Hybrid Systems of Soft Computing Technologies in Designing Team Decision for Supply Chain Management Systems of Organizations

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***Abstract*—The main objective is development of hybrid systems for adaptive designing and supply chain management / strategizing of team decision "packages" for design work based on the use of soft computing technologies and system-creative thinking (SCT). An algorithm is proposed, and the results of case studies on predicting the effectiveness and optimal organization of team thinking, as well as designing team solutions using the technical package of social technologies are presented. They are exemplified by developing a system of products and marketing channels (points of contact) of an employer brand (EB) of an organization for individual stakeholder groups. An algorithm has been developed for using a system of hybrid "soft computing" technologies and system-creative thinking in supply chain process of project teamwork; practical calculations have been carried out using this algorithm. The algorithm and systems of models for using "soft computing" for supply chain developed allow us to obtain a synergistic effect from controlling a system of hybrid technologies at various stages of teamwork. The package includes a "basic" technology comprising "training teams", and also the formation of a KPI system that characterize team work (units 1 and 2), "product" technologies comprising analysis of team organization thinking, forecasting team performance, team productivity management, as well as supply chain management of project (units 4, 5, 6), and also "closing" technology being a strategizing (adaptive management) of team work (dynamic control of the algorithm as a whole).**

***Keywords*—** *Hybrid soft computing technologies, supply chain management, decision packages, employer brand (EB), employer brand products (EB products), touch points.*

1. Introduction

A variety of soft computing techniques have been employed to improve effectiveness and efficiency in various aspects of supply chain management. The necessary condition for work being a result of the transition to a digital (electronic) economy as an economic activity carried out in a hybrid world (VUCA-world with its uncertainty and confusion) is the fulfilment of all necessary meaningful actions through supply chain. This requires highly effective and, at the same time, low-cost information and communication technologies (ICTs), the core of which should be hybrid systems of soft computing technologies. At the same time, despite the development of artificial intelligence technologies (AI technologies), the key link in socio-economic activity remains a man, his or her resources (HR), although the forms of their activity (and interaction with AI) undergo tectonic changes: a transition from HR to (H&AI)R and, further, to ((H-> H') & AI)R-management, where H'R are the cognitive-communicative resources of a person / team in altered states of consciousness (ASC), the most important of which for the purpose of productive work is the state of a single creative field (SCF) [1-8]. The post-industrial / informational stage of social development requires a new creative approach to supply chain management of an organization based on non-standard HR management, including team supply chain branding. This approach is based on the following provisions:

1. Change in the methods of constructing and

transferring knowledge, as well as the formation of competence through the development of digital technologies and telecommunication systems (processes of virtualization and gamification, the use of exocortex, etc.). Digital technologies change the socio-economic reality radically [9, 10].

2. The "half-disintegration" of professional knowledge, skills and abilities is reduced; critical requirements for the learning process in the digital economy arise, while the content and technologies of its production, distribution, use and disposal are growing exponentially. The critical parameters / factors influencing supply chain branding are: avalanche-like development of the Internet; digital augmented environment comprising artificial intelligence system (semantic intelligence), gamification, virtualization and augmented reality; cognitive revolution (biological feedback systems: biofeedback, artificial mental components (exocortex), HTTP-2 protocols (neuro-interface)), bio- and nano-technologies (Intel Insight) [7].

3. An integral approach to the formation of hybrid hierarchical systems created on the basis of productive thinking / behaviour models throughout the entire life cycle (LC) of teams is needed [11-17].

4. HR analytics being, first of all, predictive (predicative), becomes a key business function for the use of data, including Big Data and Big Live Data, for understanding the principles and effective patterns of teamwork supply chain-branding and their implementation in operational processes of the organization [10].

5. In the Digital era, organizations badly need a different type of team, namely, "digital" TF teams that generate constant interaction and involvement of participants in a single creative field (SCF) operating within the attributive rather than the target approach using an additional "Joker" team role. Currently, there is an active order specifically for teams (demand for cooperativeness (co-creation)): hiring of teams, development of team educational and career paths (especially for R&D and management teams) according to the logic of movement towards hybrid network management / strategizing [17].

6. To perform cultural, spiritual and socio-economic breakthrough, Russia needs creative teams (TF-teams) formed already at the university level. Moreover, the authors of the paper believe that it is necessary to prepare project teams at school (including that the teams should be mixed, from different schools and countries based on international educational business projects) [17].

2. Materials and Methods

It is widely recognized that effective supply chain management is imperative in order for organizations to compete and have strategic competitive advantage. "Soft Computing" [18-25] is a technology that combines inaccurate, approximate methods for solving problems, often having no a solution in polynomial time. Soft computing technologies are focused on solving control problems with poorly structured control objects, using fuzzy set tools, fuzzy logic, fuzzy controllers, artificial neural networks, genetic algorithms and evolutionary modelling. Various soft computing methods can complement each other and are often used together, forming hybrid systems that include quantitative, qualitative, quantitative and qualitative technologies [22]. Such hybrid systems are much more informative than separate teamwork management technologies, for example, cognitive modelling technologies [1]. Despite the clearly increased interest in teamwork both in Russia and abroad, the potential creative and communicative opportunities for the technologization of teamwork are practically not used until now. Existing technologies for designing social solutions, including team / group work management (E. Durkheim, P. Bourdieu, G. Simmel, T. Parsons and others) [13, 23] based on the concepts of classical (non-network) social knowledge and neopositivistic theories of knowledge, inadequacy, and complexity of VUCA-world. Used strategies, schemes and algorithms, including postmodernist are either fundamentally linear, or their recommendations are too general for specific practical work [22] and clearly do not correspond to the realities of the VUCA-world. The scheme proposed by the authors, taking into account the principles of system analytics and system-creative thinking [22], uses a hybrid technology system of soft computing and system-creative thinking (SCT) with the use of managing team project work is shown in figure 1. This diagram allows implementing a synergistic approach in the management of project teamwork by accumulating the results of the previous stages at each subsequent stage.

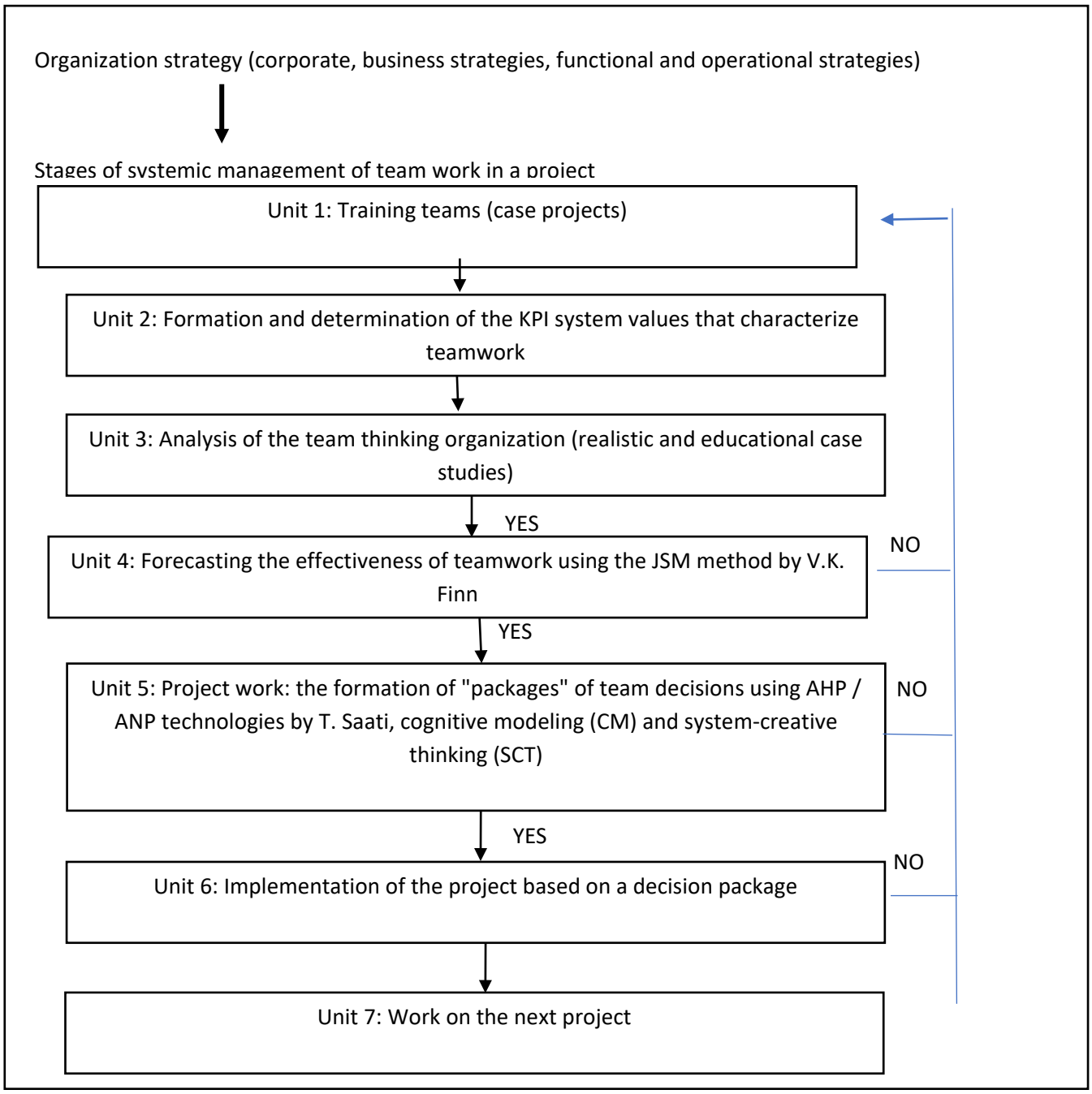

Figure 1. Scheme on using a system of hybrid technologies of soft computing and system-creative thinking in project team work in an organization

Unit 1: Training teams (case studies). This stage appeared as a result of the analysis of field studies related to the management of international educational business projects (IOBP) [17]. Practice has shown that between the stages of managing the IOBP designed to form teams and their use in a specific project work, there must be a stage of preliminary training ("choir practice") of teams, which in the future increases their productivity. Training is carried out on the basis of mini-projects (2-5 days of preliminarily prepared case studies / seminar projects). At this stage, rapid diagnosis of the project team is carried out, using a battery of various psychological tests (MBTI, MMPI, MSI, "self-perception" by R.M. Belbin, TSI (structure of intellect), InQ, profile of creative potential, intellectual lability (Torens), emotional personality state (Lusher test) and other psychological tests) to determine the communicative and cognitive potentials of individual participants in teams and

teams in general. A preliminary management analysis of an organization is carried out here (testing was carried out in the study using TeamCreator 2.1 software module PC TTRP-EURECA, Certificate on the official registration by the Federal Service for Intellectual Property, Patents and Trademarks No. 20066610693). The algorithm for managing and evaluating teamwork based on the online version of TeamCreator 2.1 included: mandatory tests “Self-perception” (R. M. Belbin), a modified test for assessing the convergence of an initial intra-team roles vision based on the concordance coefficient, MBTI, MSI tests (I. Adizes), temperament type (Eysenck), InQ (thinking styles), creativity test (J. Rowe). The screen layout of the TeamCreator 2.1 software module in the team building and management analysis mode is shown in figure 2.

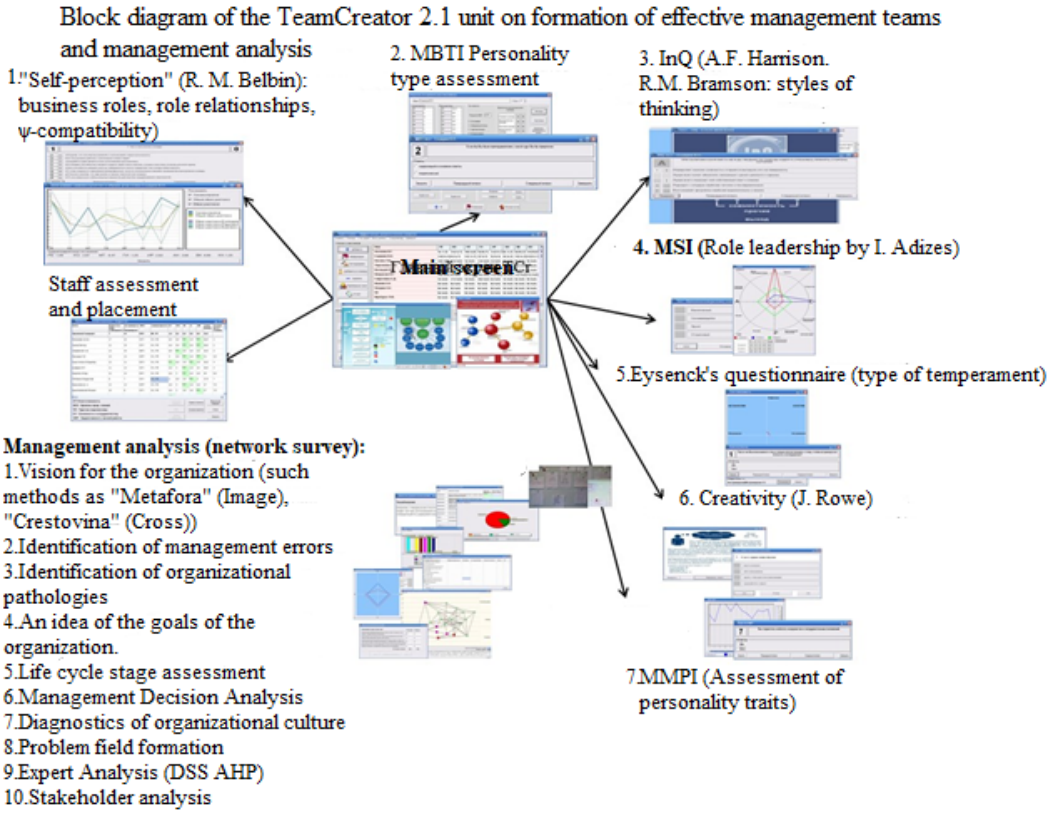

Figure 2. Screens layout of TeamCreator 2.1 program organization unit from the TTRP-EURICA software package

The team convergence is assessed for the problem-target area (PTO) in the same unit separately for targets and problems, using the coefficient of concordance Kk (M. Kendal, B. Smith). The significance of Kk is evaluated by the criterion χ^2, for $\chi^2_{act} > \chi 2_{tab}$ the coefficient of concordance is significant, and the consistency of expert estimates is high; therefore the group / team has a fairly high agreement for the problem-target area and team perception and can be potentially productive.

Block 2: Formation and determination of the KPI system values that characterize teamwork. In a digital economy, organizations face a key question: what system of organizational, cognitive, communication and psychological parameters contains information that determines the productivity of a team. The fundamental difference between the system of key performance indicators (KPI) of a team and the usual (tactical) indicators is that the first always reflects the strategic levers of team performance, while ordinary indicators can measure the local and tactical aspects of teamwork. KPIs are metrics on the basis of which a moderator, coach, or team “joker” develops and implements the team thinking and behaviour strategy in the project. Incorrect metrics transfer distorted information about the teamwork process; moreover, incorrect metrics support the false belief that work is going in the right direction. In contrast to the effective KPI system, incorrect metrics are usually

vague and fuzzy and do not reflect all possible nuances that affect the final result. The following rules / principles must be followed to develop an effective KPI system:

1. An effective KPI system reflects key management parameters and team performance;
2. An effective KPI system provides internal and external contexts of the company's work (efficiency scales - unsatisfactory, satisfactory, reference comparisons, for example, based on regression benchmarking models [20]); it is always relevant and is based on real data;
3. An effective KPI system is developed by the top management of an organization and decomposed into all levels of team management, based on corporate standards for measurements and integrated data from all departments that participate in their development;
4. An effective system of KPI teams is convenient for interpretation and motivates team members;
5. The introduction of an effective system of KPI teams must begin at the stage of its development, supporting the interest of employees in its use, the need for regular measurement and control of indicators, as well as the distribution of responsibility;

The key target of using the KPI system for supply chain branding of a team is to create a synergistic effect from team actions of employees of various departments and services, while solving the tasks of retaining and attracting the necessary specialists. It is necessary to adhere to a special algorithm with the purpose of create an effective system of team KPIs in the organization [19]. During this study, the following indicators were included in the KPI system for assessing and managing team productivity:

1. Cost indicators - ROI;
2. Value indicators - coefficients of role, target and problem concordance, image / reputation, and recognition of the team;
3. Organizational and managerial indicators - the time of cooperative work, the level of competence; indicators of teamwork productivity selected experimentally were also included here [18].

Regression benchmarking modelling technology [19] can be used for integral assessment of the entire KPI system; it allows one to evaluate the impact on the team performance of each indicator of the KPI system, which, in the future, can be used to optimize the team work taking into account, inter alia, individual patterns of team thinking organization (cognitive modelling, unit 5).

Unit 3: Analysis of the team thinking organization (realistic and training case studies at the training stage) was carried out on the basis of the methodology of the 4-level scheme [4]. The moderator records the team work entering in the record the entire team discourse in the protocol (most often based on video recording), establishing that the elements of the discourse belong to the levels of organization of thinking: operational, substantive, reflective, emotional (personal) (figure 3).

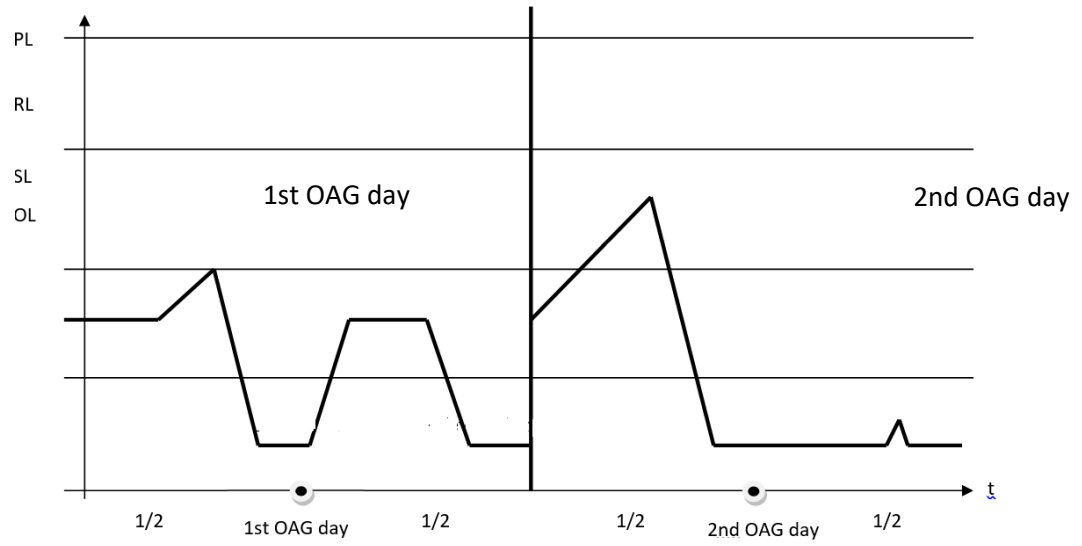

Figure 3. Dynamics by levels of organization of thinking

It is clearly seen in the graph shown in figure 3, that one of the decisions developed by the team (on including small businesses in the form of outsourcing / franchise in the list of stakeholders

and developing a specific employer brand product system and marketing channels for it) was received in the first half of the second day of the project at a reflective level (RL). Practice shows that almost all (especially truly creative and paradoxical) decisions using the system-creative thinking (SCT) technology were obtained at the reflexive level of the stage of rethinking the problem situation (PS), with an almost instantaneous transition to the OL stage (wording / rewording of the decision obtained. The situation of "cognitive blockade" (as a result of accumulation of fatigue and errors in decisions, including errors in communication solutions that caused internal team "wrangles") occurred at ¾ of the first work day, with a 15% deviation from the forecast of occurrence of such a situation for this team (which subsequently made it possible to adjust the fuzzy cognitive model of the individual work pattern for this team, see unit 5).

Block 4: Forecasting the teamwork effectiveness using the JSM-method by V.K. Finn. The advantage of artificial intelligence methods in the social management tasks is biasing the formal limitations inherent in classical methods (such as SPSS) [5]:

1) Incorrect work with small samples;

2) Difficulties with the allocation of relationships of various types between the sample parameters;

3) Difficulties with the determining of the reliability of causal relationships between parameters;

4) Absence of criteria for the reality concerning the designed types of parameters.

In this case, it is proposed to use the data mining and knowledge discovery technologies (Finn's JSM method designed to analyse the dependencies between a combination of features and the desired effect). The general task of studying the phenomenon understood as the "object – effect" relationship corresponds to two classes of problems that correspond to the direct and inverse types of JSM reasoning [5]. The most interesting task is the following: assessment of the projected team / group performance of people during the implementation of a specific complex project based on the analysis of the results of its instant diagnostics on a micro project in the form of an organization and activity game (OAG) (micro project implementation period from 2 to 5 days) and comparing these results with the parameters of successful and unsuccessful teams during their implementation of realistic complex projects with a fact base (FB). The mathematical formulation of the JSM method is given in [2].

The calculations performed by the authors of the paper showed that the team under study can count on obtaining an effective result. The basic principles and methods of the express diagnostics of the creative and managerial potential of administrative employees are given in [11, 18].

Block 5: Project work is the formation of "packages" of team decisions (development of an employer brand product system and marketing channels for their promotion in the process of supply chain branding) using T. Saati's AHP / ANP technologies and system-creative thinking (SCT) technology), with simultaneous management of teamwork performance based on its individual pattern formed using cognitive modelling (CM) technology. Adaptive planning and management (strategizing) [19] of the HR-branding process is associated with the technology of continuous and step-by-step correction of decisions in accordance with the change in the problem situation and / or expert opinions about such changes (forecasting). The general scheme of using these technologies in the strategizing process is shown in figure 4 (the scheme of the AHP technology used in this study is shown in figure 6).

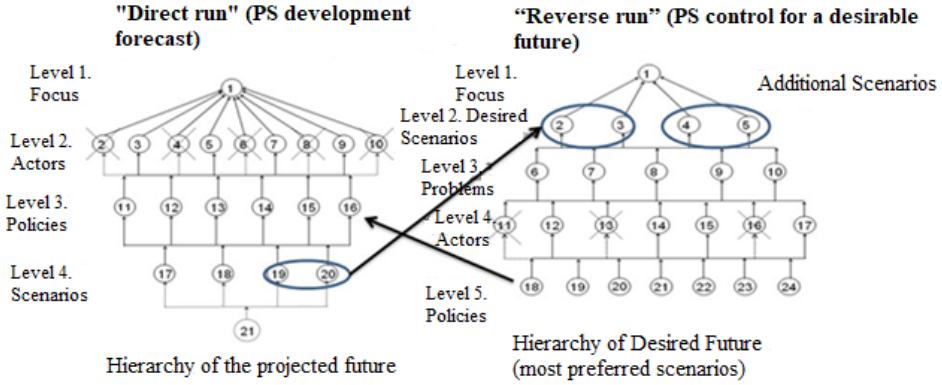

Figure 4. General scheme of strategic adaptive management according to the AHP technology by T. Saati. Source: compiled by the authors

AHP / ANP - technologies are usually used twice: as a hierarchy of the "projected future" (direct run) and as a hierarchy of the "desired future" (reverse run) [14]. From the point of view of experts, the most effective policies, decisions / products and marketing channels will be used at the next "direct run" corrective step, etc. until the desired final effect would be achieved, in our case, the high estimated PAR conversion for the target audience, small business at the "Act" stage as a key stage of the user flow [6]. More complex variants of "runs" are possible, including various combinations of stages / elements of strategizing, for example, non-classical variants of a conventional double bypass / run or alternative double bypass / run [15], when the subject's ideas change both concerning objects of study (alternative scenarios), and the targets / necessary result, and it is possible to introduce additional parameters: analysis tools and the context / conditions of the problem situation (PS).

It is obvious that increasing the efficiency of planning and managing the design and use of the employer brand product system and marketing channels (touch points) can be achieved through the use of all stages of the user flow, taking into account their synergistic effect; however, this requires a lot more calculations. In this case, an integrated system of models is used. Such an integrated system of models for the HR-branding information and communication mechanism (touch point management on the user's path) is shown schematically in figure 5. The system includes five hierarchical AHP models (for each stage "5A" of F. Kotler's concept) and, in addition, submodal management models: a specific trajectory proposed by experts along the "empirical grid" for each employer brand product and a marketing channel at each stage of the "5A" technology of "user paths" [24] (figure 7).

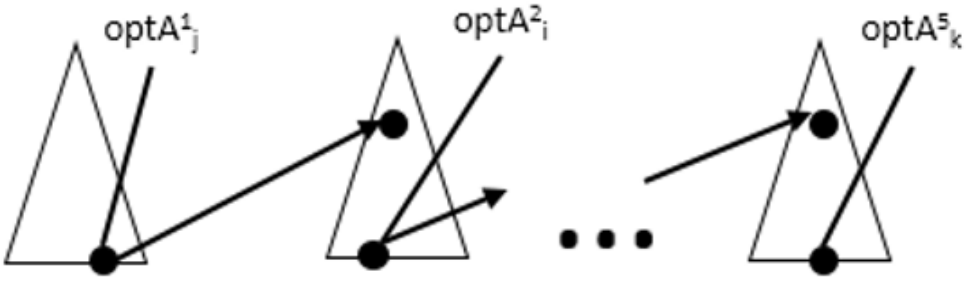

Figure 5. The system of design models for the employer brand product system and marketing channels for all stages of the 5A technology.

The interaction between different levels of the hierarchy in the proposed model system is carried out by converting the characteristics (decision systems of the employer brand and marketing channels) obtained at the previous stage 5A of the concept into the parameters of the models used at the next (adjacent) stage [9]. Thus, the proposed model system provides a synergistic effect of the

accumulation of conversions along the entire path of the “user path”, allowing the coefficients of the final PAR and BAR conversions to increase [6], while optimizing the passage of the user path, relying on the archetypal “bow tie” model [6]. The software module "multi-expert AHP-technology" at PC TTRP-EURECA is used for specific calculations.

Possible alternative systems of employer brand products and market channels (they form touch points together) of the “direct run” are a frame structure that includes: environmental parameters taking into account its level of disequilibrium (K-level), target audience, stage of the user flow, an employer brand product system with their characteristics and marketing channels. In turn, the adjusted product systems of the employer brand and the marketing channels of the “reverse run” is a frame that includes parameters characterizing alternative “touch points”. The employer brand products are developed taking into account the stage of the organization’s life cycle and the development stage of the employer brand (EB); different competencies and different specialists who need to be retained and / or attracted are important at different stages, and it is important to consider the time lag / delay of the managerial impact on the target audience. Soft resonant control with "point-wise touch" in the right place, at the right time is used to increase the effectiveness of the employer brand in the VUCA - world (in contrast to the broad advertising of marketing 3.0 for the SPOD-world). Touch points are any communications between the employer brand products promoted through certain market channels and a user (including with other users in the communities, i.e. this is any action at each stage of 5A-technology (Fig. 6). For a detailed description of multichannel marketing technology, see [6]. The K level was determined by experts as nonequilibrium (> 3) for touch points at the “Act” stage of 5A technology, based on recent macroeconomic and political events: coronavirus in China, armed conflicts in Syria, Libya, and Palestine, which involves the use of strategic task analytics (STA) in non-equilibrium environments [22].

Stage-by-stage optimization of touch points was carried out on the basis of building an industry archetype (model) of user behaviour in 5A technology [6]. it was determined empirically that the behaviour of users of employer brand products for the agricultural complex “Skvortsovo” corresponds to the archetypal model “Funnel” [6], for the optimization of which the benchmark model “Bow Tie” was used [6] allowing to level out the shortcomings of this model. For the “Funnel” model, the key is the Act stage of the user flow (independent “immersion” in the experience of acquiring and using the employer brand product / employer brand product system). The employer brand product system of this model is controlled by a whole network of touch points (Aware & Appeal for advertising, Ask for websites and call centres, Act for channels of direct inclusion in actions ("sales"), and Advocate for experience of communicative consequences). According to foreign experts, the “Funnel” model is most suited for breakthrough digital innovations [6]. The key goal of optimization for the “Funnel” model is 2 points: firstly, increasing user commitment (a multi-channel marketing strategy that provides users with online / offline experience regardless of touch points being an unhindered experience when switching from one channel to another). Secondly, there should be an increasing in the compliance index as a start for more profitable potential offers of employer brand products. An increase in the index of compliance with expectations of reality dramatically increases the loyalty of both full-time and potential employees. To this end, a special project was developed in the Company Grouping AIC "Skvortsovo" for the wide involvement of users (through gamification, creation of social communities), from schoolchildren and students (hackathons) to cooperation in the form of outsourcing and franchise (small business) with solving specific problem situations of users, which is typical for HR supply chain 3.0+.

Team project management was carried out using cognitive modelling technology [1]. Cognitive modelling is the technology for solving complex weakly structured problem situations (PS); it includes several stages (selection / formation of a problem situation, construction of a cognitive PS map carried out using a multi-expert procedure for extracting PS parameters, their kind / type, assessment of the nature and power of their influence on each other, the formation of a conceptual cognitive map (CM) model in the form of a directed graph (including determining the CM type: clear / fuzzy CM, the delay in the influence of parameters on each other and the resulting parameters, factors, etc.). Cognitive modelling

tasks include predicting the behaviour of the system / individual parameters, making rational / optimal decisions on parameter management, as well as tasks related to strategizing (adaptive planning and management) and self-organization of systems. The cognitive modelling algorithm includes the following steps: “direct run” - 1. Structuring the task / problem / problem situation; selecting influence parameters (X) and resulting parameters (Y); 2. Building a network of connections between parameters, determining their type (positive / negative, direct / inverse); 3. Expert assessment of the communication impact power (0 <aij <1); 4. The formation of a cognitive map by setting the initial values of the parameters and the propagation of a "power surge" (disturbance). If it is necessary to control the cognitive map, step 5 (“reverse run”) is added: it comprises rationalization / optimization of control parameters to achieve the required values of the resulting parameters.

To increase the team efficiency / performance, the Cognitive Modelling software module of the TTRP-EURICA PC was used.

Unit 6: The project was implemented on the basis of a decision package formed using a hybrid system of soft computing technologies proposed by the authors and SCRUM / SMC-technologies of management design, as well as the software module “Project Management” of PC TTRP-EURECA.

Unit 7: Upon successful implementation of the project, the transition to the next project occurs (unit 1/2).

3. Results

The authors simulated in the study the team project work related to the development of the employer brand product system and marketing channels (touch points on the user flow path) for the target audience “small business” at the Company Grouping AIC Skvortsovo related to outsourcing activities (environmentally friendly production of feed and meat raw materials) and franchise. According to the results of preliminary express diagnostics and additional determination based on the existing fact base (FB) of experienced teams (see unit 4), this development team was assigned to potential effective / successful teams. In this case, critical parameters were identified for all levels of thinking organization (unit 3). The team was announced with the resources provided and the deadlines for the completion of individual stages and the completion of the project as a whole. The team itself chose the technology of management design in the form of a gate structure. The key goal of the team moderator was to determine the rational / optimal trajectory of team work management in the design process, first of all, to predict the time of occurrence of the cognitive blockade / lock-up taking into account the leading individual and typological characteristics of the participants and the team as a whole, and environmental resistance, taking into account the level of complexity of tasks / problems, the dynamics of stress and fatigue occurrence, the volume of work performed and, as a result, the number of errors affecting the resulting parameters: the amount of work, their quality and terms of the project. We also used separate methods of system-creative thinking-technology (multi-coordinate analysis, PDG ψ-techniques) [21, p. 56-65]. Marketers (activity experts) designed these scenarios in the process of AHP strategic planning (unit 3). The experts had to carry out two loops of forward and reverse runs using the AHP technology to achieve the planned PAR conversion (> 0.5).

The first “direct run” loop the included an AHP system included five levels: the first level (the key goal of the run) comprising a multi-expert forecast for evaluating the HR supply chain effectiveness at the Act stage for the target audience of small business; the second level (criteria for evaluating the designed employer brand product system) included five indicators (types of empirical experiences) - 2.1 Sensations, 2.2 Feelings, 2.3 Reflections, 2.4 Actions, and 2.5 Correlation with the focus group [23]; the third level (employer brand product system) includes the following products in four areas: 3.1. Outsourcing (3.1.1 Section of the corporate portal, which includes EVP as the main offer, as well as bonus offers on accounting and legal support; each business unit is provided with a personal account, which reflects the parameters for fulfilling the concluded agreements); 3.2. Franchise (3.2.1 Production franchise, 3.2.2 Trade franchise similar to clause 3.1.1); 3.3 Investments (section of the corporate portal with proposals for investments in small business at 3.3.1 Outsourcing and 3.3.2 Franchise similar to clause 3.1.1); 3.4 Training (a series of continuing education programs in the field of selected areas in the following form: 3.4.1 Training seminars, 3.4.2 Organizational and active games (OAG), 3.4.3 Coaching, 3.4.4 Project seminars,

3.4.5 Master classes); the fourth level (system of marketing channels) includes: 4.1 Relevant sections of the corporate portal, 4.2 Social networks (4.2.1 Facebook, 4.2.2 Odnoklassniki, 4.2.3 Vkontakte, 4.2.4 Telegram), 4.3 Thematic forums, 4.4 News portals. The most general classification of marketing channels is usually carried out according to three parameters: on-line / off-line, paid / own / earned and sales / communication [6]; the fifth level is a generalized scenario that includes two state variables evaluated by experts: vertex 5.1. Purchase action ratio (PAR) metric <0.5, vertex 5.2 "PAR metric> = 0.5." If a multi-expert assessment is inclined to the first variable, a “reverse run” is used - the main problems are determined that are related to the missing value (> 0.5) of the PAR metric and the solutions offered by experts to correct both the employer brand product system and marketing channels. The iteration process is carried out until the predicted value of the PAR metric does not exceed 0.5, which will indicate that the designed system of employer brand products and marketing channels is potentially effective at this stage of the user flow for this target audience. The first loop of designing an employer brand product system and marketing channels in a generalized scenario showed a PAR metric <0.5 of 0.625, which led to a correction of the original employer brand product system and marketing channels in the reverse run. The reverse run scheme for the first loop included the following levels: the first level (the goal of the reverse run) is the correction of the original system of the employer brand products and marketing channels; the second level (problems that experts believe originating when the designed system of employer brand products and marketing channels for the first loop is implemented) when these problems are characteristic of the archetypal model “funnel”; the third level (corrective decisions for the original system of employer brand products and marketing channels - figure 6);

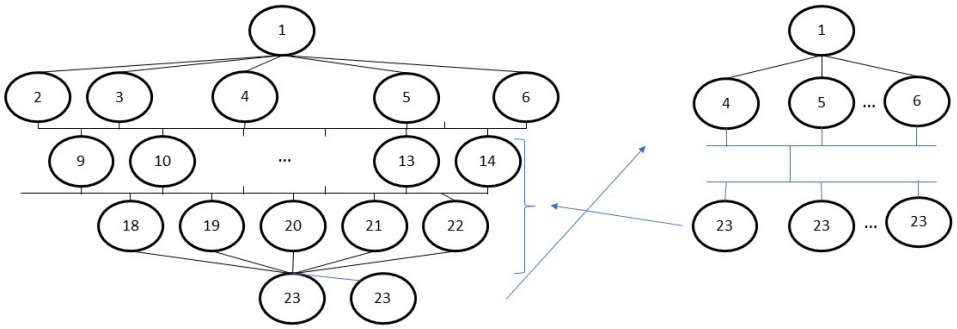

Figure 6. The content scheme of the AHP technology for the project “Digital employer brand”

The optimal tuning of touch points (critical) for the user flow, which include the employer brand product system and marketing channels when passing the second loop of the AHP technology, was carried out by transforming them (eliminating old ones or including new ones) and fine tuning, which comprises choosing the best modalities for them. Such tuning of a package employer brand solution is the management of modalities and submodalities of an object, in our case, the employer brand products system [23] using the “empirical wheel” (a tool for constructing “empirical hybrids” of employer brand products [23, p. 172-176] and the "empirical grid" [23, p. 179-183] (a tool for constructing and managing "holistic hybrids" of employer brand products). Management of submodalities (sensations, feelings, thoughts, actions and correlation with the focus group) of the employer brand product was carried out according to the four coordinates of the “empirical grid”: intensity (intensification vs. weakening), depth (expansion vs. narrowing), volume (enrichment vs. simplification) and binding (compound vs. separation) (figure 7).

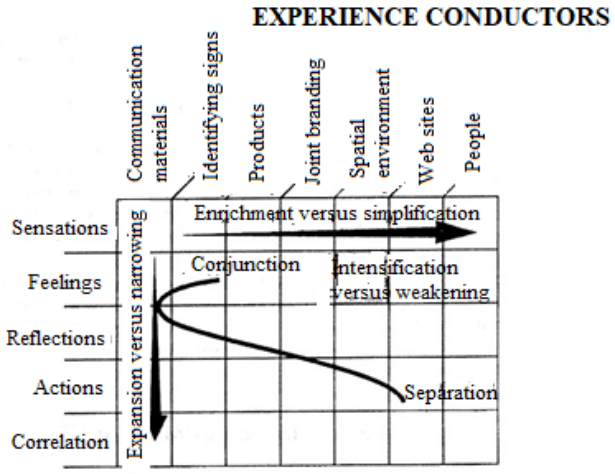

Figure 7. "Empirical grid" by B.Shmitt

Figure8 shows the adjusted design scheme of the employer brand product system and marketing channels for the target audience "outsourcing of small business" for the second loop using AHP technology.

As a result of the initial system correction for the employer brand products and marketing channels, the initial AHP hierarchy was adjusted as follows: the third level was made up of the following peaks highlighted above - 3.1, Outsourcing (3.1.1. - a section of the corporate portal that includes the main offer in the form of EVP, as well as bonus offers on accounting and legal support; each business unit is provided with a personal account, which reflects the parameters for the implementation of the agreements concluded); 3.2. Franchise (3.2.2. Trade franchise); 3.3 Investments (section of the corporate portal with proposals for investments in small business at 3.3.1 Outsourcing and 3.3.2 Franchise); 3.4. Training (a series of additional professional education programs in the field of selected areas in the form of 3.4.2 Organizational and activity games (OAG) and 3.4.4 Seminars and projects). The fourth level (system of marketing channels) includes: 4.1 Relevant sections of the corporate portal of information and communication technologies platform "Digital Valley of Crimea", 4.2 Social networks (4.2.3. VKontakte), 4.3 Thematic forums. Additional channels included: 4.4. Youtube and 4.5. Webinars on the information and communication technology platform "Digital Valley of Crimea". The results of the expert assessment (three experts participated in the assessment) are shown in figure 8. The metric 5.1 (PAR <0.5) value was 0.221, and metric 5.2 (PAR> = 0.5) was 0.779, which allows us to consider the designed system of employer brand products and marketing channels as potentially productive.

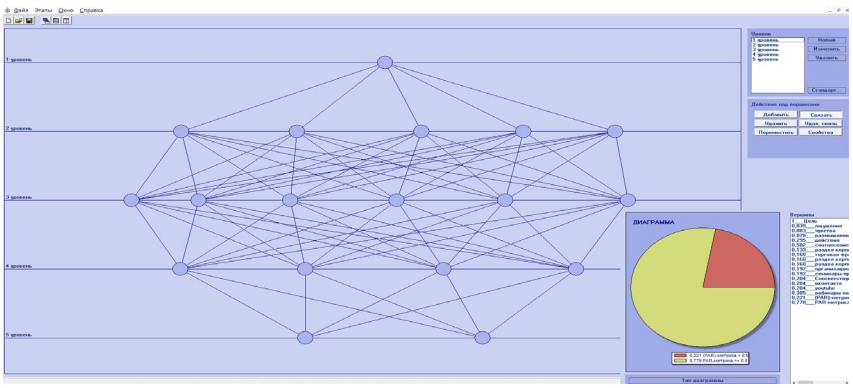

Figure 8. The adjusted design scheme of the employer brand product system and marketing channels for the second loop of the target audience "Outsourcing of small business"

The team behaviour / response graph in the form of a fuzzy cognitive map (FCM) with k1 = 0.2 and k2 = 0.8 is shown in the figure 9.

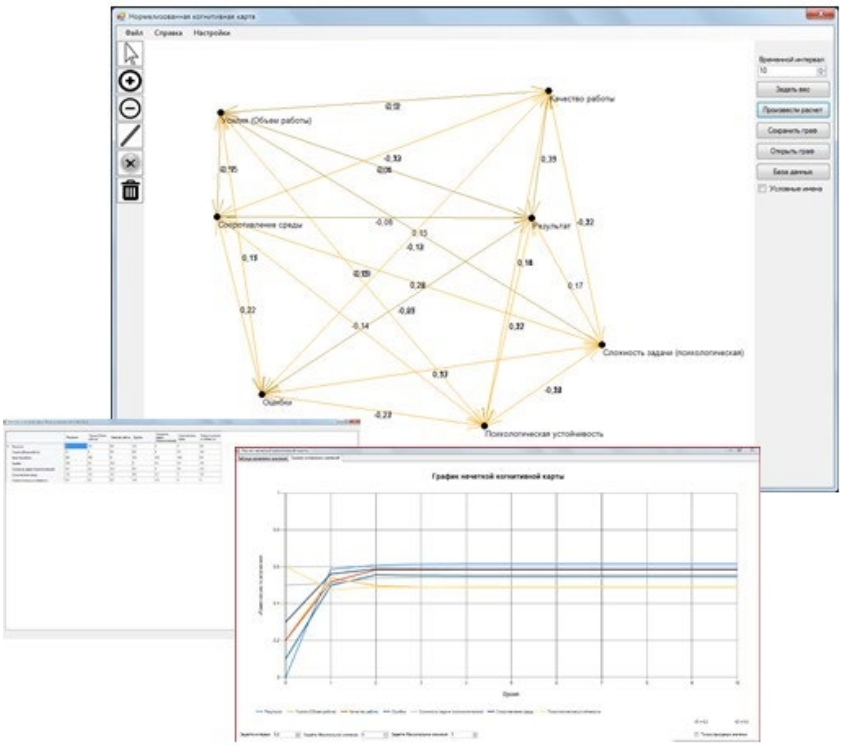

Figure 9. Screens of the Cognitive Modelling software module created with the use of PC TTRP-EURECA

At the same time, the leading individual typological features (VITO) of the team included a typical (template) thinking organization trajectory (unit 3 of the thinking organization level) and the results of basic psychological tests. The graph shown in figure 9 a possible sharp decrease in work performance (as a result of error accumulation) in the third quarter of the project execution period, as well as a noticeable decrease in the first quarter of the project execution period due to the emergence of cognitive blockade. It is assumed that precisely at these times, the team will be given with maximum assistance, in the first case, by additional relaxation of the team members, especially those who are critical to high loads and stresses, as well as the introduction of "fresh forces" in the form of a "joker". In the second case, the balance of discussion of emerging problems was also improved, and the discussion was less emotive due to additional activation of the ETF team by the moderator (specific methods of such activation included strengthening team reflection and improving the coherence of goals and actions along with their correction), while the complexity of the discourse for "Generator of ideas" (GI) and "analytics" (AN) was increased [3]. As a result of the interventions carried out, the team successfully completed the project with a minimum deviation from the deadline and with high quality (solutions were proposed to expand the list of HR-branding stakeholders by including small businesses / farming at the points critical for the Company Grouping AIC "Skvortsovo" by increasing the environmental friendliness of raw materials and finished products, as well as solutions related to the series of hackathons for schoolchildren and university students as potential employees of the organization being engineers and technologists; a series of organizational and activity games on PN-TIPS for engineering and technology personnel was also held).

4. Discussions

A lot of academicians have developed research interest in improving and/or optimizing SCM performance and decision making capability. Numerous soft computing(SC) techniques including but not limited to fuzzy logic and fuzzy

sets, artificial neural networks, genetic algorithm, Bayesian network, rough set theory etc has been applied for decision making and analysis within a number of supply chain management processes. On the basis of a pilot study held, the main problems associated with the use of the proposed hybrid soft computing systems can be distinguished:

1. Difficulties arising from the "convolution" of decisions at various stages of modelling (the problem of the correct synthesis of knowledge). The most preferable here are formalized AHP / ANP expert technologies, which make it possible to evaluate not only the final (alternative) results, but, at the same time, the consistency of the opinions of both an individual expert and their groups.
2. High professional requirements specified for experts: they should not only "feel the digital picture" well, but, above all, feel the processes (their dynamics and behaviour "on the edge of chaos").
3. Classical problems associated with the operationalization of concepts and their quantification (first of all, this refers to concepts that characterize the parameters of a team's unified creative field (UCF)). The "key indicator system" (KPI) concept remains vague: it does not have accurate set of indicators, what can be considered a system and what cannot, what needs to be done to make the initial set of indicators exactly a system? This is especially true concerning the KPI system characterizing the process of organizing team thinking and behaviour, as well as evaluating its effectiveness.
4. There are problems with the use and development of the methods themselves that are part of hybrid technologies, for example, the JSM method [18], as well as cognitive modelling: taking into account delays, out-of-design interventions in the process under study, etc.
5. The most "subtle" and complex are the problems associated with taking into account the leading individual typological characteristics of team members and their psychophysiological conditions in practical work; even small unaccounted deviations can fundamentally change the result of joint activities.
6. It seems interesting to use down-technologies of artificial intelligence (neural networks, etc.) in further research in order to compare the results and develop the line of hybrid technologies themselves.

Not all technologies and solutions proposed by the authors were used due to limited resources and the timing of the pilot project, which did not allow a complete picture of the proposed hybrid technology system to use.

5. Conclusions

It can be noted that the use of hybrid systems of "soft computing" technologies in the design of teamwork has several advantages: firstly, a synergistic effect from the use of individual technologies in a single system is achieved, and secondly, the use of SCM-technologies can significantly enhance cognitive and creative capabilities of individual "soft computing" technologies [14], thirdly, hybrid systems allow us to create sustainable "package solutions" designed not for individual problems, but in general for the entire problem situations (PS), while simultaneously considering its various aspects (cultural and ideological, social, legal, economic, technical and technological and psycho-physiological). Fourth, the use of artificial intelligence technologies and Big Data / Big Live Data allow us to find hidden patterns of thinking and behaviour of teams that often escape the eyes of a moderator and facilitators when working with the team. Fifth, the use of the proposed hybrid technology system for developing the employer brand product system and marketing channels of AIC Skvortso has led to encouraging results, which will further enable this area to be effectively developed as part of the organization's digitalization.

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