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Online Tools for a Sustainable Collaborative Economy

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Abstract. This paper looks at the theory and practice of online systems aimed at building an economy based upon trust. It looks at practical ways in which we can create an economy driven directly by social and economic need rather than commercial pressures. It describes current projects which are developing some of the needed tools. It gives an extended fictional example in which these tools are integrated and extended, and provides a summary of the theoretical principles upon which such a sustainable, collaborative economy would need to be based.

1 Introduction

An image of a radically different future has been forming in response to the various environmental, social and economic problems facing the world. It is exemplified by such documents as Agenda 21 and the Earth Charter and the many submissions by non-governmental organisations (NGOs) to the World Summit on Sustainable Development in Johannesburg in 2002 (Petkova, Maurer, Henninger and Irwin 2002, Sachs 2002). Global governance is a theme of some work (Esty and Ivanovna, 2002), with some using an explicit systems perspective as in this paper (Madron and Jopling, 2003).

Previous work by this author has attempted to flesh out what such a future might look like, particularly in the area of exchange and economy (Alexander 2000, 2002), adding to a considerable existing literature (as, for example Lietaer, 2001, Henderson, 1996, von Weizsacker, Lovins and Lovins, 1997).

We have gone through many economic crises over the past century or so, but now that we are also up against environmental limits, crises beyond all our past experience loom. Earlier civilizations that collapsed, generally did so when they over-reached environmental constraints. With our present huge population of 6 billion set to rise at least another 50% before it stabilizes, our impact is sure to increase unless there is major change. We have created a period of massive global extinction of species that could reach a point at which humanity is swept away or at best decimated. There is really no alternative to radical change.

The core element of such a future would be a changed relationship between people, moving towards a collaborative world based upon trust and away from competition. Much of this paper will look at online tools to help build and maintain such relationships.

This new relationship—for those taking it up—would be the basis for the growth of new forms of economic activity. These would begin to be driven directly by environmental and social need rather than determined by money flows. (For example: a farmer who, through connection with local consumers, could aim to farm his land to best maintain its fertility and beauty, while providing local organic food that suited the tastes of his/her customers, rather than simply farming to maximize income from the food distribution industry.)

The pressures created by a need to maximize money flows are a dominant reason for the continuing environmental destruction and advancing poverty and inequality. (Douthwaite, 1996) The nature of an economy with this correct driving force—environmental and social need—is the other key issue this paper will develop, giving principles, existing examples, and future possibilities.

The change to such a future is likely to come about more through grassroots and civil society initiatives linking together, than through governmental or international regulation and initiatives. Governments are more likely to follow civil society than to take the lead.

Central to this vision is collaboration and the linking of groups. This means that it will need a communications infrastructure, and moreover, one that is capable of matching the diversity and changing needs of the participating population. The few-to-many broadcast media of the past do not have the required flexibility, so that such a change will require the use of the kinds of interactions the modern Internet and Web are providing.

The purpose of this paper is to further develop the economic aspects of this image of the future, showing how online systems could enable and support it. It will give practical examples and develop theoretical principles. The paper will start by taking a brief look at a selection of current projects that are consistent with this approach. It will then present an extended fictional example, set a few years in the future, which combines the features of current examples, and adds extra dimensions to both relationship and trading aspects. This is to provide a context for more practical details than a purely theoretical approach would allow. The final section will give theoretical principles of a sustainable, collaborative economy drawing on both the current and the fictional examples.

2 What's Happening Now?

There are a huge number of projects and Web sites that provide or are developing the social structures and tools required for a sustainable, collaborative economy. This section describes just a few which illustrate the principles needed.

2.1 Trust-based Information Systems

“Money is institutionalized mistrust.” Prof. Michael Hussey

Early human societies were economic co-operatives, in which people gave to and received from their communities without explicit balancing returns on each transaction (Sahlins, 1972). This worked because the close, ongoing relationship between people created trust. As larger scale agricultural and then city-based cultures

developed, this trust was lost and so barter and then money systems were developed to enable exchange between strangers with very limited trust.

Our modern information systems are bringing back the possibility of trust-based exchange, and a considerable literature is developing showing the importance of trust, and the significance of reputation in maintaining it (Mohtashemi and Mui, 2003, Oxendine, Borgida, Sullivan and Jackson 2003). "...indirect reciprocity requires that the reputation and status of members of a group be continually assessed and reassessed" (Alexander, 1987)

2.1.1. Reputation and Rating in eBay and Slashdot

A large part of the success of the eBay online auction/sales sites (eBay.com) is their rating system. At the completion of every transaction, buyer and seller are invited to rate and comment upon each other. The set of these ratings and comments forms a public reputation for all members, accessible to anyone considering either buying from or selling to them. It is widely used by members, and creates an atmosphere in which people seek to be seen as trustworthy. This mechanism provides internal, natural self-regulation that does not require external policing and enforcement of standards.

Similarly, there are websites giving comparative product information and ratings on sellers by previous customers, on almost anything one can imagine buying. Through this means, public reputation based on customer ratings is becoming an increasingly powerful means of self-regulation in the economy.

Another form of reputation that is becoming widespread is illustrated by the Weblog 'Slashdot, News for Nerds', (slashdot.org) a very heavily used news and discussion site for people interested in open source software and related issues. People active in the discussions get opportunities to rate other people's contributions. Thus every message has a score, with those that are disliked given negative scores and those that are liked given positive scores. Users only see messages that score above a threshold that they can adjust. Thus rubbish gets hidden (but not actually censored) while good messages get highlighted. The total of anyone's scores is called their 'karma' and can be seen as a measure of the quality of their contributions. Again, this provides self-regulation by users.

2.1.2. Local Currencies and the Open Money Project

Local currencies are trading systems using various forms of money that are restricted to use by a defined group, usually quite small. They may have their own notes and coins or use checks, slips of paper or other records. (Lietaer, 2001) Some of the best-known systems are Time Dollars (or Time Banks in the UK), and LETS (Local Exchange Trading Systems). Within the group to which the currency is restricted, there is an on-going relationship and sense of reputation which means that trust features more highly than in conventional financial transactions. Thus local currencies are a big step towards a trust-based economy.

The Open Money Project (www.openmoney.org) is a recent development by the originators of LETS, which emphasizes the role that local businesses can play in promoting their community. It is developing core software for rich trading systems

using local currencies. It will allow individuals to be members of many overlapping groups, which might have their own currencies or which might share one.

2.1.3. Living Directory, an Extended Trust-based Community

Living Directory (formerly Friendly Favors) (favors.org) is a web-based community that has been online since August 1999 and claims over 36,000 participants in over 150 countries. It is explicitly trust-based, with membership by invitation from existing members, but with mechanisms to enable strangers to meet members and build trust with them. Its function is to enable members to support each other's projects by sharing know-how, connections and resources. It has an internal currency called 'Thankyou's or 'T's, which functions like a discount on conventional monetary transactions. It enables members to find others with shared interests by enabling them to create a personal profile with key words that is open to other members designated as 'friends'.

2.2 Linking up Existing Groups

The Internet is generally thought of as the great linking technology. It has created new social forms, such as chat rooms and weblogs. It has facilitated an unprecedented growth of non-governmental organizations (NGOs) concerned with every conceivable environmental and social cause. However, the next level of linking, where separate groups join forces or share resources, is not well supported on the Internet. This social linking was not part of its original purpose or architecture, and there are various social and technical barriers to it. Each organization has its own online database of members that are not easily linked. Individuals have multiple, incompatible online identities with each organization to which they belong. However, there are now many initiatives aimed at overcoming these barriers.

2.2.1. One World – Linking the Major NGOs

One World (oneworld.net) is a network of over 1,500 organisations in 90 countries that "is dedicated to harnessing the democratic potential of the Internet to promote human rights and sustainable development" and has "a vision of equitable and sustainable distribution of wealth amongst the world's population, underpinned by global attainment and protection of human rights and by governance structures which permit local communities control over their own affairs."

2.2.2. Many One – the Ethical Alternative to AOL

ManyOne (manyone.net) is designing a platform that will enable the linking of groups and individuals with social and environmental concerns. It is developing a slick multi-media browser that provides educational features and enables trade and communication.

2.2.3. *Persistent Identity and the Augmented Social Network Project*

The Augmented Social Network (ASN) project (Jordan, Hauser and Foster, 2003) was announced at a recent conference on Networking a Sustainable Future (www.planetwork.net) and was acclaimed there as the technical solution to linking groups and individuals that everyone had been looking for. Its purpose is to extend the functionality of the Internet through open standards and software development to provide 'persistent identity' online. Persistent identity provides an alternative to an individual having a separate, incompatible identity, password, and personal profile with every online organization of which they are a part. Instead, you are registered with an 'identity broker', who controls your online profile. When you log-on to a group, the id and password are automatically referred back to your identity broker to be checked.

The ASN project is developing a form of persistent identity that is suitable for non-commercial civil society organizations. (There are already well-advanced commercial versions, such as Microsoft's 'Passport'.) It will enable individuals to control their own profile and who is allowed to see it. The project also includes 'relationship brokers' who have access to personal profiles and can suggest useful connections and alliances.

The ASN project intends the software needed to implement its systems to be open source and freely available for non-commercial uses. If successful, it will spawn a new industry, a set of businesses offering identity and relationship brokering services. They will be the guardians and facilitators of online trust-based relationships.

3 An Extended Example

The preceding examples of current projects show many of the needed ingredients for a sustainable, collaborative economy: groups with an intention of linking for social and environmental purposes, reputation systems, local currencies within a group with a trust relationship, ways of linking people with common interests, of matching people's wants and offers, new software tailored to support these functions and systems of persistent identity and relationship brokering.

The fictional example that follows is meant to incorporate most of these ingredients in a single system, while adding extra features to enhance the maintenance of a good relationship. It adds an environmental dimension to exchange by adding environmental information as part of an extended 'cost'. It promotes community service rather than monetary gain as a motivation for exchange. The purpose of the example is to help people to envision a sustainable, co-operative world and to provide a context for the theory in the next section.

3.1 The Setting

3.1.1. *Keith K. and Friends in 2010*

Let us imagine a group of people centered on 'Keith K', in the year 2010. The year is chosen only a few years into the future so that we can assume that life is largely

as it is now, but that there is the beginning of a movement, which we could call 'Planetary Citizenship', to build a sustainable, co-operative economy. It has grown to perhaps 1% of the population. Keith is a member of several groups who know each other quite well, and with overlapping memberships, one of many variants on a theme that have formed part of this worldwide movement.

The result is that in the small groups there is an initial basis of trust. Similarly, in the larger movement, many groups are linked to other groups through shared members, while others are linked indirectly, as through 'friends of friends of friends'. Thus the movement as a whole starts with a set of personal links, some direct and some indirect which are the basis of trust and reputation, (as highlighted in Mohtashemi and Mui, 2003). It is a co-operative of co-operatives. This explicit, known connection between people has become a central part of Planetary Citizenship.

3.1.2. Online Infrastructure – the 'Community Support Providers'

One group of Keith's friends, with radical IT and media interests, have set up a local business, 'PlaNet' which is a 'Community Support Provider' (CSP). It is part of a globally linked set of similar businesses that collectively develop, supply and support open source software for use by their customers (for example, of the sort being developed by ManyOne and the Augmented Social Network project). They have developed friendships around the world through their links with other CSPs. This helps with trading and other activities.

The CSPs provide the usual services of an ISP—Internet access, e-mail, Web space— for their customers but with better support on a more personal basis. They also act as an Identity Broker. Beyond this, they offer a local homepage which provides local news, events, wants and offers, and generally provides the basis for the growing new co-operative economy, as will be described below. This builds on their connection with the Planetary Citizenship movement, which enables them to offer local and global trade on an ethical and sustainable basis.

Although linked globally, each CSP provides services and support customized to the needs and culture of their members, so Third World CSPs might be based upon one connection point in a village, while in the West access is widespread.

3.1.3. An Example of the Co-operative Economy – the Food Co-operative

Another group of Keith's friends, with interests in food, gardening and cooking, have set up another local business the 'Funky Foods' co-operative. Their basic premise is to find ways of providing an alternative to the industrial food system for at least some of their members' foods. This is a key step in creating a more environmentally-friendly lifestyle. They do this by organizing local gardeners and sympathetic local farmers, first of all, but also more distant sources of food on a Fair Trade basis through links regionally and globally with similar businesses in the Planetary Citizenship movement. They also supply non-members through local shops and cafés.

As a co-operative, they encourage their members to spend small amounts of time either helping out in associated gardens or farms, or with food distribution or with

administering the co-op. The CSP software helps them to collect orders, arrange deliveries, organize voluntary labor and provides low-effort accounts.

The food co-operative is just one of a number of co-operatives and local businesses that have become associated with the Planetary Citizenship movement in Keith's area.

3.2 Support for Connection and Relationship

If the basis for Planetary Citizenship is a changed relationship between people, then considerable support will be needed for that. Co-operation and mutual support require skills of communication and organization (Mohtashemi and Mui 2003), which need to be learned. Moreover, e-mail and online discussions are notorious for their bad communication. That is a reflection of the general lack of awareness of what good communication means, compounded by an absence of body language and tone of voice (Alexander, 2000a). The software being developed now, and assumed to exist in this example, can function as social templates, creating expectations and encouraging good communication. Thus it can provide natural, self-regulating mechanisms for co-operative behavior.

3.2.1. The Address Book

If connection and relationship are central to Planetary Citizenship, then the personal address book is likely to be central to its software. It provides a natural place to indicate connection and reputation.

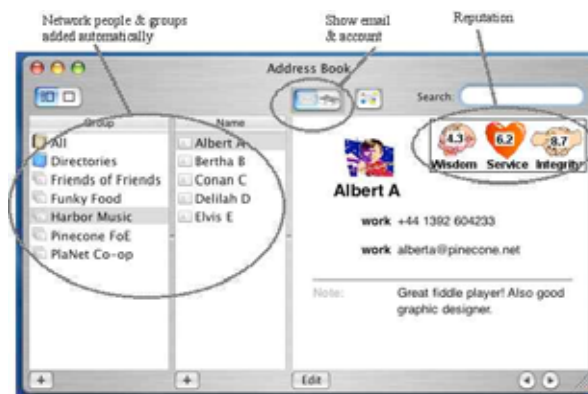


Figure 1 – A sample address book entry

Figure 1 shows what such an entry in Keith K's address book might look like. (It is based on a modern address book, courtesy of Apple Computer, with extra features added graphically.)

As with current address books, it includes lists of individuals and groups. However, through the connections with other CSPs and the use of persistent identity, it can automatically add entries from people and groups with whom there is a known relationship of trust, and can keep them up to date.

It also displays reputation. The details of this are likely to vary from group to group, as will the degree to which it is publicly displayed. Keith K's groups use three notional dimensions of reputation, as shown in Figure 1, all of which are based upon polls.

- 'Wisdom' is based on ratings given to the person's contributions to group discussions, as is in done on Slashdot. High scores mean that people like what you have to say in group discussions.
- 'Service' comes out of the exchange system, and indicates hours freely given to the community. The point of putting it so prominently is to encourage that.
- 'Integrity' is the kind of rating you get on eBay and many eCommerce sites on the web today. High scores mean people think you have done a good job when you have sold something or served someone.

3.2.2. Encouraging Good Communication

One of the deeper issues underlying the social and environmental problems the world faces is the poor communication skill endemic in modern societies. In a competitive and hierarchical society, the skill of understanding another's point of view, of conflict resolution and consensus building get left behind. People talk across each other rather than check that they have been understood. Communications engineers have learned what is necessary to get two machines to communicate effectively. There is a basic communication cycle of statement followed by a check that the statement has been correctly understood

The enhanced mail system in this fictional example attempts to bring this issue to people's awareness. As shown in Figure 2, it distinguishes three types of message (notionally), normal informal messages, somewhat more formal ones in which people need to be clear about what they are agreeing on, and messages about delicate and sensitive issues, where feelings are on the line and conflict could arise or has arisen.

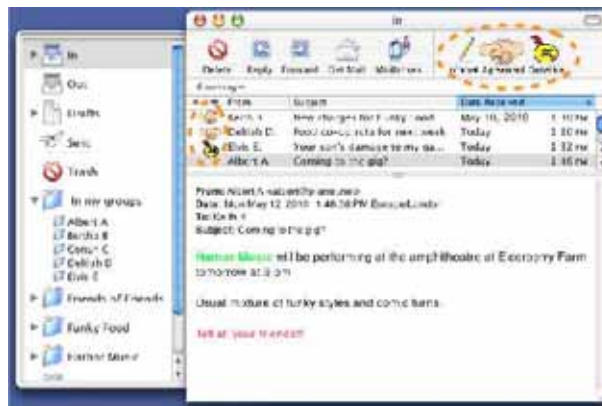


Figure 2 – A mailbox with sensitivity of message types distinguished

The message displayed in Figure 2 is casual and informal. To complete the communication cycle, all it needs is a simple acknowledgement, such as is shown in Figure 3. It is automatically generated so that all the user has to do is click on 'send'. A similar form can be generated for the next type of message, which makes agreements explicit.

Figure 4 shows a template for sensitive messages. It tries to stop people simply arguing across one another, by encouraging them each to express and acknowledge the other's point of view.

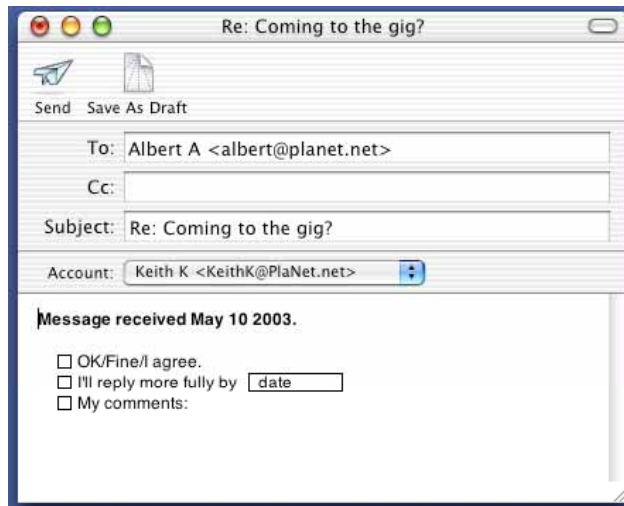


Figure 3 – An automatic reply to an informal message



Figure 4 – An automatic reply for a sensitive message

It is a social template that people can choose to use or not. At the very least, its existence points out that seeing someone else's point of view is important if you are hoping to come to some agreement with them or to resolve a conflict.

The facilities for supporting co-operative relationships are all about improving communication by helping people to realize that it is an issue and creating expectations and suggesting constructive solutions.

3.3 Support for Co-operation and Exchange

A key issue in the Planetary Citizenship movement we are imagining is an economy that is driven by social need and is sensitive to environmental pressures. This is difficult in a competitive economy where financial pressures often oppose it. In the more co-operative economy we are envisaging it becomes more possible. It can be greatly assisted by online tools.

3.3.1. Information on Quality and Environmental Impact

One of the pleasures of the web now is that you can look up anything you want to buy and find out what is available, what is good and bad, and compare prices. You can often find ratings of products and suppliers too. Ratings, reviews, reputations are a great help, but these sites almost never take the environment into account, or the social conditions of manufacture (for example, trainers made by poor children in the third world). There are, however, the beginnings of this (see www.ecotorch.com, for example), but it could be taken much further.

In Keith K's world, detailed information for buyers is thoroughly integrated into the software provided by the PlaNet CSP, as shown in Figure 5.

		Real Costs	Money Costs
<p>Toby's Tot Trader 23 Apple Ave. Quality new & used goods 23 Reviews</p>  <p>Avent Microwave Steam Sterilizers 502 18 Reviews</p>	 Footprint: 2.5 Energy: 6.3	 Hours: 1.8 Conditions: 	<p>€ 45</p> <p>20% €</p>
<p>Bertha's Baby Boutique 750 Pinecone Place Everything for your baby 16 Reviews</p>  <p>Gerber Electric Sterilizer set 7 Reviews</p>	 Footprint: 3.6 Energy: 0.4	 Hours: 1.6 Conditions: 	<p>€ 28</p> <p>0% €</p>

Figure 5 – An extract from the ‘green yellow pages’

If Keith wants to buy a sterilizer set, he does a search. He gets a list that puts those companies associated with his groups in the network first, thus promoting firms that are local and trusted. It includes reviews both of the product and of the firm, by people in the network.

Cost is not given simply in national currency. ‘Real costs’, which are the impact of consuming that item are given too. They are a complex concept that can be expressed in many ways. As shown here they are divided into an environmental and a social section. The environmental side is then further broken down into ecological footprint, which is a fairly broad measuring tool, plus the energy costs. The social costs are broken down into the number of hours it took to make the object, plus a rating of the social conditions of the workers.

On the money side, there is not only the conventional cost in national currency (Euros for no good reason), but also a local currency (the Green Euro?). Support for local currencies must come built into the CSP software.

Comparing these two products, it is clear that the one with the greater cost in money is also better in real cost.

3.3.2. A Low-effort Account System

If a co-operative economy is to be driven by information flows rather than money flows, the information systems will need to be really easy to use, in the same way that e-mail is easier than paper mail. In this example, we assume that all members potentially have online accounts with all other individuals or businesses. Transactions and records are an extension of the e-mail system.

When Keith K gets his food from Funky Foods, his purchases are recorded, perhaps using a swipe card, and put on his account. Once a month he receives a bill through his e-mail, summarizing his account. This generates an automatic reply, which is in the form of a check as in Figure 6.

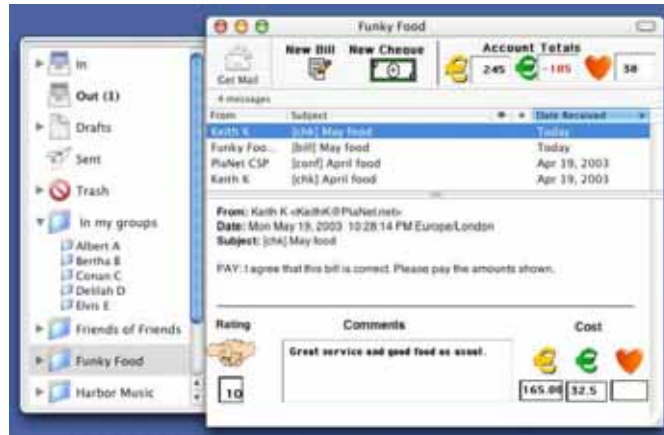


Figure 6 – An automatically generated check

To pay this bill, Keith simply sends the e-mail, after checking that it is correct. He has the option of filling in the rating and review. The rating contributes to Funky Food's integrity reputation, while the review goes on the Green Yellow Pages. So here we have several parts of the software working together to make life easy, and also to encourage co-operative behavior. The strength of this online system is that it provides an opportunity for and encourages ratings and reviews on each transaction. Such feedback could not easily be provided with conventional checks or with cash.

Notice that this account system divides cost into three categories, conventional currency (Euros in this case), local currency (the Green Euro) and Service (the heart symbol). If Keith does some work for Funky Foods he may get paid either in a currency or may choose to designate some of that work as community service, denominated in hours. That will form part of his public rating for service. (see Figure 1). By highlighting this, the software encourages public service.

4 Principles of a Sustainable, Co-operative Economy

4.1 Biological Models of Economic Organisation

One of the big lessons from events of the twentieth century is that centralized, command and control economies are not suitable organizing approaches as an alternative to the competitive market. They cannot obtain the information needed to match the variety needed and are prone to corruption. Repression is almost inevitable as a side effect of their structure.

We are in new territory here. The best models appear to be based upon biological and cybernetic principles (Madron and Jopling, 2003). The decentralized, distributed, self-regulating, feedback control of an organism is a good metaphorical starting point. This is well illustrated by the examples. Rather than central command and control, they have structures that are networks of networks (or co-operatives of co-operatives). This permits decisions to be taken at a level where information is available, by the people who are affected.

Businesses like the Planet CSP and the Funky Food co-operative have escaped from commercial pressures through their close relationship with their customers and suppliers. They have a stable niche, a territory in which they can operate constrained by feedback not competition. They are thus free to co-operate with similar groups serving different customers, as do all the CSPs, and food co-operatives in the example. Freed from competition they can share information and best practice and can support each other in a synergistic relationship.

Rather than centrally imposed targets, or goals of maximizing profit, the economy in Keith K's network is controlled by feedback, ratings and reputation by users. Businesses have direct information about their customer's reactions, rather than just a crude buy/don't buy signal or indirect marketing information.

The software is crucial to providing this feedback. It functions as a social template, creating expectations and encouraging desirable behavior, reducing the need for rules and enforcement. It creates a self-regulating economy. What happens to people who cheat on eBay? No one trades with them.

Information about environmental impact is a major part of the feedback. It thus becomes naturally incorporated into the goals of businesses. With competitive pressures reduced, firms are freed to take environmental goals seriously.

4.2 An Economy with the Right Goals

Getting the goals and motivation right is the most fundamental aspect of applying systems principles to a sustainable, co-operative economy. From a systems perspective, the direct motivation and all corrective feedback on the economic behavior of individuals, businesses, and other organizations should be determined by:

- The health of the natural world, (including wilderness areas as well as fisheries, farmland, waterways, etc.) its diversity and ecological stability.
- The health and well being of all of humanity: adequate food, a healthy lifestyle, emotional health and support, security, community, etc.

This is clearly radically different from the present. In a competitive economy, where economic survival means maintaining adequate money flows, these goals are a luxury which get very low priority (Lietaer 2001). It is very difficult for a business to give social and environmental considerations a high priority if it means being unable to survive in the market.

The most radical part of the picture given in the examples is the move away from an economy driven by money and towards an economy driven by goals of service towards the environment and the community. It remains to be seen how far in that direction we can go.

In ManyOne and other systems, local currencies are often limited to a discount on conventional monetary prices. In Keith K's world, for local transactions there was a choice of national or local currency or community service. The point of that was to encourage a group to move towards service as it became able to. More distant exchange was based upon Fair Trade, which puts social and environmental concerns before lowest price or highest profit. These are all useful but limited steps, still a long way from a complete change of goals for the economy.

With businesses constrained by information and feedback rather than competitive pressures, and in niches where they serve customers based upon relationship and reputation, lowest price or highest profit no longer determine what is purchased or how it is produced. Much of the function served by money now is removed.

The final step is to move towards an economy in which information and feedback fully constrain activities so that money can be phased out. As Keith K and friends do more for their local co-ops as service, they gradually receive more as service, with no payment required. The extent to which this can be extended between groups and globally is an open question which is probably unanswerable from where we are at present.

4.3 Community and Relationship as the Basis for an Economy

In ancient times, when people lived in small, largely self-sufficient communities, the 'economy' was much more closely aligned with these goals (although 'humanity' was often restricted to one's own cultural group, and detrimental environmental effects were quite local). The disconnection from what seems like obvious goals has occurred gradually over the past few thousand years reaching an extreme as economic globalization reached its full extent in the latter part of the 20th century (Alexander, 2002).

For an economy to be based upon these global goals, the goals of the individuals and organizations that make it up need to be aligned rather than opposed, cooperative rather than competitive. That is the reason for the emphasis on community and the need for good relationships and communication to enable it

The key social skills needed to keep goals aligned are those of understanding another's perspective and of conflict resolution. These are skills that need to be developed and learned. The software used by Keith K. gave some support for such skills, but what is most important is an understanding of their importance and a desire to develop them.

5 Moving to a Sustainable Co-operative Economy

The kind of radical transformation described in this paper could be called revolutionary, but if it is to succeed it will need to be more like the industrial revolution than like a political revolution: starting small and within the existing system, learning what works, gradually becoming more influential and continuing to learn as it grows.

The present starting points are very small, but are numerous. They include experiments with new forms of co-operatives, eco-villages, local currencies, fair trade and much more. They involve that small minority of people who can get beyond cynicism to envision a positive future.

They are now at the stage where they are beginning to link together. They will have a lot to learn from each other, and a lot more to invent. They are beginning to form a network of networks, a co-operative of co-operatives. This will form the framework for the nervous system of a metaphorical global organism. It is only as this stage matures that a larger scale acceptance will have a good chance of success.

(The fictional example of Keith K and friends assumed a 1% global takeup by 2010.)

As this co-op of co-ops matures, it will become very attractive to the many individuals, businesses and organizations that are seeking a more environmentally sound and stable way of living. They will find that it offers them a way out of the competitive traps in which they have been caught and so the movement will grow rapidly. Participating businesses will be able to offer discounts in local currencies and to pay their employees partly in local currencies. Their contributions to the community as service will form part of their public reputation and so will be encouraged.

As the growing network becomes a significant market to be served by the business community, larger organizations will be in to take it seriously. They too will begin to participate in local currency systems and to contribute more community service. However, for them to do so successfully, they will also need to participate in the feedback mechanisms it has built: the ratings, reviews and information on real social and environmental costs. Through these feedback mechanisms, the mainstream economy will become ensnared and transformed.

It is probably only at this late stage that it is likely to become acceptable to the political mainstream as well, and from that point on the transition will be very rapid.

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