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ABSTRACT

For over 30 years the installation of information systems has been promoted in developing nations by international organizations and international consultancies in order to transfer technical expertise from the industrialized countries to the Third World. While some have questioned the value of indiscriminately transferring scientific and technical information without ensuring some means of adapting the new techniques to local conditions, others welcome the social and economic development that technological advancement can offer. There are, however, a multitude of factors that affect programs for the transfer of information technology and the development of information networks including: (1) the negotiation process; (2) the physical environment; (3) the political and economic infrastructure of the receiving country; (4) technological assimilation and support training; (5) administrative support; and (6) training and support for local staff. Attention to these factors can lessen the chances of failure for international cooperation, but they cannot by themselves guarantee success. (49 references) (DB)

SOME PROBLEMS INVOLVED IN THE INSTALLATION OF ADVANCED INFORMATION SYSTEMS IN DEVELOPING COUNTRIES

by

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1. INTRODUCTION

A comprehensive study has been published by Parker (1) on Unesco's efforts to assist developing countries, by using consultancies and projects in the area of documentation and information systems. Similar studies of other international organisations and project finance agencies would be useful to give a more complete picture of the scale of the work carried out over more than thirty years in promoting the installation of information systems in several countries.

One of the new studies to analyse the effectiveness of international consultancies was carried out by Ferreira (2), who studied scientific and technical information in Brazil. His study includes some evaluation of the consultancies' success calculated with reference to a model which takes account of the effort spent in identifying the problem and suggesting solutions. This model, which may be taken as standard, studies the consultancy process in itself, but does not consider the subsequent developments. It is this, in fact, which provides the most valuable indication of the extent to which a consultancy or project has had positive effects on the development of information structures, or whether they were isolated actions, with no follow up.

It is a complex question; many authors have raised the problem of installing information systems in developing countries or have analysed the difficulties involved in setting up effective mechanisms to transfer technical expertise from the industrialised countries to the Third-World.

Some have questioned the value of indiscriminately transferring scientific and technical information without ensuring some means of adapting the new techniques to local conditions. Slogans like "Information is power" or "information is the basis of development" should be re-examined and, according to Saracevic (7), need to be proved with regard to the structures in place in developing countries. The concept of information services in these countries has been discussed in detail by Saracevic et al. (8) and by Keren and Harmon (9).

Moreover, the selection of censoring of information by the suppliers, who are often unfamiliar with conditions in the receiving country (when it is not a case of still more dubious motivations) seems indefensible. (10)

One attempt to establish direct links between the countries of the southern hemisphere, allowing the exchange of suitable or

adapted technology and facilitating business transactions, which is worthy of mention is the TIPS project (Technological Information Pilot System) (11). It will be a few years before the results of this can be evaluated with any reliability.

An analysis, however superficial and imprecise, aimed at identifying the consultancies and projects which have really brought about positive results and have survived the economic difficulties and political storms of developing countries would succeed in listing only a very few.

The aim of this study is to analyse some of the determining factors in the success or failure of projects or consultancies, in order to propose a list of factors or conditions which seem to be indispensible if an international cooperation programme is to have any hope of success. If all or any of these conditions are unfulfilled the prognosis cannot be encouraging. It should, however, be clearly stated that the proposed conditions must be respected if a project or consultancy mission is to produce favourable results, but they can in no way guarantee such results.

2. SOME STATEMENTS, QUESTIONS AND DOUBTS

It is generally admitted that social development is inseparable from economic development (12), (13). Moreover, economic development is also seen as a consequence of scientific and technical development (14-16), which can only be achieved if there is a solid base of modern technology to provide a direction for national policies (17-22).

According to some authors it would be better to replace the expressions "developing countries" and "developed countries" with "dependent countries" and "dominant countries" respectively (23-28). In economic jargon the terms "central countries" and "peripheral countries" are sometimes used. Might we one day speak of "marginal" or "marginalised" countries? The question remains to be answered.

In Vitro's opinion (30), the gradual transfer of information from the rich countries to the developing countries will eventually reduce the gap between the northern and southern hemispheres.

Menou (31) emphasises and backs up this opinion by stating "that there is no other option, as regards a strategy for developing the information services industry, than that of making the greatest possible use of modern technology".

Although these points of view are basically incontestable, they seem somewhat over-optimistic and even utopian, given the complexity of the problem. In fact, over the last few years, the gap between rich and poor countries has been increasing.

Parker (32) gives a brief but rigorous analysis of the reasons underlying Unesco's inability at the time "to propose directions for the formulation and implementation of national information policies of for the roles and functions of the focal points in this field."

It is worth mentioning, in passing, that internal conflicts like, for example, the competition between NATIS and UNISIST, have occasionally had negative repercussions on programmes in certain countries. In this case, however, the creation of the General Information Programme has been a happy ending to the story.

Dosa (33) gives a pertinent reminder that "development cannot be reduced to economic growth; it is in fact a process whose aim is to satisfy human needs both of a material and non-material nature, through the transformation of structures." She also refers to a study by the Dag Hammarskjold Foundation and The International Foundation for Development Alternatives, which

draws attention to the fact that "the flow of capital into developing countries is in danger of excluding (from the development process) some eight hundred million people who live in the most abject poverty."

In a recent article, Vitro has emphasised the need to reconsider the role which science and technology can play in development (34). Development should in fact be considered in a new light. We should think of integrated development (in terms of social, economic, cultural and technological factors), adapted to the local situation, as both a starting point and a goal to be attained, within the framework of international cooperation. We should therefore congratulate the United Nations on their recent decision to put a considerable proportion of the funds set aside for cooperation with Brazil towards the consolidation and improvement of the infrastructure in the 'Favela de la Rocinha', the largest - and one of the poorest - of the shanty towns in Rio de Janeiro, whilst continuing to support the most advanced development projects.

It is also worth mentioning that certain programmes and projects whose aim is to install information systems on a so-called national scale by pouring money, obtained from high interest

loans, into third-world countries have in reality only achieved an increase in the burden of debt (35). Moreover, one may quite legitimately doubt the real intentions which may be hiding behind a mask of aid and generous, disinterested support from certain governments, in the installation of information systems for scientific, technical, economic and social development. Might there not be, in some cases, a hidden intention to create markets for equipment and products manufactured by the donor country; to further economic domination, in other words?

The recent 'world-wide' protest against the 'destruction' of the Amazonian rain-forest only increases such doubts, when one considers that more than half of the area 'destroyed' over the last twenty years is the result of projects run by foreign companies or multinationals based in industrialised countries. It is a strange coincidence that the countries which are the most vociferous against these 'attacks on the ecological balance' are precisely those which are chiefly responsible for the hole in the ozone layer.

The receiving countries can, on the other hand, effectively neutralise the development efforts which they have encouraged if they take excessively protectionist measures.

The interests at stake in the bid to control information at the dawn of this new era are immense (34-43), and a new awareness is beginning to develop.

Parker (44) remarks that "the explosion of interest in the field of information, from other international agencies, multinational groups, governments and their agencies and thousands of commercial enterprises or university and research institutions, and even individuals, will have more influence on the future role of Unesco and on its influence in this field (information) than will the explosion of information itself."

The same applies to the long list of international organisations and cooperation agencies of various types, in the fields of science and technology. (45)

Several authors have tackled the problem of the transfer of technology and information (46), and have greatly contributed to an understanding of the problem. An examination - necessarily incomplete - of the reams of articles and papers dealing with the problems raised here, leaves one with the impression that we can only see the tip of the iceberg to understand properly the the effect of all the factors influencing the success of projects to

transfer information and to set up advanced information systems.

3. SOME DETERMINING FACTORS AND CONDITIONS

Before we come to the heart of the matter, we would like to state that we are optimistic about the enormous potential of the international organisations for transferring knowledge to developing countries and for establishing information systems.

In Unesco's case, the development of the ISIS, Mini-ISIS and Micro-ISIS systems, the work towards standardisation, the important documents published under the auspices of the General Information Programme and the RAMP programme are some examples of the sort of positive results we can expect from international cooperation. The INIS and AGRIS systems, developed by the International Agency for Atomic Energy (IAAE) and the United Nations Food and Agriculture organisation (FAO) respectively, and the MEDLARS/MEDLINE system which was a result of cooperation between the United States national medical library and the Panamerican Health Organisation which created the regional medical library at Sao Paulo, are further examples - among others - of the possiblities arising from cooperation between industrialised countries and and developing countries, with

obvious advantages for all involved.

We could mention many more consultancies and projects which have had concrete and positive results. Nevertheless, if one were to take the consultancies cited in the appendices to Parker's work (47) and analyse them one by one, the total number of those which have given rise to tangible practical results - and not just recommendations - would be quite small.

One might then ask why missions to formulate projects are not carried through to the completion of the project or why it is that, even if projects achieve their aims as long as the country is receiving outside aid, they very often collapse when this comes to an end.

In the light of what has been said so far, we can see that attention has been paid to the human aspects and especially to the qualities of the consultants and their relations with their opposite numbers (48-52). Other publications dealing with these same aspects can be cited to complete the list (53-55). The other factors mentioned, however, do not seem to have been thought worthy of much attention by researchers.

In an earlier work (56), one of the authors of the present paper drew attention to some factors which were (a) technological, (b) related to having and effect on the difficulties involved in setting up information networks. Another of the authors of this paper divided the factors likely to affect the transfer of information technology into the following categories: (a) economic, (b) staff-related, (c) physical and ecological, (d) cultural, demographic and social, (e) political, and (f) related to the infrastructure (57).

In the remaining part of this paper we will attempt to draw up a list - which will naturally be incomplete - of the conditions which seem important if we are to be able to hope for some positive results from international cooperation work. Even if our assertions may sometimes appear to be generalisations, the comments and observations accompanying some of the points in this list are the fruit of real experience gained on the ground in Brazil.

They are in fact guides which should make it possible to define an administrative model applicable to precise cases or which could be applied at a national or international scale.

Factors and conditions preceding any negociations

- Absolute harmony between the political priorities of the receiving country and the interests or actions outlined in the donor organisation's programme.

It is worth mentioning that the programmes of activities - and therefore, the allocation of funds - are decided at the international organisations' General Meetings, at which representatives of the member countries are present. More attention should be paid to the qualifications and expertise of the national representatives selected by the governments.

-The availability of channels of communication duly approved by both parties.

Respecting the hierarchy and the proper channels of communication can prolong the negociation process, but is vital for a legitimate agreement. Similarly, those responsible for the negociations should be duly approved.

-The identification of the points in each party's action programme which are associated with the mission or project which

is the object or the aid or cooperation under negociation.

It goes without saying that the duration of the actions negociated may not excede either the scope of the parties' plans or programmes or the total funds available.

Factors and conditions related to the environment

-The political stability of the receiving country.

-The action or project must be in harmony with the socio-economic and cultural conditions within which it is to operate.

Due attention must be paid to the tensions which could result from too sudden a change in the living or working conditions of a section of the community, or from investments which only benfit part of the community to the detriment of the rest of the population.

-The products or results of the projects must provide sufficient benefit for the target community. The results must make a positive contribution towards improving the users' living or working conditions.

Factors and conditions relating to the infrastructure

-Ensuring that the suggested technologicaal innovations can be carried out in the conditions already existing or to be created.

Modern information systems must make use of the facilities offered by telecommunications, but it is pointless to hope to benefit from such facilities within the project if they are not available elsewhere in the country. It might be possible, if need be, to ask the receiving country to take certain preparatory measures to back up the existing infrastructure before commencing the action or project.
It should not, however, be forgotten that the project or action is intended to initiate or accelerate steady and constant development and not to solve a small, short-term problem.

-The equipment brought in by international aid or cooperation must be suitable for local conditions.

It is useless to import very advanced equipment for which spare parts cannot be found, if needed, or which cannot be maintained in the country concerned.

Factors and conditions relating to institutions

-The institution receiving the aid must have the appropriate position within the hierarchy of the parent institution.

-Official support for the accomplishment of the new functions and responsibilities which may result from the action or project is indispensible for the institution receiving international aid. It is useless to put effort into setting up a centre of excellence which does not have the support of the authorities to guarantee its new functions and responsibilities and to ensure its continuity and eventual expansion, by means of the necessary legislation.

-Other national institutions which carry out complementary or similar activities should be integrated into the project.

There is no need to insist on the importance of integration and standardisation in the area of teleinformatics and information networks.

Technological factors and conditions

-Local staff must be able to assimilate the new technology brought in or developed by the project.

-There must be a real possibility of adapting new technology to local conditions.

New technology must be put into use in progressive stages. One should not pass on to the next stage without checking that the results of the previous stage have been consolidated.

-The possibility of using suitable or adapted technology which already exists in the area should be analysed before deciding to import the equivalent equipment.

The project or action should encourage the use of local resources.

Economic factors and conditions

-To ensure, before beginning any action, that the funds which the two parties are to devote to the project really exist and will be available when and as planned.
Delays in the availability of funds can endanger the project.

-The financial contributions of both parties should be carefully studied and set out clearly, as should the conditions for spending it effectively.

Inflationary effects should be avoided as should burdensome conditions for loan repayment which could neutralise the positive effects of the project.

-International money should not be used for paying local staff.

At the end of the project there is a risk of running out of money to pay the staff.

-Not to subscribe to publications or enter into maintenance contracts using international money, without reasonable certainty of being able to continue the same after the end of the project.

Human factors and conditions

(For factors involving consultants and experts see the recommendations set out by the authors cited at the beginning of this section.)

-The local official responsible for the execution of the project must have the necessary support from the authorities to accomplish the work.

-The local staff must have the necessary level of expertise to master the new skills and technology which the project may involve.

-The local staff, at all levels, must be assured, as far as possible, that the necessary financial and working conditions exist to guarantee their continued employment after the end of the project.

-The project must provide the necessary training to enable the local staff to absorb the new knowledge and techniques involved in the project thus ensuring that the services function well and eventually expand.

-The project must ensure that users - whether individuals or institutions - are involved in the process of evaluating the services.

Administrative factors and conditions

-Guarantees of the existence of the necessary conditions and mechanisms to oversee and control all the stages planned and to evaluate the results.

-Guarantees of the existance of the necessary conditions and mechanisms to control expenditure and calculate running costs, as well as to evaluate the benefits and utility of the results.

4. CONCLUSION

If these conditions are observed the chances of success for international projects will be increased. Checking the real conditions for the continuity of the actions undertaken should lead to a reduction in the number of reports which are not followed up and systems which collapse once the international cooperation comes to an end, bringing considerable savings of effort and money.

In the proposed model the donor organisation and the receiving country are seen as complementary to each other. New conditions for development should emerge from the harmonious integration of their efforts and resources.

in conclusion, we repeat what was said above: although these conditions can lessen the chances of international cooperation failing, alone they cannot be considered a guarantee of success. For that to be possible one decisive element must be taken into consideration: the will to succeed in all involved.

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