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for COMPLEX and UNCERTAIN
SYSTEMS

Volume III

**Edited
by**

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ORGANIZATIONAL ECOLOGY OF BUSINESS INCUBATION IN DEVELOPING COUNTRIES

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ABSTRACT

Sustainable development is a means to solve social problems by using available resources in an efficient wasteless way that permits a long-term development of the society. Then it is highly advantageous for the developing societies to select, among the alternative development modes, the one that makes an optimal use of technology and available natural and human resources minimizing the waste.

One way to promote the development of technology is the establishment of a technological incubation program by special organizations called incubators in order to help the local business people with legal, financing and marketing services as well as a small operating infrastructure for establishing new small successful enterprises. Unfortunately in the developing countries there is a high failure rate among the new incubators because of a complex evolving eco-systemic dynamics due to environmental instabilities and a small number of prospective clients.

In this paper, we are going to analyze the incubator population dynamics as a function of the incubation projects (available resources) and the organizational fitness in a dynamic perspective. We are going to use an eco-systemic organizational model to represent the way the incubators compete for environmental resources in a limited niche capacity and co-evolve with the environment.¹

Keywords: Organizational ecology, business incubators, developing countries

1. Introduction

The evolution of the economic and ecological crisis on the global political scene has shifted environmental discourse towards the goals of sustainable development. Sustainable development is a means to solve social problems by using available resources in an efficient wasteless way that

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permits a long-term development of the society. The natural resources must follow the next conditions to make possible the sustainable development.

1. No renewable resource should be used at a slower rate than their generation.
2. Contaminants shall occur at a slower rate than it can be recycled, neutralized or absorbed by the environment.
3. No renewable resource should be utilized at faster speed than necessary to replace a renewable resource sustainably used.

These conditions are interesting to study in a dynamic perspective. We believe that one way to promote the development of technology is the establishment of a technological incubation program by special organizations called incubators.

Business Incubation

The incubators are a sort of consulting enterprises where the local business people may find legal, financing and marketing services as well as a small operating infrastructure for helping to establish and consolidate new successful enterprises. In developing countries we find three types of incubators: those focused on traditional businesses, those oriented to intermediate technology and those that try to foster high tech technology enterprises.

Globally the number of incubators has grown. Since the eighties in Mexico, an incubator program tried to support new technology companies in high-tech projects. However, most of these incubators have already closed their operations. Thus, in the nineties there was a closure of more than 75% of incubators emerged. The causal factors of this phenomenon are attributed to economic crises, changes in authorities, inexperienced management and limitations on access to financing. (Alcaraz R., 2004). Nowadays, México has more than five hundred incubator programs, but most of them are focused on intermediate technology, followed by the traditional business model, and a few high tech incubator programs. Thus the intermediate technology incubation program is the most successful incubation model in Mexico. Intermediate technology incubators support those enterprises whose requirements of physical and technological infrastructure and operating mechanisms involve semi-skilled people and processes, incorporating innovative elements. Some of the industry products supported are: local computer networks development, web applications, telecommunications, semi-specialized software and food industry technology. The incubation time in these centers is approximately 12 months.

Organizational Ecology Of Business Incubation

Organizational ecology concerns how the technological, economic and social competitive environments influence the creation, the survival and the demise of new organizations. The emphasis is on the evolutionary dynamics of the processes influencing organizational life. We used Stella® as the system dynamics software to visualize the incubation context (see Figure 1).

The intermediate technology market size depends on the development level of the projects. One in ten projects has the technical and commercial maturity to be considered for being the product of a new company affecting the incubators generation rate.

Conclusions

For intermediate technology incubators we presented a dynamic organizational ecology model where the more relevant state variables were identified as the incubators population, the level of the country's economic development, the size of the intermediate technology market, the economic and social resources constituting the available social capital, the balance of the country's competitive advantages/disadvantages as well as the effective government industrial policies.

and high technology, we saw an incubator generation pattern in states of more develop industrial; and also, where there is presence of universities and research institutes. This suggests that in these zones is has a potential market or the availability of resources to develop projects with technical and commercial maturity.

In Mexico, it is observed that the incubation models of intermediate technological are having a higher rate of generation. The opening of new incubators and cyclic closure are part of the process of adaptation to the market. About the incubation generation rate could be more, increasing the number of projects. These projects should be target of technological gaps.

The incubator models must consolidate the business robustness with specialized capacitation in sustainable development; that means characterize their resources (renewable, and no renewable resource) and balance their use rate. If the new business is thinking in the future now, it has more opportunity to be part of it.

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