Article from **Policy Perspectives**
(http://www.imakenews.com/cppa/e_article000865107.cfm?x=b6Gdd3k,b30DNQvw,w)

July 19, 2007

Swarm Intelligence

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A couple of years ago, Professor Jeffery Nielsen published a book titled The Myth of Leadership: Creating Leaderless Organizations. As reported by Rosemary Winters in a May 16, 2005 Salt Lake Tribune article, Professor Nielsen's book rests on two premises: Real communication can occur only between equals; and secrecy breeds corruption and abuses of power. Organizations may be better off without leaders.

According to the professor, "The problem is the rank-based nature of leadership." Instead of a rank-based system, Nielsen's book promotes peer-based management. In his model, everyone has an equal right to speak and an equal obligation to listen. Employees equally share leadership roles, information, decision making and setting competency standards. Peer leadership councils and task forces manage work, with senior executives serving as consultants instead of commanders.

Now, I do have some concerns with Professor Nielson's peer-based management, yet at the same time, there seems to be a lot of common sense behind what the good professor is saying. Then came support for peer-based management and from an unusual source—the July 2007 National Geographic magazine article by Peter Miller, *Swarm Theory—Ants, Bees, and Birds Teach us how to Cope with a Complex World.*

Mr. Miller's article speaks to ***the genius of swarms***—what scientists call ***swarm intelligence***. Swarm intelligence is about nature at work. In nature, a single ant, bird, fish, or honeybee is not a smart worker, just a hard worker. However, a colony of ants can solve complex problems such as finding the shortest path to the best food, allocating workers to different tasks, and defending territory from neighbors. Wow, each ant is a hard worker, but their genius in coping with their complex ant world is in the collective of all the ants.

Now, for the part that made me wonder about traditional roles of managers and leaders and made me think Professor Nielsen and swarm intelligence might be on to something.

One key to an ant colony is that no one's in charge. No generals command ant warriors. No manager's boss workers, the queen plays no role except to lay eggs. ***Even with half a million ants, a colony functions just fine with no management at all***—at least none that we would recognize. It relies instead upon countless interactions between individual ants, each of which is following simple rules of thumb. Scientists describe such a system as self-organizing.

Speaking directly about swarm intelligence, Mr. Miller goes on to say…

Whether we are talking about ants, bees, pigeons, or caribou, the ingredients of smart group behavior—decentralized control, response to local cues, simple rules of thumb—add up to shrewd strategy to cope with complexity.

Even though swarming honeybees frequently differ about where to establish a new nest, the group usually chooses the best site. Bees reach this decision by gathering information, conducting independent evaluations, and holding a kind of vote—the same practices used by

traders in Chicago that drive the price of soybean futures.

We are not used to solving decentralized problems in a decentralized way. We typically think of a leader as someone who can influence us and we are willing to follow because we believe in the cause or the vision. With decentralization there is no leader and members collectively choose to act in a manner that is best for the whole. For example, consider the way Google uses decentralization (swarm intelligence) to find what you are looking for. When you type in a search query, Google surveys Web pages on its index servers to identify the most relevant ones. What is most relevant? Google uses the swarm intelligence of those using the Web to determine a page's relevancy. This is swarm intelligence—no manager, no leader. Such thoughts underline an important truth about swarm intelligence:

Crowds tend to be wise only if individual members act responsibly and make their own decisions. A group will not be smart if its members imitate one another, slavishly follow fads, or wait for someone to tell them what to do. When a group is being intelligent, whether it is a colony of ants or a group of attorneys, it relies on its members to do their own part.

Now you bet—I am thinking "outside the box" here. This is not traditional management or traditional leadership in theory or practice—it just makes common sense. Here is the hard core, linear approach to the genius of swarms.

First, any collective requires ***individuals who appreciate, understand and have the skills and abilities to function in their independent roles and responsibilities.*** Although all the individuals in the group make the collective, this first step is not an exercise for the collective; this is for each individual. The analogy is to the single ant, bird, fish or honeybee where each must have the skill and ability to perform the job.

Second, ***each individual acts responsibly and adopts key group values.*** Professor Nielsen calls these values of a peer-based organization.

- ***Openness***—everyone shares equally in information.
- ***Transparency***—everyone shares equally in decision-making.
- ***Alignment***—everyone shares equally in leadership roles and responsibilities.
- ***Competence***—everyone shares equally in the development of peer competencies.

Finally, the ***role of a manager and of a leader is to consult, facilitate and serve each individual in the workgroup.*** This means to never be a traditional boss, never be one to hoard information, and never be one to make all the decisions.

This final step is difficult because it is incongruent with swarm intelligence. In nature, of course, animals travel in big groups, and whether it is a flock, school, or herd, the animals increase their chances of detecting predators, finding food, locating a mate, or following a migration route. In nature, coordinating movements with one another can be a matter of life or death.

Well, we humans live a complex existence and our motivations may be as basic as our friends in nature, but most likely, our motivations are more complex and this in turn makes us more independent. It is this independence or freedom to choose between good alternatives that call for managers and leaders to facilitate conditions where swarm intelligence can thrive and leaders who work with the group to find meaningful direction in vision.

Nature does not need a leader ant to consult, facilitate and serve individual ants. However, we independent-minded humans do need good managers and leaders to set the conditions where all involved can experience the benefits of swarm intelligence.