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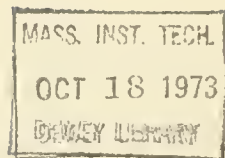
Some Obstacles to Regional Cooperation
in Central America for the Joint Development
of Computer Technology Programs

Ramón C. Barquín

679-73

October 1973

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INTRODUCTION:

There has been a very marked trend towards political and economic integration throughout the whole world within the last few decades, as indicated by the emergence of such organizations as the European Economic Community (EEC), the European Free Trade Association (EFTA), Latin American Free Trade Association (LAFTA), East African Common Market (EACM), the Central American Common Market (CACM), and others. Whether the reason for this movement lies in a natural response of groups of nations to the economic pressures of the superpowers, or as the route to international harmony, or as an instrument of accelerated development, or other reasons or combinations of reasons, it is obviously an important phenomenon affecting nations and their dealings with one another.

At the same time economic development has been the stated primary goal of most governments in the less advanced countries. While keeping in mind some of the observations and warnings made by authors like Furtado and Gunder Frank¹, it is nonetheless through the rapid development of the economic resources of a nation that many of the tragic ills besieging the poorer countries may be attenuated or eventually eliminated. Technology has a very important function in bringing about development, and computer technology in specific, even more so. The United Nations, through its Advisory Committee for the Application of Science and Technology to Development (ACAST) has said:

"Technology has an essential role to play in reducing the disparities that exist between the developing countries and the developed ones. Computers are especially important in this context, because so many computer applications have a direct bearing on some of the main facets of the development process and reflect certain aspects of the technology that has facilitated the growth of the economically advanced countries."²

It becomes, therefore, important to look at computer technology not only at the local, or national level, but also from a regional standpoint and assess the costs and benefits regional development through multinational projects and other programs. Some advantages to be gained by such undertakings as the creation of uniform systems, common standards, some centralization of hardware, etc. are obvious from the point of view of cost reduction and a more efficient utilization of the scarce skilled manpower available. Additional schemes and projects, as well as more detail on the latter, can be found in other works on the subject.³ It is generally accepted, however sceptical the actual acceptance might seem, that benefits are to be accrued by such regional cooperation and undertaking of common or joint programs. Rather than dwell on the gains and advantages to be had, the purpose of this work is to deal with the reasons that often inject scepticism into any plans for cooperation at a regional level, that is: the obstacles to regional cooperation. It will be attempted to identify first those obstacles of a general nature which will tend to appear independently of the nature of the project involved. Secondly, those that are specifically related to computer technology problems.

So as to present a clear and orderly panorama in the analysis at hand, one group of nations, or region, had to be chosen. Central America was selected for a number of rather strong reasons. First, the geographical unity and continuity, coupled with the relative homogeneity of race, economics, culture, politics, and other factors. Second, the similar situation concerning the computational levels of the five countries. Lastly, the long history and relative success of integration already present in Central America. All of these factors together presented a compelling argument for choosing Central America as the object of the study. One additional reason of force which became determinant was the fact that Central America, through its many existing instruments of integration, presents the most probable theater for such joint programs and cooperation to take place with a measure of success in Latin America.

Background on the Process of Central American Integration:

The five countries⁴ that make up the Central American Common Market (CACM) are united by very tight bonds dating from a uniform administration organized by the Spanish Crown. The zone was administered as a unit under the Capitanía General del Reino de Guatemala for the major part of the colonial period. Upon independence in 1821 the five countries formed a Federation that existed as such for only fifteen years. Many attempts followed each other in the aftermath of this to form anew the Federation, none of which met with much success over a period spanning more than a century.

After World War II the possibility of again uniting the countries in the visage of the old Federation was viewed with renewed interest, and many hands helped to rekindle the fires of integration. Given to the arduous task of bringing it about, the regimes of the five nations agreed to conversations on the matters. Under great pressures to develop their countries, and the region, economically, it was a unanimous decision to search for regional unity through economic cooperation rather than political cooperation.

In 1951 the Organization of Central American States (ODECA) was created with the aid of the United Nation's Economic Commission for Latin America (ECLA). That same year the Committee for the Economic Cooperation in the Central American Isthmus was formed. From 1950 on the idea of a Central American Common Market became prevalent, and treaties

to that effect were signed in 1958 and 1960. The last one of these was the General Treaty for the Economic Integration of Central America, signed in Managua in 1960, which replaced the 1958 agreement and gave the guidelines for the establishment of free trade within the region. In 1964, upon Costa Rica's ratification of the General Treaty, the Central American Common Market was born.⁵

Three later accords completed the structure of the CACM, although there are still others which refer to different aspects of regional integration. The three were: Convention on Integrated Industries, Convention on Uniform Fiscal Incentives for Industrial Development, and Convention for Monetary Unity. The first of these attempted to establish the tenet that the CACM, due to its size not permitting the efficient existence of more than one production enterprise to take advantage of economies of scale, should benefit from the establishment of special monopolies. The second accord created a system of fiscal incentives to reward certain types of industries understood to be more beneficial for the development of the region. The third one had as its objective the monetary union of Central America, and established the Central American Peso (C\$A) which is used in most regional transactions and operations, and which enjoys parity with the U.S. dollar.

The establishment of a Customs and Monetary Union, together with a harmonizing of fiscal policies, should obtain greater degree of integration in the region. At the same time, this will allow the strengthening of commercial and financial relations with neighboring countries, such as Mexico, which has already established a plan cooperating with Central

American integration, and has bought a number of the bonds issued by the Bank for Central American Economic Integration (BCIE). In the case of Panama, in addition to having signed bilateral treaties with Costa Rica and Nicaragua, it has now joined ODECA and many other associated institutions, although not the CACM. The probabilities of it joining some time in the future seem quite good, and even the possible expansion of the system into the Caribbean is not considered out of the question.⁶ Also, at the Punta del Este 1967 Meeting of Latin American Presidents, steps were taken towards the eventual creation of a Latin American Common Market bringing together LAFTA and the CACM. A directive was passed to LAFTA's Permanent Executive Council instructing it to establish the necessary communications with corresponding organs within the CACM for future discussion.

The effects of regional integration, from the signing of the General Treaty to date have been quite healthy for the overall economic development of the region. Intraregional trade, specifically, has gone from \$32.7 million in 1960 to \$258.3 million in 1968. The 1969 war between El Salvador and Honduras brought about a sudden stop in the growth trends and dynamism of this intraregional trade, but in spite of this and with most problems still unresolved, by 1970 there had been a 20% increase in regional trade growth. Today, intraregional imports account for 24% of the total, and intraregional exports make for 27.2% of all exports of the five countries.⁷

There is no doubt that the El Salvador-Honduras War brought about a

deep crisis within the CACM that has placed Honduras almost totally outside the system. Nonetheless, there are additional factors that contribute to this situation, and which shed some necessary light on certain aspects of the CACM that forces qualification of its success. The most important one of these is the fact that not all countries seem to have benefitted equally from the free trade situation. Honduras, for example, considers that it has gained much less than the more industrialized Guatemala and El Salvador. Costa Rica, with the highest per capita consumption, also lays claim to a similar argument. Nicaragua, at times ostracized for the stronghand political tactics of the Somoza family, decries the fact of having nary a site of regional organization.

All in all, however, the situation of Central American integration is favorable with respect to similar attempts in Latin America and other parts of the world.

TABLE 1

Intra-Central American Trade
1950-1960

<u>YEAR</u>	<u>Total</u> <u>(U.S. \$M)</u>	<u>Percentage increase</u> <u>over previous year</u>
1950	8.3	
1951	9.7	17.4
1952	10.3	5.6
1953	11.4	10.6
1954	13.4	17.9
1955	12.8	-4.7
1956	13.5	5.4
1957	16.6	22.8
1958	20.5	24.1
1959	28.0	36.3
1960	32.7	16.7
1961	36.8	12.6
1962	50.4	36.9
1963	72.1	40.3
1964	106.4	41.6
1965	135.9	27.7
1966	176.0	29.5
1967	213.6	21.3

SOURCE: Cochrane (1969) p.117.

Structure of the Central American Common Market (CACM):

There are a varied number of instrumental organisms which integrate the Central American Common Market directly. At the same time, many other non-official entities also comprise the overall Movement for Central American Integration. Figure 1 gives a fairly accurate view of the main organizations which constitute the Movement. A brief description of each one of these is now in order:

Organization of Central American States (ODECA)

The San Salvador Charter created ODECA, and according to its Article 21, became an effective organism on January 9, 1952. Its supreme command lies in the Meetings of the Central American Presidents, whenever they occur, and all else is subordinated to this. The Meeting of Foreign Ministers is the main directing organism, however, and this event takes place every two years. The Central American Office, which is situated in San Salvador, is the General Secretariat of the Organization and therefore its actual ruling body. ODECA was greatly strengthened and expanded by the modifications to the San Salvador Charter made in 1962 during the 6th Extraordinary Meeting of Foreign Ministers in Panama. A number of additional organisms were created, and the doors were left open for the eventual membership of Panama within the Organization. In addition, a Central American Court of Justice was established, as well as the Central American Economic Council, a Legislative Council, and others to function within ODECA. Due to the importance of the economic issue, the Central American Economic Council would later become pivotal in the formation of the CACM.

Secretariat for the General Treaty of Central American Economic Integration (SIECA)

The General Treaty for the Economic Integration of Central America in 1960, determined the creation of SIECA, which soon became the cornerstone for the Common Market. Its main functions are to supervise the correct application of the General Treaty, and to implement the directives of the Central American Economic Council, and the Executive Council of ODECA. SIECA is permanently located in Guatemala City, and is headed by a Secretary General with a three year appointive term. The Economic Council, which is integrated by the Ministers of Finance of the five countries, sets down economic policy and guidelines for SIECA to follow. SIECA also has been entrusted with all forms of direct relations with other organizations of regional integration, such as LAFTA, EEC, etc.

Central American Bank for Economic Integration (BCIE)

Created by the 1960 Meeting of the CCE in Managua, the BCIE has been in operations with physical domicile in Tegucigalpa since May 1961. The initial authorized capital of U.S.\$16 million was recruited at \$4 million per country. (Costa Rica had not yet signed the protocol.) Its main objective is to promote integration and balanced economic development within the member countries. In order to accomplish its mission adequately it tends to six specific investment areas:

- 1.- Infrastructure projects.
- 2.- Long term investment in regional industries.
- 3.- Coordinated projects in special agricultural areas.
- 4.- Certain financing of enterprises which need to expand with overall benefit for the region.
- 5.- Financing of services necessary for the better functioning of CACM.
- 6.- Other projects that would tend to create economic complementation and increase intraregional trade.

In 1966 an Integration Fund was established to finance projects specially directed to aiding integration.

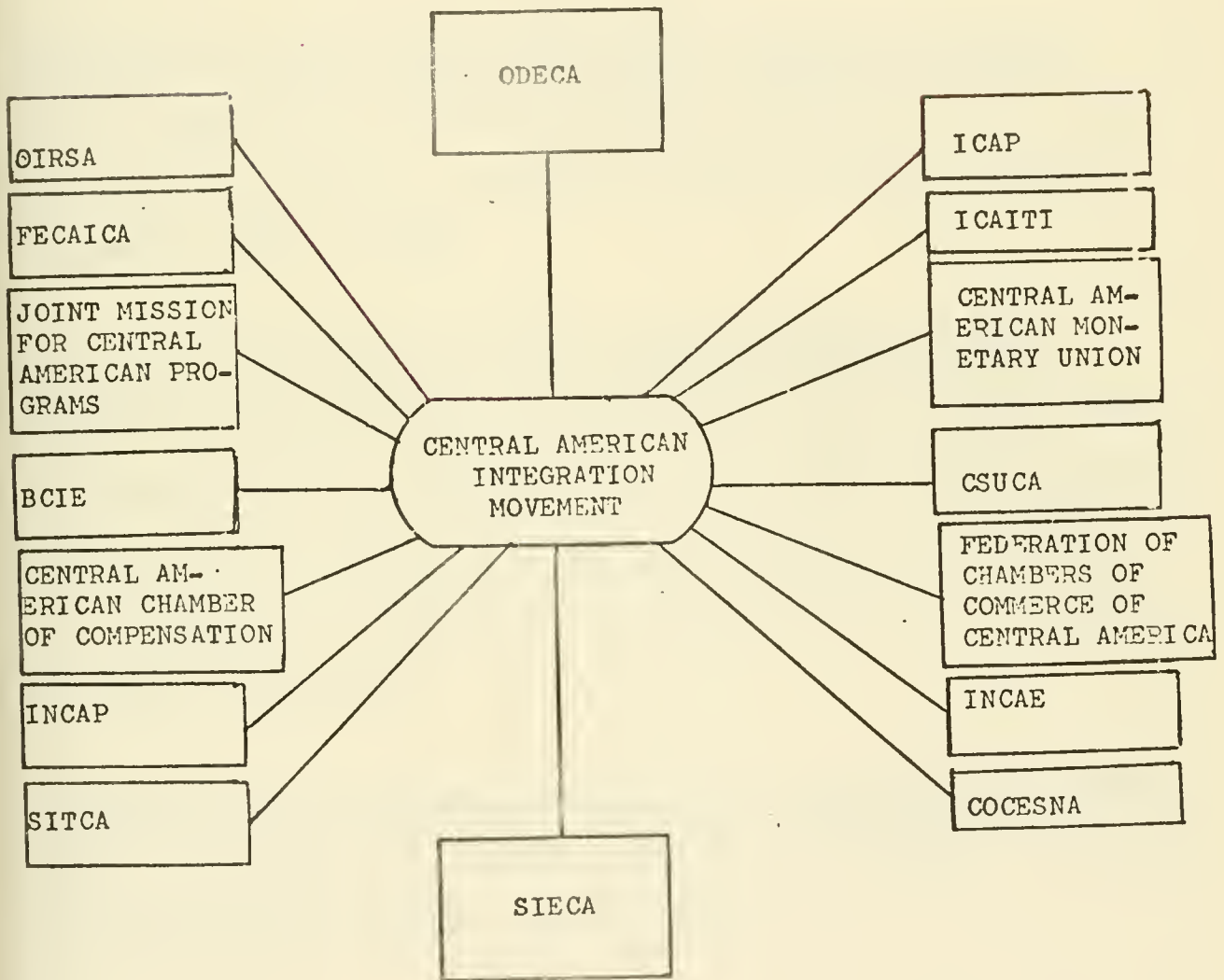
At the end of fiscal 1971, the BCIE had authorized capital amounting to \$60 million, and assets of \$317 million. Over its lifetime it has loaned \$271.4 million through 400 transactions, which is approximately 15% of the region's total investment.⁸

Central American Monetary Union

The Agreement for the Establishment of the Central American Monetary Unity was signed in San Salvador in 1964. It attempts to promote uniformity in the exchanges, provide financial assistance to correct temporary balance of payment deficits, expand the Central American multilateral compensation system, create conditions for the coordination of fiscal and monetary policy, and to establish a network for permanent aid and consultation.

FIGURE 1

CENTRAL AMERICAN INTEGRATION



Regional International Organism for Agricultural Health (OIRSA)

Coordinates all regional programs dealing with agricultural health.

Does research in related topics and provides assistance to the member countries within their specialty.

Federation of Central American Industrial Association (FECAICA)

It is a federation of the many industrial associations of the Central American countries. It serves as liaison and policy guidance organism to BCIE and SIECA.

Institute of Nutrition for Central America and Panama (INCAP)

A regional organization supported by public and private grants, functioning adjunct though independently of the Universidad de San Carlos in Guatemala, and doing work in nutrition studies. It is renowned for its development of INCAPARINA, a highly nutritional food complement now in use extensively.

Secretariat for the Touristic Integration of Central America (SITCA)

Coordinates programs to facilitate tourism in the region, and promote the same within and outside Central America.

Central American Institute of Public Administration (ICAP)

Permanently situated in Costa Rica, it provides a higher center of education for public administrators, offering programs equivalent to Master's degrees in public administration.

Central American Institute of Research and Industrial Technology (ICAITI)

Initially organized in 1955, it has a most important function in the development and adaptation of technology to the needs of the region.

Central American Superior University Council (CSUCA)

Composed by the Rectors (Presidents) of the five national universities, it coordinates regional assistance in education at the university level by providing guidance and instrumenting educational aid from outside the region also.

Central American Institute of Business Administration (INCAE)

Sitting on the outskirts of Managua, INCAE has been awarding MBA's for the last five years. Administered and run with strong assistance from the Harvard Business School, the Institute's program of studies is extremely attractive to Central American businessmen seeking to benefit from good technical education in the field of management and business administration.⁹

Central American Corporation of Air Navigation Services (COCESNA)

Coordinates the air traffic and navigation programs within the Central American region. It is situated in Tegucigalpa.

These are some of the presently existing organisms of Central American integration. Their functioning, and their manner of emergence, yields some insights as to the overall process of integration.

An Overview of the Computer Industry in Central America:

Central America has, as of today, 106 computer installations¹¹ divided into 96 of small size and 10 of medium capacity. That is, about 94.4% of the computers are small in capacity, versus 5.6% medium, and no large computers at all. This compares, overall, with the rest of Latin America by presenting a pronounced bias towards the smaller end of the computer spectrum. Latin America as a whole has a distribution of 73%, 23% and 4% according to the three categories explained. The region as a whole accounts for approximately 3.3% of the number of computers installed in Latin America, and some less than that according to the dollar amount of installed equipment. The computers-to-people and computers-to-G.N.P. ratios, however, are slightly higher than the Latin American averages, with Costa Rica having the highest computer-to-G.N.P. ratio in Latin America excluding Puerto Rico.

The distribution of these computers along their usage in the public or private sectors of the economy seems to be about 40% public to 60% private at present. Most of the systems, approximately 85%, are concentrated in the capital cities with but a mere percentage existing inland.¹² The largest computer installation in all of Central America, at present, is the one of SEDCA (Sistemas Electrónicos de Datos y Ciencias Administrativas) in San José, Costa Rica. It is the regional datacenter for the United Fruit Co., and utilizes an IBM 360/40 and an IBM 360/30 for its operations. The 360/40, with 96K of memory is the largest computer in

TABLE 2DATA PROCESSING WAGES

AVERAGE MONTHLY SALARIES IN U.S. DOLLARS

<u>COUNTRY</u>	<u>SYSTEMS ANALYST</u>	<u>COMPUTER PROGRAMMER</u>	<u>COMPUTER OPERATOR</u>	<u>KEYPUNCH OPERATOR</u>
Costa Rica	400.00	270.00	155.00	100.00
El Salvador	500.00	350.00	190.00	125.00
Guatemala	600.00	400.00	315.00	260.00
Honduras	500.00	425.00	275.00	150.00
Nicaragua	650.00	400.00	350.00	180.00

CACM	530.00	369.00	257.00	163.00

SOURCE: Personal research done by the author on an M.I.T.-sponsored investigation on the computer industry in Latin America. Information obtained directly from first-hand sources in the different countries. 10

TABLE 3COMPUTERS IN CENTRAL AMERICA

<u>COUNTRY</u>	<u>TOTAL COMPUTERS</u>	<u>SMALL</u> ¹¹	<u>MEDIUM</u> ¹¹	<u>LARGE</u> ¹¹	<u>COMPUTERS PER MILLION PEOPLE</u>	<u>COMPUTERS PER \$B OF G.N.P.</u>
Costa Rica	29	25	4	0	16.42	40.85
El Salvador	21	20	1	0	5.97	25.00
Guatemala	27	25	2	0	5.22	18.25
Honduras	16	14	2	0	6.20	28.27
Nicaragua	13	12	1	0	6.56	20.06

CACM	106	96	10	0	7.05	25.09

Panama*	28	20	8	0	19.79	35.26
Mexico*	573	398	149	26	11.86	24.59

SOURCE: Personal research done by the author on an M.I.T.-sponsored investigation on the computer industry in Latin America. Information obtained directly from computer manufacturers' sales offices in all of the countries concerned. (January and February 1973.)

* Panama and Mexico information included only for comparison.

Central America at present.

All the countries in Central America, excepting Costa Rica, fall in the Group D category of CIDP rankings.¹³ This is basically the equivalent of being in transition from the Initial level of computer activity to the Basic level using the United Nations scheme.¹⁴ Costa Rica is clearly already at the Basic level, falling in the Group C class, and as such presents certain different characteristics. The Group D and Group C characteristics for Latin American countries are:¹⁵

Group D: Relatively few computers; manufacturers well established; a few government installations doing administrative work; operations and data preparation, as well as most programming is in native hands; systems analysis and development, where it is done, is mostly imported; basic systems training provided by manufacturer; business schools offering some courses in keypunching, operations and mechanized accounting.

Group C: Considerable number of computers installed or on-order; all programming done by native personnel, even some basic systems programming; systems analysis and design being rapidly taken over by natives; adequate service bureau operations appear with consistency; business schools offer programs in data processing activities such as keypunching, operations, mechanized accounting and basics of programming; universities commence to offer some computer-oriented courses within their science or engineering curriculums; some initial government awareness of computer industry as an entity in itself; insinuations of user-groups and professional organizations.

These groups and rankings serve a general purpose of categorization for easier manipulation and analysis. However, some countries are difficult to place due to their special characteristics. Guatemala, if it were only the capital city, would easily fit the Group C characteristics. As it is, with the rest of the nation, it is in Group D.

Most of the work being done by the region's computers is of the administrative control variety, with very little being used in scientific applications. or education or medicine. Sophisticated applications are found only at very selected sites, such as certain government agencies, regional centers of multi-national corporations, or exclusive private installations.

Education is provided primarily by the computer vendors, this being supplemented slightly by in-house training at certain sites, a minuscule number of graduates of private commercial schools, and some university training. Universities are just commencing to introduce computer programming and some related courses into their curriculums, and only at Guatemala's San Carlos is there a semblance of a systems curriculum.

Operators and programmers are found in relatively good numbers now, even though there is always a strong market for skilled programmers. Systems analysts are almost non-existent, however, their functions not being well defined and overlapped rather functionally with that of the programmer or the data processing manager.

Wages are, of course, low by U.S. standards; but compare relatively well with the rest of Latin America. Costa Rica presents the lowest set of salary ranges, but that may be a reflection, more than anything else, of the recent depreciations that its currency has undergone.

IBM is consistently the strongest manufacturer present in any one country of the region, though NCR and Burroughs are established in most of the nations too. There is also a smattering of other firms, and their equipment, including some Hewlett-Packard, DEC, Data General, MAI.

The first computer to arrive in Central America seems to have been an IBM 1401 delivered to the Office of Statistics and Census of the Costa Rican government in 1960. This followed shortly after, in 1961, by other 1401's for the Guatemalan Railroads, and a brewery in El Salvador. Third generation computers drifted into the region in the form of IBM 360/30's for the Banco de Guatemala, and a 360/20 for ADOC in El Salvador.

There are as of yet no teleprocessing networks in Central America, nor time-sharing systems.

Advantages of Regional Cooperation for the Development of Joint Computer Technology Programs:

In order to speak of obstacles to cooperation it should be clear that there are advantages to cooperation, at a regional level, of a sufficiently interesting nature to provide incentives for the same. Without dwelling on the point for a very long time, it will be attempted to illustrate by presenting three possible joint projects and analyzing the benefits that would accrue under the same.

1.) Establishment of a Central American Computer Systems Support Center. At such a center a pool of high level skilled manpower specializing in different areas of computer work would be pooled for assisting soliciting installations in member countries. The concept of such centers is already in wide use within the organizations of computer manufacturers and vendors. The personnel working there, in addition to being of high quality by selection, gains invaluable experience by being exposed to a great variety of different problems enhancing tremendously his problem-solving capabilities by enlarging his set of known problems and solutions. In many cases these people become proficient enough to solve some systems problems by telephone, and in any case there is an almost assured gain in overall time needed to solve a problem. The existence of such a center would also provide an additional degree of confidence on the part of users, primarily in areas where due to other factors the skills-level might be low.

2.) Creation of a Central American Computer Software Clearinghouse.

Here, specific attention could be given to the task of scanning the software market in the U.S. and other advanced countries and selecting those programs, or programming packages that might well serve a specified purpose within the region. Determining first whether the package is applicable or not; second, whether it is economically desirable based on price, amount of modifications, value of potential results, etc. Lastly, if necessary, implement such modifications, document the changes and the operating procedures, and translate directions and reports into Spanish. The fact that many man-years of the highest paid and sought after programming and systems analysis skills might be acquired through the purchase of such packages definitely merits looking into. Very adequate statistical programs exist which one installation or country alone might not be able to buy. Or hospital administration systems which might prove extremely valuable to a nation's health care organizations. Or CAI (Computer-Aided Instruction) programs for education with very high social benefits involved. By pooling resources at such a clearinghouse economies of scale become available which should yield direct gains for all the member countries.

3.) Installation of one large computer within the region.

Certain amount of jobs and computation, of a very important nature for the planning and scientific communities of developing countries, involve the utilization of machines of larger size than those available within

the region today. This phenomenon is evident from the classical example of the use of linear programming for some optimization techniques. If the system to be solved has a large number of equations, the matrix generated and the routines necessary to manipulate it will use up large amounts of a computer's memory. Therefore, large computers become an actual necessity in some of these cases.¹⁶ Large systems, however, are usually quite expensive. Probably no one country could really justify some of the costs involved based on its own needs at present. There is a good argument to be made for the region to share the costs and benefits of one large installation for these cases. In fact, already there are a number of sources where funds could easily be rechanneled to help maintain such an installation. INCAP, for example, spends a considerable amount of money sending data, sometimes people also, to different parts of the U.S. to be run and returned to Guatemala.¹⁷

In addition to these three points just mentioned, there is no doubt that the integration process per se has aided computation indirectly, by creating an expanded, homogeneous market which becomes more attractive to computer vendors in general. The union also gives the region more leverage when dealing with the same.

General Obstacles to Regional Cooperation:

Some of the most obvious and pervasive general obstacles to regional cooperation are nationalism, bureaucratic survival, lack of skilled personnel and functional and structural differences.

Nationalism takes on many forms and becomes an obstacle to regional cooperation in a large number of ways. Nationalism is, of course, an obvious phenomenon in a region which for more than a century persisted in remaining in stages of almost constant wars or revolutions within it. Guatemalans are Central Americans, but they are first Guatemalans; Salvadoreans and Hondurans are like cat and dog since the 1969 war; Costa Ricans, culturally distinct, are first of all "ticos." As a result of this nationalism and first allegiance to the smaller homeland, there is a tendency to implement controls on information exchanges where sensitive information---possibly endangering the national security?---take place. These security involvements usually yield many a project failure.

Another direct consequence of nationalism often delaing terrific blows to regional cooperation is the problem of site selection. If an organism is created it must be domiciled somewhere, and most surely there will be an argument and debate over which country will constitute its host nation. These petty arguments over site selection can sometimes lead to inconformity and inefficiency on the part of many nationals of an unsatisfied country.

The problem of bureaucratic survival is also critical many times for regional cooperation. Once a structure is created, there are many vested interests with a stake in maintaining the status quo. It is not rare to see bureaucrats rejecting regional cooperation from the start, usually condemning or ridiculing its results, because of fears directly related to job security. This is most common when connected to the additional difficulty of inadequate training or skill. The fear of confronting regional consultants, or experts, in the field of endeavor of an incompetent person will usually result in having that person attempt to avoid such confrontation. Since there is an actual lack of skilled personnel at many levels within the official structure of the Central American governments, this case of obstaculization is probably frequent.

The differences in governmental structures and their functions within the Central American countries is another common obstacle to regional cooperation. There are myriad cases where similarly named bodies of two different countries in Central America will have totally different functions. Preconceived ideas about structure and functionality can cause difficulties when a person encounters something other than he had expected. The same holds true for specific posts. The functions to be performed by a person with the same, or similar, title may vary from country to country. This, in addition to being an unsettling element within plan for cooperation, may also be a delaying factor in progressing beyond the most elementary stages of success.

The lack of a uniform terminology and vocabulary in many technical areas can also be an obstacle for realizing regional joint projects. Some success has been had in the specific case of customs terminology, and in January of 1956 a Uniform Central American Customs Nomenclature (NAUCA) was adopted. This provided a common base for communications among the technicians jointly working for the establishment of regional trade and tariff regulations. Most areas have not been as fortunate, and difficulties arise frequently due to this factor of disuniformity in the technical vocabulary.

There are many other general obstacles to cooperation which are not independent of specific persons or circumstances. A common one is related to wages. Unless there exists a normalization, or equalization, of wages for people who will be working together, in close contact for a joint project, a strong barrier to cooperation may develop. Of course there will always be differentials based on function, background, experience and education, but variances due purely to environmental reasons (national differences) should be dealt with rapidly.

Another factor which might work either way is the physical location of the new site. If someone ⁱⁿ Managua does not want to live in Guatemala he might very well reject the offer to move and participate in certain joint project. At the same time, he might relish the idea, in which case the circumstance would benefit the program

These, in short, are some of the general obstacles to regional cooperation confronted upon a first analysis of the "problematica" of the region. They are usually independent of the special case concept, whichever it might be. They could conceivably exist the same in dealing with a common cultural program than with a joint scientific project. Next, the special obstacles to regional cooperation related to computer technology will be discussed.

Obstacles to Regional Cooperation for the Joint Development of Computer Technology:

Nationalism, again, plays a frontline role in obstructing certain types of cooperation here. Computers are quite expensive, powerful, and thus perfect status symbols. Countries, especially small and less developed ones, become rather jealous with its status symbols and many time reject openness or the possibility of sharing. The Central American case would probably prove similarly true in many cases. Even though all national governments of the region have their own computers, basically none of the regional organizations have one. Exception to this are: INCAP, which has an IBM 1620 from way back, and which came in part as a grant; and BCIE, which has an IBM System/3 to be installed proximately. The case of BCIE is promising, for they will be utilizing their machine as an aid in providing information from their regional statistics on foreign trade, which are prepared by BCIE for SIECA.¹⁸ An attempt to provide computer education with a regional scope is now also under study by CSUCA and the Universidad de Costa Rica, with some difficulties at present in the negotiations pending the decision of a computer manufacturer to grant considerable educational discounts.

Skills level, or professional competence, is also critical as an obstacle to cooperation here. An incompetent, or unqualified, programmer might be terrified of being confronted with someone who will find him out. Because of the complex nature of computers, and the aura of mystery with which

they are surrounded in amidst where they are not widely understood, the computer professionals can often hide their incompetence in numerical vagueness or technical smokescreens. In effect, an AID systems consultant for Central America tells of a DP manager's "fear of showing the results of a census run because he was obtaining all negative figures."

Bureaucratic survival is especially critical in the computer field. Computer systems, as information handlers that they are, are also information collectors, concentrators and storers. Since information is very definitely a power factor, the people who handle this information and have access to it thus are holders of very direct elements of power. This makes it both difficult to disengage them from their source of power, and personally undesirable to them to be disengaged. In the case of projects involving possible centralization of equipment, or sharing of the power resource---the computer system---these persons should be expected to resist all efforts.

The differences in governmental structures and their functions also have a direct impact on regional cooperation for joint computer technology programs. Centralization as a route to cost reductions is becoming a viable technique in many government operations. No hardware centralization, however, can be really and truly successful without a prior process of systems standardization and uniformation. Structural differences in counterpart government sections or departments would make the task of systems centralization monumental without first undertaking a political and administrative reorganization to allow standardization. This

train of thought and logic make these differences a definite obstacle to this type of regional cooperation. Assume, for example, a project to develop jointly a uniform program for each country's general statistics. The joint group might find that the Office for Statistics and Census is under Treasury in Costa Rica, under Commerce in Nicaragua, and an independent entity in El Salvador. These structural variations also cause format differences in the data collection methods, the generation and even distribution of the final result. To standardize the lot it would first be necessary to have the Office for Statistics and Census uniformly situated within the government structures of all the region's countries: a very very difficult task. Only BCIE, for SIECA, has been partially successful in developing a uniform regional system of statistics: the foreign trade ones. This they have done by pressuring all of the region's Central Banks into compliance, and aiding them in actually developing their country's national figures to be reported to BCIE.

A uniform systems vocabulary should not be a very real obstacle to cooperation here since all five countries have common sources for their computer terminology: English language manuals, or Spanish translations of the English texts. In addition, should the CACM decide on any specific choice of words for some systems term, it could always request the ICAITI, or ICAP, or INCAE to prepare a glossary of terms for common usage within the region.

Conclusion:

At the beginning of this work it was stated that the final objective was to deal with the reasons that often inject scepticism into any plans for regional cooperation, that is: the obstacles to regional cooperation. Computer technology being undoubtedly important for the achievement of economic development through its capacity to aid in management and planning, as well as its ability to control and monitor information and processes; Central America, the stage of one of the most successful regional integration movements on the Globe--- the Honduras-El Salvador War of 1969 notwithstanding; the actual research combined all three elements to study the obstacles to regional cooperation in Central America for the joint development of computer technology programs.

Background information on the Central American integration process was presented, as well as the structure of the CACM and many of its internal organisms. An overview of the computer industry in the region, as an additional background note, was also included. Finally, the specific analysis of the obstacles to regional cooperation in this area was presented. Divided into two parts, the first attempted to explain some of the independent problems which would obstruct and delay cooperation no matter what the circumstances. The second part tied most of these in to the very particular problem of computer technology.

TABLE 4GENERAL INFORMATION

<u>COUNTRY</u>	<u>CAPITAL</u>	<u>AREA</u> (sq.mi.)	<u>POPULATION</u> (millions)	<u>G.N.P.</u> (US \$ M)	<u>CURRENCY</u>
Costa Rica	San Jose	19,653	1.766	714	Colon
El Salvador	San Salvador	8,083	3.515	840	Colon
Guatemala	Guatemala	42,042	5.170	1,471	Quetzal
Honduras	Tegucigalpa	43,277	2.582	556	Lempira
Nicaragua	Managua	53,668	1.982	648	Cordoba

CACM		166,733	15.015	4,225	Peso Centro- Americano

References:

1. Attempting to preclude the pursuit of economic development per se as a deity without looking at some of the additional problems of a nation, focusing on actual social welfare and income distribution.
2. ---"The Application of Computer Technology to Development," United Nations Publication, New York, 1971, p 7.
3. Loc. cit. p 25
4. Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.
5. ---"Mercado Común Centroamericano: Síntesis Económica y Financiera #2," Oficina de Estudios para la Colaboración Económica Internacional, Buenos Aires, Argentina, 1968, p 304.
6. Nye, J.S., "Central American Regional Integration," International Regionalism: Readings, Little, Brown and Co., Boston, 1968, p 413.
7. ---"La Integración de la América Latina y la Cooperación Internacional," Secretaría General de la Organización de Estados Americanos, Asesoría de Integración, Washington, D.C., 10 March 72, p 5. (Mimeographed)
8. ---"X Memoria 1970/1971," Banco Centroamericano de Integración Económica, Tegucigalpa, Honduras, 1971, p 9.
9. ---Catalógo '71-'72 INCAE, Instituto Centroamericano de Administración de Empresas, Managua, Nicaragua, 1971, p 22.
10. The research took place during the summer of 1972 in South America, and during the months of December 1972, January and February 1973 in Mexico, Central America and the Caribbean. The work was specifically directed towards the author's Ph.D. dissertation on the computer industry in Latin America.
11. Using the same criteria as the United Nations group, the breakdown is:
Small---Up to 32K inclusive
Medium--Over 32K up to 256K inclusive
Large---Over 256K
12. Honduras is the exceptional case in the region having only 62.5% of its computers in Tegucigalpa, and the rest distributed between San Pedro Sula and La Ceiba.

13. CIDP (Computer Industry Development Potential) is an index by weighing a number of economic, educational and technological variables. The CIDP continuum bunches the Latin American countries into groups, at the same time that it ranks the countries. The overall rankings for the Central American countries are:

Costa Rica	10
El Salvador	17
Guatemala	18
Honduras	20
Nicaragua	13

For more detail see: Barquin, R.C., "Development of the Computer Industry in the Latin American Nations: An Evaluation of Strategies and Policy," Electrical Engineer's Thesis, M.I.T., June 1972.

14. United Nations, op cit p52-53.

15. Barquin, op cit p40-41.

16. Pool, I de S., Stone, P., and Szalai, A., "Communications, Computers and Automation for Development," UNITAR (United Nations Institute for Training and Research, Research Report # 8, New York, 1971, p 37.

17. Personal communication to the author from Ing. Pedro Arenales at INCAP.

18. Personal communication to the author by Econ. Tomás Armando Aguilar at BCIE.

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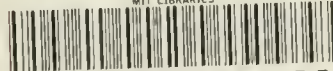
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