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Ethics of Systems Thinking

I share Knut Ims's admiration for *systems thinking*. Systems thinking represented by the pioneering works of *West E. Churchman, Russel Ackoff, Ian Mitroff* and others played an important role in the academic development of both of us. In this paper I explore some ethical assumptions and implications of system thinking in reference to social and environmental decision making.

Influenced by systems thinking *Jozsef Kindler*, professor of decision sciences and co-founder of the Business Ethics Center at Corvinus University of Budapest, developed a new methodology for multidimensional decision making. (Kindler, J. and Papp, O. 1977) Kindler's methodology is designed for multi-criteria evaluation of complex systems. It can serve as a prime illustration of the ethical agenda of systems thinking.

I focus on three crucial elements of the Kindler's methodology:

- (i) the completeness of evaluation criteria,
- (ii) the measurement of evaluation criteria,
- (iii) the problem of disqualification.

1 The Completeness of Evaluation Criteria

In the case of a complex system we should consider *all the important aspects* of the *system* and create appropriate evaluation criteria for them. For example, if the system in question is a touristic project which transforms the local ecosystem and the culture of local community, it is not enough to study the direct capital investment, job creation and the expected tourists flow but one should also consider the longer term ecological, social and cultural impacts of the project.

In Hungary in 2008-2010 a group of American and Israeli investors wanted to develop a huge gambling and holiday complex called the *King's City*. The complex consisted of 5000 newly built apartments in a nearly natural environment, at the the *Lake Velence*, 60 km south-west of Budapest. (Figure 1) The project was 2 billion USD and expected to generate a good return on the invested capital in some years. However, it would destroy the nearby ecosystems and drastically transform the life of local people with increasing traffic of gamblers and the corresponding criminal activities including drugs and prostitution. (Figure 2) The area represents

one of the most vulnerable parts of Hungarian society. It is populated by low income people and poor holiday-makers. (Figures 3 and 4) The territory is important for the whole of Hungary because of the historical and cultural sites nearby. Some considered the King's City project as "raping the soul of Hungary", an effort which attempts to force Hungarian people for serving Western and Middle-Eastern extravagant rich.

Figure 1 *Lake Velence, the place of the planned King's City project*



Figure 2 *The Casino looks like this*



Figure 3 *The Lake is used by local people*



Figure 4 *Modest living in the area*



2 *The Measurement of Evaluation Criteria*

Every evaluation criterion should be measured by its own scale. It can be an absolute scale, an interval scale or an ordinal scale. Influenced by the economic cost-benefit analysis today's evaluation practice tends to measure everything in money terms. Decision makers usually disregard those criteria which are not measurable by money. Or they use quasi-market valuation techniques for assessing them. This habit is rather problematic because it transforms lower scale measurement entities to the absolute scale measurement of money.

In multidimensional decision making it is suggested that we should use the so-called 5 points Lickert scale which represents the ordinal scale of measurement. System S for evaluation criterion E can yield the following values:

- | | | |
|--------------|---|---|
| | 5 | if system S is <i>very good</i> according to evaluation criterion E |
| | 4 | if system S is <i>good</i> according to evaluation criterion E |
| (1) $E(S) =$ | 3 | if system S is <i>neutral</i> according to evaluation criterion E |
| | 2 | if system S is <i>bad</i> according to evaluation criterion E |
| | 1 | if system S is <i>very bad</i> according to evaluation criterion E |

Higher level (absolute or interval scale) measures can be transformed into ordinal scale and can be compared with lower level measures. In this way decision makers are able to make justice to the more qualitative aspects of the decision situation. The exercise is consistent with the philosophy of social choice advocated by *Amartya Sen* in his book "The Idea of Justice" (Sen, A. 2009)

In the case of the King's City project economic, ecological, social and cultural aspects should be distinguished. Economic criteria are measurable by money on the absolute scale of measurement but ecological, social and cultural criteria can only be measured on lower scale, that is, on the ordinal scale of measurement.

Let K be the King's City project and $-K$ be the non-realization of the project. Let B, E, S, C be the economic, ecological, social and cultural aspects of the project. Based on the extensive studies of the project we can say that the evaluations of the state of affairs with and without the project are as follows:

$$(2) \quad V(K) = [B(K) = 5, E(K) = 1, S(K) = 2, C(K) = 1]$$

$$(3) \quad V(-K) = [B(-K) = 1, E(-K) = 5, S(-K) = 4, C(-K) = 5]$$

This means that the project is highly beneficial from the business point of view but it is very bad from the ecological and cultural point of view and bad from the social point of view. The non-realization of the project is very bad from the business point of view but good from the social point of view and very good from the ecological and cultural point of view.

The decision problem is whether $V(K)$ or $V(-K)$ should be preferred. This is not a trivial problem if we do not permit aggregation across the diverse value dimensions. The no-aggregation rule implies that a gain in one dimension cannot compensate a loss in another dimension.

3 *The Problem of Disqualification*

There is no super system, that is a system which would be superior to any other system considering all the relevant value dimensions. Every complex system has some disadvantages in comparison to other systems. Kindler and others suggest using the so-called *disqualification coefficient*, a measure which shows in % term that a given system is worse than the other systems in comparison.

Calculating the disqualification coefficient for the realization and the non-realization of the King's City project we can get:

$$(4) \quad \delta(K) = 75 \%$$

$$(5) \quad \delta(-K) = 25 \%$$

(4) and (5) mean that K is worse than -K in 75 % of the evaluation criteria while -K is worse than K in 25 % of the the evaluation criteria. It implies that there are considerable disadvantages of realizing the project.

We should set a maximum level for disadvantages, that is, define the level of acceptable disadvantages for a system. This logic is different from the philosophy of cost-benefit analysis which says that a system is acceptable if its advantages are greater than its disadvantages. In the multidimensional decision making framework a system is acceptable if and only if its disadvantages do not exceed a certain level.

The decision rule "elimination by aspect" described by Stanford University decision psychologist *Amos Tversky* expresses a similar insight. (Tversky, A. 1972) A system is unacceptable for the decision makers if there are value dimensions in which the system is so negative that there is no compensation for it. This means that the disadvantages of the system destroy all of its other advantages. A project can bring enormous negative ecological, social and cultural impacts that no monetary gains can compensate them.

4 *Whole Systems and the Quality of Life*

Systems theory suggests that the *quality of life* can be served by taking the view of whole systems. This requires considering all the relevant value dimensions, evaluating the performance of systems in adequate scales of measurement and using disqualification criteria for blocking trade offs among non-substitutable values. (Zsolnai, L. 2008) In our ecologically fragile, socially disintegrating world the multidimensional decision making is a prerequisite for survival.

References:

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