CHAPITRE 12

Diasporas, Development and ICTs

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This chapter adopts the following two assumptions:

– The first has largely been developed in the preceding chapters of this volume and stands as follows: diaspora constitute a new and potentially useful instrument for enacting cooperation policies with developing countries.

– The second will be more specifically addressed in this chapter and holds that a skilful use of Information and Communication Technologies (ICTs) will improve both the efficiency and effectiveness of this policy instrument.

In other words, a direct relationship is postulated between diasporas, development and ICTs. In an effort to represent the nature of this relationship, we've built a model that takes into account the following considerations.

The other chapters in this volume have shown that a number of conditions have to be met if diasporas are to serve for enacting cooperation policies with developing countries. The one which is of particular interest to us in this chapter is the idea that diasporas require high quality communication systems because they are non-territorialized entities who define, maintain, activate and reproduce their identity through collective exchange and interactions. Computer-mediated communications (CMC) offer the promise of new forms of interaction between members of a diaspora, institutions, people and associations in both their host and home countries. Technological infrastructures are emerging that appear eminently desirable for establishing an approach to international cooperation in terms of "co-development".

Co-development implies that the mobility of competent, highly qualified members of developing countries towards the North should not be considered as a brain drain but as a potential source of human resources for increasing the skills and knowledge available for development in the South. It is a concept that takes into account empirical evidence concerning personal motivations for involvement in diaspora networks.

We now know, for example, that the desire to share, support and defend a specific set of socio-cultural traditions and values is no longer the only explication of a personal engagement in a diaspora network: expatriates are increasingly seeking to actively take part in designing, negotiating and constructing the future of their home countries as well. However, we also know that these efforts to build the future are often "bottom-up" and fragile in the sense that they crucially depend upon relationships with public and private institutions that are neither robust nor stable. And this is where the weakness lies in considering diasporas as a policy tool. Dispersed, bottom-up, non-institutionalized activity is often much less efficient than it might be and this of course has nothing to do with technology.

Our main argument in this chapter will be the following: ICTs contribution to co-development will depend upon how they are used to implement procedures for articulating and coordinating the vast range of grassroots and institutional actions implied by the co-development concept. The concept of co-development raises two symmetrical problems: if grassroots actions fail to gain institutional support they will tend to have a limited life span because they are too dependent upon the good will and connivance networks of those who initiate them; inversely, if institutional action doesn't gain grassroots support, it will cut itself off from a rich, highly motivated source of human resources for implementing development projects. ICTs in the co-development context should be seen as a means of overcoming these two types of problem. This is what we hope to show in this chapter.

Modeling diaspora, development and ICT relationships

Our data concerns grassroots and institutional initiatives for development. We did not seek to build an exhaustive list of these actions but rather to illustrate how ICTs can be used to articulate and coordinate them. Three categories of actions were considered:

– *Those at the diaspora level* were identified and analyzed using information available through the Web sites of expatriate networks. These data raise two major problems.

1) The first concerns their reliability. For example, a list of 171 Web sites was established for preparing this report by the Documentation Service of the IRD but, of these, only 79 were considered as being a reliable source of data for our purposes (see Appendix). Among the 92 sites eliminated, some were no longer active, others were undergoing re-construction but

the vast majority simply didn't meet the quality criteria we imposed. Of course this judgment was subjective and this is where the reliability problem lies: a great deal of work is required to calibrate Web site data in order to produce quality control standards for evaluating potential biases resulting from their use. For the moment, no formal benchmarks exist that would be of help in determining best practices in Web site design.

2) The second concerns Web site representativity. Does the information published on a Web site express the views of the Web site designer, a very small or a very large proportion of the diaspora population living abroad? Once again there is no "standard" response to this question. An intimate, expert knowledge of the diaspora milieu is required to deal with this representativity issue.

Despite these two problems, Web sites are nevertheless the best source of information now available on "bottom-up" initiatives for development. This report will make proposals as to how their quality can be improved.

– *Those at the institutional level* can be modeled using policy documents which are produced by institutions to accompany their actions. Institutions are accountable to their members for differences between what is announced and what is achieved. Policy documents set out the priorities, goals and objectives of a program which then become a framework for evaluating results obtained. In this study, a White Paper produced by the French Inter-ministerial Committee for International Cooperation and Development (CICID, 2002) was considered as being typical of a top-down, institutional policy statement. Four lines of action are defined in this White Paper organizing bilateral relationships between France and 54 countries belonging to what the French call their "Zone de Solidarité Prioritaire" (ZSP). Each line of action : 1) efficient States, 2) efficient Markets, 3) human development and 4) sustainable development - is defined by a subset of priorities which, together, fix the goals and objectives of French cooperation and development policy in the ZSP.

– *Those at the global level*, because probably the most characteristic feature of computer-mediated interaction with the South is the rapid extension of the Global Information Infrastructure. The GII is the name given to the Internet, the World Wide Web and the extended global wireless, mobile, satellite telecommunications system. It holds out the promise to Southern countries of accessing the digital libraries of the North, of building international "collaboratories" where laboratories of the South and the North work together in a research world "without walls" and of rich, distance learning environments for sharing knowledge and skills. That said, much of the literature concerning the GII makes the point that this infrastructure is not as universal as it might be and, in fact, a digital divide is growing between the North and the South. Evidence shows that access to the products and services of the GII is more costly, limited and difficult in developing than in developed countries. This situation will obviously influence the way ICTs can be used to coordinated bottom-up and top-down actions for development and consequently needs to be understood.

A final consideration that structured out efforts to represent the relationships between diaspora, development and ICTs derives from our experience as members of LIMSI, an engineering laboratory of the CNRS doing fundamental computer science and cognitive science research on computer-mediated communications. Our model requires some idea of what the future will hold. With respect to computer-mediated communications the answer to this question is relatively simple and can be resumed in the following formula: the future no longer lies in building information systems but in building interaction spaces for distributed collective action. Some key words describing the research underway are useful in illustrating this affirmation. Concepts such as the semantic web, natural language interfaces, middleware formalisms and multi-agent systems share in common the concern that despite rapid technological progress, computer-mediated communications will suffer from a machine's fundamental incapacity to deal with semantic heterogeneity and natural language ambiguity in the same way that people do. Computer-mediated communications might become a source of additional confusion, misunderstanding, tension and conflicts instead of being a new opportunity for learning and doing things together. Over the past 10 years, progress in hardware and software design together with the rapid increase in telecommunication bandwidth, explain this radical change in research perspectives.

Engineers can now technically implement interaction spaces, however, the socio-cognitive conditions of their effective use still needs to be urgently understood. How is the information generated through computer-mediated social interactions identified, interpreted, aggregated and transformed into useful knowledge for collective action? Our work on this question at LIMSI suggests the fundamental importance of establishing mechanisms in an interaction space for building trust and confidence. These mechanisms intervene at three levels, as part of the general self-organization mechanics of a group and more specifically in structuring communications and in organizing knowledge sharing. We've attempted to gain evidence of the existence of these mechanisms for confidence building in our analysis of the use that diaspora networks make of their Web sites.

Because computer-mediated communications require confidence, it is of interest to note that in the diaspora context this confidence is generally spontaneously forthcoming for socio-cultural reasons: people share traditions that give them both a strong sense of belonging and security in the quality of their relationships with others. In other words, the socio-cultural base of diaspora collective practices is particularly favorable to the use of the new interaction spaces under development in research laboratories at the present time. That said, we are not there yet and one of the problems we faced in carrying out our Web site analysis was precisely to try and determine where we are. The future implies supporting diaspora integration in the co-development process through building and implementing custom-tailored interaction systems. Today, we can expect that Web technologies are still predominately used to manage the information access problem. But what does the road hold out for those diaspora networks that want to move from information to interaction? We adopted the following technical assumptions to answer this question:

– Today, the Web technologies commercially available for information exchange and access serve for database management, hypertext navigation, multi-media and computer-supported communication applications. Generally, these four types of technologies are stand alone systems requiring specific installation and the capacity to work across a variety of technical infrastructures.

– That said, in the past decade, much effort has gone into building the conditions of an interoperability where these four systems are available to the user in a single, coherent environment. Interoperability is the technical condition for commercially marketing the "interaction spaces" of tomorrow. These spaces are starting to appear (Quickplace, YahooGroups, Netmeeting…).

– And finally, the third assumption refers to the research described above which is aimed at improving the operation of these interaction spaces through the use of machine intelligence. We expect a growing use of natural language interfaces and multi-agent systems in the future.

In the time imparted to us we've only been able to explore hypotheses, determine variables and qualify data. Our model should be considered as a heuristic device for integrating these results into a general picture of relationships between diaspora, development and ICTs. It is built around the idea that diaspora networks are representative of bottom-up, distributed collective practices.

The "bottom-up" notion was defined above: it implies that diasporas are fragile social constructs whose existence and identity depend upon the good will and the connivance of people who share the same socio-cultural traditions. The "distributed" concept implies that members of a diaspora network are generally located in different geographical locations and will consequently be open to using computer-mediated communications to exchange information and interact. Finally, the "collective practice" notion implies that they share a sense of collective identity and engage actions to sustain and reproduce it. Among these actions are those in favor of the country of origin but not exclusively: many activities such as organizing social events or defending a specific socio-cultural viewpoint (Chinese-American, Haitian, Arab…) on political, economic, scientific and/or ethnical questions in the host country are possible as well. The following figure will help understand the articulation between these different elements of our analysis:

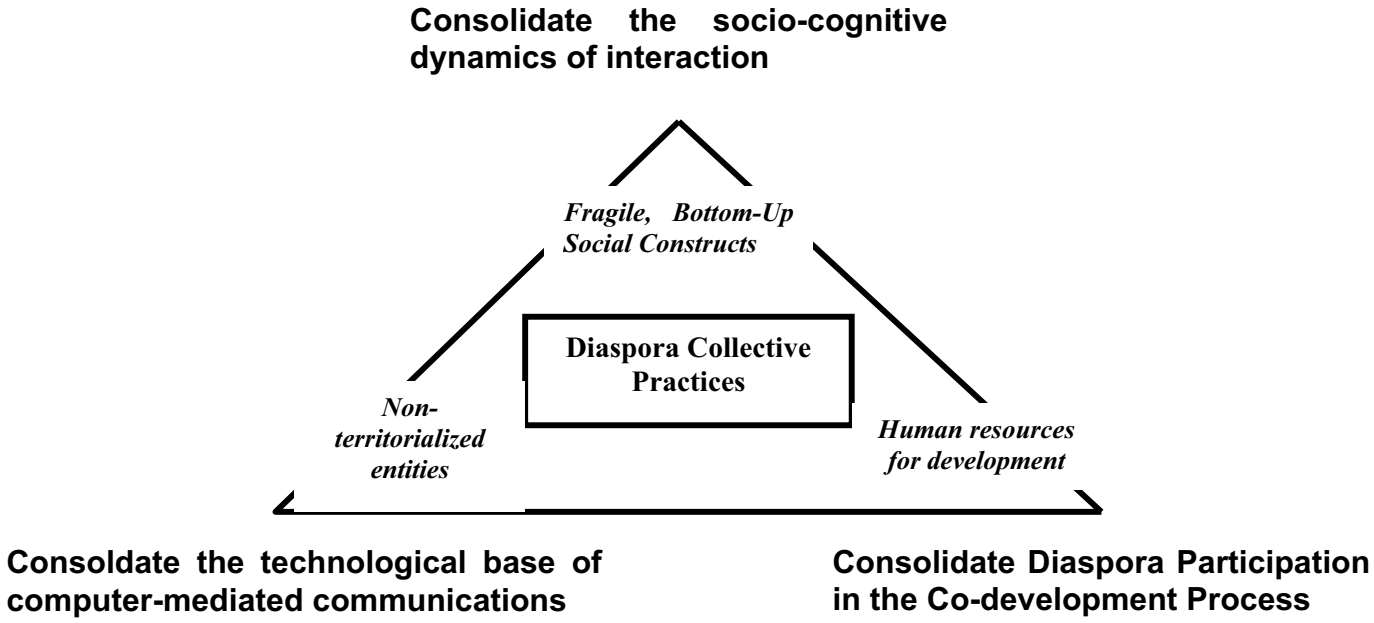


Figure 1 : A model of diaspora, development and ICT relationships

Figure 1 defines the prescriptive stance we will be taking in the rest of this chapter:

– because diaspora networks are fragile social constructs, ICTs should be used to consolidate and reinforce the socio-cognitive processes underlying collective practices;

– because they are non-territorialized entities, a solid technological base for computer-mediated communications should be developed;

– because they are composed of highly qualified people, ICTs should prove their usefulness in opening up new avenues of participation for those people in the co-development process.

These, then, are the three pillars of our argument but the argument is made, as we said above, with the goal of identifying and implementing concrete procedures for articulating and coordinating the vast range of grassroots and institutional actions implied by the co-development concept. This articulation is missing at the present time. For example, in the White Paper by the French Interministerial Committee for International Cooperation and Development, diaspora networks are not envisaged as a policy instrument for co-development. One of the reasons for this no doubt lies in the lack of a methodology for identifying opportunities of grassroots and institutional cooperation. Our proposals to improve this situation follow.

Diaspora Web sites and the mobilization of human resources for development

Table 1 shows that diaspora Web sites can't yet be considered as a reliable means of mobilizing human resources for development in the French *Zone de Solidarité Prioritaire* (ZSP). It was constructed using the following assumption: expatriates from the ZSP should maintain constant, on-going contact with institutions, associations and people in their home countries; without evidence of these contacts, the idea that diaspora networks are effectively a source of highly qualified, highly motivated human resources for development is hard to defend. The best evidence of Web-mediated contacts would be traffic measures, that is, statistics counting the number of times actors from host and home countries use diaspora Web sites but, for the moment, this type of data doesn't exist. So we simply considered that an upper limit on

their use as a communication channel is given by the number of diaspora networks that have Web sites. Table 1 shows that only 12 of the 54 ZSP member countries have diaspora in this situation and its on the basis of this figure that we conclude to the small role played by ICTs in mobilizing human resources for ZSP development. However, the precision of this figure should not hide the limits of the analysis.

Zone de solidarité prioritaire	**Geographical distribution of Diaspora networks using Web technologies to support their activity**
Proche-Orient : *Liban**, Territoires autonomes palestiniens, Yémen.	**Proche-Orient** : Iran, Liban, Turquie *(2)**
Afrique du Nord : Algérie, *Maroc*, *Tunisie*.	**Afrique du Nord** : Maroc, Tunisie (2)
Afrique sub-saharienne et océan Indien : *Afrique du Sud*, Angola, Bénin, Burkina-Faso, Burundi, *Cameroun*, Cap-Vert, Centrafrique, Comores, Congo, Côte d'Ivoire, Djibouti, Érythrée, *Éthiopie*, Gabon, Ghana, Gambie, Guinée, Guinée-Bissau, Guinée équatoriale, *Kenya*, Libéria, Madagascar, *Mali*, Mauritanie, Mozambique, Namibie, Niger, *Nigeria*, Ouganda, R. D. du Congo, Rwanda, São Tomé et Príncipe, Sénégal, Sierra Leone, *Soudan*, Tanzanie, Tchad, *Togo*, Zimbabwe.	**Afrique sub-saharienne** : Afrique du Sud, Cameroun, Éthiopie (3), Kenya, Mali, Nigeria (3), Soudan, Togo,
Péninsule indochinoise : Cambodge, Laos, Vietnam.	**Asie** : Bangladesh (4), Chine (6), Corée (3), Inde (7), Japon, Pakistan, Philippines (2), Thaïlande (5).
Caraïbes : Cuba, *Haïti*, République dominicaine.	**Europe** : Grèce (2), Hongrie, Irlande, Italie, Kosovo, Pologne, Suisse, Tchécoslovaquie, Ukraine.
Amérique latine : Surinam.	**Amérique Centrale** : Salvador, Haïti, Porto Rico.
Pacifique : Vanuatu.	**Amérique du Sud** : Argentine (2), Colombie, Pérou, Venezuela
	Autres identités géographiques citées : – Afrique (2) – Asie (6) – Pays arabes (2) – Tiers-monde (2)
**Liban :* countries who have diaspora that use Web sites to support their activity.	**(2) Number in brackets* : Number of diaspora networks in a given geographical area using a Web site.

Table 1 : Use of Web sites by diaspora from counties of the ZSP

The list of 54 ZSP member countries on the left hand side of Table 1 was extracted from the White Paper defining French policy for international cooperation and development. The 79 diaspora networks listed on the right hand side are those selected because of the quality of their Web sites given the goals of this report. As explained above, the criteria used for selection were restrictive: Web site design had to include concrete measures to support the socio-cognitive dynamics of computer-mediated interactions on the one hand, and to use database, hypertext, multimedia and/or communication technologies on the other hand. Consequently, Table 1 is at best only an approximation of the current situation, however, the message is clear: few experiments are underway that would allow ZSP diaspora networks to acquire the experience

and the skills needed for interacting through Internet with institutions and other grassroots actors in their home countries.

We next coded our data to distinguish between three situations:

– When Web sites were used to support diaspora activity in the host country, they generally served to announce up-and-coming social events, to list job opportunities and organize community aid for needy members of the expatriate population (mostly students, the old and the ill) or more generally to knit ties serving to defend socio-cultural traditions in a foreign country.

– When Web sites were used to support programs for the home country, the content of these programs was coded using the list of French priorities for the ZSP as a means of identifying possible zones of overlap between bottom-up and top-down policy initiatives.

Finally, a limited number of diaspora networks used their Web sites for simultaneously building a sense of collective identity abroad and for mobilizing support in favor of projects for their home countries. An example concerns the Association of Pakistan Physicians of North America, one of the 79 networks in our general population. We concluded that the designers of this network's Web site intended to support both home and host country activities given their formulation of the following objectives "to assist in the orientation and adjustment of newly arriving Pakistani physicians in the United States" and "to encourage medical education and delivery of better health care in Pakistan, specifically by arranging for donation of medical literature, medical supplies, and by arranging lecture tours, medical conferences, and seminars in Pakistan". Despite the fact that Pakistan is not a member of the ZSP, the network announces activity which intersects with French policy in favor of human development through better health care and we consequently coded this overlap as well.

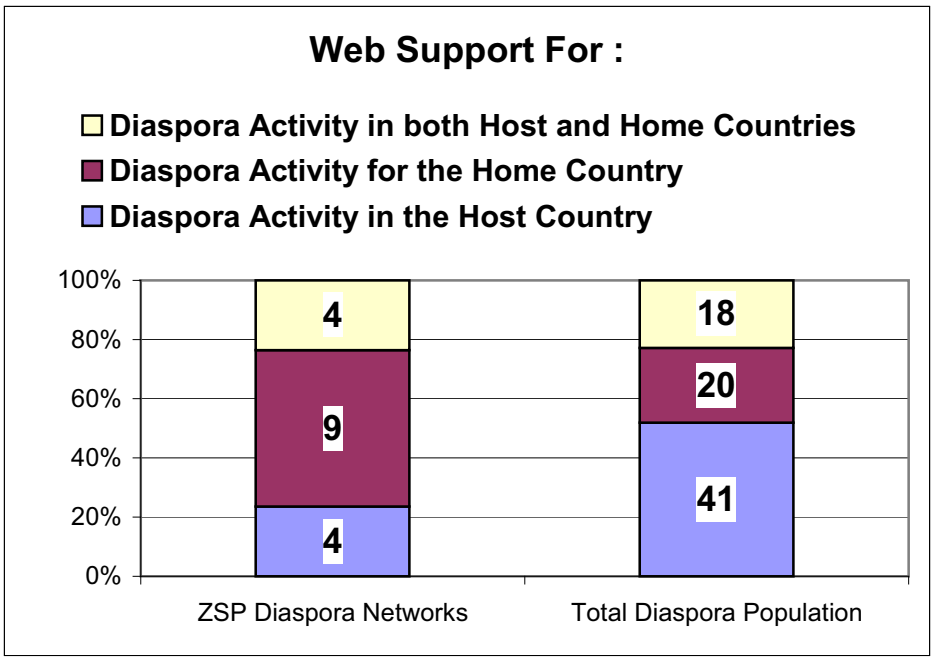


Figure 2: The goals and intentions of diaspora networks as expressed on their Web sites

Figure 2 shows that the diaspora networks of the ZSP are more focused on improving the situation in their home countries than the networks of the general diaspora population. More than 50% of the networks in the general population against 20% of the networks in the ZSP countries use their Web sites to support, almost exclusively, diaspora activity in their host countries. Symmetrically, 60% of the ZSP networks use their Web sites in the opposite manner, for mobilizing support for actions in favor of their home countries against 20% in the general population. Despite the small numbers shown on Figure 2, it clearly suggests that diaspora networks are a potentially good source of highly motivated people for the development of their

home countries and confirms the interest of attempting to articulate bottom-up and top-down initiatives in the ZSP.

Coordination implies adopting a strategy for aggregating over the multitude of specific, individual strategies proposed for development. Figure 3 shows statistics produced by coding the overlap between diaspora and French policy objectives[1]. It provides an empirical representation of the best categories for coordinating bottom-up diaspora activity from a French policy perspective.

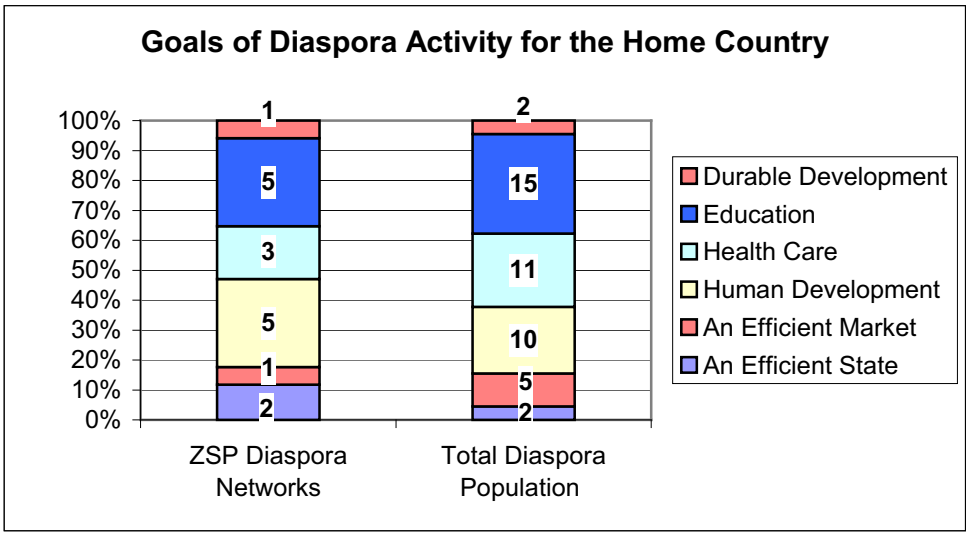


Figure 3: The overlap of diaspora activity with French priorities for international cooperation and development

The priorities for development shown in the legend of Figure 3 are those that are defined in the White Paper of the French Interministerial Committee. In fact only four chapter headings were used in this document – an efficient State, an efficient Market, human and sustainable development – but empirically, we found that a very large majority of diaspora networks focus on questions relating to human development through improved health care and education. We consequently decided to use 6 categories to resume our data, the general categories of:

– *human development*, intersects with the French concern for protection of human rights, the promotion of cultural identity as a motor of development and the right of access to basic water, urban and digital technology infrastructures. It is interesting to note that a comparatively large number of ZSP diaspora networks position themselves in favor of actions on these themes;

– *an efficient State*, intersects with the French goal to promote administration structures that guarantee a separation of powers, legality and an efficient implementation of public policies;

– *an efficient Market*, intersects with the goal to promote the dynamism of the private sector and, in one case, regional economic integration;

– and, finally, *sustainable development* intersects with the two goals of better managing natural resources and preserving the global environment.

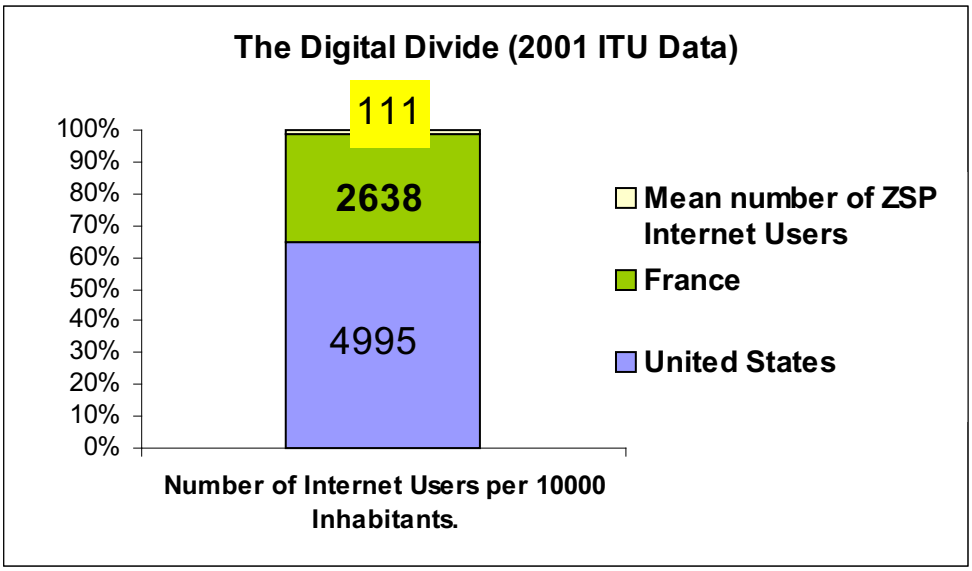
Not all French priorities found an echo at the grassroots level. As figure 3 shows this is particularly the case with respect to promoting an efficient State, an efficient Market and sustainable development. But this finding itself is important because it suggests that:

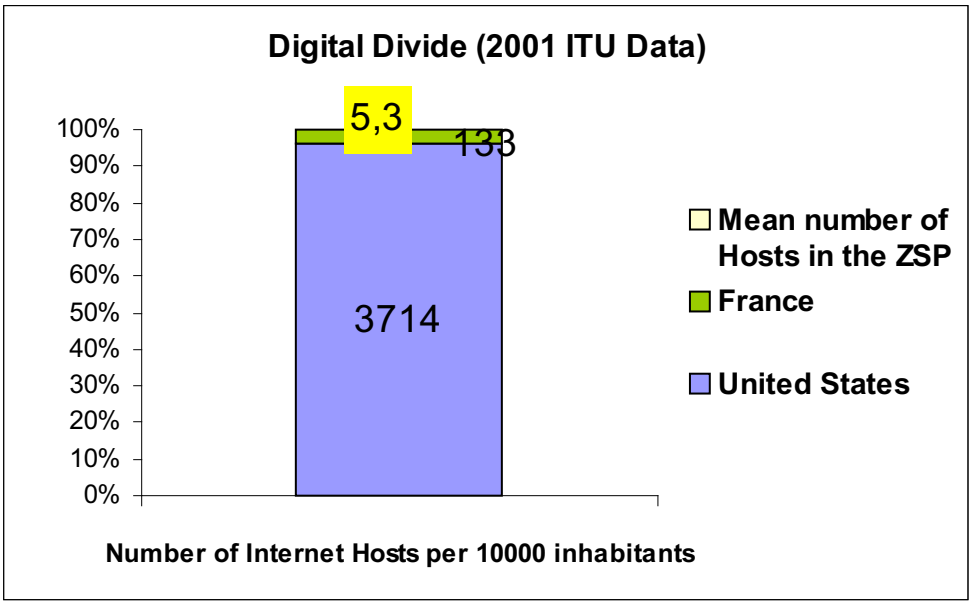
– diaspora networks can and should be considered as an instrument of development policy in the health and education areas;

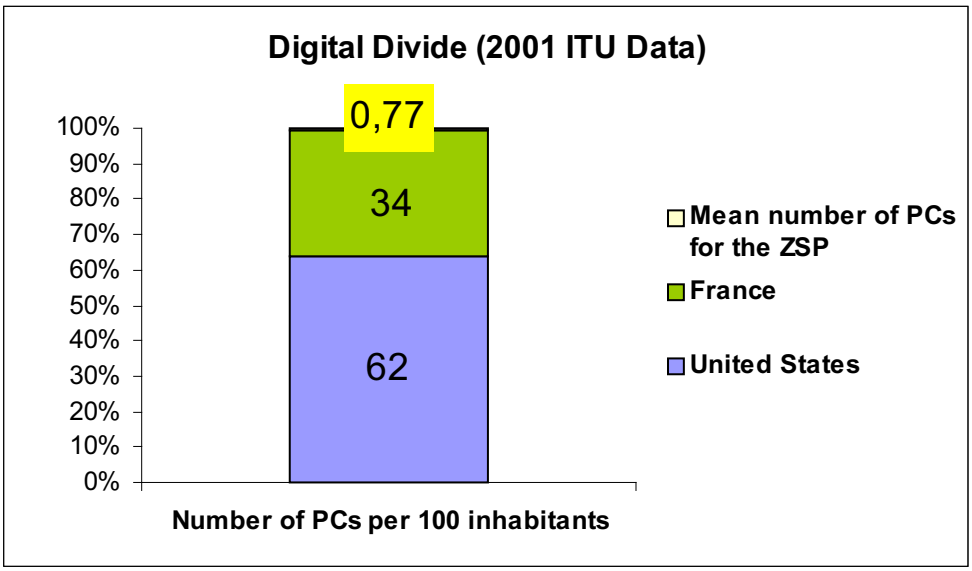
[1] We double coded when diaspora objectives intersected with several areas of French policy concern. Consequently, despite the fact that only 38 networks in the global population announced their intention to explicitly work for their home countries (see Figure 2), 45 cases of overlap are detected on Figure 3. In other words, 7 networks in the global population have objectives which are particularly well articulated with French policy objectives.

- French institutions should probably contribute to getting engineers involved in development because, compared to their colleagues from the medical and/or university arenas, engineers are less present as a group in our total diaspora population despite the need for infrastructure and sustainable development projects.

Figure 4 : The Digital Divide in the Zone de Solidarité Prioritaire







Our goal thus far has been to show the interest of using Web site information sources to monitor diaspora network activity and to examine its overlap with institutional, top-down policy statements. Our conclusions open the way to a discussion of the two other orientations of the model presented in Figure 1 above: if institutions want to efficiently and effectively use ICTs to mobilize the human resources of diaspora for co-development, efforts to consolidate both the socio-cognitive and technology base of computer-mediated communications will have to be taken.

In sections "Using ICTs..." and "Consolidating the technological bases…" below concrete proposals will be made on how to organize these efforts. Before making them, however, we will first look at the digital divide separating the North and the South in their use of the Global Information Infrastructure. ICT support for co-development is sharply constrained by the lack of suitable technological infrastructures in the South, however, our data suggests that the socio-cognitive objectives of diaspora networks are at least as important as infrastructures in explaining how and why ICTs are used. This is what we want to show now.

The digital divide viewed from a ZSP perspective

In order to put the digital divide into a ZSP perspective, we used data published by the International Telecommunications Union (ITU) in its series entitled *Internet indicators: Hosts, Users and Number of PCs*. The ITU is an international organization within the United Nations System where governments and the private sector coordinate global telecom networks and services. It is recognized as being an authoritative source of statistics on the extension of the global information infrastructure and has work underway to produce standard indicators and definitions. In what follows, the number of hosts and personal computers (PCs) serves to measure the quality of Internet infrastructures whereas Internet accessibility is measured by user statistics generated through sampling techniques. These two dimensions – quality of infrastructures and quality of access – need to be considered separately (Minges, 2000):

– *User statistics* are typically based on sample surveys projected for the population as a whole. There are many rules of thumb for carrying out these projections: for example, in the African context, Mike Jensen argues that each computer with an Email or Internet connection usually supports a range of 3 to 5 users (Jensen, 2002). User statistics serve to measure access.

– *Hosts* are a useful measure of the number of computers in a nation connected to Internet, but they are not a good indicator of access. Hosts clearly serve to disseminate information and are channels for selling products and services, but a wide range of automatic

devices are also hosts such as name servers, mail servers and file servers. These allow Internet to operate, but are less meaningful in terms of access.

– The number of *personal computers* available in a country is a straightforward measure of infrastructure because dial-up Internet access requires a telephone line and a personal computer (with a modem). For example, if 25% of households have PCs with modems, then Internet access from households cannot exceed 25%.

Here, then, are three graphs that resume the ZSP situation in terms of the three indicators just defined. In order to visualize the digital divide, our findings for the ZSP are compared with figures for France and the United States.

The three graphs on Figure 4 speak for themselves and require little comment:

– Because less than 1% of the ZSP population owns a PC, the opportunity for ZSP diasporas of developing their audience in home countries is weak. Of course, the figures don't take into account the skewed distribution of PCs and the fact that many high-qualified, home country professionals will have them.

– The excessively low number of hosts underlines the extent to which the physical operation of Internet in the ZSP member countries is deficient by Northern country standards. That said, section "The global context…" of this chapter resumes some of the international initiatives currently underway to correct this situation.

– Finally, the comparatively very low number of Internet users in the ZSP member countries is understandable because of the infrastructure limitations just mentioned.

In order to take the analysis further, we attempted to explore the following question: the figures describing the depth of the digital divide project a very bleak image indeed, so is there a specific set of reasons that explains why the diaspora of 12 ZSP member countries are currently experimenting Web-mediated communications, *malgré tout*? For this analysis, we divided our population of 53 countries (no statistics were available through the ITU on the situation in Liberia) into four quartiles and used the median to describe variations of the three variables (users, hosts and PCs) over each of these four data sets. The median is obtained by first ordering a data set and then identifying the value halfway through the set, below and above which there lies an equal number of data values. It is a good descriptive measure for skewed data. Finally, we controlled for the type of use made of the Web by the ZSP diaspora networks. Only actions aimed at supporting the home country are coherent with our present analysis; projects limited to supporting diaspora activity abroad would to the contrary be interpreted as confirming the insurmountable limits of the digital divide. Table 2 resumes this analysis:

	Number of Internet Hosts per 10000 inhabitants	**Number of Internet Users per 10000 Inhabitants**	**Number of PCs per 100 inhabitans**	**Web Support for :**
1st quartile				
Ethiopie	0,01	3,88	0,12	both the Diaspora Abroad and the Home Country
Nigeria	0,06	17,57	0,68	both the Diaspora Abroad and the Home Country
Soudan		17,61	3,36	the Home Country
Quartile Median	**0,14**	**8**	**0,19**	
2nd Quartile				
Cameroon	0,26	29,6	0,39	the Home Country
Mali	0,07	25,69	0,12	both the Diaspora Abroad and the Home Country
Quartile Median	**0,21**	**25,16**	**0,33**	

3rd Quartile				
Togo	0,47	107,37	2,15	the Home Country
Haïti		36,38		both the Diaspora Abroad and the Home Country
Marrocco	0,81	131,45	1,31	the Home Country
Quartile	**0,78**	**51,32**	**1,09**	
Median				
4th Quartile				
Kenya	0,86	159,78	0,56	Diaspora abrod
Tunisia	0,22	412,37	2,37	Diaspora abrod
South Africa	54,45	700,58	6,85	both the Diaspora Abroad and the Home Country
Lebanon	19,97	858	5,62	the Home Country
Quartile	**9,575**	**273,63**	**2,37**	
Median				

Table 2 : Experimenting Internet to gain the Practical Experience and Know-how for bridging the Digital Divide

Table 2 is interesting for at least three reasons:

– There is almost an equal distribution over the four classes distinguishing between the countries that are very badly off with respect to the digital divide (1st quartile), badly off (2nd quartile), on the rise (3rd quartile) and emerging (4th quartile). This can be interpreted to mean, as we said above, that socio-cognitive motivations are just as important as technical considerations for wanting to experiment computer-mediated interactions.

– These motivations are directed at helping the home country as the information contained in the last column of Table 2 shows. Its paradoxical to note that the diaspora from countries who are the best off with respect to the digital divide (4th quartile) are those that seem particularly motivated by the use of Web technologies to sustain their activity abroad.

– Finally, the quartile medians establish for each of the classes and for each of the variables the diversity of situations encountered in the ZSP countries. For example, looking at the real values on Table 2 for the number of Internet users per 10,000 inhabitants, Ethiopia is on the bottom side of the median in the 1st quartile while South Africa and Lebanon are on the top, upper side of the median in the 4th quartile. We can see that the ZSP hardly provides a uniform picture in terms of the digital divide: for Ethiopia, there are 4 Internet users per 10,000 inhabitants; for South Africa and Lebanon respectively 700 and 858. However, if some countries are much worse off than others, the figures concerning France (2,638) and the United States (4,995) remind us that even the countries in the best relative position within the ZSP are still very weak in comparison with countries in the North.

Using ICTs to consolidate the socio-cognitive dynamics of co-development

Table 2 has presented timid evidence to suggest that there is a real interest in ZSP countries to experiment Internet for gaining the practical experience and know-how needed to bridge the digital divide. But what does it mean to "experiment the Internet"? We will attempt to answer this question from the perspective outlined above concerning the socio-cognitive dynamics of co-development and will use, for this purpose, the data concerning the general diaspora population. Our main argument will be the following: Web sites have an inherently political function in the life of a diaspora, a function which is currently not well perceived because of the attention given to their use for information access and dissemination. Web sites should to the contrary be considered as the focal point of a reflexive process instrumental in maintaining the momentum of on-going collective action. This political function is more important than the information function that is generally assigned to them.

We've said above that diaspora networks are fragile social constructs depending more upon the personal engagement of their members than upon specific, institutional forms of support. We've also said that a sense of community, identity and mission emerges out of the debates, conflicts and negotiations that accompany collective action. In general sociological

terms, bottom-up, ad-hoc organizations require tools for constantly up-dating and visualizing where they are collectively, that is, they need to install mechanisms for keeping track of where agreement lies, the problems under discussion and the categories of interpretation which can legitimately be considered relevant for finding solutions. The particular difficulty of developing these tools in the diaspora context lies in the distributed, ad-hoc nature of network activity and this is where Web sites are potentially useful.

– First, they are the focal point of a distributed practice, an object that is shared in common by all the members of the network no matter where they are geographically located in the world.

– Second, Web sites serve for information access and dissemination: they enable diaspora to electronically publish a coherent expression of what is going on in their networks and at the same time to get feedback from both the network and the outside world on the way in which this discourse is perceived.

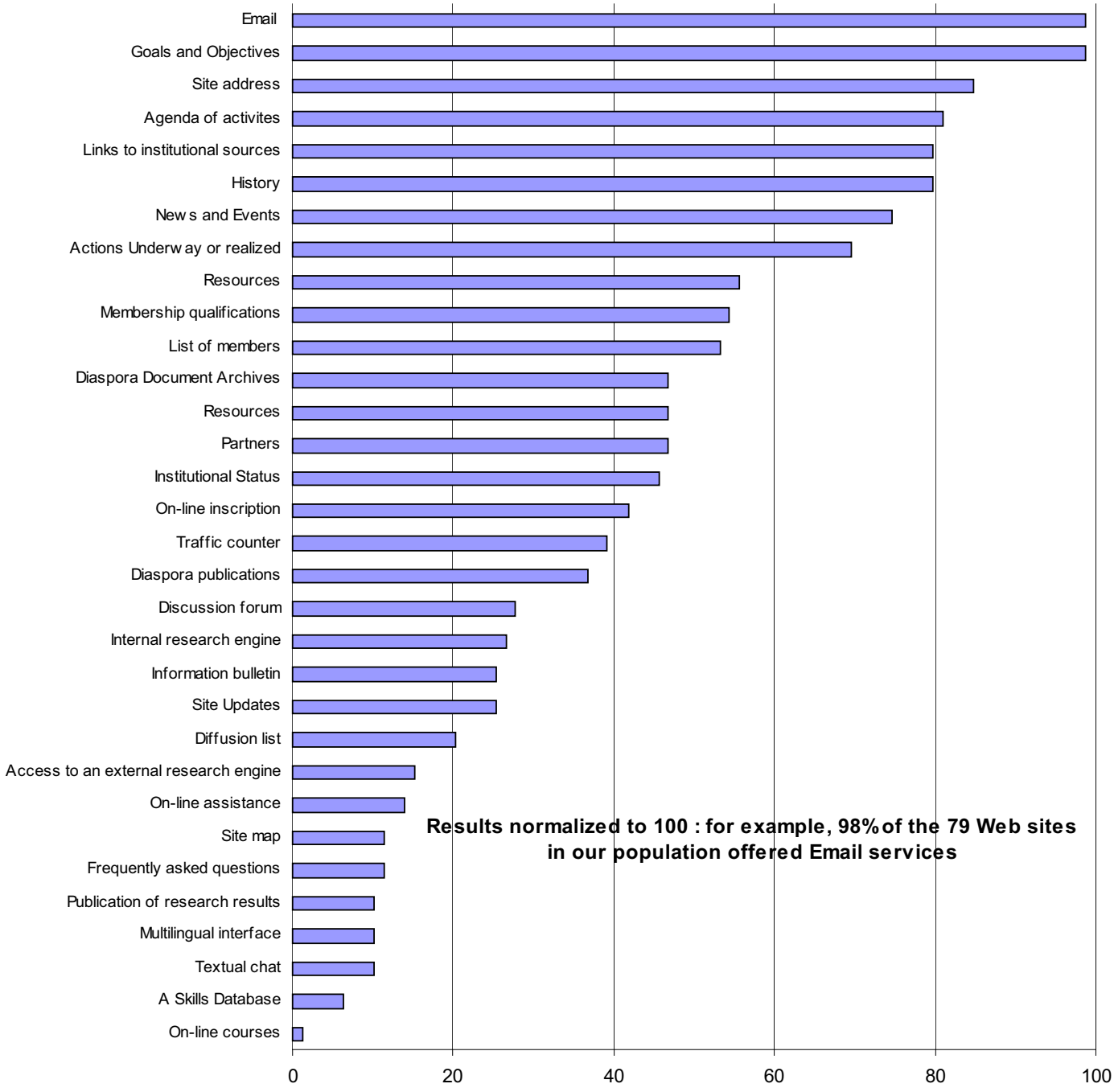
– Third, and most importantly from our point of view, the feedback generated in reaction to a message published on the Web can be used to sustain the reflexive dynamics of collective action. In this perspective, building a Web site is considered as being an experiment in discourse building. A direct relationship is assumed between the form and content of a Web site and the effectiveness and the efficiency of the discourse under construction. And this is the relationship we want specifically to study here.

In what follows, an empirical approach is used to describe the physical features which currently characterize diaspora Web sites and a more conceptual approach to describe content. Figure 5 summarizes the results of the empirical analysis. In order to identify the list of variables shown on this figure, we first analyzed 30 of the 79 Web sites in our population and then went back and systematically coded all 79 Web sites for the presence or absence of each variable. Our results show the need for a much more systematic approach to defining data fields and functions than is currently the case, particularly if Web sites are to serve as a source of information for monitoring the overlap between bottom-up and top-down initiatives for co-development as we suggested earlier. The conceptual approach builds upon the results of this empirical analysis and will be presented in § “The political function…” below.

The need to specify the use of data-fields and functions

Figure 5 shows the lack of any formalized structure of data presentation in our population of 79 Web sites. Some of the most basic elements of information are missing in some cases. Its surprising, for example, that 12 of the 79 sites don’t give any postal address, 16 don’t provide any background information on the history of the diaspora and 43 don’t give any indication on the diapsora’s institutional status. Without these elements, useful historical, geographic and institutional information for understanding and interpreting the diaspora discourse is missing.

Figure 5 : Data fields and functions on Diaspora Web Sites



The distribution on Figure 5 also shows that all the diasporas (except 1) use Internet to publicize their goals and objectives, and close to 75% of the sites present the "news" of their group. Roughly half the sites provide membership lists, forms for on-line inscriptions and actively solicit donations, however, the number of databases describing the skills and qualifications of diaspora members and their offers of services is still very low (5).

Close to 80% of the sites publicize their agenda of activities (meetings, important dates, speakers…) and although the figures are lower for other types of actions, well over half the sites make an effort to describe their projects, their means of action and to provide members with access to a document archive. That said, computer-mediated interactions almost always take the form of an Email exchange; very little use is currently being made of chat, list servers, frequently asked questions and discussion forums. More troubling still, is the little attention given to help visitors find their way on diaspora sites. Only 9 offer a map of the site, 11 offer on-line help services, 8 multilingual services and 21 local search engines. Knowledge sharing suffers the same fate: very little attention is given to popularizing research results and only one site has a multi-media program dedicated to on-line teaching. Finally, close to 80% of the sites provide their members with a list of external links to other sites, but very few provide navigation aids.

In conclusion, what we called above the "Information Access and Dissemination Paradigm" clearly seems to dominate diaspora Web site design at the present time; Internet serves essentially to broadcast information not to encourage interaction. But even in terms of the information paradigm, immediate action should be taken to formalize the data fields and functions presented on diaspora Web sites. A real need exists to exercise stricter quality control measures in order to restrain the multiplication of Web site data structures and to improve the global visibility of diaspora activity over the Web. Normalized functions and data fields would, for example, greatly improve the capacity of institutions to monitor bottom-up, grassroots activity. That said, as we explained above, monitoring bottom-up activity isn't enough; a gap exists between detecting possibilities for cooperation and actually engaging in programs of co-development. We will turn to ways of bridging that gap now.

The political function of Web sites

Designing Web sites should be considered as an experiment in discourse building. Adopting this position offers an elegant solution to the methodological problem of evaluating the reciprocal relationships between technical infrastructures on the one hand and diaspora activity on the other hand. It fully accounts as well for the idea that the socio-cognitive dynamism of collective action is built and maintained through criticism, conflicts and negotiation. When technological design is assimilated with the task of discourse building, criticism leveled at Web site design will, by definition, be considered an implicit criticism of a diaspora's co-development discourse and, symmetrically, when this discourse is criticized, by definition, the need to redesign a Web site to accommodate new perspectives on co-development will have to be taken seriously. In other words, assimilating design and discourse points to the existence of a never-ending, on-going adjustment process. Only rarely will a situation stabilize to the point where people feel confident in the quality of computer-mediated communications. In general, this quality is constantly open to criticism: for example, members of a network will show constant concern that their Web site be a faithful expression of what they are seeking to achieve together; technology will evolve constantly redefining the conditions of access and use of the global information infrastructure; institutional policies for international cooperation and development will change over time. In section 5 of this chapter we will look at some of the factors of change in the global environment that give meaning and configure the relationships between design, discourse and action at the local level, in specific diaspora situations. The point here is the following: confidence in the quality of computer-mediated interactions is hard to maintain but, at the same time, criticism is the motor of adjustment and trust building. What then are the categories required to observe this adjustment process at work? Table 3 was built in an attempt to answer this question.

Table 3 : Data fields and functions on diaspora Web sites distributed over	
The social processes of involvement in the co-development process :	**The technolgies supporting these processes :**
A.) The process of self-organization	
A.1.) Presentation of the network	
Site address	D-B Technologies (Data-Base Technologies)
History	D-B Technologies
Institutional status	D-B Technologies
A.2.) Consciousness building	
Presentation of goals and objectives	D-B Technologies
List of members	D-B Technologies
Membership qualifications	D-B Technologies
A skill's database	D-B Technologies
Partners	D-B Technologies
Means of action	D-B Technologies
News and events	D-B Technologies
On-line inscription	D-B Technologies
Site Up-dates	D-B Technologies
B.) Knowledge collectivization and sharing	
B.1.) Knowledge Collectivization	
Diaspora Document Archives	Multi-media
Agenda of activites	D-B Technologies
Actions Underway or realized	D-B Technologies
B.2. Knowledge Sharing	
Diaspora publications	Multi-media
Publication of research results	Multi-media
On-line courses	Multi-media
B.3.) Navigation	
Frequently asked questions	Hypertext
Site map	Hypertext
Multilingual interface	Hypertext
On-line assistance	Hypertext
Traffic counter	D-B Technologies
C.) Awareness building and mobilization	
C.1.) Communication between members via the site	
Discussion forum	CMC (Computer-Mediated Communications)
Textual chat	CMC
Diffusion list	CMC
Email	CMC
Frequently asked questions	CMC
C.2.) Communications between diaspora and its environment	
Links to institutional sources	Hypertext
Access to an external research engine	Hypertext
Information bulletin	D-B Technologies

The first column in table 3 entitled the "social processes of diaspora involvement in co-development" uses a theoretical understanding of how confidence is built in computer-mediated

environments to highlight three socio-cognitive processes: self-organization, knowledge collectivization and sharing; awareness building and mobilization. We assume that these processes interact with one another to determine the specific form of a diaspora discourse in a given situation.

We then used the variables identified on Figure 5 above to characterize each of these three processes and thereby established an intersection between the underlying dynamics of discourse production and the data fields/functions available on Web sites. In other words, we formally placed ourselves in a position to evaluate the reciprocal relationships co-defining technology and diaspora activity, in accordance with the prescriptions we outlined above.

Finally, the right hand column of Table 3 entitled "the technologies supporting the social processes of diaspora involvement in co-development" lists the technologies we would expect to see used in implementing the data fields and functions identified in the right hand column. This information suggests how the technological base of computer-mediated interactions can be consolidated (see section "Consolidating the technological bases…" below).

We used a hierarchical classification technique to process the data presented in column 1 of Table 3. This type of statistical analysis allows for a comparison of an ideal situation with one that is effectively observed. For example, we would ideally want each site to clearly present the diaspora network it is designed to support and to organize this support along the three lines shown in column 1 in order to:

– Sustain a sense of socio-cultural identity in the host country;
– Collectivize and share knowledge;
– Mobilize human resources for home country development.

If such were the case, we would conclude that sociologically skilful discourses are being produced with ICT support and we would have little need to criticize what we observed: to the contrary, in an ideal situation, our observations would confirm that procedures are in place for coordinating and articulating a diaspora's engagement in the co-development process.

As Figure 6 shows, our statistical analysis didn't confirm the ideal situation we'd like to see enacted:

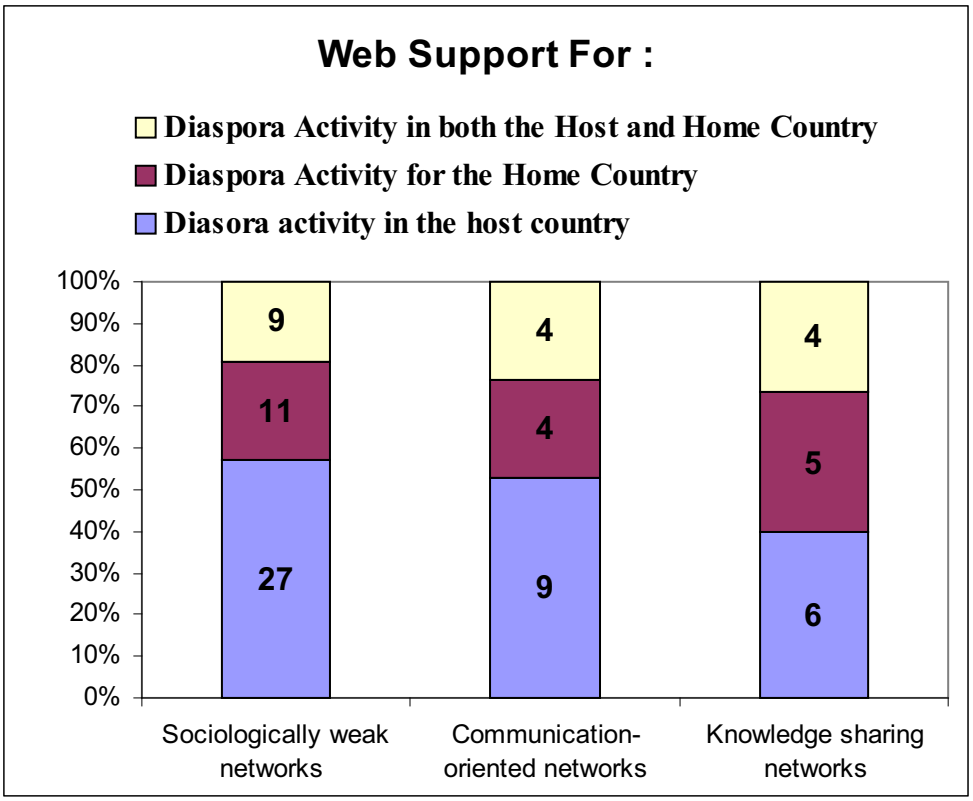


Figure 6 : ICT support for discourse building

Figure 6 shows that the vast majority of Web sites in our population were designed without any clear perception of how to integrate the co-development process. Worse still, of the 47 sites classed in this situation, over 50% of them focus their efforts on consolidating their diaspora network abroad and generally ignore the home country situation. We refer to them as being sociologically weak in the sense that they statistically pay less attention than we would expect to sustaining the socio-cognitive dynamics of self-organization, knowledge collectivization and sharing; awareness building and mobilization. The large number of networks in this class confirms that a great deal still needs to be done to build the conditions for technologically supporting co-development. But the problem seems to be more sociological than technological.

Class 2 is also predominately concerned with supporting diaspora activity in host countries. The two points on the 7 point scale that specifically characterize design strategies in this class are efforts to organize communications among their members via the site and efforts aimed at consciousness building. This group of networks can be criticized for the little attention given to knowledge collectivization and sharing on the one hand, and to communication strategies with the outside world on the other hand. An identical criticism can be leveled against the group 3 but for exactly the opposite reasons. Too focused on knowledge sharing, the members of this group do not optimally use ICTs for internal communications between their members. As figure 6 shows, this group of diaspora networks is turned towards their country of origin and perhaps not sufficiently aware of the need to engage actions for building a sense of community in the host country.

We will now show that the sociologically weakness of diaspora Web site design strategies is doubled by a technological weakness as well.

Consolidating the technological base of computer-mediated communications

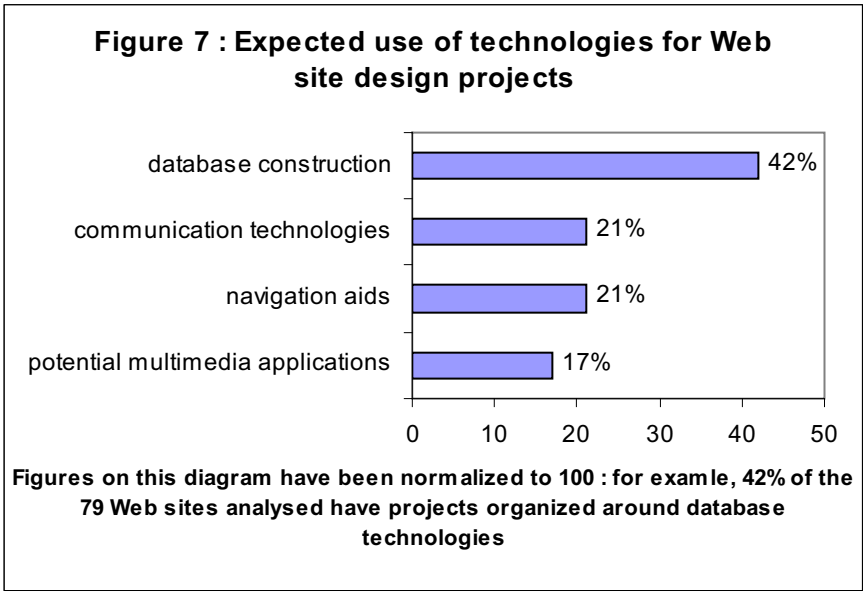
The column in table 3 entitled “technologies for supporting the social processes of involvement in the co-development process” lists four technologies that are currently used for Web site construction: database, hypertext, communication and multi-media technologies. As we explained earlier, these technologies are still generally used independently of one another but over the past 10 years a great deal of work has gone into building the conditions of system convergence. System interoperability is necessary for implementing the interaction environments which are currently under development in research laboratories and which are starting as well to enter the commercial market. Our prescriptive stance is consequently to say that:

– diasporas should be moving towards system convergence as a precondition for implementing the interaction environments of tomorrow;

– and that this move should be coordinated with the formulation of sociologically skilful discourses in the sense defined by the seven categories shown in the left hand column of table 3.

Our analysis shows that a great deal remains to be done to enact this proposal as well. It is based on Figures 7 and 8 which follow and which exploit the information contained in the right hand column of table 2 above. This column serves to define the technology we would expect Web designers to use in order to exploit the data fields and functions offered through their Web sites.

Figure 7 shows that the projects envisaged on Web sites massively imply the use of



data-base technologies and that less than 20% of diaspora networks have projects that would benefit from designing multi-media applications.

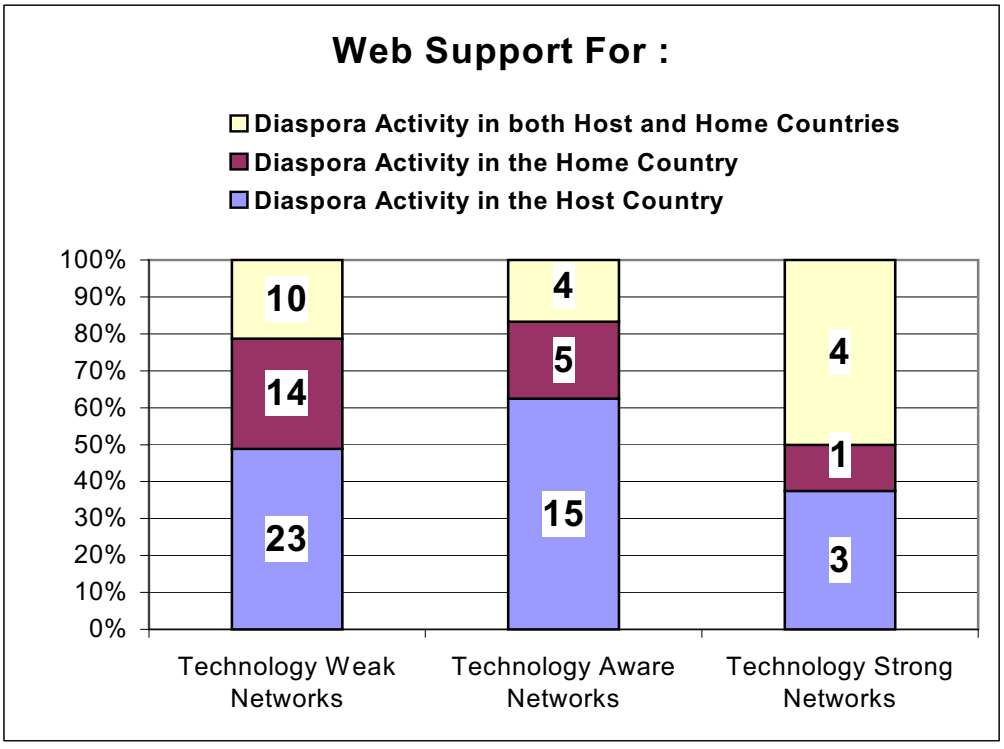


Figure 8: A three-point scale for measuring technological skillfulness in supporting diaspora activity

Figure 8 makes use of a three point scale to position how the projects envisaged by diaspora fit on the continuum leading from individual use of technologies to their integrated use for supporting collective interactions. Once again a hierarchical classification technique was used to determine if any particular implementation strategy is privileged by diaspora networks. Ideally, we would hope to identify networks that are moving towards convergence.

Figure 8 shows that this is the case for 8 out of the 79 networks analyzed. These networks are technologically "strong" in the sense that they actively appear to be envisaging applications that integrate across the four technical systems we've identified. Its interesting to note that the motivation for these projects appears to be aimed at improving relationships with the countries of origin.

The diaspora group classed as "technologically aware" uses three of the four technologies; their projects don't seem to include the need for multi-media applications. This class is more turned upon itself than towards the country of origin which no doubt explains why multimedia applications are not envisaged. Multimedia applications are essentially motivated by projects aimed at sharing knowledge which doesn't appear to be a priority for the networks identified.

Finally, the largest group is the one developing projects which don't require integrating across the four technologies. In order to explore in more detail the nature of these projects we distributed the 47 networks classed as "technologically weak" over the seven categories defining the content of a sociologically competent discourse and found that 22 of these sites have projects aimed at consciousness building, 12 privilege knowledge sharing with intensive use of socio-cognitive navigation aids, finally, 13 privilege communication between members of the diaspora via the site. The possibility shown here of disaggregating data to study the technological support given to collective sense-making activity is an important feature of the methodology proposed.

We've now reached the end of the data analyses undertaken to show concretely how diaspora, development and ICT relationships can be consolidated and reinforced. Their consolidation is necessary if diaspora networks are to be considered as instruments for enacting cooperation policies with developing countries because, at the present time, ties are weak. However, this conclusion is based upon our use of Web site data and, as we've seen especially for the French *Zone de Solidarité Prioritaire*, using this type of data to open a window onto the diaspora situation is a particularly restrictive approach. On the one hand, developing countries do not currently have the technological infrastructures that would justify a privileged use of Web-mediated relationships; they suffer from being on the wrong side of the digital divide. On the other hand, the exclusive use of Web site data ignores the many other communication channels available for maintaining contact with home countries such as Email, telephone or postal contact. For these reasons, then, section that follows attempts to enlarge the scope of our analysis and draw lessons from general efforts to use ICTs for development.

The global context: lessons from experience

This report has shown that ICTs cannot yet be considered as a reliable means for mobilizing the highly qualified and often highly motivated human resources of diaspora networks behind development projects for their countries of origin. We suspect that Market forces are largely responsible for this situation given the "market deficiency model" (Arrow, 1962) which holds that the Market is an unsatisfactory instrument for achieving the common good and that public policies are required to overcome its deficiencies. These policies are being adopted at both a national and international level as we saw above when looking at French priorities for its "Zone de Solidarité Prioritaire" and as we will see below when looking at the *New Partnership* proposals of the eight most powerful countries in the world (the G8). Using the market deficiency perspective justifies paying particular attention to ways of articulating bottom-up, grassroots initiatives with top-down, institutional action for cooperation and development. It holds that:

– establishing coherence between these two types of action will be the best way to fight against the inequalities generated by efforts to maximize individual, private enterprise profits and that

– the outcome of the struggle (where the borderline between the common good and private interests is finally placed) is constantly under negotiation.

Our goal in this section is to clarify a certain number of elements affecting this negotiation in the hopes of moving the borderline as much as possible in the direction of the common good.

Improving infrastructures for development

The digital divide is obviously a reason explaining why ICTs are not playing the role they should in the co-development process. However, this situation could change. For example, in sections 5.4 and 5.5 of the G8 Action Plan for a *New Partnership for African Development* (NEPAD), the following proposals are made for:

(5.4) **Helping Africa create digital opportunities** – including by:

– Encouraging the Digital Opportunity Task Force (DOT Force) International e-Development Resources Network to focus on Africa, and supporting other DOT Force initiatives that can help to create digital opportunities, each building wherever possible on African initiatives already underway;

– Working towards the goal of universal access to ICT by working with African countries to improve national, regional and international telecommunications and ICT regulations and policies in order to create ICT-friendly environments;

– Encouraging and supporting the development of public-private partnerships to fast-track the development of ICT infrastructure; and,

– Supporting entrepreneurship and human resource development of Africans within the ICT Sector.

(5.5) **Helping Africa make more effective use of ICT in the context of promoting sustainable economic, social and political development**.

The French policy for its *Zone de Solidarité Prioritaire* fits nicely into this NEPAD framework which suggests a general consensus in Northern countries about priorities for development. However, official declarations of the type shown here leave open a number of questions which can be illustrated using the following examples :

– Le passage d'Internet à une échelle supérieure est à l'ordre du jour depuis plusieurs années (1997). Il est question de changer le standard de l'IP, le protocole de base de constitution des paquets élémentaires qui circulent sur le Net (passer de l'IPv4 actuel à l'IPv6, disent les experts). Mais ce passage coûtera cher. Cela demande de mettre à jour les logiciels de tous les serveurs, de tous les équipements de communication et tous les ordinateurs connectés. Depuis la fin de la bulle financière déclenchée par ceux qui ont suivi les prophètes de la « net-économie », les grands opérateurs reconfigurent leur projets. Cela peut renforcer ce qui était perceptible depuis le lancement de cette modification coûteuse : une dichotomie entre plusieurs niveaux de réseaux. Même si, ou d'autant plus, des passerelles entre ces niveaux existent dès aujourd'hui au niveau de la recherche. Aura-t-on des « bulles » IPv4 dans un ensemble IPv6, comme l'annonce le milieu promoteur de cette nouveauté, ou plutôt le contraire, une majeure partie du Sud « restant » à l'IPv4 ?

– Quant à la formation, de nombreuses initiatives sont annoncées notamment dans le domaine universitaire francophone par l'intermédiaire de *l'Agence universitaire de la francophonie* (AUF), mais les efforts de formation technologique de bon niveau ne risquent-ils pas d'alimenter la fuite des cerveaux, sur un marché du travail tendu au Nord ? Quant aux contenus véhiculés par le Web, presque tous les pays africains ont des sites officiels ; les secteurs de tourisme et de l'investissement étranger ont mis en ligne des sites très attractifs. Les membres de la société civile sont également actifs, mais sur les 140 mailing-lists ou news-groups relatifs à l'Afrique que nous avons relevés, presque tous sont hébergés hors continent.

– Enfin, l'ARENA (Advanced Research and Education Network Atlas) donne la liste des réseaux de la recherche dans le monde, par grand continent. Les cartes réunies dans cet atlas montrent que, pour l'Afrique, trois réseaux seulement existent (un euro-méditerranéen, un marocain, un tunisien). Les « backbones », ces colonnes vertébrales des réseaux de recherche et d'éducation de type Internet2, ne sont pas prévus sur l'Afrique, ni sur aucun des pays de la ZSP. De même que pour le GTRN (A Global Terabit Research Network) ou « Advanced High Speed Network for Global Research and Education », en voici les indications : « The GTRN will

consist of a global backbone connecting national and multi-national networks in North America, and Europe and Asia. *Later it is expected to be expanded to Latin America, Russia, the Middle East and Africa* (souligné par nous). »

These examples show the limits of official declarations in favour of actions for overcoming the digital divide. They tend to focus on infrastructures, training, content and new forms of partnership between the North and the South, but are often silent about procedures that might be useful in organizing the co-development process. And this is where diasporas can play an important role.

Experimenting ICTs for development

Diaspora action in favour of co-development will take many forms. Three socio-cognitive forces explaining this diversity have been identified in this report: the dynamics of consciousness building and self-organisation, knowledge collectivization and sharing, communication patterns both within diaspora networks and with the outside world. However, its virtually impossible given our current knowledge of the mechanisms underlying computer-mediated interactions to say how these forces configure specific organizational postures. For the moment, only concrete learning and doing experiences can be envisaged for defining configuration procedures. The problem is to know how best to engage these experiments, and its this question we want to address here given the specialized literature available.

L'étude des communautés virtuelles en réseau a commencé dans les années 1980, dans des milieux sociaux restreints. Leurs pratiques ont été analysées pour comprendre notamment les processus identitaires à l'œuvre, comment la distance entre leurs membres est maîtrisée, la construction des contenus et des prises de décisions, le rôle de la médiation. Ces analyses permettent de tirer trois conclusions quant aux conditions à réunir pour forger des procédures efficaces de l'action diasporique :

– Aucun réseau numérique ne fonctionne sans une médiation humaine de qualité.

– L'inflation de métaphores visant à faciliter la compréhension des enjeux est à éviter.

– Des espaces privatifs à l'intérieur des espaces collectifs sont nécessaires.

Pour une médiation humaine de qualité

Un réseau a besoin de « mailleurs », hommes ou femmes maîtrisant dans le quotidien les techniques utilisées. Ces personnes peuvent être conceptrices du système qu'elles « gèrent », mais il s'agit là de deux fonctions différentes. Le mailleur est en observation régulière du fonctionnement technique des outils et de leurs liens, de leur pertinence et de leurs limites. Il en fait un savoir collectif pour tout le groupe et prépare les améliorations, en suivant l'état d'évolution des techniques.

Un réseau a besoin de « médiateurs ». On peut en distinguer plusieurs sortes :

– les passeurs, ceux qui repèrent les informations et les font circuler ;

– les filtreurs, ceux qui savent bien séparer le bon grain de l'ivraie, dans une information foisonnante (ils commencent à être sérieusement aidés par les machines en réseau) ;

– les interprètes, ceux qui arrivent à mettre en perspective les informations et les connaissances, pour l'ensemble d'un groupe ou pour une de ses parties ;

– les guides pour les techniques de navigation à plusieurs sur le Web…

De manière générale, les médiateurs donnent à chacun les moyens de construire une voie équilibrée entre un accès automatique à l'information, et un accès par une médiation humaine.

Un réseau a besoin de « modérateur » ; ce rôle prend une place importante dès lors que le réseau électronique est à accès large ; on peut choisir de laisser chacun publier librement, avec contrôle *a posteriori*, ou, au contraire, établir un contrôle *a priori*.

Enfin, la présence de « traducteurs » s'impose, quand plusieurs langues sont en jeu. Le dialogue avec des acteurs du pays hôte (voire de plusieurs, de langues différentes), ne parlant pas la langue du pays d'origine, nécessite que l'on prenne en considération cette question. La solution la plus fréquemment utilisée aujourd'hui dans les réseaux multilingues est la « traduction automatique assistée ». Le message original est traduit à l'aide d'un logiciel de

traduction par traducteur automatique. Un traducteur humain vérifie l'absence de faux sens, voire de contresens, avant de transmettre. Cela impose bien sûr un passage obligé des messages par le point de traduction. Des malentendus peuvent se glisser dans cette chaîne de traitement, que seul le dialogue interactif peut lever.

Pour une clarification des images sociales des TIC

An inflation of metaphors currently characterizes thinking about opportunities for using ICTs to organize collective action. The result is often a smoke screen making the situation more confused than it should be. We will consequently consider three metaphors which we feel should be avoided if appropriate procedures are to be developed for learning and doing things together in computer-mediated environments.

La première façon de penser l'Internet, dominante, consiste à présenter le réseau comme un versant nouveau de l'activité commerciale. Il est désormais probable que cette forme de commerce prendra sa place dans un ensemble de moyens déjà largement dimensionnés. Elle passe sous silence les dynamiques socio-cognitives et politiques qui ont été au centre de ce rapport.

D'autres ont vu Internet, non sans quelque raison, comme une gigantesque extension du Minitel, un moyen technique merveilleux pour trouver les données nécessaires à toutes les activités, pratiques ou non, de notre vie moderne ; en couleurs, en textes et images, en son, en vidéo, bref en multimédia. Ce volet est en plein développement, soit en tant que moyen gratuit ou payant d'accéder aisément à un nombre très important de données, soit (et) comme lieu de « présentation de soi ». Or, ce rapport a monté que l'intérêt actuel pour le multimédia cache la pauvreté des espaces d'interaction sémantiquement riches et intégrés, où des usagers peuvent facilement accéder, par l'intermédiaire d'un terminal unique, à des produits et services exploitant des technologies multiples, telles que les bases de données, les hypertextes, celles de la communication électronique *et* du multimédia. Le multimédia n'est pas une fin en soi ; il doit intégrer les espaces d'interaction sémantiquement riches en cours de construction.

La métaphore de la bibliothèque universelle est une troisième orientation qui trouve sa force dans la prégnance du paradigme « information access and dissemination ». Mais on sait aujourd'hui que la gestion efficace des bibliothèques digitales doit tenir compte de ce qu'il est possible de faire avec des fonds numériques, tels que :

– des classements personnalisés ;

– la modification à la demande de la structure d'un texte, ou d'un ensemble de textes, pour l'adapter à un point de vue ;

– la circulation entre plusieurs niveaux d'un ou de plusieurs textes (« monter » vers des méta-données sur le texte, « descendre » vers un niveau de détail sur des objets élémentaires du texte) ;

– l'annotation « au fil de l'eau », soit pour un usage personnel ou pour que d'autres en prennent connaissance.

Entrer dans une bibliothèque digitale revient, en fait, à entrer dans une situation d'interaction médiatisée par les grilles de lecture spécifiques qu'apportent les uns et les autres à l'étude des documents consultés. La recherche actuellement en cours en informatique documentaire vise à développer des outils permettant de visualiser la complémentarité de ces grilles de lecture ou, au contraire, de cartographier leurs différences. Par des mesures portant sur le degré d'intersection entre des classifications, des points de vue, des annotations et des stratégies de circulation dans les données, l'objectif est d'encourager la réflexivité essentielle à la production collective des connaissances nouvelles.

Une clarification conceptuelle est nécessaire pour avoir une meilleure compréhension des mécanismes qui sous-tendent le développement d'interactions médiatisées par ordinateur. La multiplication des formules du type – Internet, un nouveau marché mondial; Internet, un Minitel amélioré; ou Internet, une gigantesque bibliothèque digitale – nuit aux efforts que suppose cette clarification.

Pour des espaces « privatifs »

Plusieurs niveaux d'espaces d'interaction et d'élaboration doivent être disponibles. L'espace collectif d'un groupe important doit pouvoir être scindé en plusieurs sous-espaces, chacun étant défini par des droits d'accès propres. Des sous-groupes peuvent avoir besoin en effet d'interagir pendant un temps, de manière « privative ». Des niveaux de confidentialité peuvent ainsi être nécessaires. Attention, cependant, que chaque membre puisse aisément percevoir l'ensemble des « salles » qu'il a à sa disposition.

Creating digital opportunities for diaspora involvement in the co-development process

In this report, we've used three sources of information, two of which undergo severe quality controls – these are *a)* the statistics measuring the development, deployment and use of the global information infrastructure and *b)* policy documents setting out top-down institutional programs for international cooperation and development – and one that doesn't – *c)* Web site data on bottom-up diaspora initiatives in favour of Southern country development. Much needs to be done on calibrating this last source of data for use in monitoring opportunities for active diaspora involvement in the co-development process. More specifically, standard approaches to the issues of data reliability and representativity discussed earlier in this report have to be developed. A course on this subject could eventually be launched within the framework of actions supported by the *Agence universitaire de la francophonie* (AUF).

L'AUF a créé les « campus numériques », chaque campus comprenant un espace de formation aux et par les technologies de l'information et de la communication, et un centre de ressources où les professeurs peuvent venir produire des contenus pédagogiques ou informationnels, un espace de consultation d'Internet en accès libre et une salle de visioconférence. On y trouve aussi des centres d'accès à l'information scientifique et technique. Cette dernière structure est répliquée dans d'autres villes où l'entité « campus » complète n'existe pas. Les campus et centres sont présents dans près de la moitié des pays de la ZSP. Le réseau de l'AUF constitue ainsi le seul réseau entre unités d'enseignement supérieur en Afrique de l'Ouest. Il pourrait promouvoir des projets visant à formaliser la conception des sites Internet pour la mobilisation des diasporas en faveur d'actions pour le co-développement.

A summary of proposals and recommendations

Proposal 1: The use made of new information and communication technologies (ICTs) for international co-operation and development depends upon the respective roles of Market forces, public policies and grassroots initiatives in the design, realisation and deployment of the global information infrastructure.

Proposal 2: The articulation and coordination of bottom-up grassroot actions with top-down institutional policies is necessary if the domination of Market forces is to be avoided.

Proposal 3: The Market is an unsatisfactory instrument for achieving the common good.

Proposal 4: Co-development is a concept defining the common good in the diaspora context. It implies that the mobility of competent, highly qualified members of developing countries towards the North should not be considered as a brain drain but as a potential source of human resources for increasing the skills and knowledge available for development in the South. It also implies that full recognition be given to the fact that personal knowledge and skills are not only necessary for finding a job on the increasingly competitive, international labor market but are, as well, the cornerstones of mutual cooperation and assistance.

Proposal 5: ICTs can be used to identify opportunities for mutual cooperation and assistance in favor of co-development, thereby augmenting the capacity of diaspora networks to take part in organizing North-South relationships and achieve the common good.

Recommendation 1: The data required to detect opportunities for diaspora involvement in the co-development process are weak. Web sites can be considered a source of these data, but

much has yet to be done in order to calibrate them for dealing with the general problems of data reliability and representativity and with the specific problems of data formats and functions.

Recommendation 2: Strategies for coding Web site data have yet to be designed in order to capitalize and transmit the experience, know-how and skills which are currently being developed through grassroot experiments of ICTs.

Recommendation 3: Data calibration and coding are a prerequisite for using ICTs for managing diaspora involvement in the co-development process. The Digital Campus program of the *Agence universitaire de la francophonie* could be used to train future Web masters in the use of calibration and coding techniques.

Recommendation 4: Coding Web site data should be undertaken with the goal of articulating bottom-up, diaspora activity in favour of their home countries with top-down, institutional programs for development. Policy documents currently produced in the North suggest using at least six categories for defining this coding strategy:

– human development through improved health care;

– human development through education;

– human development through the protection of human rights, the promotion of cultural identity as a motor of development and the right of access to basic water, urban and digital technology infrastructures ;

– an efficient State based upon administrative structures that guarantee a separation of powers, legality and an efficient implementation of public policies ;

– an efficient Market serving to promote the dynamism of the private sector and regional economic integration ;

– and, finally, sustainable development through a better management of natural resources and preservation of the global environment.

Recommendation 5: a grid for systematically monitoring Web site data similar to the one above should be used as an instrument of coordination. For example, our analysis of Web sites using this grid showed greater involvement of diaspora medical doctors and university faculty than engineers in development projects for their home countries. While human development through health care and education is obviously an essential objective, the same can be said of sustainable development and improvement of basic infrastructures which both require mobilization of highly qualified engineers.

Proposal 6: The global information infrastructure or GII is the name given to the Internet, the World Wide Web and the extended global wireless, mobile, satellite telecommunications system. Conditions for accessing the GII and for using its products and services are much better in the North than in the South. However, focusing on the need to combat unequal development opportunities resulting from this digital divide should not mask evidence of the many grassroot experiments underway to acquire the practical experience, skills and know-how for managing computer-mediated interactions. However, more needs to be done, particularly in the member countries of the French *Zone de Solidarité Prioritaire*.

Proposal 7: Perception of how to concretely experiment ICTs is clouded at the present time by an inflation of metaphors that are grounded in the "information access and dissemination" paradigm.

Proposal 8: "Internet as a marketplace", "Internet as a huge, user-friendly Minitel", or "Internet as a gigantic digital library" are all metaphors that insist upon the importance of gaining access to relevant information for economic activity, daily life and socio-cultural development. Organizing diaspora involvement in the co-development process requires adopting a different perspective, one that pays full attention to the socio-cognitive dynamics structuring distributed collective practices.

Proposal 9: the information needed to coordinate the diversity of individual strategies for engaging in collective action isn't simply given; its constructed through the discussions resulting from differences in interpretation, conflicts and negotiations. Computer-mediated interaction raises the fundamental problem of how confidence is built and maintained in the viability of efforts aimed at transforming information into useful knowledge for collective action.

Proposal 10: three processes interact to produce specific types of socio-cognitive organizations: the dynamics of consciousness-building and self-organisation; knowledge collectivization and sharing; patterns of communication both within diaspora networks and with the outside world. Confidence exists when all three processes operate smoothly, but this is rarely the case because of the diversity of individual strategies mentioned earlier.

Recommendation 6: Web sites need to be considered as meeting places for establishing confidence, building discourses and more generally making sense out of on-going collective actions. They can play this role because:

– They are the focal point of a distributed practice, an object that is shared in common by all the members of a diaspora network no matter where they are geographically located in the world.

– They serve for information access and dissemination by allowing diaspora to electronically publish a coherent expression of what is going on in their networks and to get feedback from both the network and the outside world on the way in which their discourse is perceived.

– And most importantly from our point of view, this feedback can be used to sustain the reflexive dynamics of collective action. It can be used to change tactics, modify discourses and more generally to position the diaspora in a new light with respect to the co-development process.

Recommendation 7: A skilful use of ICTs should demonstrate mastery in managing the socio-cognitive underpinnings of the confidence-building process. We would expect to find on Web sites data fields and functions for:

– sustaining a sense of identity in the host country through such things as announcements of up-and-coming socio-cultural events, support and assistance measures for diaspora community members;

– collectivizing and sharing knowledge through specific publication and training programs;

– mobilizing human resources for home country development through mediated discussion groups.

Recommendation 8: Successfully managing computer-mediated interactions requires forging at least four new types of skills:

– Les « mailleurs » observent régulièrement le fonctionnement technique des outils et de leurs liens, leur pertinence et leurs limites. Ils en font un savoir collectif pour tout le groupe et préparent les améliorations, en suivant l'état de l'évolution des techniques.

–Les « modérateurs » veillent au respect des règles du groupe en matière de contenus, de déontologie et de politesse.

– Les « traducteurs » s'efforcent de réduire l'hétérogénéité sémantique, en vérifiant l'absence de faux sens, voire de contresens, dans le passage d'une langue à une autre.

Recommendation 9: Attention should be given to the need for creating « private spaces » in computer-mediated interaction environments.

Recommendation 10: In the diaspora context, the "information access and dissemination" paradigm should be replaced by an "interaction paradigm" aimed at understanding and managing the confidence-building mechanisms at work in producing useful knowledge for collective action.

Proposal 11: Today, the Web technologies commercially available for information exchange and access serve for database management, hypertext navigation, multi-media and computer-supported communication applications. Generally, these four types of technologies are stand alone systems requiring specific installation and the capacity to work across a variety of technical infrastructures.

Proposal 12: During the past decade, much effort has gone into building the conditions of an interoperability where these four systems are available to the user in a single, coherent environment. Interoperability is the technical condition for commercially marketing the "interaction spaces" of tomorrow. These spaces are starting to appear (Quickplace, YahooGroups, Netmeeting…).

Proposal 13: Research is underway which aims at improving the operation of these interaction spaces through the use of machine intelligence. A growing use of natural language interfaces and multi-agent systems can be expected in the future.

Recommendation 11: Diaspora networks should design their Web sites on the basis of a clear understanding of technological trends.

Recommendation 12: Technology is moving from stand-alone systems to integrated environments where machine intelligence will increasingly serve to support semantically rich, social interactions. Integrating this movement requires cheap, effective and efficient access to the products and services of the Global Information Infrastructure which is not the case for developing Southern countries at the present time. Evidence was produced in this report showing the very real difficulties in reducing the digital divide, particularly in the French *Zone de solidarité prioritaire*. It is consequently urgent to take new measures aimed at improving the situation.

Recommendation 13: Among these measures is the one highlighted in this report. Our starting point was to say "if grassroots actions fail to gain institutional support they will tend to have a limited life span because they are too dependent upon the good will and connivance networks of those who initiate them; inversely, if institutional action doesn't gain grassroots support, it will cut itself off from a rich, highly motivated source of human resources for co-development". Although technological infrastructures in the South are in urgent need of improvement, they are nonetheless sufficient in their current state to immediately start experimenting solutions for overcoming these two symmetrical problems. ICTs can and should be seen as a means of consolidating and reinforcing diaspora involvement in the co-development process.

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ANNEXE 1

Les actions possibles des diasporas scientifiques et techniques dans un contexte en évolution

On va tâcher dans cette annexe de mieux cerner la réalité du « paysage » en matière d'ICT en mettant en évidence les éléments d'évolution positive dans lesquels l'action des DST pourraient s'insérer. On va voir qu'au sein d'une situation globalement peu favorable, l'intervention d'acteurs déterminés pourrait être à la source d'innovations adaptées. Celles-ci ne résultent pas seulement de la mise à disposition de « biens communs » ; elles peuvent s'élaborer à travers des pratiques collectives dont des expériences et des recherches récentes permettent tracer quelques caractéristiques.

La réalité présente de la « fracture numérique ». Quelques points forts

Des éléments ont été précédemment avancés quant aux inégalités d'usages des réseaux numériques, entre la ZSP et le reste du monde. On voudrait insister ici sur quelques points complémentaires, en privilégiant la situation africaine.

Les données disponibles sur le fonctionnement actuel d'Internet sont extrêmement nombreuses. Grâce à la puissance informationnelle de ce réseau de réseaux, appliquée à lui-même, on a accès aussi bien à des statistiques détaillées sur le nombre d'utilisateurs, sur la puissance des réseaux locaux dans les différentes régions de la planète, qu'à quantité de données sur les diverses institutions porteuses de projets TIC dans les zones du globe en difficulté, qu'elles soient publiques, privées, ou qu'elles appartiennent au tiers secteur. Ces données sont assez régulièrement mises à jour – autre versant des possibilités ouvertes par la puissance informatique. Certaines institutions se sont donné comme rôle de suivre régulièrement les évolutions au plan mondial (voir en particulier le site du CAIDA – Super-computing Center de l'Université de San Diego, Californie). Enfin, de nombreux rapports et travaux de recherches spécialisées sont à disposition, dont beaucoup en ligne.

Notre intention n'est pas ici de traiter de manière exhaustive cette matière immense, mais de la lire et d'en restituer l'essentiel au vu de la question posée dans ce chapitre : comment les diasporas pourraient utiliser toutes les ressources du réseau, actuelles et potentielles, pour être actrices du développement de leur pays d'origine ?

On s'est appuyé ici sur les données les plus récentes rassemblées et interprétées par un consultant sud-africain, Mike Jensen (mise à jour juillet 2002[1],) et sur la liste des projets TIC pour le développement en Afrique, quoique cette liste soit ancienne (octobre 1998[2]).

L'extension d'Internet ne se réduit aucunement à des questions de « tuyaux » et de puissance de machines, et donc ne se limite pas aux aspects techniques, mais elle est également affaire de normes, de réglementations et de stratégies financières. Le réseau est aussi un des lieux d'expression de rapports de force politiques, en particulier de ce que les pouvoirs publics du Nord nomment « politiques de développement » et « lutte contre la pauvreté », et ce que certaines élites du Sud appuyées par une partie de la société civile du Nord appellent « recherche d'un autre développement », que pourraient ouvrir la fin du « pillage », direct et indirect, des ressources naturelles et humaines, l'éradication du poids de la dette et une organisation plus auto-centrée (Traoré, 1999 et 2001).

[1] http://demiurge.wn.apc.org/africa/afstat.htm
[2] http://www3.wn.apc.org/africa/projects.htm

L'expression de « fracture numérique » a fait florès depuis plusieurs années dans les enceintes internationales. Orientée uniquement au début sur les problèmes posés par l'accès, les infrastructures et les coûts, la notion s'est étendue aux différents domaines d'inégalités, y compris celles des compétences et des contenus.

Si on ne raisonne que sur les nombres d'internautes la cause est entendue : les déséquilibres sont immenses, quel que soit l'indicateur retenu. Quelques chiffres seulement, un peu anciens, mais toujours éclairants (source, ITU World Telecommunication Indicators Database). Le monde industrialisé et les pays émergents représentent plus de 90 % des usagers d'Internet , l'Afrique ne compte que 0,5 % de ce même total, et l'ensemble des pays de faible revenu ne parvient pas à 5 %, alors que ces pays représentent 60 % de la population de la planète.

On doit cependant équilibrer ces données factuelles par d'autres, moins quantifiées, plus incertaines, mais qui permettent d'éclairer le paysage d'une manière plus positive, et surtout d'imaginer des points et modes d'insertion de membres de DST.

1) Le nombre d'organismes de toute nature menant des actions de corrections ou de détournement du déséquilibre relaté ci-avant est impressionnant.

Mike Jensen a dressé la liste des intervenants en matière de TIC sur le continent africain. Bien entendu, l'hétérogénéité des fins, des objectifs, des moyens de ces actions, est importante. Les coordinations sont mal assurées, les chasses gardées nombreuses. Il y a cependant là matière à réflexion pour les DST. Les personnes diplômées originaires d'un pays ou d'une zone du Sud, ayant acquis statut et reconnaissance, sont à l'évidence très bien placées pour être des « agents de coordination et d'interface» au sein de ce jeu d'acteurs multiples.

2) À un autre niveau, plus difficile à évaluer, on ne peut qu'être frappé par les multiples expériences d'investissement personnel et collectif du réseau, tel qu'il est, avec les limites actuelles de l'équipement du Sud, dans lesquelles s'inventent des formes d'usages reflétant un intérêt et une volonté farouche de ne pas laisser passer cette « révolution numérique » ; même si ces formes apparaissent souvent insatisfaisantes, pour des raisons de coût, de saturation de réseau (un étudiant dans un centre universitaire d'Afrique de l'Ouest, au cours de l'été 2001, devait partager le temps de connexion disponible en limitant sa connexion à un quart d'heure ; en revanche, un cybercafé, dans un pays aux contraintes politiques fortes, est une précieuse fenêtre sur le monde pour ceux qui ont appris à lire…).

Les membres des DST devraient pouvoir s'appuyer sur cette inventivité, à technologie donnée, dans leur pays d'origine, dont ils partagent les racines culturelles.

Si on se rappelle que parmi « les plus spectaculaires innovations d'usage de l'Internet – l'e-mail, le chat, le web, Napster et ses clones (et le SMS dans les réseaux mobiles) –, aucune ou presque n'a été conçue au sein d'une grande entreprise du secteur » (D. Kaplan, nov. 2001), on peut imaginer qu'il puisse y avoir dans cette rencontre entre les DST et leur pays d'origine une source importante d'innovation d'usages. On trouve une base de 150 expériences de TIC pour le développement sur le site http://www.anais.org

Accès et infrastructures, prix

L'évaluation du nombre d'internautes en Afrique n'est pas simple. Sur ce continent, chaque ordinateur ou connexion est utilisé par trois à cinq personnes.

Mike Jensen estime cependant que sur les 816 millions de personnes qui, approximativement, peuplaient l'Afrique en 2001, la proportion d'usagers selon le type de moyen de communication est de 1 sur 4 pour la radio (205 millions), ce qui place très largement en tête ce médium, de 1 sur 13 pour la TV (62 m), de 1 sur 35 pour le téléphone mobile (24 m), de 1 sur 40 pour une ligne téléphonique fixe (20 m). Cette proportion tombe à un sur 130 pour les propriétaires de PC (dont beaucoup ne sont pas connectés à Internet), et à environ 200/240 pour les usagers d'Internet.

Si on ne retient que les souscripteurs d'un accès Internet (1,7 million), 1,2 d'entre eux vivent en Afrique du Nord (quatre pays) et en Afrique du Sud, les 500 000 autres se répartissant entre les 49 autres pays sub-sahariens.

Il a été procédé à une autre estimation, par pays, en mesurant la bande passante, c'est-à-dire le flux international de données sortant du pays. Cette mesure est un indicateur de l'activité

sur le réseau dans chaque pays car le système Internet africain est extériorisé. L'usage des fournisseurs d'accès (ISP) et des hébergeurs américains et européens est très important et les serveurs hébergeurs de sites gratuits, en Europe ou aux États-Unis, sont très utilisés (sur un débit des pays africains vers l'extérieur de 1,5 Gbps, 1 s'oriente vers les États-Unis, 375 Mbps vers l'Europe, 13 Mbps vers un autres pays d'Afrique).

Voici la carte de la bande sortante internationale (figure 9).

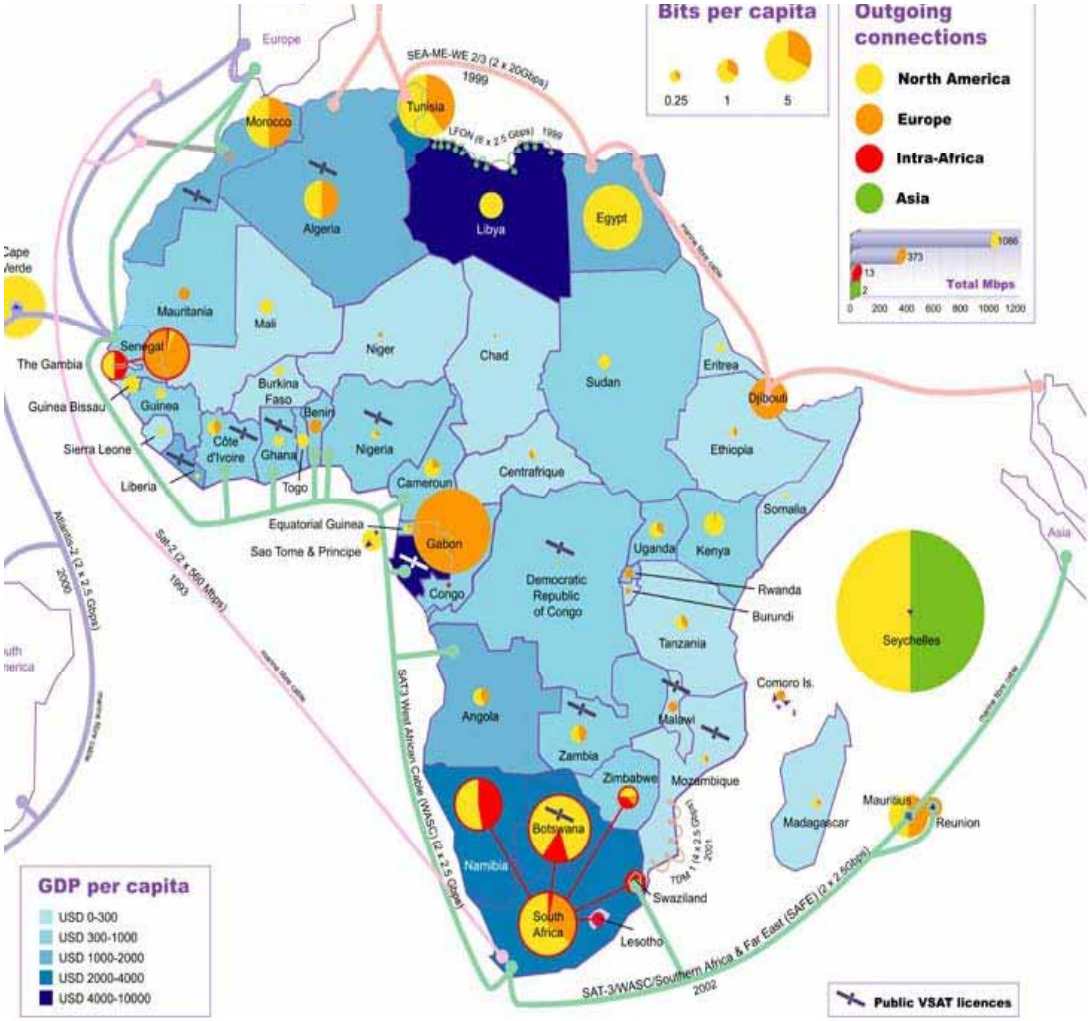
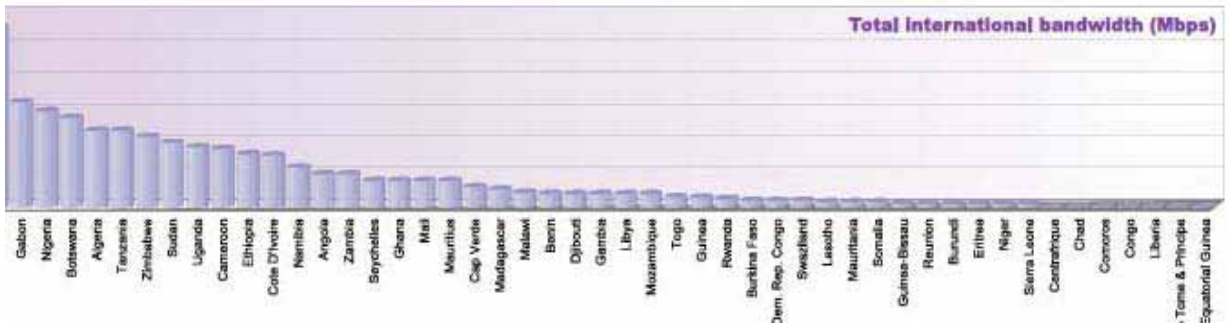


Figure 9 (ci-contre). Carte du trafic Internet, par pays africain (source site IRDC http://www.idrc.ca/acacia/divide/)



Note de présentation de la carte de l'IRDC

The size of the Internet infrastructure is a good indication of a country's progress towards an information-based economy […]
One indicator that is becoming increasingly popular is to measure the amount of international Internet bandwidth used by a country – the "size of the pipe", most often measured in Kilobits per second (Kbps), or Megabits per second (Mbps). Most of the Internet traffic in a developing country is international (75-90%), so the size of its international traffic compared to population size provides a ready indication of the extent of Internet activity in a country. […]
The coloured circle in each country on the map shows to exact scale the international bandwidth available in bits per capita (BPC) available in Mid 2002 on publicly accessible IP networks. It is derived by dividing the country's total projected population for mid 2002 by the country's total amount of outgoing international bandwidth in bits per second.
The absolute data is displayed in the ranked bar graph running along the bottom of the map. The countries are shaded according to their wealth as measured by World Bank GDP/capita figures for 1999.
As is evident from the map, there is an extremely large variation in the BPC index, ranging from 0.02 to over 40 – a factor of over 1000. These figures reflect the wide range of wealth in different countries, however GDP per capita only varies by a factor of about 30, which indicates that there are other influences also at work: Bandwidth price varies considerably on the continent and this impacts heavily on demand. Price is in turn influenced by the regulatory environment – the presence of competition, availability of wireless and VSAT licences, as well as access to international fibre-optic bandwidth.
Clearly shown by the map is that there is almost no intra-African Internet connectivity and the vast majority of international bandwidth lands in the G8 countries […]

However the recent establishment of the West African marine fibre cable (WASC) has already resulted in plans by operators in Gabon, Cote d'Ivoire, Namibia, Nigeria and Senegal to establish large international Internet links and this may substantially increase the available Internet bandwidth. Senegal has already proceeded in this direction with its 45Mbps Internet circuit to France via the recently installed Atlantis-2 cable, which it is now sharing with neighbouring Gambia. Senegal is planning to become a regional hub and will shortly be linking its Internet backbone to Mauritania and Mali, much like South Africa has done with its neighbouring countries.
Similarly the availability of low-cost VSAT licenses is expected to have a major impact on the Internet infrastructure in countries that allow it […]

Il y a peu d'interconnexions locales, et donc la consommation de bande passante internationale, chère, est élevée.

Les coûts restent trop élevés. Un abonnement de 20 heures/mois coûte en moyenne 60$, alors que le montant équivalent est de 22 aux États-Unis et 39 en Europe !

La situation évolue cependant : le nombre de fournisseurs d'accès (ISP) est croissant, le nombre de points d'entrée de réseau aussi ; vingt pays ont au moins cinq ISP actifs, sept en ont plus de dix. Différents ISP interviennent sur plusieurs pays. L'Afrique du Sud a déjà établi des liens avec plusieurs pays voisins, le Sénégal et la Gambie ont fait de même. Plusieurs pays hors de l'Afrique francophone établissent un système de transfert local entre ISP. L'adoption du système du prix d'un appel local est faite dans un nombre croissant de pays (mais seulement 19 pays l'utilisent à ce jour)

Depuis quelques années, il y a un développement très rapide de toutes les sortes de points d'accès communs (kiosques, cybercafés, télécentres). Des solutions satellitaires à deux sens apparaissent, à des prix sans doute abordables pour des collectivités comme des universités.

Au plan mondial, le passage d'Internet à une échelle supérieure est à l'ordre du jour depuis plusieurs années (1997), on l'a vu. Cette situation risque de redoubler les inégalités actuelles (donc sur IPv4) en matière de hauts débits.

Contenus

Presque tous les pays ont des sites officiels. Il y a encore très peu d'usages de type e-administration, mais cela pourrait évoluer avec le déploiement des télé-centres. Plusieurs agences intergouvernementales ont des sites de qualité. Les secteurs du tourisme et de l'investissement étranger ont mis en ligne des sites très attractifs. Les pays francophones sont mieux présents en termes de contenus sur le Web et de présentation institutionnelle. Cela semble dû à l'action de l'AUF et de l'ACCT's BIEF (voir plus bas).

Il y a deux grandes agences de news africaine, IPS et PANA. L'agence de l'ONU, ECA (Economic Comission for Africa), est également active (voir http://www.uneca.org/DISD).

Formation des compétences

Formation des techniciens de réseaux

Mis à part quelques rares universités, la formation en ingénierie des réseaux est peu dispensée. L'UNDP et l'entreprise Cisco, leader mondial dans l'industrie des serveurs, ont créé récemment une formation spécifique dans plusieurs pays. Plus globalement, l'UNITAR et l'IRD ont établi, au Cameroun, les bases d'un réseau de centres spécialisés, les CITI, étendu à plusieurs pays francophones.

Mais les efforts de formation technologique de bon niveau ne risquent-ils pas d'alimenter la fuite des cerveaux, sur un marché du travail tendu au Nord ? Seul le lancement d'actions significatives permettra de la limiter.

Éducation universitaire et recherche

Sur le site http://arena.internet2.edu/ est établi un lien avec celui de la recherche française : http://www.renater.fr/International/ReseauxRecherche.htm

Le projet ARENA (Advanced Research and Education Network Atlas) rassemble l'information sur les réseaux de recherche et d'éducation de niveau universitaire à travers le monde. On dispose ainsi de la liste des réseaux de la recherche dans le monde, par grand continent. Beaucoup sont cartographiés. Sur l'Amérique, l'Asie-Pacifique et l'Europe, nombre de réseaux existent, certains interconnectés et maillés. Pour l'Afrique, nous avons signalé l'existence de trois uniques réseaux (un euro-méditeranéen, un marocain, un tunisien). *Aucun autre réseau n'est signalé par l'ARENA*.

Nous l'avons déjà signalé, sur le site de l'ARENA, *rien n'est prévu sur l'Afrique, ni sur aucun des pays de la ZSP*, en matière de « backbones » des réseaux de recherche et d'éducation de type Internet2, à travers le monde.

L'Amérique latine est un peu mieux lotie (voir l'exemple du réseau AMPATH, Amérique du Nord et du Sud – Florida International University, aidée par la NSF). La carte est donnée en figure 10 ci-après.

Figure 10. Réseau AMPATH Amérique du Nord et du Sud – Florida International University, aidée par NSF http://arena.internet2.edu/

Dans le domaine universitaire francophone, la référence en Afrique est l'action de l'AUF. Cette institution a mis en place plusieurs outils numériques, une liste de discussion (Framonde), lieu d'échanges sur la coopération universitaire, un système hébergeant des informations que tout département universitaire francophone voudrait porter à la connaissance des autres, sur le Web. Elle a également lancé un bulletin trimestriel sur l'enseignement du français, tient un agenda scientifique et une rubrique écho de la vie universitaire. Elle a aussi créé comme on l'a déjà signalé des « campus numériques ». Ces campus et centres sont présents dans près de la moitié des pays de la ZSP.

Le réseau de l'AUF constitue ainsi le seul réseau entre unités d'enseignement supérieur en Afrique de l'Ouest.

L'AVU (African Virtual University) est présente dans onze pays de l'Afrique anglophone, dont dix de la ZSP. Sa structure est bien plus légère que celle de l'AUF, s'intéressant à la seule diffusion de cours en ligne, par la voie satellitaire (la voie de retour passe par le téléphone, fax et mail).

Projets et réalisations majeures en matières d'ICT. Vers une situation améliorée ?

De nombreuses initiatives

On doit garder présent à l'esprit que cet ensemble de corrections, dont certaines sont remarquables, se situe sur une toile de fond de régression ou stagnation, selon les pays, de l'aide financière au développement, de crise des « modèles de développement » et d'expression de plus en plus vive d'un désarroi face aux politiques des grandes institutions financières internationales.

On doit aussi bien considérer que la tendance générale dans les instances internationales est de raisonner (dans le domaine des TIC entre autres) sur trois entités en interaction, secteur public, secteur privé et société civile. Les DST font assurément partie de la troisième entité. Le moins qu'on puisse dire est que ce modèle tripartite se cherche, non sans engendrer bien des ambiguïtés, dont témoignent les tentatives dont il est rendu compte ici, et même les actions que pourraient entreprendre les DST dans ce domaine.

Rappelons les très récentes déclarations d'un groupe spécialisé du G8 (Dot-Force, créé il y a deux ans) lors de la rencontre canadienne de juin 2002 (http://www.dotforce.org) . On trouve dans une partie du point 5 du G8 Action Plan (qui en comprend huit), consacré au plan NEPAD, les souhaits en matière de TIC en Afrique, dans lesquels des actions de DST pourraient s'inclure.

« (*5.3) Working with African partners to increase assistance to Africa's research and higher education capacity in enhanced-partnership countries – including by*:

- *Supporting the development of research centres and the establishment of chairs of excellence in areas integral to the NEPAD in Africa; and,*
- *Favouring the exchange of visiting academics and encouraging research partnerships between G8/donor and African research institutions.*

(5.4) Helping Africa create digital opportunities – including by:

- *Encouraging the Digital Opportunity Task Force (DOT Force) International e-Development Resources Network to focus on Africa, and supporting other DOT Force initiatives that can help to create digital opportunities, each building wherever possible on African initiatives already underway;*
- *Working towards the goal of universal access to ICT by working with African countries to improve national, regional and international telecommunications and ICT regulations and policies in order to create ICT-friendly environments;*
- *Encouraging and supporting the development of public-private partnerships to fast- track the development of ICT infrastructure; and*
- *Supporting entrepreneurship and human resource development of Africans within the ICT Sector.*

(5.5) Helping Africa make more effective use of ICT in the context of promoting sustainable economic, social and political development. »

En écho à ces déclarations, voici le train d'initiatives qui ont été proposées.

– Un appui du Canada au développement de l'Afrique ($Can 35 million), proche de l'esprit du programme américain passé Leland ($US 15 M sur cinq ans 1995-2000).

– Une initiative du PNUD et de la Fondation Markle, la GDOI (Global Digital Opportunity Initiative) qui vise une « stratégie globale d'utilisation des TIC pour le

développement » (avec deux pays tests, Mozambique et Bolivie) (sites http://www.opt-init.org et http://www.markle.org).

– L'amélioration de l'accès et de la connectivité en Afrique est visée par les programmes ADEN (France, soutien aux télé-centres, partage des expériences), CATIA (Angleterre) et au programme d'entraide et de dépannage de télé-centres (CRDI canadien et IICD Pays-Bas).

– Sur les perfectionnement des compétences, on relève deux axes :

une orientation entreprise et TIC, avec la création d'un réseau à but non lucratif « pour l'entrepreneurship », avec initialisation en Afrique ;

un réseau d'experts Nord et Sud pour construire un centre d'information et d'expertise sur la construction et le suivi de cyber-stratégies : RIRCD.

– Sur la création et le partage des contenus, sont proposés :

un Open Knowledge Network, création de contenus locaux et échange/augmentation de pertinence entres acteurs du Sud – projet pilote à Pondichéry ;

un réseau TIC et besoins de santé, orienté vers (par ?) les malades.

We've seen that French policy for its *Zone de solidarité prioritaire* nicely fits into this NEPAD framework and can be supplemented by a formal, systematic approach to monitoring digital opportunities for computer-mediated cooperation.

Actions possibles des DST dans ce contexte en évolution

L'ensemble de ces initiatives comporte sans aucun doute une certaine dose « d'effets d'annonce ». Cependant, l'ensemble est suffisamment important pour qu'une tentative de « pénétration opérationnelle » de ce dispositif puisse être entreprise par des membres des DST des pays concernés. Ceux-ci peuvent *a priori* devenirs des acteurs clefs de la mise en place effective de ces programmes, des observateurs des forces et faiblesses des diverses structures et procédures qui les orientent, et, si nécessaire, de contestation des orientations prises et des résultats. Il reste beaucoup à faire au vu des immenses déséquilibres, qui risquent encore de s'accroître si on n'y met pas bon ordre, le plus grave repéré ici étant l'absence de l'Afrique dans les réseaux de la recherche mondiale, et le risque très probable de mise à l'écart de ce continent des prochains développements du réseau (Internet2/Ipv6). Ces chantiers peuvent être des points d'action privilégiés pour les DST.

– En premier lieu, l'existence de données d'informations sur la situation du pays est *a priori* positive, lorsqu'elles ne sont pas un sous-contrôle, pour accroître les relations entre la DST et le pays d'origine. On a dit plus haut comment les informations en provenance de ce dernier pouvaient être un facteur de renforcement de la première. Des membres de la DST proches du milieu des médias dans le pays hôte peuvent aider au développement d'une presse diversifiée et de qualité (et de radios également, dont on sait qu'elles sont très écoutées). La DST peut aussi alimenter celle-ci par des informations de première main sur la diaspora. On peut voir là un premier cercle vertueux, relativement aisé à mettre en place.

– On vient de rappeler que la communauté internationale est active en matière de TIC ; on notera que c'est dans le domaine des communications que se prépare le premier sommet mondial auquel des éléments de la société civile internationale sont conviés à participer à part entière (au Sommet mondial de l'UIT, Genève, 2003). Ce qui peut être jugé comme bien faible par rapport aux problèmes posés est estimé ici comme un indice d'un mouvement dans lequel des DST pourraient devenir très actives.

– Une DST (ou un groupe de DST de plusieurs pays) peut ainsi intervenir dans un des dispositifs ou projets existants. Prenons l'exemple d'un grand domaine où existent plusieurs projets, l'information pour l'agriculture par exemple. Si une « agence » voyait le jour, internationale, régionale ou nationale, des membres d'une ou plusieurs DST des pays concernés pourraient y trouver leur place, soit en se faisant connaître des acteurs déjà identifiés, au Nord comme au Sud, soit en repérant par leurs réseaux personnels d'autres acteurs potentiels, soit encore en proposant leur expertise, tant sur le thème de l'agriculture que sur celui de l'information, ou bien en lançant des actions complémentaires à celles de l'agence (en matière de formation, par exemple).

Si l'agence n'existe pas, pourquoi une ou plusieurs DST n'y pourvoiraient-elles pas ?

– Les pays du Sud manquent cruellement d'experts dans toutes les instances internationales, pas seulement celles traitant des TIC. Il y a là une place très importantes pour les DST. Des mécanismes relativement légers, *via* les réseaux numériques, devraient pouvoir être trouvés, entre DST et cadres du pays d'origine. La proximité culturelle et politique (quand cette dernière existe !) pourrait être un facteur de dynamisme très important.

– On peut faire l'hypothèse que les DST sont moins marquées par des contraintes institutionnelles. Elles pourraient utiliser leur position indépendante pour articuler des institutions déjà en place. Par exemple, si AUF et Carnegie avaient des actions de même type dans un même pays ou dans des pays voisins, la ou les DST de ces pays pourraient promouvoir une forme de complémentarité entre ces deux acteurs.

ANNEXE 2

Sites adresses

	Codes	Diaspora Networks	Diaspora Web Sites
	1	**Selected for study**	
	0	**Not selected for study**	
Code	**AFRICA**		
0	**Africa**	African Distance Learning Association	http://www.physics.ncat.edu/~michael/adla/
0	**Africa**	African Educational Research Network (AERN)	http://www2.ncsu.edu/ncsu/aern/INDEX.HTML
0	**Africa**	African Networks for Health Research & Development (AFRO-NETS)	http://www.afronets.org/index.php
0	**Africa**	Africawired	http://www.africawired.com/
1	**Africa**	The International Society Of African Scientists (ISAS)	http://www.dca.net/isas/
0	**Africa**	The National Society of Black Engineers (NSBE)	http://www.nsbe.org/international/
1	**Africa**	Standford African Students Association	http://www.stanford.edu/group/sasa/
0	**Africa**	The African Community International (The African Center)	http://www.africancommunity.net/
0	**Africa**	Computer Scientists of the African Diaspora	http://www.math.buffalo.edu/mad/computer-science/cs-peeps.html
0	**Africa**	International African Students Association (IASA)	http://www.iasaonline.org/
1	**Cameroon**	The Cameroon Society of Engineers (CSE), USA	http://www1.stpt.usf.edu/njoh/cse/cseusa.htm
0	**Cameroon**	World-Wide Research On Or By Cameroonians	http://hometown.aol.com/Sucord/index.html
0	**Ethiopia**	Ethiopian Distance Learning Association	http://www.physics.ncat.edu/~michael/edla/
1	**Ethiopia**	Ethiopian Economic Association (EEA))	http://eea.ethiopiaonline.net/
1	**Ethiopia**	Ethiopian Professionals Association Network (EPAN)	http://www.epanonline.org/
0	**Ethiopia**	Ethiopian Professors	http://www.angelfire.com/de/EthiopianProfessors/index.html
0	**Ethiopia**	Ethiopian Students Association International	http://www.esai.org/
1	**Ethiopia**	Federation Ethiopian Organizations for the Spread of Knowledge (FEOSK)	http://www.physics.ncat.edu/~michael/vses/
0	**Ethiopia**	The Ethiopian scientific society (ESS)	http://www.his.com/~ess/
0	**Ethiopia**	The Ethiopian Society of Chemical Engineers	http://esche.homestead.com/
0	**Ethiopia**	Gesellschaft zur Förderung der Medizin, Ingenieur und Naturwissenschaften in Äthiopien	http://www.emenssg.de/
0	**Kenya**	Association of Kenyans Abroad	http://knightline.com/kenbul/orgs.htm
1	**Kenya**	The Kenyan Community Abroad (KCA)	http://www.kenyansabroad.org/
1	**Mali**	Malinet, the Malian World Network	http://callisto.si.usherb.ca/~malinet/
0	**Morocco**	Moroccan Association of Researchers and Scholars Abroad (MARS)	http://www.mars-net.org/
1	**Morocco**	Initiativgruppe Marokkanischer Ingenieur-Studenten für RegenerativeEnergien	http://www.imir.org/

1	**Nigeria**	Association of Nigerians Abroad	http://www.ananet.org/
1	**Nigeria**	Nigerian American Public Service Professionals Association	http://www.nappas.org/
0	**Nigeria**	Nigerian Business Forum (NBF)	http://groups.yahoo.com/group/nbforum/
1	**Nigeria**	Igbo Cultural and Support Network	http://www.igbocsn.com/
1	**South Africa**	South African Network of Skills Abroad	http://sansa.nrf.ac.za/
1	**Sudan**	Sudan-American Foundation for Education, Inc.	http://www.sudan.com/safe/
1	**Tunisia**	Association des Chercheurs Enseignants Tunisiens de France (ACETEF)	http://www.acetef.org/
1	**Tunisia**	Association des Tunisiens des Grandes Ecoles (ATUGE)	http://www.atuge.org/
0	**Tunisia**	Rassemblement des Etudiants Tunisiens de Nice (RETUN)	http://www.unice.fr/RI/guideshtml/guidef/associations.htm
0	**Tunisia**	Cercle de Recherche Interdisciplinaire Tunisien de Toulouse (CRITT)	sans adresse
0	**Tunisia**	The Tunisian Scientific Consortium	http://www-rennes.enst-bretagne.fr/~hamdi/TSC.html
1	**Togo**	Communauté Togolaise au Canada (CTC)	http://www.diastode.org/ctc/index.html
	ASIA		
1	**Asia**	Asian American Architects and Engineers Association, Southern California	http://www.aaaesc.com/
1	**Asia**	Asian American Manufacturers Association (AAMA)	http://www.aamasv.com/
1	**Asia**	Asian Professional Exchange (APEX)	http://www.apex.org/index.htm
1	**Asia**	Asia-Silicon Valley Connection (ASVC)	http://www.asvc.org/index.html
1	**Asia**	The National Association of Asian Professionals	http://www.naaap.org/
1	**Asia**	National Asian American Telecommunications Association	http://www.naatanet.org/
	ASIA Middle-East		
1	**Arab Countries**	Network of Arab Scientists and Technologists Abroad	http://www.asta-net.org/asta.html
1	**Arab Countries**	National Arab American Meducal Association (NAAMA)	http://www.naama.com/
0	**Arab Countries**	Islamic Medical Association of North America	http://www.imana.org/
0	**Iran**	The Iranian Scholar Scientific Information Network	Not accessible anymore
1	**Iran**	Iranian American Medical Association	http://www.iama.net/
1	**Lebanon**	The American Lebanese Medical Association	http://www.almamater.org/ALMA/Default.html
0	**Lebanon**	TOKTEN for Lebanon	http://web.cyberia.net.lb/tokten/what.htm
0	**Palestine**	Palestinian Scientists and Technologists Abroad (PALESTA)	http://www.palesta.net/
0	**Palestine**	Programme of Assistance to the Palestinian People	http://pappsrv.papp.undp.org/programme/tokten.html
1	**Turkey**	Association of Turkish American Scientists	http://www.atas.org/
1	**Turkey**	The Society of Turkish American Architects, Engineers and Scientists, Inc. (MIM)	http://www.inx.net/~turkiye/

	ASIA South		
0	**Bangladesh**	Bangladesh Chemical and Biological Society of North America (BCBSNA)	mailto:kamal.das@netl.doe.gov
0	**Bangladesh**	Bangladesh Environment Network	http://www.ben-center.org/
1	**Bangladesh**	Bangladesh Medical Association, North America	http://www.bmana.com/
1	**Bangladesh**	American Association of Bangladeshi Engineers and Architects, NY-NJ-CT, Inc. (AABEA Tristate, Inc.)	http://aabeatriste.hypermart.net/aabea.html
1	**Bangladesh**	The Bangladeshi-American Foundation, Inc. (BAFI)	http://www.bafi.org/
0	**Bangladesh**	North America Bangladesh Statistics Association	mailto:mali@gw.bsu.edu
1	**Bangladesh**	North American Bangladeshi Islamic Community (NABIC)	http://www.nabic.org/
1	**Bangladesh**	EB2000: Expatriate Bangladeshi 2000	http://www.eb2000.org/
1	**Bangladesh**	TechBangla for transferring to and developing indigenous technology and products in Bangladesh	http://www.techbangla.org/
0	**Bangladesh**	The Association for Economic and Development Studies on Bangladesh (AEDSB)	http://www.aesdb.org/
0	**Bangladesh**	Alochona	http://www.alochona.org/profile.htm
1	**India**	Indian CEO High Tech Council (ICEO)	http://www.indianceo.com/
0	**India**	The Association of Kerala Medical Graduates	http://www.akmg.org/
1	**India**	The Network of Indian Professionals North America Chapter (NETIP)	http://www.netip.org/
1	**India**	Silicon Valley Indian Professionals Association	http://www.sipa.org/
0	**India**	The India Network Foundation	http://www.indnet.org/inf.html
1	**India**	The Indus Entrepreneurs (TiE)	http://www.tie.org/
1	**India**	The Society of Indian Scientists Abroad (SISAB)	http://www.sisab.net/default.asp
0	**India**	a) Worldwide Indian Network	http://theory.stanford.edu/people/arjun/WIN.html
0	**India**	b) The International Association of Scientists and Engineers and Technologists of Bharatiya Origin	No website
0	**India**	c) Interface for Non-resident Indian Scientists and Technologists Programme (INRIST)	http://sunsite.sut.ac.jp/asia/india/jitnet/csir/tokten.html
1	**India**	The Worldwide Indian Network (WIN)	http://www.win-india.org/
1	**India**	American Association of the Physicians of Indian Origin (AAPI)	http://www.aapiusia.org/aapi.nsf
0	**Pakistan**	Return of Qualified Expatriate Nationals to Pakistan	http://www.rpi.edu/dept/union/paksa/www/html/pakistan/TOKTEN/html
1	**Pakistan**	The Association of Pakistani Physicians Of North America (APPNA)	http://www.appna.org/

	ASIA South East		
0	**Malaysia**	Malaysian Scientist Abroad Search	http://www.mastic.gov.my/masticlink/stm/sctdlm.asp?
0	**Philippines**	Brain Gain Network	Website not accessible anymore
0	**Philippines**	Society of Filipino-American Young Professionals (SFAYP)	http://www.sfayp.org/
1	**Philippines**	Society of Philippine Surgeons in America	http://www.philippine-surgeons.com/
1	**Philippines**	K A P W A filipino club	http://www.luc.edu/orgs/kapwa/
1	**Thailand**	Association of Thai Professionals in America and Canada (ATPAC)	http://www.atpac.org/
0	**Thailand**	Association of Thai Professionals in Europe	No website
1	**Thailand**	Association of Thai Professionals in Japan (ATPJ)	http://owl.fedu.uec.ac.jp/ATPIJ/
1	**Thailand**	Reverse Brain Drain Project – Thailand	http://rbd.nstda.or.th/
1	**Thailand**	Thai American Young Professionals Association (TAYPA)	http://www.taypa.org/
1	**Thailand**	Thai Physicians Association of America	thaiphysiciansocciation/INDEX1.htm
0	**Vietnam**	Vietnamese Professionals Society (VPS)	http://www.vps.org/sommaire_en.php3
0	**Vietnam**	VPS France chapter	http://www.phapviet.com/vpsfrance/
	Asia East		
0	**China**	Chinese American Engineers and Scientists Association of Southern California(CESASC)	http://cesasc.org/
1	**China**	Chinese American Medical Society	http://www.camsociety.org/
1	**China**	Chinese American Physicians Society	http://www.caps-ca.org/
0	**China**	Chinese American Professionals in Taiwan ??	http://66.34.111.156/capt/
0	**China**	Chinese Scholars Abroad	http://chisa.edu.cn/
1	**China**	Chinese Software Professionals Association	http://www.cspa.com/
0	**China**	Human Rights in China (HRIC)	http://iso.hrichina.org:8151/iso/
0	**China**	The Institute of High Energy Physics in Beijing overseas scholars' web page list (U.S. mirror site)	http://solar.rtd.utk.edu/china/hands/key.html
0	**China**	The American Association of Chinese Physicians (bcp inaccessibles)	http://ourworld.compuserve.com/homepages/aacp/
1	**China**	Federation of Chinese American and Chinese Canadian Medical Societies (FCMS)	http://www.fcmsdocs.org/
0	**China**	Oriented - The online network for Taiwan's global community	http://oriented.org/
0	**China**	Medical Professionals Alliance in Taiwan	http://www.worldhealth.org.tw/
1	**China**	Society of Chinese Bio-scientists in America	http://www.scba-society.org/
1	**Korea**	The Global Network of Los Angeles, Inc	http://members.aol.com/gknla/
0	**Korea**	Korea University Computer Science & Engineering (KUCSE) Alumni Abroad	http://www.cis.upenn.edu/~ishin/kucs.html
1	**Korea**	Korean-American Scientists and Engineers Association	http//:www.ksea.org/
1	**Korea**	The International Association of Korean Lawyers (IAKL)	http://www.iakl.org/iakl/showpage.
1	**Korea**	The Society of Korean-American Scholars (SKAS)	http://www.skas.org/
0	**Korea**	International Network of Korean Entrepreneurs (INKE)	http://www.inke.org/

0	**Japan**	Japanese Associate Network	http://www.geosc.psu.edu/~kawakita/janet-t.html
	EUROPA		
0	**Armenia**	The Armenian Volunteer Corps	http://www.armenianvolunteer.org/
0	**Bulgaria**	Bulgarian Telework Association (BgTA)	http://www.bg-telework.org/English/index.html
0	**Belgium**	Belgians Abroad Home Pages	http://www-2.cs.cmu.edu/~dellaert/belgians/long.html
0	**Belgium**	Belgian Expatriates Webring	http://www.villageois.org/pierre/belgexpat/
1	**CZ**	Czechoslovak Society of Arts and Sciences (SVU)	http://www.svu2000.org/index.htm
1	**Hungary**	Hungarian Medical Association of America	http://www.hmaa.org/index.htm
0	**Hungary**	Hungarian Science Abroad	http://www.mta.hu/english/domus/abroad.htm
1	**FRY**	Kosova Foundation for Economic Reconstruction and Development	http://www.kosova-foundation.org/
1	**Poland**	Polish-American Medical Society	http://medicus2000.com/
0	**Poland**	The Polish Scientists Abroad	Website not accessible anymore
0	**Romania**	The Forum for Science and Reform (FORS Foundation)	http://fors.ong.ro/
1	**Ukraine**	Ukrainian Medical Association of North American	http://www.umana.org/
0	**Greece**	The Council of Hellenes Abroad (SAE),	http://www.saeworld.org/
0	**Greece**	Federation of Cephalonians and Ithacicians Abroad	http://www.cephalonia.org/
0	**Greece**	Biomedical scientists of Hellenic origin in diaspora	http://www.hri.org/helbiomed/
1	**Greece**	The American Hellenic Educational Progressive Association (AHEPA)	http://www.ahepa.org/
0	**Greece**	MedNet Hellas	http://www.mednet.gr/
0	**Greece**	Opportunity for Greek Researchers Abroad	http://ccl.osc.edu/cca/jobs/joblist/mess0216.html
1	**Greece**	World Hellenic BioMedical Association	http://www.hri.org/whba/
0	**Italy**	Banca Dati dei Ricercatori Italiani all'estero	http://missions.itu.int/~italy/science/distscie.htm
0	**Italy**	D.A.V.I.N.C.I.	http://davinci.esteri.it/index_eng.htm
1	**Italy**	The National Italian American Foundation (NIAF)	http://www.niaf.org/
1	**Irland**	Irish Research Scientists Association	http://www.irsa.ie/About/Aims.html
0	**Norway**	Association of Norwegian Students	http://www.ansa.no/ansa/english.htm
0	**Switzerland**	The Swiss-List	http://www.swiss-list.com//
1	**Switzerland**	Swiss Talents	http://www.swisstalents.org/
	Central AMERICA		
0	**Cuba**	Medical Education Cooperation with Cuba	http://www.medicc.org/
0	**El Salvador**	Conectandonos al Futuro de El Salvador (Connecting to El Salvador's Future)	http://www.conectando.org.sv/
1	**El Salvador**	Salvadoran American Medical Society	http://www.samsdoctors.com/
0	**Puerto Rico**	The Interamerican College of Physicians and Surgeons (ICPS)	http://users.rcn.com/icps/
1	**Puerto Rico**	ASPIRA Association, Inc	http://www.aspira.org/index.html
1	**Haiti**	Association Of Haitian Physicians Abroad (AMHE)	http://www.amhe.org/

	South AMERICA		
0	**Latin Americ**	Latin American Council for Biomedical Research	http://clabe.ucdavis.edu/clabe.html
0	**Latin Americ**	Association Lattino-americaine de Scientifiques (Latin American Association of Scientists) – ALAS	http://www.unesco.org/
0	**Latin Americ**	Consejo Latinoamericano De Biomedicina Experimental Network CLABENET	http://clabe.ucdavis.edu/clabenet.html
0	**Argentina**	Programa para la Vinculacion con Cientificos y Tecnicios Argentinos en el ExteriorPROCITEXT	http://www.landfield.com/faqs/argentina-faq/part7
1	**Argentina**	Asociación Argentino-Norteamericana para el Avance de la Ciencia, la Tecnología y la Cultura	http://www.anacitec.org/
0	**Argentina**	Profesionales Argentinos En El Exterior (PROAR)	http://www.anacitec.org/proar/index.html
1	**Argentina**	Red de Estudiantes y Graduados Argentinos en Estados Unidos	http://www.red-argentina.net/
0	**Argentina**	Alumni Foundation de Argentina	just born!
0	**Colombia**	a) Colombian Network of Researchers Abroad – New York Node	http://www.pecx.org/
1	**Colombia**	b) Colombian Network of Researchers Abroad – Brazilian Node	http://www.mat.unb.br/~ayala/nodobrasil.html
0	**Colombia**	c) Colombian Network of Researchers Abroad – Italian node	http://www.pg.infn.it/redcaldas/
1	**Peru**	Peruvian American Medical Society (PAMS)	http://menbers.aol.com/PAMS1996/
0	**Peru**	Red Cientifica Peruana (Peruvian Scientific Network)	http://www.rcp.net.pe/peru/peru_ingles.html
0	**Uruguay**	Red Academica Uruguaya (Uruguayan Academic Network)	http://www.rau.edu.uy/
0	**Venezuela**	El Programa Talento Venezolano en el Exterior (Program of Venezuelan Talents Abroad – TALVEN)	http://www.embavenez-paris.com/divers/talven.htm
1	**Venezuela**	Venezuelan American Medical Association	http://www.vama.org/
	INTERNATIONAL		
1		Francophoneau Japon	http://www.sciencescope.org/
0		The Third World Network of Scientific Organizations (TWNSO)	http://www.twnso.org/
0		The Third World Organization for Women in Science (TWOWS)	http://www.twows.org/
1		Third World Academy of Sciences	http://www.twas.org/
0		Scientists for Health And REsearch for Development (SHARED)	http://www.shared.de/default.asp
0	Women	Women in Global Science and Technology WIGSAT	http://www.wigsat.org/i
0	Women	Once and Future Action Network (OFAN)	http://www.wigsat.org/ofan/ofan.html
0	Women	The E-Mentoring Network for Women in Engineering and Science	http://www.mentornet.net/
0	Native Indian	The American Indian Council of Architects and Engineers	http://www.aicae.org/
0	Native Indian	The American Indian Science & Engineering Society (AISES)	http://www.aises.org/