Creating and Operating WorldAgInfo System (WAgIS)

Executive Summary

1) Concept: Create and operate an Internet based multimedia agricultural database designed to support user-created content and feedback. The system, called "WorldAgInfo System" or "WAgIS," will incorporate features found in Wikipedia, FaceBook, YouTube, and eBay. WAgIS will be extended beyond all of these systems in that it will accommodate interfaces for illiterate users and incorporate content delivery options oriented to the conditions found in South Asia and Africa.

2) Rationale: Though many agricultural databases are already in place, they are fragmented and often inaccessible to smallholders. Furthermore, almost none of these databases have mechanisms for recording and sharing user feedback. Feedback is essential for helping the content providers know which information has been found useful and what additional sources of information are in demand.

When user feedback can be seen by other users of the system, it has the ability to provide content and credibility for the contents being commented on. Our trips indicate that smallholder have strong concerns regarding the credibility of the information they are receiving either because they don't know the trustworthiness of the source or they are not sure if the information applies to their specific conditions. In Africa we frequently heard that middlemen would provide inaccurate information so as to get a better deal from the farmer. Indian smallholder farmers frequently mentioned fertilizer salesmen would tell them that far more fertilizer was required than was actually true. Fortunately, farmers do trust one another and thus their feedback is surest foundation for creating trust in the database's content.

Evidence the project can be successful: The examples of Wikipedia, Facebook and eBay demonstrate the power of user participation. That participation may be in the form of direct content creation or it may be reviews of content created by others. eBay may be the closest model to the issues faced by smallholder farmers in that participants are often dealing with highly specific conditions. Agriculture information is much closer to diversity found on eBay than it is to a general department store; even with fairly general topics, such as how to germinate seeds, the information may depend greatly on local conditions. Essentially, agriculture is a vast collection of niche information.

The Design Team site visits routinely found smallholder farmers interested in obtaining information that we knew to be available. Sometimes the farmers did not know of the information but in many more situations they knew of the information but did not trust the information source. Once again, eBay is a good model in that it uses the feedback of the community to create trust relationships between unacquainted participants. While the first few users are taking a chance,

the users who follow have a good basis for establishing the creditability of the information source and of the specific information to their individual needs.

3) Expected benefits of the project: The nature of the benefits will be in increased access to information, the better matching of information to specific requirements, and the creation of trust and creditability in the information. Access to timely and credible information has the potential to dramatically impact the farmers. Just the awareness of new farming techniques and new seed variants could transform the agricultural environment in South Asia and Africa. If successful, it directly addresses the most oppressive poverty, the poverty of information and knowledge.

The scope of the benefits will naturally depend on the amount of the information in the system and the number of users who can interact with the system. Digital resources can grow at exponential rates with little increase in financial outlays. A successful system creates a cycle of content growth and user growth.

Feedback will make the information valuable but multiple access methods is critical for making WAgIS feasble. The system will augment Internet access by adding cell phone SMS messaging, voice, and easy transfer to CD-ROM and to paper. The key to WAgIS is that it will use every possible communication system to connect with the smallholder farmer via either direct communication or through intermediary media.

Direct access by smallholder farmers is just one way to improve the condition of smallholder farms. Improving the information sources for agricultural universities, research institutes, agricultural extension workers, and policy maker are all ways to help the smallholder farmer. WAgIS both serves the information needs of these groups and provides a library of appropriate content which can be used by their entities in their interactions with smallholder farmers.

Sustainability and scale: Scaling a computer-based operation is relatively easy because of the well-known scaling methods of computing infrastructure. The per-unit cost goes down as the system scales. As WAgIS becomes more popular, advertising and various usage fees could be collected. Initial hardware and software might reasonably be expected as a donation. As the size goes up it is quite possible that the costs per use will go down and it may actually turn profitable.

The major impediments to scaling are local languages and poor communication systems. If content were all in English and the Internet was ubiquitous and high-speed, scaling would primarily be an issue of processor/storage capacity and bandwidth to some central facility. The best course of action is to focus on national centers. This also has the advantage of allowing for close interaction with local government and research entities. Scaling in this case would therefore

be a system of replicating the best practices from current national systems to new national systems. The first three national centers would be in Bamako, Mali, Harie, Zambia, and Bangalore, India. Given the size and complexity of India, each state will be considered the equivalent of a nation. These three areas have been selected because the reasons these three countries were considered important representatives of agriculture in their region when planning our design team's site visits continue to apply for locations suitable for prototyping and development.

Whereas an international structure for WAgIS is current not feasible, a national only approach is equally untenable. WAgIS will require a center someplace in North America or Europe. This center would build relationships with centers of agricultural information and technology providers. In order to offer the user the friendliest and more flexible interface, WAgIS will need to employ some of the most cutting edge technologies in GIS, automated language translation, text-to-voice, and data-mining strategies. The center will also help coordinated national efforts and create mechanisms where data and experiences can be shared. The international center will not have to scale at the same rate as that of the national entities because it's role is more that of coordination and development. The labor and technological efforts will primarily be at the national level.

4) Projected costs of the project. The initial cost for building each national system and running it during its first year will be approximately 1.5 million USD. Given three development sites, that would entail 4.5 million. The international center would be additional 2 million for a total first year expenditure of 6.5 million.

- $150,000 for computer hardware
- $ 50,000 for modifying WAgIS technical system for local conditions
- $250,000 for content conversion: data format and translation
- $350,000 for staff salaries: One director, one executive assistant, one graphic designer, one editor, one driver, travel and consulting fees
- $350,000 for office rent, supplies, insurance, attorney and other fees
- $150,000 for Internet and telephone lines
- $200,000 for promotion of WAgIS's availability

Computer and development costs will go down in subsequent years and content translators and other labor associated with the increases in size and use will increase. Additional content editors might be required as languages are added. The approximate yearly operational cost will be 1.2 million per national center.

The international center will require a small office with sophisticated technology. The international center needs to be able to replicate the technologies of the national centers so that it can help develop new features. The approximate costs are provided below.

$250,000 for WAgIS software development

$100,000 for staff travel
$50,000 for computer equipment
$300,000 for office rent, insurance, fees, etc.
$500,000 for staff and consulting. Staff will entail a project manager, accountant, office manger/executive secretary, systems architect, project evaluator, part-time intellectual property attorney
$850,000 for content acquisition and licensing, data conversion, and translation

5) Measures of success. There are many internal measurements that can be used to determine success. Some possible site generated statistics are the number of users, the amount and types of content, and the average ranking of content. Some external measurements could be the name recognition of the system by key stakeholders, especially that of smallholder farmers. In addition to name recognition can be percentage of usage, user experience and the likeliness of using the same again.

6) Risks: The most significant risk is the cost of Internet access that makes access difficult to find and expensive when found. The use of cell phones to access a text-to-speech system may not be well received for a variety of reasons ranging from voice quality to the cost of the calls.

Getting content current agricultural databases may be difficult for IP and/or territorial reasons. While much of the content will be user generated, there has to be a significant amount of currently existing content. Content holders may be concerned that WAgIS will reduce the interest and thus funding of their work. They may be concerned that IP rights might be infringed or that remote information may get out of synch with their master database.

Some information providers may not be comfortable with the concept that any user can leave feedback related to their information.