



**Workshop on "Intellectual Leadership
and the African Information Society
Initiative:
What Role for Africa's Academic
Community?"**



Ford Foundation

15 – 16 June 2003
Addis Ababa, Ethiopia

International Livestock Research Institute (ILRI)
Addis Ababa, Ethiopia

**PARTENERSHIPS IN HIGHER EDUCATION IN AFRICA:
COMMUNICATIONS IMPLICATIONS BEYOND THE 2000s**

By J. Habib Sy, Ph.D, Director, Aid Transparency

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Africa's dilemma in the area of higher education is best exemplified by the outstanding contradiction between obsolete, outdated programs and demands for more democracy, more relevance, more equity, less dependence vis-à-vis the former colonial powers, U.S. hegemony and so-called globalisation. Drastic changes in international relations have pushed Africa further to the margins of history. Bilateral and multilateral assistance have been drastically reduced while the debt burden is worsened by endemic corruption and an endless cycle of crises. Value crises, deteriorating economies, cultural extroversion, political upheavals and social mayhem, global poverty, famine, massive displacements of entire communities are striking images of Africa's plight on television screens throughout the world.

State of education and telecommunications in Africa

In 1990, Africa's share of world trade was about 4 percent while its total populations rose to 642 millions in 1990 and to 739 million in 1995 with the highest rate of population growth in the world. It is estimated that in 1985 51 percent of the total population of Africa lived in absolute poverty. The number is expected to rise to 265 millions people or some 43 percent of the population by the year 2000 (UNESCO, 1995). While poverty is worsening year after year, Africa has been a net exporter of capital to the international financial institutions and OECD countries (RODNEY) 1981; AMIN, 1992). Structural adjustment programs (SAPs) have significantly aggravated Africa's debt crisis. They have contributed in no-small way to perpetuating the primacy of old educational programs some of which dates back to the colonial period. Unemployment is prevalent especially among young persons aged 15-24. In some cases, the rate of unemployment of educated persons (doctors, nutritionists, pharmacists, etc) tends to be higher than persons who have not been in school (Unesco, 1995).

Africa is the only region in the world reducing its per capita expenditure on education: \$26 in 1985, \$28 in 1990 and 1992 as opposed to \$27 in 1985, \$39 in 1990 and \$49 in 1992 in developing countries as a block. Meanwhile, illiteracy rates for women are higher than 60 percent in many countries, which has adversely affected the ability of women to empower themselves as meaningful change agents and decision makers (Unesco, 1995). Women's participation in higher education is much lower. In 1991 there were only 27 percent of women in Sub-Saharan Africa's global student population as opposed to 33 percent in Eastern Asia and 36 percent in Southern Asia. The same year, there were 5,000 students per 100,000 people in North America, 2,500 students per 100,000 in most developing countries and only 100 students par 100,000 peoples in Sub-Saharan, Africa (1995). Federico Mayor, Unesco's Director General accurately summarized the situation of African universities when he suggested that:

An imposed history appears to weigh heavily at many points in African higher educational institutions, which appear far from organically adapted to the societies of which they are a part. The problems are well known: irrelevance of many academic programs; artificial compartmentalization between subjects; imbalances in enrolments as between the sciences and the humanities and in the orientation of research; insufficient emphasis on African languages of instruction-shortcomings that create and perpetuate the chronic shortage of qualified personnel for development work (Mayor, 1991).

Powerful winds of change are blowing on the old continent (Zaire; Liberia; Kenya; South Africa; Angola; etc.). Conservative governments have been obliged by angry young students to engage although timidly into reforms, national consultations on education and the building of stronger and more democratic partnerships between universities and communities, students, private sector and marginally NGOs. Progress on that score has been woefully slow given Africa's overwhelming educational needs. While

Paper presented at the Conference on "Partnership in Higher Education in Africa", Gaborone, Botswana; August 11-15, 1997.

Africa is dragging her feet towards genuine progress rapid industrialized nations and several Asian Countries at an increasingly greater speed develop scientific and technological advances as well as new educational services and research opportunities, OECD's economies have reached a stage where brainpower and knowledge brokerage have become quintessential features for growth, new ideas, exploration of new frontiers, globalization, expansion and hegemonies.

The past two decades have witnessed the rise of huge communications empires and the advent of new communications technologies with striking abilities and potential to alter positively or negatively life styles, growth, information flow and scientific and technological achievements. Africa has been marginalized in terms of access to telecommunications infrastructures and communications software (SY, 1984, 1992, 1996). In most countries, SAPs have forced African States to liberalize and privatize telecommunications and information sectors (NOUMBA, 1993). But the bottom line is that Africa's telecommunications sector is the most underdeveloped in the world. Brussels has more telephone lines than all sub-Saharan countries less South Africa. There are four times more telephone sets in Japan than in the entire continent.

More importantly, Africa has no dedicated communications satellite capability, no access at all to the world's geostationary resources (SY, 1996), which means that she has less chances to democratize access to cost effective and timely communications services beyond the 2000s (KONE and SY, 1993). PANAFTTEL, RASCOM, AFROSAT and several other telecommunications ventures have proved to be ill-conceived and in any case irrelevant to national and international demands for higher levels of performance and excellence in the educational sector.

Africa's involvement in and access to INTERNET, an information superhighway used perhaps by more than 30 million people throughout the globe, is also of a marginal nature. Very few countries with the exception of South Africa, Tunisia, Egypt and Zimbabwe have full access to INTERNET. Electronic mailing has been described as an embryonic sector (AAS/AAAS, 1992). Most existing network are directly controlled and generated by external forces or international cooperation. It has been suggested that 90 percent of telephone traffic and 88 percent of telex traffic between African countries is routed via non-African countries. 67.6 percent of this traffic is handled via the former colonial powers as a result of poor or inadequate communications links between neighbouring countries (ADAM and HAFKIN, 1992). In addition, transborder data flow in the African region is hampered by lack of skilled personnel to install and configure data communications equipment and software, insufficient mastery of computer-mediated communications software, unavailability of direct telephone lines for communications links, poor communications lines, management and administrative problems, unavailability of basic data communications supplies and equipment, etc (ADAM and AFKIN, 1992).

African Universities and new Communications Technologies

Between the 1960s and the mid-1970s the newly built African States seemed to be attracted by North America and Europe's starting discoveries in the area of educational technology. Several projects were launched in countries such as Ivory Coast, Kenya, Egypt, Senegal and a few others, which were seen as a showcase of Western capitalism. In Ivory Coast, Kenya and Senegal distance learning projects using television, radio broadcasting or instructional satellite were launched under the auspices of the United Nations Transport and Communications Decade and North American universities (Stanford University; MIT; etc.). Less than a decade later, all these projects failed either because they were ill-conceived or as a result of foreign experts' lack of understanding of African cultures and their interplay with several other factors (inadequate training of educators at primary school level; poor infrastructures; embryonic telecommunications equipment; inadequacy of program entirely based on foreign languages; etc.)

These failures have also been attributed to an identity crisis within Africa's institutions of higher learning, which prompted them to re-define the mission of African universities during a Seminar on the Development of Higher Education in Africa held in Accra (25-29 November 1991) under the auspices of the Unesco. Participants suggested that the African University's principal mission "is the generation, dissemination, advancement and application of knowledge in the service of society at the local, regional and international levels". Participants also recommended the setting up of units to develop partnerships with industry, the computerization and development of library facilities and the optimization of information technologies in university management (Unesco, 1991). In other words, Africa seemed determined to re-

invent and educational system almost entirely left in foreign hands or inspired by outdated colonial doctrines. What was at stake here was the recognition that governments should create an enabling environment to train specialized educators in sufficient numbers. It was also governments' responsibility to clarify the mission of their respective universities so that they become centers of excellence sensitive to the pulses of their respective nations and communities.

The definition of the African university's mission suggested above by African educational authorities had strong communications components for generating, disseminating, advancing and applying knowledge to social progress, economic empowerment and cultural enlightenment is basically an act of communications and a commitment to the ideals of telecommunications development. The extension of such functions at local, regional and international levels require powerful and reliable telecommunications system nationally and in the entire continent including in distant and isolated settings.

In 1992, delegates from "francophone" Africa met in Dakar under the auspices of the Unesco around the same topic than in Accra. There was an outstanding debate on the introduction of new communications technologies in Africa's educational systems. Several constraints were identified in the following areas; data processing, handling, storage, dissemination and utilization; poor conditions for the adequate training of manpower to manage such information technology systems and; lack of pluridisciplinary and integrated high level teams to design and manage curricula, training packages and educational tools in a regional perspective and in view of minimizing related costs (Unesco, 1992).

Before and after the two meetings mentioned above there have been dozen of meetings, seminars, workshops, teleconferences, exhibits, etc. mostly organized by bilateral, multilateral and private organizations with the ultimate objective to open Africa to the promises of a global telecommunications market in full expansion. New utopias and crusades in the name of the "information Society", the "Global village", INTERNET, cyber communications through dissemination packages and software were presented as magical formulas to all societal illnesses. Extremely powerful financial forces and huge communications empires have generated over the past decade a global euphoria on the demise of old ideologies and the rise of cyber innovations.

The ubiquity of the "information Age" is pervasive and at the same time misleading. Despite Porat's findings ascertaining that 53 percent of the United States economy is generated by an information sector and a knowledge industry in full swing (PORAT, 1978), the question of power relationships and the struggle between social classes for the control of communications processes and their packaging and re-packaging as commodities are entirely ignored by dominant speeches on development and growth through cyberspace (MATTELART, 1979. Mouline, 1996). African communications scholars have not fully and critically explored the implications of this debate on Africa's educational system either. In fact, most communicationists organized through the African Council on Communication Education (ACCE) are conservative in their approaches and tend mostly to ruminate on ideas produced in Europe or North America. African, communications specialists have been unable over the past two decades to significantly challenge dominant paradigms on education through communications and more importantly to produce new ideas of relevance in the fundamental debate on how to develop Africa while protecting her interests and sovereignty.

With the on-going process on telecommunications globalization and the increasing weight of North American and European telecommunications carriers (SY, 1996), the very concept of democracy is threatened. For access to INTERNET services, distant learning opportunities, computerized library packages or strategic databases will not be within reach for isolated and poor African nations unable to integrate their economies and brains into a powerful and respected community of States. The promises of the information Age are all about money and financial leveraging. Nothing will be free. Services will be available for all but based on money power not philanthropy. When a service is offered for free during a brief period of time it will just a marketing incentive or a mechanism to create within a recipient country some kind of addiction to turnkey communications ventures. This process is firmly rooted in Africa's neurotic attraction for new communications technologies. A few African "technocrats" paid by international financial institutions is busy selling the concept of a virtual university as a panacea to Africa's severe educational crisis. If African decision takers fall in this new trap it will be damaging to

generations of Africans unable to benefit from the existence of modern universities of the kind actually enjoyed by industrialized countries.

What we are witnessing through this anecdotal debate on the relevance of virtual African universities is a transfer on the African soil of a larger debate initiated by industrialized nations. The central question giving sleepless nights to political and military strategists is how will XXIst century world cope with a fundamental break in humankind's history, i.e., our perception of and relationship with time. In a few decades we were able to pass through the walls of sound and heat. The wall of sound was crossed by supersonic and hypersonic aviation. Rockets able to place human beings and spatial vehicles in orbit and make them land on the moon and soon on Mars transcended heat wall. The third wall, the wall of light cannot be crossed. You travel through it. We are in juncture in History where this new time wall (light) and the speed required "travel through it" has become humankind's principal contradiction. Reaching light wall (starting with optical fibres) is a major historical event, which bewilders history (VIRILIO, 1996). This major fact also distorts and puzzles the relationships between beings and matter. The battle between virtual and real time entails a re-writing of geopolitics, geo-strategy, geo-finance and geo-democracy. Cyberspace is a new form of perspective, a perspective of real-virtual time with a digital element allowing one to remotely touch, see, hear and perhaps feel. Information superhighways are just the tip of the iceberg. They are a means; a channel through which a unipolar world dominated by a triumphant United States of America wants to reach global hegemony. What is called "globalisation" is a flashing mirror hiding the phenomenon of virtualisation. For what is effectively globalized through simultaneity is time, a unique time, a world time (see the figure titled Integrating Space-World in space-time) within which global and local time or glocal time are reachable (VIRILIO, 1996) thereby becoming an instant conduit for manipulation and control (BENIGER, 1996) by the forces dominating the world (i.e., political and financial forces and not what conventional economists misleading refer to as "market forces").

Scholars holding that Africa is evolving outside of History because of her scientific and technological backwardness are fooling themselves. The XXIst century will be (already is) dominated by virtuality and Glocal time includes Africa and the world in the same virtual time, a time which in a near future will enable Western strategists to simultaneously and instantly control natural resources through remote sensing, capital through cyber financial empires and labor through a telematics hypermarket of virtual, temporary jobs and golden collars (intelligent computer) fully aware of the glocal character of markets, industries and democracies.

Another indication of the fact that Africa has already entered Glocal time is the noise on good governance and democratization introduced in all our communications channels by multilateral and bilateral organizations as well as international financial institutions (The World bank and the International Monetary Fund). Bill Clinton's concern in his new "Priority Africa Initiatives" is not democratic development. His goal is to conquer the African market (as is already the case in South Africa, Nigeria, and the Democratic Republic of Congo, Angola and Egypt, the giants of Africa). Two weeks after he announced to the world his intentions on Africa, Bill Gates secretly visited South Africa and Nigeria in an attempt to strike a deal with far reaching consequences for these two countries and Africa.

The Global Information Infrastructure placed on the international agenda by Albert Gore, Vice-President of the U.S.A. is concerned with selling technology and harmonizing laws for countries (markets) utilizing electronic superhighways (see the Figure on Directions of Transborder Data Flow). This objective is contradicted by less liberal French laws applied by "francophone" Africans on property rights (QUEAU, 1996). The implication of all these laws and the most recent General Agreement on Trade and Tariffs (GATT) followed by the Treaty on Intellectual Property Rights (TRIPS) within the framework of the World Trade Organization are a global empowerment of the richest countries on the poorest countries and within countries of the powerful on the powerless. Schools, universities, libraries and non profit servers and nodes throughout the world are bound to sell information and documentation to end-users when universal access to world's scientific and cultural heritage should be guaranteed to all. In the XXIst century, African schools, universities and museums as we know them today will not be able to afford the payment of services, which would make them universally competitive. In addition, the future of on-line services in the banking, cultural and technological industries will be determined by who will control what

share of cyber economics (Netscape Communications, First Data, Microsoft, Bill Gates and his "Bill dollars" which perhaps would have replaced the dollar bills, etc.)

Africa should be aware of the fact that digital technology is not a central factor for entrenching democracy, free flow of information, knowledge dissemination and social relationships freed from inequality or oppression. This is an illusion, a utopia cynically packaged by Western strategists for public relations purposes. The outstanding reality of to-day's world is that 20 percent of world population control 80 percent of global resources while 80 percent of world population control less than 20 percent of world's resources.

In a country such as Senegal, one of the poorest countries worldwide more than 60 percent of people leave below the poverty line with an annual income of less than 100 US dollars and more than a quarter of the total population (8 million people) clustering in a capital city where value systems are collapsing at a speed directly proportional to the economic crisis. Fortune magazine's 100 richest persons in the world control more assets than the combined fortune of one and a half billion habitants in the world. These shocking inequalities have tripled over the past thirty years according to a recent survey carried out by The World Bank and the United Nations system. In 1960, 20 percent of humankind's richest social segments were 30 times richer than 20 percent of the poorest in the world. In 1990, the former were 60 times richer than the latter (GALEANO, 1996).

Structural adjustment programs (SAPs) aggravate Africa's state of chronic poverty and are in many ways even in contradiction with the basic ideals of liberalism. All industrialized countries and particularly the United States have strongly and on long term basis subsidized their educational sectors and schools systems (free books in public school; creation of subsidized States universities; etc.). On the contrary, in Africa SAPs bear a significant responsibility in the aggravation of Africa's educational crisis by forcing States to cut on educational expenses and privatise universities and an increasing percentage of public educational utilities.

Full access to INTERNET services, electronic mailing and digital communications is still embryonic (see Africa's e-mail map). A great number of projects have been launched over the years to salvage Africa from oblivion through virtual communications. The World Bank has launched the Info Dev Program with the aim of "creating an enabling environment for markets in which private sector has the primary responsibility in the areas of capital investment and provision of services". Universities are targeted in this scenario but only in so far as they would commercialise on line library services to already impoverished student and faculty population (in Nigeria and Kenya, for instance, faculty members earn an average amount of 100 U.S. dollars per month! In francophone Africa, France and its Western French speaking allies have decided to launch a network offering access to INTERNET, e-mailing and Sy-fed-refer databases on a moderate and promotional fee basis. In 1996, South Africa, President Nelson Mandela and the G7 as well as other Southern partners convened a meeting on The Information Society and Development. The Leland Initiative spearheaded by the U.S.A.I.D. aims at privatizing and liberalizing telecommunications services as well as ensuring Internet's expansion in Africa. In the mean time, the European Union is about to launch a mega electronic network in view of fostering international trade (RENAUD, 1996; NOUMBA et al., 1993).

A common denominator for all these programs is their central drive for the widespread utilization of new communications technologies including universities and an ideal means for Africa's integration in a global marketing tightly controlled by the G7 countries. This strategic goal may prove to be wrong soon for two reasons. First, unless social revolution with far reaching consequences take place in Africa, the small number of end-users will not grow significantly in the coming decade as a result of widespread and growing poverty, poor telecommunications infrastructures and high illiteracy rates coupled with extremely small numbers of graduates and computer literate. Therefore, marginalisation risks will be real between the 2000s and 2020s, which would represent a setback for OECD's trade expansion aims. Secondly, telecommunications de-regulation never conditioned digital communications growth and expansion anywhere in the world and this will certainly not happen in Africa. In the United States, the number of computers connected to INTERNET the network of networks is stimulated by State subsidization of telecommunications infrastructures including in institutions of higher learning and school systems. Further, Internet was heavily subsidized between 1986 when it was created as a Defense Department project and 1995 when the Federal government decided to gradually phase out its support

and encourage privatisation. In addition, INTERNET, benefited from indirect financing through a good number of research development projects mostly located in universities (RENAUD, 1996).

All this will also mean that access to knowledge beyond the 2000s will be directly proportionate to information costs and related economies of scale. Information pricing will widen the gap between information hungry nations and information affluent societies. Within Africa itself, such costs will be unbearable for students and faculty members and will aggravate social, economic and educational imbalances. They will as well widen the gap between have and have-nots. If present educational and telecommunications trends remain constant or do not change drastically, it is likely that African universities will not be able to secure access to Internet and global electronic services. At the time they will be able to secure adequate budgets for accessing such services Internet may already belong to News Corporation, Time Warner or Bill Gates with contents and tariffs of less relevance to academia and university communities.

Access to the Internet services by farmers in distant locations or the informal sector evolving in the peripheries of poorly managed cities will become even more elusive as a possibility. The African poor as well as all the other wretched of the world not be connected to the INTERNET or any other net for the matter. The African women, children and populations at risk and millions of refugees abandoned on the battlefields of civil and economic confrontations for the control of natural resources and political power will remain in the prehistory of communications unable to enter in the digital age.

This reality should prompt African scholars and decision takers in the educational sector to stop fantasizing about INTERNET, the information superhighways and all the other myths of the Information Age and the Planetary Village (see the figure on the Information Pyramid). The harsh reality is that Africa does not have a communications industry and no satellite communications capacity in a foreseeable future. Telephone sets, computers, television sets even radio sets are imported at extremely prohibitive costs, microwave technology, optical fibres, switching equipment, earth stations technology, satellite dishes, connectors, transponder hardware, submarine cables, etc.

African universities should become central niches for building and re-conceptualising in co-operation with national and foreign private sectors communications industries that are still extremely underdeveloped or in many case remnants of nineteenth century technology introduced by colonialism. Investing in this sector is key to Africa's national security interests. Perhaps, the very future of African States as we know them today is at stake. They may be re-colonized (and the process has already started) through telecommunications technology entirely in the service of the corporate world and through the powerful federations of the XXIst century (Europe and its Eastern European allies, the U.S.A. and its NAFTA allies, a self-reliant China, a stabilized India, a new Russia with a re-organized economy and society and its independent allies of the former Soviet empire). For the time being Africa can still afford to ignore such threats. But for how long? Universities are literally transformed into battlefields between rigid Ministries of Higher Learning, angry students and frustrated faculty members mostly evolving in ivory towers isolated from industry, private sector and grassroots communities. These partners can no longer ignore each other. Time has come to actively promote the conditions for their positive interfacing. What is at stake in this particular instance is not so much digitalisation or technocratic approaches and policies (they are always within reach for any dependable and visionary government) as a full integration of the value systems and immense heritage of universities, communities, students, educators and private and public sectors.

RELEVANT EDUCATION STRATEGIES

Unesco's countless meetings and recommendations are usually not challenging or potentially significant mechanisms for social change. The reason is simple: States are taking final decisions and they are at the outposts and the gatekeepers of the Organization's decision-making mechanisms. The Director General's Program of Action for the Development of Higher Education in Africa (1990-1995) (Unesco, 1992) performed a good diagnosis of Africa's educational systems but recommendations were timid and lacked vision. Now that the period covered by this Program has ended progress is nowhere at sight except in the case of a few isolated and therefore meaningless "success stories". The African Regional Consultation Preparatory To the World Conference on Higher Education (Dakar, Senegal, 1-4 April 1997) was even more disappointing. The Second Conference of Ministers of Higher learning and

Research of West African States, which took place in Ouagadougou (9-12 April 1996), presented to the Unesco Consultation in Dakar several recommendations.

At national level, the following recommendations were suggested: reform of the baccalaureate exams; diversification of areas of specialization in institutions of higher learning; adoption of global scientific and technological research policies; training of teachers and researchers; creation of linkages between universities and research centres; dissemination of scientific and technological information; fostering linkages between research centres; creation of a data bank on Africa's scientific and technological potentialities. Let us have a look at each of these options.

"Reform of the baccalaureate examination": this exam is actually an extremely elitist examination and a way to eliminate high school students whose enrolment is beyond the African universities' infrastructures and financial capabilities. Africa's primary and secondary school system should be entirely reformed and rebuilt almost from scratch to break away from the old colonial educational doctrines. All the national examinations at each gate of the primary and secondary school systems should be suppressed. Their only function is to decrease the number of university and high school graduates because unemployment rates over the past three decades have consistently reached extremely high levels (between 20 and 70 percent). The baccalaureate examination should either be partially suppressed or thoroughly reformed so that it becomes a formality as in the U.S. (with an option for the more challenging and competitive International Baccalaureate).

"Diversification of areas of specialization in institutions of higher learning". A positive interface between universities and development processes does not really societies" depend on the diversification of areas of specialization. It is more a question of relevance of specialization offered by universities. Quality rather than quantity should be the focus. Second, useless and costly duplications of specialization should be stopped. There should be a systematic and permanent consultation process between African institutions of higher learning so that they can harmonize their programs, iron out difficulties between francophone, arabophone, lusophone and Anglophone educational systems and create pools of specialization per region or sub-region.

"Adoption of global scientific and technological research policies": the question of what should be the best research policies for Africa has been debated at length during a countless number of meetings and for a including those organized by Unesco itself. The problem is to convince governments of the relevance of S and T research to development process and therefore the urgent need to rank order research in Africa's top priority lists. Financial scarcity at national level pleads for the creation of regional centres of S and T specialising in priority areas of the future not of the past (i.e., research on monoculture crops undertaken by centre created by France in its former colonies). S and T research should aim at ensuring Africa's development through democracy, growth, equity, regional integration and self-reliance. For instance, all African countries should create together a regional version of the Bellagio Foundation in Italy attracting the best minds in Africa and the World and empowering researchers to outline Africa's present and future with more confidence and through their own lenses.

"Training of teachers and researchers": There are too many unrelated training programs and there are not enough specific training sessions for researchers. This problem should be solved through the creation of two African centres for research and training respectively covering Northern, Western and Central Africa and Eastern, and Southern Africa. Such centres would be sub-regional in scope and controlled by a Board of Governors comprised of academics from both sub regions with an observer status for concerned States and donors. The mission of such regional centres entirely managed by African themselves would be to provide administrative assistance, institutional support and harmonization to African research institutions and stakeholders and knowledge brokering to the benefit of governmental, non-governmental and civil society organizations and private sector. The financial sustainability of this joint undertaking would be ensured through grants (from States; private sector and bilateral as well as multilateral donors), income generation activities (commercialising consultancy services from universities and members of the two research centres, organizing intellectual property rights in cooperation with existing regional bodies on a fee basis, offering library on-line services to research institutions, private sector, government agencies on a competitive fee basis; etc) and the creation by universities and private sector of research laboratories selling services in the medical, agricultural, electrical engineering, communications fields, etc. Training mechanisms, tools and

processes would be designed, operationalised and evaluated outside the realm of States and donors agencies lacking flexibility.

“Creation of linkages between universities and research centres»: this is a status quo proposal. Linkages between these two entities should be done on a sub-regional basis and according to the guidelines suggested in the paragraph above.

“Dissemination of scientific and technological information»: national and regional STI dissemination mechanisms may be created with a focus at the same time on the promotion of research results and their utilization by end-users. The precondition for the existence of such mechanisms is the existence of reliable, integrated and competitive telecommunications infrastructures nationally and regionally. Existing trends on national telecommunications sector privatisation under SAPs will hurt Africa's national interests and hampers future regional integration objective for private foreign investor's motivation for profit and growth does not necessarily take into account imperatives such as moderate telecommunications tariffs and services to universities, research centres, etc. Another pre-condition for the launching of relevant STI mechanisms would be to ensure in a coordinated fashion access to international data bases and to create an enabling environment for the acquisition, handling, dissemination, storage and preservation of strategic and primary data.

“Fostering linkages between research centres»: if research centres remain unchanged in their respective missions, their lack of relevance to end user and to self-reliant development linking them would be next to impossible and useless in any case. Besides the creation of appropriate mechanisms linking research centres around realistic objectives it is essential to develop Africa's S and T publications and book industry. This particular is almost completely ignored by governments and donor agencies. Initiatives such as, the African Book Fairs and joint efforts to develop health sciences libraries and training packages for African librarians should be encouraged. But most of these projects are donor driven when essentially African should support them themselves (philanthropists, private sector, banks, public sector, private investors, etc). Success in this area depends on the relevance of the African University's mission to all these stakeholders.

“Creation of data bank on Africa's scientific and technological potentialities»: this represents a minimal program. It is not enough to give policy makers and investor a public relations tool on Africa's S and T potentialities. The questions at stake here are much larger and should entail transborder data flows between Africa and the rest of the world, ensuring universities, re-building existing university libraries and creating the equivalent of a Library of Congress with a sub-regional scope in each of the five African sub-regions (North, West, Centre, South and East).

Creating partnerships: which way to go?

Joseph Ki-Zerbo rightly pointed out that „education is the software in the central computer that programs the future of societies“ (KI-ZERBO, 1989). In today's world education cannot take place outside the realm of the information sector. In the past decades, a fundamental shift in humankind's pursuit of excellence through education: knowledge has become the engine and the fuel of the most powerful economies and societies. Knowledge conditions the control of power but only in so far as relevant and value-added information fuels the process of knowledge acquisition. But the acquisition of knowledge has a cost precisely because it has become the new resource (brainpower) for economic performance, productivity, growth and, more importantly, transparency and accountability. An editorialist of *African Business* (June 1997) wrote: “Through knowledge, we add value to ourselves. We then naturally add value to our lives and everything in our lives. Educated people never allow despots to rule over them and educated people never allow the tyranny of poverty to crush them.”

Mr. Mahathir Mohammed, Prime Minister of Malaysia was quoted recently as saying: “It can be no accident that there is today no wealthy developed country that is information-poor, and no information-rich country that is poor and underdeveloped” (TALERIO and GAUDETTE, 1995). It has also been suggested that “those nations that establish (their information) infrastructure and develop a broad range of application first will have a tremendous competitive advantage over those that lag behind. This advantage will accrue not only to the telecommunications industry, but also to such industries as

manufacturing, banking and entertainment and to such activities as education and healthcare" (ALLAIRE, 1994).

All around the world and particularly in the OECD countries education correlates with employment, income and opportunity (TALERO and GAUDETTE, 1995). In Africa it is quite the contrary. Education correlates with unemployment, lack of income and opportunity. In several African countries doctors, pharmacists, teachers, journalists, computers analysts and engineers, pilots, electrical engineers, mathematicians, even communications specialists, etc, are finding it extremely difficult to make a living or even find job. The brain drain process paralysing Africa and many underdeveloped countries is almost encouraged by irresponsible governments preferring to run the risk of loosing national graduates rather than having to support their grievances.

No one would dispute the fact that government action is necessary because it is the manager of taxpayer's contributions. Aid agencies cannot either take in their hands alone the destiny of an entire nation. The myths on "development" aid and the "generosity" of bilateral and international financial organization have miserably fallen apart especially in the past two decades. Africa and all developing countries are net exporters of capital to the industrialized nations. This fact has been proven beyond the shadow of a doubt by several authors (FALL, 199*). In any case, governments are compelled to establish broad partnerships with the private sector, grassroots communities, non-governmental organizations, civil society organizations, international organizations and development agencies. SAPs, successive economic crises, dwindling financial resources, capitalism's new strategies and the strategic importance of the information sector in contemporary economies and societies have significantly changed and curtailed States' role.

The United Nations has decided to create a programme entirely focused on Harnessing Information for Africa's Development in the years ahead. Talero and Gaudette suggested the following guidelines for government action in the information sector (Talero and Gaudette, 1995).

Government intervention to harness information for development is necessary on several fronts: as policy-makers, as major users of information technology, and as compensating influence against market failures. Also, government must supervise and coordinate education, the key to human economic development.

As policy-makers, government set many rules of the marketplace and must do so fairly. The role of government includes policy, creating the policies, laws, regulations, and institutions needed for the information economy.

As user of information products, governments can capture large benefits from information technology and can influence the supply as a major consumer. Government work is by its very nature highly information intensive in terms of data collection, archiving, dissemination, and processing. Government procurement will, for better or worse, affect standards and offerings of the information technology market.

In each of the areas where government intervention is necessary there is a strong role for universities and research institutions. African local administrations have been unable to hire and keep on a long-term basis the best graduate whose studies were costly in all respects to taxpayers and governments shrinking national budgets. Researchers and universities must be empowered to assist government in designing, implementing and evaluating policies, laws, regulations, and institutions, programs without which information cannot be harnessed for development. African governments spend several dozen million U.S. dollars on various consultancy fees on a yearly basis. The bulk of these expenditures are paid to foreign "experts" mostly imposed by bilateral and multilateral aid agencies. Several studies have documented the fact that most of the time the expertise sought from aid agencies by government are available sometimes in better quality and rarely in S and T areas where African expertise is just not available.

The privatisation of telecommunications carriers in the African context is a serious mistake and a major threat to Africa's national security interests. Africa's telecommunications sector is increasing under siege through SAPs and OECD countries pressuring to the limit. The African government to sell their

telecommunications industries to OECD's multinational corporations. These private interests have aggressively started positioning themselves in a monopoly situation through local markets and within highly strategic sectors (water, electricity, telecommunications, mineral extraction, agro industrial sector; etc). This process may lead to Africa's economic, financial and political re-colonization. The World Bank and the IMF are also to blame for this sad state of things. They have convinced the African governments that the OECD countries have themselves liberalized and privatised their telecommunications industries, which is true. What they are not saying is that the United States telecommunications sector is essentially controlled by internal capital except in a few instances where other OECD telecommunications carriers have been able to capture a small slice of the huge U.S. knowledge industry. In Europe, the situation is different since the giant U.S. companies have been able right after the war to capture and control a sizeable segment of national telecommunications marketplaces. Despite their community of interest in several strategic sectors including in the defence industry Europe is progressively trying to regain its independence.

The biggest threat Africa's telecommunications sector's privatisation will come in the years ahead through the contradiction between foreign private carriers and universities, research institutions and researchers in search for special telecommunications tariffs. Primary and secondary schools also would rightly want to benefit from such reduced tariffs. Who will subsidize such needs in countries where poverty has destabilized the entire society including civil servants whose income has been significantly slashed by SAPs, inflation rates, unemployment, devaluation and extremely costly imported goods? That is why when the international financial institutions advise African governments to "push the education agenda" and "jump start the private sector" they must be asked by government how this kind of major contradiction will be solved.

It has become fashionable to compare the performance of Asian and African economies and to deduct from such exercises that Asia is doing better than Africa because it has understood the value of investing in education and the information sector at the same time. The World Bank suggests that "education is the main theme of the story of the differences in growth between Sub-Saharan African and the East Asia high performer" (The world bank, 1993). Again, the Bank is comparing apples and oranges. Eastern Asia and Black Africa do not share the same history (slavery, colonialism, strong influence of former colonial powers in ongoing policies, etc). Sub-Saharan Africa never benefited in the past three decades from the same level, depth and soft lending investment opportunities than Eastern Asia. In addition, there has been huge transfers of technology, the installation of computer and information technology industries, etc. This comparison does not make sense and The World Bank know it. Through such exercises they launch public relations campaigns to justify their own (racist?) biases favouring East Asia.

India sometimes compared to Sub Saharan Africa to explain why its is "taking off" in "high tech" information related sectors while Africans are still in the margins of history. The World Bank knows very well that Africa's first graduate came a decade after they became independent in the 1960s whereas England's colonial educational policy allowed native Indians to benefit from access to universal education before World War II. In Zaire, after the Belgians left in 1963, the country had 5 graduates with a university degree! So, what are we comparing here!

A recent survey (Unseco, 1996) indicated the following features of universities' information systems:

1. Existing computerized management systems in Africa universities do not adequately meet present needs; most universities need new systems.
2. Overall there is no dominant computer hardware and software supplier. Current systems are not changed as a result of financial scarcity and a significant "brain drain" haemorrhage that prevents universities from employing qualified computer specialists.
3. There are four possible approaches for the development of improved management and administrative system: a/ Developing all the system in house but incorporating package if relevant; b/ Using externally produced packages but with minor modifications; c/ Collaboration between universities in either a/or b/; d/ The exchange of software between universities.

The survey indicated further that option a/ may be unrealistic given the amount of time required to complete the process while option b/ may prove to be costly (the cost of bought commercial packages can be significant between \$ 500,000 and \$1,000,000). Option c/and d/ were recommended while option b/might be considered worthy of attention only if universities can undertake that jointly.

Partnership is therefore needed between information hardware and software suppliers, universities, government and private sector. It should be the responsibility of government to create an enabling environment (see Chart on STI Dissemination, Utilization and Planning Strategy) so that access to reliable and cost effective telecommunications services, intelligent computers and robots are possible for researchers, students and administrators. Governments should also be held accountable for empowering researchers through motivational mechanisms showing that brainpower is really promoted and not destroyed. STI dissemination and the promotion of its utilization will require adequate communications channels such as dedicated satellite communications capability, instructional radio and television broadcasting, full access to Internet, teleconferencing and distance learning services. It is unrealistic to expect from the African State to be able to secure funds and know how to perform all these tasks and set in motion nationally and regionally integrated information systems. The only way out of this nightmare is to develop joint projects and tackle the issues both nationally and regionally.

University/Private sector partnership should be based on a basic and simple rule: they should develop linkages that are mutually interesting and beneficial to both of them (see Figure on University/Industry Partnership). Both university and industry should agree on what they would offer in the linkage and on what is highly relevant to their respective missions and objectives (Kinyanjui, 1996).

Students should have access to computer facilities, which is, not be case most of the time. It is not uncommon to see graduate students in francophone Africa with no exposure at all to P.C. technology and software until the end of their tenure. This rule also applies to faculty members. This trend must be completely reversed and now. Given the declining costs of computers it should be possible for any university to prioritise on its budget the acquisition of PCs and the construction of a Computer centre of moderate size available to all enrolled university students. Such centres may be managed with the assistance of senior computer science students. The Centre may sell consultancy services that would make it more sustainable able to get involved in the University Outreach Program (AIDS education campaigns, adult literacy programs, coaching primary and secondary schools students in sports, etc). In other words, African university's output should be students with a competitive level of expertise, ready to function in the job maker place and with a degree of utility to the university itself and to the community. Such a student should be a money maker (with access to assistantship for the best ones) and a provider of services to the community and the private sector.

The States as was suggested earlier should provide the entire nation with an enabling environment making telecommunications services available to the university, the private sector and communities. Indeed distance learning programs cannot function with unreliable telecommunications systems and lack of access to data banks, on line library services and cost effective transponder facilities.

NGOs and CSOs need information exchange mechanisms able to link them up with other partners pursuing the same goals within and outside Africa. They should also have access to efficient and relevant extension services with adequate STI dissemination and utilization tools and mechanisms.

The private sector needs well-trained students from the university with the ability to handle specialized software, intelligent computers and robots. In addition, the private sector's expectations from industry or private sector may focus on the following types of links:

1. Contract research or support research through grants;
2. Sponsor a university chair alone or jointly;
3. Support graduate students to do industry related research;
4. Hire summer students;
5. Support for post doctoral studies
6. Support for university professors to do research on company premises;
7. Allow company scientists to hold part-time university appointments;
8. Management structure with explicit responsibility for university links;

9. Senior executive responsible for specific university links;
10. Participate in university based centres of excellence;
11. Input into a degree granting program;
12. Allow company employees to pursue advanced research degrees;
13. Have a scientific advisory board (Potworowski, 1991).

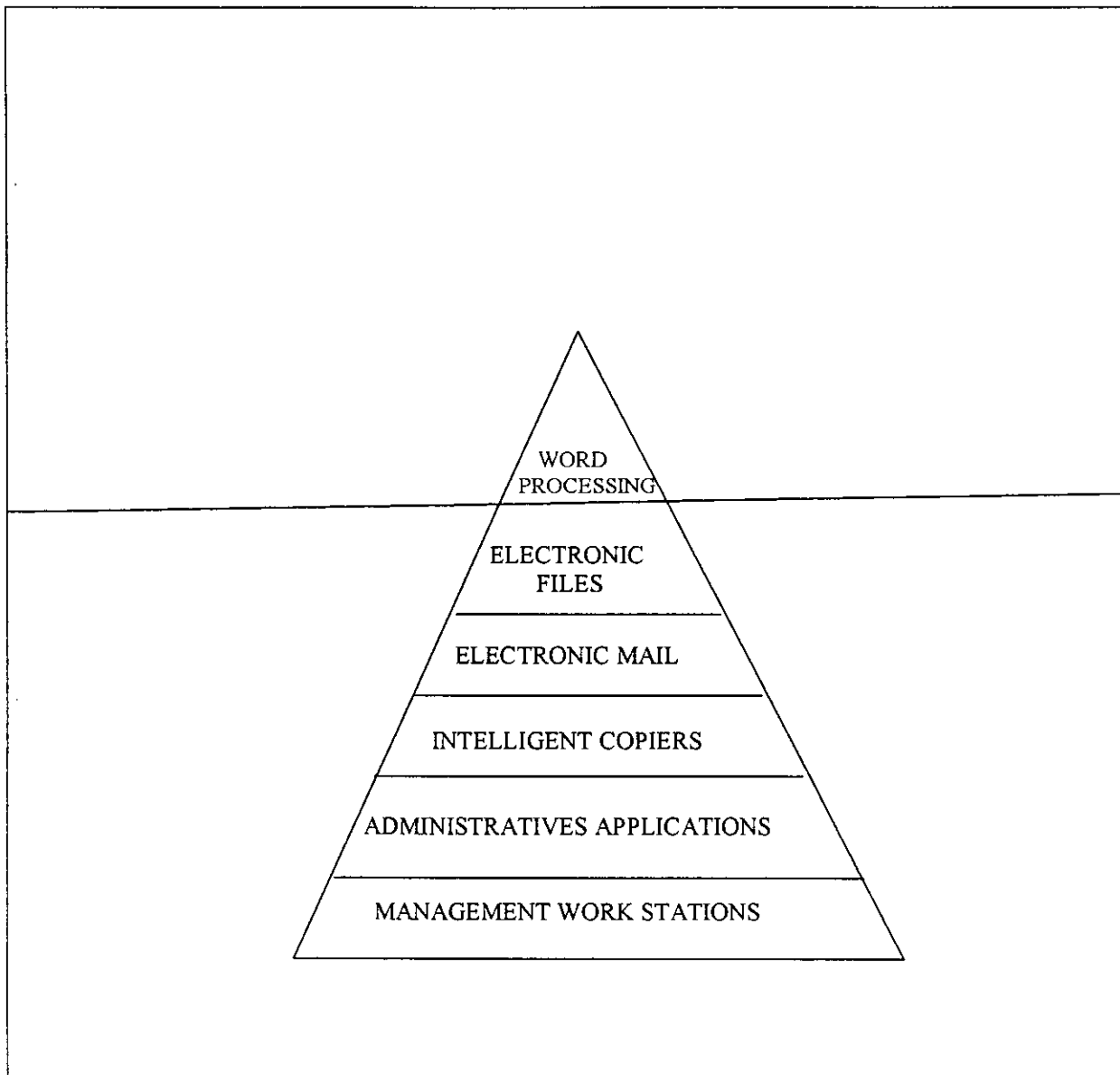
Both the private sector and the university are undergoing fundamental changes in terms of their respective information technology needs. From the 1960s to the 1980s data processing was the priority. Starting in the 1980s a new wave of technological innovations generalized networking technologies. This was an indication of the universal shift from industrial economy to information economy. Africa may not have undergone the same waves of technological changes but she is following the same paths towards the utilization of innovative IT systems compatible with what the rest of the world is using (see the Figure on Shifts in IT Technology).

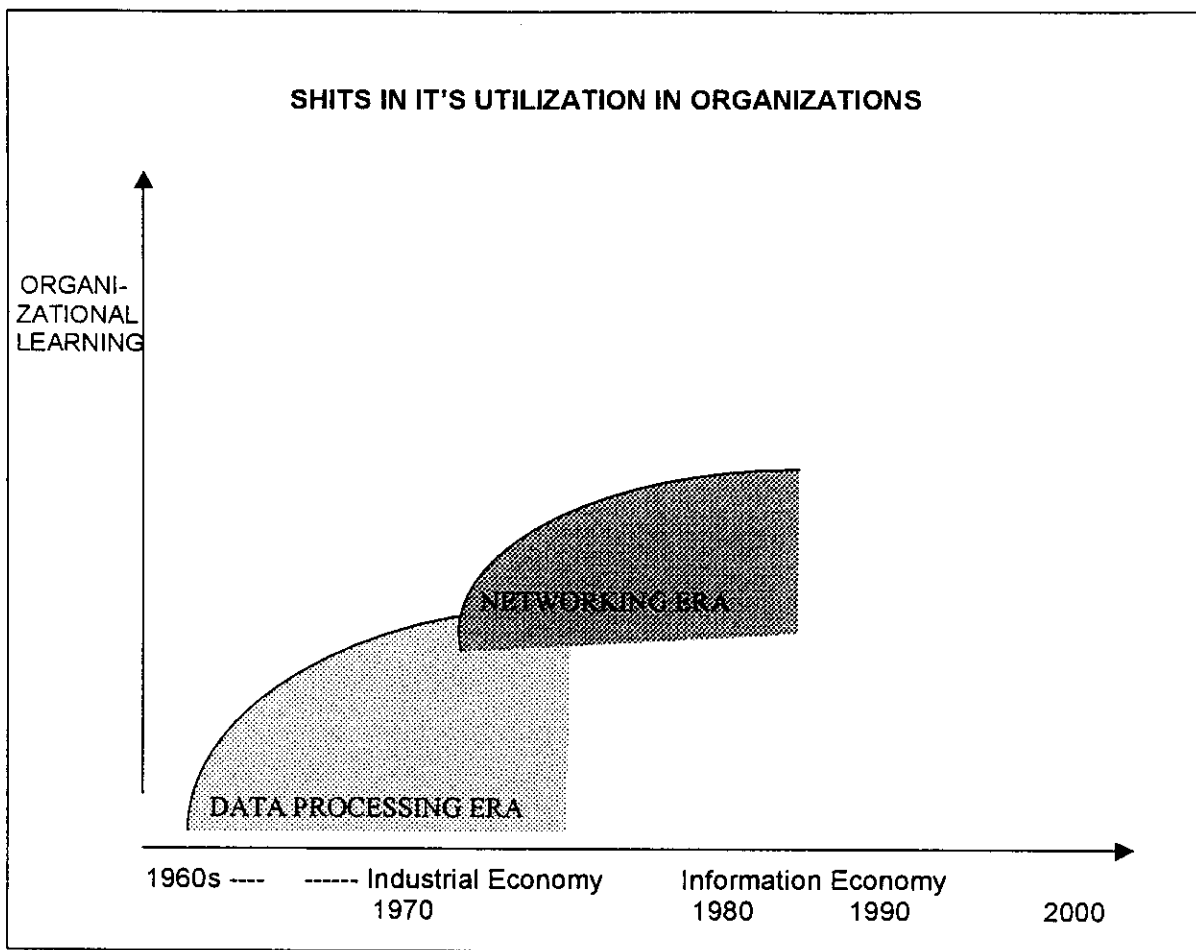
Partnership between higher learning institutions and other partners (NGOs, CSOs, public sector, private sector, communities and students) has strong communications implications (see the Figure on Partnership in Higher Education: Communications Implications). The ideal situation for a university is represented in the Figure on IT Types and Formats and the illustration on the Detailed architecture of an expert system. But we know that in real life there are no ideal situations. Partnerships should be revisited, re-invented on a permanent basis. It is in the nature of education to constantly question its objectives and the output of its programs. Partnership contracted by higher learning institutions follow the same pattern of being endlessly and critically appraised. Educational programs should not last 5 years without being evaluated, redesigned, re-tested and critically appraised by students, faculty, the private sector and administrators. What is relevant this year may become completely outdated next year especially in the area of telematics, multimedia, light speed means of transmission and information technology.

The African University is so to speak condemned to constantly appraise itself or else run the risk of rapidly sinking into the abyss of prehistory.

The social turmoil we are witnessing in our campuses is an expression of this constant struggle between old and new, relevance and irrelevance, status quo and @ evolution. African university administrators may have become too old perhaps to understand the times they are living in and how to lead their students' populations and faculty colleagues. Given their training and scientific records a sizeable number of vice-chancellors are not fit for the job. Most of them are selected by Heads of States on the basis of political preference not academic merit and ability to lead their institutions and people in the complex world of the future.

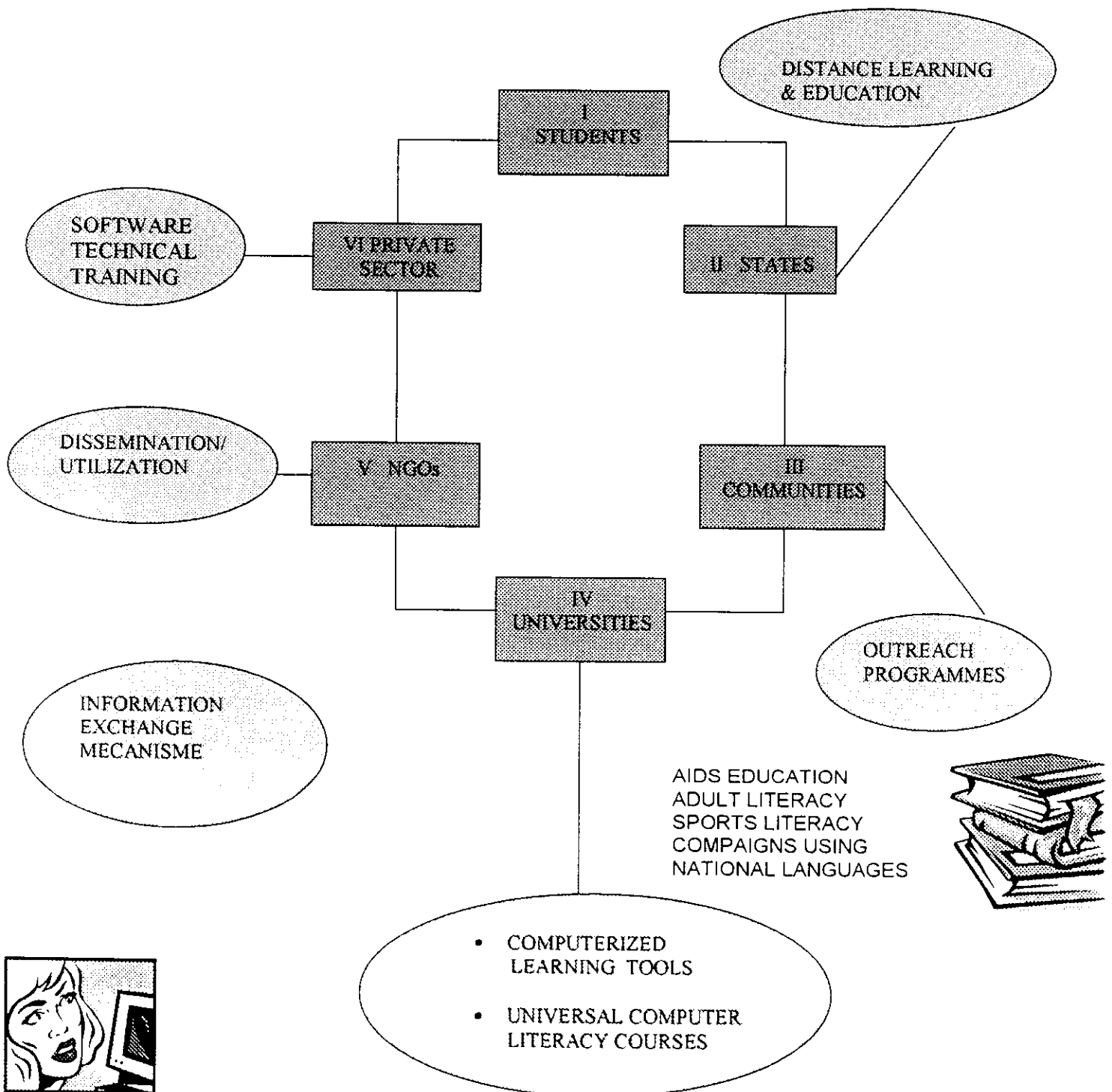
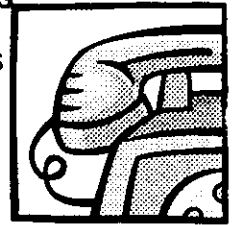
This exploratory exercise will not end with a conclusion. Most African universities still belong to the past. They are a vivid legacy of colonial adventurism and African subservience despite their modern look. They may have computer labs, teach research methodologies and manipulate artificial intelligence. But they still function, behave and think in an artificial manner, outside the realm of history and the future. Africa is yearning for new and bold partnerships that would reconcile her with her past, present and future destiny.





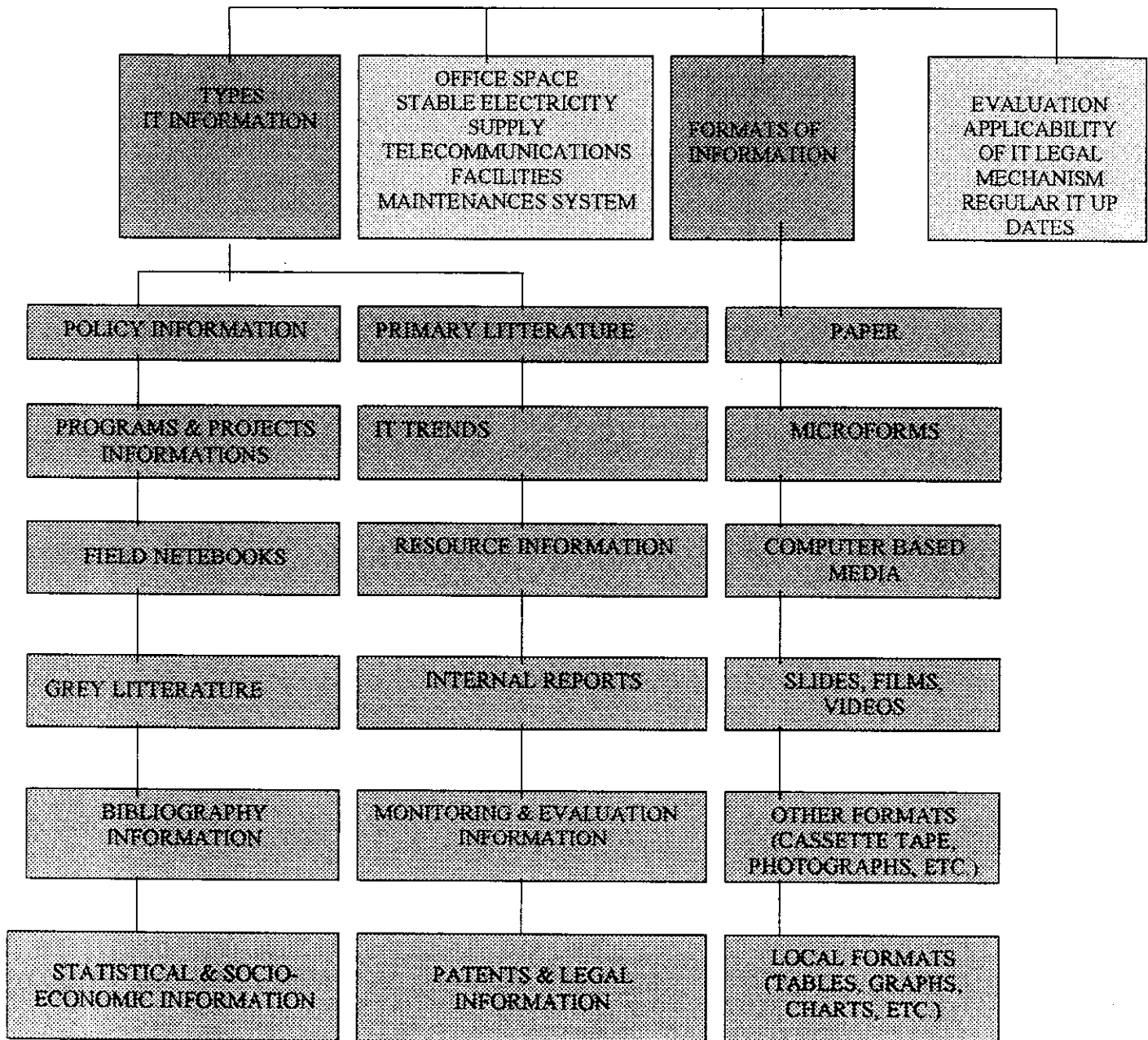
PARTNERSHIPS IN HIGHER EDUCATION: COMMUNICATIONS IMPLICATIONS

ACCESS TO DATA BANKS
DEDICATED SATELLITES
& SERVICES

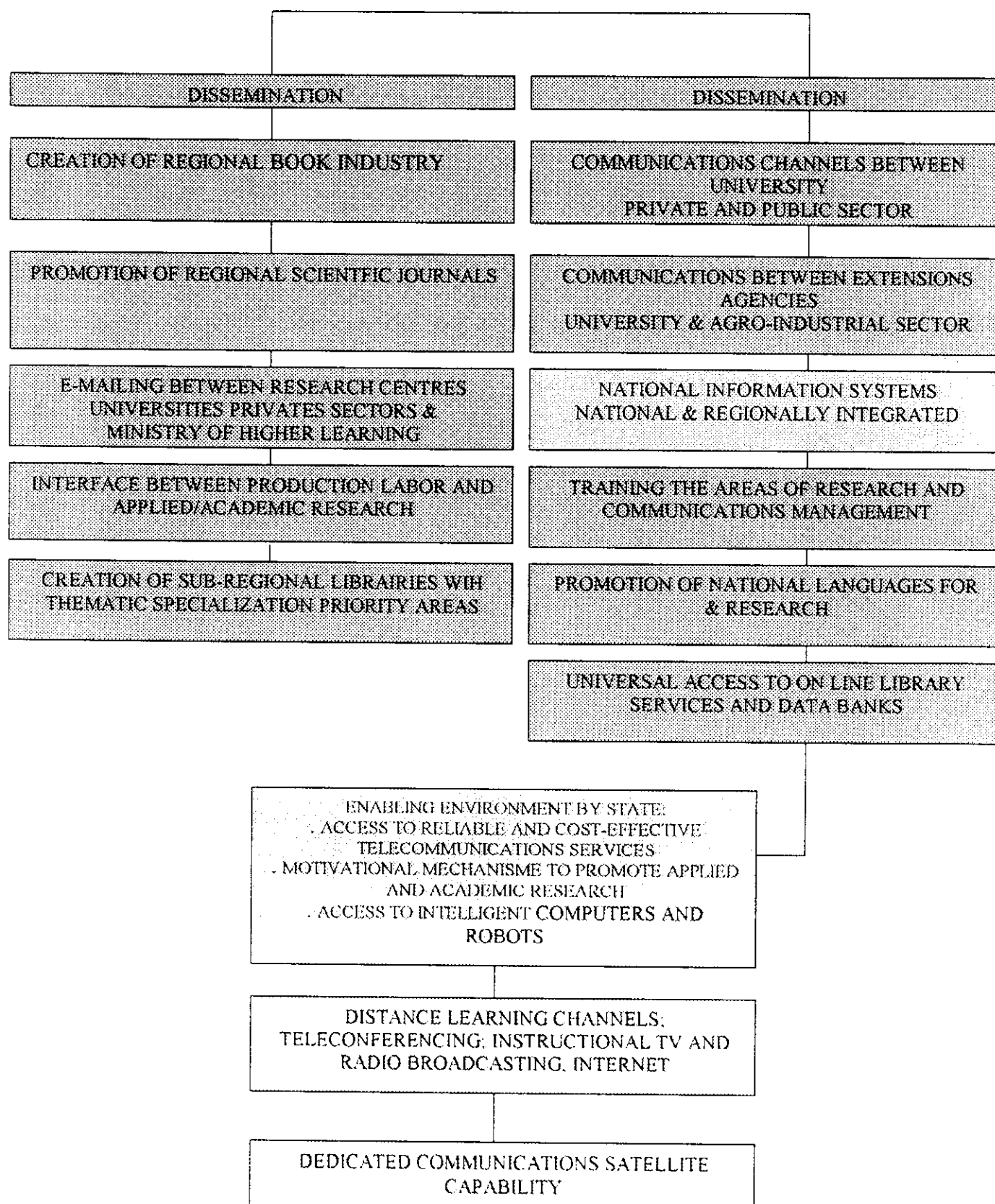


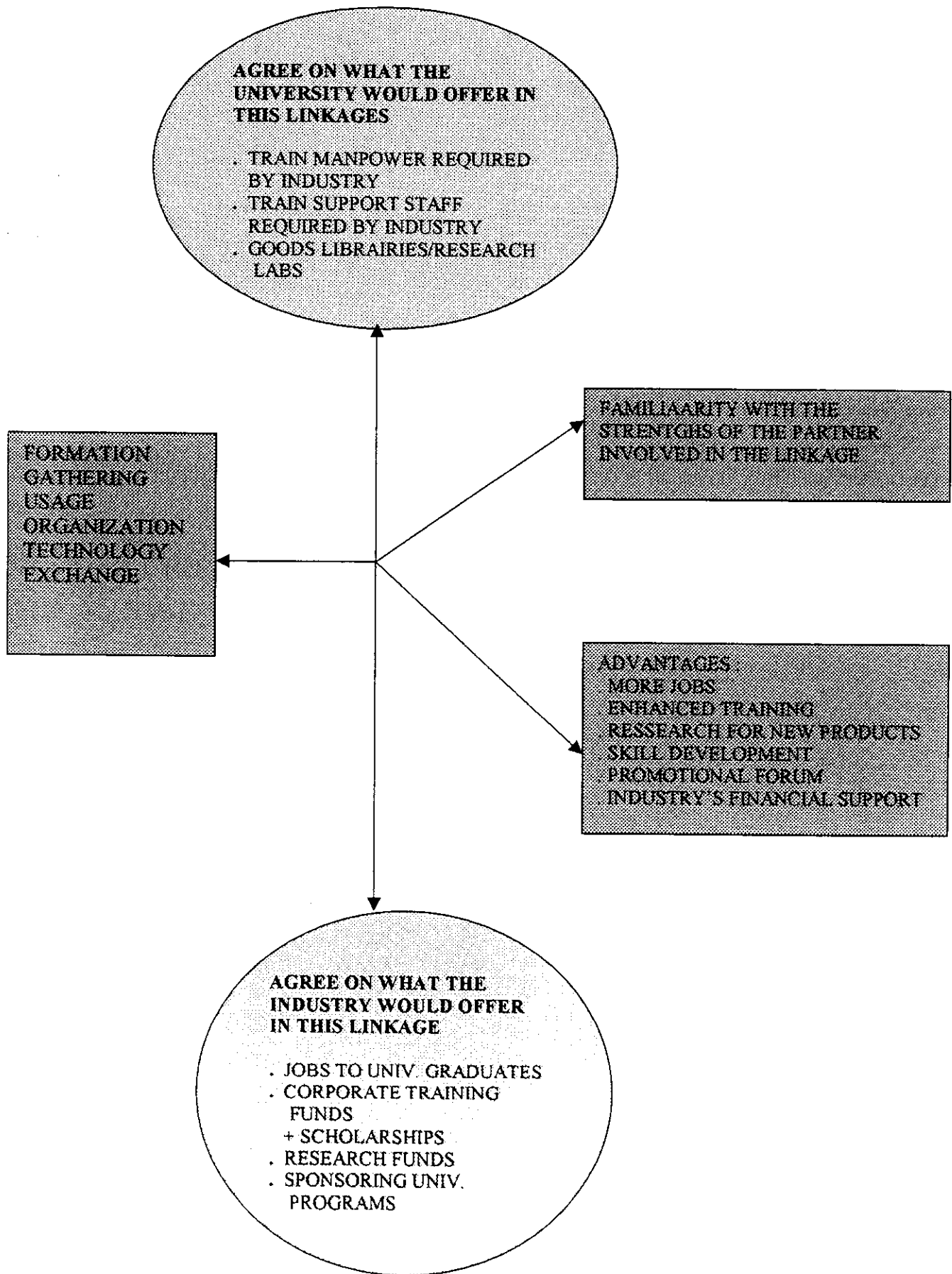
TELECONFERENCING
ADEQUATE SOFTWARE
SPECIALIZED MANPOWER

INFORMATION TECHNOLOGY: TYPES AND FORMATS



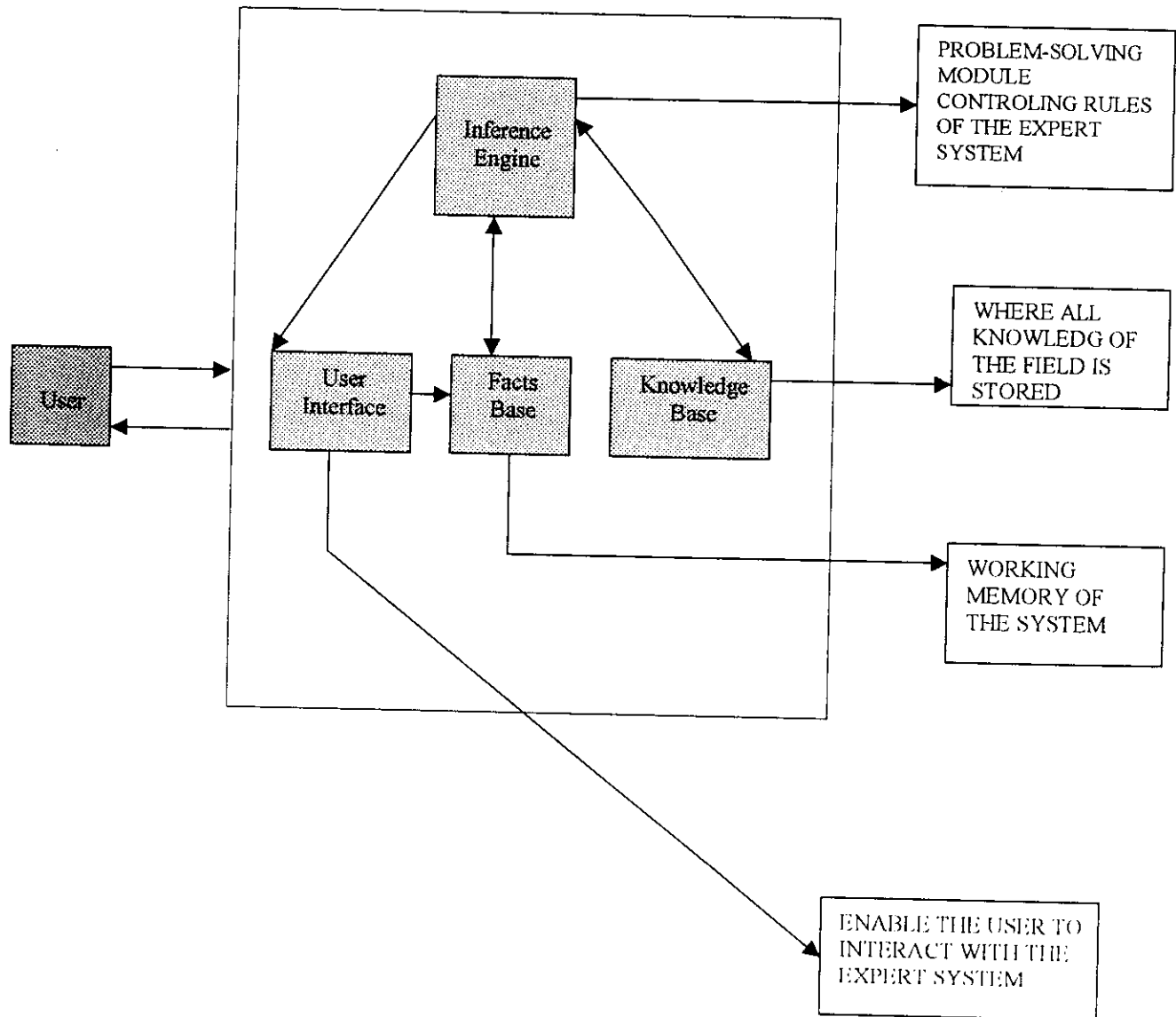
STI DISSEMINATION, UTILIZATION & PLANNING STRATEGY





PARTNERSHIP-DEVELOPMENT RELATIONSHIPS OF MUTUAL

DETAILED ARCHITECTURE OF AN EXPERT SYSTEM



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