

DIGITAL GOVERNANCE MODEL FOR JOINT HIGHER EDUCATION PROGRAMMES

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Abstract

The aim of the study is to develop a digital governance model for a joint educational programme that integrates the academic, administrative, and oversight processes of partner universities within a unified information environment. The methodological framework combines systems and process approaches, educational programme life-cycle analysis, data-flow modelling, and responsibility allocation. A five-layer architecture is proposed, comprising regulatory and governance, process, integration, analytics, and user-interaction layers. Unlike the local automation of individual operations, the model relies on a shared registry of governance objects, end-to-end digital approval workflows, and a common performance framework. Critical points are identified, including curriculum alignment, student lifecycle management, recognition of learning outcomes, monitoring of financial obligations, quality assurance, and graduation. Requirements for interoperability, role-based access, operational auditing, and personal-data protection are formulated. The practical significance of the model lies in reducing discrepancies between partner institutions' information systems, shortening approval cycles, and improving the traceability of management decisions.

Keywords: Joint educational programme, digital governance, higher education, interoperability, programme lifecycle, quality assurance, data analytics.

Introduction

A joint educational programme creates a single academic product but is managed by institutions with different regulations, information systems, and areas of responsibility. As a result, data on student enrolment, curricula, tuition payments, academic arrears, and graduation are often generated in parallel. Discrepancies may be detected only at later stages, when correction requires repeated coordination and creates risks for students. In such an environment, digitalisation cannot be reduced to the implementation of a stand-alone platform; rather, the inter-university decision-making mechanism itself becomes the object of transformation.

The OECD views an effective digital education ecosystem as a combination of infrastructure, data, rules, and governance institutions, with particular emphasis on interoperability and data reuse [1–3]. The European Digital Education Action Plan also links technological development



with cooperation, accessibility, and quality [4]. For joint programmes, these principles imply the need to align not only software interfaces, but also data semantics, participant responsibilities, and evidence of procedural compliance.

The research problem lies in the absence of an integrated model that combines the life cycle of a joint programme, the exchange of reliable data, and joint monitoring of outcomes. The aim of this article is to develop such a model and determine the conditions for its implementation. To achieve this aim, the study addresses the following tasks: identifying governance objects and processes; defining the layers of the digital architecture; describing the allocation of responsibilities and the performance-indicator framework; and determining implementation risks and stages.

Literature Review

Research on the digital transformation of higher education has developed along three interrelated strands. The first covers digital ecosystems and institutional governance. OECD publications emphasise that the existence of platforms alone does not ensure a systemic effect; strategy, sustainable financing, data standards, and coordination among stakeholders are also required [1; 3]. The second strand concerns student information and learning systems. Modern learning management systems (LMS) and student information systems (SIS) support planning, recording of results, and reporting; however, the separate development of these systems creates duplication and limits the comparability of information [2].

The third strand addresses quality assurance and the recognition of learning outcomes. ISO 21001:2025 specifies requirements for an educational organisation management system focused on learners and other stakeholders [5]. The European approach to micro-credentials demonstrates the importance of standardised descriptions of learning outcomes, workload, level, assessment methods, and the issuing body [6]. A similar principle applies to joint programmes: recognition should be based on structured data and pre-agreed rules rather than on ad hoc exchanges of scanned documents.

The literature provides a fairly comprehensive account of digital tools used within individual universities, while the inter-organisational level remains less developed. Source systems, shared registries, and analytical data marts are often not clearly distinguished; data ownership, update deadlines, and procedures for resolving discrepancies are also insufficiently defined. This study addresses that gap through a process-architecture model of governance.

Materials and Methods

The study is conceptual and applied in nature. The unit of analysis is a joint educational programme delivered by two or more universities on the basis of an agreement and an approved curriculum. A systems approach was used to define the composition and boundaries of the model; a process approach was applied to decompose the programme life cycle; data-flow modelling was used to describe information exchange; RACI logic was employed to allocate responsibilities; and a risk-based approach was used to select control points. The normative framework consisted of the provisions of ISO 21001:2025 and international recommendations on the governance of digital education ecosystems [1–6].



The model was designed in four steps. First, the key objects were identified: the programme, curriculum version, course, learning outcome, student, instructor, contractual obligation, financial transaction, decision of a collegial body, and qualification document. The processes were then grouped by life-cycle stage. In the third step, the trigger event, input data, responsible party, control mechanism, output, and digital audit trail were defined for each process. In the fourth step, a system of indicators was developed to assess not the volume of digital operations, but the quality of joint governance.

Results

The proposed digital model is not a single monolithic system but a coordinated interaction environment. Universities retain their own information systems while transferring a normatively defined set of data to a shared registry. Each record contains its source, owner, version, update time, and verification status. Any change to critical information triggers an approval workflow and is recorded in an audit log.

Table 1. Layers of the Digital Governance Model

Layer	Purpose	Main elements
1	Regulatory and collegial governance	Agreements, regulations, roles, authority matrix, recognition rules, deadlines, and control points.
2	End-to-end processes	Programme design, admissions, teaching and learning, mobility, assessment, graduation, and quality monitoring.
3	Integration and data	Shared registry, APIs, reference data, identifiers, version control, and electronic signatures.
4	Analytics and control	Dashboards, early warnings, discrepancy checks, and workload and risk forecasting.
5	User interaction	Personal accounts for students, instructors, coordinators, and managers; notifications and service requests.

The regulatory and governance layer defines which decisions each partner is authorised to make and which decisions require joint approval. The process layer translates contractual provisions into executable workflows. The integration layer ensures technical and semantic compatibility. The analytics layer detects deviations before they produce irreversible consequences. The user-interaction layer provides each participant only with the functions and data corresponding to their role.

The programme life cycle includes seven stages:

- initiation and economic justification;
- design; approval and licensing;
- recruitment and enrolment; delivery of the educational process;
- quality assessment and corrective actions;
- graduation or programme closure.

Transition between stages is permitted only after a digital check of a mandatory set of conditions. For example, recruitment opens after the current curriculum version has been approved, teaching resources have been assigned, tuition fees have been agreed, and



recognition rules have been published. The mechanism does not replace collegial decision-making; instead, it prevents implementation of a decision when the underlying data are incomplete.

Table 2. End-to-End Processes and Digital Outputs

Process	Digital output	Control
Curriculum	Unified version of courses, credits, learning outcomes, and forms of assessment	Version comparison; prevention of unapproved changes
Student lifecycle	Agreed student status and transition history	Unique identifier; verification of the grounds for official orders
Teaching and learning	Grades, attendance, academic arrears, and academic mobility	Submission deadline; authorship; conversion rules
Recognition	Decision on recognition of learning outcomes and supporting evidence	Equivalence matrix and bilateral confirmation
Finance	Charges, payments, and obligations between partners	Status reconciliation and deviation alerts
Quality	Feedback, KPIs, and corrective actions	Responsible person, deadline, and evidence of closure
Graduation	Eligibility, final assessment, and document details	Verification of academic and financial requirements

The central element of the model is a shared registry, but the “single source of truth” principle is applied in a differentiated manner. Ownership of the primary record remains with the system in which the legally significant event occurs. The shared registry stores the agreed status, links to supporting evidence, and the history of changes. This prevents uncontrolled duplication while simultaneously creating a common view of the programme.

Roles are allocated according to the scheme “process owner – executor – approver – controller – informed participant”. The academic director is responsible for programme content and learning outcomes; the coordinator manages inter-university workflows and deadlines; university units are responsible for legally significant operations in their own systems; the quality assurance unit independently verifies performance indicators; and the IT service is responsible for availability, integration, and security. Students have access to statuses, grounds for decisions, and service requests, but not to other participants’ internal data.

Four groups of indicators are proposed for evaluating effectiveness. The operational group includes the median approval time, the share of operations completed without manual re-entry, and the number of overdue tasks. Data quality is characterised by the completeness of mandatory fields, the share of records with a verified source, and the number of inter-system discrepancies. The academic group includes achievement of learning outcomes, timeliness of recognition, and the share of students at risk of academic underperformance. The governance group reflects implementation of decisions, closure of corrective actions, and stakeholder satisfaction.

The overall maturity index of the model can be calculated as a weighted sum of normalised component indicators:

$$M = \sum(w_i \times x_i), \text{ where } x_i \in [0, 1] \text{ and } \sum w_i = 1.$$

The weighting coefficients are approved by the joint governing body. The index should not be used to conceal critical deviations: breaches of data protection, the integrity of assessment, or the legality of enrolment must be displayed separately as blocking risks.

Discussion

The proposed model differs from a centralised platform in that it separates institutional autonomy from shared responsibility. Technical integration without a common data dictionary merely accelerates the transmission of inconsistencies. By contrast, harmonising reference data, statuses, and ownership makes it possible to begin with a limited set of integrations and gradually expand the environment. This is consistent with the OECD conclusion that interoperability includes technical, semantic, organisational, and legal components [2].

The main governance effect arises at transition points between universities. If course recognition, a change in student status, or admission to final assessment is designed as an end-to-end process, the system can check data completeness in advance and assign the task to a specific authorised official. This reduces transaction costs and makes decisions reproducible. At the same time, the quality requirements for regulations increase: a digital workflow cannot compensate for unclear authority.

Implementation risks are grouped into five categories. Regulatory risk is associated with differences in legislation and internal regulations. Organisational risk manifests itself in resistance to transparent allocation of responsibility. Technological risk includes system incompatibility and vendor dependence. Information risk covers errors in reference data, duplicate records, and untimely updates. Ethical and legal risks relate to excessive data collection, opaque automated assessment, and unauthorised access. Mitigation measures include data minimisation, role-based access, logging, regular review of access rights, redundancy, and a procedure for human appeal of automated recommendations.

Implementation should proceed in stages. At the diagnostic stage, a process map and a discrepancy register are prepared. A shared data dictionary, roles, and indicators are then approved. The pilot environment covers one of the most problematic processes, such as the recognition of learning outcomes. After its effects have been evaluated, student lifecycle management, quality assurance, and finance are added. The final stage introduces predictive analytics; however, decisions with legal consequences must remain under the responsibility of an authorised person. Generative artificial intelligence may be used to prepare briefs, identify inconsistencies, and route enquiries, but this requires source control and a prohibition on autonomous decision-making [7].

A limitation of the study is the conceptual nature of the model: its quantitative effectiveness should be tested using data from a specific consortium. Future research should validate the indicators before and after implementation, analyse user experience, and assess the impact of the digital environment on recognition time, the number of discrepancies, and academic outcomes.



Conclusion

Digital governance of a joint educational programme should be built around coordinated processes and data rather than around a single software product. The proposed five-layer model integrates regulatory governance, the programme life cycle, system integration, analytics, and user services. Its core principles are single-point creation of primary data, clearly assigned ownership, version control, an end-to-end digital audit trail, shared indicators, and role-based access.

The practical application of the model makes it possible to shift control from remedying consequences to the early detection of deviations. At the same time, the digital environment does not abolish partner autonomy or collegial procedures; it makes their implementation verifiable. The sustainability of the model is determined not by the number of functions, but by the quality of regulations, interoperability, and the ability of universities to manage change jointly.

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