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If the NGO operates in a low uncertainty and low complexity environment, usually no ecosystem strategy dominates in this case. However, because the NGO is a center of a complex system of asset-sharing along with the nature and welfare orientation of this setting, a niche strategy is slowly spreading here.

However, roles in the ecosystem are not necessarily inert where one niche player may eventually become a keystone for its own newly developed ecosystem or where one organization may take more than one role/strategy in different domains within the same ecosystem (Iansiti and Levien, March 2004).

Please note that this research deals mainly with organizations where profit is not the ultimate aspire but rather social welfare and value are the focus. That is why multiple keystones are swiftly emerging to help other NGOs simply to spread out good wealth in the community.

With high uncertainty and high complexity of relationship, a keystone strategy may be most effective. High uncertainty and high complexity is quite rare in the NGO ecosystem environment, but if ever, the government does play the role of keystone in this case. In Egypt the government promotes the health of the ecosystem for altruistic reasons and not because it is a great strategy. Moreover, the niche players force the keystone to stay honest and prevent it from straying into domination.

With high uncertainty of relationships, a niche strategy is the most appropriate. Competition and limited resources will be mainly in the fund-raising that the NGO would need. Competition is not that fierce because the government does secure a fixed amount of money to the NGOs, but even other sources of fund-raising are not always competed against due to value or social aim of those not for profit organizations. Niche players who represent the bulk of the ecosystem are responsible for most value creation and therefore typically operate in the shadow of a keystone. More niche players dictate the need for a multiple keystones to orchestrate the ecosystem.

If the NGO relies on a complex network of external assets with a high complexity of relationship but at the same time operates in a low uncertainty environment, a hub of potential keystones start adopting the keystone strategy. For example, EBNATI and ELSEWEDI orphanages? endeavor changed to simply taking care of orphans to setting up small profit generating projects to help in the expenses needed for the orphan girls. However, Federations in Egypt were not as transparent and the role was not built on trust management. Here a physical dominator subjugated the ecosystem for a very long time until recent changes in management took place. Shift in strategies in those federations from physical to value dominator, although slow, is taking place.

model: the business partners. When the business partners are not for profit oriented, an ecosystem strategy selection will differ from the profit oriented partners.

As proposed in Exhibit II, the two dimensions are the complexity of the NGO's relationships with other NGOs and the uncertainty of those relationships in the ecosystem. Here the complexity of relationships is influenced by the current or future aim of the NGO that does affect the number of NGOs, suppliers, customers, business partners and the like. Uncertainty, on the other hand, is affected by the limited resources, the kind of competition the NGO faces, the turbulence or rapid change as well as insecure environments.

The NGO environment in Egypt is quite stable strongly administered by governmental constraints with more mutualism and sharing than predation and competition. However, the fact that those NGOs are there to do some social good without profit being their main objective makes the ecosystem type or choice of strategy quite different. Keystone players and niche players are the most popular in such an ambiance. Keystone organizations play a crucial role in NGO ecosystems. Rarely do physical dominators exist because of the relatively stable environment that is not characterized by fierce competition.

H Complexity	physical/ value dominator (multiple keystones)	value dominator (keystone)
	no ecosystem/ niche	niche/ value dominator (multiple keystones)
L	L	H
	Uncertainty	

Exhibit II: Four Strategies for NGOs

determine one's place in it to develop the strategy to match that role. The strategy adopted must optimize the ecosystem health in the long run and avoid being myopic in nature by undermining critical domains. The choice of strategy is very important. "Healthy ecosystems create growth, not just for the individual company, but for others as well." Iansiti, 2005.

According to Iansiti and Levien (2004), the choice of strategy is mainly two dimensional depending on the general level of turbulence as well as on the complexity of the relationships notwithstanding the kind of company or aim as being an influential factor. In a highly turbulent environment they propose a niche strategy if the complexity is low. A keystone is proposed in a complex network of relationship coupled with a turbulent environment. With low turbulence they propose a physical dominator when complexity is high and hardly any ecosystem strategy when complexity is low (Iansiti and Levien, March 2004).

Iansiti (2005) stresses the importance of the appropriate information systems to support the new ecosystem. He proposes a three month plan to help Chief Information Officers (CIOs) shift in strategies. In the first month one should be able to "take stock" of one's own system by understanding how technology can help in that shift and how that shift can consequently affect the business as a whole. In the second month one should observe where the ecosystem is heading by deciding what role one has a potential for and if it is what one wants. Identifying network strategies and potential partners that work best is also an essential step in that month. In the last month one should set up the proper metrics to help manage the ecosystem by examining the needed new information sources, business applications, critical technology, or information assets.

This study proposes a third dimension to Inasiti and Levien's

number of loosely interconnected participants who depend on each other for their mutual effectiveness and survival. And like business network participants, biological species in ecosystems share their fate with each other. If the ecosystem is healthy, individual species thrive." (Iansiti and Levien, 2004). Being aware of the analogy between business networks and an evolved biological ecosystem develop the strategy to match that role. The strategy adopted must optimize the ecosystem health in the long run and avoid being myopic in nature by undermining critical domains. The choice of strategy is very important. "Healthy ecosystems create growth, not just for the individual company, but for others as well." Iansiti, 2005.

According to Iansiti and Levien (2004), the choice of strategy is mainly two dimensional depending on the general level of turbulence as well as on the complexity of the relationship managing an information system.

NGO ecosystems is a set of related NGOs that are mutually coexisting, developing, and interacting in a dynamic manner and at the same time creating a healthy ecological balance in the NGO environment. For example, the NGO ecosystem includes institutions and people that provide the financing, community partners whose action and feedback affect the services the NGO provides, the complementary services that are used in conjunction with the NGOs, the technology needed and even customers in some cases. In Egypt this environment has become quite stable with more cooperation than competition and a lot of positive interaction but within some governmental constraints. NGO information systems share the same knowledge and database in an integrative and supportive ambiance.

Selecting the Appropriate Ecological Strategy for NGOs

Iansiti and Levien (March, 2004), stress the importance of assessing the health of the ecosystem as a whole and then

Task is the organization's *raison d'être* and here we are dealing with not for profit organizations referred to as non governmental organizations in Egypt. Task being not for profit oriented is mainly focused on the social welfare of the community.

Actors are people who act and need not be exclusively humans (Leavitt, 1965). In this research it will be the people within the NGOs as well as the business partners.

Technology refers to the hardware, network and the like as well as the technical competence and skills of the people/actors. In Egypt major changes took place in the late 80s that allowed computers and communication via the net to be more available. In the late 90s the Communication Industry gave away computers to poor districts and made the internet much easier to access from home.

Structure, on the other hand, refers to the systems of work flow and communication (Leavitt, 1965). Here the concern will be on internal and external operations as well as on managing a network of business partners.

The level of analysis here is at the ecological level where the focus is on the relation of a single or multiple organizations to the environment (Selznick, 1949) or the relations among the organizations (Pfeffer and Salancick, 1978).

Biological, Business, Information, and NGO Ecosystems

Ecosystems is a dynamic complex of plant, animal, and microorganism communities and their non-living environment interacting as a functional unit (UNEP, 2006).

Iansiti and Levien (2004) explain business ecosystems by comparing them to biological ecosystems. "Like business networks, biological ecosystems are characterized by a large

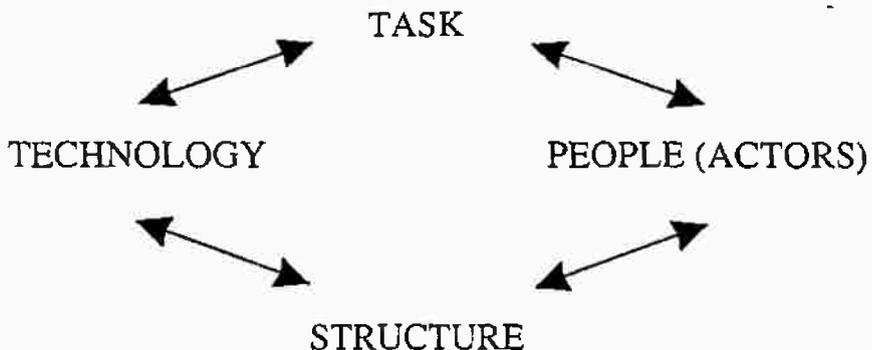
Strategy and the Management of NGO Information Ecology

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Introduction

Technological evolution will not only affect a lot of non governmental organizations (NGOs), but also suggest totally novel applications some of which are presently emerging in Egypt. Supported by the Leavitt's diamond, this paper studies the connection between ecosystems and NGOs especially how new technologies will influence NGOs and consequently how social demand can impulse the ecosystem strategy adopted.

The Leavitt model (see Exhibit I), emphasizes the influence between task, technology, people, and structure where a change in one usually results in retaliatory change in the others (Leavitt 1965) and where all are inter-wined in mutually dependent relationships outside of which none have much meaning.



*Exhibit I: Leavitt's Diamond
(Leavitt, 1965)*

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