

Implementation of Mobile Satellite Services in Developing Countries - The Mexican Experience

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ABSTRACT

In the present paper, we present an analysis of the differences between Developing Countries (DCs) and Industrialized Countries (ICs) that concern Mobile Satellite Services (MSS) providers and regulators, and make a series of recommendations that may improve the odds for a successful implementation of MSS in DCs.

MSS MARKETS

At a time when Mobile Satellite Services (MSS) gain momentum all over the world, industry firms and regulators find themselves busy developing the terms and standards in which the services will operate in the future. Since the technology was, and is being originated in the Industrialized Countries (ICs), it is natural that their efforts focus on addressing the needs and requirements that ICs have for MSS.

As this process takes place, the industry participants should bear in mind that Developing Countries (DCs) represent an important potential market from which they could reap generous benefits. For this to happen, MSS providers must first understand the peculiar requirements and needs that DCs have from MSS, which differ significantly from the requirements of ICs.

At the DC's end, policy makers and regulators must appraise the far reaching

effects that the adoption of MSS may have in their countries' economies. For this reason, they must formulate sensible regulations capable of promoting the investment required to provide MSS within a framework that considers the country's needs and priorities.

DIFFERENCES BETWEEN DCs AND ICs

For the introduction of MSS in DCs, industry firms and regulators must consider contextual and implementation factors that differ significantly from the ones they encounter in ICs.

Contextual Factors

i) Needs

Among country blocks, their geography and economic specialization determine the needs and applications for telecommunications. While ICs tend to specialize economically in services and the transfer of information, DCs specialize in manufacturing and in the exploitation of their natural resources across extensive geographical and deficiently communicated regions. While the former demand intensive communications able to transfer information at high speeds in order to enhance the quality of services, the later require links that support their industrial activities and the distribution of goods. One suitable service to fulfill these needs is the object of our discussions at this conference.

ii) Infrastructure

The infrastructure of DCs is characterized by a limited availability of the most elementary resources needed to provide MSS, such as satellite coverage, terrestrial links and trained engineers. It is also distinguished by big imbalances between private and public services, where on one hand we find private users with sophisticated networks for the transmission of data and voice while on the other we find deficiencies in public services such as the telephone and telegraph networks.

iii) Objectives and Strategies: Telecommunications as a Strategic Sector

One of the most significant factors that distinguish DCs are the objectives and strategies they follow, shaped in the form of their particular regulations. These are defined by the national priorities as perceived by the decision makers. While in the ICs the main objective has been the economic development of the nation, the goal in DCs has been to maintain socio-political harmony within a framework of economic development. This has been reached through a strong, centralized government and the designation of strategic enterprises or sectors, as is the case of telecommunications.

In the past, the reasons to designate telecommunications a strategic sector are mainly three: to have control over the basic infrastructure which is vital for the security of the country and the economy; to have a public service provided to all the population uniformly and equitably; and to provide the service with the lowest possible cost by achieving economies of scale in the investment and its operation. For the future, we foresee a trend towards decentralization as reflected in current global political and economical events.

iv) Legal Restrictions

The legal restrictions and regulations to foreign investment in strategic sectors in DCs are originated mainly for reasons of sovereignty, control and the creation of a national technological base. The restrictions vary considerably from country to country and deal with issues such as whether foreign firms can participate, in what degree and what kind of commitments are required from them -which include amount of investment, degree of local integration, technology transfer and reduced charge service to government institutions among others.

v) Underlying Economic Conditions

It is evident that DCs and more particularly Latinamerican countries, find themselves in a far reaching process of political, economical and social changes. At the same time, their economies are characterized by high inflation, unemployment, recession, a decreasing standard of living and a growing external debt. These problems are aggravated by a shortage of foreign currency due to credit restrictions imposed by lenders while many of their exports have been affected by lower prices in the international markets. Because of these factors, the relative cost of introducing MSS to DCs is much higher than the cost of introduction to ICs, as manifested by the comparison of the price paid for a monthly rental fee for the service in terms of the minimum wages paid in each country.

vi) Applications and Benefits

As in ICs, the primary application (for the foreseeable future) of MSS in DCs is in the area of logistics management for medium and long haul trucks. But in DCs, this sector of transportation plays a much greater role in the national economy given the lack of adequate, alternative transportation means as those employed in

ICs (such as railroads, airplanes and fluvial means). Unfortunately for DCs, the demand for transportation is not being fulfilled due to the lack of resources to provide and maintain the service while at the same time, a great part of their vehicle fleet works at low utilization levels because, among other reasons, the absence of proper communications required for the management of logistics. In México and until recently, these problems were compounded because of regulations that restricted the transit of transport vehicles to fixed routes. The de-regulation that was introduced in the past year pretends to correct this problem and encourage greater utilization of vehicles. The introduction of MSS could complement this effort by providing the communications infrastructure needed to coordinate logistics and improve productivity.

vii) Technological Culture

The technological culture of potential users of MSS in DC's is rather unsophisticated, considering that telephone communications and computers are marginally integrated into their logistics. Because of this, MSS represent a "quantum leap" to users in DC's, both in terms of the level of sophistication of the technology they are used to handle and in the opening of new opportunities due to the integration of MSS to their operations.

Implementation Factors

i) Process to Obtain Required Permits

The process to obtain the required permits to operate and exploit MSS in DC's is complex, because of the many parties involved in the decision making. Through the process, the authorities consider besides technical issues such as standards, band allocation and interference problems, other issues that concern the political, economical and social viability of the project: who is the service provider, its nationality, what

experience does it have, how much power does it gain, what are the effects on different sectors of the economy, what is the cost to the country in terms of monetary reserves and so on.

ii) Configurations of the Systems

The configurations of MSS for DCs must consider that fundamentally, MSS represent a productivity tool to their economies, intensive in manufacturing and extractive industries, while in ICs, besides increasing productivity, the service enhances the quality of services thus playing an important effect in the competitiveness of firms in the ICs' service oriented economy.

iii) Understanding the Market

Understanding of the market, its needs, segmentation, leaders, attitudes towards technology, business culture, the degree of customization and integration of equipment, expected rates of failure that determine service and maintenance expenses, among others, are issues crucial to the success of the implementation, and singular to the idiosyncrasy of DCs.

iv) Objections by Third Parties

The objections to the implementation of MSS in DC's can come from unexpected directions, mainly because of the threat that a new, far reaching technology such as MSS signifies to the market position of traditional leaders. Influential, well established firms involved in communications, transportation, truck production, transportation brokerage, etc. may oppose the introduction of a new productivity tool such as MSS that may adversely affect their hold on the market.

RECOMMENDATIONS TO MSS PROVIDERS

From the former analysis, it is clear that industry firms considering participation in

DCs must develop very focused and well planned strategies, much different from the ones devised for ICs. As these firms plan for significant investments to develop technology and infrastructure to provide the service, they must bear in mind that in order to achieve a successful penetration in DCs, they must provide technologies and standards that fulfill the markets' specific needs and are in accordance with the country's national objectives.

Specific recommendations concerning the entrance of MSS providers to DCs are the following:

i) Find a Strong Local Associate

Given the complexities and the restrictions that MSS providers face in their effort to enter DC's, the association with a strong local firm with a good record in dealing with the authorities is essential. MSS providers must also check the potential associate's capabilities in case technology transfer and local manufacturing is required. Most important, the firm must assess the associate's honesty and reputation because, in case of any dispute, local laws will naturally favor a local firm against a foreign one. There are several types of agreements that can be signed with a local associate: Commercialization Agreements, Royalty Agreements, Joint Ventures and Direct Investments. Each alternative has its pros and cons, and their analysis must consider the following issues:

- Type of association wanted or required by law.
- Percent of participation in venture, if allowed by regulations.
- Investment in terms of technology and cash.
- Investment in local infrastructure to provide service and to service and maintain equipment.
- Local integration of equipment.
- Return in terms of profits or royalties.
- Legal Restrictions.

ii) Understand Laws

Given that restrictions and regulations vary among industries and some may be negotiable, a good understanding of the laws and regulations, as well as of the idiosyncracies of the regulators is needed in order to reach the best possible conditions allowed by the law.

iii) Plan for Added Costs

MSS firms must plan for the added costs involved in providing the infrastructure needed for MSS in DCs, such as building terrestrial links and recruiting and training technical people.

iv) Plan for Technology Transfer

Given that DCs policies and laws condition the introduction of new technologies, such as MSS, to the provider transferring technology to the DC in varying degrees, MSS providers need to adopt a long term strategy that considers technology transfer along with proper protection of patents and processes.

v) Configure to the Market's Needs

When developing hardware to provide the service, industry firms should consider an open architecture flexible enough to accommodate operation using the locally available infrastructure. Thought should also be given to the fact that in DCs, the MSS short and medium term market comprehends mainly industrial users which have more need to data communications, as opposed to the smaller consumer segment which has better use for voice communications.

vi) Customize

Although the current globalization craze favors the standardization of products, it is clear that industrial products and services, such as MSS in DC's, require a high

degree of customization in order to provide a solution to the specific needs of each market and user. In this respect, the most important aspect to be considered is that, to succeed with the users, MSS must be designed to provide total solutions to specific problems rather than be presented as a sophisticated communications link.

vii) Educate the Market

In order to fulfill the expectations from MSS, a big effort must be spent in the education of a market which is usually reluctant to adopt new technologies. The training programs to operate the hardware should consider the language and the idiosyncracies of users.

RECOMMENDATIONS TO POLICY MAKERS AND REGULATORS IN DCs

For years, in ICs as well as in DCs, norms that regulate public services have lagged significantly behind the technological innovations that drive those services. The consequence of this has been a high cost in terms of the benefits that society could have derived from the services if the regulations were actual. This problem is more acute in DCs, where regulations must consider a much greater number of factors, as explained in previous paragraphs.

Given their need to improve the condition of their economies, DCs can not afford the luxury of the burdensome cost mentioned before. Some suggestions that may help formulate regulations to reap the expected benefits from MSS are the following:

i) Re-evaluate Strategic Sectors

It is unnecessary and quite costly for DCs to have all the value added telecommunications services centralized. Government should allow that these services be provided by national, private firms and focus instead in formulating and enforcing proper regulation to guide the

exploitation of such services according to the national objectives and needs. The implementation of this policy will not jeopardize the country's sovereignty if proper regulation is formulated to control and supervise such service providers.

ii) Nurture a Technological Base

The nurturing of a technological base is one of the national priorities of DCs. It is required, among other reasons, in order to modernize and develop technology to better serve the particular needs of the country and to improve the terms of international exchange for the DC.

Regulators and policy makers must provide a solid ground to foster a real international technological cooperation. At the same time, policy makers must give impulse to the country's scientific and technological programs with the goal of reaching the levels where technology is not only adopted but also generated.

iii) Use Standards that Maximize Utilization of National Resources

The regulation of standards must contemplate the utilization of infrastructure already available in the country in order to maximize its utilization, minimize the outflow of precious foreign exchange and provide needed experience to qualified personnel to operate and develop technology in the future. Given that most of the market operates within the limits of the country, primary consideration should be given to standards that employ national links. For the market segment that requires greater coverage, as in the case of international flights for example, hybrid standards that allow international coordination of links should be employed.

iv) Define Regulation According to the Market's Needs

Regulators must research the needs and

requirements of the sectors that may adopt MSS. As a result, they will be able to formulate the proper regulations that can guarantee the greatest benefits from the service. The combination of properly regulated MSS together with the de-regulation of transportation, as in the case of México, will provide the solutions that DCs require in order to increase transportation productivity and efficiency, achieving thus the desired effects in the overall economy.

CONCLUSIONS

DCs represent an attractive potential market for MSS participants while at the same time, MSS technology could render great benefits to the DCs economies. For this to happen, MSS technologies must be flexible enough to adapt to the specific needs of the countries and employ their available infrastructure.

In order to succeed in these markets, MSS providers must understand the underlying contextual and implementation issues that affect them, and choose a suitable local firm through which the main hurdles of implementation can be overcome.

Regulators at DCs should keep in mind that a new technology such as MSS offers the opportunity to formulate new regulations to develop a local technological base through technology transfer.

Quoting Carlo de Benedetti who said "technological innovation has progressed like a series of waves clearly defined. Each wave has introduced new series of technologies that in turn, have fused with their applications causing a cascade of innovations". DCs have in MSS a good opportunity to create their own cascade of innovations whose effects will benefit not only the DCs, but the technology providers as well.

REFERENCES

1. **Benedetti, C.** 1987. *The new role of Europe in the World Market.* New York, USA.
2. **Capital, Mercados Financieros.** 1990. Monthly, February, numb. 28. México D.F., México.
3. **COSPAR/COSTED/UN.** 1982. *Conclusions from COSPAR/COSTED/UN symposium on the role and impact of space research in Developing Countries, COSPAR/IAF/UNISPACE '82 forum, Space Resolutions Vol 3 No 7.* Viena, Austria.
4. **Fondo de Cultura Economica.** 1986. *Las actividades espaciales en México, una revisión crítica.* México D.F., México.
5. **Fondo de Cultura Económica.** 1986. *Memoria del Primer Seminario Latinoamericano de Conversión Industrial, Exposición, Síntesis y Perspectivas.* México D.F., México.
6. **Luisignan B. B.** 1981. *Technology Transfer. Document for the Communication Satellites Planning Center, Stanford University.* Stanford CA, USA.
7. **Melody, William H.** 1986. *Telecommunications - policy directions for the technology and information services.* Economic and Social Research Council. London, England.
8. **Mobile Satellite Conference, NASA-JPL.** May 3-5, 1988. *Proceedings.* USA.
9. **Onward and Upward Conference organized by Phillips Publishing.** 1989. *Proceedings.* Washington D.C., USA
10. **UIT.** 1988. *Benefits of Telecommunications for the Transportation sector in Developing Countries.* Geneva, Switzerland.