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# Cross-Platform Collaboration with Help Virtual Digital Thinking of Technological Mind with Artificial Intelligence

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**Abstract**

The article discusses a hierarchical categorical approach to cross-platform cooperation through virtual intelligent digital thinking based on the criteria and knowledge and skills of mankind. Virtual thinking performs analysis, synthesis, logical judgments and develops the cognitive and creative abilities of the technological mind based on artificial intelligence. Technological intelligence with artificial intelligence can compare thoughts, opinions, images and worldviews according to the criterion of utility for good. A technological mind with artificial intelligence can choose thoughts, opinions, images and worldviews according to the criterion of preference: either equivalent, equivalent, or similar. Technological intelligence with artificial intelligence can detect novelty on the principle of opposite (optimal - not optimal; effective - not effective; dangerous - safe, etc.) according to the criterion from the opposite based on objective conditions and patterns based on communicative associative logic. It is possible to increase professional knowledge by technological cognitive intelligence with communicative associative virtual thinking by means of artificial intelligence on quantitative and qualitative patterns on technological platforms with analytical systems. The technological mind is more efficient than the human in terms of the speed of information processing and learning, as well as in terms of the volume of rapid memory and information sampling. The human mind is incapable of cross-platform cooperation without technological mind with artificial intelligence.

**Keywords:** Technological intelligence; Hierarchical categorical approach; Virtual thinking; Criteria; Patterns; Artificial intelligence

**Introduction**

The best practices of cross-platform interaction to improve the efficiency of cooperation are considered in the project management [1]. The article discusses cross-platform cooperation based on technological intelligence, as well as the technological implementation of hierarchical categorical virtual digital thinking based on the approach to the formation of human thinking proposed by the author in the publication [2]. In a similar way, virtual thinking of the technological mind is formed and developed [3]. Virtual thinking develops on the technological triad: technological intelligence, language and living information. Live information of the updated environment, recorded in the language,

can be operated on functionally and harmoniously self-organizing ensembles of intellectual agents of technological mind with artificial intelligence, as its ability to give birth to virtual thoughts. Hierarchical categorical virtual digital thinking of the technological mind effectively implements cross-platform cooperation and is a universal approach of cross-platform interaction for various types of activities.

**Technological Intelligent Mind**

Technological intelligent mind is complex high-tech hardware and software system containing a functionally extensible self-organizing ensemble of intelligent agents, all types and types

of communication means, devices for receiving, processing and transmitting all types, types and formats of information, artificial intelligence tools, a smart interface and short-term memory for storing current information. The software functionality of an extensible self-organizing ensemble of intelligent agents carries out virtual digital thinking on decision-making, queries, information search and analysis and other necessary functions of cross-platform interaction using technologies and artificial intelligence tools [4-6]. The technological mind provides cross-platform interaction between digital platforms located on different computer architectures. The cross-platform of the technological mind is provided, firstly, by cross-platform compilers of high-level languages such as C, C++, Free Pascal, Free Basic, Pure Basic and others. Secondly, interpreters of cross-platform execution environments. Thirdly, the layout and execution of a single code for various platforms. Fourth, self-adaptation of a smart communication interface. Fifth, a mobile operating system for managing the application processes of different digital platforms with different hardware. Intelligent interaction enables physical and virtual digital reality communication, free exchange of resources, data, software and artificial intelligence algorithms between cloud storage, peripheral servers and terminal devices. Smart connectivity provides seamless coverage and functioning of the technological mind, application and digital data sharing, and organizational interoperability of digital platforms. Efficient universal cross-platform cooperation requires powerful supercomputers with artificial intelligence [7]. A system of intelligent solutions for any scenario is based on a variety of communications. Expanding the ability to obtain and analyze information allows you to comprehensively improve communication and interaction between specialists and digital platforms in an intelligent environment. Specialists work with digital platforms through the technological mind. The technological mind fulfills the requests of the information specialists of the relevant digital platforms based on virtual digital thinking.

### Virtual Digital Thinking of the Technological Mind

Digital virtual thinking is the ability to see and describe tasks that are expedient to solve with modern technology. Solve your question with the help of modern technologies, this is the power of digital thinking - the ability to use all the possibilities of the modern world and implement them into your life to simplify many complex tasks. There are a large number of programs and technologies that automate routine work, process data, and perform calculations. The technological mind should know which technology, which problem it solves, and be able to put it into practice. The role of digital virtual thinking is especially important now that the volume of information in the world is growing exponentially. That is why one of the key tasks of the 21st century is to work with large amounts of information. A person without the help of machines can no longer cope with such amounts of data, and here digital technologies come to the rescue, in which digital virtual thinking helps us.

Digital mindset is a collection of hard and soft skills that simplify activities in the modern technological world. Thinking virtually digitally means using technology for real results. For example, working in flexible frameworks like Scrum and Kanban,

which allow you to change a product on the go, unit economics (a modeling method that helps determine business profitability through calculating the profitability of each product) and prototyping (developing "drafts" of solutions for their further adjustment to business tasks) have become everyday attributes of an intelligent virtual business.

It is important for the technological mind to be able to work with large amounts of data, be critical of incoming information and be able to separate the necessary knowledge from digital noise. Many processes require expertise from the technological mind in several areas at once. The most elegant solutions are born at the intersection of disciplines, combining a creative and analytical approach to solving problems, being a synthesis of many disciplines. Virtual digital interdisciplinary thinking contributes to result and client orientation.

Virtual digital thinking perceives reality through live information and knowledge gained from the experiment and derives new knowledge from it through communicative associative logic. When virtual digital thinking is outside the relevant practical knowledge, it is difficult to clarify reality. Virtuality itself is a dangerous environment in which digital thinking can lose an adequate connection with reality and lose its intellectual mission. When digital thinking is underpinned by practical knowledge and live information, it is realistic. The author proposed a hierarchical categorical approach to virtual digital thinking based on criteria.

### Hierarchical Categorical Virtual Digital Thinking

The technological mind is immersed in a variety of situations requiring an adaptive response to the structural, systemic and hierarchical aspects of digital platforms. The structure indicates their internal organization. The system describes their external organization. The sequence of stages of their development is reflected in the set of hierarchy levels. The hierarchy manifests itself as an ordered set of clearly distinguishable levels. The higher levels dominate the lower levels. The way you dominate depends on which categories the hierarchy is drawn up in. Each hierarchy interacts with its environment as a hierarchical system at any given moment. The whole variety of intermediate levels boils down to the internal organization of connections, without affecting the qualitative originality of the relationships of the selected levels.

Currently, there are many digital platforms to help solve problems in various subject areas. The technological mind supports problem solving by virtual digital hierarchical categorical thinking based on the hierarchical analysis method developed by the American scientist T. Saati. Virtual digital hierarchical categorical thinking is a universal method of supporting various solutions to problems, corresponding to the natural course of human thinking. The method allows you to analyze the problem. At the same time, the problem of decision-making is presented in the form of a hierarchically ordered system of connections indicating the mutual influence of factors and decisions. The method allows you to collect data on the problem and synthesize the decision-making problem taking into account the available quantitative and qualitative information. The method allows you to organize a discussion of the

problem, contributes to the achievement of consensus. The method serves as a universal systematic basis for decision-making, allowing the decision-making process to be put on stream.

Virtual digital hierarchical categorical thinking uses a set of alternative solutions, a criterion for rating solutions, a set of groups of the same type of factors that affect the rating, many directional connections that indicate the effects of decisions, criteria and factors on each other. The hierarchy is presented as a tree from the target through criteria to alternatives. In accordance with the hierarchy, analysis of matrices of paired comparisons of criteria by goal and alternatives by criteria is carried out. A tree of alternatives is being built. A rating calculation of priorities is carried out for the entire hierarchy in the aggregate. The highest rating will correspond to the alternative with the highest global priority value. The technological mind implements interplatform interaction in a universal and efficient manner. Virtual digital hierarchical categorical thinking of the technological mind optimally and promptly implements digital virtual cross-platform cooperation by self-organizing ensembles of intelligent agents [8-14].

### **Interplatform Collaboration Based on Virtual Digital Thinking**

Digital virtual cross-platform collaboration is the use of digital technology to collaborate with digital platforms through technological intelligence. Virtual cross-platform cooperation is carried out through technology intelligence communication mediated by technology. Participating digital platforms in virtual collaboration, interact and communicate exclusively through technological channels. They use virtual collaboration to transmit information, communicating virtually through speech, visual, written, and digital means. Virtual cross-platform collaboration is commonly used by globally distributed business groups and interdisciplinary scientific researchers. Cross-platform cooperation is the process of combining the knowledge of different parties to achieve a common goal. Cross-platform virtual collaboration is designed to share knowledge between parties who cannot share information due to physical separation. Virtual collaboration platforms allow you to transfer different types of information to achieve a common goal. Most virtual collaboration platforms use the Internet.

Today, the use of virtual cross-platform cooperation technologies extends to industries as diverse as manufacturing, energy, business, healthcare, insurance, government and public safety [15]. Mobile collaboration through technology platforms allows multiple users in different locations to synergistically combine their contributions while working to solve problems or issues in today's complex work environment. This can be done in real time with technological mind without downtime. One of the qualitative factors associated with the introduction of platforms is a shift towards collective consciousness and cooperative forms of interaction. Modern tools allow you to transparently and correctly assess and take into account the contribution of each of the participants in the chain to the cost of the final product. In this case, the following model becomes possible: all participants in the chain become participants

in a "smart contract" and, working in a single information system, give their semi-product to the next participant at cost (without laying either risks or margins) or for sale (free). At the same time, the system records the objective contribution of each participant. The store also takes final products from the collector (or winery) at cost/free of charge. At the time of sale, when the energy intensity of the product appears in the system, all participants in the chain will receive profit, which is automatically distributed among them, according to their contribution to the final product.

Correctly carried out digitalization and platformization will have a positive effect in any area of the economy. The cornerstone of the formation of technological platforms is territorial-geographical convergence, a geographically isolated association of industries of several different industries, between which synergy and mutually functional relations are possible and a number of new, scientifically sound technologies, solutions and achievements are brought to new systems of practical activity strategically important for the economy. The BRICS technology platform is being formed for international industrial cooperation. Digital platforms implement the idea of a multilateral market on a planetary scale, stimulating the development of competition and deepening specialization. A platform economy with an energy economic equivalent effectively expends material resources and uses human resources with the help of strong artificial intelligence with optimal technological singularity based on the accumulated experience of safe risks and criteria of benefit and preference of society and man [16].

### **Conclusion**

Cross-platform collaboration through technological intelligence allows engineers to create applications for different platforms with a single code base, thereby saving time, money and unnecessary effort. One important step towards the digital success of a virtual digital mindset-based cross-platform collaboration is to build a mobile operating system to enable the smart interface of intelligent technological intelligence to be customized, as well as to improve performance and provide access to all functions of any device. If you focus on a large audience consisting of users of various platforms, cross-platform development based on intelligent technological intelligence will solve this problem. By choosing to create a digital product on a cross platform platform, you will get a wider market coverage, more users - more profits. The proposed approach will satisfy the ever-increasing demand for cross-platform cooperation.

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### **Conflict of Interest**

No Conflict of interest.

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