A Case Study of Assessment Applied to the "Cashless Society" Concept

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ABSTRACT

In previous papers [1–3] Mitroff and Turoff have introduced the relationships between technological forecasting and assessment and modern views of philosophical inquiry. This paper transcends discussions of theory and philosophy by providing the reader with a case history description of utilizing these concepts of philosophical inquiry in formulating the approach to a particular problem in technology assessment.

Introduction

It is very rare that those of us practicing in the field of forecasting and assessment ever have a free hand to conduct a technology assessment study as we would really like to. We usually operate in environments where time, effort, and money are primary constraints that place limits on what can be done. Other constraints which also impact are the organizational environment and the expertise available. Still, we may maintain a sense of professional pride in doing the best job possible within the given constraints. However, there is one constraint which we find difficult to bear. This is when the sponsor requesting the work has rigid preconceptions with respect to the fundamental nature of the problem. It is this latter constraint that usually gives the analyst his greatest pangs of conscience and misgivings. By the time he receives the problem it is often so rigidly formulated that the approach is implicit in the statement of the problem and the nature of the results that will be obtained are largely preordained. The choice facing the analyst at this point is whether to let the sponsor remain content or confront him with the possibility he may be seeking the right solution but to the wrong problem. It is sometimes very difficult to get across the concept that in the technology assessment area a major part of the consideration is the determination of what the problem really is, i.e., what is the question for which we wish to generate an answer?

Recently we encountered this situation with an organization that wished an assessment of the "Cashless Society" concept. Confronting the problem directly, we expressed certain misgivings to the sponsor with respect to their formulation of the problem. It was a bit of a shock to us that they, in fact, agreed and in turn provided us with sizeable funding for an initial phase of the study to investigate the nature of the problem.

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At first we were a little at loose ends—never having faced before this rather unique set of circumstances. However, we did arrive at an approach that was quite successful. In fact, it is a description of this first phase of the effort that we wish to share with the readers of this journal. We feel it to be of sufficient novelty to serve of some value to those who may wish to follow in our footsteps. It is, of course, quite rare when one can present a ground breaking endeavor and offer guidance that is not otherwise obtainable.

After due consideration on the nature of our problem, i.e., determining the nature of the sponsor's problem, we concluded that the first issue to face was the type of expertise to be brought to bear on this issue. We finally concluded that what was needed was some philosophical reflection. It is, after all, the philosophers' occupation, or pre-occupation as some would have it, to contemplate the "nature of problems" and the approaches to be taken in determining the approaches to be taken to problems . . . and so on. All of our readers are familiar with the problem of determining who the experts are in technical areas. The same problem is multiplied considerably when one observes the set of living philosophers. Fortunately, we were able to avoid this pitfall due to an opportune set of circumstances. As it turns out, we were able to apply the "test of time" as a selection criterion.

For some minds this is, of course, the only reliable criterion known for the selection of experts; usually, however, it is infeasible to apply. If we may further digress for a moment, our solution may be worthy of some explanation. We found in an obscure research laboratory a completely new and revolutionary communication device—an "Electronic Poltergeist Information Communicator," or EPIC for short, utilizing the latest large scale integrated circuitry and holographic information processing techniques. This device promises to revolutionize communications and represents a fascinating case study of technological innovation. That is not our subject here, but perhaps we will address it in a later sequel. Since this communication unit was a first model, it was quite expensive to use because of excessive power requirements and a rather short time between failures of components (low MTBF). Because of this constraint we instructed all the philosophers contacted via this device to limit the length of their remarks and focus on specifics. This was a bit of a blessing in disguise in dealing with noted philosophers and had the further benefit of allowing us to reproduce for you here the verbatum comments of each of the philosophers without any abstraction and any resulting bias on our part that might therefore creep in. Enough of our bias has already "crept in" anyway. The remainder of this paper, then, is the transcripts of the translation of the remarks from the original Morse type source language recordings.

Transcripts

The first philosopher we called upon via this device was a man who, in our opinion, has greatly influenced the development of the deductive sciences—Professor Leibniz.

Comments of Leibniz

"Gentlemen, the problem and its approach is quite clear cut. I have many disciples in the current society that can address this issue. I could recommend to you any of a number of competent operations researchers and even certain members of the new school of system dynamics as typified by the work of Forrester and Meadows. However, it is quite flattering that you have invested the time and effort to call on me personally so at least let me undertake to point you in the right direction and alert you to one possible pitfall.

"I observe the initial work statement prepared by your sponsor placed a large emphasis on the concept of cash. While it is true that the formal structure underlying the flow of money in the society is one of the fundamental concepts necessary for an understanding of the society, this has been carried by some disciplines to the point of being thought of as the only component. The emphasis on structure and relationships governing the flow of money has become a mirage preventing a true investigation of society's structures. In dealing with the concept of a cashless society you should take care to remember that money transactions are only, in many instances, a virtual representation of the structure that physically underlies the movements and transfers of goods and services in the society. Avoid becoming intrigued with the many data representations that the flow of cash can take on. If you wish to understand the impact of the cashless society, you must seek to build up a formal model of society which deals with the fundamental physical parameters such as energy and materials. With such a model you will be able to reflect changes in the handling of money in terms of the impacts on the more fundamental parameters governing the society. Within the framework of this model you will be able to construct alternative structures to represent feasiable forms for the 'cashless society' of the future. Until you do make explicit the relationships governing the structure of the society, you cannot expect to do assessments and planning for the future, regardless of what topics you address.

"Many of the current alternative approachers are mere conveniences brought about by an inability to handle the true complexity of any model which would in fact represent our current society. However, the current emergence of computers provides a tool with which you can create and process models of sufficient richness to account for the multifacet aspects of such a complex dynamical system as the society in which you now live. This is a considerable advantage over the technology available in my time. Over the years a great many great minds have deduced the structures underlying various micro components of this system and it only remains to deduce the overall structure into which these may be placed. You have a challenging problem here and an obvious approach to be taken. Thank you for your time and this opportunity to converse with you."

We found Leibniz's view of the problem very encouraging and somewhat pleasing in its rather straightforward, clear guidance on what had to be done. Rationalists are always straightforward; it is the nature of their nature, i.e., how they think about anything. We were at this point, ready to actually tackle the problem. However, we would not have been accomplishing the objective of our initial contract if we did not seek other views. We next called on a man who has had considerable impact on the development of the inductive sciences—Professor John Locke.

Comments of Locke

"Ladies and Gentlemen, while my distinguished colleague Leibniz has certainly made some interesting points, I'm very much afraid he would send you down the wrong path. It is certainly true that economics, as limited to the observation of money flows and transactions, has not lived up to its expectations of providing a sufficient understanding of the society. However, it has not been because of its lack of models, but rather because of a lack of data and the ability to process the data properly. In the past data has been costly to collect and process; financial data, however, by its nature, is recorded in volume and regularity. The emphasis on this type of data has therefore been a result of its availability. Until the advent of computers, this served as a convenient workable represen-

tation of society to the extent we were feasibly able to observe the data generated by the society. Now the costs of gathering and processing data in electronic form are so minimal, relative to benefits, that we can obtain all the data of significance to the understanding of society. This is a considerable advantage over the technology available in my time. Certainly this view is well represented by those of my disciples who are now concerned with the subject of 'social indicators.' There is no pretention today, even on the part of most economists, that financial data alone is sufficient.

"If you therefore wish to address the questions of the 'cashless society' in a productive manner, then I would recommend a collection of all major social indicators into one computer system, so that various alternative data representations and statistical analyses methods can be utilized. Based upon this data resource you may then seek to utilize Delphi procedures to obtain the best judgments of the relationship of the data to the issues your sponsor wishes to address.

"You see, it is *hard facts, data, information* in its correct representation, that humans can judge and relate to their concerns. In particular, it is quite clear from the data *now* available that the society has already moved into the initial transition phase to a 'cashless society.' Those structures that Leibniz would wish to model are already in the process of change; therefore, *it is only by observing the data and its resulting trends that you will be able to detect what is really taking place. You now, gentlemen,* have two data points in your analysis of this problem, and I wish to suggest that you will need a significantly greater number to obtain a consensus on the truth of the matter."

This result led us to question the wisdom of ever consulting with two philosophers on the same question. We no longer had a clear-cut approach. Perhaps we should have expected the discrepancies between the approaches offered by Misters Locke and Leibniz. This of course, necessitated the seeking of a third view. For this we went to an individual who had in his time the opportunity to reflect on the philosophies of both Locke and Leibniz—a Mr. I. Kant.

Comments of Kant

"Ladies and Gentlemen, and my noted fellow philosophers. I have been most disturbed by what I have heard here today. How can you propose approaches when it is unclear as to what is even meant by an assessment of the 'cashless society.' What objective do you in fact seek to meet? If you merely wish to observe the transition to the cashless society, then perhaps the program outlined by Locke is appropriate. If, however, you seek to influence the course of events, then Leibniz's approach may be more fruitful. In any case, it would be dangerous in this situation to rely on *one* approach. When you have clearly defined your objectives then you must undertake alternative approaches. You will quickly discover that, in the process of examining the relationships of your approaches to your goals and objectives, the separation of data-oriented efforts and model-oriented efforts is an unworkable artifice. Neither Leibniz nor Locke can ever do an effective job without borrowing from each other's philosophy, either consciously or subconsciously. I would note that even to observe the data one has to presuppose some model. Therefore, Leibniz is necessary, but not sufficient.

"The collection of social indicators always implies an underlying model for the structure of society that is being considered. Some model is always used to guide the data collection effort. Neither can one build a model to apply to an objective without having some concept of what data is available or can be collected. A model for which there is no

data has no content for a specific issue or objective. I would strongly urge you to require your sponsor to lay down a specific set of objectives and that you undertake aspects of both the approaches outlined by Locke and Leibniz within the context of those objectives. You will observe in such an effort alternative combinations of models and data which will impact on any specific issue. You will then be able to observe out of these alternatives which is the best for your purposes. From a practical standpoint, any attempt to look at the future offers a greater number of alternative model and data approaches than is feasible to carry out in any reasonable time. We humans are very versatile in terms of the perspectives we can create. It is only when you hold your objectives in view and require a recognition of the inseparability of data from models that we can focus in on what is meaningful. You can easily find today a great many of my 'students' in the schools of policy science, cost-effectiveness, and normative assessment techniques who are perfectly capable of carrying out such an effort for you. I would even recommend the use of Delphi, but not necessarily to generate a consensus, but rather for the contribution of alternative and/or diverse views on your topic."

Apparently, one or three philosophers can be useful. With the remarks of Mr. Kant I felt we had tied the pieces together rather effectively. However, there was still some money in the budget for this phase of the study and the sponsor of our effort would lose face with his peer group within his organization if we did not expend all that he had requested. After some consideration, we decided to call upon an argumentative old crotch by the name of Mr. Hegel.

Comments of Hegel

"Thank you. It has been of great disappointment to me over the years to observe the movement of western society away from the conflict between opposing views. There seems to be a mistaken belief that there is something illogical, chaotic, impolite, and/or nonproductive about an approach that is founded on structured debate. I am therefore quite pleased at this unique opportunity to illustrate for you how a new vista on your problem may be brought forth by the use of a philosophical approach that is dependent on conflict.

"From the comments of my fellow philosophers and the work statement you have provided me, it would seem all of you are working under a hidden premise. This is that the cashless society is merely a transition from the current financial structure to an electronic form for the transfer and accounting of the associated information for the exchange of funds. It has not seemed to have occurred to anyone that an electronic form for the exchange of money allows a completely different and opposing approach to dealing with the exchange of goods and services. In principle, the electronic form of accounting (in the broad sense) could allow the abolition of the very concept of money. With data in electronic form it would be possible to move the society to a complete "bid and barter" system. Individuals and organizations could hold wealth based upon goods and services directly and each exchange could be carried out in an auction and bidding procedure. It could very well be that in such an environment problems such as inflation might very well be minimized. I do not mean, in any sense, to pre-judge this alternative as the desirable way to go. Rather I recommend that you examine on a comparative basis the current plans and this opposing alternative. If you do this in a manner such as to arrive at the strongest position for each, then you may very well find another alternative, representing a synthesis of the two, which incorporates the best of both. At the very

least, however, you will have more confidence in your current approach if you conclude after this exercise that it is still the best one.

"In essence, I am somewhat in agreement with Mr. Kant, except for the notable exception that one of the major goals underlying such an must always be the construction of opposing objectives. I would also observe that humans are very inventive and they can always manipulate the same data to support contrary views. It is the recognition of this fact and its utilization that lends strength to the utility of structured debate. While I realize the current costs of utilizing EPIC for communication precludes an alternative format for these discussions, I wish to suggest that my approach would have been ideally suited for our topic here today. As it is now, you have an unstructured advocacy process that can often be more confounding than enlightening."

Well, the remarks of Hegel completely wiped out the seemingly coherent position we had arrived at previously with Kant. Seemingly four philosophers were as bad as two. It was quite clear we needed further advice in order to salvage the situation. Since we had used up our budgeted funds at this point, we applied to our sponsor for a supplement. Since he had been following our efforts closely, he provided some indication that he expected some pragmatic insight as a final output. After some reflection on this rather crucial situation, we decided to turn to the early 20th century American pragmatist—E.A. Singer.

Comments of Singer

"Gentlemen, I cannot help but reflect that the quandry in which you have placed yourselves in is due in large measure to your own values and ethics which underlied this particular mode of inquiry which you have chosen. You have implicitly assumed along with all these other gentlemen that the problem you are addressing and the various approaches being put forth are separable from ethical concerns. In point of fact, every one of the philosophers who has spoken has his own set of personal values which are inseparable from the approach he takes. When you seek to understand these values, you will find yourself in a better position to gauge the strength and weaknesses of their individual approaches. Leibniz assumes that using one's head is always best; Locke, his eyes; Kant wants to integrate his head (thinking) with his eyes (seeing); and Hegel wants to initiate a fight within separate parts of his head. Each assumes that his mode of inquiry is best. This is their supreme value assumption. It is also their supreme arrogance, just as it is mine.

"It would, of course, be unfair at this point if I did not expose for you my own values after having done so for my colleagues. In essence, my ethic is that there are no absolute values or goals; however, I am not a relativist, for I don't believe that all sets of values are equally worthwhile. Some assumption on values and goals always underlies an individual design of an approach to a problem. The design must be of such a nature as to expose those values and provide the opportunity to modify them and reflect this back into the design. Such an endeavor is demanding and, in principle, unending; therefore, it is not commonly attempted. Nevertheless, the serious nature of problems apparently facing your society has motivated a growing number of individuals to call for more efforts of this type. Commonly you will find this expressed by those calling for "holistic" approaches to problems, and I refer you for example to the work of C. West Churchman and Russell Ackoff.

"Perhaps all this would become clearer if we look at the specific problem you have at hand. When you begin to talk of the problem of the 'cashless society' you cannot be

divorced from the underlying values and psychology of the individuals and the various groups that form the society. Going down to the next level, let us take the specific issue of 'crime' and its relationships to the concept of a 'cashless society' as an example of the use of value considerations.

"If Leibniz had approached this issue, his model would probably have told you what types of crime would be eliminated or minimized in various alternative mechanisms for structuring the cashless society. Locke, however, would have been able to alert you to the beginnings of new forms of crime as a result of his monitoring of the data. Kant, given the objective of minimizing crime, might be able to show you how it could be done even more effectively with other alternatives than the 'cashless society.' Hegel would force us to scrutinize the appropriateness of utilizing considerations on crime, as opposed to other issues basic to establish views on the issue of a cashless society. With all these rather major contributions, what then would I offer? Consider 'crime' within the context of 'value'; everyone else has assumed crime is an undesirable component of society that serves no useful function. Perhaps, in fact, it serves a very crucial function. Crime, in a holistic sense, can be viewed as a regulartory mechanism on the society. For example, if crime is on the increase, it can be viewed as an indicator for society of deeper problems that need coreection. Society is forced at some point to take action against a rising crime problem and hopefully to correct the factors that drive individuals to rebel in this form against the society. In a cash oriented society it is easier for people to turn to crime then in a cashless society, particularly those people at the lower economic levels (who are therefore more likely to feel inequities). The danger for society in a cashless society then, is that it may raise the threshold for crime to such a level that it is impossible for the society to detect when it has a problem. The threshold may be so great that the signal of discontent is no longer a rising crime rate, but a revolution. Your proper objective in this view is to avoid eliminating the opportunity for crime when you seek to create a cashless society. Unless, of course, you can substitute at some point another signal for the society that is as effective as this one.

"In summary I would, therefore, strongly advise you not to ignore the problem of ethics, values, and psychology in your considerations of this problem."

Conclusion

In addition to our basic question we had now developed a lemma[1] on the use of consultants at least in the area of philosophy: always use an odd number of consultants—never an even number.

With the advice of Singer, it was now quite obvious on how to apply the advice of our various philosophical consultants. What we actually did was so successful that our sponsor labeled it as proprietary and the results cannot be disclosed here. However, aspects of that effort are part of our general knowledge base which we bring to bear on assessment studies for any of our clients.

However, a significant factor in the success of our effort was the realization, as well as that of our sponsor, were inseparable from our investigation. In view of this, a significant portion of our effort went into gaining an understanding of how each of us approached the problems concerned with the "cashless society." One specific item we can leave with you is the questionnaire at the end of this paper which we found useful in stimulating both reflection and discussion of this topic. It has been our experience in utilizing this questionnaire to find that every approach is represented in any group by at least a significant minority who give it first preference.

Epilogue

Based upon the success of our initial effort with EPIC, our sponsor financed the construction of an EPIC II which allowed simultaneous discussion across the centuries. We then brought the same philosophers back together for a group discussion of the problem. The first thing we discovered was, what any Delphi practitionaire could have guessed! It was impossible to keep the group focused on the particular problem of the cashless society and the results proved to be too long to produce verbatim. However, a number of interesting observations were produced and we offer the following short summary.

Leibniz observed that the cashless society model was only a small submodel of the total societal or "world" model and that in principle the latter was the necessary objective if the submodel was to be possible.

Locke pointed out that a model contains no new knowledge and at best is only an educational device for those using it. In essence, it can never reflect more than what the designers have put into it.

Kant observed that a technology assessment effort, whether it be the use of models, data, or combinations thereof, is the process of *writing history in advance.*

Hegel emphasized that as a result of Kant's observation we must be very careful that we do not write the wrong history of the future and therefore we must strive to examine opposing views.

Singer reflected that the model and data do not reflect future values or even present values if they were done in the past. Therefore, they may limit our options and hide discontinuities that seem to be characteristic of our current society, e.g., "Future Shock."

Locke and Leibniz argued that we must observe or model the values that are there now, before we can proceed into the future with our history.

Kant suggested that placing too much concern on present values would in effect place the state above the individual. While this was not without precedent, it can have the effect of freezing the society into a mold.

Hegel suggested that we invite the ancient philosophers into the discussion since they could deal with ethics and values in a pure sense, uncontaminated with many of the current technological concerns.

Singer felt that the ancients could not have the same weight as the more contemporary philosophers represented in this group because of all that has taken place since the time of Plato, Aristotle, etc.

Hegel rejoindered that leaving out the ancients, seemed like a holistic view with a hole in it.

On that note we requested a final conclusion of their discussion and they managed to agree that work should begin on two new models of EPIC. One, to communicate with philosophers of the future (there was some question as to whether there would be any, or whether everyone would be, or if computers would take over the same role); and two, to communicate with philosophers of other planets, since the restriction to humans was arbitrary in nature.

EPIC, of course, must use an actual human as the medium to allow communication. It also requires somewhat of a psychological compatibility between the poltergeist and the medium.

I wish to express my thanks to Carl Hammer, Richard Longhurst, Jack Schuman, Dave Snyder, and Richard Wilcox for their cooperation in this unique experiment.

INDIVIDUAL ACTION AND PHILOSOPHY PROFILE

Please identify your most typical action, modes and philosophical approach by ranking the five stereotypes in the order in which they most nearly characterized your behavior. For example, if you most often solve a problem by establishing "pros and cons," then you would rank "conflictual" as number one; if next most often you look to mathematical representations of the problem, you would rank "mathematical" as number two; and so on. *Do not make ties.*

Rank

Mathematical–Leibnizian

Compulsively reduces every problem to mathematical form even when it is not appropriate or efficient. Always seeks a general set of impersonal rules, guides or procedures to be followed regardless of the situation. ____

Realist–Lockean

Exclusively associates reality with hard data or "facts," even when data are not adequate or relevant. Considers the final consensus of a group the best judgment regardless of individual minority views. ____

Idealist–Kantian

Insists on associating reality with speculative possibilities, even when they are not feasible. Always wishes to take time to examine alternative approaches to an objective even when a feasible and desirable approach is at hand. ____

Conflictual–Hegelian

Must insure an opposing view is presented and supported even when every one is in complete agreement. Believes all data can be represented to support either side of a debate no matter what the subject or the data. ____

Pragamatist–Singerian

Assumes there are no hard or fixed goals or objectives and anything can be subject to change at any time. Always reflects on the broadest possible view of the system even when it is not called for. Must always examine the motivations and values of those doing the job even when the job is being done well. ____

This profile is based upon an original design by Ralph Lenz which was later modified by Ian Mitroff and Murray Turoff. Because it is purposely focused on the negative aspects of each inquiry mode it is not intended as a fair representation of the inquiry modes. For that the reader is referred to the earlier references.

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