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UTILIZATION OF MANUAL SIMULATION GAMES TO DEVELOP SCENARIOS OF FUTURE EVENTS--AN EXPLORATORY STUDY

W. C. House, University of Arkansas
H. S. Napier, University of Arkansas

ABSTRACT

A future oriented manual simulation game, Futuribles, was used to generate sequences of events which were grouped into scenarios representing possible future environments. A group consensus technique was used to determine which events from a selected secondary list were most likely to influence the occurrence of events in a primary list. The results allowed construction of several plausible scenarios which could then be evaluated further for feasibility, consistency and likely impact on evaluating organizations. Expansion of technique to include additional primary and secondary events, cross impacts within primary and secondary events, and probability statements could improve the results achieved in terms of realism and comprehensiveness.

INTRODUCTION

Scenario development has proven to be a useful adjunct to other forecasting techniques for a number of business organizations concerned with determining possible and plausible combinations of events which could have a significant impact on company sales, profits, productivity, cash flows, capital structures, and other key performance indicators. These scenarios provide organization managers with a broader perspective concerning rapidly changing environments and a clearer understanding of cause and effect relationships possible in environments that differ from present conditions.

Description of Manual Simulation Came

Business policy and general management courses concerned with environmental analysis and strategy selection would seem to be well suited to the utilization of newer methods for improving student understanding of scenario generation/evaluation. An example of a manual simulation game which can be used to help generate scenarios is Futuribles, a future oriented simulation game based on a number of statements of expected future environmental conditions. The game contains 288 playing cards which are grouped into 19 categories such as computer/communications, learning/human experience, energy, family relations, food, health/bio-engineering, housing settlements, international relations, law and government, population/natural resource, religion, space/transportation, and work/leisure. Each card contains one statement of an expected future condition.

Players are organized into small groups (4-8 members). In playing the game, players draw seven cards from a dealer and, in a typical sequence, each player in turn lays down 1 or 2 cards from their hands for further discussion. A number of variations are possible. For example, players can select events which they feel are most likely or least likely, to which they are most strongly or least strongly committed, or which they believe are most desirable or least desirable.

Game Playing Used to Generate Event Sequence

An introductory management course at the graduate level was used with the futuribles games for scenario generation/analysis into the classroom. Students were organized into twelve teams of 3-4 members each. In two preliminary rounds of play, random selections of future event cards were distributed to each team, all players were dealt seven cards each, and then each member was asked to select two cards from his(her) hand which contained future events which they thought most likely and least likely to occur. Finally, each group was requested to arrive at a consensus as to the future events most likely or least likely to occur. In a third round of play, student teams were asked to select several desirable end result events and then identify other events which would be likely to have a positive impact on the occurrence of the selected events.

In the fourth round of play, students were given a list of eight end result events (List A) and ten influencing events (List B) drawn from the computer/communications and learning categories of the futuribles game. Each team was asked to determine which events in List B were likely to have a positive impact, negative impact, or no effect on events contained in List A. Future events on each list are contained in Exhibit 1.

Exhibit 1
Lists of End Result and Influencing Events used In Forecasting Exercise

LIST A--END RESULT EVENTS

A. Increasing use of computerized management information systems.
B. Increasing use of communication over transportation.
C. Increasing use of computers in the design and simulation of social and physical systems.
D. Increasing novelty, diversity in range and variety of individual choices.
E. Improving education for culturally or economically disadvantaged and disabled learners.
F. More learning in settings outside classroom.
G. Increasing emphasis on learning for future than learning about past; on changing society rather than adapting to It.
H. Increasing orientation toward lifelong learning.

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Influencing Events Found To Have A Positive Impact on Selected End Result Events By Student Teams

End Result Event	Positively Influenced By
A. Increasing use of computerized management information systems	1. Diffusion of computer improvement 2. Diffusion of remote terminals 3. Development of time-shared networks
B. Increasing use of communications over transportation	1. Diffusion of remote terminals, cassette 2. Diffusion of computer improvement portable personal telephone 3. Development of time-shared network
C. Increasing use of computers In design, simulation of social, physical systems	1. Diffusion of remote terminals, computer improvements 2. Development of time-shared network 3. Increasing use of computer for drill, instruction
D. Increasing novelty, diversity in range, variety of individual choices	1. Diffusion of computer improvement 2. Development of education as a network of learn- opportunities 3. Increasing practice of informal education
E. Improving education for culturally, economically disadvantaged or disabled learners	1. Diffusion of cassette TV 2. Development of time-shared network 3. Curriculum, educational diversity and flexibility 4. Increasing instruction individualization, educational 5. Network of learning opportunities 6. Increasing informal education practice cassette
F. More learning in settings outside the classroom	1. Diffusion of remote terminals, TV 2. Time-shared computer networks 3. Increasing use of computer for instruction 4. Educational network of learning opportunities 5. Increasing informal education practice
G. Increasing emphasis on learning for future	1. Curriculum, educational diversity, flexibility 2. Computer use for instruction 3. Educational network of learning opportunities 4. Increasing informal education practice
H. Increasing orientation toward lifelong learning	1. Time-shared networks 2. Curriculum, educational flexibility 3. Computer use for instruction 4. Educational network of learning opportunities 5. Increasing informal education practice

Scenarios Developed From Previous Stage-Consensus

The preceding exhibits and paragraphs indicate clearly which secondary or influencing events were thought to have a positive impact on the end result or primary events being considered in the opinion of an overwhelming majority of the student teams surveyed. From the tentative cause and effect relationships established, It is possible to select several secondary events and construct a likely scenario of end result. Scenario A (Exhibit 3) presents a logical sequence of events which could result from expansion of computer terminals, networks, and hardware improvements. Scenario B (Exhibit 3) follows the same pattern for a combination of technological advances and flexibility in educational programs. These scenarios can then be examined for logical consistency and validity by the participants and the probable impact of these developments on the organization's goals and strategies can then be considered and evaluated.

Examples Of Scenarios Constructed From Event Relationships Established In Experimental Study

Scenario A:

Assumptions: 1. Diffusion of computer improvements in speed, cost, compactness, flexibility
2. Diffusion of remote terminals at distant locations
3. Development of nation-wide, time-sharing computer networks with wide public access could be expected to lead to:

Results: A. Increasing use of computerized management information systems
B. Increasing use of communications over transportation
C. Increasing use of computers in design And simulation of social and physical systems
D. More learning in settings outside the classroom

LIST B -- INFLUENCING EVENTS

1. Diffusion of remote terminals at some distance from the computer.
2. Diffusion of cassette TV for education, business, home use.
3. Development of nation-wide, time-sharing computer networks with wide public access.
4. Diffusion of portable, personal phone.
5. Diffusion of computer improvements--cheaper, smaller, faster, more powerful, more flexible.
6. Increasing diversity and flexibility of curriculum and educational requirements.
7. Increasing individualization of instruction--with supporting resources, programs, etc.
8. Slowly increasing use of the computer and related technology for instruction, drill, and exploration.
9. Development of education as a network of learning opportunities, resources with less emphasis on a production system of curricula and schools.
10. Increasing practice of informal education-- facilitating student initiative, freedom in discovery, inquiry.

Cause-Effect Relationships Established By Croup Consensus

Events on List B which were selected by at least 11 of the 12 teams as having a positive impact on the occurrence of one or more of the events on List B were chosen for further analysis and evaluation. Exhibit two indicates those influencing events which overwhelming consensus of the groups felt would increase the likelihood of the various end result events occurring. For purposes of this study, influencing events which were thought to have a negative impact on the likelihood of occurrence of end result events were not considered since in no case did more than one-third of the groups feel any influencing event listed would have a negative impact on the end result events.

Scenario B:

Assumptions;
1. Diffusion of cassette TV for education, business, home use
2. Increasing diversity, flexibility of curriculum and educational requirements
3. Slowly increasing use of the computer and related technology for instruction, drill, exploration
4. Increasing practice of informal education-- facilitating student Initiative, freedom in discovery, inquiry could be expected to lead to:

Results:
A. Improving education for culturally, economically disadvantaged or disabled learners
B. Increasing emphasis on learning for future than learning about the past; on changing society than adapting to it.
C. Increasing orientation toward lifelong learning
D. Increasing novelty, diversity in the range and variety of choices available to individuals.

Method Evaluation and Limitation

The Futuribles Method game used here to construct scenarios has a number of important limitations. The events considered are restricted to a limited number, ignoring some events which may have an important impact on the environment. Cross impacts between primarily (end-result) events and secondary (influencing) events are not considered; neither is consideration given to the fact that some events may have stronger influences than others on occurrence of a given event. Negative influences are also ignored for purposes of this study. This study could have been expanded by increasing the number of events evaluated, by considering both positive and negative influences, and by increasing the rounds of play to allow for assessing two-way interactions of selected events.

In any event, the use of the Futuribles game as a vehicle for scenario generation is a simple, easy and organized way to introduce and illustrate the process of scenario development to small groups involved in forecasting,. The study of future states of the environment is of critical importance as a back- ground for goal setting, strategy selection, and policy setting and techniques that simplify the process are of obvious value. Expan8ion of the format suggested here is relatively straightforward and may provide a means for improved forecasts and analysis of environmental settings of business firms, both real and simulated.