An Ontological Framework for Responsibility Coordination in the Student Evaluation Processes: A Case Study from the Sabaragamuwa University of Sri Lanka

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Abstract

In Sri Lankan Higher Education Institutions (HEIs), student evaluation and monitoring processes remain difficult to manage due to the absence of a unified framework and systematic approach. Student Evaluation (SE) practices vary considerably across disciplines and faculties, driven by institution-specific and subject-specific policies, with inconsistencies particularly evident among arts, science, and commerce stream, even within the same HEI as observed at Sabaragamuwa University of Sri Lanka. This study employed a hybrid research design that integrated the Design Science Research Methodology (DSRM) with the Interpretative Phenomenological Analysis (IPA) approach. The research resulted in the development of an Ontological Framework for Responsibility Coordination (OFRC), created to support the entire SE process. However, the applicability of the framework was validated only within the selected Pre-Student Evaluation Phase of the HEIs. The results confirm that the proposed ontology provides a complete and consistent representation of student evaluation actors, activities, and responsibilities, with expert validation supporting its correctness and practical relevance. Explicit modelling of responsibility coordination was shown to improve accountability, transparency, and traceability, providing a validated foundation for the design of digital and Information Technology (IT) enabled student evaluation systems. The research implications are such that this framework is intended for use by system developers, offering a structured foundation that can be directly adopted during system design and implementation. Further, its integration is foreseen to bring several promising benefits, especially in supporting the digitization of evaluation processes. Among many others, such advantages include increased reliability, heightened operational efficiency, smoother workflows, and increased productivity for students and academic institutions in general.

Keywords: Evaluation and Monitoring, Higher Education Institutions (HEIs), Student Evaluation (SE), Process Ontologies, SE Responsibility Coordination Matrix

INTRODUCTION

The Sri Lankan public higher education system encompasses more than fifteen national universities, each with several faculties offering degree programs in Arts, Science, Management, and many other disciplines. The Sri Lanka Qualifications Framework stipulates a standard structure for Student Evaluation (SE) and for the award of qualifications, while academic quality and institutional compliance with established standards are guaranteed through the Quality Assurance and Accreditation Council under the University Grants Commission (UGC).

Although there is a continuous effort towards the harmonization of the education model, there is a significant heterogeneity among universities in undergraduate testing procedures, examination practices, and monitoring processes of evaluation systems.

The attempts toward harmonization notwithstanding, transparency, accuracy, and accountability in SE do not have access to centralized and automated processes across Sri Lankan Higher Education Institutions (HEIs). Neither does any existing system of SE establish responsibility, nor is workflow tracking carried out effectively.

However, persisting inconsistencies in the current system continue to create serious difficulties in establishing uniform and fair procedures of final evaluation at undergraduate programmes. Besides, the lack of adequate monitoring functions and an institutional operating mechanism in the existing SE system limits efforts towards pursuing standardization in the higher education sector. In view of these limitations, this research proposes the development of an Ontological Framework for Responsibility Coordination in SE. This

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study is predicated on three key elements, namely: (1) developing a classification of sub-activities in respect to pre-evaluation work, (2) developing a theoretical framework in relation to responsibility coordination, and (3) illustrating the practical application of the suggested framework using matrix-based applications. Accordingly, this study develops a structured methodology for designing Information Technology (IT) enabled solutions to enhance implementation accuracy with a minimum of human error, increasing efficiency and ensuring fairness in the evaluation of undergraduate performance in Sri Lankan universities.

Despite the presence of regulatory instruments such as the Sri Lanka Qualifications Framework (SLQF) and the Manual of Procedure for the Conduct of University Examinations (University Grants Commission, 1983), prior studies report persistent inconsistencies in assessment practices, responsibility allocation, and result compilation across Sri Lankan HEIs (Gunawardena, 2019; Perera & Ranasinghe, 2020). These inconsistencies are particularly evident in pre-evaluation activities, where responsibilities are implicitly assumed rather than formally defined, leading to delays, duplication of effort, and accountability gaps. However, existing literature does not provide a formalized, ontology-based approach to model student evaluation processes or to systematically coordinate responsibilities using established role assignment frameworks. This gap motivates the present study, which seeks to address the absence of structured responsibility coordination mechanisms in Sri Lankan student evaluation systems.

LITERATURE REVIEW

As for the assessment of undergraduate performance and even compiling the final results and performance based on specific courses, very little research has been carried out within the Sri Lankan university system. In fact, although the research backdrop is from outside Sri Lanka, the theoretical and methodological implications are essential for the definition of the digital assessment system and the accountability frameworks within the Sri Lankan higher education sector.

The 'Manual of Procedure for the Conduct of University Examinations' developed by the UGC in 1983 remains the guiding document that has the ability to influence the examination systems across the country of Sri Lanka. The manual comprehensively addresses the structure relating to transparency, consistencies, and confidentiality of the process and provides guidelines. The document is very supportive of transparency and confidentiality and does not deal with the issues of digital transformation of responsibility frameworks.

Recent studies have focused on the clarity of roles and accountability in an evaluation system. RACI itself an acronym for a standard set of role categories Responsible, Accountable, Consulted, and Informed in organizational and project management contexts-is well-known through versions such as PACSI (Perform, Accountable, Control, Suggest and Informed), RAPID (Recommend, Agree, Perform, Input and Decide), RACIQ (Responsible, Accountable, Consulted, Informed and Quality), and RASCI (Responsible, Accountable, Support, Consulted and Informed). The following sets of studies have identified that RACI, in the context of IT, healthcare, construction, and public sector projects, reduces ambiguity, promotes coordination, and results in much improved team communication. Case studies by Lee et al. (2021) and Suhanda and Pratami (2021) point at the practical benefits of RACI within multi-stakeholder environments with some limitations-the latter, in particular, within organizational cultures expecting flexibility rather than rigid accountability structures.

Other frameworks, such as the Business Motivation Model of Object Management (Object Management Group, 2015), assert that business rules and directives require formalization so as to guide organizational behavior. Such framework supports the reasoning behind why academic evaluation systems need structured digital governance and policy enforcement. For instance, *Business Motivation Model (*BMM)-style rules might define decision boundaries, just as in the case of business directives prescribed in the form of operational policies.

Since then, research studies have contributed comprehensively to understanding student evaluation on university campuses, with a dominance of student attitudes, learning processes, and outcomes, and with little concern for evaluation and its relationship to university governance, responsibility coordination, and strategic alignment. Recently, Stravakou, (2024) has investigated evaluation and assessment processes and practices for university students in Greek universities, finding that even though more traditional evaluation processes still occur, students appreciate and find useful more diverse and authentic evaluation processes and methods, such as projects and research evaluations. Nonetheless, this study detects a series of disclosed problems regarding inconsistency, subjectivity, and lack of evaluation transparency at the department and instructor levels, indicating flaws and weaknesses in current evaluation processes and systems. By contrast, a more recent study has been published in the Journal “Assessment and Evaluation in Higher Education”, which investigates student evaluation processes and practices in research universities from the perspective and through the voices of institutional actors, finding, through its comprehensive methodology and research approach, that evaluation processes and practices occur and are shaped through social constructivism, discipline cultures, institutional priorities, and power relationships, rather than following institutional standardization and systematic governance. Even though this research provides valuable indications and suggestions for a better understanding of evaluation processes and practices from a constructivist perspective, still, it does not provide systematic processes for responsibility allocation and for adjustment and alignment with institutional objectives and aims (Boud & Molloy, 2013).

By contrast, a study more recent and relative to this discussion has been conducted, termed “Evaluating Students’ Involvement in Research Projects”, investigating, through a comprehensive study, undergraduate students’ participation in research projects, with valuable outcomes and conclusions regarding their positive influence on improving their academic skills, critical thinking, and engagement, and more specifically emphasizing enhanced learning and working effectiveness and productivity (Huet et al., 2009). Still, this study points to a series of difficulties and problems related to a lack of institutional and supervisory support and structures, reflecting, thus, a lack of established systematic responsibility coordination processes and procedures.

Sri Lankan studies reveal fragmented and inconsistent assessment and grading practices in higher education institutions. None of the regulatory bodies, including SLQF and Quality Assurance and Accreditation Council (QAAC), describe processes for digital result compilation, approval workflows, or allocation of responsibilities, even as they set standards (Gunawardena, 2019). The studies on Information and Communication Technology (ICT) adoption establish a certain level of readiness to adopt digital solutions in education, but none of the Sri Lankan universities has put in place an integrated electronic evaluation system with accompanying policies on responsibilities (Perera & Ranasinghe, 2020).

Design approaches in the area of ontology systems have been broadly employed for knowledge representation in a domain, representation of actor-role relations, and achieving semantic interoperability for complex information systems. Principles for engineering an ontology usually includes notion extraction, definition of a class hierarchy, representation of relations, definition of constraints, and validation (Gruber, 1993). In higher education, various e-learning systems, curricula, or e-assessment systems related to learning have employed ontologies for improvement in automation, semantic interoperability, or ease of governance. Current approaches to represent in ontologies hardly address responsibility coordination, let alone adopt role allocation representations, for example, RACI, in evaluation processes. Current studies on ontologies in related research have underplayed the aspect of validation with actual stakeholders, especially in the realm of student evaluation in higher education institutions (Staab & Studer, 2009; Uschold & Grüninger, 1996).

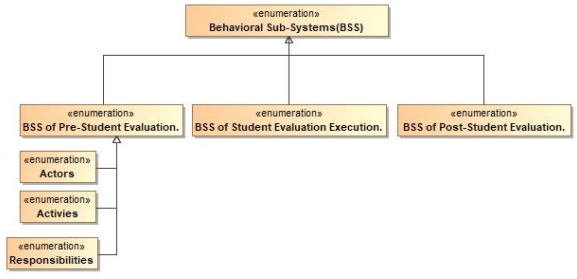
However, there are no studies found in the Sri Lankan context to investigate SE using RACI and BMM and, as a result, there is clear research gap here. By using these standards, we can identify the processes and activities of student evaluation and responsibility coordination.

Manual Assessment Systems (MAS):

Universities rely on Manual Assessment Systems (MAS), processes characterized by their complexity and time-intensive nature. The framework comprises multiple stages that unfold over an extended period, often obscuring a clear understanding of the overall workflow. To address this challenge and to support the development of an IT-Based Solution (ITBS), this study proposes a structured framework for assessment processes.

Prevailing Manual Assessment Systems (MAS) could be categorized into three specific sub-processes [Figure 1] corresponding to different stages, Pre-Evaluation, Evaluation Execution, and Post-evaluation.

Figure 1: Behavioral Stages of Manual Evaluation System.



Source: Developed by the Author, 2025.

I. Pre- Student Evaluation Phase (PSEP):

This process commences with the Manual Assessment System (MAS) at the first phase, where it is required to design the assessment criteria, obtain the necessary approvals, and issue relevant appointments.

II. Student Evaluation Execution Phase (SEEP):

The second stage is the Student Evaluation Execution Phase (SEEP) that occurs after the pre-Student Evaluation stage is over. Its purpose is to conduct the evaluation within the approved procedures and guidelines.

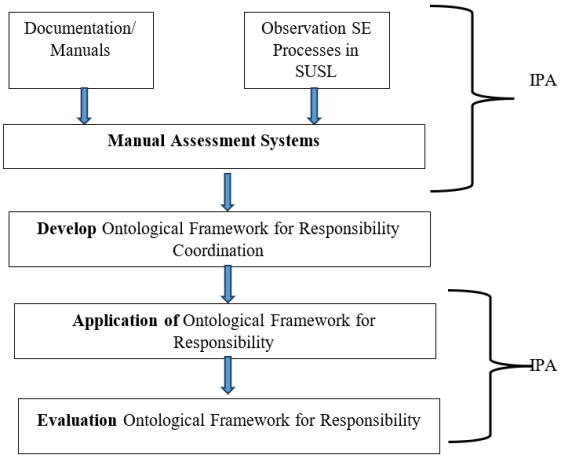
III. Post- Student Evaluation Phase (PSEP):

The focus of this phase is on the activities after an assessment takes place (i.e. after SEEP), such as marking answer scripts, producing marksheets, producing final grades, recording results, and publishing the evaluation outcomes. Also, students are given the opportunity to view their results, to clarify and/or discuss any questions, concerns, and/or complaints related to the evaluation process.

METHODOLOGY

This research typically follows two complementary hybrid paradigms [Figure 2]. This study is completed by adapting a hybrid approach combining Design Science Research Methodology (DSRM) and Interpretative Phenomenological Analysis (IPA). Design science focuses on applying knowledge to create new artifacts for human use. IPA is a qualitative research approach that is interested in the exploration of how people interpret their lived experiences (Smith et al., 2009). Given the theories of phenomenology, hermeneutics, and idiographic, IPA sets out to understand meaning based on a person's subjective interpretation within particular contexts.

Figure 2: Hybrid Methodology Process for Pre-Student Evaluation.



Source: Developed by the Author, 2025.

For this study, the methodology adopted the Object Management Group (OMG) standard, integrating principles from both the Design Science Research Methodology and Interpretative Phenomenological Analysis (IPA). These approaches were employed to develop an Ontological Framework for Responsibility Coordination (OFRC) for the Pre-Student Evaluation Phase in SE.

Data collection for the IPA component involved semi-structured interviews with purposively selected domain experts, including the Examination Registrar, Dean, Head of Department, and Subject Management Assistant in the Sabaragamuwa University of Sri Lanka. Interviews were audio-recorded, transcribed verbatim, and analyzed using idiographic IPA steps comprising initial noting, emergent theme development, and cross-case analysis. Ontology development followed established engineering steps, including domain concept extraction from documents and interviews, class and relationship modeling, constraint definition using responsibility rules, and expert-based validation. Ethical clearance was obtained from the relevant faculty authority, and informed consent was secured from all participants prior to data collection.

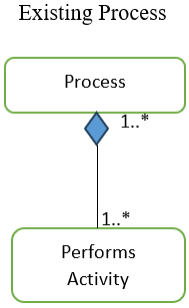
RESULTS AND DISCUSSION

Analysis of Responsibility Coordination Matrices reveals that there is a lack of accountability processes within the manual system of student evaluation. The use of RACI roles in the application of the ontology identified shadow responsibility dependencies that were previously undocumented and helped confirm that the actor–activity relationship is complete. Additionally, expert validation identified that the ontology provides insights into educational processes that were not reflected in manual processes.

The inclusion of RACI and Business Motivation Model (BMM) principles helped to shape this ontology by relating operational roles with institution-defined rules, decision authority, and goals, such that static process descriptions were transformed into traceable system components.

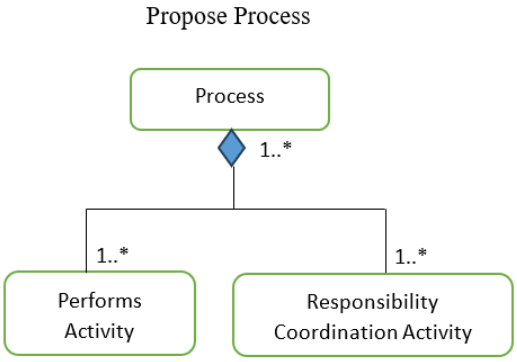
In most cases, when developing any solution pertaining to IT projects, the performance aspect within processes is likely to be overlooked. In paper-setting within a process, as in other processes, the focus is on completing the process task of setting papers, considering that the particular task is accomplished after completion [Figure 2]. In that case, many responsibilities and processes exist within the Pre-Student Evaluation Phase–Related Responsibility Coordination (PSEPRC) process that are likely to go beyond accomplishing a task. A good system is likely to be developed through considering all these factors within responsibility coordination. When the student evaluation process is conducted manually, or even in the majority of automated SE solutions [Figure 3], activities are performed without explicit responsibility coordination; the proposed process [Figure 4] enables the identification and formalization of responsibility coordination activities in addition to operational tasks.

Figure 3: Process without Responsibility Coordination Activity.



Source: Developed by the Author, 2025.

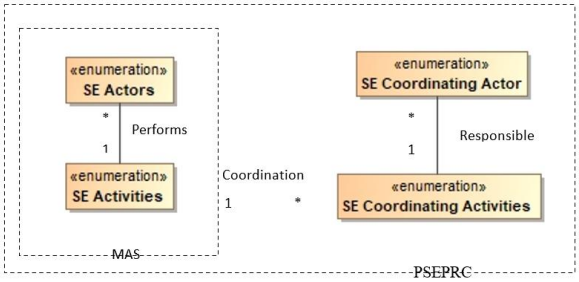
Figure 4: Process with Responsibility Coordination Activity.



Source: Developed by the Author, 2025.

This research identifies all the actors, activities, and responsibilities involved in the behaviour of the related responsibilities. These responsibilities and coordination activities are highly valuable for system designers when creating IT-based solutions for SE. The manual system performs the activities, but it does not clearly identify the coordination of each activity or the responsibilities of each actor [Figure 5].

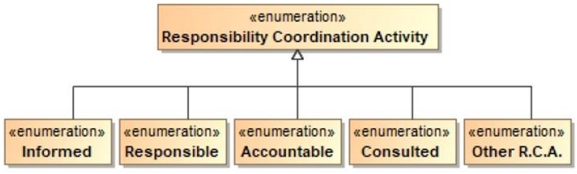
Figure 5:Meta Model for SE Processing Ontology.



Source: Developed by the Author, 2025.

For example, in any pre-student evaluation process, it is important to first identify the type of actor involved. Additionally, key performance factors must be defined, including who is responsible for the task, who is accountable for approval, who should be consulted, and who needs to be informed. If additional key performance factors are relevant to the process, these must also be considered to ensure a comprehensive and effective system design [Figure 4] .

Figure 6: Sub-Activities of Responsibility Coordination.



Source: Developed by the Author, 2025.

Pre-Student Evaluation Phase Related Responsibilities Coordination (PSEPRRC):

This process is initiated at the earliest stage of the Manual Evaluation Process (MEP), focusing on designing the evaluation framework, scheduling the evaluation process, obtaining necessary recommendations and approvals, and issuing relevant appointments.

In the manual process of evaluation, the tasks are usually performed without a properly structured record of responsibility coordination. The research explores a responsibility coordination framework for the Pre-Student Evaluation Phase in the student Evaluation, which will be helpful to design an IT-based solution for enhancement of the SE process. Several sub-activities are considered under the umbrella of responsibility-related coordination in the SE process by the researcher, including:

1. Student Registration Related Responsibility Coordination
2. Scheduling Examination Timetable Related Responsibility Coordination
3. Nomination of Paper Setting Related Responsibility Coordination
4. Nomination of Paper Moderation Related Responsibility Coordination
5. Scheduling Examination Conduct Related Responsibility Coordination
6. Faculty Board Related Responsibility Coordination
7. Senate Board Related Responsibility Coordination

This structured approach ensures a more efficient and transparent SE process within the faculty.

Students' Registration Related Responsibilities Coordination

The process of enrolling undergraduates for examinations is a validation of their preparedness for any assessment. To date, such an exercise involves the submission of necessary documents, payment of examination fees, and validation of information about students' academic and personal details. Every effort is made to ensure accurate enrolment through the validation of the eligibility of students and subsequently enrolling them in the correct courses. This also includes filling in index numbers, assigning examination numbers, or using the existing registration number of the student to issue admit cards and update student information in the institutional database. The ability to stay within timelines and follow guidelines as specified prevents delays and disqualification. A well-structured and transparent registration process is imperative for maintaining the integrity and efficiency of the examination system. The main actors and classification of activities in the students' registration process within a university system typically include:

Students are the main participants who complete the registration process by providing the required academic and personal information.

Admissions Officer in the Examination Department are Responsible for verifying students' eligibility, processing applications, and approving enrolment. They ensure students are registered for the correct courses and exams based on their academic progress.

The Registrar's Office manages student records, course registration, and ensures compliance with academic regulations. The faculty board consists of academic staff members or coordinators who assist subject or course selection. The Finance Branch handles the examination payments, scholarships, and financial aid verification. IT Department MIS (Management Information System) Team maintains the online registration for the candidate if required. The University Administration / Faculty Board and the Senate Board approve students' deferments or overseas leave, and policies related to student registration and academic regulations. This is considered a special case.

Each actor has coordination responsibilities for the following activities. Based on the actors and activities classification, develop the Responsibility Coordination Matrix (RCM) as follows [Table 1]:

Abbreviations Used Throughout All Responsibility Coordination Matrices

AP - Assigned Personnel	**ITU - Information Technology Unit**
CS - Conducting Staff	**M** - Moderator
D - Dean	**MS** - Minor Staff
E – Examiner	**PM** - Paper Moderator
EA - Examination Administration	**PS** - Paper Setter
ED - Examination Department	**P** - Professors
F - Faculty	**REB** - Registrar / Examinations Department
FA - Faculty Authority	**Rg** - Registrar
FB - Faculty Board	**S** - Students
FB - Finance Branch	**SMA** - Subject Management Assistant
FR - Faculty Registrar	**US** - University Senate
HOD - Head of Department	

Table 1: Students' Registration Related Responsibilities Coordination.

Key Responsibilities	**Coordination of the Responsibilities**						
	S	**Rg**	**ITU**	**F**	**FB**	**EA**	**SMA**
Submit application	R/Pe	A	C	I	-	I	-
Verify Document	C	A	-	I	-	R	Pe
Approval Admission	-	A	-	R	-	-	-
Create Student Record	-	A	R	C		I	Pe
Enrol in courses	R/Pe	C	-	A	-	-	-
Provide system Access	R	-	A/Pe	Re	-	I	-
Resolve technical issues	Re	-	R/A	Re	-	-	Pe
Process exam payment	R/Pe	C	I	I	A	-	-
Verify Payment status	C	A	-	I	R	-	Pe
Confirm Registration	C	A	I	I		R	Pe

Source: Developed by the Author, 2025.

Definitions:

- **R - Responsible:** The person who carries out the work to complete the task.
- **A - Accountable:** The person who is ultimately answerable for the completion and outcome of the task.
- **C - Consulted:** The person who provides input or expertise before the task is completed.
- **I - Informed:** The person who is kept updated on the progress of the task.
- **Re - Request:** The person who initiates the task request.
- **Pe - Perform:** The parties carry out the task (actually doing the work).

Building on the actor and activity classification, as well as the responsibility coordination ontology, the coordination of each activity within the students' registration process of the SE system can be comprehensively documented. This systematic documentation facilitates improved monitoring and auditing of the system, while also enhancing overall accuracy.

Scheduling Examination Timetable Related Responsibilities Coordination

Scheduling an examination timetable is an important step in organizing the process of assessment. This involves assigning specific dates and times for each examination, while considering such factors as the availability of exam venues, course structures and requirements, and, when possible, student preferences. A well-thought-out timetable allows for minimal conflicts to arise with exams and allows students time to prepare themselves while resources are used judiciously. Careful planning and coordination are essential to accommodate the needs of all stakeholders and to ensure a smooth and orderly examination process while following UGC guidelines (University Grants Commission, 1983). Identify the actors and activities classification involved, define the responsibilities of each actor within this process, and develop the Responsibilities Coordination Matrix (RCM) for scheduling the timetable. Each actor has coordination responsibilities for the following activities. Based on the actors, activities, and process, develop the Responsibility Coordination Matrix (RCM) as follows [Table 2]:

Table 2: Scheduling Examination Timetable Related Responsibilities Coordination.

Key Responsibilities	**Coordination of the Responsibilities**						
	EA	**F**	**ITU**	**Rg**	**S**	**MS**	**SMA**
Collect exam schedules from departments	A	R	-	-	-	-	Pe
Coordinate exam dates and time	A	R	-	C	-	-	Pe
Assign exam halls/venues	A	C	-	-	-	R	-
Generate draft timetable	A	C	-	-	-	-	Pe
Display draft TIMETABLE for students	-	-	-	-	-	-	Pe
Handle timetable adjustments (if needed)	A	R	-	C	I	-	Pe
Verify and approve timetable	A	R	-	C	-	-	-
Publish final timetable	A	C	R	I	I	-	Pe
IT system access for schedule management	-	-	A/Pe	-	-	-	-
Notify students and faculty	A	R	-	C	I	-	Pe
Monitor adherence to exam schedule	A	R	-	C	-	-	-

Source: Developed by the Author, 2025.

The developed actor and activity classification, together with the responsibility coordination ontology for the Scheduling Examination Timetable within the SE system, can be comprehensively documented, and such systematic documentation enhances the ability to monitor and audit the system, thereby improving accuracy and overall process reliability.

Nomination of Paper Setting Related Responsibilities Coordination:

The task of setting question papers is relegated to capable individuals who are typically lecturers who have taught the specific course units. They ensure the questions are aligned with the curriculum and thus accurately represent the learning outcomes and intended competencies of the course. The exercise entails devising questions that test a range of skills, from knowledge to critical thinking and problem-solving abilities. Great care is taken in making the questions academically sound, simple, and fair so that they are of the standards required and are suitable for different student capabilities. This careful process sustains the validity and applicability of the test. It is the responsibility of the Paper Setter to set examination question papers in line with the curriculum, learning outcomes, and assessment policies of the university. He/she is appointed by the Head of the Department, recommended by the Faculty Board, and approved by the University Senate. Once approved, an appointment letter is issued by the Head of the Department. The Paper Setter should ensure the confidentiality, fairness, and academic integrity of the examination and has to strictly follow university rules and regulations. Each actor is responsible for coordinating the succeeding activities. Based on the actors, activities, and process define the Responsibilities Coordination Matrix (RCM) as follows [Table 3]:

Table 3: Nomination of Paper Setting Related Responsibilities Coordination.

Key Responsibilities	Coordination of the Responsibilities					
	HOD	FB	US	PS	ITU	SMA
Nominate Paper Setter	R, A	C	I	-	-	-
Recommend Paper Setter	I	R, A	C	-	-	-
Approve Paper Setter	I	R, A	C	-	-	-
Issue Appointment Letter	I	C	R, A	-	-	Pe
Prepare Examination Paper	I	I	I	R, A	-	-
Ensure Compliance & Confidentiality	I	I	I	R, A	-	Pe
Submit Paper within Deadline	I	I	I	R, A	-	-
Update the IT system	C	-	-	I	R, A, Pe	-

Source: Developed by the Author, 2025.

This all-inclusive document of the actor and activity classification, along with the responsibility coordination ontology developed for the paper-setting nomination process in the SE system, enhances the transparency, auditability, and overall accuracy of the system.

Nomination of Paper Moderating Related Responsibilities Coordination

The Question Paper Moderator's position is one of the most critical in the university system to assure quality, fairness, and accuracy in examination papers. Moderation of question papers to ensure that they are aligned with the curriculum, university examination rules, and academic integrity is the responsibility of the moderator. The moderator clears questions as adequate, straightforward, and unbiased, removing grammatical, typographical, mark allocation, or factual errors. They also ensure that the marking scheme is integrated, suitably matched to the questions, and fair. Results are confidential, ensuring security at the highest level and maintaining the integrity of assessment. Appointments involve recommendations by Head of the Department, nomination by the Faculty Board, and approval by the University Senate. The Head of Department issues an appointment letter upon approval, and activity updates on moderation activities are coordinated by the IT Unit. Through proper scrutiny and observance of university policy, the Question Paper Moderator ensures that the examination process for students is conducted equitably and uniformly. The Paper Moderator is most likely to be a senior academic. For the activities listed above, all actors have coordination responsibilities. Based on the actors and activities listed above, build the RCM as follows [Table 4].

Table 4: Nomination of Paper Moderating Related Responsibilities Coordination.

Key Responsibilities	Coordination of the Responsibilities					
	HOD	FB	US	PM	ITU	SMA
Nominate Paper Moderator	R, A	C	I	-	-	Pe
Recommend Paper Moderator	I	R, A	C	-	-	-
Approve Paper Moderator	I	C	R, A	-	-	-
Issue Appointment Letter	R, A	I	I	-	-	Pe
Review and Moderate Exam Paper	I	I	I	R, A	-	-
Ensure Compliance with Standards	I	I	I	R, A	-	-
Ensure Clarity and Fairness	I	I	I	R, A	-	-
Activity Updates & Record Keeping	I	I	I	I	R, A	Pe

Source: Developed by the Author, 2025.

The integration of detailed actor and activity classifications with the responsibility coordination ontology for the paper moderator nomination process within the SE system provides a rigorously structured documentation framework, thus improving process transparency, auditability, and operational accuracy.

Scheduling Examination Conducting Related Responsibilities Coordination

Staff scheduling for the conduct of examinations is a prime activity in facilitating the smooth conduct of the examination process. The process involves preparing an exhaustive roster for assigning duties and responsibilities to supervisors, invigilators, and other ancillary personnel. The roster is so constructed as to provide adequate coverage for each examination session, considering such factors as the availability of staff, their experience, and their interest, and the nature of the examination arrangement. Systematic scheduling keeps things in line, preventing violations of examination protocols and solving any unforeseen problems effectively. A good roster system contributes much to the maintenance of integrity and the smooth conduct of the examinations. As per UGC guidelines (University Grants Commission, 1983), staff nomination for the supervision of examinations, invigilation, hall planning, vehicle planning, and handling of written papers are some of the very important activities for the conduct of an examination. Staff nominations for each of the stated positions must be done by the faculties to ensure that key duties are assigned only to competent staff. These are scrutinized and approved by the Examinations Department before sending appointment letters to the nominated staff. For the ease of transparency and efficiency in coordination, the IT Unit updates the records on these activities. The structured approach ensures handling of all key aspects of examination

logistics while ensuring accountability of all actors. Each actor has the following coordination responsibilities for activities. Based on the actors and activities developed above, the RCM is as follows [Table 5].

Table 5: Scheduling Examination Conducting Related Responsibilities Coordination.

Key Responsibilities	Coordination of the Responsibilities				
	FB	ED	ITU	FR	SMA
Nominate Supervisors & Invigilators	R, A	C	I	-	Pe
Nominate Personnel for Hall Arrangements	R, A	C	I	R, A	-
Nominate Personnel for Vehicle Arrangements	R, A	C	I	R, A	Pe
Nominate Personnel for Written Paper Arrangements	R, A	C	I	R, A	-
Approve Nominations	I	R, A	I	-	-
Issue Appointment Letters	I	R, A	I	-	Pe
Update Activity Records	I	I	R, A	-	Pe
Supervise & Monitor Examinations	I	I	I	R, A	-
Manage Hall Arrangements	I	I	I	R, A	-
Coordinate Vehicle Arrangements	I	I	I	R, A	Pe
Handle Written Paper Arrangements	I	I	I	R, A	-

Source: Developed by the Author, 2025.

Through the integration of actor and activity classifications with the responsibility coordination ontology, the Scheduling Examination Conducting process in the SE system is documented in a more rigorous and traceable manner. This enhanced documentation framework contributes to improved transparency, reinforces audit mechanisms, and ensures higher levels of operational accuracy.

Faculty Board Related Responsibilities Coordination

The Faculty Board plays an instrumental role in the assurance of quality and integrity in the examination process. The board, comprising academic authorities and faculty members, scrutinizes evaluation procedures, including the list of paper setters and moderators, examination schedules, and the assignment of conducting the staff. All aspects are scrutinized to ensure they are according to institutional regulations and academic standards and UGC guideline. Recommendations by the Faculty Board indicates that the process is in line with the curriculum objectives while being non-discriminatory, fair, and equitable. Such monitoring by the Faculty Board is essential for the validation of the examination framework to meet stakeholders' expectations and those of the institution itself. Finally, such recommendations are sent to the University Senate for approval, and based on the actors and activities, develop the Responsibilities Coordination Matrix (RCM) as follows: [Table 6]

Table 6: Faculty Board Related Responsibilities Coordination

Key Responsibilities	Coordination of the Responsibilities							
	FB	D	HOD	E	M	CS	US	SMA
Prepare list of paper setters and moderators	C	A	R	R	C	I	I	Pe
Review/recommend list of paper setters and moderators	R	A	C	C	C	I	I	Pe
Approve examination schedule	R	A	C	I	I	C	I	-
Assign conducting staff	R	A	C	I	I	R	I	Pe
Ensure compliance with institutional regulations and academic standards	R	A	C	I	I	I	I	-
Validate fairness, transparency, and consistency of the examination process	R	A	C	C	C	I	I	-
Submit recommendations for approval	R	A	C	I	I	I	A	Pe
Final approval of recommendations	I	C	I	I	I	I	A	Pe

Source: Developed by the Author, 2025.

University Senate Board Related Responsibilities Coordination

The evaluation process is sent to the University Senate for final approval by the Faculty Board, which consists of senior academic authorities. Membership of the University Senate includes all professors, deans, and Heads of Departments. This board's endorsement is an important confirmation that examination and assessment procedures have been subject to appropriate academic standards and the attainment of institutional objectives put forth by the university. The Senate then examines the framework of evaluation, such as how the design of examinations is done, the policy on seniority, and adherence to university statutes. Its approval validates the integrity of the process in ensuring that the process meets the university's goals for education and sustains the quality of academic assessments. It is important because such scrutiny helps to ensure that the credibility and equity of the promoted system of evaluation are observed. The University Senate approves all processes of evaluation, and based on the actors identified and their activities, the following Responsibilities Coordination Matrix (RCM) is developed [Table 7].

Table 7: Senate Board Related Responsibilities Coordination

Key Responsibilities	Coordination of the Responsibilities						
	US	**FB**	**D**	**HOD**	**P**	**RED**	**SMA**
Submit recommendations from Faculty Board for review	I	R	A	C	I	I	Pe
Review evaluation framework (design, policies, compliance)	R	C	C	C	C	C	Pe
Ensure alignment with university academic standards	R	C	C	C	C	I	-
Validate seniority policies in examination and assessment	R	C	C	C	C	I	-
Ensure compliance with university regulations	R	C	C	C	C	C	-
Approve final recommendations of Faculty Board	A	C	I	I	I	I	-
Uphold credibility, fairness, and transparency of the evaluation system	R	C	C	C	C	I	-
Communicate final approval to relevant authorities	R	I	I	I	I	A	-

Source: Developed by the Author, 2025.

Paper Setting /Moderating Execution Related Responsibilities Coordination

The paper setter, having prepared the initial draft of the question paper, proceeds in a systematic manner for quality control. This is followed by moderation before submission to the Examination Department. It involves an examination by the moderator, who goes through the paper very meticulously for its clarity, consistency, and correspondence with the prescribed curriculum or academic standards for the examination. The aim is to make the questions justifiable, easy to understand, and challenging enough. Then, after moderation, the paper is forwarded to the paper setter for proofreading. This is to spot and correct any errors in grammar, typesetting, mark allocation, or formatting. It also provides an opportunity to proofread twice for content correctness, so nothing unintended or inconsistent is included in the paper. Once proofreading and revision of any mistakes are completed, the final question paper is sent back to the Examination Department. The paper is then ready to proceed to the printing and packaging stages. This laborious exercise, involving multiple stages of scrutiny and refinement, ensures that the question paper is at the desired academic standard, free of any errors, and prepared to be distributed among students in an open and professional way. Every actor has coordination responsibilities for the subsequent activities. Based on the actors and activities, develop the Responsibility Coordination Matrix (RCM) below [Table 8].

Table 8: Paper Setting /Moderating Execution Related Responsibilities Coordination.

Key Responsibilities (activity classification)	Coordination of the Responsibilities					
	PS	**M**	**EB**	**HOD**	**FA**	**SMA**
Draft Initial Question Paper	R	I	I	A	C	-
Submit Paper to Examination Department	R	I	A	C	I	-
Moderation of Paper	I	R	C	C	I	-
Review for Clarity, Consistency, and Alignment	I	R	C	C	I	-
Return Paper to Paper Setter after Moderation	I	R	I	A	I	-
Proofreading of Paper	R	I	C	A	I	-
Final Revisions and Editing	R	I	A	I	I	-
Submit Final Paper to Examination Department	R	I	A	I	I	Pe
Prepare Paper for Printing & Packaging	I	I	R	I	A	Pe

Source: Developed by the Author, 2025.

After developing the activity classification framework and Responsibility Coordination Matrix, discussions were held with domain experts (Examination Registrar, Subject Management Assistant, Dean of the Faculty, and Head of the Department) to evaluate the completeness and correctness of the proposed framework. The results showed a satisfactory level of agreement with the framework.

Research Limitations

This study was conducted as a pilot investigation, concentrating on the development of an Ontological Framework for the Responsibility Coordination Matrix (OFRCM) within the Pre-Student Evaluation Phase (SPEP). In addition to this core contribution, two supplementary ontological frameworks were conceptually formulated: one for the Student Evaluation Execution Phase (SEEP) and another for the Post-Student Evaluation Phase (PSEP). Although these latter frameworks were not explored in detail here, they offer significant potential for further research development. The results also show that such a theoretical framework can form the basis for the design and implementation of an IT-based solution to assist and accelerate the process of student evaluation across universities.

CONCLUSION

The current article offers an Ontological Framework for Responsibility Coordination that has been proposed and tested for the important gap in the management of the student evaluation process in Sri Lankan Higher Education Institutions. The inherent inconsistencies and tacit assumptions of responsibility regarding the assessment and accountability procedures in the existing manual systems led to the amalgamation of a methodological approach in this research that combined the principles of Design Science Research Methodology and Interpretative Phenomenological Analysis.

The proposed framework incorporates the modelling of actors, activities, and responsibility relationships in the Pre-Student Evaluation Phase through the integration of ontology engineering techniques with responsibility assignment approaches like the RACI responsibility assignment matrix, as well as business governance principles in the Business Motivation Model (BMM). The empirical validation exercise

with the involvement of domain experts demonstrated the effectiveness of the proposed framework in providing a comprehensive, cohesive, and relevant representation of responsibility coordination, which is largely absent in the current, manually performed responsibility assignment process.

Theoretically, this study further applied the usage of ontologies not only to knowledge representation but to the governance of responsibility within higher education institutions. In a more practical sense, this research has a structured background related to the development of IT-enabled student evaluation systems.

Though it is a valuable contribution, it has also opened several research avenues. First, as the current study only considered the Pre-Student Evaluation Phase in the ontological framework, the framework needs to be expanded to cover the whole procedure, including the other two phases - the Student Evaluation Execution Phase and the Post-Student Evaluation Phase. Second, because the framework has been validated by performing a case study at Sabaragamuwa University of Sri Lanka, a different study needs to be conducted in the future to validate the generality of the framework at several different universities. Finally, because the study has opened an avenue to implement an effective IT-based student evaluation system by using the proposed ontological framework, several different studies should be conducted in the future to explore how the usability and acceptability of the system and its resistance to digitization influence organizational efficiency.

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