Dr. Karlheinz Steinmüller

Z_**punkt** GmbH

The Foresight Company

The Future as Wild Card

A Short Introduction to a New Concept

Berlin 2004

Futures studies at the beginning of the 21st century

Futures studies (or foresight) have experienced a number of remarkable developments in the last two decades. They have departed from the planning optimism that characterized their earlier days and from far-reaching forecasts of the future. Thirty years ago, Herman Kahn sought to describe the coming two hundred years; by contrast, futures research today seeks to identify in quite pragmatic fashion feasible roads into a future that will be worth living. But futurologists have learned yet another lesson: There is always a chance that dramatic events change the whole image of the future, they way we think about it, the concepts we use and even the aims we try to achieve.

September 11, the collapse of the communist block and the first oil crisis are examples for such surprising and disrupting events. As discontinuities they lead to the failure of prognoses and, moreover, they even represent a challenge to scenario techniques.

Some remarks on methodological developments

Generally speaking, from the viewpoint of the methods applied, futures research experienced a development in the 1980s and 1990s that may be characterized as a move toward "enhanced pragmatism". Complex (but relatively rigid) formalisms such as analyses of interactions and certain other quantitative methods are used less frequently; sophisticated (and not so sophisticated) scenario techniques often now take their place. Brainstorming techniques and various participatory methods such as futures workshops have also experienced a tremendous growth in popularity (Burmeister *et al.* 200).

In some regards – especially in the field of methodology – technology assessment (TA) has evolved along lines similar to foresight. Some observers speak of a "change in perspective" in recent years: TA is no longer primarily an advisory instrument for the legislative and executive branches with the purpose of limiting damage at the end of a technological development vector. Just as the major emphasis in foresight has shifted from forecasts to the design of desirable futures, TA today concentrates efforts on shaping technology at an early stage in the genesis of a technology ("creative technology assessment"). Among other aspects, this implies getting new groups of operatives involved – businesses, associations and various interest groups within society ("stakeholders").

Pertinent developments are also to be seen in the philosophy of science. What has been overcome in particular is the traditional notion of the logical identity of explanation and prognosis, something that goes back to the beginnings of the philosophy

of science. To put it simply: Even where a correct *post hoc* explanation can be supplied for a certain phenomenon, it does not automatically follow that *ex ante* prognoses can also be submitted. In the field of logic we have finally been able to also take into account the fundamental difference between past and future – the irreversibility of the past together with the open-endedness of the future.

Even recent advances in such distant disciplines as the historical sciences can be set in relationship to futures research. History is no longer considered to be a finished object that needs only to be uncovered, where in accordance with Ranke's dictum, historians simply jot it down "as is really was"; instead, it is seen as a construct. The historian uses today's traces from the past and his or her own conceptual instruments to collate individual findings and form a picture of the past – not entirely dissimilar to the futures researcher who observes current trends and uses his conceptualisation instruments to construct a picture of the future. There are direct parallels to the new sub-discipline of counter-factual historical research which constructs pasts which never existed but which might have existed – in such a way scenario techniques applied not to the future but to the past. Thus, for example, the Nobel Prize winning historian Robert W. Fogel examined the course that economic development might have taken in the United States if the railway network had not been created in the last century. What effects would the absence of rail transportation have had on business and the economy?

Counter-factual questions of this type are resolved in a sort of scenario study. A historical scenario study such as this differs from a futurological study in that not the present, but rather some point in time in the past, is taken as the starting point and that the historian always has at hand a reference model, a standard scenario, in the form of the established actual history (Steinmüller 1999).

Among the newly emergent theories of recent decades, those trumpeting self-organization and chaos have undoubtedly had the greatest impact on futures research. Indeed, it may on occasion even appear as though chaos and self-organization were undermining the actual foundations of futures studies. According to certain popular interpretations, neither forecasting nor planning are feasible: minute changes in the initial situation can lead to major changes in the final results such that the consequences can no longer be estimated. The fact is that chaos theory, properly applied, makes possible a more precise demarcation between areas in which prognoses are possible and those where they are not – in each case within the framework of the assumed model of reality.

Self-organization, as both a theoretical and a practical social concept, forces us to rethink futures planning once again. Practical futures research has for some time now indicated that planning in the conventional fashion – pursuing a fixed course once it

has been laid down – is not feasible in our highly complex society. Incremental planning, which embraces step-by-step examination of goals and instruments and is always open to external influences and changes, thus continues to be a central concept in the shaping of futures.

These brief comments were intended to provide a framework for the discussion of 'wild cards' that will now follow.

Wild cards – "futurequakes"

In retrospect we can probably readily agree that major catastrophes such as the reactor accident at Chernobyl could be viewed in this sense as wild cards. Individual political events with grave consequences such as the terror attacks of September the 11th might also be considered to be wild cards. One could probably even see the collapse of the Soviet system as such a wild card; it was certainly a wild card for the prognosticators inside the Communist Block. Was the first oil crisis a wild card? Many would say so but we have learned that Shell was prepared for such an event. Consequently we must question whether this was truly a wild card.

Ten years ago, the CIFS (Copenhagen Institute for Futures Studies), BIPE Conseil (Issy-Les-Moulineaux) and the Institute for the Future (Menlo Park, California) suggested in a joint publication a definition for wild cards:

> "A wild card is a future development or event with a relatively low probability of occurrence but a likely high impact on the conduct of business" (BIPE *et al.* 1992, p. v)

As a rule, neither the likelihood nor the impact potential will be known in advance; both will have to be assessed when identifying an event as a wild card. In regard to probability, a qualitative evaluation will, as a rule, be sufficient, determining that this is an event that is indeed improbable but not entirely impossible. In much the same way, a qualitative estimate of the impact is sufficient for the identification of wild cards: potentially wide-ranging impacts are expected. The actual evaluation of the consequences, for which a wide variety of methodological instruments (borrowed from technology assessment, for example) might be considered, does not take place during the identification or selection of the wild cards to be used in a scenario process, instead coming later, in the step known as "analysis of the disruptive event".

At first glance a wild card is something surprising, perhaps even shocking, something which happens unexpectedly. Surprise is, however, a very subjective concept and therefore not suitable as a criterion. Nevertheless the question, "what might surprise you?", is a good starting point for a wild card brainstorming session. The element of surprise disappears, however, during closer analysis.

In any case, characterizing an event or development as a wild card depends upon the overall framework of the study being undertaken: a new mathematical theory which would make cryptography obsolete would, for example, have an immense impact on the information and communications technologies sector; within the framework of a demographic study, however, it is irrelevant.

In a way, the definition propounded by the three institutes noted above actually plays down the real value of the notion of wild cards. Characterizing them by low probability and high impact misses a central point: The effect of a wild card is tremendous since it does not fit into our usual frame of reference as it undermines our concept of the ordinary normal way of things, making the concepts through which we regard the world appear doubtful.

Wild cards change our frame of reference, our mental map of the world. This can be demonstrated by the emergence of words with new meanings after a wild card has occurred: super-terrorism, climate protection, or – to take some older ones – aids, stagflation, and glocalisation. Therefore, wild cards do not only change reality but also, and perhaps even more deeply, they change our perception of reality and our concepts. As is often observed, they re-write the future, but they re-write the past also. We look with different eyes to past developments. Did they give rise to the wild card? What trends favoured such events? Which "weak signals" already hinted at the wild card?

Take Chernobyl as an example. The Chernobyl disaster was not only one more reactor accident (of a yet unknown dimension), nothing like, say, the disaster of Harrisburgh (Three Miles Island). It was without any precedent for a second reason: it changed the way most people now think about the "peaceful use of the atom".

If the future is the space of our hopes and fears, our wishes and plans, or, more generally: our expectations, wild cards are shocks to this space. They are "futurequakes" changing all of the landscape of the future.

Approaches to systemization

There are lots of quite different wild cards: A sudden baby boom in Europe or a new epidemic, a break-through in high-temperature superconductivity research or a shifting of the Gulf Stream, political upheavals of all kinds, wars, assassinations, an end to Moore's Law (the ever increasing performance of computers), gene-tech hazards, a radio-smog panic and many, many more. In his catalogue Petersen (1997) lists 78 wild cards. We describe 55 wild cards in our recent publication (Steinmüller 2004).

Different aspects may be used to systematize wild cards.

1. Topic: The subject of the wild card, or the sector in which the wild card originates, or upon which it will have direct impact (e. g.: technological wild cards, political wild cards).
2. Impact: Will the wild card have only minimal consequences within the framework of a given scenario or will it trigger an entirely new scenario? Such a differentiation between potent and less potent wild cards is possible only after completing the analysis of the consequences.
3. Plausibility: All wild cards are by definition unlikely but some are highly improbable, some are less improbable and some are simply not very probable (depending upon our assessment). Another differentiation carries greater psychological weight: some wild cards are plausible; they fit – although perhaps only after a preliminary analysis – the worldview held by those who carry out the study. Other wild cards are not plausible; they go against intuition and common sense, without, however, being absolutely impossible. Seen from a methodological perspective, it might make sense to take even "impossible" wild cards into account because the demarcation (often fuzzy at best) between the possible and the impossible is based on the knowledge available at the moment and even on one's personal view of the world.
4. Time scale: Here it would be necessary to differentiate between wild cards – which are sudden, unique events – and processes, *i.e.* improbable short-term, medium-term or longer-term developments.
5. Causes: One may distinguish between wild cards, which occur without any preparation whatsoever – often in the form of accidents or catastrophes due to a chance coincidence of circumstances – and wild cards, which are the result of longer-term processes – typically creeping catastrophes.

Wild cards, creeping catastrophes and chaos theory

Discontinuities in trends or structures represent a prominent group of wild cards. Like some sudden events, accidents or catastrophes, such breaks in trends or structures may be traceable to processes that transpire unobserved for some period of time because they have not drawn public or scientific attention to themselves. These gradual, unnoticed processes are "creeping catastrophes" in contrast to acute, catastrophic events (Böhret 1990).

The concept of "creeping catastrophe" was obviously coined with a view toward ecological damage which slowly accumulates; it may, however, also be made to fit a general theory of management for complex systems. As such we can say that creeping catastrophes result from the interplay of numerous causes. As these causes are

mostly unknown, since their causalities are complicated and interrelated, and their effects delayed, the instruments for evaluating the consequences (or those for "risk assessment", too) are inadequate for dealing with such creeping catastrophes. Creeping catastrophes thus culminate in events that are apparently indeterminate, unpredictable and confusing and which represent a serious problem not only for futures researchers but also for decision-makers and the political system as a whole.

Wild cards very often evolve in just the same way. For a while, they gestate in a hidden, latent form. Then, suddenly, they become manifest. Therefore wild cards are characterized by the fact that they take decision-makers in government or business by surprise – either as the result of a creeping catastrophe or analogous to them – and thus provoke non-systematic, inadequate and inappropriate reactions which are primarily "for show". It is, of course, impossible to prepare for every conceivable wild card. But the discussion of wild cards in the course of decision-making or consulting processes and including them in futures studies or game plans can reduce the element of surprise when a real wild card does occur and can in general increase flexibility in responding to such occurrences.

In some respects the concept of wild cards forms the qualitative counterpart to the concept of chaos in the theory of dynamic systems. Like chaos, wild cards place limits on both prognostication and planning. Like chaos, they are the result of the inherent complexity of the system being analysed and of its environment. Like the bifurcations in the chaos theory, they mark the beginning of new developments, diverging evolutionary paths. In addition, they may be interpreted as an expression of non-linear system behaviour.

One conclusion of chaos theory is that non-linearity can lead to counter-intuitive behaviour. A basic rule for futures studies is not to depend on that which is intuitively convincing, but rather to take counter-intuitive system behaviour into account. This is possible, however (at least in part), by augmenting the study with a wild card analysis. Even when formulating multiple scenarios, a complementary wild card analysis can be helpful in testing the stability of scenarios or their susceptibility to interference by external influences or internal disruptive factors which had been neglected or disregarded. In the theory of dynamic systems, tests such as these are known as sensitivity analysis. As opposed to dynamic systems, however, it is hardly possible to vary individual parameters just slightly in scenarios. Wild cards are a much coarser instrument – but an instrument that can be used in qualitative studies.

Wild cards taken from science fiction?

Wild cards can be found in a number of ways. The most obvious is to identify them with the usual creativity methods – workshops and brainstorming. Another means is

through the use of surveys. But polling experts presume a very high degree of openness to unconventional thinking and this may not always be the case. A further possibility is to make use of historical analogies, to evaluate comparable situations, to ask which events or developments acted as wild cards at that time, and to construct analogies for the present situation. Finally, science fiction is available as a reservoir for wild cards. Due to the high density of ideas that this kind of fiction contains, it is advisable here to evaluate stories that are similar to the topic being dealt with in the study. Science fiction authors ultimately place great value on surprising their readers with new ideas, some of which might be suitable for consideration as wild cards. Since, however, only a very small portion of science fiction is really original in character and certain motifs are repeated *ad nauseam*, this approach may prove to be quite tedious in practice.

From a theoretical point of view, at least two parallels can be determined between wild cards and the role of innovation in science fiction. On the one hand, both concepts imply a deviation from the conventional world, or from the mainstream future. On the other hand, the "What if ...?" principle which many authors use in their writing corresponds in part to an impact assessment.

Ideally, science fiction scenarios exhibit a number of advantages when compared with futurological scenarios. Science fiction scenarios are as a rule detailed, complex and holistic plans for the world that includes day-to-day living and everyday human needs and behaviour patterns along with emotional aspects. Finally, science fiction writers are not bound by questions of technical (or social) practicality and thus can be particularly vivid when depicting desires, goals and concerns in their scenarios. One could even argue that science fiction writers – because they take into account everyday human behaviour patterns and by way of example include at least speculatively the options for abusing any given technology – have a more correct (more complex!) view of people and technology than do some futurologists. Naturally the great majority of science fiction does not satisfy this ideal model. In spite of this, it may very well be worthwhile to examine science fiction for wild cards.

Practical aspects

In general, wild cards can fulfil several functions in a scenario development process:

- They can, as has already been mentioned, be used in order to estimate the susceptibility of a scenario to external disruptions.
- They can be used to compensate for potential weak points in the conceptual framework (mental map).

- They can help those who devise and use scenarios to recognize alternatives and to be open-minded in regard to unexpected developments.
- Ultimately, they can also be used to counteract certain widespread faults – such as a shortage of imaginative capacity, the predominance of wishful thinking or a fixation on catastrophic scenarios ("hyper worst case thinking").

What then are the criteria for selecting suitable wild cards? There is no all-embracing answer to this question, and one can indicate only a few general rules based on experience. Moreover they are intended above all to obtain additional information through a wild card analysis.

Firstly, the wild card must be appropriate to the problem. A wild card need not necessarily stem from the central topical area of the study, but it should nonetheless be associated with it. Wild cards that would be entirely without consequences will not uncover any additional information. Secondly, a wild card should be as original as possible, should be something which has not already been taken into account in another form; its consequences should not be immediately apparent. Thirdly, one should also think about wild cards that (in accordance with conventional thinking) are at the far edge of that which is just barely possible.

A few fundamental rules can be formulated for dealing with wild cards, too:

- The analysis should not be limited to one or two wild cards. This would cause too much attention to be paid to a single direction; the plausibility or transparency of the study could also suffer.
- "Negative" wild cards, those that presumably would not support the scenario constructed, but rather would undermine it, should be given priority consideration (as a test for the stability of the scenario). More incisive analysis may, however, demonstrate that "supportive" wild cards can also have interesting counter-intuitive consequences.
- In addition to wild cards with a strong contextual reference to the topics stated in the scenario, it is also advisable to consider those that imply a change in the peripheral conditions, its environment.
- In order to avoid potential prejudices, it may be useful – especially when identifying wild cards – to incorporate outside expertise into the study, either through interviews or by way of a workshop.

Let me close with a brief, non-technical estimate of probability. In accordance with the definition, the probability of any single wild card occurring will be so small as to be negligible. But the number of wild cards rises rapidly as we look farther into the future. Therefore, the probability that no wild card will occur, *i.e.* the probability that

the standard scenario will prevail, approaches zero. In the long run, our future will be shaped by wild cards.

References

BIPE Conseil / Copenhagen Institute for Futures Studies / Institute for the Future: *Wild Cards: A Multinational Perspective*, Institute for the Future 1992

Böhret, Carl: *Folgen. Entwurf für eine aktive Politik gegen schleichende Katastrophen*, Opladen 1990

Burmeister, Klaus / Neef, Andreas / Albert, Bernhard / Glockner, Holger: *Zukunftsforschung und Unternehmen. Praxis, Methoden, Perspektiven*, Z_dossier 02, Essen 2002

Harremoës, Poul et al. (eds.): *Late lessons from early warnings. The precautionary principle 1886 – 2000*, Copenhagen 2001

Klinke, Andreas / Ortwin Renn: *Prometheus Unbound. Challenges of Risk Evaluation, Risk Classification, and Risk Management*, Working Paper 153 of the Akademie für Technikfolgenabschätzung Baden-Württemberg, Stuttgart 1999

Petersen, John L.: *Out of the Blue, Wild Cards and Other Big Surprises*, Washington 1997, second edition 2002

Rockfellow, John D.: "Wild Cards – Preparing for 'The Big One'", in: *The Futurist*, Jan-Feb 1994

Steinmüller, Angela and Karlheinz: *Wild Cards. Wenn das Unwahrscheinliche eintritt*, Hamburg 2004

Steinmüller, Angela and Karlheinz: *Visionen 1900 – 2000 – 2100. Eine Chronik der Zukunft*, Hamburg 1999

Steinmüller, Karlheinz: „Zukünfte, die nicht Geschichte wurden. Zum Gedankenexperiment in Zukunftsforschung und Geschichtswissenschaft", in: Michael Salewski (ed.): *Was wäre wenn. Alternativ- und Parallelgeschichte: Brücken zwischen Phantasie und Wirklichkeit*, Stuttgart 1999