A Virtual Intelligent Creativity Matrix for Employees Clustered Interactivity Network with Knowledge Development Program

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ABSTRACT

Creative organizations needing teams to combine and integrate inputs from other teams, the teams’ structure of interaction is an important prerequisite for creativity. Here, the authors investigate different structural aspects teams’ network organization and their creativity within a knowledge development program (KDP). Initially, a pilot group of people in an organization is selected. This group is evaluated through creativity parameters using a questionnaire. Considering the questionnaires’ data, a decision maker configures the creativity matrix by a bipolar scoring technique. Applying the creativity matrix, clustering is performed. The pilot group is divided into some research teams. The research subjects are submitted to the teams and their progress in solving the problem is assessed through a comprehensive network interaction assessment method (CNIAM). Finally, an allocated problem is solved and some new research subjects are evolved to be assigned to the next configured teams. This procedure is repeated dynamically for different time periods. A case study in Mazandaran Gas Company in Iran is worked out to illustrate the effectiveness and applicability of the proposed approach.

Keywords: Comprehensive Network Interaction Assessment Method (CNIAM), Creativity Matrix, Intelligent Clustering, Knowledge Development Program (KDP), Network Organization

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INTRODUCTION

In today’s knowledge-intensive environment, Knowledge Development Programs (KDPs) are increasingly employed for executing innovative efforts (Oxley & Sampson, 2004; Smith & Blanck, 2002). Researchers and practitioners mainly agree that effective management plays a critical role in the success of such KDPs (Pinto & Prescott, 1988). Unfortunately, the knowledge and experience base of most managers refer to smaller-scale projects consisting of only a few project teams. This may be responsible for what Flyvbjerg et al. (2003) call a ‘performance paradox’: “At the same time as many more and much larger infrastructure projects are being proposed and built around the world, it is becoming clear that many such projects have strikingly poor performance records ...”.

KDPs employ a project-management like approach with the team as the organizational nucleus (e.g., van Engelen et al., 2001). The information network of these teams defines the opportunities available to them to create new knowledge (e.g., Uzzi, 1996). As many scholars have argued, networks of organizational linkages are critical to a host of organizational processes and outcomes (e.g., Baum & Ingram, 1998; Darr et al., 1995; Hansen, 1999; Reagans & McEvily, 2003; Szulanski, 1996). New knowledge is the result of creative achievements. Creativity, therefore, molds the foundation for poor or high degree of performance. The extent to which teams in KDPs produce creative ideas depends not only on their internal processes and achievements, but also on the work environment in which they operate (e.g., Amabile et al., 2004; Perry-Smith & Shalley, 2003; Reiter-Palmon & Illies, 2004). Since new knowledge is mainly created when existing bases of information are disseminated through interaction between interacting teams with varying areas of expertise, creativity is couched in interaction networks (e.g., Leenders et al., 2003; Hansen, 1999; Ingram & Robert, 2000; Reagans & Zuckerman, 2001; Tsai, 2001; Uzzi, 1996).

Any organization needs teamwork among employees for productivity purposes in problem solving. Organizations face various problems in their determined missions. A useful approach to address these problems is to configure teams consisting of expert employees. Due to their knowledge and experience of the organization, these teams understand the organization’s problems better than external research groups and thus may solve the problems more effectively. Hence, the significant decision to be made is configuration of the teams. Creative teams would be able to propose more practical and beneficial solutions for organization’s problems. Since creativity is a qualitative concept, analyzing and decision making require knowledge management algorithms and methodologies. These methodologies are employed in the different steps of configuring teams, task assignment to teams, teams’ progress assessment and executive solution proposals for problems.

In the present work, we propose a creativity matrix analyzing creativity parameters of a pilot group in an organization. Then, using an intelligent clustering technique, research teams are configured and research subjects are allocated to them. The teams’ progress in solving the problem is evaluated through a knowledge development program by a comprehensive network interaction assessment method. Consequently, the problem is solved and some new research subjects are evolved to be allocated to the next configured teams. This procedure is repeated dynamically for different time periods. A flowchart of our proposed creativity algorithm is shown in Figure 1.

In this flowchart, in the initialization phase, the system is in its base state. Then, the research subjects (problems) are determined or given by the experts of the organization. Here, teams are configured and clustered. Each team begins the problem solving process using an operational procedure in which research methodologies and required training are considered. In the study and research period, teams try to acquire the knowledge for solving the problem and propose some outputs. The outputs are then analyzed to present solution strategies. These strategies are managed to be effectively implemented in the organization. Here, to enhance the
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