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APPLICATION OF GARTNER MATURITY CYCLES FOR RISK FORECASTING

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Abstract

Gartner maturity cycles are a graphical representation of penetration, adaptation and social influence of specific new technologies (innovations). The term was introduced by the Gartner research and consulting company specializing in the information technology markets. Since 1995, Gartner has used this technique to describe and evaluate the enthusiasm that causes users to experience technological innovation. However, the use of Gartner maturity cycles in scientific research is not limited. The evolution of sociotechnical and sociocultural systems as a result of natural development causes synergistic processes leading to the emergence of some control (auto-control and auto-intelligent) system, which "drives" the central elements of the system using action acceptors – homeostatic (negative feedback) and destructive (positive feedback) regulators. For example, such acceptors can be decrees, orders, standards, laws, fakes and others. All of them have a single goal: the most comfortable and emotionally confirmed survival in umwelt and umgebung. For example, for a sociocultural system, umgebung can be considered in four spheres of influence: political, economic, sociodemographic and technological (PEST analysis). This paper discusses the application of Gartner maturity cycles in risk management. The choice of this particular toolkit is caused by the effective reflection of Gartner maturity cycles not only in innovation studies, in particular the description of the life cycle of innovation, but also in the development (evolution) of sociotechnical and sociocultural systems. The author argues for a thesis about the successful application of Gartner maturity cycles in risk forecasting process, which is a key task of the transdisciplinary risk management model.

1. Introduction

The development of the sociocultural sphere in a digital umwelt (the inner circle of digital reality) determines the convergence of the development of natural (created by nature), artificial (created by man) and biotechnical (man-controlled and regulated artificial and natural) components (Budanov et al., 2017). Any control system implies a direct or latent model reflecting structural and system changes in the state of the control object. There is a problem of choosing the method (later – methods, algorithms, technologies) of control within the framework of these models.

2. Problem Statement

Risk forecasting is one of the key tasks and actions within the framework of the risk management procedure. This task can be solved in various ways using one or more risk prevention and management tools (Maiakova & Larina, 2019; Somov, 2018). However, within the framework of this study it is advisable to evaluate the possibility of applying the Gartner maturity cycles within the framework of risk prevention methodology and the transdisciplinary model of socio-cultural risk management, since this technique has shown its effectiveness not only in describing the life cycle of innovations, but also in reflecting the development (evolution) of sociotechnical and sociocultural systems.

3. Research Questions

Within the framework of this paper the author attempts to answer several essential questions:
- what is the essence of Gartner maturity cycles, and what is the humanitarian "section" of this tool;
- what is the relationship between the Gartner maturity cycle methodology and the modern philosophy and science concept;
- is it possible to apply Gartner maturity cycles to prevent sociocultural risks, what are the boundaries of such application.

4. Purpose of the Study

The purpose of the study is to review and evaluate the possibility of applying Gartner maturity cycles in risk forecasting, which is a key task of the transdisciplinary risk management model.

5. Research Methods

In order to achieve these objectives, it is advisable to apply the following methodological principles: the principle of comprehensiveness, which will provide for a multidimensional study of the research problem; the principle of comprehensiveness, in which the scientific problem being studied is explored through various interdisciplinary approaches as a whole; the principle of systematics, by which structural elements can be traced and the problem assessed as a holistic system of interconnected and

interacting elements; the principle of determinism, on the basis of which various types of analysis are carried out. The methodological basis of the study is a wide interdisciplinary synthesis of works on the philosophy and history of science, the philosophy of science and technology, the theory of complexity, synergy, forecasting, innovation, the theory of modern management, the methodology of Gartner maturity cycles, synergistic modeling. In the aspect of post-classical science this project offers a trans- and interdisciplinary methodology to understand the risk management system of man-made civilization.

6. Findings

The co-evolution of the socio-cultural cluster of human activity and society with digital reality is characterized by the development of certain components in a digital form. The studies of Gartner maturity cycle (first mentioned in 1995) showed that the life cycle of innovation (or any technology) is characterized by a certain curve (Fig. 1).
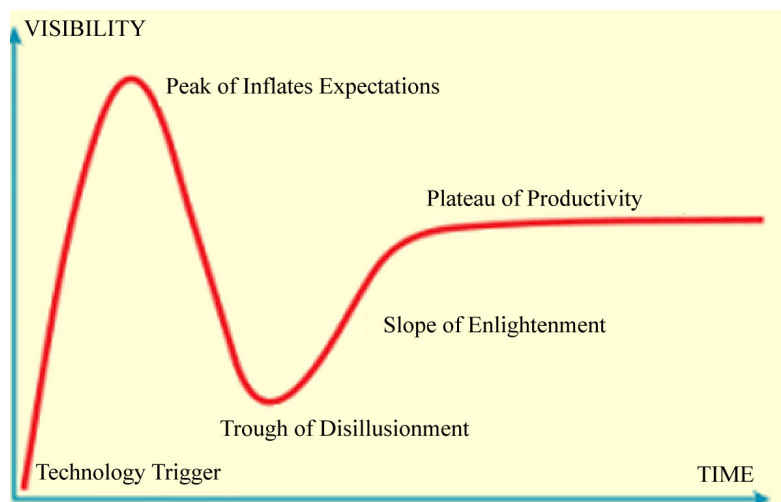

Figure 1. Gartner Maturity Cycle (Bushmelev, 2013)

Researchers note 5 phases of Gartner maturity cycles (Gartner curve):

1. Technology launch – the first phase of the cycle: a technological breakthrough, the launch of an implementation project that promises the achievement of the desired goals and solution to many problems (good if not all).

2. Peak of inflated expectations – public excitement leads to excessive enthusiasm and unrealistic expectations. Successful application of technology is possible, but usually failures prevail.

3. Trough of disillusionment – technology is unable to meet expectations and quickly extinguishes enthusiasm. Various "good" reasons appear thus impeding the progress of the project.

4. Slope of enlightenment – revision of some ideas or tasks, adjustment of the project progress.

5. Plateau of productivity – the benefits of technology are becoming evident and recognized by everyone. Technology is stable and evolving into the second and third generation. The final height of the plateau depends on how widely the technology is used.

This curve can also destroy the project. If at the very beginning of the project the bar of expectations is overstated, then after item 2, the fall may be so strong that it becomes incompatible with the life of this project. Besides, in the area of item 4 there is another obstacle – "game of chicken" (Duck, 2003), the essence of which is that at first glance the situation may look successful, but in statistical analysis the values of key indicators will not be stable, but arrhythmic, then they will either decrease as much as possible, and this will be a signal of the project failure, or stabilize, which can be called an improvement.

The phenomenon reflected in the Gartner curve graphically represents various stages that technological innovation (any innovation) undergoes during its formation. Ancient philosophers also highlighted some cycles in the development of Mankind. The rhythmocascade theory (Arshinov & Budanov, 2015; Budanov, 1999) is very similar to the Gartner phenomenon. The development of any biological entity resembles a curve in many ways. In fact, it exists in a simplified form of two U – curves (laws) converging (or attracting) subsequently to a certain attractor. This effect is known in medicine as characterizing the dynamics of pathological processes, in epidemiology – as the spread of epidemics, in geography – as the dynamics of the spread of landscapes, in sociology and politics – as "spread of rumors", the popularity of a politician.

Considering the wide application of Gartner curves in various spheres and clusters of human and social activity, let us evaluate the possibility of their application in risk prevention methodology. In our view, the five standard phases of the Gartner curve for risk management will look as follows.

1. Risk formation – identification, risk analysis.

2. Peak of inflated expectations from measures to eliminate and minimize risk – package of measures formed in stressful conditions leads to unrealistic expectations. Successful implementation of activities is possible, but often the threat remains.

3. Trough of disillusionment – risk is present and initial measures show their incapacity. The decision-making system fails. There is a crisis situation.

4. Slope of enlightenment – revision and adjustment of both the set of minimizing measures and the attitude to risk. Risk changes its "character", becomes predictable, which means that the set of measures seeks to be universal.

5. Plateau of riskogenics – risk is under control. In case of its re-emergence at any stage of the socio-cultural process (from idea to implementation), the measures to eliminate or minimize it will be applied in advance or in a timely manner.

It is also worth noting that the ability to predict the Gartner curves is designed for 2–3 cycles ahead, which can be calculated for decades (as in the case of digitalization, for example). Thus, the Gartner curve can describe not only the risk analysis, but also become the basis for risk forecasting and management methodology.

For adequate application of the Gartner curves it is necessary to perform a structurally parametric identification of the mathematical function G(t) of the Gartner curve. Conversely, analysis and prognosis will occur only at a qualitative level avoiding quantitative analysis. The researchers work hard and efficiently on the predictive technique based on the Gartner curves in the quantitative aspect.

One of the most "mysterious" segments of the Gartner curve is the so-called transition period. In this regard, there is a question on how to find out what gives rise to the transition period in the context of the study of sociocultural risks reflected in the Gartner curve? In our opinion, the following reasons are possible.

1. Targeted articulated information impact.

2. Unpredictable exposure (Black Swan) (Taleb, 2013). To understand it, it is necessary to either find a risk analogue and hypothesis, or reduce the sampling rate of risk monitoring. However, in this case, "false" local scenarios can be detected and a possible omission of the main scenario.

It is logical to describe this reason using the complexity theory (Arshinov & Budanov, 2017). Suppose the risk management process has come to the bifurcation point. There is some synergistic level consisting of small fluctuations, which have the goal of moving to the next level, but there is not enough knowledge, energy, strength, etc. for this transition and the formation of a new scenario of events (transition process). Finally, at the end of time, one of the fluctuations (the strongest) breaks through the "bifurcation shell" and pulls the entire system to a new level ("a chick broke the egg-shell"). If under the external influences, including spontaneous ones, the "bifurcation shell" breaks through the wrong fluctuation, then there will be a "false" local scenario and a possible omission of the main scenario. For such a case, along with a universal set of risk elimination and minimization, a critical (emergency) set of measures should be developed. Of course, this is an ideal option, but even with a universal complex it will be much easier and less destructive for the society to "cope" with uncontrolled and unpredictable risk.

3. Unknown, synergistic cause. In this case, it is necessary to predict with a sufficient degree of probability the re-occurrence of risk or the occurrence of a similar risk – the bifurcation point. It shall be noted that when approaching it, correlations should increase, autocorrelation and coherence should decrease. This point can be predicted by using statistical criteria, sufficiently large in terms of research and observation results, previous experience and continuous monitoring of key processes. A quantitative assessment can be obtained by using the analogy method from the Group Method of Data Handling (GMDH): "many curves can be drawn through two points, but only a few of them will be acceptable proximity to the third" (Ivakhnenko & Ivakhnenko, 2013, para. 4).

7. Conclusion

Thus, the Gartner curve allows assessing whether there will be a "jump" at the bifurcation point – the formation of a new (predicted) risk or a new development scenario. It is this feature of the Gartner curve that allows referring to the possibility of its application in the risk forecasting methodology, as well as the risk management model.

Based on the results of this study, the basics of the Gartner curve methodology were analyzed, the socio-humanistic applications of this technique were evaluated; the relationships of the Gartner curves and the modern methodology of philosophy and science, in particular the theory of complexity, synergy, the concept of crises and others, were established; the boundaries of the Gartner curves application for the prevention of sociocultural risks were defined, and five standard phases of the Gartner curve for risk management within the transdisciplinary risk management model were developed.

Acknowledgments

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