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INNOVATIVE DEVELOPMENT OF EDUCATIONAL SYSTEMS IN THE BANI ENVIRONMENT

Abstract. The rapid advancement of technology and the ever-changing global landscape have presented unique challenges and opportunities for educational systems worldwide. The introduction of the BANI (Brittle, Anxious, Nonlinear, Incomprehensible) framework as a response to the volatile and unpredictable nature of contemporary environments has further emphasized the need for innovative approaches to education. This paper explores the innovative development of educational systems within the BANI environment, focusing on the integration of emerging technologies, pedagogical strategies, and learner-centred approaches. The paper begins by providing a comprehensive overview of the BANI framework and its implications for educational systems. It highlights the key characteristics of the BANI environment, including its inherent brittleness, anxiety-inducing nature, nonlinearity, and incomprehensibility. The formal model of interaction between projects and the BANI environment can assess innovation project value for future optimisation. Furthermore, it elucidates the potential consequences of neglecting to adapt educational systems to these volatile conditions, emphasizing the importance of innovation in education. Drawing upon recent research and theoretical frameworks, the paper explores various innovative approaches to educational development in the BANI environment. It discusses the integration of emerging technologies, such as artificial intelligence, virtual reality, and augmented reality, into teaching and learning processes. Moreover, it investigates the implementation of learner-centred development strategies that foster critical thinking, problem-solving skills, creativity, and adaptability. The paper addresses the role of educators and institutions in supporting innovative development within the BANI environment. It emphasizes the need for professional development programs that empower educators to leverage emerging technologies and implement learner-centred approaches effectively. Key management of innovative project principles in the BANI environment is defined in the paper. Additionally, it highlights the significance of collaboration

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among educational stakeholders, including policymakers, administrators, teachers, students, and parents, to foster an ecosystem that nurtures innovation in education. The paper discusses potential challenges and ethical considerations associated with the innovative development of educational systems in the BANI environment. It explores issues related to equity, privacy, data security, and the digital divide, emphasizing the importance of responsible and inclusive approaches to educational innovation. Contributes to the existing literature by providing insights and recommendations for the innovative development of educational systems within the BANI environment. By embracing emerging technologies, learner-centred pedagogies, and collaborative efforts, educational systems can better prepare learners to thrive in uncertain and rapidly changing contexts.

Keywords: innovation, development trends, education establishments, VUCA and BANI environment, the model for interaction projects and BANI, the algorithm for managing projects

Introduction

Currently, the innovative development of organizations plays a key role in their competitiveness and sustainability in a globalized, rapidly changing, fragile and high-risk market. Rapid technological change, the constant evolution of consumer preferences and the uncertainty in the business environment require companies to constantly introduce new ideas and technological solutions. Increasing the efficiency and effectiveness of innovative development of organizations is relevant and important, as it helps to present the current innovation landscape based on trends that shape the future of business. Consider the main trends in the innovative development of organizations that cover various areas, including technology, strategic planning, organizational culture and customer interaction. Each of the trends will be presented with relevant examples and illustrations to give readers a clear idea of how these trends are applied in practice. We will discuss the benefits and challenges associated with each trend, as well as recommendations for organizations to successfully innovate. Organization Innovation Trends is a valuable asset and resource for managers, entrepreneurs, researchers, and anyone interested in updating their knowledge of the latest business innovations and trends.

The purpose of the article is to present trends in the innovative development of educational systems and the global environment of BANI to search for new opportunities and strategies to ensure sustainable development and market success [1].

1. Trends in the global development of educational organizations

Consider some of the technology trends we are currently seeing: Artificial Intelligence (AI) and Machine Learning: AI and Machine Learning continue to evolve and find more applications in various fields, including automation, medicine, finance, transportation, and more. These technologies enable computer systems to learn and make decisions based on data, resulting in new capabilities and improved efficiency.

1. Internet of Things (Internet of Things, IoT). IoT describes a network of physical objects connected by a network and exchanging data. This allows you to create intelligent systems that can control and manage various devices and processes, improving comfort, energy efficiency and safety.

2. Blockchain (Blockchain). Blockchain is a decentralized and distributed data recording system that provides transparency, security and integrity. It has found application in the financial sector (for example, cryptocurrencies), supply chains, data management and other areas where a reliable and transparent system is required.

3. Augmented Reality (AR) and virtual reality (Virtual Reality, VR). AR and VR provide opportunities for interaction and perception of a mixed real and virtual world. They are used in a variety of applications including education, entertainment, training, and simulation.

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4. Robotics. Robotics continues to evolve, exploring the possibilities of autonomous and collaborating robots. Robots are used in manufacturing, delivery service, and healthcare, as well as for domestic purposes.

5. Biotechnologies and genetic engineering. Biotechnology and genetic engineering are leading to discoveries in medicine, agriculture, food production and other areas. They include technologies such as gene editing, tissue engineering and personalized medicine.

These are some of the trends in technology development. The development of technology continues to accelerate, opening up new opportunities and causing changes in various areas of life and business. The driver for the implementation of these trends is digitalization.

Digitalization is one of the main trends in the development of technology. It describes the process of converting analogue information, processes and services into digital format.

In the modern world, more and more companies and organizations are striving to move to digital systems and processes. It includes:

1. Digital platforms. Creation of digital platforms that connect various aspects of the business such as sales, marketing, customer management, etc. This allows you to more effectively manage your business and provide digital services.

2. Cloud computing. The use of cloud computing allows companies to store and process data remotely, as well as scale resources according to needs. This provides flexibility, scalability and data availability.

3. Artificial intelligence (AI) and data analytics. Apply AI and data analytics to process and analyze large amounts of data, identify patterns, predict and make more informed decisions.

Digitalization is changing the way educational organizations interact with customers, organize their business processes and deliver products and services [2]. It also opens up new opportunities to innovate, create new business models and improve the customer experience. Organizations that successfully adapt to this trend can gain a competitive advantage in the market [3].

2. Models of the Environment in the innovative development of educational systems

The VUCA model and the BANI model are tools for analyzing and understanding the changing business environment in the processes of developing strategies for the innovative development of organizations and projects.

The VUCA model helps organizations to recognize and adapt to changes in the world around them, develop strategies and make decisions, taking into account the above factors.

The VUCA model (English Volatility, Uncertainty, Complexity, Ambiguity) was developed in the late 1980s as part of a military strategy and later transferred to the business environment [3]. It was created by military analysts and academics to describe the characteristics and challenges faced by military and political leaders in the post-Cold War era. Consider the description of the model.

The VUCA model is a model designed to describe today's rapidly changing and unstable world. Here is the transcript of English words into Russian:

- Volatility is the volatility and instability that can affect the business environment.
- Uncertainty is the uncertainty and unpredictability associated with future events and their consequences.
- Complexity is the relationship and interdependence of various factors and variables in the business environment.
- Ambiguity is the vagueness and ambiguity of information that can make it difficult to make decisions.

Initially, the term VUCA was used in the context of international relations and denoted the nature of changes in the geopolitical situation after the collapse of the Soviet Union. However,

it was later adapted for use in a business environment to describe the rapidly changing and volatile nature of today's business environment. The VUCA model has become widespread in organizations and the business community as it helps organizations recognize and adapt to the complexities and challenges of today's world. It recalls the need for flexibility, adaptation and innovation in a rapidly changing market and technology.

Over time, the VUCA model has become widely used in the field of strategic management, leadership and organizational development. It helps executives and executives make informed decisions, develop strategies, adapt to change, and effectively manage uncertainty and complexity in the business environment.

The BANI (Brittle, Anxious, Nonlinear, and Incomprehensible) model was proposed in 2020 in the context of the challenges posed by the COVID-19 pandemic [1]. Its creator is Mark Bonshen, an American futurologist, a specialist in strategic development and innovation.

Unlike the VUCA model, which was developed by military analysts, the BANI model comes from the business environment and has a narrower focus on the challenges posed by the pandemic and its consequences.

Mark Bonschen created the BANI model based on observations and analysis of the changes taking place in the business environment as a result of the COVID-19 pandemic. He noted that existing models and approaches to strategic planning and management are not always effective in a rapidly changing and unpredictable world caused by the pandemic.

The BANI model consists of four main elements that reflect the challenges posed by the pandemic:

- Fragility (Brittle) is the vulnerability of the system and its inability to withstand strong shocks and crises.
- Anxious is the ability of a system to become stronger and more resilient after experiencing a shock, the ability to benefit from uncertainty and crisis.
- Non-linearity is the unpredictability and non-linearity of the impact of events and variables on a system.
- Redundancy (Incomprehensible) is the availability of spare resources, backup plans and flexibility to mitigate the effects of failures and failures.

The BANI model encourages organizations and leaders to develop systems that are flexible and sustainable, given the characteristics described in the model. It highlights the need to adapt, innovate and be ready for the unexpected in an ever-changing business environment driven by the pandemic and other changes [4].

3. Algorithm for Modeling the Environment in the Innovative Development of the Educational System

The BANI model primarily describes the characteristics of complex and uncertain environments. However, in the context of navigating and thriving in a BANI environment, certain competencies and skills can be valuable. Here are some key project management competencies (fig. 1):

1. Sustainability. The ability to bounce back from setbacks, adapt to changing circumstances, and stay focused and productive in the face of challenges. Sustainability helps individuals and teams maintain their performance and well-being in the BANI environment.

2. Adaptability. The ability to adjust and change approaches, strategies and plans as the situation evolves. Being open to change, accepting new ideas and quickly changing situations when needed are important qualities in a BANI environment.

3. System thinking. The ability to understand and analyze complex systems, recognizing the interconnectedness and interdependence of various factors. Systems thinking allows people

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to consider the larger context, anticipate potential ripple effects, and identify impact points for intervention.

4. Creativity and innovation. The ability to think creatively, generate new ideas and look for innovative solutions. In the BANI environment, creativity and innovation can help individuals and teams overcome non-linear challenges and find unique approaches to problem-solving.

5. Emotional intelligence. The ability to recognize, understand and manage one's emotions, as well as to empathize with and relate to others. Emotional intelligence enables effective communication, collaboration and relationship building, which is vital in a BANI environment where anxiety and uncertainty can prevail.

6. Ability to learn. Willingness and ability to learn quickly and adapt to new or changing situations. The ability to learn includes curiosity, the search for new knowledge, feedback and continuous improvement of skills and competencies.

7. Decision-making under conditions of uncertainty. The ability to make informed decisions despite incomplete information and ambiguity. It involves assessing risks, considering multiple points of view, and using analytical and intuitive thinking to overcome uncertainty.

8. Cooperation and communication. Ability to work effectively with a variety of people and teams, promoting open and transparent communication. Cooperation and communication skills help build trust, facilitate knowledge sharing and ensure effective coordination in complex and dynamic environments.

9. Strategic thinking. The ability to see the big picture, anticipate future trends and develop long-term strategies. Strategic thinking allows people to navigate the confusing BANI environment by identifying patterns, opportunities and potential directions.

10. Adaptation to digital technologies. Given the increasing digitalization of various aspects of life and work, having competencies related to technology adoption and digital literacy is critical in the BANI environment. This includes the ability to use digital tools, data analysis, and the use of technology to improve productivity and decision-making.

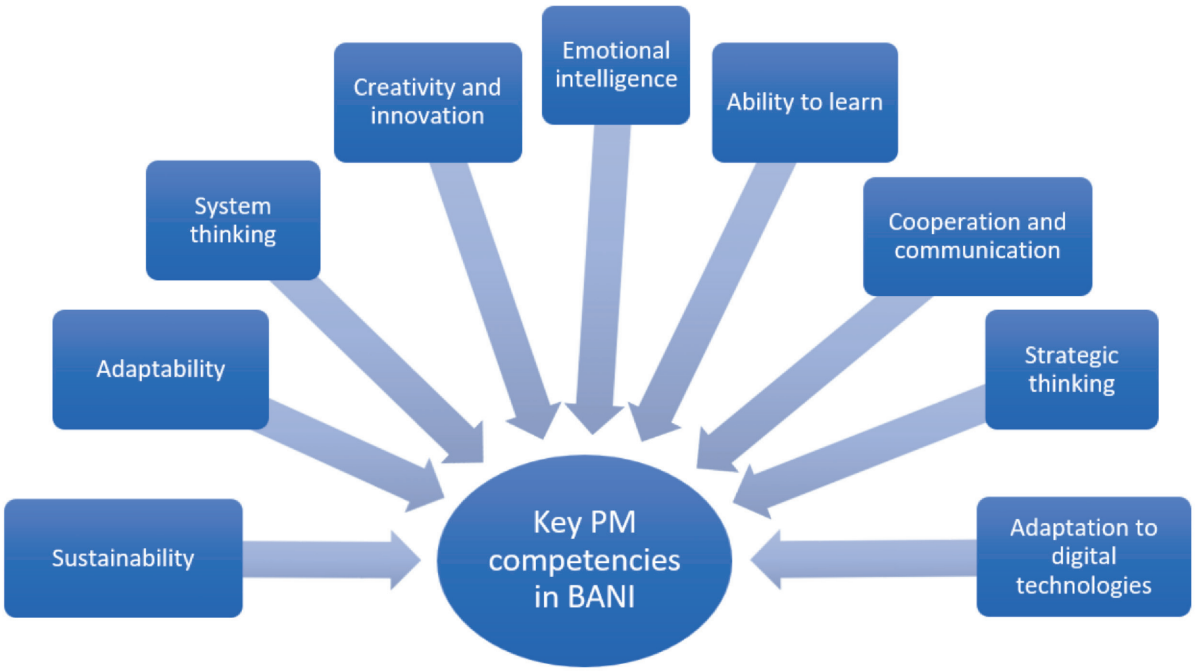

Figure 1. Key project management competencies in BANI environment

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These competencies provide individuals with the skills and abilities necessary to overcome the complexities, uncertainties and challenges of the BANI environment. The development and development of these competencies can enable individuals and teams to thrive and innovate in the face of changing circumstances [5, 6, 7].

Modelling a BANI environment involves creating a virtual or hypothetical scenario that exhibits the characteristics of Fragility, Anxiety, Non-Linearity, and Incomprehensibility. While the BANI model is primarily a conceptual framework, you can use various techniques to mimic or create an environment that reflects its attributes [8]. Here are a few steps you may want to consider:

1. Define the context. Define the specific context or domain in which you want to mimic the BANI environment. This may be due to a business, social or technological scenario.

2. Determine the characteristics. Understand the key characteristics of the BANI environment - fragility, restlessness, non-linearity and incomprehensibility - and determine how they manifest themselves in the context of your choice. For example, identify sources of fragility, uncertainty, complexity, and lack of clarity.

3. Development scenarios. Develop scenarios or situations that embody the characteristics of BANI. Create a range of problems, failures, uncertainties, and complex interactions that participants will encounter in the simulated environment. Consider using tools such as scenario planning or simulation to develop these scenarios.

4. Create realistic simulations. Create or simulate an environment using appropriate tools and technologies. This may include creating computer simulations, virtual reality (VR) environments, or even tabletop exercises. Ensure that the simulated environment accurately reflects the characteristics and challenges of the BANI model.

5. Enable dynamic elements. Introduce elements of variability, uncertainty, complexity and ambiguity into the modelling. Ensure that the environment is not static but dynamically evolves, introducing unexpected changes and interactions.

6. Involve participants. Involve participants or stakeholders who become familiar with the BANI environment. These may be individuals or teams that will overcome the simulated challenges. Clearly state the goals, rules, and guidelines for modelling.

7. Promote learning and adaptation. During the simulation, encourage participants to analyze, adapt, and respond to the challenges they face. Facilitate discussions, debriefings and reflections to promote learning in the BANI environment and identify strategies for resilience and adaptation.

8. Iterative improvement. Continuously refine and improve the simulation based on participant feedback and lessons learned. Modify and introduce new tasks to keep the BANI environment dynamic and attractive.

Modelling a BANI environment is a creative and dynamic process that requires careful design and facilitation. It aims to provide participants with an experiential understanding of the complexities and uncertainties present in certain situations, allowing them to develop adaptive skills and strategies [6, 7].

4. The formal model of interaction between projects and BANI environment

Consider the formal model of the BANI environment and its interaction with the implementation and success of innovative projects based on the value approach.

Let us define one of the projects carried out in the process of digitalization of the university. The task of the mathematical model is to evaluate the value delivered by the project in a BANI environment.

Let the environment model be determined by set E.

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$$E=<E_1, E_2, E_3, E_4>. \quad (1)$$

Let us introduce the notation:

$k=\overline{1,K}$ – serial number of the element of the environment (projection of the tuple E) associated with the project, K=4 – the total number of elements under consideration;

$\beta^k, k=\overline{1,K}$ – priority of the *k-th* element at the considered level,

$\sum_{k=1}^{K} \beta_k = 1$;

$S_i^k, k=\overline{1,K}, i=\overline{1,n_k}$ – criterion assessment of the *i-th* goal of the *k-th* projection, n_K – the total number of goals of the considered element of the environment that affect the project;

$\alpha_i^k, k=\overline{1,K}, i=\overline{1,n_k}$ – priority of the goal of the projection under consideration

$$\sum_{i=1}^{n_k} \alpha_i^k = 1, k=\overline{1,K}; \quad (2)$$

$S_{ij}^k, k=\overline{1,K}, i=\overline{1,n_k}, j=\overline{1,m}$ – characteristics of the results of the implementation of the *j-th* project from the position of the *i-th* goal of the *k-th* projection, that is S_{ij}^k, the assessment is comparable to S_i^k, respectively, has the same dimension

$R_i^k, k=\overline{1,K}, i=\overline{1,n_k}$ – budget of the *i-th* goal of the *k-th* projection;

$T_i^k, k=\overline{1,K}, i=\overline{1,n_k}$ – the term for achieving the *i-th* goal of the *k-th* projection.

As an assessment of the value of projects $0 \le V_a^j \le 1, j=\overline{1,m}$ for the condition of multidimensionality, the following is proposed:

$$V_a^j = 1 - \sum_{k=1}^{K} \beta^k \left[\sum_{i=1}^{n_k} \alpha_i^k \frac{(S_{ij}^k - S_i^k)^2}{(S_i^k)^2} \cdot \frac{T^j}{T_i^k} \cdot \frac{R^j}{R_i^k} \right] \quad (3)$$

This value is integral, as it takes into account all related projections and goals. Following (3), the assessment of the degree of achievement of goals for each projection, taking into account the priority of both projections and goals, is "adjusted" in time and budget based on the reasoning that was outlined above. According to the approach adopted above, projects are considered for which the conditions for budget and time are met:

$$R^j \le R_i^k, k=\overline{1,K}, i=\overline{1,n_k}, T^j \le T_i^k, k=\overline{1,K}, i=\overline{1,n_k}, \quad (4)$$

Note that the components (3) have an independent value:

$$V_k^j = 1 - \beta^k \left[\sum_{i=1}^{n_k} \alpha_i^k \frac{(S_{ij}^k - S_i^k)^2}{(S_i^k)^2} \cdot \frac{T^j}{T_i^k} \cdot \frac{R^j}{R_i^k} \right], k=\overline{1,K} \quad (5)$$

– the value of the project for the *k-th* projection;

$$V_{ik}^j = 1 - \alpha_i^k \frac{(S_{ij}^k - S_i^k)^2}{(S_i^k)^2} \cdot \frac{T^j}{T_i^k} \cdot \frac{R^j}{R_i^k}, k=\overline{1,K}, i=\overline{1,n_k} \quad (6)$$

– the value of the project from the position of the *i-th* goal of the *k-th* projection.

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This allows a more detailed study of the value of the project from various points of view - from a single goal to an aggregate assessment of the value as a whole, taking into account the influence of the BANI environment.

5. Management of innovative projects in the BANI environment

Management of innovative projects in the BANI environment requires a flexible and adaptive approach [9]. Here are some key principles (fig. 2) considerations for effectively managing innovation projects in such a complex and uncertain environment:

1. Flexibility. Recognize that the BANI environment is dynamic and requires flexibility. Implement iterative and incremental methods such as Agile or Lean Startup to encourage agility, experimentation, and rapid learning. Break the project down into smaller, manageable tasks and constantly re-evaluate and adjust the direction of the project based on feedback and new ideas.

2. Culture of innovation. Develop a culture that values and encourages innovation, adaptability and sustainability. To promote open communication, cooperation and psychological safety in the project team. Encourage different perspectives, creativity and the exchange of ideas. Create an environment where people feel capable of taking calculated risks and learning from mistakes [10, 11].

3. Human-centered design. In BANI environments, it is important to understand the needs, behaviours and motivations of end users or customers. Use human-centred design principles to deeply empathize with users and gain insight into their changing preferences and expectations. Continually interact with users throughout the project to collect feedback and propose solutions.

4. Scenario planning and risk management. Given the instability and uncertainty of the BANI environment, scenario planning is critical. Anticipate various possible scenarios and develop contingency plans. Identify risks and develop strategies to mitigate or respond to them. Monitor the external environment regularly and be prepared to adjust project plans based on new trends or disruptive events.

5. Cross-functional collaboration. BANI environments are often associated with complex and interrelated tasks. Encourage cross-functional collaboration within the project team and between different departments or stakeholders. Encourage different experiences and perspectives to solve complex problems from different angles. Facilitate effective communication and knowledge sharing to ensure alignment and common understanding of project objectives.

6. Rapid prototyping and testing. In a BANI environment, it is important to quickly test assumptions and collect feedback. Use a rapid prototyping approach to develop minimum viable products (MVPs) or prototypes that can be tested with users or stakeholders. Iterate based on feedback and insights, refining solutions and reducing uncertainty as the project progresses.

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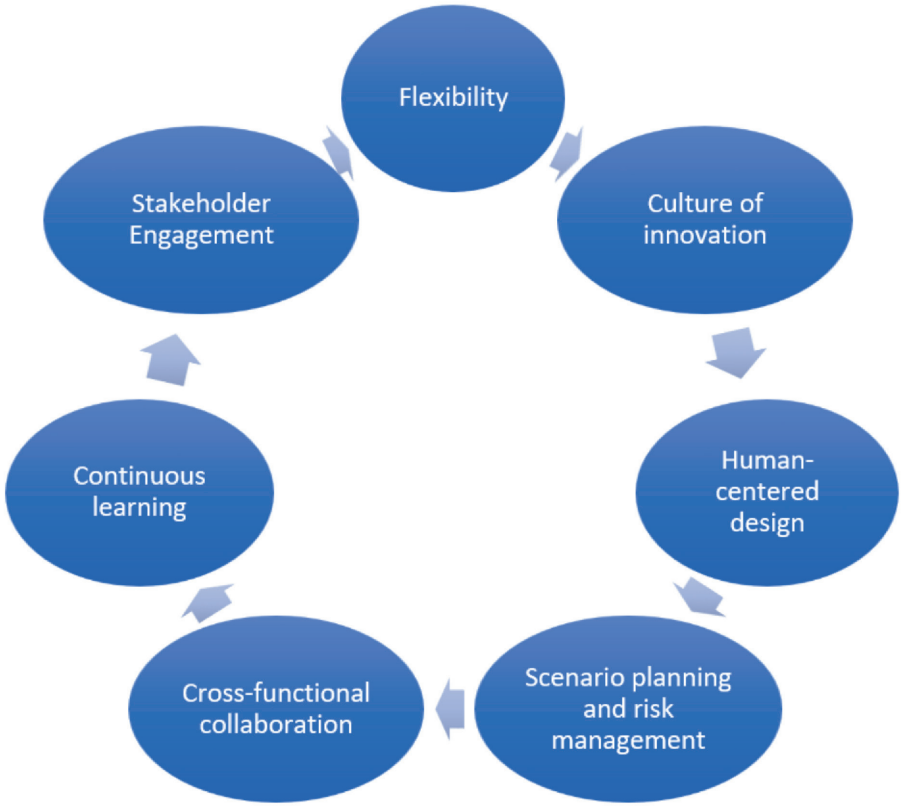

Figure 2. Key management of innovative projects principles in the BANI environment

7. Continuous learning and adaptation. Encourage learning in the project team. Reflect regularly on the progress of the project, its results and lessons learned. Foster a culture of continuous improvement by capturing and sharing knowledge gained from the project. Adapt project plans and strategies to reflect new information and changing circumstances.

8. Stakeholder Engagement and Communication. Engage and communicate with stakeholders throughout the project life cycle. Inform stakeholders about project progress, issues, and potential impact on their interests. Actively seek their input and participation to ensure that their needs are met and to benefit from their expertise and support.

Managing innovation projects in a BANI environment requires a flexible and iterative approach. Accept uncertainty, adapt to change, and seize the opportunities presented by the complexity of the environment. By encouraging a culture of innovation, flexibility, and collaboration, you can increase the likelihood of success in these challenging environments.

6. Leveraging Agile in a BANI Environment

Leveraging Agile in a BANI environment is critical to effectively managing projects and navigating complex and uncertain situations. Here are some specific strategies for achieving flexibility:

1. Iterative and incremental approach. Break the project down into smaller, manageable tasks or iterations. Instead of trying to plan and complete the entire project ahead of time, focus on incremental efficiency gains. Each iteration allows for feedback, learning, and course correction based on new ideas and changing circumstances.

2. Adaptive planning. Recognize that plans may need tweaking as the project progresses. Use adaptive planning methodologies such as Agile or Lean that emphasize flexibility and

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responsiveness. Constantly re-evaluate and adjust the project plan based on feedback, new requirements, and market dynamics. Be open to changing timing, scope, or priorities as needed.

3. Cross-functional teams. Create cross-functional project teams made up of people with different skills and experiences. This diversity provides a broader perspective, better problem-solving, and more effective collaboration. Encourage close collaboration and open communication among team members, promoting a shared understanding of the project's goals and facilitating collective decision-making.

4. Rapid prototyping and verification. Use rapid prototyping to rapidly develop and test ideas or solutions. Create minimum viable products (MVP) or prototypes that can be shared and tested with stakeholders, end users or customers. Gather feedback in a timely and frequent manner to identify improvements, test assumptions, and make informed decisions about the direction of the project.

5. Continuous learning and improvement. Nurture a culture of continuous learning and improvement within the project team. Encourage regular retrospectives or lesson-learning sessions to reflect on the progress of the project and its results. Gather ideas, identify areas for improvement, and implement changes in subsequent iterations. Encourage experimentation and learn from failure to spur innovation and improve project outcomes.

6. Accept the changes. The BANI environment is characterized by volatility and uncertainty. Instead of resisting change, embrace it as an opportunity. Encourage team members to be adaptable, open-minded, and open to ambiguity. Create an environment where change is seen as a natural part of the project journey and where adjustments can be made quickly to respond to emerging issues or opportunities.

7. Transparent communication. Effective and transparent communication is essential in a BANI environment. Ensure open and consistent communication between team members and stakeholders. Develop a culture of trust and safety by allowing team members to voice concerns, share ideas, and provide feedback without fear of judgment. Maintain regular communication channels to keep everyone informed and aligned.

8. Empowered decision-making. Empower team members to make decisions within their area of expertise. Encourage autonomy, ownership and responsibility. Provide a framework for common goals, guiding principles and objectives for decision-making. Allow team members to take calculated risks, innovate and find creative solutions to problems that arise in the BANI environment.

By applying Agile in a BANI environment, you can effectively respond to change, learn from feedback, and adapt your approach to optimize project outcomes. Flexibility allows you to deal with the complexities and uncertainties present in such environments, allowing you to create value in an iterative and agile manner.

Project management in a BANI environment refers to the application of the principles and methods of managing projects in an environment characterized by volatility, uncertainty, complexity and ambiguity (BANI). The acronym BANI represents the challenges organizations face due to rapidly changing markets, disruptive technologies, unpredictable events and changing customer needs. To effectively manage projects in a BANI environment, project managers need to adopt agile and adaptive approaches that enable flexibility, rapid decision-making, and continuous learning. Here are some key considerations for managing projects in a BANI environment:

Agile Methodologies. Use agile project management methodologies such as Scrum or Kanban. These methodologies encourage iterative and incremental development, allowing design teams to quickly respond to changing requirements and take into account feedback.

1. Dynamic planning. Traditional project planning may not be suitable for a BANI environment. Instead, focus on dynamic planning, which allows you to adjust and correct course

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as new information becomes available. Use techniques such as rolling wave planning and frequent reassessment of project goals and priorities.

2. Continuous communication. Establish open communication channels within the project team and stakeholders. Encourage frequent interactions, feedback loops, and collaborations to keep everyone connected and aware of changing circumstances.
3. Management of risks. In a BANI environment, risks can arise unexpectedly. Implement a robust risk management process to proactively identify, assess, and mitigate risks. Review risk assessments regularly and update mitigation strategies as needed.
4. Iterative and phased product delivery. Break the project scope into smaller, manageable chunks and add value incrementally. This approach allows you to realize benefits early and helps you adapt to changing requirements or market conditions.
5. Changes during the implementation of projects. Recognize that change is inevitable in the BANI environment. Create a culture that supports change and encourages innovation. Encourage team members to be adaptable, learn from mistakes, and look for opportunities to improve.
6. Stakeholder Engagement. Engage stakeholders throughout the life cycle of the project. Seek their feedback, involve them in decision-making processes, and keep them informed about project progress and changes. Actively manage stakeholder expectations and resolve issues quickly.
7. Continuous learning. Shape the mindset of the project team. Encourage knowledge sharing, encourage cross-functional collaboration, and create opportunities for ongoing skill development. Highlight lessons learned and incorporate them into future projects.
8. Robust change management. Implement a robust change management process to handle changes efficiently. Assess the impact of changes, clearly communicate them, and provide appropriate support to affected individuals or teams.
9. Agile tools and technologies. Use project management tools and technologies that support agile practices. Use collaboration platforms, task management tools, and vision boards to improve communication, transparency, and team coordination.

By applying these strategies, project managers can cope with the challenges of the BANI environment and increase the chances of project success in the face of volatility, uncertainty, complexity, and ambiguity.

Conclusion

The innovative development of educational systems is becoming increasingly important in a BANI environment where variability, uncertainty, unpredictability and disruption play a key role. Educational institutions must adapt flexibly to the changing demands and needs of students, teachers and society as a whole. The introduction of innovations in educational systems should be based on an understanding of new technologies and teaching methods. Technological innovations, such as the use of artificial intelligence, augmented reality and adaptive platforms, can significantly improve the learning process and expand access to knowledge. Educational institutions must create an innovative culture that encourages creativity, experimentation and collaboration. It is important to create an environment where teachers and students can explore new ideas, share knowledge and contribute to the development of educational practices. A key element in the innovative development of educational systems is the transition from passive to active learning. Teachers should become knowledge facilitators, encouraging students to explore on their own, critical thinking and problem-solving. Collaboration and partnerships between educational institutions, industry, government agencies and other stakeholders are essential for the innovative development of education. The exchange of experience, resources and expertise makes it possible to create a strong ecosystem capable

of effectively responding to the challenges and opportunities of the BANI environment. The innovative development of educational systems should be aimed at developing complex skills such as critical thinking, communication, collaboration, creative thinking and adaptability. Students must be prepared for a rapidly changing world and be able to apply their knowledge and skills in a variety of situations. The innovative development of educational systems in a BANI environment requires progressive thinking, flexibility and openness to new ideas and approaches. It enables educational institutions to successfully adapt to the changing demands of society and provide students with the quality education they need to successfully adapt in the future.

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