

# Innovative Activities in Terms of Information Processing

*Peter Balco*

*Faculty of Management, Comenius University in Bratislava, Slovakia*

*Martina Drahošová*

*Faculty of Management, Comenius University in Bratislava, Slovakia*

*Michal Greguš*

*Faculty of Management, Comenius University in Bratislava, Slovakia*

*Mojmír Kališ*

*EMKAconsult s.r.o. Bratislava, Slovakia*

## Abstract

In our contribution we are describing methodological issues of innovation process in terms of information processing. It is the "meta-innovation methodology". The quality of input information and their processing is a general prerequisite for effective innovation activities. The ability of teams to solve innovative tasks - our different research outputs describe different spontaneous ability to solve logical tasks in teams. The synergistic effect reaches 25-45% of all tested model teams. To effectively deal with existing observations, we consider applying a methodology based on TRIZ modelled in the form of ARIZ.

**Keywords:** TRIZ, ARIZ, Innovation

**JEL classification:** O1

## Introduction

Organizational theory emphasizes the central role of information management in the organization (Choo, 1991 Simon, 1978 Mintzberg 1973 and others.). To decide which role it plays as an integral part of management in general, particularly in innovation, it is necessary to reduce the sources of errors in determining the right quality and efficient processing of information (Choo, 1991). Current models of innovation based on (a) the derivation of innovation by economic pressures, (b) the needs of adaptation to changes in the external environment, (c) the derivation of future trends, (d) models which depend on the knowledge and skills of organization (Croley & Cropley, 2015). All models of innovation work on the principle of information processing. The knowledge management integrates and supports the effective development of innovation on the principle of information processing (Darroch, 2005). Effective use of information processing is key in considering the methodological basis of the innovation process.

In our paper we deal with executive requirements to process the information needed for effective innovation management. Information needed for innovative decisions based on (1) understanding the external environment in terms of the development of scientific knowledge in the area, the development of innovation activities in the area, knowledge of the structure of current and anticipated market

needs, (2) information on the internal environment of the organization in terms of technology, economic condition, cognitive abilities and skills of the organization and value-emotional characteristics of the organization, (3) knowledge level of ability to creatively solve problems in teams.

Sometimes it is possible that even one single individual can possess enough knowledge, skills, and abilities to bring about changes and be innovative. Singular skills are important in field of innovation, but when we gather together some skilled individuals and create a team or project team, they can create by their cooperation greater added value than any one person individually. By implementation of any initiative, form of cooperation can facilitate outcome and maximize the effectiveness of using a team approach.

## Individual versus team problem solving

Individuals always bring with them into groups their own ideas and assumptions. If the group solution is simply one persistent member's ideas, then there are chances that the team was not effectively utilized. Individuals should work cooperatively by being open to other opinions and methods. In this way, the team can develop an innovative solution, which should be superior to any individual team member's ideas (Stephen Covey, 2013).

Word *team* has evolved from Middle English word, *teme*, and this one from Old English word, *team*, which indicates offspring or lineage, to a later term that referred to two or more draft animals harnessed to the same vehicle or implement, to its present use, which includes a number of persons associated together in work or activity (Merriam-Webster, 2017). Team can refer to football, departments, or offices. This word indicates that members of any group or team are all working and cooperating toward a common goal or purpose.

The chance for synergy is the greatest when project team members do not see things in the same way. "Strength lies in differences, not in similarities." (Steven Covey, 2013). We must respect and appreciate these differences so we can learn what they show us. Strive to work with people who do not think like you do.

How do you create a synergistic team?

There are many ways you can help your team work well together. Here are a few examples.

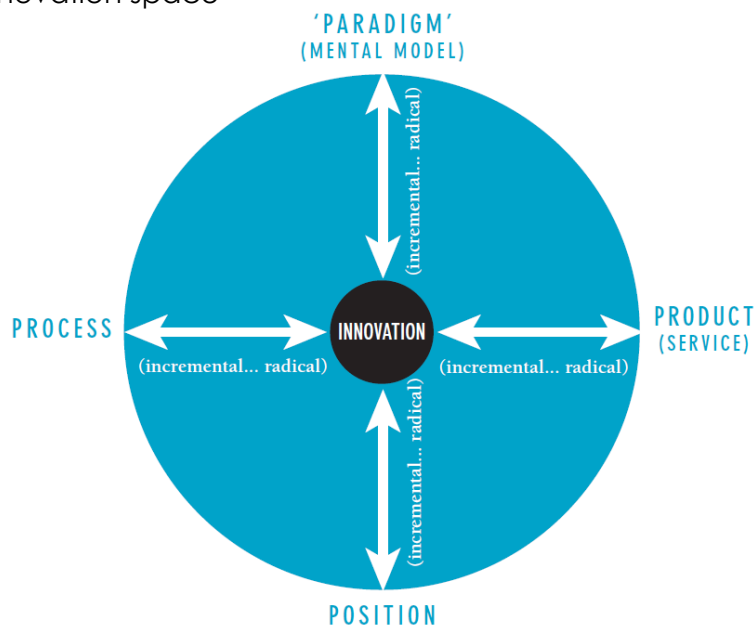
- Start out by understanding how team members are similar and different from one another using a tool like the Myers-Briggs Type Indicator.
- Establish a recognition system that rewards both individual and team accomplishments. Be cautious to only reward people for achieving or exceeding project goals, not for working overtime due to poor project planning on their part.
- Open and continuous communications is the key.
- Assume the best about people. It's easy to focus on what we think is the worst about people when we must work with them day in and day out for months at a time. Put on the rose coloured glasses occasionally and see what is best in them.
- Get together socially periodically to celebrate project successes.
- Encourage team members to be supportive of one another. (Arnold, K. J., 1999)

"What sets apart high performance teams is the degree of commitment, particularly how deeply committed the team members are to one another." (Katzenbach, J. R., Smith, D. K., 2015)

## Innovation and Synergy

Innovation is the process of translating an idea or invention into a good or service that creates value or for which customers will pay. To be called an innovation, an idea must be replicable at an economical cost and must satisfy a specific need. Innovation involves deliberate application of information, imagination and initiative in deriving greater or different values from resources, and includes all processes by which new ideas are generated and converted into useful products. In business, innovation often results when ideas are applied by the company in order to further satisfy the needs and expectations of the customers (Business Dictionary, 2017). Innovation management in standardly managed organization includes following four management interactions, areas - product, process, staff and environment.

Figure 1  
Innovation space



Source: Tidd, Bessant, Pavitt, 2005

Strategic Innovation is the creation of growth strategies, new product categories, services or business models that change the game and generate significant new value for customers and the corporation (Kotelnikov, V.).

A common feature and the effectiveness criteria for all four components of innovation management is the ability to process information related to the external environment, the market requirements, the internal organizational possibilities and the ability to effectively address specific tasks to innovation team. In our research, we oriented to:

- databases of information - knowledge consisting of structured and unstructured data
- information concerning the economic performance of the organization and its ability to respond flexibly to market requirements
- set the architecture of information system based on the IT enterprise architecture reflected needs of the organization

- corporate culture which supports or hinders innovation activities in the organization.

## Data processing

Data processing (DP) is the collection and manipulation of items of data to produce meaningful information. Despite this general definition, the term DP is more commonly associated with specialist business tasks of this nature such as sales order processing, purchase ledger processing and payroll processing. For very many years, the methods of Data Processing have involved electric means, principally the computer. Any modern study of Data Processing must therefore look at Electronic Data Processing (EDP) in detail. However, EDP must be seen in context as one of a number of important areas of Information Technology (IT).

Data is the term used to describe basic facts about the activities of a business. Examples are: the number of hours worked by any employee on a particular machine; his or her rate of pay; the amount and type of materials consumed in a particular process; the number of tons of finished product produced in a day or week. Information is obtained by assembling items of data into a meaningful form, e.g. a payroll, an invoice, a financial statement or an efficiency report. Information can range from a simple report about routine operations up to a report required by top management to make strategic decisions.

## Gathering information from companies and their analysis

There are many possibilities to gather the necessary information from companies, e.g. database that maintains a state - financially centralized database of state bodies; internet and social media; querying companies for their internal data.

After gathering the data, we need to process them to get information. On this processing, we use knowledge management.

Knowledge Management is a scientific process that initiates its working by amassing knowledge (both tacit and explicit), filtering it, structuring or restructuring it, storing and finally disseminating it. The dissemination process of the already stored knowledge is again very crucial, as it should also be in such a manner that

- The access to knowledge is timely, accurate and easy;
- The accessed knowledge aids adequately in decision making, and
- The available knowledge facilitates in creation or generation of new knowledge. [3]

A successful knowledge management strategy must address four key areas:

- Knowledge management strategy as a core focus and competency,
- Flexible structure for knowledge creation and dissemination,
- Technology and processes, and
- Skilled knowledgeable workers (Neto, Souza, Neves, Barbosa, 2008.).

## Processing of information in an innovation team

The ultimate place where innovative ideas get a realization is innovation teams. The quality of their work is a "sine qua non" condition for the success of innovative activities in the organization (Cropley and Cropley, 2015). Fourth Innovation Theory claims that innovation results from the team activities that are characterized: (1) concentrating on clear and realistic goals with which the team members are identified (vision), (2) Interaction between team members is in a non-threatening atmosphere (participatory security), (3) identification with high performance standards (task orientation), (4) support for innovation experiments, that is,

cooperation on the development and application of new ideas (innovation support).

Our research on the factors of synergic performance in teams confirmed the importance of focusing on the role and the positive atmosphere in teams that were significantly higher in teams that achieved synergy. These findings reminisce of the West's innovation theory - teams that have innovative potential show a high level of focus on the role and the high degree of cooperativity in interactions. If we considered team synergy as a type of innovative solution, then these results both support the West's theory of team innovativeness, but also give information about team direction towards innovation.

Decision-making strategies - problem-solving - in teams are an essential factor for successful teamwork. In our research, teams that did not achieve a synergic result (only repeat the result of the best team member or the team result was worse as a result of the best individual) showed significantly higher numbers in the problem-solving process. Random (estimated) solutions and voting based solutions. This signal the need to standardize the problem-solving process in the team - ARIZ, which is a widely accepted problem-solving guide in an innovative way. It is also necessary for team members to master problem-solving techniques in line with the TRIZ methodology and to master techniques for the acquisition of ideas for innovation.

## Conclusion

The ability of teams to solve innovative tasks are linked to critical input data and their processing by innovation teams. The different research outputs describe different spontaneous ability to solve logical tasks in teams. From the perspective of observation the innovative problem-solving is important to create added value within innovation environment. The presented analysis is very attractive for future research, where we want to focus on design, testing the model of right processing of information by innovative activities.

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## About the authors

Peter Balco studied at the Faculty of Electrical Engineering and Computer Science, Technical University. DEA diploma and Ph.D. advocating on C.E.M.-CNRS Montpellier, USTL II, France for optoelectronics and optoelectronic system. He holds a Professional Diploma in Management MBA Business school level 1 CUB, a member of The Open University, UK. It has many years of experience in managing of IT and TELCO operating environment as well as the delivery of IT and TELCO projects for large international organizations. Currently he works in area of IT architecture, cloud services and data analysts. A member of the Technical Committee TC 37 (Information Technology) at Slovak Standards Institute. Certified Auditor for ISO9000, ISO20000, ISO27000 certificate holder P3O and PRINCE2, BPM, TOGAF. The author can be contacted at [peter.balco@fm.uniba.sk](mailto:peter.balco@fm.uniba.sk).

Michal Greguš is Vice-Dean for International Relations and Information Technology Faculty of Management at Comenius University in Bratislava, Professor and Head of Department of Information Systems and Member of the Supervisory Board BPUG Slovakia. Main research areas in which work includes project management and information systems and modeling of financial and economic processes on the computer. He has published over one hundred scientific publications in renowned scientific journals and proceedings of international scientific conferences (He was also a regular member of the program committees of conferences, for example, Business Informatics Research, Wireless Telecommunication Symposium and others). The author can be contacted at [Michal.Gregusml@fm.uniba.sk](mailto:Michal.Gregusml@fm.uniba.sk).

Martina Drahošová is a researcher at Comenius University in Bratislava Faculty of Management, e-Europe Research & Development Centre. She is focusing on online marketing, marketing on social media and security on social media. Since the completion of a Master's degree works in online marketing and deals with issues of social media. Dedicated to the processing of structured and unstructured data in marketing and social media for business purposes. She received PhD in Information Systems at the Faculty of Management, Comenius University in Bratislava with the dissertation thesis "Analysis of Effectiveness and Threats of Use of ICT after the Introduction of Web 2.0 in Selected Countries". She participated in many scientific international conferences. Author can be contacted at [martina.drahosova@fm.uniba.sk](mailto:martina.drahosova@fm.uniba.sk).

Mojmír Kališ's company is oriented on HR risk management (anti-fraud), improving the performance of teams (based mainly on team reflexivity), personal selection and training (managerial and sales persons). Know-how is based on thorough knowledge of Slovak and Czech business environment, on the more than 20 years managerial experience (mainly at the HR management), on the wide range of theoretical knowledge and on the own scientific research (the main topic is improving the

performance of work teams). He is the member of International Association of Applied Psychology and Slovak Psychological Association.