virtual organization is the management of goal- oriented activity in a way that is independent of the means for its realization. This implies a logical separation between the conception and planning of an activity, on the one hand, and its implementation, on the other. By activity we mean anything undertaken in an organization, be it production, marketing, distribution, research and development, or any other domain. It is important to keep in mind that the separation between conception and implementation is categorical, in the sense that conception deals with an abstract model of an activity and is not materially dependent upon any particular outcome. However, this categorical distinction does not imply a master- slave relationship: that is, implementation may also require abstract modeling for its own purposes.

In the definitions above we can clearly recognize libraries, when they evolve shared collections and interlibrary loan systems, when they join their forces to achieve collectively lower subscription prices and online access, when they share records and metadata, when they jointly organize e-learning courses and continuing education programs.

Virtual Organisation Characteristics and Libraries

Five are the specific factors, which are crucial to the virtual organization emergence:⁹

1. The increasing prevalence of flat or horizontal organization structures.
2. The emergence of environments that require inter-organizational cooperation as well as competition.

primarily characterized as being a network of independent, geographically dispersed organizations with a partial mission overlap. Within the network, all partners provide their own core competencies and the cooperation is based on semi- stable relations. The products and services provided by a Virtual Organization are dependent on innovation and are strongly customer- based. Further, a virtual organization is secondary characterized by a single identity with loyalty being shared among the partners and the cooperation based on trust and information technology. In addition, there is also a clear distinction between a strategic and an operational level.»

⁷ Hale and Whitlam (1997) p. 3. See also Speier et al (2000) p. 62, where they notice the characteristics: «a web of companies each contributing resources, virtually vertically integrated, linked through interenterprise business and production systems, aimed at reduced business cycle time, aimed at One –stop shop.»

⁸ p. 270-1.

3. Changes in workers' expectations of organizational participation.
4. A continued shift from production to service /knowledge work environments.
5. The increasing globalisation of trade and corporate activity.

The Key factors of virtual organization, as they have been pointed out by the researchers, can be identified with the consortia activities, although they have been neither structured nor organized according to virtual organization principles:¹⁰

1. Emphasis on a more egalitarian approach to management.
2. The entities involved are in(ter)dependent and yet tied together in a loose network with some pre-defined procedures or protocol to guide any collaborative arrangement entered into.
3. The key to creating a virtual organization is "human" and not technology.
4. A virtual organization must touch on (an) issue(s) that have a direct, immediate impact on the group involved.
5. Legislation on the virtual organization might differ from country to country.
6. Commitment from each participant to the Network Organization or to reaching the (short term) goal of the network organization.
7. All comments should be public and shared with the entire group.
8. Learning how to think in the Information Age is the single most critical "technology skill" which you must acquire as an associated partner.

As we can perceive, the library consortia as well as the international library cooperation relate common goals or shared aspired projects, as the shared subscription to databases for achieving more favourable conditions, the implementation of a research project etc. That is, they achieve the effective and interested administration of the scientific production of the organizations they belong to. We can regard that libraries participate to more than one contributions in order to implement a goal, the equality between partners, the interdependence and the independence.

What is remaining to be proved emphatically is the human contribution, which is usually implicit but not explicitly confessed.

Additionally, there are three levels of Virtuality in libraries:¹¹

⁹ Townsend et al (2000), p. 70.

¹⁰ Strausak (1998), p. 9-10.

¹¹ Bauwens (1994), p. 134-5.

1st level: Electronic access (OPAC) and a real library background. This corresponds to the first automation phase of libraries.

2nd level: Electronic access to virtual collections combined to document delivery. This is the level, which is valid today.

3rd level: electronic access to virtual collections, which are constituted by electronic documents. This level is in the experimental phase and concerns special limited collections.

Certainly, the libraries' activities are not organized according to Virtual Organization rules, although they are facilitated by computer and communications technology. Virtual Organization however uses processes the applications of which will advance the future of libraries' organization.

Bultje and van Wijk (1998)¹² expose 27 virtual organization characteristics, as they collected them from the literature. Six of them are commonly accepted as key factors. We refer to them first and then we choose those, which are relevant to libraries cooperation.

✓ Based on core competencies. Partners will only contribute to the VO with their core competencies. The partners in the VO or in the initiating organization determine hereby the necessary business processes. The combination of all core competencies leads to synergy and enables a flexible way of meeting the customer demands. Excellence is important, because every partner brings its core competence, it's possible to create a "best-of-everything" organization.

✓ Network of independent organizations. An organization network is a set of independent organizations connected by semi-stable relations.

✓ One identity. VO must have its own identity. Besides the identity of the VO, the identity of partners can also remain visible. These VOs are called soft VOs. A hard VO looks from the outside like one common organization.

✓ Based on information technology. Important for the VO are the advances in transportation, communication and computing. An information network will help widespread companies to link up and work together.

✓ No hierarchy. There exists no hierarchy in a VO, because of the equality of the partners. This enhances the efficiency and the responsiveness and decreases the overhead.

¹² p. 10-12.

- ✓ Distinction between a strategical and operational level (separability): on a managerial level exists a clear distinction between the abstract requirements and the concrete implementation to reach the organizational goals, which is called switching. There is also difference between a global strategic management level and a local operational management level. This is for coping with the difficult control problem.¹³
- ✓ Small sized partners. Like mentioned before, the partners will only bring in their core competencies and this is often not the whole company. Furthermore, flexibility and fast moving is necessary for going after opportunities. Only small companies or parts of large companies can achieve this. Large companies are often slow in, for example, decision-making and innovation, what is essential for responding to the opportunities.¹⁴
- ✓ Vague/ fluid boundaries. The VO redefines the traditional boundaries of organizations. More cooperation among competitors, customers, suppliers, designers etc. makes it difficult to determine where one organization begins and another ends.
- ✓ Shared ownership. A VO lacks the “classical trinity”, which is important for an efficient cooperation. Shared ownership means in this case that every independent partner has its own interests in the VO and parts of the VO can have different owners. So not only the VO has its interests but also the participating partners. When the goal of a partner is met or can’t be met, it will /can step out of the VO.
- ✓ Shared leadership means that every partner controls its own resources but not automatically the resources of the whole VO.
- ✓ Geographically dispersed.
- ✓ Based on trust. The fate of each partner is dependent on the fate of other partners. The semi-stable relations (less formal and less permanent) and the shared risks make

¹³ See Mowshowitz (1994), p. 269: «The idea of virtual organization is not entirely new in that its defining characteristics can be seen in nascent form in a host of different settings. One such characteristic is the separation of conceptualization from execution of tasks. Another is the use of objective criteria for the allocation of resources. What is new in virtual organization is the status of separability as a general principle, applicable to all the functions of management- one that allows for crafting structures that enable management to switch at will between different options for implementing an organization’s requirements.»

¹⁴ Lepak and Snell (1998) p. 219 explain: «The more varied the environment, the more extensive the differentiation. This model for organizing was ideal in rigid hierarchical firms striving to lower costs and increase efficiency. In today’s business environment, however, uncertainty stems as much from technological and market change as it does from complexity. Simply differentiating within the firm is often not sufficient for today’s virtual structures. To adapt to environmental and competitive pressures, virtual organizations have altered the fundamental nature of structural differentiation. Whereas hierarchical firms tended to differentiate within their incorporated boundaries, virtual organizations extend beyond their boundaries to establish collaborative structures with external specialists.»

the partners also more dependent. And because of the sharing of information and knowledge, there must be a high amount of trust among the partners.

✓ No organizational chart and meta- organization. The VO is a network of all sorts of organizational structures. That's why it is difficult to draw an organizational chart. VO does not presuppose any particular form of organization. It is a kind of umbrella organization.

✓ Customer-based and mass- customisation. Customers have particular needs and wishes, and ask for individual products. Organizations are collaborating in a VO to produce this mass- customisation. Strong customer interaction is essential for the development of a virtual product.

Being sensitive to customer needs is important but it is only part of doing business. A business needs a product that is in demand and most important, a product that people find valuable enough to pay for. For academic research libraries revenues may come in direct or indirect form. The emphasis on service and customer must go hand in hand with income and support.¹⁵

LIS managers will have to wrestle with the strategic implications of such services and integrate them, somehow, into their recurrent budgets. They need realistic financial deals and contracts to be able to make these products widely available to their users- they can no longer afford to pay continually inflating periodical prices and they cannot match the buying power of the commercial sector.¹⁶ They will need to ensure that sufficient training facilities, equipment and courses are available, for both their staff and for users. They will have to determine the optimum mix, for their environment, of locally, regionally and nationally networked databases, whether these are held on CD ROM or other electronic media, and whether they contain bibliographic information or images. Their decisions will depend, amongst other factors, upon the pricing policy, transparency of networking, and the nature of the interface for each product.

A strategy is seeking affiliation with similar institutions... these affiliations and collaborative efforts strengthen an academic library's position vis a vis technology vendors and higher costs. Academic libraries have had a tradition of collaborating in selected areas, such as interlibrary loan and collection development. These efforts need to be expanded if libraries are to survive in the changing environment... For the

¹⁵ D' Andria (1994) p. 88.

consumer, these partnerships provide convenience, better connections and a greater selection of options. Similar alliances among research libraries, particularly configurations based on regional collections, would establish formidable collections of resources, considerable convenience to information users, and significantly strengthen the position of academic libraries in information marketplace.¹⁷

A model of people networks with five structural and five process characteristics describe the nature and indicate the potential of such networks. Structural characteristics include:¹⁸

1. Network participants, though whole and autonomous individuals, are a part of a network, which is in turn, a whole but also a part of something larger.
2. Networks have a level of structure with exchange among participants.
3. Networks bring parts together under a decentralized cooperative structure but minimize participant's dependency on the network itself by balancing its forces of concentration and distribution.
4. Networks bring together the many perspectives of its members who are autonomous yet cooperate in the network because of common values and visions.
5. Networks have multiple facilitative leadership with all participants able to share leadership roles and responsibilities related to the network.

Networks are not new to libraries and librarians. Resource –sharing, computer and library information networks have had important roles in library development, resulting in two readily identified network structures: bibliographic utilities and service centers. At the other end of the spectrum, individual reference librarians and acquisitions librarians use search strategies to tap their personal networks of contacts. Whether such contacts were deliberately built or resulted from natural instincts, individual effectiveness in daily work is directly related to the extent and degree of effective use of such networks.

Although not explicitly understood as such, people networks, one to one or group-to-group, exist in any library (e.g. grapevines, management teams, reference referrals) and within the field (staff developers, young adult librarians, consultants). These are similar to those that function throughout professions, politics and business, most strongly among the very powerful and powerless. Studies of personal influence

¹⁶ Smith (1993) p. 23.

¹⁷ D' Andria (1994) p. 85.

¹⁸ Conroy (1983) p. 78-9.

networks have demonstrated the importance of interpersonal networks in opinion formation and decision- making in a variety of areas.

Given its flexible, adaptive structure and process characteristics, people networks can be seen as encouraging communication at various depths and able to sense and adapt to environmental influences and needs. They are thus able to anticipate the future, transform themselves to meet new challenges, nurture individual participants and provide a cooperative mechanism for exchange. They can bridge the growing distance between rapid technological advances and human values, keeping each in touch with the other. Terming the people network the institution of our time and valuing it for its openness, ability to adapt as a result of awareness and flexibility, networks are defined as essentially systems, consisting of nodes and links and the process of communication.¹⁹

The virtual situation requires this cultural change, which librarians knows well, because they are specially adjusted, cause of the kind of their job, that is the share of the information.

The Human side of Virtuality

The key of virtual organization function and success is the human factor and it is worthwhile that the following thoughts be mentioned:²⁰

1. Restructuring of tasks and work, e.g. dividing virtual and physical components; matching the type of work to the skills and situation- which is best done individually and which best done as a team.
2. Personal skills- developing cyber-skills, especially the ability to communicate effectively by email; this is sadly lacking in most organizations. Also, many knowledge workers do not take sufficient precautions to manage the integrity of their personal computer systems and recovery in case of accident.
3. Remote management- making traditionally trained managers comfortable with managing remotely. Management by outputs and outcome not inputs (i.e. presence of people at their workplace) is a significant shift for many.
4. Interaction skills- develop mutual respect and trust for other's knowledge and contribution.

¹⁹ Conroy (1983) p. 79.

²⁰ Skyrme (1998) p. 30 -1. He also has developed 25 Principles of proven practice, which are referred to the same source.

5. Information and knowledge management- organizing, collating and making accessible information that has been generated online.
6. Reward systems- bringing these into line for the networked and collaborative organization; recognizing the value of roles such as knowledge navigator and organizational “connector” (a person who makes links through their “know-who”); rewarding knowledge sharing and team building behaviour.

It is the bringing of these into harmonious alignment with the tasks and technology that determines the degree of success in the outcome of virtualisation.

The changes in work are expected to operate in a different form of organization and assume new organizational roles. These changes in the work setting affect the way that team members conduct their work and how they communicate and express themselves.²¹

1. Virtual team members must learn new ways to express themselves and to understand others in an environment with a diminished sense of presence.
2. Virtual team members will be required to have superior team participation skills. Because team membership will be somewhat fluid, effective teams will require members who can quickly assimilate into the team.
3. Virtual team members will have to become proficient with a variety of computer- based technologies.
4. In many organizations, virtual team membership will cross national boundaries, and a variety of cultural backgrounds will be represented on the team. This will complicate communications and work interactions, and will require additional team member development in the areas of communication and cultural diversity.

Fritz and Manheim (1998)²² refer five critical processes in virtual work organizations, which are the people management, relationship management, work management, knowledge management and technology management. We draw these two, which are of interested here:

²¹ Townsend et al (2000), p. 75.

²² p. 124.

1. People are key to successful virtual work ...²³ they must work more autonomously and be prepared to make decisions independently, while also working collaboratively with distant colleagues (who many have vastly different experiences, perspectives, and incentives). The success of the virtual work environment is dependent on the expertise, knowledge and wisdom of individuals... time management and self-supervisory skills are important... a sophisticated human resource management system for recruitment, training and development, and career path management is critical to help individuals in the transnational company “cope with its diversity and complexity. The development of the skills of individuals and overall management of people in any virtual work environment appears to be crucial to effective performance.
2. Relationships are critical for efficient organizational performance...²⁴ through these relationships knowledge is transferred from one worker to another, new skills are learned, and work activities are coordinated. In order to be effective, relationships must be developed with a level of shared expectations and trust between individuals. Relationships between individuals are particularly critical for effective performance of virtual work activities... Development of relationships in a virtual environment appears more difficult as individuals are working in different physical context, and the development of a shared understanding of information and communication patterns is less easily

²³ Lipnack and Stamps (1999), p. 93 refer: «People are the core of virtual teams. But there are key factors that must be considered. The first is independence. Everyone in the virtual team must be autonomous and self-reliant but still able to be interdependent. They must know how to be me while simultaneously holding on to being we. The second aspect is shared leadership. At some point, each member of the virtual team will play a leadership role, depending on where the team is in the process. Leadership will shift, depending on the task at hand. Each person brings a particular set of skills and expertise that will be called upon in the process. The third aspect is integrated levels. Virtual teams are not only horizontally articulated teams. They must connect up and down in the organization.»

²⁴ See Lipnack and Stamps (1999), p. 93: «Links are connections –not just technology. These connections may be through face-to-face conversation or through communication technologies. But the connections themselves are totally passive. Results require interaction of some kind. Over time, those interactions will produce relationships, and if they are trusting relationships they will endure. Relationships make the organization. What makes the information age different is not the relationships or the interactions; it’s the digital technologies.» See also Townsend et al (2000), p. 76: «Effective communication skills, clarity of goals, and a performance orientation will continue to be critical attributes for virtual team members. To fully exploit the advantages of the new environment, virtual team members will require basic teamwork training and development, and will also need training to enhance team workers’ facility with the new information and communication technologies... when team members represent a variety of national or cultural groups, there will also be the need to teach team members how each of their respective cultures may differ and how they can overcome these differences and use them to the team’s advantage. »

achieved. These relationships can be influenced by several factors, such as the experience on cooperation, the number of team members et al.

The participants of the (virtual) projects should develop a sufficient level of trust among them. This is the way for them to develop a mutually understandable explicit dialect, a usually extended communication or a dialog respectful and honest. The effectiveness and the efficiency of the staff must be intermediate to the trust relations. Trust existence is crucial to a global virtual group, which members have no official control and leadership by others and which face a variety of uncertainties. Many factors can provoke the trust, such as personal relations through personal conducts, common social or demographic characteristics, anticipated future cooperation, collaborative behaviours.

Today, a new organizational structure, the virtual (V-form) organizational structure, is emerging. In many cases it is replacing the multidivisional structure, replaced the unitary form structure, because of the need for firms to remain competitive given environmental changes. Several factors are driving businesses toward the use of the virtual organizational structure. First the pace of business is continually increasing with shorter product life cycles requiring quicker response to market opportunities. Second, the cost of market entry is often smaller than previously, especially in the information services and other technology driven industries. Third, corporations are now driven more by customer demands than by internal needs. And finally, there is an increased need for globalisation to remain competitive.²⁵

The information marketplace, which is fast developing into a multi-million dollars enterprise, has turned our library patrons into information consumers. The information industry is eager to cater to these consumers. These for-profit information companies have considerable marketing experience, and substantial and recent success in selling information directly to scholars and students.²⁶

The users teaching and training on special disciplines, the preparation of the e-courses material, the commonly created and organized resources and information services, continuing education of librarians, the shared development, use and transfer of technology and tools are fields where virtual organization could be involved in the every day of libraries, in order to achieve the best practices in every domain, as virtual

²⁵ Strader et al (1998).

²⁶ D' Andria (1994) σελ. 89.

organization's main principle is the exploitation of the advantages and strengths of every partner.²⁷

Although not explicitly understood as such, people networks, one to one or group-to-group, exist in any library (e.g. grapevines, management teams, reference referrals) and within the field (staff developers, young adult librarians, consultants). These are similar to those that function throughout professions, politics and business, most strongly among the very powerful and the powerless. Studies of personal influence networks "have demonstrated the importance of interpersonal networks in opinion formation and decision making in a variety of areas."²⁸

Academic libraries focusing on the expensive, special needs of scholars and researchers. Research collections are labor-intensive operations. Research collections are expensive to acquire, develop, expand and service. Research collections require extensive and expensive preservation and conservation work. Academic libraries need to address how they can continue to be an essential component in the educational process. To achieve this goal, academic libraries must have products and services that are highly desired by a large spectrum of on and off campus information consumers.²⁹

The faculty and the library staff hold a unique middle ground position between the roles of supplier and the consumer. Although both groups are frequent consumers, and in many cases content authors, they also serve in an intermediary role between all other campus consumers and content providers. Librarians typically acquire materials for use by the entire campus population. Materials obtained using library acquisition funds should, at a minimum, be available to all local library patrons. Librarians demand that the privacy and usage patterns of their patrons be thoroughly protected. Additionally, librarians provide a wide range of information support services to the entire campus community. To perform their duties they must have wide –ranging access to the entire collection of materials.³⁰

The role of the information specialist has already changed form that of intermediary to that of advisor, instructor, and facilitator for these new services. However, this should

²⁷ Chesbrough and Teece (1996) p. 70 note: «Today few companies can afford to develop internally all the technologies that might provide an advantage in the future. In every company we studied, we found a mix of approaches. Some technologies were purchased form other companies, others were acquired through licenses, partnerships, and alliances, and still other critical technologies were developed internally. Getting the right balance is crucial.»

²⁸ Conroy (1983) p. 77.

²⁹ D' Andria (1994) p. 90.

³⁰ Alrashid κ.α. (1998).

be just the first stage in a process whereby the appropriate information specialist becomes the local operational manager responsible for the internal delivery of the relevant electronic services. Depending upon local circumstances, that responsibility may well extend to the initial negotiations with suppliers about the financial terms and other conditions for use of these products in their institutions. Other professional staff will have to be trained by them to participate in front line support for these services, and they will have to keep all staff aware of new developments.³¹

Librarians Skills and Syllabus

For the modern librarian to be able to participate in and to develop this kind of virtual space for information handling and management specific skills are required and these skills should be incorporated into the syllabi of the respective educational institutions. The basic notion from this point of view is the fact that “virtual organization” is not simply a different form of an organization or institution or of the way the work and the working environment can be organized and managed. It is in fact a radically different space and context within which enterprises of whatever type, nature, structure and goals will have more and more to operate.

The differentiating, thus, and the defining feature of this new context is the digital space which has been developed and which is still being in the stage of a continuous and rapid evolution and development. This digital environment is based on the infrastructure provided by the Internet and the web and its defining characteristic is the digital information flowing through the international web of communicating networks. This flow of digital information, or “bits”, has created an environment of products, activities, organizations etc, parallel to the existing traditional one, which is based on “atoms”.

The nature, however, of both the information and its networked roads means the creation of products, institutions, organizations and activities that are not static in nature, but that they can be created very easily, on the basis of several combinations of people, information, products, services and goals. And that, also, could be changed, at any moment, dynamically, by changing the respective combination, in order to cope with new goals, objectives, etc.

³¹ Smith (1993), p. 23.

In this context the information professionals should, obviously, be able to cope both with the traditional skills of handling and managing information products, services and institutions and with the new requirements concerning the tools, methods and techniques for handling information and information services in the digital environment.

This means the knowledge, ability and competence necessary to handle, encode, describe, supplement and package information in various, dynamically changed, ways, so that they can offer various information products and services, tailored usually even to the needs of the specific user, or even to the needs of the specific search session of the specific user. This is possible of course only in the context of the digital space and with the dynamic development of virtual forms of products, services and organizations and with the flexibility that this virtuality can offer with regard to the easy combination and recombination of data, products and services, so that different needs, environments and people can be served.

From this point of view much attention should be paid from the part of the educational institutions of the LIS sector so that the necessary new skills are incorporated in the relevant curricula. These skills refer to the general knowledge of the structure, components and flow of information in the digital environment, in terms of mechanism, tools and standards. They refer also to the knowledge of the specific characteristics of the digital information and, especially, of the ways, methods, tools and standards that should be used so that this information can be handled, described, combined and manipulated in a way that permits the transformation of bits to specific products for the support of various activities and services.

From the educational point of view and since the reality seems to go in parallel with the virtuality, this means a considerable extra load for the relevant curricula, where we should have, for example, AACR in parallel with metadata schemes, or where we should have absolutely new educational modules, like, for example, encoding languages or metalanguages and standards (e.g. XML), etc. These kinds of changes are already reflected in most of the relevant curricula, but since the whole new environment is in a stage of a continuous evolution this is also the case for the curricula of the LIS sector.

Conclusion

Libraries live a complicated phase that is composed by the scarce resources, the variety of information sources and services, the growing use of electronic communication, the continuing change of conditions and organization.

Librarians, being an integral part of the organizational team, are a part of the solution, not of the problem. So, librarians must be risky and inventive to realize their role and decisive in action. They have also to visualize the future and jeopardize transferring their visions into practice.³²

The new Librarian should develop the skills, which correspond to the new roles of librarians, especially those related to the cooperation and interdependence. An indicative list contains the following³³:

Organizational development

- Leadership and vision
- Allowing knowledge `space'
- Processes that encourage the creation, storage and use of knowledge
- Redefining employment contracts
- Managing and facilitating change
- Focus on leveraging intangible assets

Infrastructure

- Technology and applications
- Environment- physical
- TQM, best practices, procedures

Culture

- Redefining core values
- Learning, coaching, mentoring, Sharing
- Trust and security
- Empowering
- Encouraging and rewarding curiosity, creativity and innovation

Content

- Identifying and recording Intellectual Capital
- Creating connectivity (e.g. people to experts, people to content, people to teams, teams to people, teams to teams)
- Building tools to acquire, organize, integrate, distribute and retrieve.

³² Creth (1995).

Knowledge Skills Ability are called the characteristics of the information professional of the 21st century and are spelled out very clearly at the following table:³⁴

Skills	Experience	Attributes	Behavior
Information: collection, structuring, retrieval, filtering, analyzing design.	[Pure] IT	Business focus	Confidence
Communication: written, presentation	Communication	Team approach	Influencing
Skills transfer: training, coaching	General management	Value ethos	Sharing
Value added	Information management	People [customer] focus	Skills transfer
	Human relations	Leadership	Risk taking
	Strategic planning	Innovative	Identification with the business [or institutional aims]
	Operations planning	Understanding the potential of IT	Listening skills
		Flexibility	Understanding the issues and ability to judge relevance, quality and reliability
		Adaptability	networking
		Recognition of opportunity	

There is already a shortage of supply, a lack of people with the right combination of skills. The new roles for information and knowledge workers require people with ambition and drive, with management understanding and insight, with readiness for change and innovation, with in-depth knowledge of IT applications and developments, as well as the more traditional skills of information management.

This is the shift that LIS syllabus must do in order to be prepared to face the present and future demands of libraries and information centers. Theoretical infrastructure and practical training is the combination of methods, which bring into a successful

³³ Abell and Oxbrow (2001), p. 85.

³⁴ Skiadas (1999), p. 26. (New skills are in bold. People from the non-business sector may wish to question the business terms used in this list). See also at Abell and Oxbrow (2001), the diagram 6.5, which perform the skills in a structured and hierarchical way, giving also the functional connections between them.

outcome, either for the tacit or the explicit knowledge and culture they need as professionals.

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Autobiographical Notes

Dr Anthi Katsirikou has been the Director of the Library of the Technical University of Crete since 1985. She received her Degree in Library and Information Science (1982) and the Degree in Political Studies (1989). She was the organizer of the 20th IATUL Conference (Technical University of Crete, Chania, Greece: May 17-21, 1999). She has participated in National and International Conferences and has issued articles at scientific journals on various aspects on Library management and a book on the same theme in Greek. Now she is currently working towards her Ph.D. degree in the field of Library Management and she teaches Library Automation at the LIS Dept. of the Technological Educational Institution of Athens. Her research interests focus on Innovation Management and Management of Change in libraries. She's a member of IFLA, IATUL and ALA.

Associate professor George Bokos, M. Phil., Ph.D.

Member of the staff of the National Library of Greece for more than 20 years Head, Cataloguing & Bibliographic Services Dept., National Library of Greece, 1988-1995 Director of the National Library of Greece, 1996-1997 Member of several technical committees and working groups, both at the national and international level and on subjects related mainly to the automated handling and management of bibliographical information. National representative of Greece in the *Telematics for Libraries* Programme of the EU Associate Professor, Archives and Library Studies Dept., Ionian University, 1994 – Project manager and coordinator of several national and international research projects He has been consulting libraries and other information services for many years on library automation and automated management of information. He is the author of several works and has participated in many conferences on the above subjects. Research interests: Library automation and Information Technologies, Electronic Publishing, Technologies and Standards for data and content encoding