

PROSPECTS FOR DEVELOPING INTELLIGENT DECISION SUPPORT SYSTEMS IN THE ECONOMIC ECOSYSTEM OF HIGHER EDUCATION

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Abstract

The paper analyses the prospects for developing intelligent decision support systems (IDSS) within the economic ecosystem of higher education — the system of interrelated relations between the state, higher education institutions, students, employers, financial institutions and IT companies. Based on international surveys, the degree of institutionalisation of AI governance in universities and the fragmentation of strategic approaches are assessed. IDSS functions matching the ecosystem actors and their decisions are systematised, and a three-layer architecture and a roadmap for the phased development of IDSS for 2026–2030 are proposed.

Keywords: Decision support system, intelligent system, economic ecosystem, higher education, AI governance, data layer, dashboard, roadmap, AI policy.

INTRODUCTION

Today higher education functions not as a collection of individual institutions but as an **economic ecosystem** in which the state, higher education institutions (HEIs), students, employers, banks and technology companies exchange resources and information [5]. In such a system, a decision by one actor (for example, the state's grant quotas or an employer's skill requirements) directly affects the economic position of the others. As a result, management decisions become multifactorial and interdependent, and they are increasingly difficult to justify using traditional methods.

Intelligent decision support systems (IDSS) are information systems that combine data, analytical models and AI tools to present the decision-maker

with alternative options and their consequences [4]. Building them, however, first requires an institutional basis for AI governance. Globally, the situation here is still inadequate: a UNESCO survey of more than 450 schools and universities found that fewer than 10% had institutional policies or formal guidance on generative AI [1].

The aim of the study is to assess the organisational and economic conditions for developing IDSS in the economic ecosystem of higher education and to substantiate its architecture and implementation stages.

MAIN PART

A 2025 EDUCAUSE study involving 788 professionals showed that AI activity in HEIs is largely fragmented (Figure 1): 55% of respondents reported that AI work happens in isolated pockets without coordination, only 22% reported an institution-wide approach, and 11% said there was no AI strategy at all [2]. Such fragmentation is the main obstacle to IDSS, since the system requires combining the data of different units in a single environment.

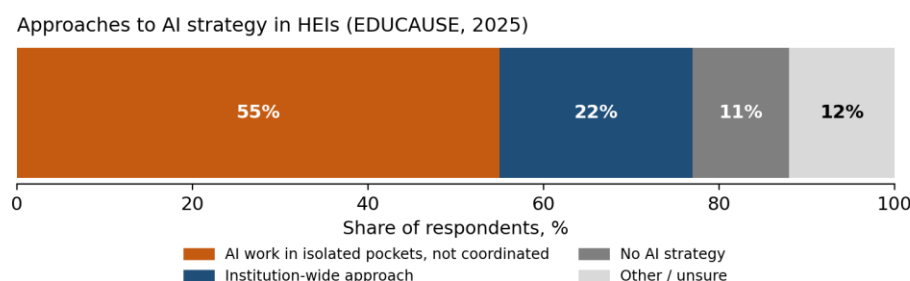


Figure 1. Approaches to developing an AI strategy in HEIs, 2025

Source: compiled by the author based on the EDUCAUSE 2025 AI Landscape Study [2].

At the same time, institutionalisation is accelerating (Figure 2): within one year the share of HEIs that consider AI a strategic priority rose from 49% to 57%, and the share with AI acceptable-use policies from 23% to 39% [3]. Concerns are also high: 91% of respondents are worried about misinformation and 90% about unauthorised use of data; only 25% of leaders expressed full enthusiasm about AI, while 46% combined caution with enthusiasm [2]. This means that the design of IDSS must pay particular attention to reliability and data security.



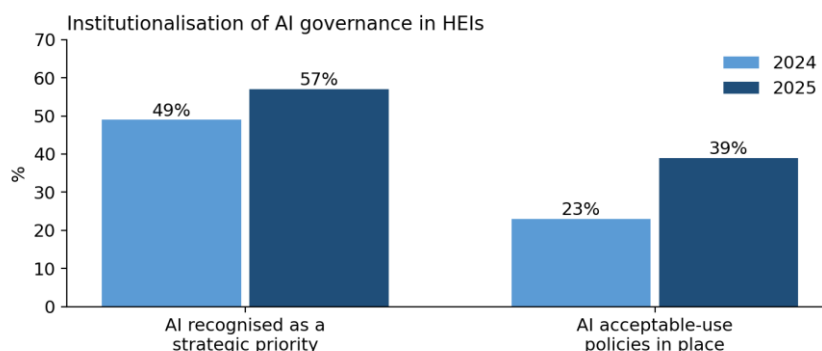


Figure 2. Institutionalisation of AI governance in HEIs, 2024–2025

Source: compiled by the author based on EDUCAUSE data published by GovTech [3].

The value of IDSS lies in its ability to coordinate the decisions of several ecosystem actors at once. Table 1 lists the main actors, the economic decisions they make and the corresponding IDSS functions.

Table 1 Actors of the higher education economic ecosystem and IDSS functions

Actor	Main economic decision	IDSS function	Required data
Ministry	Grant quotas, HEI funding	Forecasting demand for specialists, “what-if” scenarios	Labour market, demographics, HEMIS
HEI leadership	Tuition fees, budget, investment	Income and expenditure forecasting, optimisation	Financial reports, admissions, payments
Students and families	Choice of programme and HEI, financing education	Assessing the return on education investment	Graduate employment and wages
Employers	Staffing orders, internships and partnerships	Analysing the balance of skill supply and demand	Vacancies, competences
Banks and investors	Education loans, investment in HEI infrastructure	Credit and investment risk scoring	HEI financial indicators, payment discipline
IT companies	Developing education technology products	Identifying market needs	Platform statistics

Source: developed by the author.

The proposed IDSS consists of three layers (Figure 3): a data layer (HEMIS, financial reports, labour market and open government data), a model layer (forecasting, optimisation, classification and scenario analysis) and an interface layer (dashboards, automated alerts and an LLM assistant that accepts natural-language queries). Decision outcomes return to the ecosystem and become a new data source for subsequent analysis.



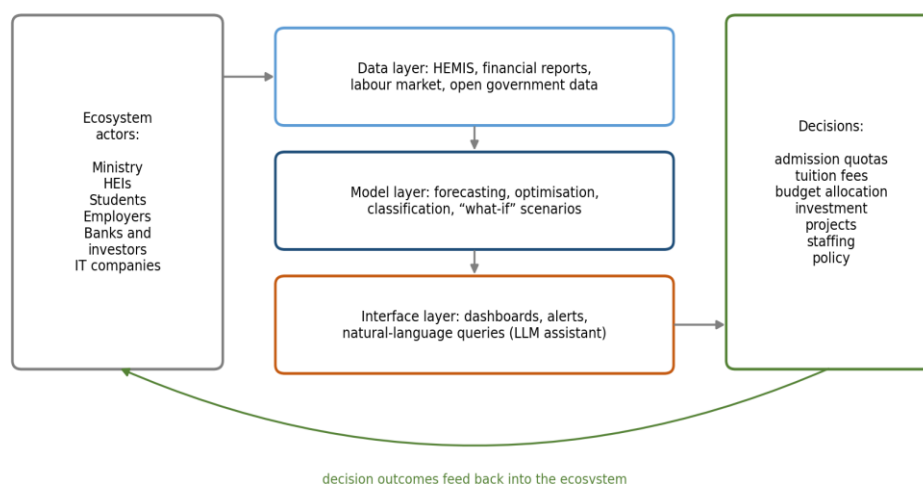


Figure 3. IDSS architecture in the economic ecosystem of higher education

Source: developed by the author.

Given the fragmentation and risks observed in international practice, it is advisable to develop IDSS in phases rather than implementing it in full at once (Table 2).

Table 2 Proposed roadmap for developing IDSS

Stage	Period	Main activities	Expected result
1. Institutional basis	2026–2027	Adopt AI policies and data governance rules in HEIs; designate responsible units	Fragmentation overcome
2. Data integration	2027–2028	Combine HEMIS, financial and labour market data in a single warehouse; quality standards	Reliable database
3. Pilot models	2028–2029	Test income forecasting and risk scoring models in 5–10 HEIs	Model accuracy and economic impact confirmed
4. Ecosystem-wide scaling	2029–2030	Launch interfaces for the ministry, banks and employers; LLM assistant	Coordinated decisions at ecosystem level

Source: developed by the author.

CONCLUSION AND RECOMMENDATIONS

The analysis shows that the technological capacity to develop IDSS exists, but the main constraint is institutional: fragmented AI governance, a lack of formal policies and concerns about data security. For the economic

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ecosystem of higher education, IDSS should be seen not as a tool of an individual HEI but as infrastructure for coordination among actors. On this basis, the following recommendations are made:

1. Adopt a unified IDSS concept. Develop a concept for the higher education system defining the purpose, actors, data composition and allocation of responsibility for IDSS.
2. Open datasets. Publish anonymised datasets on graduate employment, wages and HEI financial indicators in open formats.
3. Human oversight principle. Establish in regulation that IDSS recommendations are a basis for the decision-maker rather than a final decision, and ensure that every algorithmic recommendation is explainable.
4. Public-private partnership. Involve IT companies and banks as partners in developing IDSS modules and share the costs.
5. Efficiency monitoring. At the end of each stage, assess the impact of IDSS on the speed and accuracy of decision-making.

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