

THE NETWORK OF KNOWLEDGE IN DESIGN: A SUPPORT FOR A MACRO LEARNING ORGANIZATION.

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ABSTRACT

Within the context of the Colombian economy, the turning towards trade deregulation (*Economic Aperture*) has evidenced the need for the productive structures for being more competitive, evidencing, as well, the need for *productive organizations* to take into consideration market requirements. This dynamics demand restructuring business organizations addressed to define differentiation qualities and values of products aimed at integrate knowledge in design process as the means for small and medium sized enterprises (MIE and SME) to achieve more competitiveness. Additionally, the establishment of a close liaison between *productive and academic organizations* make possible to encourage Research and Development, the training of manpower and thus implementing the solutions to the barriers related to environmental issues. This is aimed at proposing the development of a *learning network* that, making easy the establishment of liaisons between the stakeholders, claims to support the exchange of information, knowledge, goods and services, thus bringing about more close bonds and mutual cooperation. Such connections, as a pivotal factor of the network, allows for guiding the students, researchers, professors, designers and businessmen to pursue the continued progress and training on the tools for products development. This way, will be possible the promotion differentiation values, development of new products and enhancement of management resources and thus increased competitiveness and productivity.

Key words: Learning network, design knowledge, cooperation links, differentiating values, Colombian MIE and SME, competitiveness, stakeholders.

1 THE STATE OF THE ART

Trade deregulation or *economic aperture*, the advancement of transport and communications have brought about a new dynamics of the market as a result of increased goods and services supply and a new differentiation strategies. In addition, MIE – SME revaluation, the interest to favor sustainable development and the opportunity to take part in the global marketplaces, have led to transform exploitation productive structures into exportation structures. To deal with this challenge and respond to the importance given to exporting activity of the country, Colombian government has implemented, in 1998, the National Policy of Competitiveness and Productivity – NPCP. For the purposes to become adapted to Colombian needs, a relationship between competitiveness, productivity, the NPCP has been established, as showed in Figure 1 below.

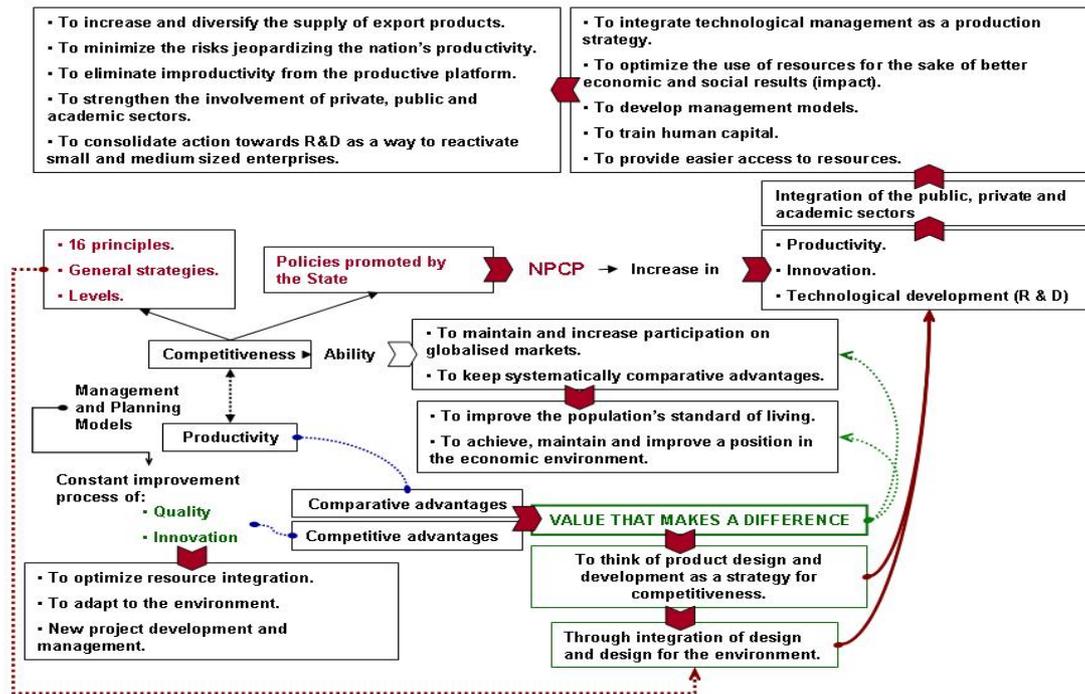


Figure 1: Analysis of the state-of-the-art

These relations show NPCP as an array of actions driving the several economic sectors vis-à-vis productivity and competitiveness of the economic framework of the country. NPCP, by boosting Productivity and Competitiveness seeks to promote, inside the productive structure, the enhancement of productivity, innovation, and development by means of joint action of public, private and academic sectors. For such purposes, the Colombian Government has taken the measures to promote the development of efficient productive processes in order to adapt, enhance and put in place productivity improvement programs.

According to Decennial Plan 1999-2009¹, including as an element of analysis the relation to competitiveness; the implementation of some actions of NPCP, mainly the joint activities by the players, has given rise to a confidence, open dialogue and jointly decisions making process environment. As exportation activity is concerned, the country has obtained the significant increase of export of the so-called non traditional goods. The studies, however, indicate as well that to be incorporated to the global context, it is mandatory to define the organizational scheme the models of resources management, improve the access qualified human resources and R& programs, favoring the incorporation of new technologies. Furthermore, such challenge implies a change of mind, the purpose of which will be to enlarge and improve products and services portfolio, obtain a differentiating value generating more impact and defining the strategies to sustain such competitive and comparative advantages. Lastly, all such requirements, as well as the current dynamics and consumption, require the improvement of innovations and development of products, increased knowledge in design as a strategic factor and competitiveness, necessary for productive businesses.

2 PROBLEM: EXPRESSION OF AN INTERVENTION OPPORTUNITY

For the reasons above, ongoing finding out of competitiveness and productivity obliges to enhance management styles and models and the adaptation the environment, the standard methods of creation and development of product and project management. Thus, it is evident the need to promote a learning management process taking as pivotal element human capital resource, the integration of archetypes of participative management that, by way of cooperation among the several different players, promote team-working culture. At the same time that this strategy promotes coordinating

¹ **Decennial Plan:** Dossier of Colombian Government including the set of actions and policies vis-à-vis country competitiveness

efforts of the several units, it improves differentiating values definition and enhances knowledge generation and diffusion.

This view allows for underlining, in the frame of this search, the types of problems related to the improvement of competitiveness of Colombian productive structures. The first problem is linked to *the knowledge on design and to competences of innovation and development of products*. “*The studies about industrial design intervention effects, in MIE – SME of Leatherworking and footwear of Bogota D.C., between 2000 and 2004*”, have showed that 82% of businesses lack from the knowledge of methodological tools for innovation of product, ignoring the design process strategies. Therefore, given the innovating nature of design, it turns out to be necessary to promote knowledge on design, prioritizing the cooperation of the stakeholders for the appropriation and integration of knowledge into the design. The second and third problems make reference to the *dynamics of participation committing the different stakeholders of Colombian society in the training and qualification of the human capital resource*.

According to the studies conducted by Colombian government, the effects of the lack of growth of productive sectors lead to their exit from the market and the displacement of human resource towards secondary sectors. This situation clearly evidences that to encourage competitiveness; it will be required to establish cooperation mechanisms in order to favor the achievement of academic, companies and businessmen goals, thereby meeting the needs of productive sectors in connection with manpower qualification in respect of the appropriation of new technologies. In the same way, encouraging innovation and coordinating the efforts of the different sectors to stimulate growth and development process.

3 HYPOTHESIS

It could be observed that the agglutinating factor of the problems above referred to is the dynamics of change, demanding great responsibility and actions by participants, and needing the commitment of stakeholders. From this it is inferred that favoring participation requires the development of mechanisms of connection and communication making easier the exchange of information, know-how and services in order to continuously nourish the dynamics of change to obtain development, growth and competitiveness. *How to encourage players' participation? How promote exchange among the sectors? How further the generation of cooperation links promoting sustainable growth and development?*

Considering that competitiveness involves the determination of strategies leading to obtain competitive and comparative advantages, it remains, then, the question about how to encourage the enhancement of know-how on design to promote the enhancement of differentiating values (competitive advantages) of products and organizations? How to contribute to an improvement of internal and external resources management, promoting specialization of sectors and the compliance with comparative advantages? Furthermore, how to ease the access of the organizations to external resources?

Above questions take as a starting point the competitiveness and productivity; this enhancement must lead to the encouragement of socioeconomic, political, and cultural growth of the country, mainly, the access to education, the rise in the quality of life and increase in work appropriateness's for the population. For such purposes, *how to identify the needs of productive sectors, related to human capital training, to define educational programs to meet their needs? What are the means allowing to facilitate the access to such training programs?*

Finally, this dynamics need to set forth the goals, the long-term projection to sustain the growth and promote R&D in order to nourish innovation and product development processes, human capital training, and dynamics themselves. For such purposes, *it will be possible to measure the amount of resources of academic sector promoting cross-functional labor culture and R&D? How to approach academic and productive sectors in order to promote and enhance innovation culture in the organizations?*

All above questions lead us to propose the hypotheses below:

- *Will the creation of a student network encourage diffusion of knowledge on design improving the appropriation of tools for product innovation by the agents involved?*
- *Will agents interaction with the system maturity phases lead to continued growth of competences related to innovation and development of products and services?*

- Will promotion of links, information exchange, and know-how between the stakeholders generate the bonds of cooperation to promote change dynamics towards increased competitiveness?
- Will the establishment of bonds among stakeholders promote access to training increasing response capacity of programs and manpower to the needs of productive sectors?
- Will the dynamics of participation and cooperation applying for the convergence of agents promote R&D to innovation?

4 THE NETWORK OF KNOWLEDGE IN DESIGN: A SUPPORT FOR A MACRO LEARNING ORGANIZATION

Considering the approaches given in the hypotheses above, the analysis of relations between the stakeholders discloses that continued support with the context gains momentum owing to the need of knowing the component of economic environment to envisage and begin the actions vis-à-vis the new opportunities. It is even the need to put productive organizations in the right way taking the organization itself into account, as well as the context, the market and the consumer to respond to the requirements of the more and more competitive marketplaces. Additionally, taking into account the infrastructure provided by the generation of know-how and learning activities in the *academic organizations*, the relationships with *productive organizations* make possible to promote R&D, manpower training and find the solution to the problems related to environmental issues. Lastly, such relationships nourish the system and encourage identification, sustainability and enhancement of competitive and comparative advantages towards the increased competitiveness. By observing these factors, it is possible to establish a scheme of relations – Figure 2 – among the stakeholders involved, thereby identifying resources and contributions, in order to determine the requirements imposed by the system.

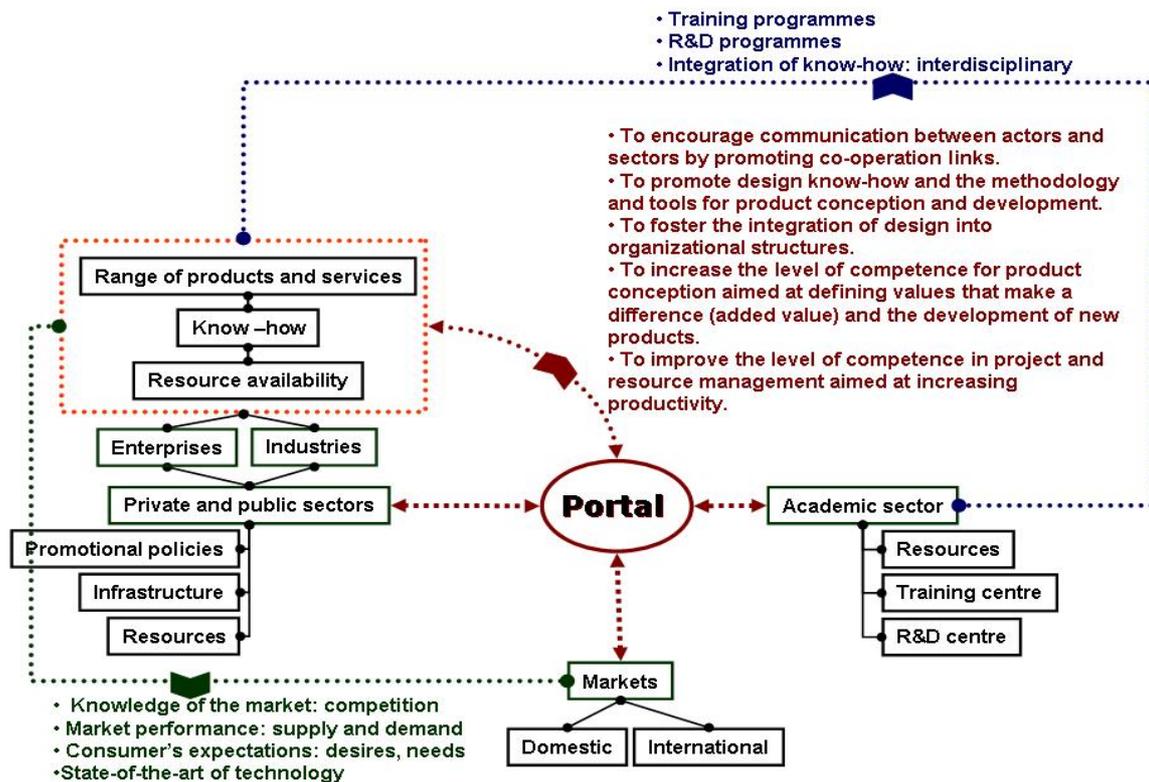


Figure 2: Scheme of relations of stakeholders involved

Based on the analysis of relations, we reach to the proposition of a *Learning Network* that, promoting the establishment of connections among stakeholders, it is intended the furtherance of information exchange, know-how, goods and services among stakeholders, by generating links of cooperation. Such links, the essential common factor of the network, will allow to guide the students, researchers, professors, designers, and businessmen toward a progressive and continuous learning process of tools for product innovation and development. This way, to encourage differentiation values definition

(aggregated value), the development of new products (innovation) and enhancement of management resources aimed at enhancing productivity and competitiveness.

By using the functional analysis of the system, 3 stages of maturity of *Network Knowledge in Design* are determined. Table 1: Functional Analysis of NKD, summarizes the primary functions to be accomplished in order to reach the objectives set forth in connection with increase of differentiation values of products and organizations vis-à-vis the competitiveness.

Table 1. Functional Analysis of NKD

Stage	Function	Title	Criterion	Flexibility
NKD EMERGENCE	Fp1	The system allows to promote diffusion of knowledge on design among stakeholders	Diffusion	F0
	Fp2	The system allows for productive organizations to identify their requirements in dealing with their activity and product innovation process	Identify	F1
	Fp3	The system allows for the students to increase their knowledge on product innovation and development	Increase	F2
	Fp4	The system allows for academicians to propose related to information offered by stakeholders	Propose	F0
	Fp5	The system allows for professionals to increase their vision related to design, innovation and development of products	Increase	F1
NKD DEVELOPMENT	Fp6	The system allows to establish a network of relationships convoking the stakeholders	Establish	F0
	Fp7	The system allows for productive organizations to enhance methods and tools integration in product innovation and development	Enhance	F0
	Fp8	System allows for the students to nourish their learning the means of exchanges	Nourish	F2
	Fp9	The system allows for academicians to take part in the council structures	Participate	F1
	Fp10	The system allows for professionals to improve their participation in cross-functional teams of product innovation and development	Improve	F1
NKD EXPLOITATION	Fp11	The system allows to propose action based on the needs of users	Propose	F0
	Fp12	The system allows for productive organizations to improve internal process of product innovation and development, production and resources management	Improve	F0
	Fp13	The system allows fro students to improve decision making process vis-à-vis their training	Improve	F2
	Fp14	The system allows for academicians to take part in R&D projects	Participate	F0
	Fp15	The system allows for professionals to improve their decision making process vis-à-vis the context for product development	Improve	F0

NKD Emergence Stage is established as an informational stage, primarily addressed to disseminate the knowledge in design, innovation and development of products and support vis-à-vis the competitiveness. Secondly, to introduce the system, while exhorting the participation of the users in the network.

NKD Development supports the time of active participation and research to strengthen the bonds among stakeholders by promoting know-how, experience, results, services exchange, inter alia. Such exchange is concerned on interest to the understanding of methodological elements of innovation and development of products, facilitating the access to methodological support structures turning into motive promoting R&D and generation and appropriation of know-how.

And the *Exploitation Stage of the NKD* addresses to nourish relationships, organizations, stakeholders and lastly, NKD and dynamics of change towards growth and development. Where exchange become the basis for diagnosis and feedback by means of creative action, for instance, contests, conferences, forums,

To reach these goals, NKD avails itself of two interacting mechanisms, the first of which allows mass and integral introduction and dissemination of system, know-how on design and services offered through the network. This, making easy users access, the NKD web portal provides information classified as follows:

- **NKD:** What's NKD? Who is addressed to? What are its purposes? How to join NKD? How to contact NKD?
- **Knowledge on Design:** What are methodological elements on innovation and development of products? How to promote elements integration?
- **Participants and Participation:** Who are participating stakeholders? What services are offered? How to access the services? How to contact others?
- **Diagnosis and Feedback:** This segment offers information related to events, such as seminars, workshops, forums, shows, etc.

The second mechanism allows personal and direct contact with participants; this mechanism promote the participation of students, researchers, designers and businessmen to develop cross-functional teams by promoting R&D, generation and dissemination of new knowledge.

5 EXPERIMENTAL PROTOCOL

Based on the duties determined in the functional analysis, the liaison among four factors related to research factor is determined: Level of learning, Cycles System, Stakeholders and users, in order to set forth the program of NKD deployment which will allow increased learning of the network. The first table allows to feature the learning levels of users (initial levels of knowledge in design) in order to anticipate the wanted advancements after the interaction with network maturity stages.

Table 2. Levels of training – Users – Cycle System.

		Users			Cycle system		
		Businessman	Students, academicians	Designers, Consultants	NKD EMERGENCE		
Levels of training	Beginner	<ul style="list-style-type: none"> •Feeble knowledge in design. •Non-existence of established processes of design and product development. •The design is regarded as the last recourse. •Absence of an internal design department. 	Students <ul style="list-style-type: none"> •Knowledge of the methods and tools in design and development of products. •Weak knowledge of the professional and productive environment. 	Professionals <ul style="list-style-type: none"> •Knowledge of the methods and tools in design and development of products. 	The NKD supports the dissemination of knowledge in design between the actors.		
					Allows the productive organizations to identify its requests regarding its activity and the design of products process.	<ul style="list-style-type: none"> •Allows the students to widen its knowledge in design and products development. •Allows the academicians to propose projects. 	Allows the professionals to enlarge his vision concerning the design and development of products.

		Users			Cycle system		
		Businessman	Students, academicians	Designers, Consultants	Development of the NKD		
Levels of training	Practitioner	<ul style="list-style-type: none"> •Design process established, but flexibility lack. •Interest to widen the offer of products and services, while seeking values of differentiation and innovation. •Requires the R&D, but does not have an access to the projects. 	academicians <ul style="list-style-type: none"> • Management of the methods and tools of design and development of products. •Closer relation with the professional environment. •Require to establish a closer relation with the professional and productive environment to promote the R&D. 	Professionals <ul style="list-style-type: none"> • Management of the methods and tools of design and development of products. •Closer relation with the professional environment. •Require to establish a closer relation with the professional and productive environment for better meeting their needs. 	The NKD established a network of relations convening the actors.		
	Expert	<ul style="list-style-type: none"> •Integration of the processes, methods and tools of design and development of products. •Mobilize in-house actions to innovate, requires the R&D, but does not have an access to the projects. •Interest to envision, project and plan its actions regarding the external changes. 	academicians <ul style="list-style-type: none"> •Interest to be brought up to date in relation to the design and the productive context. •Require to establish a closer relation with the professional and productive environment. 	Professionals <ul style="list-style-type: none"> •Interest to be brought up to date in relation to the design and the productive context. 	Exploitation of the NKD		
					The NKD proposes actions starting from the needs expressed by the users.		
					Allows the productive organizations to improve the in-house processes of design and development of products, production and management of resources.	<ul style="list-style-type: none"> •Allows the students to improve the decision-making regarding its formation. •Allows the academicians to take part in projects of R&D. 	Allows the professionals to improve his participation in multidisciplinary teams of design and development of products.

The Table 3: Cycle System – Stakeholders – Users, allows for determining the objectives of learning evolution of each stakeholder and the network, considering participation of stakeholders in each stage of system.

Table 3: Cycle system – Stakeholders – Users

	Stakeholders			Users		
	Productive organizations	Academics organizations	Corporative	Businessman	Students, academicians	Designers, Consultants

Cycle system	NKD EMERGENCE	<ul style="list-style-type: none"> •To widen its knowledge in design. •To experience the methods and tools in design and development of products. <ul style="list-style-type: none"> •To try out the system. •To submit itself to the community. 			<ul style="list-style-type: none"> •To widen its knowledge in design and design and development of products. •To be integrated into the dynamics of participation. 			
					<ul style="list-style-type: none"> •To know the contributions of the design. •To identify its needs and requests. 	<p>Academicians</p> <ul style="list-style-type: none"> •To widen its vision of the design and development of products. •To question itself vis-a-vis the information exposed. 	<ul style="list-style-type: none"> •To identify its needs and requests. •To widen its vision of the design and development of products. •To experience the methods and tools in design and development of products. 	
	DEVELOPMENT OF THE NKD	<ul style="list-style-type: none"> •To express ideas, questions, requests. •To seek and reach services offered to answer its requests. •To reach the structures of council of assistance to the task. •To improve its processes of design and development of products. •To increase the capacity to define added values. 			<ul style="list-style-type: none"> •To consolidate structures of council to offer an assistance to the task. •To reinforce the bonds with the external context. •To improve the formation of the human capital, to start projects in R&D and the generation of knowledge. •To submit the overdrafts resulting from the processes of R&D. 	<ul style="list-style-type: none"> •To expose its experiences and overdrafts resulting from its professional activity. •To express ideas, questions, requests. •To seek and reach the services offered to answer the requests. •To reach the structures of council of assistance to the task. 	<p>To take part in dynamics by the way of the exchanges.</p>	
					<ul style="list-style-type: none"> •To improve integration of the methods and tools in design and development of products. •To diversify the offer of goods and services by the way of the exchanges of good and services. 	<p>Students:</p> <ul style="list-style-type: none"> •To nourish its training by the way of the exchanges. <p>Academicians:</p> <ul style="list-style-type: none"> •To nourish its process of teaching. •To start projects of R&D. •To form part of the structures of council. •To publish the results of its research, while contributing to the training of the actors. 	<ul style="list-style-type: none"> •To approach the needs of the professional and academic environment. •To make contributions resulting from its professional activity. •To increase the capacity to define added values of the products. •To improve its participation in multidisciplinary teams of design and development of products. 	
EXPLOITATION OF THE NKD	<p>To reach diagnostic and feedback issues of the activity of the community with the gate</p>			<ul style="list-style-type: none"> •To take an active part in the processes of formation and teaching. •To approach in the professional environment 				
	<ul style="list-style-type: none"> •To improve the in-house processes of design and development of products and production. •To increase its capacity to define values of differentiation (greater added value) of the products and organization. 	<ul style="list-style-type: none"> •To encourage the R&D and the generation of knowledge. •To improve the formation of the human capital while meeting the needs for the external context. •To promote the dissemination of knowledge. 	<ul style="list-style-type: none"> •To increase its competences in design and development of products. •To increase its participation in the generation of knowledge. 	<ul style="list-style-type: none"> •To improve the in-house decision-making while defining actions to launch. •To increase the values of differentiation (greater added value) of the products and the organization. 	<p>Students:</p> <ul style="list-style-type: none"> •To improve the decision-making regarding its formation. <p>Academicians:</p> <ul style="list-style-type: none"> •To increase its participation in the generation and dissemination of knowledge. •To take part in projects of R&D while bringing to the solution needs for the external context. 	<p>To improve the decision-making regarding the development of products.</p>		

Relations established on the tables above are consolidated in matrix allowing structuring network development program and the strategies to verify NKD and stakeholders development. The Table 4: Deployment program shows specific strategies to put into operation the network.

Table 4: Deployment program

Objectives compared to the users.	Constraints of the system.	Actions supported by the NKD.		Actions to undertake	Activities.
Allows the productive organizations to identify its requests regarding its activity and the design of products process	<ul style="list-style-type: none"> •The system must facilitate the access of the users with the system is. •The system must call with the participation of the actors. •The system must support the knowledge of the design and development of products. •The system must promote the establishment of a dynamics of participation. 	<ul style="list-style-type: none"> •To widen its knowledge in design and development of products. •To be integrated into the dynamics of participation 	<ul style="list-style-type: none"> •To know the contributions of the design. •To identify its needs and requests. 	To consolidate the Committee of the NKD.	<ul style="list-style-type: none"> •To convene the participation of the academicians to make its contributions. •To build information around knowledge in design.
Allows the students to widen its knowledge in design and products development			<ul style="list-style-type: none"> •To widen its vision of the design and development of products. •To question itself vis-a-vis the information exposed. 	Introduction of the NKD to the community.	<ul style="list-style-type: none"> •Consolidation of a data base of the actors to convene. •To set up strategies of diffusion of the NKD.
Allows the academicians to propose projects.			<ul style="list-style-type: none"> •To identify its needs and requests. •To widen its vision of the design and development of products. •To experience the methods and tools in design and development of products. 	Opening of the NKD	<ul style="list-style-type: none"> •Launching of the Web site NKD. •To present knowledge in Design.
Allows the professionals to enlarge his vision concerning the design and development of products.			<ul style="list-style-type: none"> •To promote the interaction with the NKD 	<ul style="list-style-type: none"> •To set up strategies of diffusion of the network. 	
Allows the productive organizations to improve integration of the methods and tools in design and development of products.	<ul style="list-style-type: none"> •The system must promote the exchanges. •The system must support the definition of added values. •The system must encourage the participation of the actors. •The system must facilitate the access to the service of council. •The system must support the R&D. 	To take part in dynamics by the way of the exchanges.	<ul style="list-style-type: none"> •To improve integration of the methods and tools in design and development of products. •To diversify the offer of goods and services by the way of the exchanges of good and services. 	To promote the participations of the businessman	To convene the participation of the actors to take part in a process of diagnosis.
Allows the students to nourish his training by the way of the exchanges.			To nourish its training by the way of the exchanges.	To promote the participations of the students.	
Allows the academicians to take part in structures of council.			<ul style="list-style-type: none"> •To nourish its process of teaching. •To start projects of 	To promote the participation of groups of research.	

			<p>R&D.</p> <ul style="list-style-type: none"> •To form part of the structures of council. •To publish the results of its research, while contributing to the training of the actors. 		
<p>Allows the professionals to improve his participation in multidisciplinary teams of design and development of products.</p>			<ul style="list-style-type: none"> •To approach the needs of the professional and academic environment. •To make contributions resulting from its professional activity. •To increase the capacity to define added values of the products. •To improve its participation in multidisciplinary teams of design and development of products. 	<p>To promote the participation of professionals.</p>	
<p>Allows the productive organizations to improve the in-house processes of design and development of products, production and management of resources.</p>	<ul style="list-style-type: none"> •The system must make the diagnostic ones starting from the needs expressed by actors. •The system must propose actions to meet the identified needs. 	<ul style="list-style-type: none"> •To take an active part in the processes of formation and teaching. •To approach in the professional environment 	<ul style="list-style-type: none"> •To improve the in-house decision-making while defining actions to launch. •To increase the values of differentiation (greater added value) of the products and the organization. 	<p>Launching of a call to project on the NKD</p>	<p>To set up strategies of diffusion to convene the participation of the actors.</p>
<p>Allows the students to improve the decision-making regarding its formation.</p>			<ul style="list-style-type: none"> •To improve the decision-making regarding its formation. 		
<p>Allows the academicians to take part in projects of R&D.</p>			<ul style="list-style-type: none"> •To increase its participation in the generation and dissemination of knowledge. •To take part in projects of R&D while bringing to the solution needs for the external context. 	<p>Ongoing of a project of multidisciplinary R&D</p>	

Allows the professionals to improve the decision-making considering the context.			To improve the decision-making regarding the development of products.	Launching of an event of feedback.	
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The market analyses provide with the evidence that design has gained a momentum in the organizations, exceeding the formal aspect, encouraging identification of dimensions thus evidencing the momentum of integration to organizational policies. Integral dimension, whereby design takes into account all formal, aesthetic, symbolic, and functional features – identified by consumer’s analysis – as product concept constitute elements. Industrial dimension is connected to the industry, the industrialization and mass production – the issues of industrial revolution. And technique dimension – productive, by means of which the design takes into consideration available resources (production structure, labor, know-how, etc.), the technology integrated to the product and to the production in order to achieve a better efficacy of the ideation process and product development. This way, the design has assumed the responsibility of culture of objects, of mass, of visual culture promotion and information culture integration. For such purposes, organizations need schemes to enhance their product ideation processes as well as to promote design integration – to organizational policies – as the strategic and competitiveness factor, necessary to productive organizations. This is why the front-line of action to be implemented shall be the virtual component in order to establish communication channels easing the promotion of system and the dissemination of knowledge on design. Therefore, the first action to be implemented will be development of a Committed of NKD, which will be in charge of putting into operation the promotional strategies leading to the introduction and launching the network; such actions addressed to obtain the participation of stakeholders and to encourage the exchange by means of the network, necessary to obtain the progress towards the second stage of maturity.

Concerning development stage, it is addressed to reinforce resources management models and improve productive structure of the agents. Therefore, the bonds established by means of the network are intended to offer the ways of solutions through the appropriation of the new technologies (technological transfer), promoting technological infrastructure enhancement, increased effectiveness, cut-down production cost and innovation.

Such exchanges are intended as well to improve the access to training and human capital promotion. Therefore, the network encourage academic organization participation and more specifically, the teams of research and advisory to offer the support in order to promote the appropriation of knowledge of stakeholders y encourage the implementation of R&D projects. The encouragement towards participation of such structures becomes the second line of action, because it allows as well driving of physical mechanisms.

Lastly, in order to assess network and stakeholders evolution, control mechanisms have been established. Concerning the network, the first mechanism is focused on participation in the network (compatibility of links to web site) and secondly, on liaisons among stakeholders (compatibility of offers and releases in NKD). In front of stakeholders evolution, in the ideation guided interviews have been anticipated, before and after the interaction with the system, which will allow for fathoming the condition organization status in connection with its initial level of competence in the integration of tools of product ideation and development.

6 CONCLUSION

In the proposal, the functions to be accomplished by the system are described in order to reach de objectives set forth in dealing with the problem. Therefore, if the purposes of the system are basically to increase integration level and competence of stakeholders, about product ideation, increasing competitive advantages of stakeholders and of the organization, these purposes could be only reached by enhancing knowledge of the discipline.

The establishment of NKD will allow the accomplishment of participation dynamics leading to information, knowledge, know-how and services exchange and this way to obtain a continued nourishment of exchange dynamics. This will result in the inputs to consolidate the third stage of network maturity, the activities of which will lead to propose the *modus operandi* of the network towards the community, thus contributing to enhance competitiveness of Colombia productive sectors.

Finally, this is a cyclic and of constant exchange process between the network and the environment where network is linked to, resulting in continuous dynamics and ongoing growth.

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