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**Inclusive Social Networks:
Clarifying Concepts and
Prospecting Solutions for e-Cidadania**

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Inclusive Social Networks: Clarifying Concepts and Prospecting Solutions for e-Cidadania

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Abstract

e-Cidadania¹ is a research Project inspired by one of the current grand challenges of Computer Science research in Brazil for the next years²: the Participative and Universal Access to Knowledge for the Brazilian Citizen. This Project investigates the relationship people establish in their informal communities organized around some special interests, how they use societal artifacts, including computational technology. This work builds on Organizational Semiotics (OS) to conduct the 1st Semio-Participatory Workshop of the e-Cidadania Project aiming at problem clarification, project scope definition and requirements elicitation for an inclusive social network system. This research report illustrates the use of the OS artifacts, presents the main achievements of the Workshop and discusses results of the semiotic-informed analysis.

1 Introduction

The design of systems that make sense to the users' community and that respect its diversity demands social-technical views and increased knowledge of the involved parties. Therefore, as a frame of reference for problem understanding, modeling of the organizational context,

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as well as user and system requirements gathering we base our approach in Organizational Semiotics (OS) [5, 7, 8] and its methods and artifacts. OS artifacts and methods lead to better results if used in workshops that consider the participation of users, designers, developers and other stakeholders [1]. We call these workshops “Semio-participatory” as we combine the use of artifacts from OS with techniques coming from Participatory Design.

In this sense, we have conducted the 1st Semio-Participatory Workshop, gathering researchers and community leaders and representatives. The objectives of the workshop in this stage of the project were mainly two: to make the problem clear and to elicit possible solutions. In order to collect these elements, we have used the Stakeholder Analysis Chart and the Evaluation Framing in a participatory approach, as proposed by Baranauskas et al. [1]. This combination supplied the group with a powerful tool to enable collaborative work and effective interaction.

After the workshop, the research group analyzed the outcomes and used two other artifacts from OS, the Semiotic Framework and the Ontology Chart [5], to make explicit the requirements and to model the domain, respectively.

This report is divided as follows: Section 2 describes the artifacts used, the participants’ characteristics and activities developed; Section 3 presents the charts filled out and discusses the results obtained focusing on the problem clarification; Section 4 describes the post-workshop activities related to requirements and domain modeling and Section 5 presents our conclusion and some insights for the development of the system to support Inclusive Social Networks.

2 Theory-Methodological Reference

OS is a discipline that has roots in Semiotics applied to organizational processes. OS studies the nature, characteristics, function and effect of information and communication within organizational contexts. Organization is considered a social system in which people behave in an organized manner by conforming to a certain system of norms. These norms are regularities of perception, behavior, belief and value that are exhibited as customs, habits, patterns of behavior and other cultural artifacts [5, 7]. By using Semiotics, the human-computer interaction can be understood through complex processes. Such processes, analyzed only according to the perspective of engineering, have been interpreted as purely syntactic phenomena. The analysis using Semiotics rescues the primary function of computer systems as vehicles of signs and supplies an adequate vocabulary that makes possible the agreement of computer systems in function of other types of systems of signs [3, 6].

In this context, a first step is to clarify the problem and identify possible solutions. We argue that this clarification should be done in a participatory approach, which means the use of OS artifacts to facilitate communication between communities, government, users, designers and others. This section presents the OS artifacts that were used and some details about the dynamics used in the participatory workshop.

2.1 Organizational Semiotics Artifacts

The artifacts used during the workshop were the Stakeholder Analysis Chart and the Evaluation Framing (Figures 1 and 2). The first one supports a problem articulation intended to help us understand the real situation and analyze the requirements. The second, groups the stakeholders in categories and points out the problems related to each category. The building of this chart brings about the discussion of possible solutions and new ideas, directing the flow of research work to the next step: listing and ranking/classifying system requirements.

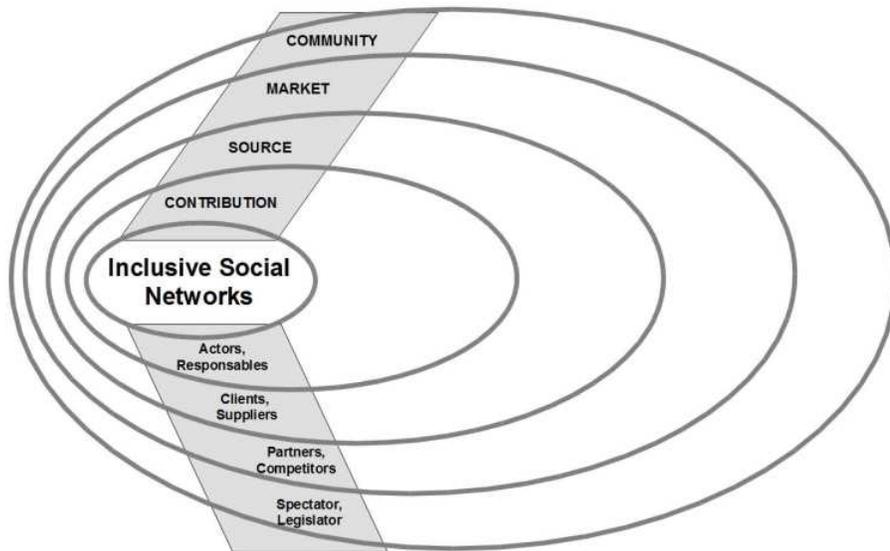


Figure 1: The Stakeholder Analysis Chart.

After the workshop, the research group used the Semiotic Framework (SF) [8] to make explicit the main requirements. The rationale for the SF is to see information as signs and to define the different aspects or levels of these signs based on the different operations you can execute upon these signs. SF consists of the views on signs from the perspective of physics, empirics, syntactic, semantic, pragmatics, and the social world. The addition of a view on information from the social world stresses that information use is always part of human behavior in a social setting, where norms or social conventions govern people's behavior. SF shows that there are six views on information that together form a complex conceptual structure [5]. Figure 3 shows the SL applied to Interactive Systems as an adaptation of the original SL from Stamper [8], based on Liu [5].

In order to model the inclusive social networks domain we used the Ontology Chart (OC) [5] which is a valuable tool for visualizing complex domains using a robust and clear notation. In Figure 4 we present an example of OC adapted from [5] which represents an employment relationship context. The major components of OCs are:

- **Affordance** is a concept initially defined by [4] as a set of repertoires of behavioral

Stakeholders	Issues and Questions	Ideas and Solutions
CONTRIBUTION Actors, Responsables		
SOURCE Clients, Suppliers		
MARKET Partners, Competitors		
COMMUNITY Spectator, Legislator		

Figure 2: The Evaluation Framing.

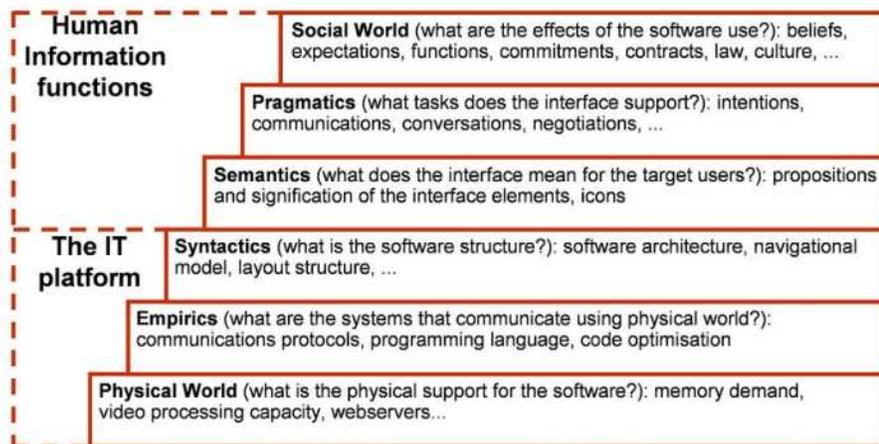


Figure 3: The Semiotic Framework applied to Interactive Systems [2].

invariants that structures of organisms offer and how they are perceived by agents. Affordances are represented in the chart by rectangles;

- **Agents** are a special type of affordance which refers to those who are capable to assume responsibilities; computational agents are not included. Agents are represented in the chart by ellipses;
- **Specifics** are used when designers aim to explicit the possible behaviors of affordances and agents. Specifics are represented in the chart by rectangles bellow the affordances;
- **Determiners** are properties which are invariants of quality and quantity of agents and affordances. Determiners are represented by # <determiner name> linked to an affordance or agent.
- **Roles** stand for a set of characteristics played by an agent during the performance of an activity. Roles are presented in the chart by half ellipses;
- **Ontological dependency** expresses an existential dependence (not causal) between two affordances. In the OC, ontological dependences are represented by links between two affordances where the existence of the element in the right ontologically depends on the existence of the element in the left, its ontological ancestor (i.e., the element in the right exists while the element in the left exists).

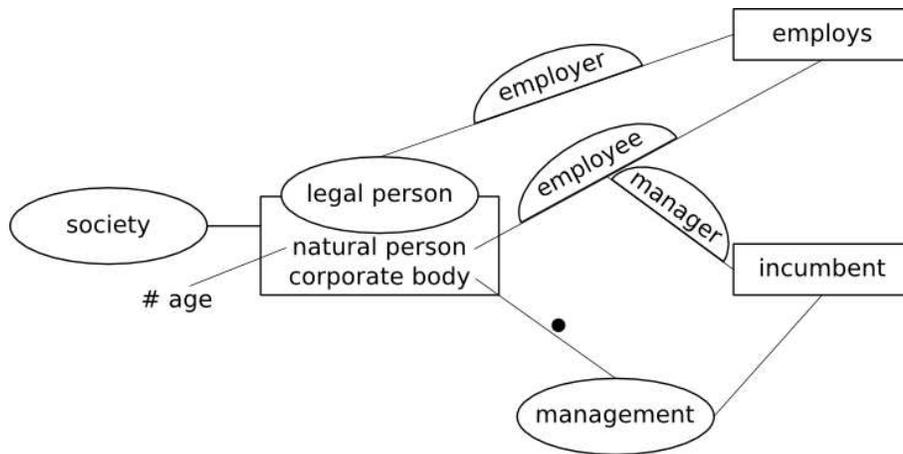


Figure 4: An example of Ontology Chart. Adapted from [5].

Figure 4 represents an employment relationship that starts from the agent root “society” that affords “legal person”. “Legal person” is a heading for the specific items “natural person” and “corporate body”. When a “legal person” is a “natural person” s/he has the property “age”. “Corporate body” has a “management” as part of the organization. “Natural person” can be employed by a “legal person” and are called “employee” and “employer”, respectively. A line with a dot associated indicates whole-part relationship between them. To be a manager, a person must be an “employee”, which is represented by “employee” as an antecedent of “manager”.

2.2 Participatory Dynamics

Thirty individuals took part of the workshop, from which 18 were from the research group and 12 represented the local community. These community representatives covered the following groups: Cidarte - an art cooperative; Educafro and Hebert de Souza - both are communitarian courses that enable students to be prepared to pass the examinations to enter colleges; Centro Comunitário Santa Lúcia - a non-governmental organization responsible for many communitarian activities in Campinas; the Neighborhood Association of Vila União - group concerned with activities for the inhabitants of Vila União; Jovem.com - a municipal initiative for the youth social inclusion brought by digital inclusion; the Graphic Cooperative - a sub-group from the Hebert de Souza that produces and prints booklets and other didactic material; the Technological Cooperative - organization that provides IT support for CRJ/Casa Brasil and for the Neighborhood Association of Vila União; Campinas City Hall and its inhabitants (end users).

These organizations could be classified in three large groups: 1. Associations or ONGs, 2. society and 3. government, which give us a broad range of participants and thus a diverse and rich source of opinions and ideas for workshop.

The activities lasted three hours and they took place at the CRJ - Centro de Referência da Juventude (Youth Reference Center). Chairs were arranged in a semi-circle in front of the artifacts (Stakeholder Analysis Chart and the Evaluation Framing) which hung on one of the walls. Post-its were distributed to the participants who would write their ideas on them and hand them to be fixed on the artifacts. Figure 5 shows some moments of the 1st Semio-Participatory Workshop.



Figure 5: Moments of e-Cidadania's 1st Semio-Participatory Workshop.

At the beginning, a brief introduction of each participant followed the explanation of the objectives of the workshop. Then, the group started to elicit the stakeholders. At a second moment, participants discussed some problems and possible solutions related to the stakeholders and filled out the Evaluation Framing Chart. At the end, participants were invited to write their ideas about what an Inclusive Social Network means.

The whole workshop was filmed and pictures were taken and the participants agreed to authorize the eventual use of their images and speeches in a written form. Some of them

received compensation in cash for their allocated time.

3 Results

The OS artifacts used in this workshop allowed the group to build a common understanding of the main question concerning this project, making it possible for the participants to share experiences and ideas about existing problems surrounding stakeholders. This activity enabled the group to collaboratively envision possible solutions for the identified problems and discuss potential consequences. The result from the Stakeholders analysis conducted the chain of thoughts of the group to build the Evaluation Framing, which is the starting material for the researchers to elicit system requirements and understand aspects that will directly impact design decisions. This section presents the resulting filled charts and how they conducted participants to a common understanding of Inclusive Social Networks.

3.1 Stakeholders Analysis

The Stakeholder Analysis Chart has proved once again the importance of understanding the context in which the problem is immersed. When the stakeholders are clearly identified it becomes easier to visualize the extension of the issue by knowing what the particular interests of each involved part are and how they affect (or are affected by) the project.

Figure 7.a illustrates the resulting artifact; and the stakeholders elicited during this first activity are listed in the last column of Table 2. The layers distribute the stakeholders into four categories, which represent different areas of impact, or different groups of information sources. Actors and responsible ones are in the first layer, which shows those who are directly involved in the problem. Clients and Suppliers are those who will effectively use the system or those who feed the system with information or services. The category Partners and Competitors include all members of the market related to Inclusive Social Networks. Finally, the last layer, Spectator and Legislator, not only comprehends those responsible for establishing the rules (be these rules official or not), but also the whole community that will receive the gains or losses as consequence of the implementation of this system.

It is interesting to notice the different sorts of concerns that the participants have, as the discussion brought up stakeholders from different fronts, including religious and spiritual communities. Such richness could only be achieved in a participatory activity, and these elements were the basis for the Evaluation Framing discussed next.

3.2 Evaluation Framing Analysis

The elements on each category of the Stakeholders chart have their own interest, responsibilities and concerns. The questions and problems related to these groups can be explicitly identified in this artifact, which helps participants to view and discuss ideas and possible solutions that will result in system requirements. The problems and ideas resulting from the workshop are listed on Table 1 below.

Table 1: Evaluation Framing.

Contribution - Actors and responsible ones	
Problems and questions	Ideas and solutions
Low education level	Audio-visual
Literacy proficiency	Popular language
English as a second language deficiency	Telecenter as a supplier
Digital illiteracy	System to help in the search for resources
Difficulties in written interaction	Provide methods to denounce what is not ethical
Technical access lacks infrastructure	Solutions that help break the low literacy problem
How to guarantee that children will not become too lazy to write?	Contract ONGs that are specialized in projects proposals
Lack of opportunities	Intelligent solutions that do not sub estimate users
How to avoid non-ethical use of the network	Friendship for the user (partner)
How to control appropriate use of the network?	Critical sense when using the network
How to define what “appropriate use” is?	Cozy ambience to welcome network participation
Resistance against the new	W3C
Privacy	System should support volunteer work (resource collection)
Difficulty in establishing terms of use	Auto-fill in fields for data input
Where to find partners who will help the community to write projects?	Use of other TICs: radio, cell phones, TV
Lack of discipline at work. Lack of focus	System should alert: “get out, you’ve got more to do”
Vast diversity among users and their interests/how to promote universal usability	
How to keep communication among people with different function restrictions?	
Participants without access to computers	
Source - Clients and suppliers	
Problems and questions	Ideas and solutions
How to make the system sustainable?	System should highlight popular (most used) services
Difficulties to offer products/services	Mechanisms to disseminate events
How to form community representatives that will maintain the system?	Mechanisms to disseminate services

<p>Coordination model is not consolidated (who can create and mediate) How to articulate the dissemination strategy? Are there qualified persons to support the realization of actions? Connection with other networks Demand of new functionalities to serve the community</p>	<p>Use of other technologies, like the cell phone Cell phones as means of facilitating communication Templates for classified ads (for services, goods, etc... events) Web radio System should provide mechanisms to organize the information (relevance) Tool to support communitarian actions (collaborative writing, templates...) Models to support communities management - sustainability Allow input/output in different medias There should be ways in which the community could take part in the system's evolution/development of new functionalities</p>
Market - Partners and competitors	
<p>Problems and questions</p> <p>There are many different kinds of communication tools that complement each other, but they are not integrated (they don't work together) Education quality Too much information. How to select the most important ones? Layer to control visit (partners) Where will the system be hosted? What is the distinguishing feature of this network that makes it different from the others? Cost of maintenance (partners) Why didn't the other network implement the recommendations for accessibility? The development of systems are focused on the "average users"</p>	<p>Ideas and solutions</p> <p>Sponsors Economic partners Independent economical collaborative initiative Open Social</p>
Community - Spectator, legislator	
<p>Problems and questions</p> <p>Conflict of interests among ONGs Freedom of each community</p>	<p>Ideas and solutions</p> <p>To supply with appropriate information Communitarian radio</p>

To promote actions for the protection of the environment	Promote interaction among people
Community awareness about things/actions that take place in the community	Articulate interests among ONGs
Lack of appropriate information	Find new partners to solve environment related problems

3.3 Participants Ideas About Inclusive Social Networks

The sentences below were taken from participants' speech during the discussions and they reinforce the group's understanding that a Social Network, with or without computer or technology support, allows for egalitarian participation.

"most people are excluded from many things ... they dont find a way to fit in, or they fell bashful to ask how to participate, how to be part of it ... In this way, it (social network) makes it possible for people to use what most people already use."

"... is to involve people that dont have much information in the project."

"... there is a cluster where people will benefit. They will show what they can do and in other side of this cluster are those who will have access to it all."

"... everywhere there are people who dont take part in projects, in schools, in the government"

It is possible to notice in the participants' speeches that they support the defined model of inclusion. Such model foresees the involved parts engaging in collaborative authorships and not simply being passively assisted.

"... 'inclusion' is a synonym for 'participation'. The more people participate, the more they will be part of that context"

"... it has to do with right and not benefit, hasn't it? To have the right to knowledge, to know what it means, and to be part of something. It has nothing to do with benevolence, but with right."

As a result of the activities, a poster was composed with the participants' understandings of what Inclusive Social Networks are. After the activities, they were given some time to consider all previous ideas and discussions and then each participant wrote on post-its their individual concept of an Inclusive Social Network. These post-its were arranged in a poster, as shown in Figure 6. The intent is to use this poster in forthcoming workshops and show all involved how their contributions helped the construction of this collaborative view of Inclusive Social Networks.



Figure 6: Reproduction of the poster with participants’ ideas about Inclusive Social Networks.

The 23 conceived thoughts addressed different aspects of the theme, covering both the physical and virtual networks. It shows the concern of the participants about communication for collaboration and sharing.

The participants’ conceptions of Inclusive Social Networks were translated and they are listed below.

1. System - something that facilitates the interaction among people and the dissemination of the information among people from the community.
2. Mechanisms of participatory, unified and collective social mobilization.
3. Networks that connect the population to a certain social inclusive service, for instance.
4. In this globalized world, I believe that Inclusive Social Network means to make the whole society part of this technological modernity.
5. Inclusive Social Network is a group that shares common interests and needs
6. Inclusive social networks is the interconnection between community and systems where they mixture composing one single mass of communication.
7. Facilitation of the information in general. Participation of the community for its union. Important benefits.
8. A system that gathers subjects, ideas, information that are of interest for the diverse

and different users that exist in our society. And that this information exchange and this interaction among users should benefit all communities.

9. An inclusive system would be the one that furnishes the maximum services as possible, of interest for the community for which it was proposed.
10. The citizen acting with the communities supported by inclusive ICT systems.
11. What is an inclusive social network? A group of people that interact sharing different elements without discriminating participants, that is, when we mention “inclusive” that means that everyone is part of that network and that the network has a common objective.
12. Network is a mechanism that allows the development of relationships based in trust and reciprocity among the people that take part of it.
13. Group of people that have interests in common that interact in a way to promote the knowledge and reach personal and group goals.
14. Inclusive Social Networks are structures that offer support to communication of many members of the society, without excluding or privileging certain groups.
15. It is a network that allows everyone to participate with mutual benefits for all participants.
16. People and organization, relations between them (people \Leftrightarrow organization, persons \Leftrightarrow person, ...), active participation of all actors, scope/open to the participation of all.
17. Inclusive social networks are a set of people discussing and interacting around the same subject and interest.
18. It is an associative set of many creators that will have access to offer and learn everything in many situations.
19. Inclusive social networks are a space - not necessarily physical, that makes it possible the exchange amount people. These exchanges can be of information, products, etc.
20. A way to unite a certain population (majority) that is not included in a social context.
21. Inclusive social networks should presuppose the suspension of values that can cause the exclusion of a certain group, community, etc. It should also allow the free association, in the perspective that the social inclusion is for every groups, ..., that are in the margin of the information of the modern world.
22. An Inclusive social network is a way to “connect” common interests of people/communities without offering barriers to the participation of the people that are part of the network (or that can become part of it), without forgetting that there are rules for participating/acting.
23. Inclusive social network. Ambiences - digitals or not - where social groups participate/interact/collaborate in the creation of knowledge and culture.

These definitions were written by persons who have different levels of education and background. The sentences were translated literally and in some cases, the meaning was not completely clear, even in the original language. In spite of that, we can notice a high level of maturity and we can see how conscious they are about the topic.

From these definitions the research team selected key concepts that served as basis for the composition of the Ontology Chart. This process is described in the next section.

4 Post-Workshop Activities

During the post-activities phase, researchers gathered in meetings in order to review and analyze the products from the workshop, discussing main findings and extracting relevant information. All contributions that came from the workshop were studied and developed into new artifacts.

4.1 Analyzing and Grouping Stakeholders

Starting with the Stakeholder analysis, the group of researchers tried a new organization of the post-its in the chart, arranging the similar ones closer together, but maintaining their original layer. This work resulted in a classification of the involved parts into groups. As result of the discussions, two new names for stakeholders arouse and they were added to the chart. In order to identify the contributions from the post-workshop activities, these new addition were written in post-its of a different color from the one used during the workshop. Figure 7.b shows the final chart and Table 2 better organizes the information.

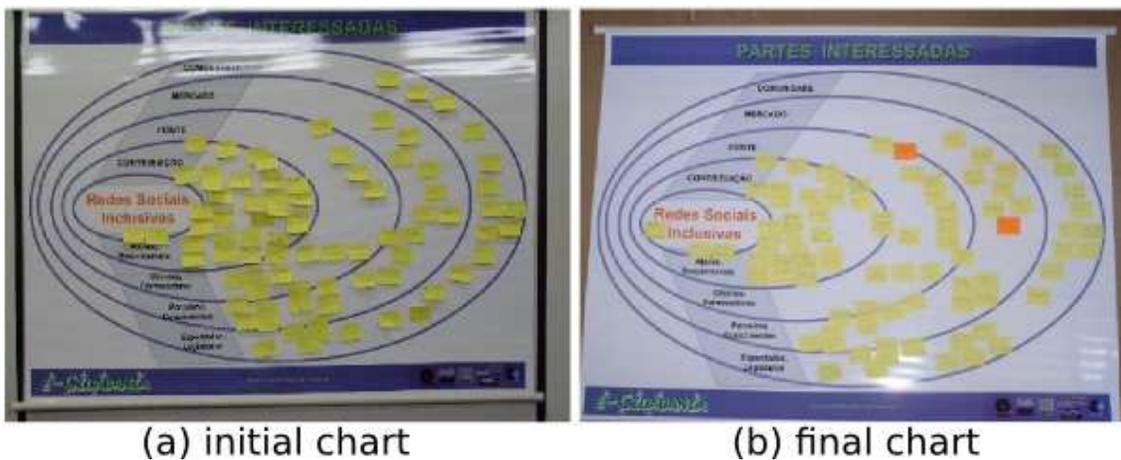


Figure 7: Resulting Stakeholder Analysis Chart.

Table 2: Classification of the stakeholders that were elicited during the participatory activity.

Core - Inclusive Social Networks	
Group	Stakeholders
Main characters	Brazilian society
	Citizens
	Final user/community
Contribution - Actors and Responsible	
Group	Stakeholders

Advanced users	Telecenter users
	Digital community
	Network administrator
	Moderators
Handicrafts	Weavers
	Craftswomen
	Dressmakers
Social groups of users	Families
	Pre-college students
	Housewives
	Elderly
	Retired people
	People with disabilities
	Pregnant women
	Children and adolescents
Social groups' leaders	Communitarian representatives
	Community Managers
	People from Cooperatives
Staff	Habitation Cooperative
	Telecenter monitor
	Social educators
	Health agents
	Technicians, psychologists, teachers
	Physicians
	Scholars from Jovem.com
Source Clients and suppliers	
Group	Stakeholders
Contributors	Actors from the Contribution layer
Organizations	Herbert de Souza
	Cooperative of technology
	Culture and music collective
Tools	Open Social
	Evaluation Tools
Service suppliers	Lavadeiras ³
	Maidservernt
	Boleiras ⁴
	Hairdressers
	Traders
	Service providers
	Producer/consumer

³Lavadeiras in Brazil are those who manually wash clothes for a living.

⁴Boleiras: usually housewives who prepare eatables (eg. cakes, pies, etc.) for selling.

	Sponsors
Market - Partners and competitors	
Group	Stakeholders
Online Social Networks	Orkut
	Convers
	Sonico
	GIGOH
	Tocadigital
	Hi5
	Facebook
	WAYN “where are you now”
Online Tools	Yahoo!
	eMule
	Google
	Wikipedia
Partners	Health Centers
	Researchers
	Financing institutions for social programs
	Financing institutions for projects and programas
	Jovem.com
Opinion leaders	Popular courses
	Instructors/educators
	“escola viveiro”
Community - Spectator, legislator	
Group	Stakeholders
Organizations	Leaders of community groups
	Neighborhood Association of Vila União
	Directors
	ONG's coordinator
	ONG's
	Community Center Santa Lúcia (ONG)
	Craftswomen cooperative
	Cidarte
	Rede Mucambos
	Educafro
Groups	Grupo de Capoeira
	Cine clube Resistência
	Grupo de Oração Cristo é Paz
	Seicho-no-iê
	Non-organized classes
Institutions	City Hall
	Telecenters
	Secretaries

	Public administration
Legislator	Legislation for Accessibility (federal, state and municipal)

A similar work was done with the Evaluation Framing Analysis: similar ideas were grouped together and possible solutions rearranged in order to facilitate reading and understanding.

From this analysis a Semiotic Framework artifact was used to organize requirements for the prospective inclusive social network system, as described in Section 4.2. From their common ground meaning for Inclusive Social Networks, a list of key concepts was structured into an Ontology chart, as it is described in Section 4.3.

4.2 The Semiotic Framework and Requirements

The Stakeholders Analysis together with the main problems they face and solutions envisioned provided by the Evaluation Frame allow an organization of the requirements for this prospective - inclusive social network - system. The six steps of the semiotic ladder summarize the main questions and requirements as follows:

The Social World - commitments, contracts, laws, beliefs, culture...

- How to guarantee that cultural elements are present in the system? Requirement: to make possible the co-authorship in the system and in the content.
- Does the user need to register with the real name or can s/he use Alias/nickname/etc.? If with the real name, how to control? Requirement: The system must present the terms of use of the system, her/his rights and duties, in a common language and in a simple way. Requirement: to make possible denunciation of what is not ethical.
- What should contain the Term of Use? How to make sure this Term is accessible for all? Requirement: To define basic Norms of behavior for the group and to consult other TU.
- The user must be able to share the personalization models that have created. Requirement: To make possible tailoring.
- The system must allow the personalization of common spaces (home of the community, for example) - cultural identification of the community - norms must be defined for the use of this resource. Requirement: To make possible tailoring.
- The whole community is a group; how to deal with sub-groups? Requirement: “natural” constitution of groups that emerge of the social interactions.

Pragmatics - intentions, conversations, negotiations, use...

- Who is going to pay for the purchase/maintenance... of assistive technologies and other hardware? Requirement: auto-support; management of the community by the community itself, search for helpers in the system.
- In the real life, negotiations on the price of services can be complex. Requirement: The system must make possible and facilitate the process of negotiation.
- During the project, will backups of contents generated by the users be a necessary task of the team? Requirement: to define size/cycle... of backups.

- Will the users have a role in the social network system? What services will be available for non-registered users? Requirement: define the possibilities of Access for the registered/non registered based on responsibilities.
- How to “motivate” the users to use the system? Requirement: system must complement, support and merge with the use of the “real” social net. Requirement: The system must offer aids (help) directed to the use of the service/system (contextual information) and support the navigation. Requirement: The system must offer “intelligent coaching” guided to the social context (support the search for financial resources; support the management of the community outside the system...). Requirement: role of the “volunteer” to collaborate with others in the use.
- Who must define protocols of interaction, privacy and security for the communities? Requirement: the community itself must define its protocols. Requirement: The system must supply a channel that makes possible the community to define its protocols and to denounce abuses of use of the system.
- Requirement: Being delivered to the community the server of the system must be housed and be kept by the community, becoming necessary the involvement of members of the community in the maintenance of the software and the hardware of the system. Requirement: qualification of the maintainers of the system.

Semantics - meanings, assumptions, validity...

- How to facilitate understanding of concepts such as “my profile” for the digitally illiterate? Requirement: offering such concepts in a simplified way, and verify possibilities of using audio, video and image (photo).
- Requirement: The system must give prominence for content (services, announcements, information, etc.) that has greater visitation.
- Requirement: The system must make possible to visualize, organize and classify content in different ways (for example, on the basis of the importance that the content has for the user). Requirement: to make possible tailoring.
- The system must allow that the content is posted in different semantic levels - for intellectual growth of the user. Requirement: to provide Wizard, templates for make the announcements, projects, etc. Requirement: to offer tool for writing suggestion. Requirement: use of popular language.

Syntactics - structure, forms, language, data, standards...

- What development platform will be used? What SGBDs should be supported? Requirement: to respect BSD license.
- How will the registration service be carried? Which data, which steps,...? Which model of interaction/navigation is more adequate given the diversity of the users? Requirement: The system must make possible input and/or output using different media (e.g., text, video, audio, SMS).
- Will all content be available in Portuguese and LIBRAS (Brazilian Sign Language)? Requirement: The system must offer access to the content and options of interaction in different media [text, image, sound and LIBRAS]. Requirement: collaborative project for content creation (with volunteers). Requirement: universal usability.

- The system must allow that the users personalize the interaction elements (change of icons, labels, size, color...). Requirement: The personalization options will have to be offered next to where they will be used and not only in one “personalization environment”.
- Requirement: The system must be developed under BSD license. Thus, all components distributed together with the system cannot transgress the BSD license.

Empirics - communication channel, noise, capacity, redundancy, efficiency...

- During the project (hosted in the NIED), “guarantee” enough band width for the users.
- Will the users of the community have access to connections that make possible the use of different types of media in the system to be developed, for example, audio and video? Requirement: different media for disruption of use barriers.
- Will it be synchronous communication?
- Connection with other networks? (Opensocial)

Physical World - infra-structure, development platform, devices...

- Requirements for the server (memory, HD, etc) and place for the installation. Requirement: enough and adjusted infrastructure.
- What assistive technologies will be available in terms of hardware?
- The system must also function in other devices. Which technologies of information and communication will be involved (cellular, TVDi, etc)? Requirement: connection with other nets.
- The auditory content provided in the web application must be easily “played” in other devices (mp3 players, for example). Requirement: extra information of context.

4.3 Then Ontology Chart and Semantics

To support the construction of the OC (presented in Figure 8), we performed a Semantic Analysis, which is a method that provides means to represent agents and their behavioral repertoires. Semantic Analysis has activities involving requirement elicitation, analysis, specification and representation [5]. The method is composed by 4 phases:

1. Problem definition;
2. Candidate affordance generation;
3. Candidate grouping;
4. Ontology charting.

For the Problem Definition phase we considered the definitions generated by the participants of the 1st Semio-Participatory Workshop presented in Section 3.3. From those definitions we extracted the major phrases and concepts resulting in the set of candidate affordances corresponding to the phase 2 of the method. In the Candidate Grouping phase

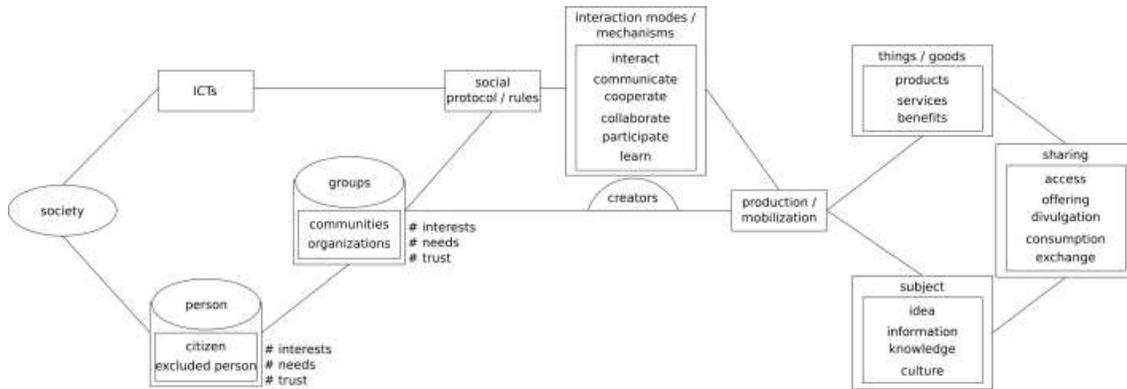


Figure 8: Ontology chart of the domain of inclusive social networks.

we identified some synonym concepts and classified each item in one of the following components: affordance, agent, role, specific and determiner.

Figure 8 represents the ontology chart resulting from the analysis of the first three phases. The root element “society” affords “ICTs” and “person”. In this context “person” have two specifics: “citizen” (i.e., those who have an “id” provided by the government) and “excluded person” (i.e., those who are unable to socialize duo to physical or social barriers). “Person” affords “groups” which have the specifics “communities” (i.e., groups not formally stated) and “organizations” (i.e., groups formally and legally stated). Both “person” and “groups” have the properties interests, needs and trust. This representation is important to separate individual characteristics from those generated by the collectivity. “Groups” establish some “social protocol / rules” to guide and promote the socialization; in the context of this work, “social protocol / rules” are supported by “ICTs”. A social protocol can allow people to socialize in a number “interaction modes / mechanisms”, we identified in the definitions a set of 6 of them: “interact”, “communicate”, “cooperate”, “collaborate”, “participate” and “learn”. When socializing through an interaction mode, a group can create a “production / mobilization”, playing the role “creator”. We distinguish the term “mobilization” to clearly address the actions in a group where the objective is to propagate a view and to articulate people to some purpose. As results of the “production / mobilization” we have two affordances: “things / goods” and “subject”. By “things / goods” we mean “products”, “services” and “benefits” and by “subject” we mean “idea”, “information”, “knowledge” and “culture”. More than to produce, the objective of an inclusive social network is the “sharing” of results of this production. From the definition of the participants we verified an especial interest in “sharing” and some ways to do that (i.e., “access”, “offering”, “divulgation”, “consumption” and “exchange”). Therefore, an inclusive social network can be synthesized as the social network where every person can integrate a group which is able to interact under a social protocol and a set of rules (translated by an ICT) to promote the sharing of goods and subjects obtained through production and mobilization within these groups.

5 Conclusion

The complexity of developing a system to support inclusive social network systems that make sense to the users' community requires a socio-technical vision of the problem and a participatory and inclusive approach for the proposal of solutions. We adopted OS as a theoretical and methodological frame of reference that permits a treatment of the problem that equally considers the informal, formal and technical levels of the social group and the system in question.

This report presented the activities regarding the 1st Semio-Participatory Workshop conducted with the target community. In this workshop, the Stakeholder Analysis Chart and the Evaluation Framing were filled out by representatives from the community, designers and developers in a participatory approach. Also, participants described an inclusive social network from their point of view. From the participants' speeches and the variety of stakeholders that were discussed (and that can be seen in the resulted chart), it is possible to notice how the community demands a system to be inclusive.

After the workshop, researchers worked grouping the stakeholders in categories that provided a higher granularity for understanding about the involved groups. The analysis of these artifacts informed an organized view of requirements through the Semiotic Framework. The descriptions participants wrote were analyzed and from them, the researchers built an Ontology Chart to represent the affordances related to inclusive social networks.

Therefore, from the first workshop, we have the clarification of the problem, identification of stakeholders, and delimitation of the scope of the solution with regard to technology and social/digital inclusion. This shared understanding of the problem help us to search for solutions that make sense to the community and that will be materialized in the software application. Next steps in this research include elaborate on other requirements with the community and starting the design phase.

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