**'United Nations/Azerbaijan
Workshop on the International Space Weather Initiative:
The Sun, Space Weather and Geosphere'**

"SPACE SCIENCE AND TECHNOLOGY: DIVERSITY AND SUSTAINABILITY"

OCTOBER 31- NOVEMBER 04, 2022, BAKU, AZERBAIJAN

**Presented by: Rustam B. Rustamov
             Azerbaijan National Academy of Sciences**

CONTENT

- *Challenges*

- Learning Organization

- Principles

- Quality Management System

- Conclusion

**"United Nations/Azerbaijan
Workshop on the International Space Weather Initiative:
The Sun, Space Weather and Geosphere"**

■ SCIENCE AND EXPLORATION

- ➢ Microgravity Sciences And Processes Symposium
- ➢ Space Exploration Symposium
- ➢ Symposium on The Search For Extraterrestrial Intelligence
- ➢ Symposium on Human Exploration Of The Solar System
- ➢ Symposium on Space Debris
- ➢ Symposium on Future Space Astronomy And Solar-system Science Missions

■ APPLICATIONS AND OPERATIONS

- ➢ Earth Observation Symposium
- ➢ Space Communications and Navigation Symposium
- ➢ Human Spaceflight Symposium
- ➢ Symposium on Small Satellite Missions
- ➢ Symposium on Integrated Applications
- ➢ Space Operations Symposium

■ TECHNOLOGY

- ➢ Astrodynamics Symposium
- ➢ Materials and Structures Symposium
- ➢ Space Power Symposium
- ➢ Space Propulsion Symposium

**"United Nations/Azerbaijan
Workshop on the International Space Weather Initiative:
The Sun, Space Weather and Geosphere"**

■ **SPACE AND SOCIETY**
➢ Space Education And Outreach Symposium
➢ Student Conference
➢ Symposium On Space Policy, Regulations And Economics
➢ History Of Astronautics Symposium
➢ Symposium On Space Activity And Society
➢ Business Innovation Symposium
➢ Colloquium On The Law Of Outer Space
➢ Multilingual Astronautical Terminology Symposium

■ **SPACEFLIGHT OPERATIONS GLOBAL TECHNICAL SESSION**
➢ Human Space Flight Global Technical Session
➢ Space Communications And Navigation Global Technical Session
➢ Student Team Competition
➢ Small Satellite Missions Global Technical Session

■ **INFRASTRUCTURE**
➢ Space Systems Symposium
➢ Space Transportation Solutions And Innovations Symposium
➢ Symposium on Building Blocks For Future Space Exploration And Development
➢ Symposium on Visions And Strategies For The Future
➢ Symposium on Safety, Quality And Knowledge Management In Space Activities
➢ Symposium on Commercial Spaceflight Safety Issues

What happens?

- **Challenges**

➢ **Problem of coordination of scientific directions of space science and technology;**

➢ **Prestige of space science and technology;**

➢ **Status of space science and commercialization; and**

➢ **Management of science and commercialization - not sufficient experience.**

- Science/education/business integration as the basic factor for sustainable development;

- Space Science/technology and education as the factor of human resources development; and

- The role of space science/technology and education in capacity building.

■ The important point:

Space science/technology - appreciation of the society.

- **DIVERSITY for space science and education sustainability**

- The diversity is the fundamental principle wide using in different condition and environment and can be accepted and understood in variety aspect of approaches.

- The diversity is explaining as platform of acceptance of many people and visions into the same of matter or option.

- In order to assess of integration effectiveness of science, education and business it is vital to monitor and diversify of this area making possible timely identification of problems in terms of development strategic plans for further management of effective commercialization of research activities and being able to create environment for timely response of any changes during the process.

■ The problem of integration of education, science and commercialization/production being the prerequisite for:

➢ high quality training development for engineers in space science/technology area; and

➢ ensuring competitiveness of domestic economy.

- It is extremely important to manage space science/technology and educational activities in accordance with the up to date requirements;

- In order to achieve this goal: determination and selection fundamental principles of management;

- The goals and objectives can play a key role in making this selection. Objectives help to determine what fundamental management principles are to be achieved by defining the expectations to be achieved;

- For this purpose, the specificity, which is based on the management of the space science/technology, educational and intellectual environment in general, must be taken into account and considered; and

- The principle of constantly expanding the opportunities of the community involved in the process to achieve the results they really strive for:

➢ creating an environment for cultivating new and broad models of thinking,

➢ creating maximum free environment for the fulfillment of collective aspirations and

➢ constantly improving people by learning and training together.

■ Learning Organization;

■ The Learning Organization assumes a kind of management in which employees constantly improve and change their environment by gaining knowledge and experience;

■ The process of re-formation of the consciousness of its employees takes place in the Learning Organization; and

■ Within such an organization, people contribute to how to create a new reality and how to change it.

Principles:

- *Systems thinking:* The idea of the learning organization developed from a body of work called system thinking. Systems thinking states that all the characteristics of a learning organization must be apparent at once in an organization for it to be a learning organization. If some of these characteristics are missing then the organization will fall short of its goal.

- **Personal mastery:** The commitment by an individual to the process of learning is known as personal mastery. There is a competitive advantage for an organization whose workforce can learn more quickly than the workforce of other organizations.

➢ Learning is considered to be more than just acquiring information;

➢ it is expanding the ability to be more productive by learning how to apply our skills to work in the most valuable way;

➢ Personal mastery appears also in a spiritual way as, for example, clarification of focus, personal vision and ability to see and interpret reality objectively;

➢ Individual learning is acquired through staff training, development and continuous self-improvement; however, learning cannot be forced upon an individual who is not receptive to learning;

➢ Research shows that most learning in the workplace is incidental, rather than the product of formal training, therefore it is important to develop a culture where personal mastery is practiced in daily life;

➢ A learning organization describes as the sum of individual learning, but there must be mechanisms for individual learning to be transferred into organizational; and

➢ Personal mastery makes possible many positive outcomes such as individual performance, self-effective, self-motivation, sense of responsibility, commitment, patience and focus on relevant matters as well as work-life balance and well-being.

■ **Principles**

Mental models: Assumptions and generalizations held by individuals and organizations are called mental models. Personal mental models describe what people can or cannot detect.

➢ Due to selective observation, mental models might limit peoples' observations;

➢ To become a learning organization, these models must be identified and challenged;

➢ Individuals tend to espouse theories, which are what they intend to follow, and theories-in-use, which are what they actually do;

➢ In creating a learning environment it is important to replace confrontational attitudes with an open culture that promotes inquiry and trust. To achieve this, the learning organization needs mechanisms for locating and assessing organizational theories of action; and

➢ For organizations, problems arise when mental models evolve beneath the level of awareness. Thus it is important to examine business issues and actively question current business practices and new skills before they become integrated into new practices.

Principles

■ *Creating an overall VISION.* It focuses on the common goals achieved as a result of joint activities. Such activity allows:

➢ to form an overview of the possible future situation of the organization;

➢ the formation of a common vision creates an atmosphere of sincere interest between the parties; and

➢ general vision skills bring the parties closer to the process of continuous improvement.

■ *Team-scale Training.* This approach aims to build knowledge as:

➢ a team and to train the team in practical ways of interacting with each other;

➢ team-level training is conducted both within the organization and as individual teams. In this case, it is talking not only about trainings and seminars, but also about creating a free exchange of ideas within the team; and

➢ In some cases, dialogue between employees may be inaccessible. Within the framework of the dialogue, one or another situation is clarified. It is an undeniable fact that discussion is the best choice. It is team-based training that has a synergistic effect, unlike emotion.

■ The main purpose of these approach is to build:

➢ a political;

➢ Economic; and

➢ cultural life which needed to be modernized.

■ In such conditions, structural reforms in:

➢ Space science/technology and educational entities;

➢ scientific research adaptation to the requirements of modern demands;

➢ the effectiveness of space science/technology; and

All above are important to carry out radical reforms in these areas.

''United Nations/Azerbaijan
Workshop on the International Space Weather Initiative:
The Sun, Space Weather and Geosphere''

■ Optimization of management and improvement of the structure in the field of space science/technology activity following measures should be implemented for improvement of management system creating integration capacities in space science-technology/education/business. What needed to be carried out?

➢ ISO 9001: 2015 in the field of scientific management - below the Quality Management System application of the above-mentioned (QMS) international standard;

➢ Involvement of the organization's staff as a whole in the process;

➢ activity aimed at customer satisfaction;

➢ direct participation of management in the process;

➢ appropriate approach to processes;

➢ continuous improvement;

➢ making decisions based on factual information; and

➢ dialogue management of mutual relations;

A **center of excellence** (**COE**) is a team, a shared facility or an entity that provides:
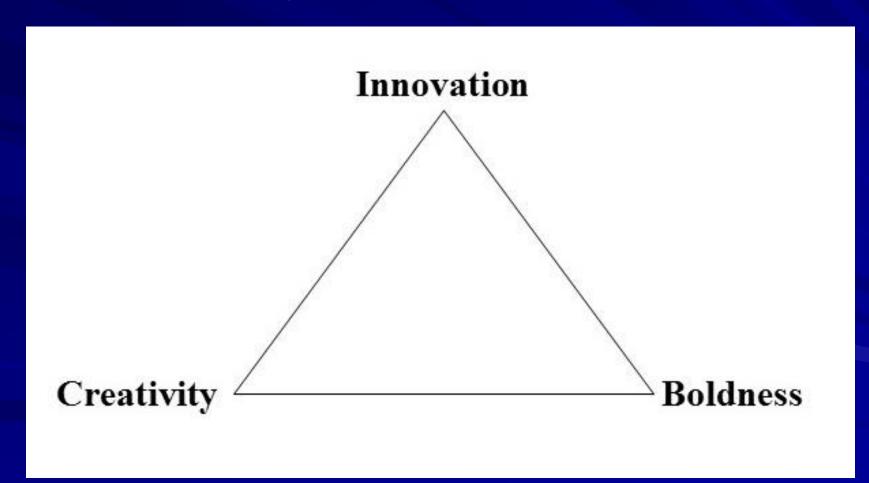
➢ leadership;

➢ best practices;

➢ research; and

➢ support and/or training for a focus area.

▮ The focus area might be:

➢ Space science/technology;

➢ business concept; and

➢ skill or a broad area of study.

Center of Excellence could be established for anything that an organization needs to focus on:

- Innovation;

- best practices; and

- competency,

- product development, or process optimization.

However, in order to set up a CoE that truly drives value for an organization, it must have empowered collocated teams with ownership and accountability, working in alignment with clearly defined objectives.

Philosophy of functioning
Innovation/Creativity/Boldness

**'"United Nations/Azerbaijan
Workshop on the International Space Weather Initiative:
The Sun, Space Weather and Geosphere"**

■ **CONCLUSIONS**

➢ Society: to ready to understand importance of space science/technology achievements

➢ Integration: space science-technology/education/business

➢ Principle: Learning organization philosophy

➢ Instrument: Quality Management System application/ISO standard application

➢ Follow up: R&D-Innovation Center/ Center of Excellence

Thank you for attention!