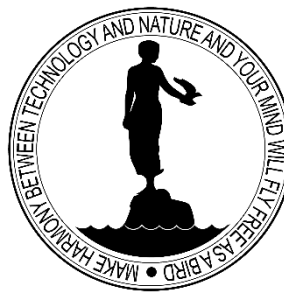


ORGANISATIONAL RESILIENCE AND INTEGRATION OF AI INTO BUSINESS SYSTEMS: APPROACHES TO ADAPTATION AND INNOVATION

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Abstract: *Business systems operate on a fundamental principle where inputs are processed through defined transformations to produce output, meeting predefined goals. Optimal efficiency hinges on the system's ability to proactively identify and neutralize disruptions that threaten its balance and functionality that often arise from unforeseen external factors or inadequate adjustments to changing conditions. The study of business systems highlights the need for innovative frameworks and strategic indicators to enhance long-term effectiveness. Moreover, technological advancements, notably in Artificial Intelligence (AI), challenge existing boundaries and urge a reevaluation of human involvement in these transformations to ensure a harmonious balance between human control and technological autonomy. This dynamic relationship is critical for fostering innovation and adaptation to future challenges in business and society.*

Key words: *business systems, adaptation, innovation, artificial intelligence*



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1. Introduction

Modern business systems are characterised by constant instability, rapid change and diverse content and elements that make them up. An environment marked by uncertainty and frequent change has made the process of adaptation an unavoidable necessity, thus creating a basis for survival and sustainability of these systems. Balance between stability and adaptability makes room for in-depth research into the components shaping their processes which can often be identified with the functioning of living organisms.

One of the main challenges for modern business systems in unstable and constantly changing environments is finding ways to shape organisational structures in such a way that they are sufficiently adaptable to respond rapidly and efficiently to various external influences and market changes. Through the complexity of the environment, we discern a number of factors that affect the operation of the business system, making it more or less complex (Boskovic & Vukcevic, 2005). Such structures are critical to enabling long-term stability and sustainable development, thus laying a solid foundation for setting strategic directions in business. In order to achieve their set goals, business systems are increasingly turning to internal transformation which involves a more flexible adaptation of the processes in place and a better coordination of all segments of the lifecycle of elements making up the system.

Considering such demands, it is evident that traditional, rigid organisational structures can no longer meet the needs of modern business. Instead, much more importance is placed on innovative, organic and adaptable organisational structures, especially devised to foster interaction and communication and further connect different functions within the system and enable maximum efficiency and dynamic functioning of all its elements (Covic & Planinic, 2025). Such approach not only ensures a more effective change management but creates a basis for balancing the internal environment and a steady and continued progress in an ever-complex business environment.

The patterns of change that one may notice in the natural world are often mirrored also within us because as individuals we represent complex biological, social and spiritual beings. From the first steps of mankind, prehistoric discoveries of tools and natural phenomena all the way to modern achievements in medicine, space exploration, communication technology and artificial intelligence, each evolutionary progress has carried an aspiration towards achieving balance between a palpable, material reality and a more subtle, spiritual dimension of life. When looking at a historical sequence of events, one may notice that the very act of a man appearing on the stage of evolution marked a significant revolution. It is then that the attention slowly turned from the solely material aspect towards a more profound and comprehensive understanding of biological, emotional and spiritual elements that shape life (Covic & Planinic, 2025). This breakthrough was not only a passing phenomenon but rather a foundation which continuously defines the development of humankind, making it possible for us to seek meaning and balance in everything we create. Looking ahead, discussions on the development of economic, social and technological systems will no doubt continue to explore the possibility of harmonising different dimensions of human action.

The focus of these discussions will go beyond efficiency and innovation towards finding ways for biological, social and spiritual elements to coexist in harmony with one another all the while creating benefits for the business system as well as for an individual and a broader social and business community. A business system that "in the era of innovation is unable to innovate is doomed to failure and disappearance" (Drucker, 2014). This mutual synergy might be the key to overcoming challenges of the modern age of business systems and creating a sustainable future in which the artificial intelligence, nature and mankind will support and elevate one another.

2. Framework of challenges of today's business systems

Every business system, regardless of its complexity or specific purpose, is based on an elementary principle according to which inputs must pass through carefully structured and defined transformation processes. The result of these processes is a generated output which is supposed to match the set goals and predefined success criteria. The key to ensuring optimal efficiency and quality of end results lies in the ability of a system to identify and successfully neutralise potential disruptions in a timely manner so that they may not compromise the system's dynamic balance and undermine its functioning, ultimately leading to deviation from the planned outcome (Covic & Planinic, 2020). Moreover, it is critical that the outputs remain consistent with the initial set of goals and standards to maintain the purpose of the system and fulfil its ultimate task.

Deviations from the intended outcomes mainly come from unforeseen external factors or insufficient system adjustment to changing environment conditions. Whichever formulation may be used when considering the concept of a business system, it remains undoubtedly a unique and complex phenomenon which cannot be reduced to a simple definition. Under the influence of a human factor, business systems are constantly going through a process of improvement and adaptation, where development takes place on different levels including the organisational, legal, financial, economic, technological and scientific as well as within the many other forms of innovation processes (Hofstede, 2010). This phenomenon of business systems is present in all aspects of human existence, comprising biological, social and spiritual dimensions, which places further emphasis on its complexity and significance. Because a building and equipment without people are worth nothing (Drljaca, 2002).

Proper development and functionality of business system cannot be conceived without a constant interaction and active contribution of man in every phase of its lifecycle. From the very first phases, man acts as a source of initial inputs of the system, takes part in every segment of a business process and his influence remains critical to the point where the end result of the system returns to him as a final user and to the very purpose of that system (Covic, 2019). In that way, the human component not only enters every phase of business activity, but it undeniably becomes the central factor around which the system forms and develops.

In the process of studying business systems, we focused special attention to their critical elements, emphasising the need for establishing modern and innovative frameworks and strategic indicators with a potential to contribute significantly to the long-term balance and efficient functionality of such systems.

Such approach becomes vital in addressing different challenges brought about by today's dynamic, complex and often unpredictable business environment (Covic & Planinic, 2025). The methodology of approach relies on a timely identification of problems and potential crisis situations with an emphasis on an in-depth analysis of sources and causes of their occurring on the fundamental levels of business processes. This mode of action enables not only a quicker detection of potential problems but also their timely elimination or adjustment, thus ensuring stability and functional flexibility of the system in early phases of its development.

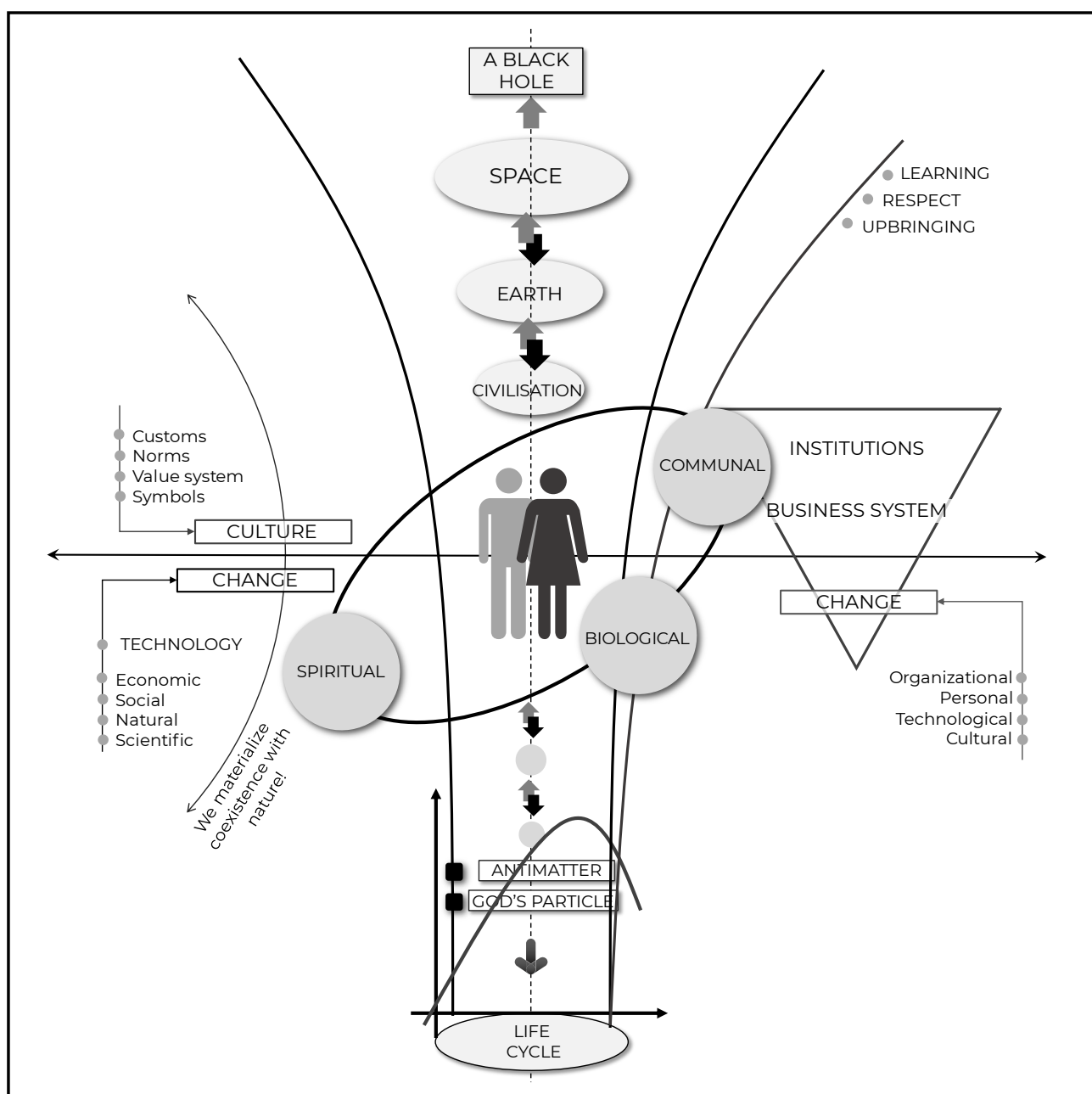


Fig. 1. Business system in hierarchical alignment of system and environment

However, despite the systematic approach and comprehensive analyses, we are still far from a thorough understanding of all the complex natural laws governing the functioning of business processes and their mutual interactions.

Instead, we are currently able to somewhat indicate the complexity, dynamics and turbulence of those processes which motivates us to further enhance analytical methods and tools. One of the crucial approaches to preparing business systems for future challenges lies in devising new internal structures and mutually connected elements which enable the integration of different elements of business operation.

It is through the recognition of those differences and their harmonious connection that a system is created, capable of survival and progress in inevitably complex and rapidly changing circumstances. Such approach contributes to creating foundations for sustainable business development and resilience to adverse external influences. Successful coordination between different levels of a system requires each subsystem to not only function within the default parameters but to actively contribute to synergistic effect of the system as a unique entity, as shown in figure 1. Regarding the complexity of relationship between the system and its subsystems, understanding of these interactions becomes a critical point for evaluation of their stability and efficiency.

In today's business landscape, the process of change management emerges as a critical element not only for the advancement but also for the survival of business systems. Although the implementation of changes has become increasingly fraught with risk and uncertainty, research (Miller, 2004) (Beer & Nohria, 2000) (Balogun & Hailey, 2004) reveals that nearly 70 percent of change initiatives fail to achieve success. Nonetheless, business systems confronted with such paradoxical dynamics have no alternative; to ensure survival and sustain a competitive advantage, they must persistently adapt their processes and strategies.

Various internal and external factors constantly affect the balance of a system, and such disturbances rarely remain isolated, as each subsystem is seldom independent or separated from the whole. Consequently, the effects of disturbance that occur within a subsystem will often reflect its significance in the system hierarchy. With technological devices, machines or organisations, every part within that set has a clearly defined purpose which is harmoniously integrated into the goals of a higher entity. Each subsystem within a broader structure plays a key role in the overall functioning of the system where actions of the subsystem affect not only its own performance but significantly shapes the level of connection and synergy within the entire system (Covic & Planinic, 2025). Such complex interdependence occurs through the exchange of different resources, from gathering and processing of inputs through transformational processes to the implementation of pre-defined goals.

3. Complexity of interactions between business systems and man throughout lifecycle

Everything around us has its natural lifecycle, which is characterised by a beginning, duration and eventually an end, whether it is about us as humans, the technology that surrounds us, about products we use or business systems we rely upon.

At the centre of every lifecycle there is a complex web of experiences, events and processes which are gradually formed over time.

It is those elements that create harmony and balance with the environment in which we exist and operate, enabling us to develop our own way of life and adapt to emerging challenges. On the other hand, a key element of these systems, as noted earlier, is a human factor which seeks to improvise and create balance within different system flows through biological, social and spiritual dimensions. In different periods of life, when viewed through the lifecycle curve, as shown in figure 2., the foundations of our existence, which are primarily biological, gradually evolve leading to significant changes in their longevity, quality and internal content.

Human lifecycle is progressively extended as we battle biological challenges in a more efficient manner, owing to the continued scientific progress but also to advantages of modern society. Individual limitations are fewer while the perception of differences and divisions are increasingly blurred thus creating gradual balance within the social context.

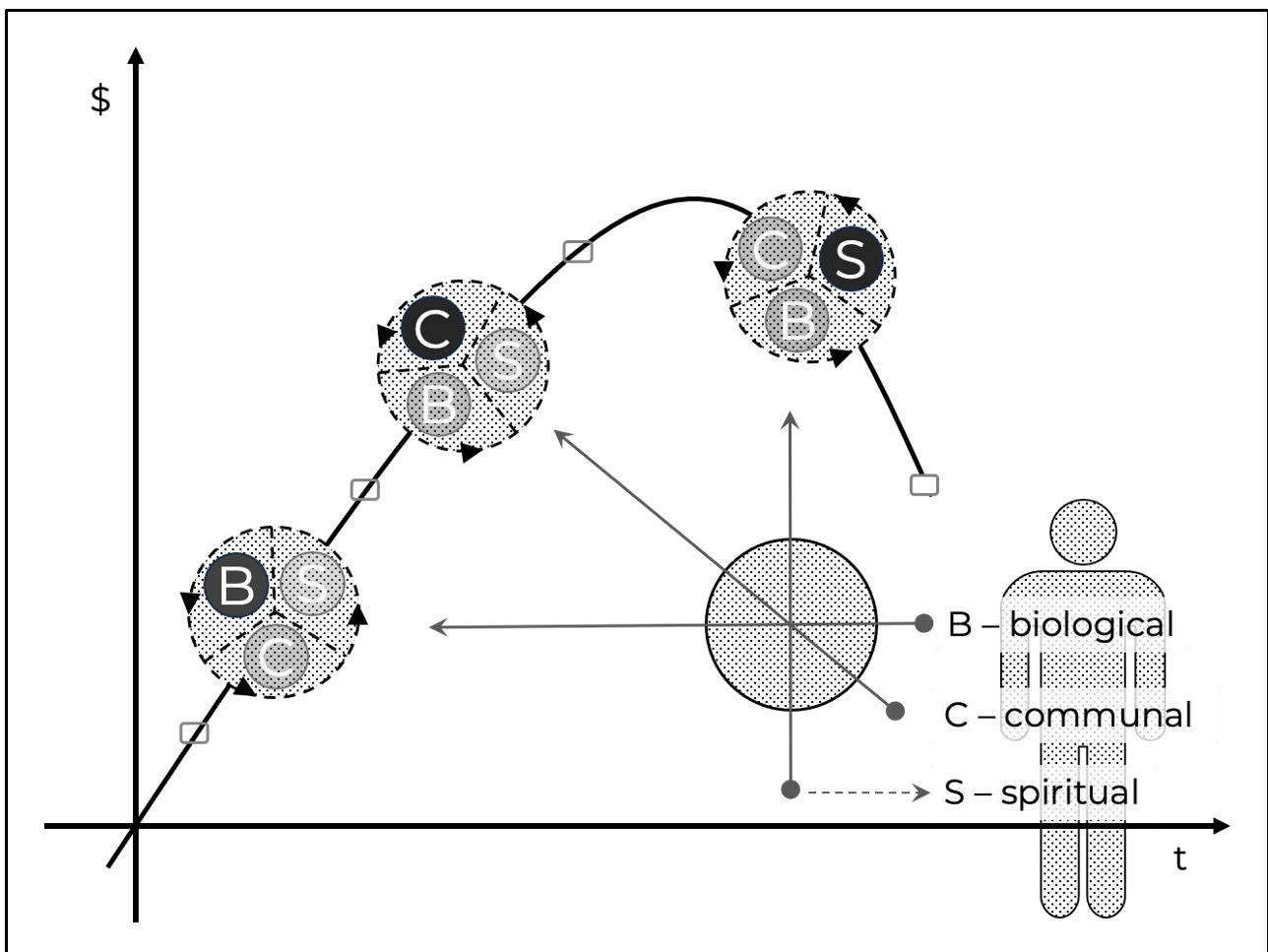


Fig. 2. The life cycle of human development features

Technological changes that happen in our environment strongly portray the dynamic way in which they affect our values, priorities and lifestyles, both on the biological and social level.

At the same time, they indirectly shape the spiritual dimension of our being which remains insufficiently explored even though it is usually perceived as a key component of human identity.

However, today's circumstances for understanding and accepting spirituality differ from those of the past, leading to different assessment of its significance and role in everyday life. As we approach advancing age, the spiritual aspect becomes more complex and susceptible to change. Our spirit is greatly impacted by our immediate surrounding, social relations and the cultural pattern to which we belong (Covic & Planinic, 2023). Finally, spirituality becomes a bridge that connects our internal perceptions with the outside world, pointing to where and how the biological and social blend with the deepest layers of human existence.

If we look at the lifecycle as a professional lifecycle, it begins in early stages when a person enters their first workplace and extends all the way to retirement and the final stages of the working life. During each of those stages, complex interactions take place between processes of change within the business system and personal reaction to those processes. This entails gradual building of the sense of belonging to an organisation, adopting common values that it promotes and adapting to specific cultural norms which are present in the organisation.

However, the way individuals react to changes within the organisation are usually conditioned by the stage in their professional careers (Schein, 2010). For instance, individuals who are in early stages of their careers are usually motivated to learn and are willing to adopt new knowledge through intensive phases of adjustment, aiming to fit in with the new environment and achieve professional progress. On the other hand, long-time employees, whose patterns of behaviour are deeply rooted in and related to the existing internal practices, often display a higher resistance to change that can disrupt established processes or jeopardise their sense of security and predictability.

4. From resistance to resilience through change

Resistance to change naturally comes from the fact that it encroaches on our safety zone and forces us to re-examine present beliefs or working principles. Resistance to change, which has roots in the organization or business environment, essentially reflects the hesitation that arises as a reaction or response to change, and is an attempt to maintain the existing state of the organization (Forgeson et al., 2001). At the same time, as humans we seek a sense of control over our own participation in the processes that have a direct impact on us. It is therefore not only important to understand this resistance to changes but to use it as a potential basis for building active resilience and openness to progress, as shown on figure 3.

There remains the crucial question: how to recognise signals and patterns which indicate change and how to transform the instinctive resistance to that change into resilience that enables adjustment and progress?

In such a manner, the concept of a lifecycle gets a more realistic structure and dynamic form, thus reflecting the natural rhythm of ups and downs as integral parts of every evolutionary process.

Seeing that the change represents a continued and inevitable part of our personal and professional life, it often brings about a certain dose of tension and insecurity. It is therefore necessary to constantly analyse and understand the lifecycle of change so that we may integrate the human element into it, which is crucial to shaping the business system.

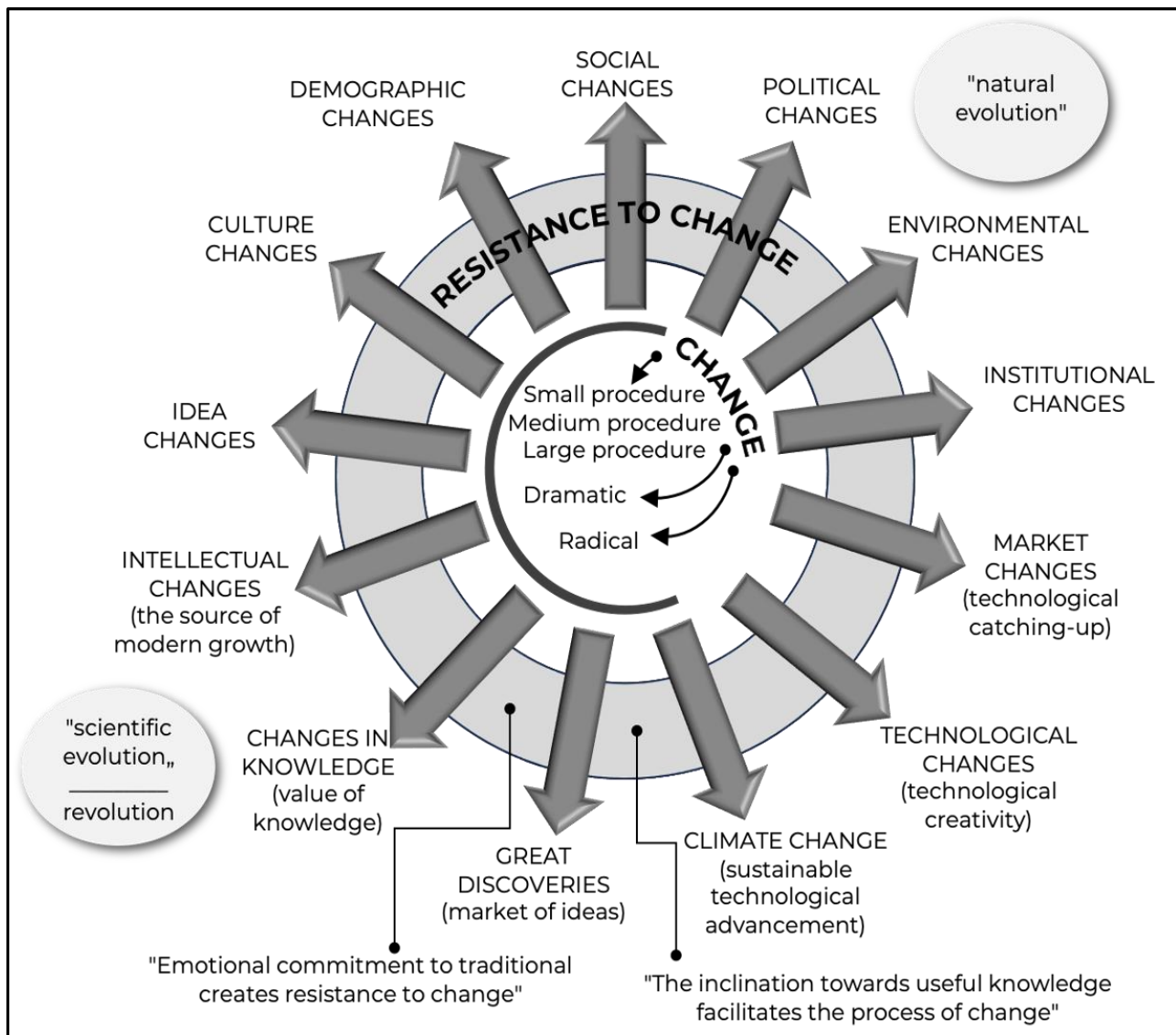


Fig. 3. Building resilience to change

Changes of the environment that have become an inevitable part of our reality require constant adjustments of business systems. However, the continuity of such adjustment often calls for the necessity of removing or redesigning those parts of the organisation which cannot respond to new challenges. It is for this reason that technological changes foster networking and connecting that exceed the former boundaries of business thinking.

At the heart of this complex process are the three critical elements which, when intertwined, shape the dynamics of development and change. First such element is information as a basic core of every transformation.

It has a power to combine different patterns of behaviour, identifying weaknesses and potential opportunities, making it an indispensable tool in modern day decision-making. The second element is time, a valuable and unstoppable resource which remains irreversibly limited despite its continued presence. Time provides unique and passing moments for decisions to be formed that may have far-reaching consequences. The third element, and perhaps the most important one, is man who is constantly changing conditions on the global scale owing to his prolonged lifecycle (Covic & Planinic, 2025).

The man observes and analyses risks, addresses challenges and gradually shapes different processes but, despite the progress, he frequently repeats the same mistakes, driven by own restraints and imperfections, notwithstanding all the technological innovations and social change that have marked the history.

Technology is continuously reshaping the way the world functions and in doing so is entirely changing the rules of the game. It is no longer just a simple tool in carrying out everyday tasks but is actively organising our day-to-day life, affecting our decisions, re-establishing our values and changing our perception of the world (Mokyr, 2017). The dynamic and fast-paced development of technological innovations affect all aspects of human activity, leaving a deep mark on the global policy, complex societies, natural ecosystems and a rising number of economic and financial systems. This continuous progress involves both opportunities and challenges and with it come turbulent situations which demand immediate reaction to control or mitigate related risks. Technology also determines the pace of change in different areas and increases the intensity and scope of change thereby producing a chain reaction in almost all the segments of the global system (Leithy, 2017).

The development of computers in the second half of the twentieth century is one of the major chapters in the history of human civilisation, yielding impressive technical innovations and opening doors to a whole new period of social, economic and intellectual development. This milestone clearly marks the moment when information systems and advancing technologies become basic tools for individuals and entire societies across the world to address everyday activities, workflows and all forms of mutual interaction and communication. Modern age, usually referred to as the era of intensive technological dynamics and constant innovation, is characterised by the presence of global technological inventions such as the Internet - a ubiquitous network of knowledge and communication, smart phones - an extension of human capabilities, and social media – shaping our perception of the world and human relations.

The emergence and development of artificial intelligence gives a new dimension to the human impact on business systems, social structures and communities and the overall human communication.

This unique relationship between the man and technology lays the groundwork for future innovation, all the while steering the global society in the direction that we can only see the outlines of. Reflecting on the scale and possibilities that this technology can offer, we are made to re-examine whether we have enough capacity and wisdom to take active part in managing these processes and guiding their development to the desired future state while retaining necessary degree of control over them and their impact on our way of life and the generations to come (Covic & Planinic, 2025).

In other words, can we find a perfect balance between human control over technological processes and autonomous capacities of artificial intelligence to act independently and change the world in which we establish new values?

5. Artificial intelligence as a catalyst of change

The process of AI integration with other general technologies is taking place at an astonishing and terrifying speed, creating innovative structures and related systems yet unknown. This intensive rate of progress greatly exceeds the current human capacity for a complete understanding of all the implications as well as the ability to adjust to its creative impacts, making this a unique and revolutionary moment in the history of the mankind. This development occurs in layers, with each step building upon previous innovations, almost without interruption or delay. Simultaneously, the continuous momentum of this evolution brings with it complex challenges that go beyond our existing experiences and will need to be systematically explored and mastered in order for us to cope with them.

Reflecting on the substantial and complex role of AI in a modern society, one cannot ignore the fact that it has become a key driver of change that affects not only the way we perceive the world but also the way we make decisions, process vast amounts of information, and understand the dynamics of social and business processes. Artificial intelligence pervades almost all aspects of our lives, from our simple day-to-day activities to the most complex scientific research or business strategies. During its dynamic evolution, artificial intelligence has undergone several major and radical transformations.

Going from theoretical assumptions to practical applications, it has proved to be a driving force which shapes modern science, technology and peoples' lives. From the moment it was conceived in human imagination as a distant vision of future, it has travelled all the way to becoming a technology that is indispensable in all aspects of human activity, including education, health, finances, transport and art. This speedy technological progress has redefined the relationship between the man and the machine, leaving many questions unanswered, such as ethics, security and future direction, as shown in figure 4.

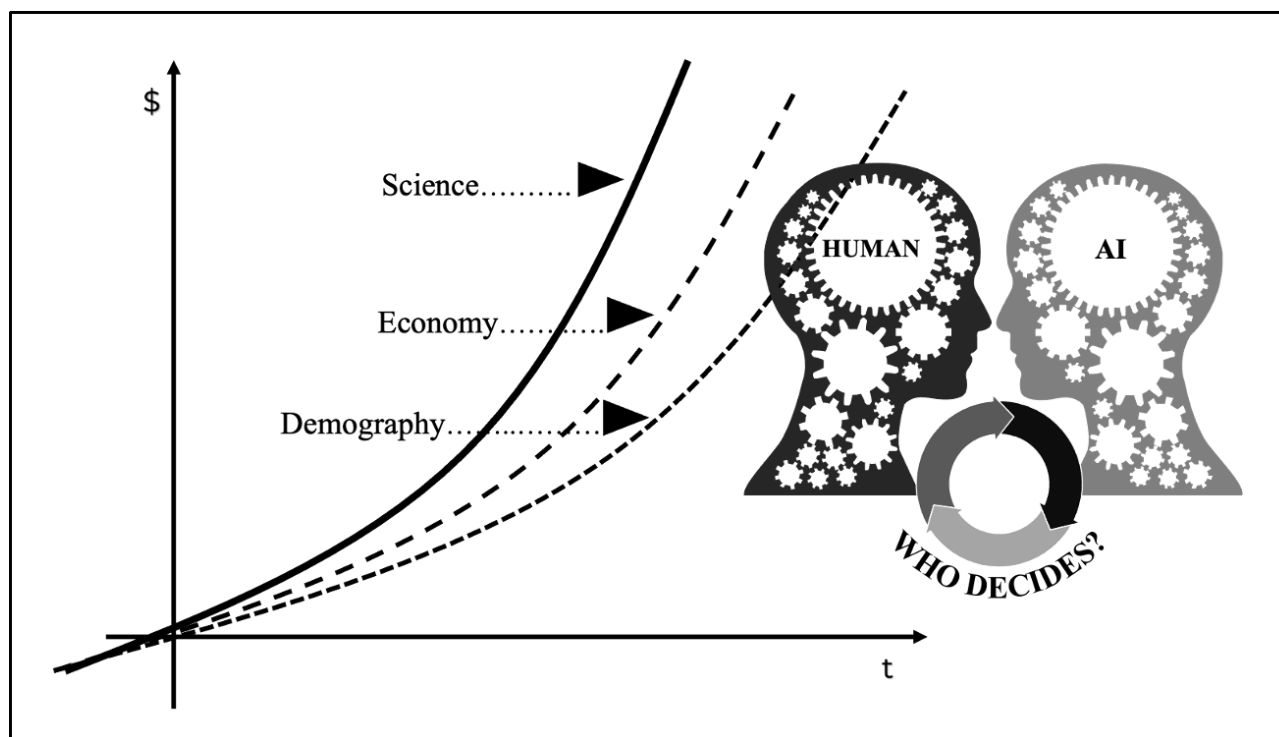


Fig. 4. The transformative role of artificial intelligence (AI) in the evolution of change

Artificial intelligence is at the same time a symbol of human innovation and an everlasting desire to overcome personal limitations through learning but also through constant designing of new technologies which exceed the usual role of a tool and become essential allies in finding new paths for success of business systems and reshaping our social and business future (Covic & Planinic, 2025). Despite the significant progress made, the full potential of artificial intelligence is yet to be unveiled. However, one thing is certain, and that is the artificial intelligence is not a mere technological mechanism, it is becoming a dynamic catalyst of change, actively redesigning and driving human vision of the future.

On the other hand, the main purpose of any business system may be viewed through its capacity to detect, identify and respond to the said change in a timely manner. In today's highly competitive and digitally oriented business environment, this fundamental principle has significantly evolved. Modern business models are focusing their attention and resources on an individual who is now at the heart of all strategic planning, decisions and operations (Covic & Planinic, 2020). A customer no longer represents a destination for our products and services but an active participant in defining a mission, vision and even an entire identity of a business system. Their desires, expectations and specific preferences are affecting how business systems develop their products, services and processes, making the customer an essential driver of innovation and growth, and ultimately of the long-term sustainability of the business system.

This paradigm shift has also changed the common market research methods. Traditional tools for data collection, such as a questionnaire or survey, have given way to sophisticated technological solutions that provide a more precise and comprehensive understanding of market needs.

Such technology-aided approach offers a deeper insight into habits and preferences of customers, enabling the business systems to quickly adjust to changing market circumstances. With the help of analytical tools based on artificial intelligence and machine learning, business systems of today are equipped to predict future trends, customise offers and build long-term trusted relations with customers. Such integrated customer understanding not only develops quality customer experience but lays the groundwork for sustainable growth that meets their needs.

Digital marketing is taking central stage in the modern business world. Based on advanced technologies and sophisticated AI tools, it offers new possibilities for establishing stronger and more efficient marketing connections. These innovations are slowly erasing traditional borders between classical operating models and extraordinary creative solutions, opening doors to new business paradigms. The said level of connection is becoming an essential part of organisational structure, integrating deeply into the management of resources, strategies and daily operations. This has a transformative effect on the way we perceive human relationships, shape customer experiences and define long-term vision of growth and development, leading business systems towards a future focused on innovation and constant adaptation to the changing markets.

We are constantly faced with numerous complex challenges, especially the demographics and climate changes as the main causes of modern-day social instabilities. These changes further increase the complexity of the problems we face through their actions. Their impact is intrinsically linked to the development and modification of global external factors, creating a strong mechanism that drives profound economic transformation (Covic & Planinic, 2025). These changes are inevitably affecting and pervading the very foundations of business structures, placing before them new demands, challenges and opportunities to adapt to the dynamic surrounding.

6. Conclusion

Readiness to change will eventually become a crucial and indispensable element of our business mission, tightly woven into the fundamental values that make up the essence of our organisational culture. At the same time, it will evolve into one of the most important strategic resources that we will use to achieve our goals and increase our competitive advantage. The very change that has now assumed the status of an all-important dynamic within business systems is more than just a tool for initiating processes. It is a part of every aspect of our business system, giving it a distinctive character and ability to adapt to changing circumstances. Still, for transformation to grow from an idea into practice and become a true guideline of our mission, it must assume central stage in all aspects of our personal development and professional engagement. In that way, change will not only impact our everyday life in a workplace but will reach a level of a broader cultural phenomenon. Its full integration will enable us to be an active participant in its creation and respond to future challenges.

Every change and transition within complex organisational systems lies on one of the most important and sensitive aspects of daily business, an effective and timely communication. When there is resistance to change in an organisation, very often because of employee dissatisfaction or insecurity, it is essential to take steps to engage the employees in the process of internal communication. This process must be carefully devised and structured to become an integral part of organisational culture and key business strategies. It is through engagement and open and two-way communication that solid foundations can be built to increase resilience to challenges imposed by change. Such an approach also contributes to better adaptation and advancement of business systems within dynamic, but often unpredictable environments of modern business. Artificial intelligence is positioning itself as a central element of a complex and dynamic network of mutual relations that define a modern business environment. Application of AI in the automation of repetitive, tedious and time-consuming tasks brings multiple benefits, mirrored in higher productivity and precision. However, notwithstanding these benefits, artificial intelligence does not only serve to replace human activity but to support and enhance human capacities, facilitating resource optimisation and a more effective response to complex challenges.

When artificial intelligence starts to assume the ability of autonomous decision-making, often outside human control and understanding, is when challenges and dilemmas start to materialise. This raises the questions of the boundaries of technological reliability and the extent to which the human factor can maintain its central role in managing the development and implementation of these systems. It is critical to find a balance that will enable artificial intelligence to remain a useful ally aimed at empowering the mankind through scientific and technological achievements and not a factor that will potentially jeopardise the security, ethics and control over human society. Deliberating these dimensions will drive future development of AI so that it may retain its status of a useful means and not a development that led to undesired outcomes, which can guide further research in this field.

In view of the above, we may agree that it is possible to transform the resistance to change, often perceived as a threat to our comfort zone or a reflection of our own insecurities, into the resilience to change. This realisation will be helpful in building our ability to view any change as an invaluable opportunity for personal and professional growth, upskilling and adaptation to dynamic circumstances around us.

7. References

- Balogun, J. & Hailey, V. H. (2004), Exploring strategic change, 2ND edition, Pearson Education Limited: Harlow
- Beer, M. & Nohria, N. (2000). Cracking the code of change, HBR's 10 must reads Chang., vol. 78, no. 3, pp. 133–141
- Boskovic, D. & Vukcevic, M. (2005). Suvremena organizacija i menadžment u globalizacijskim procesima, Pićan: Tiskara G.E.M.
- Covic, D., (2019). Lidership & human resources, University of Mostar, Mostar

- Covic, D., and Planinic, I., (2020). Organizational Culture Key Role In A Successful Change Management Process, DAAAM International Scientific Book, Vienna
- Covic, D., and Planinic, I., (2023). Culture Of Change In Public School Education In Bosnia And Herzegovina During The Ottoman Influence, Vidici, HAZU BiH, Mostar
- Covic, D., and Planinic, I., (2025). The culture of culture change, The Croatian Academy of Sciences and Arts in BiH, University of Mostar, Mostar
- Drljaca, M., (2002). Kultura kvalitete i organizacije, Hrvatska konf. o kvaliteti, Zagreb,
- Drucker, P., (2024). Innovation and entrepreneurship, Routledge, London
- Forgeson, S.; Mabin, V. J. & Green, L. (2001). Harnessing resistance: using the theory of constraints to assist change management, J. Eur. Ind. Train., vol. 25, no. 2/3/4, pp. 168–191, Leeds
- Hofstede, G., et al., (2010). Cultures and Organizations: Software of the Mind: Intercultural Cooperation and Its Importance for Survival, McGraw-Hill, New York
- Leithy, W. E., (2017). A review of the impact of national culture on economic growth, International Journal of Economics & Management Sciences, 6(4), Bruxelles
- Miller, D. (2004). Building sustainable change capability, Ind. Commer. Train., vol. 36, pp. 9–12, Leeds
- Mokyr, J. (2017). A culture of growth, Princeton University Press, New Jersey
- Schein, E. H. (2010). Organizational culture and leadership, J.Wiley & Sons, N. Jersey