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REGULATION OF DIGITAL SERVICES IN EDUCATIONAL SERVICE MANAGEMENT

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Digitalisation is changing education at two interconnected levels. The first concerns the educational process itself: learning management systems, video communication, digital libraries, adaptive content, online assessment, simulations, and artificial intelligence tools. The second concerns administration: admission, enrolment, individual study plans, registration for courses, recording of grades, academic mobility, transfer, certification, and verification of educational documents. The first level changes how people learn; the second determines whether the institution can organise, confirm, and protect the results of learning.

The purpose of this study is to identify the main regulatory and organisational principles for digital services used in educational service management. Particular attention is paid to the electronic gradebook, the continuous digital record of a learner's educational pathway, and the movement of a person between institutions and levels of education. The study is based on analysis of Ukrainian regulation and current European initiatives concerning digital student administration and learning credentials. The central argument is that isolated digital products should be replaced by interoperable services governed by common data, legal, and security rules.

A digital educational service is not simply a paper procedure transferred to an electronic form. It combines an administrative process, a user interface, data exchange, an official record, and rules defining legal consequences. For example, an electronic gradebook must do more than display marks. It must identify the course, academic period, assessment type, lecturer, authorised change, date, credit value, learning outcomes, and relationship to the approved programme. The record must remain available for review and appeal and must later support the transcript, diploma supplement, transfer, or recognition of learning.

The traditional paper gradebook reflects a fragmented model in which the student carries evidence between departments. A digital model should create a verified record once and reuse it according to access rights. This makes it possible to calculate

academic progress, identify uncompleted components, confirm eligibility for the next semester, prepare an academic certificate, and support transfer to another programme. Nevertheless, centralisation also creates risks: an incorrect entry can affect several decisions, excessive access can expose personal data, and a technical failure can interrupt both learning and administration.

Ukraine's education information infrastructure is centred on the Unified State Electronic Database on Education. The Law of Ukraine On Education defines it as an automated system for collecting, verifying, processing, storing, and protecting information about the education system (Verkhovna Rada of Ukraine, 2017). The current regulation of the database covers educational institutions, learners, educational documents, student cards, study status, enrolment, transfer, interruption and renewal of studies, academic mobility, academic certificates, and information about progression to the next level (Cabinet of Ministers of Ukraine, 2025). This creates a national foundation for a continuous educational record.

However, a national register and an institutional learning management system perform different functions. The national database should contain authoritative information required for public administration, verification, funding, statistics, and recognition. The university system should support detailed day-to-day processes: schedules, attendance where legally justified, learning materials, assignments, formative assessment, communication, course selection, and internal quality assurance. Regulation must define which system is the primary source for each data element and how verified information is transferred without repeated manual entry.

The movement of a learner between levels of education should be treated as a sequence of interoperable events. Completion of secondary education creates a verified credential; admission establishes a new status; enrolment activates access to institutional services; successful completion of programme components accumulates credits; graduation creates a qualification; admission to the next level reuses verified information. The once-only principle can reduce the repeated submission of documents, but it requires common identifiers, data definitions, validation rules, and responsibility for correcting errors.

European initiatives provide relevant organisational models. The European Student Card Initiative combines a common student identifier, the Erasmus+ application, and Erasmus Without Paper to support secure online administration before, during, and after mobility (European Commission, n.d.-a). The European Learning Model offers a multilingual structure for describing qualifications, learning opportunities, accreditations, and credentials. It is intended to improve interoperability and recognition across institutions and national systems (European Commission, n.d.-b). These approaches show that mobility depends less on a single application than on agreed data structures and trust between issuers and recipients.

European Digital Credentials for Learning are digitally issued records that can represent diplomas, certificates, micro-credentials, and other learning achievements. They are electronically sealed, machine-readable, tamper-evident, and designed for secure storage and selective sharing by the learner (European Commission, n.d.-c). This model is relevant to electronic gradebooks because it separates daily educational

records from formally issued credentials while preserving the possibility of automatic verification. A scanned diploma is only an image; a digital credential contains structured data whose origin and integrity can be checked.

The governance structure should identify a data owner, system administrator, service owner, and authorised data creators. The ministry or another legally designated authority determines national rules and register purposes. The educational institution remains responsible for the accuracy and lawfulness of the data it creates. Teachers confirm academic results within their competence; administrative units verify status changes; technical staff maintain systems but should not alter substantive records. Every change to a grade or status must be logged, attributable, and supported by an authorised decision.

Protection of personal data requires role-based access, strong authentication, encryption, backup, incident response, and limited retention. A student should see their own current and historical information and know which institution created it. A teacher should have access only to the courses and functions assigned to them. Administrative staff need access proportionate to their duties. Regulators and researchers should receive aggregated or depersonalised data whenever individual identification is unnecessary. The right to request correction must coexist with preservation of the audit trail so that an error can be fixed without concealing the history of the record.

Digital educational services should also meet accessibility and continuity requirements. A mobile interface cannot be the only channel for a legally significant action. Students with disabilities, limited connectivity, displacement experience, or lack of suitable devices require accessible web interfaces and assisted procedures. Institutions must establish how examinations, submissions, status confirmation, and document issuance continue during cyber incidents, power outages, or loss of communication. Backup systems are useful only when restoration procedures are tested and responsibilities are known.

Implementation should proceed from process analysis rather than software procurement. The institution should first map the learner's pathway from admission to graduation and identify decisions, data sources, duplication, and legal risks. It should then define a minimum common data model, access matrix, correction procedure, indicators, and integration requirements. Pilot services may include electronic course registration, grade recording, transcript generation, and verification of student status. Expansion should follow testing with students, teachers, administrative employees, and external recipients of credentials.

The effectiveness of digitalisation should be evaluated through outcomes. Relevant indicators include the share of procedures completed without a physical visit, time required to issue a transcript or certificate, number of duplicate entries, correction requests, interrupted transactions, unauthorised access incidents, successful transfers of credits, accessibility compliance, user satisfaction, and continuity of services. The number of installed platforms or electronic forms does not show whether the educational pathway has become more coherent. A system is effective when verified information follows the learner without forcing repeated confirmation and without weakening their control over personal data.

Thus, regulation of digital services in educational management should unite educational policy, administrative law, data governance, cybersecurity, and institutional

quality assurance. An electronic gradebook and a continuous learner profile can reduce bureaucracy, support mobility, and improve recognition of learning, but only when records are authoritative, interoperable, explainable, and correctable. Ukraine's national education database provides an essential legal and technical foundation; institutional platforms should complement it through controlled exchange rather than duplicate it.

It may be concluded that digital transformation of education cannot be limited to online teaching tools. It must also modernise the administrative architecture that accompanies a person through successive levels and forms of learning. The desired model is a learner-centred digital ecosystem in which each achievement is recorded once, verified by the competent institution, available to the learner, reusable for lawful purposes, and protected throughout its life cycle. Such a model connects innovation with legal certainty and makes educational mobility a managed process rather than a sequence of paper confirmations.

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PUBLIC ADMINISTRATION OF ADMINISTRATIVE SERVICE STANDARDISATION ORGANISATIONAL ASPECTS

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The quality of administrative services directly influences how citizens assess the capacity and fairness of public institutions. An administrative decision may be legally correct, yet the service through which it is obtained may remain slow, unclear, fragmented, or inaccessible. Digital channels do not eliminate this problem