EVOLUTIONARY GUIDANCE SYSTEMS AND SYSTEMS DESIGN

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ABSTRACT

A group of people working together with a common purpose can be conceptualized as a Human Activity System. The group can become an Evolutionary Guidance System. When Systems Design is combined with these aspects of Systems Thinking and Methodology into a process for Systems Development, their integration represents an important and powerful advance in the application of the Systems Approach to societal issues and the redesign of social institutions.

Introduction

The last decade has brought a tremendous surge of interest in and concern about global conditions and the future inhabitability of the Earth [4, 7]. This development has been coincident with a renewal of interest in evolution and the application of the systems approach to it [8, 9]. The emergence of systems design methodologies, such as Systems Design Architecture [1] and Soft Systems Methodology [5], has made it possible to consider more seriously than ever the use of systems design to ameliorate and reshape, from the local level to the global level, the social, political, educational, and economic institutions contributing to current global trends.

Purpose

My purpose, in the brief time allotted, is to examine the potentially fruitful link between systems design and the social evolution of institutions. Systems design when combined with an evolutionary perspective in working with human activity systems represents a powerful tool for systems evolution. It is my belief that, by incorporating the concepts and principles of evolutionary guidance systems, this link can be solidified and greater progress will be made in more intelligently directing our future.

Human Activity Systems

In whatever form a group of people unite for a purpose, the group can be designated in systems terminology as a Human Activity System (HAS). To the extent that the group establishes rules, norms, procedures, and practices which govern its activities and those of its members, the group institutionalizes. A HAS that has institutionalized is a social in-

stitution, because the process and activities of the group depend on the interpersonal relationships and social interactions among its members. A few common examples of such institutions are the nuclear family, neighborhood church, clothing factory, elementary school, small local jewelry business, city hospital, township, school district, regional government, paper manu-facturing corporation, national government, transnational conglomerate, international professional society, satellite network, and world-wide currency exchange organization.

A HAS can be defined generally as a group of human beings engaged in a group process and assorted activities which contribute to the fulfillment of its goal. To be effective, the goal of a HAS must be ascribed to by all its members. It is a common goal. It becomes the primary purpose of the system It serves to guide, motivate and inspire its members, but does not necessarily include a vision of the future for the system. The group process and activities bring definition to the system, but may not clarify the long range, life-span aspects of the system, unless the process in-corporates an emphasis on systems evolution.

Systems Development

As a HAS, an institution preoccupies the time and expends the resources of its members in ongoing activities of consuming information and raw materials, molding them into products and services, and delivering them to clients and consumers. This perspective of inflow, production, and outflow of products and services is a common one geared to the thinking of those engage in industrialization and profit making enterprises. This per-spective is compatible with many systems analysis methodologies, for example Living Systems Process Analysis [6], which enables the functional processes of an organization to be studied in detail. Although an analytical approach to institutional functioning may be helpful in decision making and strategic planning in general, these systems analysis methodologies aim at systems development and are today too limited. Design aspects must be added if the methodology is to serve institutions that must evolve in order to survive changing times and conditions.

The mission epitomizes the purpose and goals of an institution, whether explicitly stated or unspoken, but it also should manifest a vision. What is usually missing in the activities of those working in a developing institution is the articulation of the mission in the form of a clear vision. Mani-festation of the vision in the activities of the group help to distinguish a developing institution with goals but without contributory goal-fulfilling activities from an evolving institution moving toward its goals because the activities of its members embody a living vision.

The mission and vision of the institution are important considerations in systems design.

Systems Design

Planning and design are two related but not synonymous activities. The former is more characteristic of organizational change tied to institutional development, where the latter is a necessary part of systems evolution. Contrary to popular belief and usage, planning is not design, and design is not planning. If the institution is to evolve its members must work with its vision in the design and redesign of their institution and its

vision if necessary.

Systems design is an ongoing activity which requires the participation of all stakeholders if a HAS is to evolve. Design is an activity more en-compassing and complex than the development and maintenance of positions, product flow, services, and bureaucratic structures. Design retains flexibility to modify the institution as necessary in order to meet the demands of its changing environment, but it also enables an institution to couple with its environment in a proactive, dynamic process of co-evolution.

Systems design involves a process of inquiry and makes use of systems design methodologies. Now, I wish to mention one such methodology and its relevance to social evolution and the design inquiry process.

Systems Design Architecture

Bela Banathy [1] has described a generic architecture for systems design inquiry which I term Systems Design Architecture (SDA). It has shown itself applicable to a multitude of institutional problems and a variety of settings. For example, it can be used to formulate mission statements, clarify issues and problems, generate questions for systems design inquiry, articulate a process for design and redesign of institutions, and establish a HAS within the institution to manage and cope with institutional issues.

The architecture consists of five conceptual spaces. The process of mapping them can be considered a systems design inquiry process. The Design Space is the arena in which the inquiry process takes place. It is the space of reference for the design inquiry process. The HAS engaged in the inquiry incorporates into this space information from the four other spaces. The inquiry begins usually, but not necessarily, in the Contextual and Design Genesis Space, and it proceeds in a spiralling, iterative fashion to sample from the Experience Space and the Organized Knowledge Space. The thrust of the inquiry is toward the Space of the Future System, which is to contain the model of the system designed, or redesigned, in its future environment. Thus, one major outcome of the design inquiry process is to construct a model of the future system.

SDA is not only a framework for the design of a systems design inquiry, but also an ongoing point of reference throughout the inquiry process. Although the architecture is generic, the systems design inquiry process is unique to the HAS, time, and circumstances of the inquiry.

Evolutionary Guidance Systems

When a HAS commands the direction of its own activities, activities which serve to guide it in the pursuit of its mission, the HAS has become an Evolutionary Guidance System (EGS). Be it a family, organization, in-stitution, or network, an EGS is a self-organizing group of people which, by its operations and actions, engages in a creative, nurturing process. The process is evolutionary, in that there is movement toward its mission and its vision, and there are evidences of such movement in visible changes in the structures, procedures, and practices within the family, organization, institution, or network, respectively.

Each member of the group is a stakeholder and more. Various dimensions must be

represented in order for the group to qualify truly as an EGS. In fact, some time by the group must be devoted in its establishment to the incorporation of all dimensions relevant to the HAS and the systems design inquiry process. For example, key dimensions in any vital EGS are the aesthetic, economic, educational, ethical, political, scientific, social action, and technological perspectives [2]. An EGS is constituted with the intentional representation of these multiple perspectives.

Furthermore, the members of an EGS discuss, debate, and come to a consensus regarding the inclusion of perspectives in addition to those mentioned. The perspectives represented are those pertinent to the EGS in its dynamic interplay and development within its environment. The perspectives represented become tailored to the EGS, and they change as the requirements of the evolutionary process demand it.

The concept of EGS is quite compatible with SDA. EGS brings an important dynamic quality to a HAS engaged in a systems design inquiry process. As an EGS, the group takes charge of its own process with the expectation of adaptation, change, and movement toward its vision. The SDA assists the group in clarifying the evolutionary character of its activities and accomplishments through a careful examination of the conceptual spaces surrounding the Design Space of the inquiry process.

Although the problems are immense and complex, when EGS and SDA are combined in guided inquiry through the systems design inquiry process, the possibilities for the evolution of social institutions appear more attainable.

Systems Design Inquiry for Evolution

Quite separate from his contributions to SDA, Banathy [3] has described four stages for design inquiry. They are: 1) Establishment of Readiness, 2) Design of the Ideal System, 3) Design of Enabling Systems, and 4) Planning-Transformation-Implementation.

These stages of design inquiry show us a general path through the inquiry process. A look periodically at the stage process provides some important feedback to the members of the HAS regarding the extent of their progress through the inquiry. Within each stage, the HAS can draw upon the SDA to organize, evaluate, and reflect upon the inquiry process. Again, SDA provides a set of conceptual spaces to better understand and facilitate the inquiry process. A HAS, as an EGS engaged in the design inquiry process, will recycle through the four stage process again and again as it continues to guide itself and influence its surroundings.

Conclusion

The present circumstances and global trends demand a more integrated approach to institutional design and redesign. The combination of selective contributions of the systems approach, specifically HAS, SDA, and EGS, is a derivative based on simplier systems concepts and principles. This derivation can be applied within a four stage systems design inquiry process. It is a more sophisticated systems design methodology and a powerful tool for the systems evolution of our social institutions.

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CYBERNETICS AND SYSTEMS '90

Proceedings of the Tenth European Meeting on
Cybernetics and Systems Research,
organized by the Austrian Society for Cybernetic Studies,
held at the University of Vienna, Austria, 17 — 20 April 1990

Edited by

ROBERT TRAPPL
University of Vienna
and Austrian Society for Cybernetic Studies

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CYBERNETICS AND SYSTEMS '90