

Digitalization and managerial control of street-level action: The case of an Italian Public Higher Institution

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Abstract

This study investigates how the digitalization of the exam recording system in an Italian Public Higher Education Institution (PHEI) impacts the micro-level street-level bureaucrats' discretion in terms of their alignment with hard control rather than soft control mechanisms. Based on the assumptions of Actor-Network Theory and the analytical tools offered by affordance theory, we employed interviews, ethnographic observations of situated practices, and an analysis of key strategy documents. We find a redefinition of street-level bureaucrat role because, in an effort to keep their action aligned with the beliefs system rooted in the institution's control environment, they exercise office-based digital discretion in the form of rule-breaking. The study contributes to the literature about unforeseen implementation dynamics of management control tools in PHEIs due to the action of the organizational soft control system. Moreover, it adds a new nuance to the current debate about the curtailment, enablement, and continuation thesis concerning the impact of digitalization on street-level bureaucrats' discretion, providing evidence of a rule-breaking action that is not aimed at retaining a pre-existing discretionary power despite the constraint imposed by the digital tool, but at generating a new one.

Keywords: Digital Transition, Street-level bureaucrats, Public Sector, Socio-materiality Framework, Actor-Network Theory, Affordance Theory

1. Introduction

The New Public Management reforms have led to significant changes in management control (MC) of public higher education institutions (PHEIs).

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Many studies explore innovations in performance measurement (Marigonda, 2012; Ter Bogt and Scapens, 2012; Aversano et al. 2017; Farneti et al. 2017; Mozzoni et al., 2017; Paolini and Soverchia, 2017; Lamboglia et al. 2018; Francesconi et al. 2020) with a focus on research assesment tools (Avallone et al., 2012; Paolini and Quagli, 2013; Marchi et al., 2014). Other studies deal with general planning and programming issues (Cantele et al., 2012; Allini et al. 2017, 2019, 2020; Macchioni et al. 2024) and implications of: performance budgeting (Ezza et al. 2019); performance-based funding (Francesconi and Guarini, 2017); accounting information system innovations (Paolini and Soverchia, 2013; Gigli and Tieghi, 2017; Tieghi et al., 2018; Coran and Sostero, 2020; Gigli et al., 2021; Coran et al. 2023).

Innovation of MC of PHEIs also implies fundamental reengineering of their processes by embracing digitalization. Digital transformation is essential for controlling processes allowing: the real-time monitoring and traceability of the workflow (Santos and Trigo, 2025); the rapid and accurate analysis of data (Rajabov and ogli Alimov, 2025); the streamlining of administrative tasks and reduction of bureaucratic delays, significantly enhancing overall institutional performance (Alshuaibi, 2023).

Vale et al. (2022) also suggest that, although the development and implementation of MC tools are crucial, such implementation is often partial. This is due to the stakeholders' perceptions/attitudes regarding the importance of such tools. Heinicke and Guenther (2020), for example, find significant differences of perception between heads of administration and academic deans concerning MCs and teaching and research performance. Regarding the implementation and functioning of MC systems in higher education, Lambovska and Angelova-Stanimirova (2025) identified forty-eight challenges systematized into four groups (Growth Threats, Limitations, Malpractices, and Stakeholder Issues). In responding to new MCs, change may proceed along unforeseen lines because organizations enact "a creative process of arranging and translating general prescriptions for use in a specific context" (Ahrens and Khalifa, 2015, p. 106).

This creative process can easily be found when digitalization intersects the action of street-level bureaucrats (SLBs) who are public servants operating as "frontline staff making decisions about other people (citizen-clients)" (Lipsky, 2010). They perform two functions: "the control of policy implementation given existing regulations; and the translation of policy rules to clients given the street-level information on client conditions and expertise on client treatment" (Bannik et al., 2015, p. 206). On the one hand, the introduction of standardizing technologies in public service encounters is destined 'to somehow control, optimize, or delimit the exercise of discretion at the frontline' (Pedersen and Pors, 2023, p. 80). On the other hand, in adapting the control

program to local conditions, they can give rise to a “pragmatic improvisation” (Maynard-Moody and Musheno, 2012, p. 16) because their need to negotiate compromises among a plurality of goals implies ‘spaces of discretion’ (Zacka, 2017, p. 35). The current debate on how digital tools impact SLBs’ discretionary power oscillates between the theses of curtailment, enablement, and continuation, depending on the context (Marienfeldt, 2024).

Our study contributes to this field of research by investigating how the digitalization of an administrative process in an Italian PHEI, the University of Teramo (UniTe), interfaces SLBs’ discretion. Based on the assumptions of Actor-Network Theory (ANT) and the analytical tools offered by the affordance theory, we employed interviews, ethnographic observation, and an analysis of key strategy documents to understand how the digital transformation (DT) of the exam recording system changed the actions of administrative staff. The latter is intended as micro-level street-level bureaucracy serving students by providing administrative services and distributing entitlements. Specifically, the spaces of discretion of SLBs are explored in relation to the dichotomy between the hard control mechanisms introduced by the digital tools and the soft control ones relying on the core values of the control environment.

The study adds to the literature about implementation dynamics of MC tools concerning the administrative activity in PHEIs. A number of scholars have explored the effects of MC systems on the working conditions of academics (Adler and Harzing, 2009; Broadbent, 2007; Modell, 2003; Pop-Vasileva et al., 2011). However, except for Rubino et al. (2017), who analyze managers’ contribution to HEI performance, we don’t know much about the effects on administrative staff. Our study also responds to the need for more research about how the implementation of digital tools influences the MC mechanism of the public sector, where there is “a greater need for quantitative and qualitative studies” (Broccardo et al., 2023, p. 279). In addition, by investigating administrative street-level action in the neglected scenario of PHEIs, for which research is called for (Scholkmann, 2023), the study explores the impact of digital tools on SLBs’ discretionary power, on which literature has not yet reached unequivocal results so far (Marienfeldt, 2024).

The following sections are organized as follows. First, we illustrate the theoretical assumption of the study and the research methodology adopted. Second, we present the case study and discuss the results. The final section outlines the conclusions.

2. Digital discretion, ANT, and the affordance theory

The variability in the behavior of SLBs within digitalized contexts is

defined as digital discretion. Currently, the literature shows contradictory results about digital tools' impact on SLBs' discretion, providing empirical evidence of both curtailing and enabling effects, as well as of ways of coping, (Marienfeldt, 2024). According to the curtailment thesis, digital tools reduce the discretionary power of SLBs and potentially hollow out the essence of their role. The enablement thesis focuses on the potential of digital tools as action resources for public servants to fulfil their tasks and to contribute to more informed judgements. The continuation thesis assumes that, in balancing the principles of universality and particularity, SLBs can also work around official procedures to maintain their professional judgement and make meaningful decisions for particular issues (Marienfeldt, 2024). The type of impact appears to have some variability based on the type of public administration (service-oriented or regulation-oriented) (Evans, 2020; Jensen, 2018) as well as the role of the digital tool in decision-making (Bovens and Zouridis, 2002; Busch and Henriksen, 2018). According to the literature about PHEIs, teachers are driven more by enablement than by curtailment, due to higher degrees of freedom in selecting learning content and pedagogical approaches (Scholkmann, 2020; Venance et al., 2014). Administrative staff is most clearly under the influence of standardized or automated processes and digital tools would seem to limit the freedom to make exceptions, so that discretion can be exerted by “‘bending’ rules, ‘manipulating’ systems, and amending procedures” (Scholkmann, 2023).

In this study, Actor-Network Theory (ANT) provides the ontological perspective to conceptualize the interaction between human and technological actants, while affordance theory is used as an analytical tool to identify how digital technologies structure and constrain SLBs' spaces of discretion in the interplay between hard and soft controls (see Table 1). Digital discretion emerges from the socio-technical interaction between human judgement and the programmed logics embedded in information systems (Bovens and Zouridis, 2002).

Latour's ANT explains how the social and the material interrelate by depicting humans and technologies as mutually shaping entities that together make up multifaceted webs of relations. Just as technologies shape people and societies, people and societies actively build and use technologies (Callon, 1986; Latour, 2005; Law, 2008). Key to ANT is the idea that humans and technologies engage in mutually constitutive networks or “assemblages,” with no preference or distinction between people and things. To stress the non-preferential role in the network, the term actant replaces the term actor because the latter usually refers to a human member. Within the framework of ANT, the issue of actants' discretionary power is addressed relying on the distinction between intermediary

and mediator. This distinction constitutes a crucial theoretical axis for understanding the heterogeneous nature of action in socio-technical networks. An intermediary is an element totally devoid of discretionary power because it transports content without altering it, functioning as a linear and predictable carrier of effects (Latour, 2005). By contrast, a mediator exercises some form of discretionary power because it transforms, translates, or deflects what passes through it, introducing discontinuities and making action intrinsically non-linear and unpredictable (Callon, 1986; Latour, 1996). From this perspective, identifying who acts as an intermediary and who acts as a mediator becomes a fundamental analytical exercise to trace trajectories of power, agency, and stabilization within the network (Latour, 2005).

Affordance theory (Leonardi, 2011) is an analytical tool useful for explaining how materialities influence action. Each artefact presents possibilities for action (affordances) that emerge from the interaction between its material properties and the actor's skills/intentions. Affordance is defined as "the 'multifaceted relational structure' between an object/technology and the use that enables or constrains potential behavioral outcomes in a particular context (Evans et al., 2017, p. 36). According to Leonardi (2013), in interactions between users and artefacts, there are two elements: affordances and constraints, consisting of possibilities of actions or inaction. How and through which configurations affordances emerge is explained by the "mechanisms of affordance" (Davis and Chouinard, 2016; Davis, 2020) that provide the operational taxonomy classifying how technological objects structure the possible action. They do not just afford or not afford but request, demand, encourage, discourage, refuse, and allow. Requests and demands are bids placed by technological objects on user-subjects. Encourage, discourage, and refuse are the ways technologies respond to bids user-subjects place upon them. Allow pertains equally to bids from technological objects and the object's response to user-subjects" (Davis, 2020, p. 65). Request indicates a preference for some line of action over others, while demands render one line of action inevitable and other lines of action implausible. They are to be intended as approximations of the intensity with which technology pushes users in some directions and pulls them away from others. Encourage, discourage, and refuse describe how technological objects respond to users' initiatives in terms of accommodation, deterrence, or blocking. "Allow is distinct from other mechanisms of affordance due to its neutral intensity and multidirectional application. A user may take a line of action, but there is no pressure to do so, and there are no significant obstacles in the way" (Davis, 2020, p. 80).

The way digital infrastructure impacts SLBs discretion has implications for managerial control. Merchant (1982) stated that computers and other forms of automation reduce the organization’s exposure to control problems because they can be set to perform as the organization desires, and they will perform more consistently than human beings do. Currently, there is a debate on the effects and changes that digitalization may produce in MC systems (Broccardo et al., 2023). Concerning the alignment between goals and actions, authors highlighted the key positive role of digital tools (Leonardi and Treem, 2020; Munteanu and Newcomer, 2020). The primary drivers of managerial control changing – removing face-to-face encounters and standardizing routines – are associated with formal, “hard”, bureaucratic control, where the “dehumanized” impersonal execution of rules (Heidelberg, 2024) minimizes discretion. Hard controls, based on formal rules, designed for precision and inflexibility, are often referred to as the “iron cage of control”. Differently, informal, “soft”, controls refer to invisible standards derived from organizational culture and virtues instilled in employees via policy orientations (Lartey et al. 2023). They focus more on enhancing the intrinsic motivation of employees and making use of systems of self-regulation, as well as on getting the most out of people and how they can assist in overcoming challenges. Informal controls rely on intangible elements found in the control environment, where this latter serves as the foundation for the whole control program, often manifest in the governance and leadership approach and embedded in the minds of individuals.

Table 1 - Theoretical Framework Summary

Research Dimension	Theoretic al Lens	Reference	Role and contribution	Key concepts in the study
Ontological Perspective	ANT	(Callon, 1986; Latour, 2005; Law, 2008)	Conceptualize humans and technologies as mutually shaping entities that together make up multifaceted webs of relations	Network Actant Intermediary Mediator
Analytical Tool	Affordanc e Theory	(Davis and Chouinard, 2016; Davis, 2020)	Provides the specific mechanisms through which technological objects structure the possible action of human actors	Request, Demand, Encourage, Discourage, Refuse, and Allow
Contextual framework	SLBs’ Digital Discretion	(Marienfeldt, 2024)	Contextualizes how PHEI’s administrative staff exercise discretion in response to digital transition in the interplay between hard and soft controls	enablement thesis curtailment thesis continuation thesis

The difference between hard/coercive and informal/soft controls reflects the tension between the comprehensiveness of rules (principle of universality) and the retention of space for discretion and judgement about the rules (principle of particularity) that define street-level work. When applying the principle of particularity, they are called to “operationalize” the organizational culture and core values, leveraging on their competence.

3. Method

Case studies, interviews, and ethnography are well-established methodologies for studying frontline public service bureaucracies (Broccardo et al., 2023). We selected UniTe for a descriptive case study because it belongs to the class of small universities and has a unique central ICT area, allowing digitalization to be observed as a process involving the whole organization in a uniform and integrated manner. Large universities usually have departmental ICT areas in addition to the central ICT. Consequently, in DT projects, they usually experience different timeframes and methods. In this way, it is possible to observe and describe a single control system that relates to the actions of all the SLBs involved in the DT process.

We adopted a multi-method qualitative approach (Wellman, 2023) based on an analysis of key strategy documents relating to the digitalization project, interviews, and ethnographic observation of situated practices.

The documentary analysis focused on three types of documents from the organization studied: Strategic Planning Documents, Execution Documents, and Results Report Documents. It was functional to contextualize the DT of the exam recording system observed in the case study, within the whole DT strategy of the PHEI, and to review all the actors and goals connected to the specific project observed.

Two unstructured and twelve semi-structured interviews involved the ICT area and the DT Manager (DTM), Student Service Office (SSO), and Departmental¹ Staff (DS), as well as teachers and students, with an average duration of 41 minutes (see Table 2 for the full schedule). The street-level bureaucracy of PHEIs includes teachers as well as personnel from the SSO and the DS (Maynard-Moody et al., 2003). However, in the DT case investigated, the teachers are only the end-users of the new digital tools, and their discretionary power in their educational role is not in play. Our analysis

¹ Departments are affiliation structures of academic management of teaching and research.

focused on the DS and the SSO, which are composed of micro-level SLBs operating in service-oriented organizations (Jensen, 2018).

Table 2 Record of Conducted Interviews

Date	Organizational unit	Position	Type of interview	Duration
March 7, 2025	SSO	Head of the SSO	unstructured	50 minutes
March 14, 2025	ICT area	DTM	unstructured	57 minutes
March 24, 2025	Academic Staff	First-cycle degree teacher	semi-structured	34 minutes
March 24, 2025	Academic Staff	Second-cycle degree teacher	semi-structured	37 minutes
April 14, 2025	DS	Department A Officer n.1	semi-structured	45 minutes
April 14, 2025	DS	Department A Officer n.2	semi-structured	50 minutes
April 29, 2025	ICT area	ICT area operator	semi-structured	52 minutes
April 29, 2025	ICT area	DTM	semi-structured	51 minutes
May 6, 2025	SSO	SSO operator n.1	semi-structured	23 minutes
May 7, 2025	SSO	SSO operator n.2	semi-structured	20 minutes
14 May 2025	SSO	Head of the SSO	semi-structured	55 minutes
22 May 2025	Student body	First-cycle degree student	semi-structured	22 minutes
22 May 2025	Student body	Second-cycle degree student	semi-structured	25 minutes
26 May 2023	DS	Department B Officer	semi-structured	53 minutes

We selected participants' profiles based on their use of the digital tool investigated. Interviews have been employed to acquire data about the perceived "mechanisms of affordance". We adopted a thematic analysis approach, and the coding process was twofold. First, deductive coding was employed using a predefined codebook based on affordance mechanisms (request, demand, encourage, discourage, refuse, and allow) as a priori codes. Second, inductive sub-coding allowed for the identification of unexpected perceptions concerning the affordance mechanisms, ensuring that the participants' authentic experiences were fully captured. This iterative process ensured both theoretical alignment and empirical richness. Analyzing the responses to see which mechanisms emerged did not require

the use of software. All the themes have been subjected to a triangulation process to verify their consistency across the dataset. Specifically, a theme was considered validated only when evidenced by at least three different interviewees, thereby ensuring that the findings reflected shared perceptions rather than isolated experiences. Interviews have been conducted until thematic saturation was reached, whereby all the interactions among the human and technological actants were identified, and new themes stopped emerging (Kvale and Brinkmann, 2009).

In the spirit of ANT, during the interviews, we “follow the actors” and their descriptions of the technology and their own agency. However, we also needed to devote attention to the ways in which technological actants are allowed to “speak” (Callon, 1986) by complementing our analysis with factual descriptions and a researcher’s walk-through of the control mechanisms. Thus, in addition to interviews, we conducted 50 hours of shadowing across a subset of the people interviewed. Specifically, we followed the Head of the SSO (20 hours), the Quality and Teaching Support Officers for Department A (20 hours), and the DTM (10 hours) during their daily routines, with discretion and a non-participant observation mode, to observe real-time interactions with the new digital system. Field notes were taken to record behavioral patterns and workflow adjustments. Methodological triangulation was achieved by comparing interview transcripts with field notes from shadowing sessions. This ensured that the perceived effects of the DT were consistent with actual organizational behavior. Our focus was on how the whole network is constituted in everyday practice. In so doing, shadowing, through experiencing and participating in social life in settings studied, was functional to generate knowledge about connections, disruptions, and intersections in the new network enacted by the DT to come to a description of the ‘many links between many different things’ (Agar, 2004, p 17). It allowed us to be critically cautious of assuming any a priori principle stated by the interviewees and made us attentive to the ‘big picture’ (Latour, 2005, p. 187).

4. The case study

4.1 *The digital transition in UniTe and the new exam recording system*

UniTe is a small Italian PHEI, with around 5,000 students, 5 departments, 23 Degree Programs, more than 20 Masters and 6 Specialization Schools.

As stated in the three-year plan for digital transition (UniTe, Piano Triennale per la transizione digitale, 2023-2025), hereafter PTDD 23-25, UniTe has adopted the strategic macro-objective “of encouraging computerization and digitalization to promote the streamlining of procedures” (PTDD 23-25, p. 4) in compliance with national directives. The process of transition has accelerated with the Covid-19 pandemic which has given rise to a “University Digital Infrastructure Enhancement Plan 2021-2023” and the appointment in 2021 of a DTM with a prominent role in the implementation of digital initiatives. The support structure of the DTM is represented by the ICT area of the university, the unique organizational unit of the university devoted to ICT technologies, with a total of 8 staff units.

UniTe privileges traditional teaching over e-learning so that the PTDD 23-25 intends the DT in terms of administrative procedures and, specifically, of those relating to the services provided by the SSO. Among the latter, the PTDD 23-25 gave a prominent role to the total dematerialization of the exam recording system which started in 2006, still in the intermediate stage in 2023, and finally ended in 2024. This system interfaces with the students, teachers, the ICT area, DS, SSO, Protocol Office (PO). The final users are the teachers and the students, while the other parts provide services.

The DT went through several stages and saw, between the initial and intermediate stages, the replacement of an old proprietary software with the platform ESSE3 developed by Cineca, a consortium of publicly owned entities, that develops information systems for universities. The outcome of the DT was the transition from a 100% paper-based procedure to a totally dematerialized one.

4.2 The virtual network organization for exam recording and its mechanism of affordance

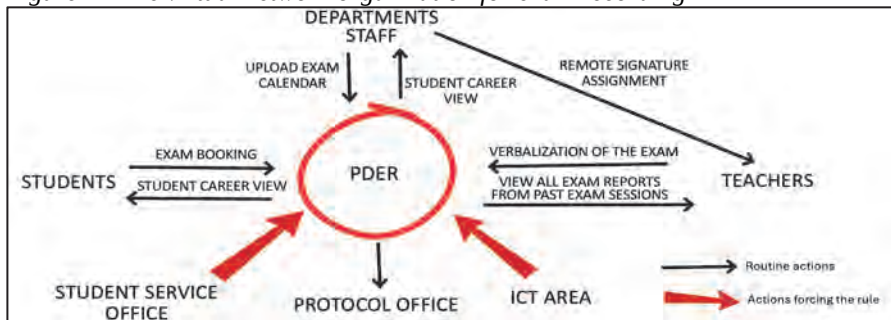
The digital platform for exam recording (DPER) adopted by UniTe is a standard digital tool developed by Cineca for all Italian PHEIs.

It generates a heterogeneous network of humans and digital technologies (Law, 1992) that has the properties of the virtual organization, i.e., an informational space or platform “which coordinates flows and processes of information and communication in order to create collective action between a group of actors” (Bekkers, 2004, p. 4). It matches the model of the federative virtual organization, “handling administrative tasks, routines and procedures, which in the case of the public organizations are based on the

execution and enforcement of public rules and regulations” (Bekkers, 2004, p. 7).

Within the network, the DPER enforces its own rule of conduct on teachers, students, departments, the protocol office, and the digital archive (see Figure 1).

Figure 1 - The virtual network organization for exam recording



Source: The authors

The human actants of the network perceive the DPER in terms of the whole range of mechanisms of affordance (request, demand, encourage, discourage, refuse, and allow), with the exception of “request” and “encourage”. When asked the specific question, all respondents stated that they do not feel encouraged to take any kind of action when interacting with the DPER and that it does not request but imposes.

The “allow” mode involves the perceptions of all the human actants of the network depending on their role in the system.

From the end user’s perspective, the student can book the exam remotely, and the teacher can have a direct line to the examinees because they are allowed, with one click, to send emails to all students booked for an exam session, or to subgroups of them, a practice that makes it easier to organize a multi-day exam or changes in dates and times.

From the other involved parts of UniTe, the use of the DPER allows:

“the total elimination of paper, and consequently of the risk of losing an exam report; the immediacy of the publication of the exam grade, the reduction of costs for the conservation of exam reports (about 60,000 per year), which were first collected in a paper file and then sent to a place for a fee and to be kept as long as required by law; the elimination of administrative steps burdening teachers, the SSO and those who managed the conservation of paper documents” (DTM, 14 March 2025).

Concerning the remaining mechanism, first of all, the DPER demands authentication for all the human actants of the network and, above all, it demands the student to book the exam, a condition without which there is no way to record the exam, even if the teacher decides to exercise a discretionary power by allowing the student to take it without a reservation.

More generally, it demands that anyone follow a prescribed rule of conduct for everything to work:

“All the configurations on the teaching side cannot have errors because what the student sees in her/his study plan must be perfect; otherwise, this whole process does not work” (DTM, 14 March 2025).

“To book the exam, the student must have an approved study plan, which is, uploaded to her/his virtual file,² approved, and only then s/he can they book the exam based on what they have in their study plan. So it is a team effort. It must be well organized, but it is a team effort. If the SSO does not work well, there are also problems in booking exams. If the department does not work well, the same thing happens. So if the student books the wrong exam, then a wrong report is made, and the teacher often notices it later” (ICT area operator, 29 April 2025).

Thus, the DPER establishes a rule of conduct for human actants' action which goes beyond the confines of its operating area and includes a series of upstream operations whose proper execution determines the smooth flow of the process managed by the platform.

It also limits the teacher's discretion regarding the organization of the exam session because the DPER discourages them from formalizing a complex organization of the exam session:

“The DPER discourages having three exams uploaded on three consecutive days because it makes no sense. Some teachers have done it before. For example, they set it so that, on the first day, I do it for freshmen, on the second day for those who have to make up, and on the third day for failing students. There were some teachers who had dedicated exams uploaded in this way. Yes, it can be done, but then it becomes very laborious for the teacher himself because he has to check if the student belongs to one category rather than another, and therefore it is more difficult for him to do all these checks” (ICT area operator, 29 April 2025).

Finally, it refuses action to the student that does not adhere to the prescribed rule of conduct, e.g. s/he will not be allowed to book the exam or

² The SSO uploads the exams required by the student's study plan to the student's virtual file.

to see the exam grade if s/he is not up to date with fees or the exam is not included in her/his study plan, or s/he has not filled out the questionnaire for the evaluation of teaching activity. In the pre-digitalization system, it happened that the student took the exam and the SSO only noticed that s/he was not in order when the exam result must be inserted in the folder containing the student's career. In this situation, the exam was cancelled, leaving the teacher the discretion to re-register it during a subsequent exam session, once the student had rectified her/his position.

All these perceived mechanisms of affordance describe hard control mechanisms internally consistent with efficiency and effectiveness objectives of the service offered. However, we also find a "refuse" mode that puts the whole virtual organization under stress because it collides with the institutional logic guiding PHEI's administrative staff, based on public service mission and procedural rationality (Boitier and Riviere, 2016).

First of all, the DPER refuses action aimed at correcting some human errors. The system is perceived as unable to handle the error internally, and operators feel obliged to force the rule from outside. When uploading the training offer, the exam calendar and the exam commissions,

"the margin of error is very high" (DS B, 26 May 2025).

In managing hundreds of exam sessions,

"it's very easy to get a date or a time wrong" (DS A, 14 April 2025).

Also, the matching of the exam with the examination board often signals errors. This kind of error is routinely solved by the SSO and DS by re-entering the DPER. On the other hand, the teacher may make mistakes in verbalizing exams. When the student or the teacher reports it to the SSO (more often) or the DS (less often), the SSO must digitally reopen and make the exam report editable. More complex situations may appear:

"The DPER forces us to have the student classified according to the year of regulation of the course of study and a cohort year, that is, the beginning of the course of study for the student. If the cohort year is not done well compared to the regulation year, it gives an error, mh. And it does not even see the study plan, the student cannot make a compilation of the study plan, cannot have his own file, and you cannot even send it to the registry office. So, this year of regulation, this cohort year must be calculated well. Otherwise it is blocked. The student is

blocked. [...] In this case, I must formally request the intervention of the ICT area". (Head of SSO, 14 May 2025)

Secondly, the DPER refuses some actions that are requested by the belief system rooted in the control environment of UniTe. This type of refusal is not considered acceptable by the micro-level SLBs who implement strategies to force the rule.

One of the core values of UniTe system of beliefs is summarized in the sentence: "seeking the most favorable solution for the student, where possible" (Head of the SSO, 14 May 2025; DS A, 14 April 2025; DS B, 26 May 2025). This is an inspiring principle of all UniTe policies. It has been part of the organizational culture for years, and it is repeated like a mantra every time the operator is called upon to resolve a dilemma between administrative correctness and student experience.

In the name of this principle, the micro-level SLBs decide to force the DPER in different cases. When the DPER refuses action because the student is not up to date with taxes, the SSO calls and invites the student to comply, even if out of time, and, once compliance has been verified, "unlocks" the DPER. In the case of conditional access to a degree course, the student may have two careers open at the same time, one for the exams to be taken in order to access the degree course, and the other for having conditionally enrolled in the degree course. To activate both careers, s/he paid the fees:

"If after one year the student has not been able to take the exams to access the degree, because many times s/he may also have personal problems, well, then I move the first instalment paid (also the second, third, fourth paid) to the following year. However, it is a job that I do as SSO also to not create complaints to the student" (Head of SSO, 14 May 2025).

The study plans are partially customizable by students who have a time window within which to select the exams of their choice on the DPER. This selection makes the exam bookable.

"We always meet the student's needs [...] if the time window expires on April 30th and s/he changed her/his mind on May 2nd, we make her/him do it" (Head of SSO, 14 May 2025). Thus, in this case, both the DS and SSO carry out a discretionary assessment about the possibility of modification because "it doesn't make sense that you ask me every day to change the exam, it's not correct because theoretically, you can't do it" (Head of SSO, 14 May 2025).

UniTe system of beliefs also includes inner rules of administrative

correctness that collide with the rule established by the DPER. In addition, the micro-level SLBs force the DPER's rule when:

“it is not compliant with the behavior that is administratively required of the operator” (Head of the SSO, 14 May 2025).

When you have a newly activated degree program, the DPER visualizes only the first year but not the following years of the course. If the student benefits from a career shortening and exams are recognized in the second or third year, the resolution of recognition of the exams cannot be uploaded.

“So, with a new degree program, the DPER imposes on me a behavior that in reality does not reflect my administrative behavior” (Head of the SSO, 14 May 2025).

This is because the board of the course of study, first, and of the Department, later, have decided to recognize exams placed in subsequent years of the course of study. The decision is formally delivered to the SSO, but the SSO can't record it. It should keep the file for a year or two and wait for the DPER to activate the years involved.

“But we don't actually do that [...] Yes, there are administrative acts that we upload, we force it, let's say, the system. We found the loophole (Authors' note: with the support of the ICT area) [...], but it is not the optimal solution because, in the following years, errors can be created” (Head of the SSO, 14 May 2025).

The error is generated because, when the DPER activates the following years, it does not recognize the exams forcibly uploaded by the SSO with the necessity to make adjustments to the student's file.

5. Discussion

The process regulation in both the pre-digitalization and totally digitalized system relies on hard controls and does not assign any discretionary power to the actants. Specifically, micro-level SLBs are assigned the role of intermediaries in the network of relations between people and technologies. The intermediary “transports meaning or force without transformation: defining its inputs is enough to define its outputs” (Latour, 2005, p. 39); in other words, a ‘placeholder’ that merely does what anyone else in its position would do (Latour, 1992: 229).

We adopted the ANT metaphor of the heterogeneous network (Law, 1992) suggesting that organizations are all effects generated in patterned networks of diverse (not simply human) materials. In such a context, the DT represents a process of heterogeneous re-engineering, replacing a network package with a new one and inducing a social re-ordering. In the case investigated, the social re-ordering consists of an enhancement of coercive control over the workflow because it entails an abrogation of individual autonomy, leaves no room for error, and deviation from the standard procedure. It has been designed to force compliance by the actors involved and make the whole work process foolproof.

In the interaction with the new technology, the human actants perceive the whole range of mechanisms of affordance contemplated by the theory (Davis and Chouinard, 2016; Davis, 2020), with the exception of the “encourage” and “request” mode, signaling the perception of flattening human action on the rule provided by the DPER and of being inside a “iron cage” of digital control compared to the pre-digitalization system:

“the more you digitize, the more you can’t say ‘Oh, ok, I made a mistake, I’ll correct it,’ or you say to the student, ‘Ok, I’ll verbalize it for you on a piece of paper’ [...] to fix this, with the paper procedure you could skip some steps [...] with the digital procedure you cannot skip them” (DTM, 14 March 2025).

Also, it implies the SSO exiting the system, depriving its SLBs of any role in the process of exam recording, while acting in upstream and downstream tasks of the process.

However, at some points of the network, the coercive control collides with informal control mechanisms, i.e., invisible rules (the student’s interest and administrative correctness) rooted in the control environment of UniTe. In other words, the DPER generates points of tension between two of the control levers theorized by Simon (1995), i.e., belief system and boundary system. The DPER serves as boundary system because it prevents deviations from standard procedures, defines the operational space since the human actant can only move within the fields and functions foreseen by the software, and leaves traces, making the boundary “visible” and any violation immediately detectable.

In the lack of coherence between hard and soft controls, the latter take over through forms of digital discretion activated by micro-level SLBs (SSO, and DS to a lesser extent), alone or supported by the ICT area in the most complex cases. In the cases observed, they decide to break the rule established by DPER by forcing DPER itself, relying on the ICT area’s support to identify the most suitable technical solution for the purpose.

Specifically, they develop an office-based discretionary response to standardization falling within the scope of the adaptive handling (Pedersen and Pors, 2023).

The only forms of digital discretion emerging from the case investigated fall into the category of workarounds, that is, goal-driven changes to an existing work system in order to overcome, bypass, or minimize the impact of aspects that are perceived as preventing that work system from achieving a desired level of efficiency and/or effectiveness (Alter, 2014). The literature on workarounds considers them negatively, when they are associated solely with noncompliance, and positively, when they are a source of innovation and improvement. In any case, they are explained as the result of a perceived misalignment between required processes, perceived organization and/or local units' goals, and/or personal interests (Alter, 2014; Bozeman, 2022; Soffert et al., 2023). In this case, there is a perceived misalignment between the required process, imposed by digital coercive control, and the perceived organizational goals as emerging by the soft control mechanisms, which leads to "tweak the system" by circumventing constraints.

Thus, in a heterogeneous network designed to leave no digital discretion on the part of human actors, the latter take possession of it in the name of the "ethics of office" instilled by the organization. While the DPER would like human actants to be intermediaries, this exercise of digital discretion makes the micro-level SLBs mediators within the network of humans and digital technologies. Mediators means that their 'input is never a good predictor of their output. Their specificity has to be taken into account every time. Mediators transform, translate, distort, and modify the meaning or the elements they are supposed to carry' (Latour, 1987: 39).

The literature considers circumventing an information system and using it differently than intended as a manifestation of power (Beerepoot et al., 2020). Within the DPER, the SLBs belonging to the SSO take on a mediation role and exercise a power that they did not have before because they must define, in conjunction with the ICT area, non-compliance methods that are technically compatible with the rigidity of the digital tool, re-designing the system architecture. Workarounds are in this scenario a form of empowerment of micro-level SLBs.

6. Conclusions

This study contributes to the literature about unforeseen implementation dynamics of MC tools in PHEIs where empirical studies are mostly focused

on research and/or academic performance (Guenther and Schmidt, 2015; Xaver and Thomas, 2019). Rosalina and Jusoh, R. (2025) also argue that there is a lack of studies discussing how beliefs control systems, are associated with individual work-related outcomes in HEIs and this research provide an example of how MCs are “shaped by social environments” (Ahrens and Khalifa, 2015, p. 106). The investigated scenario shows the facing of one of the challenges of MC systems in HEIs systematized by Lambovska and Angelova-Stanimirova, (2025): technological integration in the form of inadequate infrastructure. The perceived inadequacy of the digital tool lead SLBs to approach an increase of coercive control with workarounds breaking out of the iron cage (Huuskonen and Vakkari, 2013) so that more coercive control doesn’t imply more control over discretion. Workarounds here are legitimized by organizational soft control mechanisms. The literature exploring forms of soft control that reinterpret or neutralize digital hard control is still under development (Johansson, 2025). Some studies provide evidence of how SLBs react critically to digital hard controls, ignoring or reinterpreting them, based on professional judgment. Mostly, cognitive and adaptive resistance practices are explored: bypassing or not automatically following. This happens when the SLBs simply ignore algorithmic advice in a decision-making task (Soares et al., 2024) or change the relationship with data (data discretion) in determining how and to whom they deliver services (Gordon et al., 2024). Our case study contributes by presenting a previously unexplored workaround mode in the neglected scenario of a PHEI where the DT replaces the previous hard control system with a new inflexible one. The PHEI control environment does not limit itself to directing micro-level SLBs’ discretion but triggers it where it is not foreseen because it is considered necessary to restore the coherence of the whole system with the core values of the organization. The result is that soft control leads SLBs to technically re-interpret hard control by literally forcing the digital tool. This kind of soft control relies on the SLBs’ ethics of office envisaged by the studies presenting an appreciative perspective on frontline discretion in public-service encounters (du Gay 2000, 2009; Hennis 1988; Møller et al., 2022; Pedersen and Pors, 2023). This is because the occupancy of a public office is dependent on “the cultivation of an ethics of office, or role-morality, to support the practical wisdom needed to responsibly balance various often conflicting virtues and concerns in the frontline encounter” (Pedersen and Pors 2023, p. 81). The SLBs discretionary practices, when inspired to the ethics of office, are a precondition for equity, equality, and fairness in case-handling.

Moreover, the case study adds a new nuance to the current debate about

the curtailment, enablement, and continuation thesis concerning the impact of digitalization on SLBs' discretion (Marienfeldt, 2024). At UniTe, the DT forces the micro-level SLBs to exercise a discretionary power they did not have before (enablement). However, this effect takes place by means of modalities contemplated in the continuation thesis (rule-breaking and rule-bending). It demonstrates that rule-breaking is not necessarily a strategy to retain discretionary power despite the constraint imposed by the digital tool, but that gives rise to a new discretionary power, under the diktat of soft control mechanisms. Paradoxically, more (digital) rules may create more discretion (Evans and Harris, 2004). This effect has rarely been studied for PHEI's administrative staff (Scholkmann, 2023) because the literature has explored it especially for social and healthcare workers, police officers, and teachers.

Limitations of this study may stem from its highly contextualized analysis of an immersive single case study. The affordance theory invites to consider the conditions of affordance, i.e., under what circumstances affordances work (Davis and Chouinard, 2016; Davis, 2020). Our case study concerns a small PHEI characterized by an under-sizing of the administrative staff so that multiple roles are concentrated in the same person. The Head of the SSO is also the Head of the statistics and data processing office, while the DTM is also the Head of the ICT area and of the cyber security service. This circumstance causes a shortening of the end-to-end passages with peculiar consequences on the micro-level SLBs' response. Future research in more structured organizational contexts could add to the insights presented here.

In terms of theoretical implications, the research sheds light on how the institution's core belief systems (soft controls) influence digital transformation even when the latter imposes a hardening of controls (automated workflows, rigid software). It suggests that the "micro-level" behavior of workers is guided more by deeply rooted organizational beliefs than by the technical constraints of new digital tools, so that bureaucrats act as mediators who use rule-breaking to re-align these two forces. In terms of managerial implications, managers should recognize that a fully digitalized process is the most extreme form of boundary system, as it transforms bureaucratic rules into algorithms. If not carefully designed, it risks preventing handling special cases that the institution's values would require treating differently. If the system prevents people from fulfilling what they perceive as their core mission, they will likely bypass the system to get the "right" work done.

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