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Review

Finding the most effective organization for a global green processing practice network

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Abstract

Green initiatives worldwide should unite into a global network for sharing technology and best practices. This network is needed to informally share technology outside any system of financial incentives. When the global network works effectively toward global metrics, measurable improvement for all, regardless of nation or local government, can be made. Knowledge from accumulated research on organizational dynamics, knowledge management and communication should be applied to developing the structure for this network.

Keywords: global; knowledge management; network; organizational dynamics; tacit knowledge.

1. Many green processing networks, limited to local network focus

Governments, academia and some business networks have started numerous green processing initiatives. Some of their efforts have been published in this journal. These networks are built to foster the growth of business, best practices, or both, in the Green Processing Space. All can demonstrate some progress, based upon local metrics. That is, the metrics are developed based upon the ideal processing state, as seen by the local group. For example, the Institute for Sustainability [1] has developed the American Institute of Chemical Engineers (AIChE) Sustainability Index [2], which provides a tool for benchmarking chemical companies, using public information on five aspects of sustainability information. The city of Minneapolis, Minnesota, USA, has adopted 26 sustainability indicators to see how far the community has come [3]. The American College and University Presidents' Climate Commitment provides an action plan for carbon neutrality by 2050 [4].

The green processing networks play an important role in their local area. Support is offered for local research, or research applied for local issues. Practitioners can share their unique techniques regarding best practices on a person to person basis. Local governments can meet their goals by working with local academia and industry. The progress is real, but it is localized to the group.

2. One global network is more effective for global issues

Similar green process networks should be learning from each other. One way to learn from the groups is to read this journal. Data and information, which can be replicated after reading the articles, is shared on a local basis. Some further face to face "how to" information can be learned when some of the papers are presented at a technical meeting, such as an AIChE Annual meeting, or the American Water Works Association. For example, the American Water Works Association is an organization of practitioners that produce or maintain safe drinking water [5]. That membership consists of manufacturers, distributors, consultants, and water utilities serving cities and rural areas. Such organizations offer face to face learning at the meetings, and education and resources on the web. Education is available to members only.

The same thinking has been applied to climate change. In order to address this global issue, a global organization is required. To address the issue, the Kyoto Protocols [6] were developed, and nations were expected to join, with funded programs, due dates, and global metrics. Some progress has been made. The structure of this global organization was based on the formalized system for international treaties. Just as with many treaties, the incentives to participate were financial. Where the financial incentive was not apparent, countries did not join.

In order to make further process on green initiatives, a global network beyond that formed by national treaties is needed. A not-for-profit network is needed. The not-for-profit network would exist to help anyone meet local needs, whether or not there is a financial need. A less formal global network is needed to most effectively communicate best practices to all interested constituents. Some constituents will be interested in profit, by selling products and technologies. Others will be interested in avoiding costs, or participating in exchanges. Still others will be interested in how they can save money in their own operations. However, some members will be interested only in preserving their environment, or the global environment. There is also interest in finding a way to reach out to underdeveloped, poorly funded regions, which need to learn

how to reliably provide water and energy to their citizens. Indeed, these regions have an interest in providing a healthy environment for themselves. Whether profit is involved or not, all will benefit only when global progress is made to provide visible growth in availability of water and energy to everyone. Global progress can only be measured with globally agreed upon metrics.

In order to be measured effectively, green processing metrics need to be measured globally. They also need to be applied globally. That is, any improvement that is found locally can be seen as an addition to many global improvements. As the Rocky Mountain Institute [7] has applied a global view to energy systems, such that the reduction in energy use in any one subsystem is not cancelled out by another, a way to measure global improvement in green processing is needed.

3. Global metrics for global progress

If the metrics are established with nations, or between nations only, there is only financial incentive to meet them. Once the financial incentive is met, there is no longer any incentive to continue to work to grow availability for the whole.

Competition found between nations will also be found between different universities, and different localities. All will see themselves as competing for the limited natural resources that they are working to conserve. Likewise, professional societies will compete for members, prestige and funding. The global network can exist only when internal competition is minimized. Contributions to a global network of networks must be seen to benefit all – as equally as possible. The benefit will be the measured progress on conservation and good stewardship of resources on a global scale.

4. Reforming, or adding to technical societies, to form the global network

The network described sounds remarkably like a technical society, as we understand it today. In fact, most technical societies are already featuring green processing technical programming at many of their meetings. What is needed is a network that links all of these technical societies, the governments looking for best practices, and the academic green processing groups that exist worldwide. The impartial technical credibility of these societies and practice groups is sufficient to support development of rational measures of global progress on water and energy availability. They already understand and practice exchange of best practices within their smaller domains, and with an unbiased measure of progress based on data. All of their efforts need to be combined to establish global best practices, supported by data.

The AIChE should be at the center hub of the global network. AIChE members are leaders in the development of water treatment and use. The basis of all chemical engineering practice is material and energy balance. The systemic view of material and energy balance is an ideal approach to looking at water use efficiency, sustainable manufacturing, or managing carbon dioxide. There are AIChE members in 93 countries.

Many times, the success of green process organizations has been measured by their technical output, or the potential of the special expertise of the members. All of these successes are real, and deserve real recognition. The global network should be effective enough to recognize the contributions, and to share them, such that the work builds continually toward the global goals. In order to be effective on a global scale, the structure of the global network will be as critical as the contributions of the members participating in it.

5. Use existing knowledge about organization and knowledge management to build the network

We should look to what the world of business has learned about building networks, sharing knowledge, and fostering effect teamwork. Research and marketing departments, and consulting firms, continue to work toward the formation of the idea knowledge sharing, productive culture. Much is to be learned from what has been done. The lessons learned can be applied to building an effective global not-for-profit network about growing global access to water and energy.

Four critical factors must be managed in order for the global network to be effective:

i. Global metrics for measuring progress, and clear communication about strategies to meet them, should be reported regularly. Recognition should be provided where warranted.
ii. The scientific knowledge about conserving water and energy should be is codified such that it can be easily searched.
iii. The “who knows what” system must be easy to use, in order to find global experts. The network culture or architecture fosters frequent personal contact between practitioners.
iv. Standards for knowledge storing and individual communications are such that competition between members happens outside of the network. Information within the network cannot be owned or hoarded by any sector of the group.

Much has already been published about how to build, evaluate and maintain knowledge management networks. Some ideas are discussed below.

6. Knowledge management

Several articles are available about how knowledge is effectively shared. Should all of the repeatable knowledge be codified? [8] Repeatable knowledge is data, facts, observations, meeting proceedings, further links to other meetings, and best practices which are exactly repeatable. Once such data is identified, it must be stored. The IT architecture for that storage is important. Knowledge involves thinking about information

[9]. A study of effective knowledge storage to date, for the green initiatives which already exist, is needed. For example, can it be known what percentages of members of an organization utilize available stored data? Is some of the data more popular than other data? How is the data normally used?

Some data cannot be stored – it is best learned when shared personally. This is tacit knowledge. What is the best way to share tacit knowledge with other practitioners? The incentives for individuals to share their tacit knowledge should be understood [9]. Also, the way in which individuals can find the expertise they need in the network must be planned carefully. There is research about how project networks are more effective than individual project teams [10]. Structure and active nurturing of connections is important. Others have studied connections using Web 2.0 applications [11].

7. The culture which fosters adoption of ideas

There have been known and studied barriers to adoption of new ideas, or implementation of new technology. So much depends upon how one feels or thinks about the new technology. Cognitive psychologists and behavioral therapists have described the power of framing for influencing change. Project leaders (and global networks) can use framing to influence how others view new technology [12].

8. Communication for effective network building and information sharing

The sharing of best practices should feel easy, once the emotional, structural or cultural barriers to sharing have been overcome. There are so many options for communicating, including blogs, conference calls, Skype, electronic bulletin boards, and the very popular email. There are others, such as talking to each other, publishing in journals, etc. Each type of communication has its effective place in a global network. The trick will be to leverage them all correctly. A global network will rely heavily on some, or several, forms of electronic communication. Evaluation of the best communication medium should be based on review of the research.

9. Conclusion

Green initiatives worldwide should unite into a global network for sharing technology and best practices. This network is needed to informally share technology outside any system of financial incentives. Outside of financial incentives, the network can establish global metrics for increasing availability of water and energy. When the global network works effectively toward the global metrics, measurable improvement for all, regardless of nation or local government, can be made.

This sort of network must be crafted carefully, based upon what has been learned from research about organizations and knowledge management. The accumulated research by business schools, and psychology departments, worldwide, should be applied to developing the structure for this network. Some major goals to consider are the storage of knowledge, the best structure to foster adoption of ideas, and the most effective way to communicate.

The research cited here is only a sample of the knowledge which can be applied toward the development of the global network. The inputs from these experts about team building, organizational behavior, knowledge management, and development of innovation, must be combined for a complete solution.

The AIChE Water Initiative is working toward forming a team to develop such a network. While some of the team members will be from AIChE, others will be from the network which will be formed around it. AIChE already has a Web 2.0 platform to build a network of green processing friends. These friends can show each other how to navigate the vast cache of information on the main website, and in the proceedings of many technical meetings. The friends can also point AIChE to valuable information on other green practice websites. With the help of experts on knowledge management and organizational dynamics, a suitable product will be developed.

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