XIV Міжнародна науково-практична дистанційна конференція
«Облік, оподаткування і контроль: теорія та методологія»
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INFORMATION AND ANALYTICAL SYSTEMS FOR MANAGERIAL DECISION SUPPORT: A MODELLING APPROACH

Contemporary management and administration operate in an environment characterised by increasing complexity, uncertainty and information overload. Economic volatility, institutional transformations, digitalisation of public and corporate governance, and growing interdependence between organisational processes significantly complicate managerial decision-making. Under such conditions, traditional approaches based on fragmented information and intuitive judgement are increasingly insufficient to ensure effective and timely management outcomes.

The growing relevance of information and analytical systems in management is primarily driven by the need to structure, integrate and interpret large volumes of heterogeneous data. Modern organisations generate extensive information flows related to financial performance, operational activities, human resources, regulatory compliance and external environmental factors. Without systematic analytical processing, such data remain underutilised and do not contribute effectively to decision-making processes. Information and analytical systems address this challenge by providing a structured environment for data collection, processing and interpretation.

In the context of management and administration, information and analytical systems perform not only a technical but also a conceptual function. They support the transformation of raw data into analytically meaningful information that can be used to identify trends, assess performance and evaluate alternative courses of action. This

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analytical dimension is particularly important in complex managerial systems, where decisions often involve multiple objectives, constraints and stakeholders.

Modelling plays a central role in enhancing the analytical capacity of information systems. Through modelling, complex managerial processes can be formalised, key variables identified and relationships between different elements of the system represented in a structured manner. Models enable decision-makers to simulate potential scenarios, assess the consequences of different managerial choices and reduce uncertainty associated with strategic and operational decisions. As a result, modelling becomes an essential component of decision support rather than a purely theoretical exercise.

The relevance of information and analytical systems combined with modelling approaches is especially evident in public administration, where decisions often have long-term social and economic implications. In such contexts, the ability to justify decisions analytically, ensure transparency and demonstrate consistency with policy objectives is critical. Information and analytical systems provide a foundation for evidence-based management and contribute to greater accountability in administrative decision-making.

Information and analytical systems perform a crucial role in managerial decision support by integrating data processing capabilities with analytical and modelling tools. Their effectiveness depends not only on technological infrastructure but also on the conceptual design of analytical models embedded within these systems. Modelling serves as the core mechanism through which information is transformed into structured knowledge suitable for managerial interpretation and decision-making.

Within information and analytical systems, models are used to represent managerial processes, organisational structures and interactions between key variables. These models may take various forms, including process models, economic and financial models, optimisation models and scenario-based simulations. Regardless of their specific form, they provide a simplified yet analytically meaningful representation

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of complex managerial realities, allowing decision-makers to focus on essential relationships rather than isolated data points.

A key function of modelling in decision support systems is the evaluation of alternative managerial scenarios. By simulating different courses of action, models enable managers and administrators to assess potential outcomes, identify trade-offs and anticipate risks before decisions are implemented. This is particularly important in environments characterised by uncertainty and resource constraints, where the consequences of managerial errors can be significant. Modelling thus reduces reliance on intuition and supports more rational and evidence-based decision-making.

Another important analytical function of modelling is performance assessment. Information and analytical systems allow managers to compare planned and actual results, identify deviations and analyse their underlying causes. Through modelling, these deviations can be linked to specific managerial decisions or external factors, providing deeper insight into organisational performance. This analytical capability enhances managerial learning and supports continuous improvement in administrative practices.

In public administration, modelling within information and analytical systems plays a vital role in policy analysis and administrative decision support. Models enable the assessment of policy alternatives, evaluation of resource allocation options and analysis of potential social and economic impacts. By incorporating modelling tools into decision support systems, public authorities can improve the transparency and justification of administrative decisions, thereby strengthening public trust and accountability.

However, the effectiveness of modelling in information and analytical systems depends on several critical conditions. These include the quality and reliability of input data, the methodological soundness of the models used and the capacity of decision-makers to interpret analytical outputs correctly. Without these conditions, models may produce misleading results or be applied in a purely formal manner, limiting their value for decision support.

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The application of information and analytical systems supported by modelling approaches has significant implications for the quality of managerial decision-making and the level of transparency in management and administration. In complex organisational environments, decision-makers are increasingly required to justify their choices based on objective analysis rather than subjective judgement. Information and analytical systems contribute to this requirement by providing structured, consistent and analytically grounded inputs for decision-making processes.

From a managerial perspective, these systems enhance decision quality by improving the coherence and reliability of information used in planning and control. Modelling enables decision-makers to assess alternative strategies, evaluate potential outcomes and identify risks before implementing decisions. As a result, managerial decisions become more predictable, consistent and aligned with organisational objectives. This is particularly important in strategic management, where decisions often involve long-term commitments and significant resource allocation.

In administrative contexts, information and analytical systems supported by modelling approaches strengthen transparency and accountability. The formalisation of decision-making processes through analytical models allows decisions to be traced back to explicit assumptions, data sources and evaluation criteria. This traceability reduces arbitrariness in administrative actions and facilitates external oversight. In public administration, such transparency is essential for ensuring legitimacy, compliance with regulatory frameworks and public trust.

At the same time, increased reliance on information and analytical systems introduces new challenges related to governance and responsibility. Decision-makers may face the risk of overdependence on model outputs without sufficient critical assessment. Models inevitably simplify reality and may not fully capture social, institutional or behavioural factors influencing managerial outcomes. Therefore, analytical systems should be regarded as decision support tools rather than substitutes for professional judgement and administrative responsibility.

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The effectiveness of information and analytical systems also depends on organisational readiness, including analytical competencies of personnel, quality of data governance and integration of systems into managerial workflows. Without these conditions, the potential benefits of modelling-based decision support may remain unrealised or lead to formalistic decision-making practices that undermine transparency rather than enhance it.

In conclusion, information and analytical systems combined with modelling approaches play an increasingly important role in supporting managerial decision-making and enhancing administrative transparency. Their value lies in the ability to structure complex information, support analytical reasoning and justify decisions in a systematic manner. In the context of ongoing institutional and organisational transformations, these systems represent a key element of modern management and administration, provided that their use is accompanied by methodological rigor, organisational capacity and responsible governance.

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