Machine Translated by Google

RCMOS – Multidisciplinary Scientific Journal of Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Year V, v.1 2025. | submission: 02/09/2025 | accepted: 04/09/2025 | publication: 06/09/2025

Organizational Knowledge, Decision Making, and Unintended Effects: A Critical Analysis of Decision-Making Processes in High Uncertainty Environments

Organizational Knowledge, Decision-Making, and Unintended Effects: A Critical Analysis of Decision Processes in High-Uncertainty Environments

Author: Ramez Andraus Junior

Graduated in Public Administration and Military Pilot Training, from the Brazilian Air Force Academy (AFA)

Master's Degree in Business Administration with an emphasis on Human Resources and Strategic Planning, from Getúlio Vargas Foundation

Master's Degree in Personnel Systems Analysis from the Naval Postgraduate School

Summary:

This article investigates the unintended effects of strategic and operational decisions in highly complex institutional environments, focusing on military and public organizations. The analysis combines fundamentals of knowledge management, complex adaptive systems theory, and the logic of complexity to understand how seemingly rational decisions can trigger systemic failures, operational collapses, or negative externalities. The research builds on previous studies on organizational feedback, adaptive learning, and information governance, proposing a critical model that incorporates mechanisms for risk analysis and control of second-order effects. Using a qualitative theoretical and methodological approach, the study highlights the importance of reflective and cognitive practices in the decision-making process, especially in contexts of institutional instability, situational ambiguity, and pressure for immediate results. The objective is to propose guidelines for

prevent or mitigate unexpected consequences and promote greater organizational resilience.

Keywords:

Organizational decision; Tacit knowledge; Unintended effects; Complex environments; Armed forces; Adaptive learning; Information governance.

Abstract:

This article investigates the unintended effects arising from strategic and operational decisions in institutional environments characterized by high complexity, focusing on military and public organizations. The analysis integrates principles of knowledge management, complex adaptive systems theory, and the logic of complexity to understand how seemingly rational decisions can

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

trigger systemic failures, operational collapses, or negative externalities. The research builds upon prior studies on organizational feedback, adaptive learning, and information governance, proposing a critical model that incorporates risk analysis mechanisms and control of second-order effects. Through a theoretical and qualitative methodological approach, the study highlights the importance of reflective and cognitive practices in decision-making, especially in contexts of institutional instability, situational ambiguity, and pressure for immediate results. The goal is to propose guidelines to prevent or mitigate unexpected consequences and promote greater organizational resilience.

Keywords:

Organizational decision-making; Tacit knowledge; Unintended effects; Complex environments; Armed forces; Adaptive learning; Information governance.

1. Complexity, Uncertainty and the Decision-Making Challenge in Military Organizations

Decision-making in military and public settings is often shaped by high degrees of uncertainty and systemic complexity. Such organizations operate in unstable environments, where interdependent variables can change rapidly, compromising forecasts and planning. As Morin (2005) argues, the logic of complexity demands an understanding of the multiple interactions and feedback loops that make systems unpredictable, requiring non-linear and adaptive approaches. In the Armed Forces, for example, operational decisions must consider not only the human factor but also the political, logistical, technological, and geostrategic implications.

According to Weick and Sutcliffe (2007), management in high reliability organizations (HROs) — As is the case with military forces, it depends on continuous vigilance and readiness to respond to the unexpected. This implies recognizing that failures and side effects are not exceptions, but expected components of complex systems. Thus, a decision made based on incomplete information can generate second-order effects not anticipated in the initial analysis, compromising the mission, institutional reputation, or even troop safety.

The traditional approach to bounded rationality, proposed by Simon (1979), helps us understand why military leaders and public administrators often make suboptimal decisions. Cognitive limitations, combined with time pressure and a lack of reliable data, contribute to the emergence of unintended effects. These effects can be as damaging as the risks initially avoided, as studies of poorly planned military operations in the Middle East and Latin America demonstrate (Kiszely, 2007).

In this sense, it is crucial to integrate theories of complex adaptive systems into organizational analysis. Holland (1992) observes that such systems learn and reconfigure themselves through dynamic interactions with the environment, which requires military leaders to abandon linear models and adopt more flexible and adaptive mindsets. This also requires a culture

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

organizational strategy focused on continuous learning and the review of decision-making premises in light of new data or unforeseen results.

At the same time, institutionalized uncertainty, according to Perrow (1984), reinforces the need for decentralized decisions based on local knowledge. Military organizations that centralize decision-making power tend to respond more slowly to environmental changes, which increases the risk of operational failures. Therefore, decentralization combined with informational transparency becomes a critical success factor.

In summary, this first item argues that decision-making in highly complex and uncertain environments—such as those of military organizations—should be guided by systemic, adaptive approaches that are sensitive to unintended effects. A thorough understanding of these complex contexts is the first step toward minimizing risks and increasing institutional resilience in the face of the unpredictable.

2. Organizational Knowledge as a Decision-Making Element and Ambiguity Vector

Organizational knowledge is often treated as a key strategic asset, capable of guiding effective decisions and generating institutional advantage. However, in highly uncertain environments, such as military organizations, knowledge can also be a vector of ambiguity and generate unintended effects. Nonaka and Takeuchi (1997) define knowledge as a dynamic process of creation that emerges from the interaction between tacit and explicit knowledge, which implies recognizing that a significant portion of decision-making knowledge is embedded in practical experience and not necessarily documented. Furthermore, Davenport and Prusak (1998) argue that the way knowledge is shared and mobilized within institutions directly influences the quality of decisions made, especially in sensitive contexts such as national defense.

This tacit dimension of knowledge, prevalent in operational organizations such as armies and security forces, challenges formal decision-making models based exclusively on data and evidence. The risk of distortions in scenario interpretation intensifies when decisions are made by actors removed from the field of operation, without access to contextual knowledge. According to Argyris and Schön (1996), this disconnect between action knowledge and declared knowledge can lead to learning failures and unanticipated side effects. Furthermore, Polanyi (1966) emphasizes that tacit knowledge is personal and difficult to codify, which hinders its replication in standardized operating procedures, often leading to cognitive gaps in decision-making.

The problem is exacerbated in organizations that prioritize standardized procedures and hierarchical rigidity, hindering feedback between different decision-making levels. In such contexts, knowledge flows unidirectionally—from top to bottom—which compromises the system's adaptive capacity. Argyris's (1999) concept of "learning loops" is especially relevant here: without double-loop learning, which questions

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

assumptions and strategic objectives, organizations tend to repeat the same mistakes, even when operating based on new data. Schön (1983) adds that reflective learning is key to dealing with complex and changing problems, especially in environments where there is high risk and a need for rapid response, such as military operations.

Furthermore, the speed at which information circulates in complex environments can amplify cognitive noise and encourage hasty decisions. Weick (1995) warns of the phenomenon of "enactment," in which the processes of interpreting reality themselves shape the decision-making environment, creating a circularity between knowledge and action. In military contexts, where decisions are highly sensitive, this poorly calibrated feedback can produce devastating effects, such as unnecessary escalations of conflict or poorly assessed interventions. According to Snowden and Boone (2007), in complex systems, decisions based solely on linear models or fixed hierarchies are inadequate and prone to critical failures.

Another critical point lies in the obsolescence of institutionalized knowledge. In many public and military organizations, cognitive capital crystallizes in norms and regulations that fail to keep pace with evolving contemporary challenges. As Senge (1990) suggests, organizations that do not learn continuously are doomed to stagnation, becoming vulnerable to predictable and unpredictable failures. Resistance to change, in this case, is not only cultural but also epistemological. Mintzberg (1994) also emphasizes that overly structured decisions based on rigid plans often ignore the emerging complexities of operational environments, generating tactical and strategic mismatches.

Knowledge governance, in turn, faces the challenge of balancing information security and transparency. In sensitive sectors such as the military, excessive compartmentalization compromises systemic vision, hindering the construction of realistic scenarios. According to Boisot (1998), excessive codification of knowledge—for security purposes—can reduce its operational applicability, creating islands of decontextualized knowledge that fuel ill-informed decisions. Furthermore, Alavi and Leidner (2001) emphasize that the effectiveness of knowledge management systems depends on the organization's ability to transform data into useful and accessible insights, which requires interactive and collaborative structures.

Therefore, while organizational knowledge is a necessary condition for effective decision-making, it can also act as an obstacle when not managed adaptively. Strategic knowledge management, combined with a culture of continuous learning and fluid communication, becomes indispensable to mitigate unintended effects and ensure more robust decisions in highly complex environments. To this end, it is essential to incorporate integrative approaches such as that of Firestone and McElroy (2003), which propose knowledge management based on continuous validation processes and the mediation between the knowledge produced and its applicability in decision-making. This perspective makes it possible to align knowledge creation with the real needs of operations, strengthening institutional resilience.

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

3. Decision Making in High Uncertainty Environments: Logic, Heuristics, and Unintended Effects

Decision-making in highly uncertain environments, such as those faced by public and military institutions, is marked by cognitive limitations, a lack of reliable information, and pressure for rapid responses. In this context, rational decision-making models based on utility maximization prove insufficient. Simon (1979) proposed the concept of bounded rationality to describe how decision-makers operate with incomplete knowledge and time and resource constraints. This approach recognizes that, in complex situations, actors do not seek the ideal decision, but rather a satisfactory solution within the available possibilities, giving rise to the adoption of heuristics and mental shortcuts.

Heuristics, in turn, are cognitive strategies that enable quick, but not always accurate, decisions. Kahneman and Tversky (1974), when analyzing decision-making behavior in risk scenarios, identified heuristics such as representativeness, availability, and anchoring, which influence the perception of probabilities and the evaluation of alternatives. In highly complex environments, these heuristics can be vital for immediate action, but they can also lead to systematic errors and cognitive biases. The indiscriminate use of these strategies can result in hasty decisions, especially when institutional mechanisms for review and adaptive control are lacking.

In military organizations, these effects are exacerbated by the pressure for immediate responses and the hierarchical culture. Centralized decision-making tends to suppress the diversity of interpretations, reducing the cognitive plasticity needed to deal with new situations.
March and Olsen (1989) warn that, in these cases, the logic of appropriateness—that is, choices based on rules and expected roles—can override the logic of consequences, limiting strategic analysis. This rigidity in decision-making often results in unintended effects, when actions generate consequences that are different from or opposite to those planned.

Another relevant factor is the ambiguity of objectives and information. In conflict or crisis situations, available data is often fragmented, contradictory, or politically filtered, compromising decision-making clarity. Weick and Sutcliffe (2001) propose the concept of organizational mindfulness as a way to increase situational awareness, suggesting that resilient organizations maintain continuous attention to small failures and prepare for the unexpected. This approach requires a deliberate effort to decentralize authority, trust field operators, and incorporate multiple perspectives—aspects not always present in traditional bureaucratic institutions.

Unintended effects, as analyzed by Merton (1936), arise from the interaction between human actions and complex social systems. In institutional settings, these effects manifest when decisions made, even with good intentions, lead to unexpected and sometimes counterproductive consequences. For example, security policies that increase military presence in sensitive territories can, paradoxically, intensify tensions and generate

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

local resistance. This logic highlights the need for continuous feedback mechanisms, institutional learning, and real-time strategy review, especially in contexts marked by unpredictability.

Building more adaptive decision-making systems requires incorporating interdisciplinary approaches that combine formal logic, scenario analysis, and an understanding of emerging dynamics. Taleb (2007) introduces the concept of antifragility to describe systems that not only resist chaos but also grow stronger from it. Applying this idea to decision-making structures means creating organizations capable of learning from mistakes, tolerating uncertainty, and exploiting latent opportunities in times of crisis. This requires an epistemological shift in how risk is perceived and managed, going beyond mere prevention and embracing uncertainty as a structural given.

In short, decision-making in highly uncertain environments requires a balance between intuition and analysis, between rapid action and critical reflection. The challenge lies in developing institutional capabilities that allow for flexible handling of complexity without sacrificing strategic coherence. This implies recognizing the limits of traditional decision-making models and adopting practices based on continuous learning, context sensitivity, and the appreciation of distributed knowledge. Ultimately, effective decision-making depends less on eliminating uncertainty and more on the ability to navigate it intelligently and ethically.

4. Risks, Ambiguity and the Logic of Complexity in Institutional Environments

Risk management in highly uncertain institutional environments, such as military and public organizations, requires an approach that transcends traditional deterministic models. Such organizations often operate in contexts where events are interdependent, nonlinear, and subject to multiple unintended effects. Complexity theory, as proposed by Edgar Morin (2005), becomes essential for understanding these interrelationships and their implications for the decision-making process. Morin emphasizes that, in complex systems, decisions produce consequences that can feedback into the system, creating cycles of reinforcement or contradiction that directly impact institutional effectiveness.

Taleb's (2007) studies on the concept of "black swans" illustrate how highly improbable events can have disproportionate effects, especially in rigid organizational systems that neglect adaptability. Probabilistic logic, which guides much of traditional risk analysis, is insufficient to deal with extreme and highly ambiguous phenomena. The incorporation of qualitative methods, such as scenario analysis (Schoemaker, 1995) and cognitive mapping (Eden & Ackermann, 2001), has proven effective in expanding the situational awareness of decision-makers in settings such as the military and government institutions.

Furthermore, the ambiguity inherent in these systems imposes limits on instrumental rationality and requires the adoption of alternative rationalities, such as ecological rationality, as

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

advocated by Gigerenzer (2001). This approach suggests that adaptive heuristics may be more effective than complex models in certain decision-making contexts. This perspective is especially relevant for battlefield operations, humanitarian crisis scenarios, or natural disaster response, where time and available resources impose severe constraints on the traditional analytical process.

Military organizations, in particular, are permeated by cultural, historical, and symbolic factors that affect how risks are perceived and communicated. Studies by Janis (1972) on the phenomenon of groupthink indicate that excessive cohesion can compromise the critical capacity of decision-making groups, which is often observed in highly hierarchical structures. Therefore, promoting cognitive diversity and relative autonomy at different levels of command is a recommended strategy to mitigate this type of bias.

In this context, information governance plays a strategic role. According to Davenport and Prusak (1998), the effective circulation of relevant information is essential for the formation of useful and reliable knowledge. Institutional environments that maintain information silos and hierarchical restrictions on data flow tend to produce less effective decisions and are more likely to generate unintended effects. This relationship between information management and decision-making risk has been extensively documented in military audits of the US and NATO countries.

Another relevant aspect is the interdependence between technical-operational systems and sociopolitical systems. One example is the use of artificial intelligence in military operations, whose introduction requires not only technical risk assessment but also ethical and political analysis, as suggested by Cummings (2017). The indiscriminate use of algorithms in critical decisions can amplify errors or biases, generating unexpected results with high human and reputational costs.

Therefore, risk management in highly uncertain environments requires a multidimensional approach that integrates complexity logic, decision-making epistemology, and information governance. The challenge lies in building resilient organizational structures capable of learning from failures, incorporating multiple perspectives, and continually adapting. This management paradigm requires an institutional effort toward cultural and technological change, especially in organizations operating under constant pressure, such as the Armed Forces and civil defense agencies.

5. Feedback, Organizational Learning and Adaptation Cycles

Feedback, as a systemic mechanism, plays a fundamental role in organizational learning processes, especially in institutions subject to turbulent and uncertain environments. Classical literature on organizational learning, such as Argyris and Schön (1978), proposes a distinction between single-loop and double-loop learning. The former refers to the correction of errors within a set of preexisting rules, while the latter involves the revision of existing ones.

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

own rules that govern action. In military and government settings, double-loop learning is particularly challenging, given the normative rigidity and adherence to institutional hierarchy.

However, historical experience shows that institutions that cultivate robust feedback mechanisms are better able to anticipate unintended effects. A prime example is the U.S. Army's doctrinal reform following the strategic errors observed in Vietnam and Iraq. These reforms, analyzed by authors such as Petraeus and Amos (2006), emphasize the importance of continuous institutional learning and the systematic collection of lessons learned. Tools such as After Action Reviews (AARs) and knowledge capture systems were implemented to institutionalize feedback and foster a virtuous cycle of adaptation.

Furthermore, literature on complex adaptive systems theory, such as that of Holland (1995), suggests that organizations must develop evolutionary capabilities—structures and processes that allow them not only to react to, but also to co-evolve with, the environments in which they operate. This perspective underlies the doctrine of network-centric operations, which promotes a decentralized decision-making architecture, fostering continuous feedback between organizational nodes.

The role of leadership in this context is crucial. Weick and Sutcliffe (2001) argue that effective leaders in high-reliability environments are those who value active listening, promote sensitivity to error, and encourage disciplined improvisation. Such leaders cultivate a learning-oriented organizational culture in which feedback is not perceived as destructive criticism but as an opportunity for continuous improvement.

Additionally, feedback must be integrated into formal performance evaluation and knowledge management systems. According to Nonaka and Takeuchi (1995), tacit knowledge captured through daily interactions needs to be externalized and systematized to generate organizational value. This requires collaborative platforms, data repositories, and interpersonal exchange environments that are aligned with the institution's strategic objectives.

In practice, however, feedback often encounters political, cultural, and technical barriers that limit its effectiveness. Research by Garvin et al. (2008) reveals that many public organizations have data collection structures but lack a culture that values critical reflection and transparency. In the military, this problem is exacerbated by a culture of silence and fear of reprisal, which can seriously compromise the ability to learn from mistakes.

To overcome these obstacles, authors such as Senge (1990) propose the concept of learning organizations, in which all members are encouraged to continually expand their capacity to create the results they desire. This requires a reconfiguration of power structures and the introduction of participatory practices that foster trust, listening, and

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

experimentation. The introduction of regular feedback cycles, combined with reflective processes and institutional support, is essential to consolidate organizational learning in highly complex environments.

Finally, it's crucial that feedback be not only reactive but also proactive, feeding predictive and simulation models that allow for the anticipation of systemic behaviors. Integrating qualitative feedback with quantitative real-time data analysis can generate valuable insights to prevent unintended effects and strengthen the adaptive capacity of institutions, especially in critical contexts such as national security, defense, and public emergencies.

6. Ethical and Strategic Implications in Institutional Decisions

Decisions made in public and military organizations are marked by ethical and strategic complexity that transcends conventional technical analyses, demanding an interdisciplinary approach that considers the social, political, and moral consequences involved. Beauchamp and Childress (2013) present the four fundamental principles of applied ethics—autonomy, beneficence, nonmaleficence, and justice—which serve as a guide for evaluating institutional actions. In scenarios of high uncertainty, these principles are challenged by information gaps and the ambiguity that permeate choices, making it essential for decision-makers to incorporate ethical values into planning and execution, mitigating negative impacts on vulnerable populations and ensuring the legitimacy of processes.

In the military context, ethical discussions take on even more complex dimensions, as decisions may involve the use of force, risks to life, and human rights, requiring strict adherence to the precepts of International Humanitarian Law. Walzer (1977) emphasizes that the ethics of war must be guided by the principles of proportionality and distinction, which are fundamental to avoiding unnecessary collateral damage and preserving human dignity even in situations of armed conflict. These ethical parameters must be integrated into decision-making systems and military training, ensuring that actions are aligned with national and international standards, and that responsibilities are clearly assigned.

From a strategic perspective, models such as Game Theory (von Neumann & Morgenstern, 1944) and Multicriteria Analysis (Keeney, 1992) provide robust tools for evaluating complex scenarios, allowing for the simultaneous consideration of divergent interests and multiple variables. However, the applicability of these models in highly dynamic and uncertain environments requires adaptations that incorporate the logic of complexity and the risks of unintended effects. This implies adopting a flexible and iterative approach, where decision-making is not seen as a one-off act, but as a continuous process of monitoring, evaluation, and adjustment.

Information governance emerges as a critical element in institutional ethics, as ethical decisions depend on the quality, integrity, and transparency of available data. Floridi (2013) proposes information ethics as a field that holds actors accountable for the correct

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

Data management, protecting the privacy, confidentiality, and autonomy of affected individuals. In public institutions, adopting governance policies that promote the democratization of information and accountability is essential to building social trust and preventing abuse, especially in sensitive contexts such as national security and essential public services.

The interrelationship between ethics and technology represents an emerging challenge, especially with the increasing adoption of autonomous systems and artificial intelligence in military operations.
Cummings (2017) emphasizes that delegating critical decisions to machines requires caution, due to the possibility of biases embedded in algorithms and the lack of contextual judgment. Technological ethics demand that human oversight be maintained, with the establishment of clear regulatory frameworks that ensure accountability, transparency, and respect for fundamental rights, avoiding the risk of dehumanizing decisions.

Additionally, organizational culture plays a fundamental role in incorporating ethics into institutional practices. Military and public organizations need to develop environments that encourage critical reflection, individual and collective responsibility, and openness to dialogue on ethical dilemmas, thus reducing the risk of authoritarian or negligent practices. This robust ethical environment contributes to institutional resilience, the legitimacy of decisions, and the strengthening of relations with civil society, a crucial element for the sustainability of democratic institutions.

Finally, ethical and strategic implications must be seen as integrated and indispensable dimensions of governance and knowledge management in complex environments. Incorporating these elements favors the development of more responsible, transparent, and adaptive decision-making processes, capable of addressing contemporary challenges with a holistic vision and a commitment to collective well-being. This ethical approach expands organizations' capacity to innovate, learn, and transform, ensuring relevance and legitimacy in contexts of high volatility and uncertainty.

7. Recommendations for Improving Decision-Making Processes in High Uncertainty Environments

Given the challenges identified throughout this study, it is essential to adopt structured recommendations that can improve decision-making processes in public and military institutions exposed to highly complex and uncertain environments. First, we highlight the need to promote effective integration between different disciplines, incorporating complexity theories, knowledge management, and risk analysis to build a systemic framework that allows for the anticipation and mitigation of unintended effects. This interdisciplinary approach favors a broader view of organizational dynamics and the potential impacts of decisions.

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

Another essential recommendation concerns strengthening feedback and organizational learning mechanisms. Established practices, such as After Action Reviews (AARs), should be institutionalized and constantly improved to effectively capture lessons learned, encouraging continuous cycles of critical reflection and adaptation. Argyris and Schön (1978) emphasize that double-loop learning, which involves questioning one's own assumptions, is vital to promoting necessary structural and cultural changes in rigid, hierarchical organizations.

The incorporation of emerging technologies represents an opportunity to expand decision-making capacity, but it must be done with caution and responsibility. Systems based on artificial intelligence, simulations, and predictive analytics can provide valuable support, as long as they are aligned with rigorous ethical principles and robust governance. The combination of human and artificial intelligence enhances institutional resilience, but requires investment in training, technological infrastructure, and protocols that ensure human control and transparency.

Regarding information governance, it is recommended to develop clear policies to ensure the quality, integrity, and accessibility of data used in strategic decisions. This involves creating rigorous protocols for collecting, validating, and sharing information, as well as fostering collaborative environments that encourage the horizontal flow of knowledge, breaking down departmental silos and strengthening inter-institutional networks. Davenport and Prusak (1998) emphasize that effective knowledge management is crucial for organizational success, especially in volatile environments.

Additionally, cognitive diversity and relative autonomy within hierarchical structures should be encouraged, seeking to reduce the incidence of phenomena such as groupthink, which compromise decision-making quality. Investments in training, participatory processes, and inclusive policies are effective strategies for expanding the plurality of perspectives, stimulating constructive debate, and fostering innovation. Cognitive diversity contributes to the early identification of risks and the proposal of creative solutions.

On an ethical level, it is recommended that specific guidelines and committees be formalized to guide the incorporation of ethics into institutional decisions, especially when using new technologies. Ongoing training for managers in applied ethics, the creation of oversight mechanisms, and the adoption of clear regulatory frameworks are essential measures to ensure accountability and transparency, minimizing the risk of abuse and collateral damage.

Finally, we emphasize the importance of cultivating a resilient organizational culture that values innovation, flexibility, and continuous learning as core elements of institutional sustainability. Resilience must be viewed as a dynamic process that demands constant adaptation and the ability to transform in the face of abrupt changes and emerging crises.
Resilient institutions maintain their effectiveness, legitimacy, and social relevance, even in highly uncertain scenarios, consolidating themselves as pillars of national security and development.

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

Conclusion

A critical analysis of decision-making processes in highly uncertain environments, especially in public and military organizations, reveals the intrinsic complexity that permeates knowledge management and strategic decision-making. As highlighted by Morin (2005), complexity should not be seen as an obstacle, but as a fundamental characteristic that requires systemic, adaptive, and multidisciplinary approaches to deal with the multiple interactions and unintended effects arising from decisions. This article has shown that decisions in complex contexts transcend classical rationalism, demanding careful consideration of the sociotechnical, political, and cultural dynamics that influence organizational outcomes.

A central point emphasized was the importance of knowledge management as a key driver of decision-making effectiveness. Nonaka and Takeuchi (1997) demonstrated that converting tacit knowledge into explicit knowledge and disseminating it appropriately are crucial for organizations to learn and adapt. In military and public settings, this dynamic is particularly challenging due to hierarchical rigidity, secrecy, and operational pressures, but overcoming it is imperative to reduce the risks of poor decisions and unforeseen side effects. Building environments that facilitate knowledge sharing and collective learning represents an indispensable strategic investment.

The discussion on the logic of complexity and adaptive systems, based on Holland (1992) and Kauffman (1993), reinforces the need to view organizations as living entities, whose emergent behaviors cannot be fully predicted by traditional linear models. This perspective implies recognizing that small, local decisions can trigger cascades of broad impacts, requiring leaders with systemic and metacognitive thinking skills to anticipate patterns and respond appropriately. Models such as Cynefin (Snowden & Boone, 2007) offer valuable frameworks for classifying contexts and adjusting decision-making strategies, and are important tools for managers in volatile scenarios.

Regarding feedback and learning mechanisms, the literature points to the need for structured and continuous processes capable of capturing lessons and correcting course in a timely manner. Sterman (2000) emphasizes that a failure to understand feedback loops is a major cause of ineffective policies. Similarly, Argyris and Schön (1978) emphasize that double-loop learning is essential for revising organizational assumptions, a practice that can be difficult in traditional hierarchical environments but should be encouraged to promote innovation and resilience.

The ethical implications discussed reveal a crucial area for responsible decision-making, especially given the social and human impact of institutional actions. Walzer (1977) and Beauchamp and Childress (2013) offer foundations that reinforce the need to incorporate ethical values of justice, proportionality, and respect for human dignity into strategies and operations, especially in military contexts where risks to life are inherent. Information ethics,

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

according to Floridi (2013), it complements this vision by emphasizing the responsible management of data, a critical aspect in an increasingly digitalized and interconnected world.

The growing incorporation of technologies, especially artificial intelligence and autonomous systems, poses unprecedented challenges for governance and institutional ethics. As warned by Cummings (2017), delegating critical decisions to machines must be accompanied by rigorous human oversight and regulatory mechanisms, preventing algorithmic biases and decontextualized decisions. The integration of human and artificial intelligence represents a promising but complex frontier that requires investment in training, technological infrastructure, and the development of robust ethical policies.

Another relevant aspect is the need to promote cognitive diversity and relative autonomy in decision-making processes to avoid the phenomenon known as groupthink, which compromises the quality and innovation of decisions (Janis, 1972). Encouraging a plurality of perspectives, constructive debate, and broad participation are practices that strengthen the critical capacity of decision-making groups, increasing adaptability and institutional resilience. This requires cultural and structural changes that overcome traditional resistance and promote inclusive and collaborative environments.

Information governance emerges as a fundamental pillar for successful decision-making processes. Davenport and Prusak (1998) show that the quality of organizational knowledge is directly related to how information is collected, validated, shared, and used. Public and military institutions face additional challenges due to security issues, bureaucracy, and data segmentation, but the implementation of clear policies and appropriate technology can overcome these barriers, facilitating informed, agile, and responsible decision-making.

Organizational resilience, understood as the ability to adapt and transform in the face of crises and abrupt changes, is a desired outcome and depends on the synergy between the elements addressed. Senge (1990) emphasizes that learning organizations are capable of continually reinventing themselves, ensuring sustainability and legitimacy. In a world marked by increasing volatility and complexity, developing cultures and structures that foster this resilience is imperative for institutional success and maintaining the public interest.

Finally, this article reinforces that knowledge management, the logic of complexity, feedback mechanisms, ethics, and information governance must be integrated into a holistic decision-making model that is dynamic, adaptive, and accountable. The convergence of these elements enables not only the mitigation of unintended effects but also the strengthening of institutional capacity for innovation, transparency, and effectiveness. This advanced decision-making paradigm is essential to address contemporary challenges, ensuring that public and military organizations fulfill their missions with excellence and integrity.

References

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

ARGYRIS, C.; SCHÖN, D. Organizational learning: a theory of action perspective. Reading: Addison-Wesley, 1978.

BEAUCHAMP, TL; CHILDRESS, JF Principles of biomedical ethics. 7. ed. New York: Oxford University Press, 2013.

CUMMINGS, ML Artificial intelligence and the future of warfare. *Chatham House,* 2017.

DAVENPORT, T.H.; PRUSAK, L. Working knowledge: how organizations manage what they know. Boston: Harvard Business School Press, 1998.

FLORIDI, L. The ethics of information. Oxford: Oxford University Press, 2013.

GERRAS, SJ; WONG, L.; ALLEN, CD Organizational culture: Applying a hybrid model to the US Army. *Military Psychology,* vol. 20, no. 2, p. 85–107, 2008.

HOLLAND, JH Adaptation in natural and artificial systems. Ann Arbor: University of Michigan Press, 1992.

JANIS, IL Victims of groupthink: a psychological study of foreign-policy decisions and fiascoes. Boston: Houghton Mifflin, 1972.

KAUFFMAN, SA The origins of order: self-organization and selection in evolution. New York: Oxford University Press, 1993.

KEENEY, RL Value-focused thinking: a path to creative decisionmaking. Cambridge: Harvard University Press, 1992.

MORIN, E. Introduction to complex thinking. 4th ed. Porto Alegre: Sulina, 2005.

MOFFAT, J. Complexity theory and network-centric warfare. *The CCRP Publication Series,* 2003.

NONAKA, I.; TAKEUCHI, H. The knowledge-creating company: how Japanese companies create the dynamics of innovation. New York: Oxford University Press, 1997.

SENGE, PM The fifth discipline: the art and practice of the learning organization. New York: Doubleday, 1990.

SNOWDEN, D.; BOONE, M. A leader's framework for decision making. *Harvard Business Review,* vol. 85, no. 11, p. 68–76, 2007.

STERMAN, JD Business dynamics: systems thinking and modeling for a complex world. Boston: McGraw-Hill, 2000.

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Machine Translated by Google

VON NEUMANN, J.; MORGENSTERN, O. Theory of games and economic behavior. Princeton: Princeton University Press, 1944.

WALZER, M. Just and unjust wars: a moral argument with historical illustrations. 3rd ed. New York: Basic Books, 1977.

WENGER, E.; MCDERMOTT, R.; SNYDER, W. Cultivating communities of practice: a guide to managing knowledge. Boston: Harvard Business School Press, 2002.

This is an open access article distributed under the terms of the Creative Commons Attribution license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.