



## KNOWLEDGE SILOS<sup>1</sup>

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### ABSTRACT:

*The interaction of young people and children with technology is nothing new to anyone. The digital generation, those born after the year 1982, are proficient at using these options. Not only that: unlike the more “textual” previous generations, accustomed to doing one thing at a time and receiving more “serious” and formal education, our nephews, children, and grandchildren are more “visual,” “multi-tasking,” and “web-intelligent;” they like to learn by playing and would like learning to be not only useful but also fun.*

*Not adapting to this and not foreseeing scenarios for this generation and future generations would be irresponsible. It is clear that this poses a challenge, because they have got used to researching by “surfing the Internet,” “cutting and pasting;” in general terms, they show poor judgment when selecting their information sources and are usually naive when it comes to intellectual property. In addition, libraries are no longer a must when looking for information sources. However, even though the new generation solves everything with Google, if we look for new formulas for access to knowledge, and if we innovate information services according to their generation, we will be addressing a very important part of their growth. Therefore, university libraries in developing countries are faced with the challenge of rethinking services to position libraries, and, in general, knowledge repositories as a factor that determines academic success.*

*KNOWLEDGE SILOS encompasses the main motivation behind the work of the libraries of the University of Colima in Mexico: innovation. We cannot continue to rely on the same patterns and the same results. We need a different and braver plan, as*

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<sup>1</sup> A **sil**o is a structure for storing bulk materials. Silos are used in agriculture to store grain (...) Silos are more commonly used for bulk storage of grain, coal, cement, carbon black, wood chips, food products and sawdust. (From Wikipedia, [http://en.wikipedia.org/wiki/Storage\\_silo](http://en.wikipedia.org/wiki/Storage_silo))

*well as intervention schemes that more efficiently respond to the needs of the academic community and society. The members of the university community as a whole will be in charge of ensuring that this dream comes true. It will be achieved by schools acting as creators of wikipedias, programs for digital-and-printed reading material, programs for creating projects to ensure greater interaction between information resources and mobile devices, etc.; officials will act as program advisers; representatives will be liaison officers and promoters. Their decisive and efficient participation will be vital, as everyone would be putting forward suggestions and making contributions, while we make use of systems that are more open, horizontal and transparent, thus repositioning libraries as the providers of academic-information collections and services for the university community.*

## **OVERTURE. THE DIGITAL GENERATION**

*“Don't limit a child to your own learning,  
for he was born in another time”  
Rabindranath Tagore*

A few months ago, I attended a lecture where the speaker gave a keynote presentation on the digital generation, also called Net Gen, Y Generation, Millennials, Echo Boomers, Boomlets, Web Generation or Einstein Generation: those born after 1982, in the time of digital media, with the Web, video games, chat rooms, blogs, instant messaging, cell phones, etc<sup>2</sup>. The expert gave a comprehensive overview and asked the audience to reflect on what this represents for information services. I revisit these concepts today as a frame of reference before we get down to business.

These kids were born in the digital age and all of this comes to them naturally. They are proficient in the use of technology; those who have children or grandchildren probably know that they began to use these machines quite easily as soon as they were two years old. The so-called digital immigrants-and I include myself here-coexist with the digital generation or the digital natives. We are the ones that were born in a different time, but had to learn to use technology, and no matter how well we master it, we have a digital accent that natives detect. Mark Prensky<sup>3</sup>, who is engaged in the study of digital generations, uses this to describe the divide between today's students, parents, and teachers so as to better understand not only our children but also the new users that are coming to the libraries, and also to better adjust to the new working environments.

Digital natives are used to having quick access to information with the use of multiple sources. They are experts in multitasking; they can do several things at the same time; they are more accustomed to using multimedia than texts (images, video, and audio) or the written word. They have got used to having random access to

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<sup>2</sup> TURNBULL, Federico. The digital generation, where the ICTs are taking us. Keynote presentation given at the Interfaces conference, in Colima, Mexico, 2008.

<sup>3</sup> <http://www.marcprensky.com/writing/>

information, which does not have to be in order. They are also called the "hypertext generation;" they are used to online interaction with several people at the same time, with multiple chat sessions, for example. They like to learn when they need to, "just in time." They have got used to immediate gratification, which poses a significant challenge to librarians, because the new user demands immediacy; he or she wishes to meet his or her needs immediately, not in five minutes. In addition, they are interested in learning only what is relevant, what is useful and fun.

Digital immigrants prefer, in general, access to controlled information and a limited number of sources. They can do one thing at a time, not many; they are more text oriented, they are used to reading texts, and they find it a little difficult to add images to their daily work. They are used to the sequential process of information (one thing first, then another one, followed by another one, not all at the same time). They prefer to do their work independently, not so collaboratively; they are prepared for deferred gratification, and they learn in a more formal and serious manner.

Some of the characteristics of the various generations have been defined as follows: a) those born before the year 1946, who some call the silent generation, the mature generation, people that dedicate themselves to their work, do not like to change their job, respect figures of authority, and their motto was "duties first, fun later;" b) the baby boomers, born between 1946 and 1964, we work to live, we like to work, some will retire soon; it is a generation of optimists in general and like to have an influence on policies and products; c) the X generation, 1965-1980, also work to live, are the ones that are currently working, they have clear and consistent expectations and value the contributions that they make to the common good; d) the current generation, 1981-1994, also known as the Z generation; and e) the Millennial generation, whose members were born in the year 2000 or later, they live the moment, expect immediacy when it comes to technology, they do not like to save, they would rather live the moment.

This has a powerful impact on learning styles, the way people learn. The digital generation is characterized by speed; they can process information in a parallel manner; they search for information that contains many graphics; they are constantly connected; they try to make sure that learning becomes an active process; they like to learn with the use of games. Technology is something very important to them. They use it all the time. They are no strangers to technology, as the previous generations are. This poses a challenge to learning and becomes a problem, since when it comes to information, having something superficial is enough for them. In addition, teaching them something is not easy because they like doing their own research and they surf the Net quite a lot for this.

Critical thinking is poor, thus having an impact on teaching. They do not care much about intellectual property; for example, if something can be copied and pasted, they move it from one place to the other without thinking, to the extent that some authors warn that copyright will be banned within 20 years. They are self-focused; they themselves focus on what they find interesting; they think that everything is possible because the impact of video games has made them good at winning by whatever means necessary. They are very independent; they are multitasking (they are always doing several things at the same time). Their attention span is very short; a person cannot have a very long conversation with them, and

this can also be seen in their interaction with information. They develop their brains in hypertext mode, because they have to deal with several matters at the same time; they have to sign in, sign off; they have a mind that is more three-dimensional than that of previous generations. With regard to practical experience, they learn better by making discoveries than they do when taught theory; they like making discoveries. As a result of their multitasking ability, they find that making things is far more interesting than hearing about them. They like working with others and often ask to work in teams in their courses. They like interactive exchange when it comes to both information and personal matters. They never read instructions.

They prefer to use media that are rich in content; they show evidence of an intuitive preference for visual input; being surrounded by multimedia has made them highly competent to process visual and spatial input. We also have to consider that they were born in the time of Nintendo and Play Station. This focus on visual input and the media results in the detriment of textual literacy, which is difficult for them because they need more multimedia products. They are expert consumers; they expect to be able to choose the kind of education that they are going to receive, as well as what, where, and how they will learn, not so much in the traditional fashion, but building their own learning, choosing their own courses; they expect to be given the chance to choose in most cases, and we already see that on a daily basis: tens of coffee types, hundreds of options on the Web. They wish to have everything tailor-made for them; making sure their needs are met.

They are impatient; they want what they want right now, which is why the issue of information and services has to be dealt with immediately. This is part of the issue of multitasking, and this results in a strong demand for efficiency and immediacy from service and support providers. They are super communicators; they use several channels, such as Skype; they respond quickly and regularly, and they expect an inquiry to be answered accordingly by email, chat rooms or virtual reference. They like sending concise messages, emails whose subject states clearly what they are about; they are accessible and respond well to critique; they are even used to critique among themselves. They are competent enough to use technology, although they do not do this in depth; they like helping others to use technology and add a lovely or personal touch to their means of communication<sup>4</sup> (if you have chatted with your children or nephews and nieces, you have seen that their messages are full of emotion). In short, a 21 year-old digital native has been exposed to<sup>5</sup> 10 thousand hours of video games, 200 thousand emails, 20 thousand hours of television, 10 thousand hours of cell-phone use, less than 5 thousand hours of reading; in other words, the time spent on reading is 1/10 when compared with the time that is spent on other media, which is why using them has become natural for them. Therefore, technology is a very important part of their world, and this poses an omnipresent challenge to libraries.

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<sup>4</sup> The Carrier Innovation Company, 2008. AIESEC Digital Generation focus group, Istanbul.

<sup>5</sup> Did you know? <http://www.youtube.com/watch?v=cL9Wu2kWwSY>)

## INTERMEZZO. MEGATRENDS IN HIGHER EDUCATION

The megatrends that shape today's context inevitably determine tomorrow's context, which is why it is necessary to identify them if we want to insert libraries in a strategic perspective. There are two kinds: the extrinsic ones, imposed on institutions by the environment, and the intrinsic ones, which belong to the set of phenomena that are typical of organizations and can influence them. The socio-political context shows that there is a wide variety of what has been called megatrends, which specialists like Pierre Cazalis<sup>6</sup> have studied in depth.

Some of the extrinsic megatrends, connected with knowledge per se, show that we are experiencing today an explosion of knowledge never seen before in the history of human evolution. So much so that 88% (approximately) of the researchers that have ever lived are alive today; in 1978 there were 360,000 chemical products, while in 2008 there were approximately, 2,600,000; in 1970, 10,000 new patents were registered; in 1998, 150,000; and in 2008, 700,000. In fields such as molecular biology, the knowledge that has accumulated changes every six months, and evidence suggests a trend towards changing this knowledge every 22 days in the year 2020. With regard to nanotechnology, no one knows what is going to happen in the year 2010.

In 1984 there were only one thousand computers online; today there are one billion. In the year 2006, in one month, there were 2.7 billion Google searches. Last year, in 2008, the figure climbed to 31 billion every month. One device alone, the iPod, needed 3 years to position itself in a market of 50 million people, in less time, the same happened with Facebook, but it only took it two years. Since YouTube was created and until the year 2008, one hundred million visitors were reported; there are more than 200 million users registered on MySpace. If MySpace were a country, it would be the 5th largest nation in the world<sup>7</sup>.

With regard to reading, students read on average 8 books every year, 2,300 websites, and 1,281 Facebook profiles; they write approximately 42 pages as part of their course assignments and, in contrast, 500 email pages. Their daily activities require 26.5 hours distributed as follows: they watch TV for 1.5 hours; they are online for 3.5; they listen to music for 2.5 hours; they use their cell phone for 2 hours; they spend 3 hours in class and 2 hours at the place where they render their social service; they study for 3 hours and sleep for 7 hours. How do they do it? It is simple, they are multitasking. University students have access to computers at computer centers, cyber cafes, libraries, and many of them even have laptop computers. They

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<sup>6</sup> CAZALIS, Pierre. The higher-education megatrends and challenges, and Mexico. Base document for the seminar/workshop on the Ten Pillars of Institutional Development 2009-2013. Colima, University of Colima, 2009.

<sup>7</sup> FISH, Karl. *Did You Know 3.0: 2008 Latest Edition: Globalization & The Information Age* / modified by Scott McLeod. [www.youtube.com](http://www.youtube.com)

are fortunate, but, do they value this? Probably not; they may not know that over a billion people live on a dollar a day<sup>8</sup>.

It has been suggested that technology can help improve education, but what is really happening? Is there a difference between using a classroom board and using PowerPoint? How does learning improve in those students that take their laptop computers to class, but only to log on to Facebook? I personally believe and know (even though I do not have hard data on this) that it is not like that; ICTs alone are not the solution. What will bring about real change are the right METHODOLOGIES applied to ICTs. Key learning actions would be: remembering, understanding, applying, analyzing, assessing, creating, communicating, and collaborating, every day when carrying out projects.

In this scenario...what happens with libraries?

With regard to knowledge, we start from a scenario that includes, on the one hand, the explosion of knowledge and, on the other hand, the fact that the time during which information is useful is increasingly shorter. Therefore, the challenges we face are, among others, building new knowledge based on a set of problems, not on disciplines; everyone's need to update their knowledge on an ongoing basis and the need to organize education institutions based on the concept of permanent education. This is where a question would have to be faced...do schools and universities aim to meet this demand when designing their curricula?

Intrinsic megatrends are the direct or indirect consequence of previous megatrends, already accepted by schools, although not applied at all of them. These megatrends have to do with radical changes when designing curricula, simultaneous changes in the field of learning, such as methodologies, teamwork, self-learning, libraries, ICTs, and even ICTs themselves increasingly more linked to libraries (examples include the number of printed books, which has dropped by 12 per cent, thus making it necessary to unlock their potential), more selective recruitment and the professionalization of professors with these skills; more constant tutoring and internationalization.

In view of the above, Cazalis points to five specific consequences: a new curriculum design (with less than 15 class hours every week), group pedagogy with 8-10 students, and the professors acting as a guide, along with the alternation of work and study. It is therefore absolutely necessary to do this based on the learning process; in other words, not just information but also essential competencies, intervention skills, and group behavior.

The speed at which knowledge and techniques are being created makes it necessary to combine learning processes: acquiring knowledge, knowing how to do something (capabilities, skills, and behavior), and knowing how to be someone, by means of problem-based or task-based learning. The above results in the autonomy

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<sup>8</sup> WESCH, Michael. *A vision of students today* (video)/ made by Michael Wesch and his students taking Introduction to Cultural Anthropology at Kansas State University, 2007. <http://www.youtube.com/watch?v=dGCJ46vyR9o&feature-related>

of the graduates when they complete their university studies. Why learn useful things? The best universities are increasingly reducing their number of "regular" students, because the aim is not to train robots or specialists, but alumni that may become specialists within 40 years. In short, this involves a self-learning process and teaching students where they can find knowledge.

- **EXAMPLE FROM MEDICINE.**  
Curriculum design based on CHC.  
Four-year degree (+ graduate program).  
Group learning (8-10 students).  
No face-to-face lectures (or only on exceptional occasions).  
Eight hours per week with a professor/tutor.  
Number of problems that have to be solved: 180.
- **EXAMPLE FROM ENGINEERING**  
Same characteristics.  
- plus the completion of one "project" (robot, experimental automobile, bridge, rocket, computer program...)

Consequently, ICTs and libraries become useful information sources. It will be increasingly necessary to ensure that professors become fully autonomous when applying multimedia as teaching material, in addition to ensuring that students from home have access to a virtual library and services that give access to knowledge from anywhere. How many professors can do that? Neither ICTs nor libraries can replace professors, but they contribute to the teaching and learning process; they speed up the acquisition of information and lighten the professor's workload thanks to their real educational role: methodologies, capabilities and values, the creation of value-added environments that aim to ensure good education in the world, where, despite crises, migration problems, ethnic conflict, the *information-learning* binomial is achieved in a comprehensive manner, not only including the acquisition of knowledge but also the skills to learn how to do something and how to be someone, the ability to make sense of life.

## **ARIA. INNOVATION. RETHINKING LIBRARIES**

It is important to clearly understand the difference between intervention and innovation. The former takes place when a product is developed, but for that product to be considered a real innovation there is a component that is needed: Appropriation. Keeping this in mind, the challenge is to innovate ways of organization, goods, services, processes, advertising, and marketing; beginning by clearly understanding our reason for being or our core business, which is to provide information, but not only that; the entire statement would have to be: to provide information with the aim of generating knowledge. What do we need to achieve this? Do people need to appropriate the library, or the information and the knowledge? The answer, obviously, would be the second choice, either by means of the "library" model, the "cafeteria" model, the "network" model or any other. When I appropriate something I make it mine; I make it part of my environment; I make it part of my

needs, and I make it part of my benefits. Therefore, appropriation means "full use of;" it does not even mean "adoption," since adoption does not necessarily lead to appropriation. The UN itself agrees that appropriation must mean adoption plus "full use of."

Information plus the media and tools are not enough to achieve knowledge. Then, what other component do we need? Capabilities and skills that enable us to use them; but not only that, also attitudes, which will have to be promoted, positive attitudes towards making good use of them. For instance, every morning, when watching the news on TV, we are given access to information by means of a technological tool, although without the for-learning-purposes component. As individuals, we need the capability and skills to transform it and not just repeat what the news anchor said. This gradually contributes to building societies of knowledge.

Now, how can we add appropriation to the innovation concept? We usually associate the term "technological innovation" with a computer structure, with Internet links, with computers, but it is a lot more than that. The *Oslo Manual*<sup>9</sup> defines it as the result of a scientific process (products, processes, models, and organizational structures), in such a way that, starting from this, how can we be innovative to ensure that the use of information results in the creation of knowledge? The logical course of action would have to be the following:

1. To identify the problem(s).
2. To list inefficiencies when detecting those problems.
3. To go to the root, to the causes.
4. The key: to turn all of this into a positive thing...
5. .... The next step would involve putting forward and applying a solution to these problems. Solving those problems is the objective.

Therefore, access can no longer be the only issue. Our reason for being is different; measuring, for example, how many times a website is used is not enough, but we have to do what is needed to make sure that it really is useful. More than finding out how many people visit the library, we would have to ask ourselves how many new projects, articles, services or products have been generated thanks to libraries. In the field of economics, there is something that is called the multiplier effect. That is what we want to do, in addition to promoting good practices that bring benefits to all the circles in which we move, linking sources of knowledge with the desire to learn.

## **LEITMOTIV. KNOWLEDGE SILOS**

### **a) 1983-2008, from SIABUC to SINED**

SILOS is the name of a project resulting from a story that includes both short and great stories, like life itself. It is the evolution of a university project that, as part

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<sup>9</sup> *Oslo Manual: Proposed guidelines for collecting and interpreting technological innovation data*. 3<sup>a</sup> ed. OCDE, Eurostat, 2006.

of its determination to support the appropriation of knowledge, technology, methodologies, and people, is committed to permanent innovation.

Everything began at a public university located in one of the smallest Mexican states: Colima, where a project was launched in 1983 with the aim of developing at that institution a library system, which in those days was virtually nonexistent. That happened in the early 1980s, and the *New University* project was born, which in turn led to the creation of research centers, the first master's degrees, and the libraries. The technology that the University of Colima had was only a mainframe piece of equipment that managed only a few programs at the Computer Room. With the aim of fulfilling the University's need for the systematization of bibliographic information, the team of librarians, comprised of eight people in those days, only one of whom was a computer scientist, developed a very simple database that made it possible to manage the library collections in an orderly fashion. It was improved within months, and in a short period of time it became a more complete software system used to support classification, cataloging, book lending, inventory control, acquisition of books, and registration of scientific journals, and even the capability to generate all kinds of use and productivity statistics.

After testing the software, this group wanted to share it with other institutions, and since then the software is known as SIABUC (Comprehensive Library Automated System of the University of Colima). This was not simple at the beginning, because the compliance of the software with international standards was being questioned. Consequently, while it was true that the local creation of the software was breaking new ground, time showed that it was necessary to meet standards before sharing it. As a result, the group took it upon themselves to learn more about this subject and create a version based on the ISO 2709 standard.

The above resulted in SIABUC being used discreetly but effectively by other Mexican libraries, which in turn led to a new road: taking the risk of "leaving home" and assessing our product on a permanent basis by listening to our counterparts. In 1987, there were 17 institutions using Colima's software. It was therefore decided to hold a yearly conference attended by the users in order to learn about their experiences and suggestions. This has made it possible to develop an improved version every time. Today, there are over two thousand valid licenses, which make this network of libraries and information professionals one of the largest in Latin America.

The way had been paved for a process that had become permanent: ongoing innovation. This is how, in 1998, the first CD ROM was made. With the arrival of the first PCs, one was bought with the sole purpose of running the SIABUC program, but after three months the storage capacity of the hard disk was no longer enough: the computer was saturated with information. Buying another computer would not have solved the problem, since that would lead to the same situation after a similar period of time. We then began to think about a solution to store large amounts of data: the CD ROM, which was a big risk, as those were the days when the possibility of introducing the music CD was being questioned, considering that those were also the days when the audio cassette was well positioned at reasonable prices; in contrast, laser technology seemed out of reach. It was therefore very risky to think that the University could make CDs containing not only music but also data!

At the time when this project was conceived there were few countries producing that technology, which is why we focused on the closest country: the United States, where the first contacts were made; although, in the end, it was in Brazil, specifically at the Regional Library of Medicine (BIREME) of the Pan American Health Organization (PAHO)-the only center in Latin America making CDs back then-where we were given the knowledge that was necessary to make a CD and where the first two CDs were made. This course of action led to another road: we began to knock on doors looking for allies and also with the aim of managing resources.

The first CD ROM, *Bancos Bibliográficos Mexicanos I* (Mexican Library Banks I), was released in 1989, thus marking the start of another national collaboration network whose aim was to gather information to produce a national collective catalogue including all those Mexican universities wishing to participate. We can therefore say that this is the year when CENEDIC, the University's digital production center, was actually born. Multiple projects and editions jointly released by the University and other national centers and institutions emerged afterwards, thus consolidating the Center, whose objective today is to provide products and services aimed at systematizing information and launching digital products for the benefit of the University community and other stakeholders. The Center has been hired by universities, Mexican and foreign organizations, publishers, banks, and other companies. Our CD catalogue currently includes hundreds of titles that attest to the existence of a wide range of subjects (information on law, medicine, museography, journalism, reference material) and technological products (multimedia, hypertext, audio). This led to yet another new road: the development of self-manageable projects; and this in turn made it necessary to break new ground so as to market and promote our products and services.

To talk about networks is to talk about communication highways. Accordingly, since the late 1980s, steps were taken towards building up the computer and telecommunications network, and we were one of the first public universities to offer Internet access. Today, all the campuses of the University of Colima are interconnected through a safe and strong network, which is an essential element supporting applications and content, in addition to encouraging the establishment of national and international links. Almost no one remembers now that everything started with two satellite dishes and only one kilometer of optical fiber.

At the same time, yet another experience, which opened not one but several doors that made it possible to apply technology to the teaching and learning process, was that led by what is today known as the Center for the Production of Educational Media (Ceupromed), which was born under the leadership of Dr. Lourdes Galeana and her team of collaborators, when she, as a professor at the University's medical school, as part of her desire to improve her students' learning, encouraged two of them to get involved in technology and was allowed to use the computer area of the campus library during the night (there was only a couple of computers back then) with the aim of creating what turned out to be a very elementary version of a multimedia development that showed the process of human embryology, fully explained, although in a very simple manner.

That experience was the catalyst for what was to follow: our group of collaborators began to include more members; they gained more experience and created hundreds of educational applications and something that is very important, the methodologies that would make it possible to create platforms and learning objects. Facilities and offices were built afterwards, including the creation of the Virtual Reality Laboratory of the University of Colima and the Interactive Centers for Multimedia Learning; each center is considered a community of learning, where students and professors create their resources online and they share them following several working levels: level 1, creation of sites and portfolios; level 2, interaction, where technology graduates trained at Ceupromed advise professors on the development of material with the aim of ensuring that the learning objectives are met; level 3, learning objects (LOs), in other words, digital entities distributed through the intranet and based on collaborative work, thus building up a collection of objects of various types and subjects. What has been developed more recently are immersion objects; for example, anatomical objects using virtual-reality technology, where a student, with glasses and 3D equipment, can learn by himself or herself. All LOs include learning guidelines to be used by students and the application guidelines designed for professors; at the same time, they are given assessment material so that a student can monitor his or her own progress.

The latest challenge (2008) came when we were entrusted with the coordination of the National Distance Learning System, which is a project that would benefit the entire country and is aimed at bringing education to the places where it had not been brought before. "The aim is to transform the capabilities of our citizens with adequate proposals in order to solve the problems of our environment in every region of the country. The aim is to make sure that they learn to work together; that they learn to support one another and play the role of leaders, so as to have access to the society of knowledge and become competitive<sup>10</sup>. The objectives of this system, known as SINED, are the following:

- To make full use of existing resources.
- To ensure that distance learning is viewed as a strategic factor in the socioeconomic development of the country.
- To formulate policies.
- To guide and promote the creation of public and private funds.
- To devise strategies and pave the way for the creation of innovative educational systems that meet the needs of the country (or with this vision, prospective planning).
- To undertake studies that tell the population about the impact and advantages of the project, both at the national and the international level.
- To strengthen the SINED profile by forging strategic alliances and by signing cooperation agreements.

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<sup>10</sup> "The national distance learning project is coordinated at the University of Colima." At the General Directorate of Information of the University of Colima. *Website. University press releases.* March 2009. <http://www.ucol.mx/boletines/noticia.php?id-7570>

- To provide the SINED members with innovative and relevant information to make sure that the distance-learning programs run smoothly.
- To create the right technological platform that allows for the exchange of knowledge among the SINED members and among all the institutions, organizations or international researchers engaged in distance-learning innovation.

The system includes 6 broad subjects and 48 lines of research, each including specific projects: policies and regulations (which will give SINED a legal status), strategic planning (what to do to bring the services of this education model to everyone), outreach and development, assessment, technologies, and academia<sup>11</sup>.

This road gradually led to globalization. We began to participate in knowledge networks with similar projects that enabled us to join other national endeavors, such as the programs developed by eMexico, which is the organization in charge of Mexico's digital agenda, with whom we are jointly creating products and methodologies preceding what will be the grand National Digital Literacy Campaign. In addition, we have preserved our links with international organizations. An example of this would be our relation with Unesco, which began in 1993, and when we were appointed to host the Unesco Chair in Information Technologies in 2001, we were required to organize courses, workshops, seminars, meetings, colloquiums, conferences, meetings attended by experts, certificate courses, master's programs, in addition to preparing specialized documentary material for Latin American libraries.

## **b) 2009-2020, SILOS**

This project, more than a proposal connected with technologies, is an innovative-education proposal. The idea is to do this with libraries and technologies, but also by means of interaction among people, groups, and projects.

Those of us that have taken part in this experience: technology for the management of information and knowledge, are taking up again a previous proposal to which the following components will be added:

- The collections and repositories of the entire institution available in a virtual environment acting as a content-management center within a common portal, with efficient meta-search engines.
- Reconfiguration of the access to electronic information to ensure ease of use.
- Methodologies (to lay down guidelines, manage the web, catalogues and access services, best practices).
- Ensuring that the members of the community are permanently trained in the computer and digital skills that this new culture entails.

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<sup>11</sup> Ibidem

- Working with faculty members and the curricula with the aim of teaching students to understand and value the different kinds of information.
- Dynamics that make it possible to be close to students, faculty members, and researchers.
- Exploring modes of instruction based on collaboration.
- Communication strategies aimed at monitoring a liaison unit.
- Promotion of services with a strong marketing component.
- Attractive campaigns to ensure that our users remain loyal to us.
- Innovation and research observatory.
- Collaborative work inside and outside the institution based on the use of tools and methodologies that follow a systemic approach.
- Collection-animation programs.
- Redesigning spaces and services.
- Applications based on Web 2.0, 3.0, 4.0... +
- Business plans aimed at strengthening the products that have been successful on the academic market (especially SIABUC).

Why the name "silos"? Because Colima is a state with a strong vocation for agriculture; those of us who live here usually associate the concept of repositories with silos where the grain that will feed lots of people is kept. Our KNOWLEDGE SILOS will do the same: feed, in this case, the spirit and the mind of tens of thousands of people and communities. Fertile soil is sowed with the seed; moons and suns go by and the seed germinates and grows. When the ears are ready for harvest, they are processed and kept in silos as food that will be distributed for the benefit of the population, and also-in the case of other kinds of grain-to be sowed again so as to start another cycle of life. This is why we view libraries as areas of knowledge that will help build learning and design strategies aimed at appropriating the environment and our context, so as to feed our intelligence, our spirit, our life, and our freedom.

This dream will come true thanks to librarians, users, professors, and students as a whole. It will be promoted by schools as generators of wikipeديات, digital and printed reading programs, creative projects for increased interaction between computer resources and mobile devices, etc.; university officials would act as program advisers and as liaison officers or bridges that will further promote this endeavor. Their engagement and efficient participation will be vital, since everyone will be putting forward suggestions and making contributions, while the office in charge of the SILOS project will work following a more open, horizontal, and transparent approach. This poses a huge challenge that entails bringing about a cultural change that brakes with tradition, with hierarchical structures and tight control.

In addition, we aspire to ensure that our dream becomes transdisciplinary and transinstitutional, because the vocation for being a well connected and collaborative library that provides society with solutions is up in the air, it is in every library, which is why we plan to include more environments that commit themselves to building their own process and understanding.

Let us instill capabilities into ourselves and the users, intellectual, behavioral, and affective capabilities to significantly interact with information. Our reason for being is getting closer to *learning to learn*. Today, there is not a single place that teaches HOW TO LEARN TO LEARN, and why should not that place be the library? We have the formula:

$$\frac{W2.0...+}{5H} = K (e-R: PC, SP, AA) \rightarrow (B-Soc) = \alpha$$

Let us assume our role as information providers, but also our role as promoters of learning, growth, and transformation. As librarians, we must begin to learn more about how learning is achieved and how information turns into knowledge. This is why we must be very familiar with our environment, educational models, and the way our schools are teaching. Furthermore, on a permanent basis, we must be given training, we must do research, be up to date, be observant, and take part in the progress made by a discipline that is being transformed and is called Knowledge Management.

At the beginning, this paper places emphasis on the interaction between young people and children with technology. The *digital generation*, proficient at using these options, and, unlike the more "textual" previous generations used to doing one thing at a time and receiving more "serious" and formal education, are more "visual," "multitasking," and "web-intelligent," and would like learning to be not only useful but also fun.

Not adapting to this and not foreseeing scenarios for this generation and those to come would be irresponsible. However, even though the new generation solves everything with Google, if we find new formulas that give access to knowledge and if we innovate information services to adjust to this generation, we will be addressing a very important part of their learning. Therefore, the challenge facing the University of Colima is to rethink our services with the aim of turning our libraries, in general, and our knowledge repositories into a factor that determines our students' academic success.

The future is at stake. We can no longer use the same patterns and the same results. We need a different, more daring plan and intervention schemes that more efficiently respond to the needs of the academic community and society. In this plan, information resources, technologies, and methodologies play a pivotal role in ensuring best practices to support the teaching and learning process, which in turn will build up national and international knowledge networks that will strengthen libraries and will make them increasingly more significant, central, and nodal, according to the needs of the state, the country, and the world...thus supporting the launch of joint projects between universities and society, universities and the private sector that make it possible to both attract alternative funds and fulfill our responsibility to society as generators of practices that have a far-reaching social impact based on the main objective of universities: knowledge.

In summary, the above entails clinging to that ideal, that dream that decisively aims to instill capabilities and skills into the stakeholders in order to sensibly adopt and use information and technologies to produce (even as a means of achieving social well-being and economic development) KNOWLEDGE. And if, in addition to the above, we manage to make a contribution, even a small one, to discovering-as Mexico's humanist Pablo Latapí wrote in his dissertation titled *A good education*-"the certainties of this world and the transcendental ones," all of this would make even more sense, because the information-knowledge binomial constituting the spirit of libraries is also EDUCATION.