FUSCHL CONVERSATION 2000
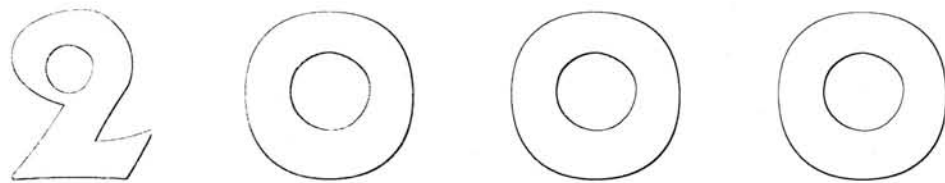
Designing Systems for Human Betterment

Collen, A., Hofer, C., Minati, G., Paritsis, N., and Penna, M. (2000).

Designing Systems for Human Betterment

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Abstract

This group report is a synopsis of our four-day conversation. The conversation of the first day was an analytic divergence of the key constructs in the theme followed by a synthetic convergence toward reconstitution of the theme in more specific terms. The second day began with further examination of the theme leading to formulation of a set of 9 essential characteristics. The set was tested through presentation and discussion of 6 applications the second and third days. Our work moved toward closure by means of writing individually and in teams, then corroborating aspects of the group report, and finally planning the presentation of our process and results to the all participants the fourth day. Our group process typified one form of team collaboration and participatory action research that implemented the particular conversation design adopted by our group.

1. Introduction

The following thematic statement was published in the *IFSR Newsletter* (1999) to reconvene the members of the 1998 conversation and invite new members:

> *The influence of systems sciences is no where more needed than in areas pertaining to human welfare and the human condition. This conversation group will continue its 1998 focus on the relevance and applications of cognitive and systems to the design of human activity systems for human betterment. We wish to emphasis the nature of social and human oriented systems that reveal to us who we become, how we come to know our world, and the ways we relate to one another. We are especially interested in such systems as learning and learner centered education (caring) systems, systems that foster human development, personal and collective guidance systems, and synergistic win-win systems. These special interests are informed by what we have learned about human beings over the course of this century and can learn constructively from each other in this coming century. We believe that knowledge of the ways we think, feel, perceive, and inter-relate help us as designers to create and develop our systems for human betterment. We expect such systems to take into consideration our human welfare as well as the welfare of those affected by our activities. The globe promises to be a more holistic, interconnected and interdependent world community. Whether we like it or not, we are entrusted from now on as the stewards of all life on the planet. Therefore, our concern for the design of systems of human betterment must include the ecological, ethical, humane, and participatory dimensions in the broadest sense.*

Picking up the conversation from the group report (Collen et al., 1998), it was clear that we needed to reexamine the key constructs comprising our conversation theme and find a more specific and concrete focus of conversation, and thereby take our group process to its next stage of development.

2. Starting the Conversation

Our brief initial period oriented new and old members, acquainted each other with our styles of communicating, and established some ground rules to conduct our conversation. Members came from diverse fields and backgrounds. The theme represented a common draw for us. Diversity was important to solicit a range of perspectives at various points along the path of the conversation. An expectation of recognizing commonality and achieving consensus on essential stepping stones of the path were implicit to the progress of the conversation.

We reviewed what the group had accomplished in its 1998 conversation and provided an introduction of self for the benefit of our newcomer to the group, then the conversation gained focus by reconsidering the chief constructs contained in the title which served us productively in the 1998 conversation.

3. Design of the Conversation

We targeted the four key constructs of our theme: designing, system, human, and betterment. We agreed to share our views about them first as autonomous ideas, and then altogether, though this proved difficult in practice. The additional dimension of context was added, in that discussion of the conceptual system implicit in our conversation must be anchored in an environment which is always changing. Later in our conversation, this notion enabled us to focus efficiently and effectively on various applications each member brought to the conversation.

The scheme for the conversation methodology was mapped (Figure 1). We termed this figure our design of the conversation at this point. The figure shows the four key constructs of our theme as the key elements in interrelation comprising the conceptual system in context. Context for the moment was defined as our conversation, areas of application, and any specified environment in which designing systems might be applied in the course of our conversation.
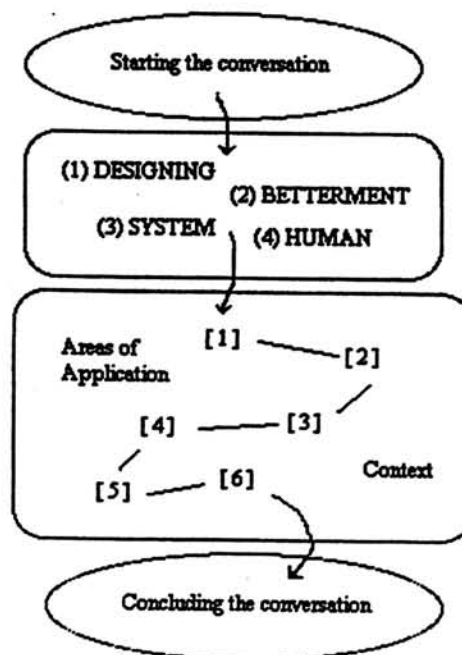

Fig. 1: Design of the Conversation

4. Key Constructs

Substantial time was spent exchanging views on the four key constructs. This conversation stage was necessary to understand one another and bring us together in the task of moving our process toward germination of something that might come from the conversation. As the conversation proceeded, the concepts became more contrasted, linked, and interrelated toward a group sense of the conceptual system imbued in our theme. Later the essential characteristics inherent in our collaboration became increasingly evident.

4.1. Designing

Design is often taken as an emergent product of the process called designing. In research, it is technically used to describe the organization of resources, people, space, and time needed to engage in the creation of something and the execution of a process. It is accomplished in a changing environment (context). Designing has functionality, process, and directionality. Designing is not deciding, predicting, and planning. There is an implementation phase after the designing phase. The designing phase involves specification of the system in that definition of functionality, project management, and process are described.

We discussed established schema which shows the place of designing in many creation and production processes (Figure 2). Designing is followed by implementation, which in turn is followed by maintenance. These phases involve cycles of interfaced feedback loops of verification and validation for analysis, specification, implementation, deployment, and maintenance. We noted that designing systems for human betterment may be viewed in the context of such a schema.
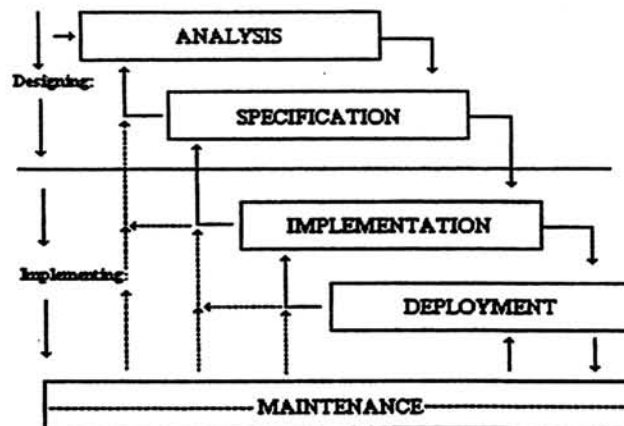

Fig. 2: Designing as process (Source: Boehm 1984)

4.2. Betterment

Betterment turns out to be a complex construct involving several aspects, as it is often a value laden and controversial idea. The aspects we discussed helped to suggest to those who are designing systems for human betterment what is meant by betterment. The stakeholders are all those affected for better and worse by systems being designed, who also need to be involved in the designing. The stakeholders include in the designing what is meant by betterment, and this value often is too implicit in and presumptive of the process. As the question immediately arises, betterment for whom? Who decides what is better, ameliorative, desired? Betterment involves ethics of the designing system. Ethics is inherently part of human systems and an open process, by which we

mean the engagement to learn, adapt, and change according to the context. Ethics of the designing system involves rules and laws, expressed and understood explicitly and implicitly regarding conduct and action, which must be distinguished from morals. These rules tend to become normative, e.g. a normative ethics for designing systems. A social system has an ethics, a collection of rules for interaction. We noted that one significant issue regarding ethics and betterment is that what may be betterment for one may be detriment for another. To illustrate, a retired person may benefit by a pension, but those who work to provide the money for this pension fund, from which the retired person receives his allowance, at the time may not view it as a benefit and wait many years to see benefit. What may at present better some stemming from contributions to the common good may not be evident for all persons. Here is a dilemma for designing systems for human betterment. We thought that designing needs to consider the individual as well as the common good, also the systems being designed and impact on its environment (superordinate system).

4.3. Systems

System was viewed more in terms of the interactions, e.g. activity among those who may be described as part of the system. Interactions among designers, interactions with environment, both natural (other persons) and artificial (machine interface) were discussed. The importance of purposiveness and communication was emphasized. The designing system may have many subsystems that interact. When a new subsystem is introduced, it changes the others. There is a progression of complexity when one considers more and more systems in interaction, which includes subsystems and the environment.

4.4. Human

The place and influence of the designer was discussed, especially in light of what is known of the observer effect on the phenomenon studied and the converse, namely, from physics (Heisenberg) and astronomy (Bessel). In human interactions, it becomes more acute as the effects are reciprocal. Therefore, in designing systems for human betterment, particularly in human activity systems, the coevolutionary (system-environment) aspects must be taken as given. However, there are different levels of organization to be considered. Three were discussed (Table 1). The anthropocentric point of view represents the classic position, the centrality of the human being, stemming from European influence. The need to control and remake the living environment for human betterment. That view has evolved to a modified view which specifies the need to keep the environment alive and sustainable to enable human betterment. The second level presented was the ethnocentric viewpoint. It represents the collective interest of an ethnic group of persons. Though facing the same dynamic and issue as anthropocentrism, it introduces the issue of the individual versus the collective good (betterment). The third level is the geocentric view. It places humans as the stewards and care takers of the planet for yet another superordinate level of common good, which suggests the imperative of a global ethics which enables betterments of both planetary life forms and peoples.

Centrism	Level	Betterment
Anthropocentric	Individual	Person
Ethnocentric	Communal	Tribe
Geocentric	Global	Planet

Table 1: Systemic levels of betterment

5. Converging the Conversation

The conversation required more synthesis after the explication of the key constructs. Designing is a dynamic collaborative process involving many human activity systems. Betterment is a more complex construct than is usually recognized. Systems is an abstract idea that needs to be linked to other concepts and context to make it meaningful for designing systems for human betterment. There can be many problems with extreme forms of anthropocentrism, ethnocentrism, and geocentrism. Betterment was taken to be the key emergent property. Goal was taken as idealized, in that designing systems occurs with a goal in mind but often changes as designing advances. The ethics of designing suggests various ways ethics imbues designing, such as imagining the best system, adopting norms to guide the designing process, generating as well as using reliable and proven-to-be-effective knowledge and practices taken as valuable to the designing process and the kinds of systems being designed.

Figure 3 was drawn to show the course being taken to implement the conversation design. It represented a step forward in detailing further Figure 1. Before our explication of the constructs, we discussed both our methodology and designing as a process pertinent to our team theme. Three aspects deepened considerably our ability to synthesize: recognition of the kinds of centricity (centrism), levels of complexity (organization), kinds of betterment (denotations). After pausing momentarily on these pads along the path of the conversation our collective exchange renewed. We moved to a more complex and at the same time more condensed view of the conversation theme.
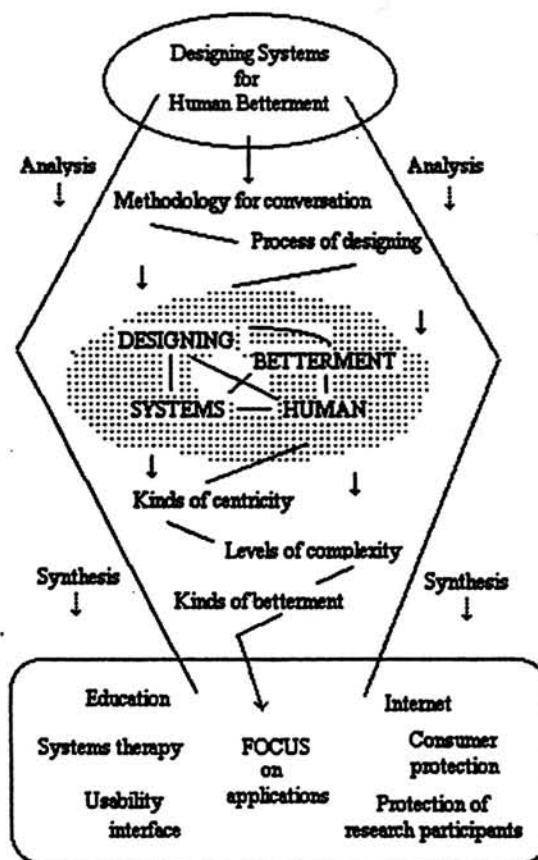

Fig. 3: Day 1 and 2 of the conversation

6. Essential Characteristics

Before moving to areas of application, we spent some time defining a set of 9 constructs considered central to our conversation theme. The fruits of our discussion are shown in Table 2. These definitions were thought about as essential characteristics to include and consider in taking up various illuminations of designing systems for human betterment. We did not take the time necessary to develop rather polished and fully agreed upon statements but roughed them out to general agreement to enable us to proceed further.

ACCEPTANCE: Betterments mean acceptance of its usage by those who are benefactors; people must want and use something, and not be imposed upon.

COEVOLUTION: Designing systems are in context; as the environ changes, so does systems; as one system changes so do others interactive with it.

CONTINUATION: Designing is continuous, never ending process.

CREATION: Designing is a creative process where betterment means discovery, understanding, invention, innovation, and amelioration.

DIVERSITY: Multiple points of view, actions, expertise, even if contradictory and conflicting; the opposite of ideology, groupthink, and homogeneity of viewpoints.

EMERGENCE: Process by which betterment becomes visible and evidenced from interactions of systems designed for human betterment.

ETHICS: Individual as well as collective good are incorporated in designing; ethics of decisions and process inherently involve ethical decisions, choices, and issues.

GOAL: The directionality of designing.

STAKEHOLDERS: Those active and affected by designing the systems for human betterment; kinds of experts in knowledge, experience, know-how; includes one who knows, one who has experience, one who is active (doer), one who may be outside and sees overview, and one who can anticipate the consequences of designing.

Table 2: Essential characteristics in designing systems for human betterment

7. Applications

Having composed a set of essential characteristics to consider and include in designing systems for human betterment, it became important for us to take up a number of applications to understand more fully and concretely whether the set would be relevant to various real world problems. We agreed that each member would present one application and relate it to the characteristics before opening the application to group discussion. In this way we obtained five illustrations of designing, but then added a sixth application which came spontaneously at one point in the course of our coverage. The subsections to follow are presented in the order they occurred.

7.1. Education

Many systems may be assumed to contribute to the emergence of educational systems. They have specific stakeholders, and to induce the emergence of educational systems for human betterment, they must be designed keeping the emergence process in mind. Systems involved are for instance, publishing, transportation, schools, telecommunications, and computers. The stakeholders are the students, their families, teachers, bus drivers, and other persons with a vested interest in education.

The systems must be designed to induce emergence from their interactions among the stakeholders. It means that they may not be designed to take care only of the effectiveness in use of resources, but must also include the expected usage, stemming from induction of emergence which can be recognized by the stakeholders as theirs.

7.2. Systems Therapy

Changes in family, groups, and institutions can become changes so disturbing that help is needed. Human systems therapy provides an example of such an intervention. Intervention is applied to reduce problems and increase satisfaction for those defining betterment. The therapeutic result is an emergent property of the effect of intervention in the system. Intervention means changes in the relationships, communications, and interactions (for example, through reframing). Stakeholders comprise the system, such as the therapist, family members, and observers. Therapy entails coevolution of all stakeholders. More diversity and healthier interdependence are sought. There is an optimal diversity with therapy, and the mutual acceptance of members is a necessity.

7.3. Internet

The rapidly growing internet is dramatically going to change the way we live. Contrary to other information resources like the book, newspaper and television, the internet with its services offers all kinds of information (text, picture, video, audio) via one integrated medium technology in a fast and easy way to every member of the human community. One major change to the antiquated information resources is that the internet offers all information independent from location and time. It does not concern whether the human is in USA, Italy, Greece or Austria when access is made. This difference seems to be very important because the book, newspaper, and television are often limited to a local area. For example, it is practically impossible to watch Austrian television broadcasts in the United States and buy the *Miami Herald* on an Austrian newsstand. Independence from time seems to be an another great advantage of the internet. Specifically, while information in the real world is often very time specific and news broadcasts occur five times on television during the day, the internet enables news access at any time.

Providing all kinds of information for all people in an easy and fast way independent from location and time is a situation that has never happened before. It demonstrates how easy this digital network can link up all people from different countries regardless of borders and political situations. Additionally, it seems that the internet is more or less independent from the natural language people are using. On the one hand, the English language is widely accepted as the internet-language for global information, and on the other hand, new techniques like automatic translation programs help to convert information from a local language into another language of our choice.

But today the internet is not only a platform to provide accurate information, but also a platform to communicate and interact with other human beings at the same (e.g. chat) or at different times (e.g. email). Further, the internet is a huge market place where everyone can buy different kinds of goods (such as books, CDs, food, and wine) independent from opening hours of stores and the physical location of sellers and distributors. Furthermore, the variety of online-shops helps us compare goods and prices. Another example how the internet can improve human life is planning vacations. By using the internet one can plan his whole journey including booking the flight, booking the hotels, making the car reservation and collecting all necessary information for the trip. In all, the internet helps to make the personal life more efficient and convenient for less time and money.

Of course there can be found more applications where the internet can contribute to human betterment, but there are also some cautions which have to be considered. Increasing human betterment via the internet means that (1) we must have access to it, (2) we must accept this medium, and (3) there must exist some regulations (ethics) which ensure a save life in the internet. These cautions point to the government and other public institutions which are requested to set appropriate actions, like building up and supporting the infrastructure as well as define laws for the internet usage.

7.4. Consumer Protection

In those countries with developed protection of their citizens as consumers by means of laws and regulations, one finds expiration dates on packaged food, ingredients stated on the labels of containers, and warnings and correct usage instructions on cartons and tags. These countries have agencies devoted to protecting the health and welfare of those who purchase and use the goods and services of society. Examples of these agencies are the Department of Consumer Affairs in California, the Federal Drug and Food Administration in the United States, and the Konsumentenschutz in Austria. These human activity systems are perhaps more obviously than others created and designed for human betterment. These systems can extend beyond the more obvious to the less visible, such as air, soil, and water. For example, the Environmental Protection Agency in the United States monitors the quality of air, soil, and water through ongoing chemical analyses for compliance with quality standards stated in federal laws.

Our conversation included extending the need for regulation and enforcement of extant standards to the impact of other systems which indirectly jeopardize human welfare. In fact, it is from many human systems designed for presumed human betterment that secondary impact emerges that only in future times, after the system has had much opportunity to operate and bring betterment to many that we discover byproducts of these systems which counter the betterments in other ways with detriments. Air, soil, and water pollution, some forms of food contamination, and urban deterioration are some examples.

We briefly discussed some contemporary controversies. The use of additives and preservatives in foods have received some substantial attention in politics and research, such as saccharin, monosodium glutamate, and fluoride. Further, we touched on the introduction of genetic manipulation to alter the color, skin thickness, size, and texture of vegetables, e.g. tomatoes.

The systemic aspects of this area of application were particularly illustrative to us of good intentions leading to aversive consequences. Designing of a system for human betterment brings an accompanying array of potentially and often invisible detriments, which may only become apparent to us in the future. We acknowledged and appreciated that our intentions are to do good, but we must be vigilant in our ignorance to likely unintended detrimental consequences. Typically it seems, we really do not know enough to advert all the negatives, but concern is growing we must know more to design systems for human betterment that incorporate the prevention of detriment, namely human and ecological protection, because of the increased rapidity in which newer systems promoted for the common good rush to implementation in the global marketplace.

7.5. Usability Interface

The application proposed makes reference to interface especially human-machine interface. However, with the expression human-interface we include as any kind of device that has a part dedicated to the interaction with the user. Usually the user must adapt to the interface designed, having in mind the functionalities of the device more than the user need. We noted the issue whether the human being must adapt and accommodate to the machine, or the machine to the human. Further, we pointed to the reciprocal cybernetic relationship inherent in usability interface and that prototyping is a process to establish usability interface.

We may have two kinds of interfaces: (1) Rigid interface, designed on rigid criteria which neglect the individual differences existing between one user and the other; and (2) Adaptive interface, whose behavior depends on the story of interaction between a particular user and the interface itself. The majority of the existent interfaces may be classified as rigid.

The main problem addressed in this application has been modeling of the user's cognitive system to understand what impact that on it of the information displayed by the interface, and how the user learns to utilize the interface itself in the most efficient way to reach his/her goals. As it has been introduced, the other problem addressed is the ability to learn. Still others problems are related to the availability of theories of attention, emotion, and memory.

We emphasized the difference between the concepts of use and usability. We have usability of the interface when it is easy to use, effective, easy to learn, and compatible with the mental schema of the user. We have use when the interface is just effective but not designed for the user need. We discussed the difference in regard to devices for the blind, deaf, and disabled, which enable them to overcome their dis-ability toward betterment, in the sense that they can interact and communicate with those who do not need these devices. Finally, we mentioned the Windows 2000 software commands as illustrative of our application, that can be disabled and made inactive, while others may be activated, to enable active customization of the software to the needs of the user.

This area of application emphasized for us that from the interactions among processes of memory, attention, emotion, perception, and knowledge representation, we have the emergence of an adaptive interface.

7.6. Research Participant Protection

In the United States the Institutional Review Board (IRB) is a concept as well as a human activity system designed for human betterment. Any human organization, institution, center, or facility that uses human beings as participants for research purposes must have a written research proposal scrutinized by a panel of reviewers (IRB) for the impact of the research procedures on the human participants. This is done for their protection. Usually there is a consent form to be read and signed. Many issues that have led to federal laws and regulations in this area apply in regard to human rights, confidentiality, coercion, informed consent, and usage of data collected. Further, many professional associations have adopted a code of ethics that includes research ethics, for example those of the American Psychological Association. These codes guide researchers and IRBs to promote and practice human protection.

As the other five areas, this area of application helped us to see more concreteness to the concepts discussed earlier. IRB looks at each case of a research project coming under its review for what

might emerge, particularly of a negative kind on the persons who participate. Each case reviewed has particular research ethics that tend to be characteristic of that project, and in broader sense, this area of application is extensive in its involvement in ethics. The stakeholders are not confined to the researcher and participants of the project, but often greatly concern the hosting institution, funding source, immediate community, and supervising personnel as well. Interestingly, there is an educational benefit that is available and often promoted when an IRB operates within an organization, such as a hospital, university, and government agency. Attention to research ethics enhances the general consciousness and organizational knowledge pertinent to human betterment. It may be that this kind of system for human betterment may serve to exemplify a means towards designing other systems for human betterment, but this idea needs to be explored and tested.

In summation, looking back over the six areas of application that comprised this portion of our conversation, we noted the variety of the subjects covered, not only their breadth in regard to society and types of human activity systems devoted to human betterment, but also the manner in which we chose to discuss each of them. There was no set rule about how best to discuss an application. Perhaps the ways we did are illustrative of choices that conversation groups have to incorporate the discussion of more concrete applications of their focus into the discourse of their conversation.

8. Designing Matrix

The next phase of our conversation was more integrative. The essential characteristics and applications suggested a matrix that may be of assistance in three ways to groups designing systems for human betterment. The matrix is shown in Table 3. For our conversation, the applications covered in previous section and contained in Figures 3 form the rows, and the essential characteristics described before the applications section and contained in Table 2 form the columns.

Areas of Application	1	2	3	Key Characteristics 4	5	6	7	8	9
A									
B									
C									
D									
E									
F									

Table 3: Application by characteristic matrix

Table 3 is meant to communicate an integrative tool for conversation design; it is not meant to dictate the structure of design. As one might imagine, any set of characteristics the design team consensually comes to as essential to their designing process may serve to form the columns of the matrix. Further, a diverse range of applications enables the designing process to test through conversation the viability of the systems under design.

Thus, firstly the matrix is a basic designerly and methodological tool to facilitate full discussion of various applications by taking up the cells (linkages) of the matrix through conversation. Secondly, the matrix provides a check list to examine systems claiming forms of betterment as emergent properties. This activity may be seen as evaluative. It may come in the form of a constructive critique and audit, and thereby ensure feedback to the design team, e.g. those in conversation designing the systems at various points in the process of designing. Thirdly, the use of the matrix may reflect those characteristics that have emerged as systemic values, a kind of valuation for the design team. This form of feedback brings appreciation and accentuation of those qualities of designing as a conversation process and of systems being designed particularly for those engaged in the conversation.

9. Summary and Conclusion

The process of the conversation consisted of an initial phase to orient the team to the task, followed by agreement on a design to conduct the sessions over the four days together as well as in relation to the other conversation groups. There was a daily progress report made to the the other groups, even though that aspect of our process is not detailed in this report. The heart of the process transpired over the middle two days culminating in an integration of contents produced into a draft for this group report by the last day. Prior to that, a group summary of our conversation was written and subsequently published (Collen et al., 2000). This final report was completed at a distance over the six months following our conversation proper.

As to the implementation of the design, the first day involved a divergent analysis of the key constructs in the theme: designing, betterment, system, and human. This phase was followed by a convergent synthesis toward reconstitution of the theme in more specific terms. The second day continued the reformulation of the focus, which subsequently led to the formulation of a set of 9 essential characteristics for designing systems for human betterment. These characteristics were defined: acceptance, coevolution, continuation, creation, diversity, emergence, ethics, goal, and stakeholders. On the second and third days, these characteristics were then applied to 6 areas of application: education, systems therapy, the internet, consumer protection, usability interface, and research participant protection. The conversation moved toward closure by means of writing individually and in teams, then corroborating aspects of the group report, and finally planning the presentation of our process and results to all participants on the fourth day.

The content of our conversation focused on the difference between the idea of designing a system and actually designing a system for human betterment, designing a system and designing systems, and conversing as a design team and working openly with the coevolutonary dynamics of conducting a designing process. We further noted betterment as a complex construct and chose to examine its importance as an emergent property. The stakeholders were seen as those who are the designers as well as those who may be affected more indirectly. Taking into account the participation and acceptance of the stakeholders became salient influences upon our thinking throughout the conversation. Systems for human betterment meant an increase in personal satisfaction, but these systems can also bring beneficial consequences at more collective levels of human organization. There were implicit subthemes over the course of the conversation, for example, that (1) betterments need to be accessible to everyone at the level of the systems designed, and (2) there is an ethics inherent in designing and the systems designed which likely needs to be made more explicit as the conversation progresses and the betterments emerge. Finally, our

conversation found that the combination of articulating and testing of the key constructs and essential characteristics with real world applications was a constructive means to conduct and then successfully conclude the conversation.

The fruits of the conversation were not only the personal experience with and knowledge gained about conversation design and collaborative inquiry through conversation for the team, but also the methodological products (specifically: conversation design, construct denotation, essential characteristics, foci of application, and linkage matrix) that can assist teams designing systems for human betterment.

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Group 5

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**SOCIAL SYSTEMS AND THE FUTURE
(THE TENTH FUSCHL CONVERSATION)**

November 2000

FUSCHL 2000 CONVERSATION 2000

DESIGNING SYSTEMS FOR HUMAN BETTERMENT
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The influence of Systems Sciences is nowhere more needed than in areas pertaining to human welfare and the human condition. This conversation group will continue its 1998 focus on the relevance and applications of cognitive and systems sciences to the design of human activity systems for human betterment. We wish to emphasize the nature of social and human-oriented systems that reveal to us who we become, how we come to know our world, and the ways we relate to one another. We are especially interested in such systems as learning and learner-centered education (caring) systems, systems that foster human development, personal and collective guidance systems, cooperative and collaborative social systems, and synergistic win-win systems. These special interests are informed by what we have learned about human beings over the course of this century and can learn constructively from each other in this coming century.

We believe that knowledge of the ways we think, feel, perceive, and inter-relate help us as designers to create and develop our systems for human betterment. We expect such systems to take into consideration our human welfare as well as the welfare of those affected by our activities. The globe promises to be a more holistic, interconnected and interdependent world community. Whether we like it or not, whether we wish to accept it or not, we are entrusted from now on as the stewards of all life on the planet. Therefore, our concern for the design of systems of human betterment must include the ecological, ethical, humane, and participatory dimensions in the broadest sense. Trigger question:

- What are the knowledge domains, problems, and issues of design when applied to the creation of systems for human betterment?