

Board of Management Audit and Assurance Committee

Date of Meeting	Wednesday 16 September 2020
Paper No.	AAC1-G
Agenda Item	5.3.1
Subject of Paper	Internal Audit Report – IT Systems Development/ Implementation
FOISA Status	Disclosable
Primary Contact	Henderson Loggie
Date of production	September 2020
Action	For Discussion and Decision

Recommendations

The Committee is asked to consider and discuss the report and the management responses to the internal audit recommendations.

1. Purpose of report

The purpose of this review is to provide management and the Audit and Assurance Committee with assurance on key controls relating to the curriculum and financial plans in place for City of Glasgow College and their alignment with the regional plan for Glasgow and the college student number targets.

2. Context and Discussion

This internal audit of IT Systems Development/Implementation provides an outline of the objectives, scope, findings and graded recommendations as appropriate, together with management responses. This constitutes an action plan for improvement.

The Report includes a number of audit findings which are assessed and graded to denote the overall level of assurance that can be taken from the Report. The gradings are defined as follows:

Good	System meets control objectives.
Satisfactory	System meets control objectives with some weaknesses present.
Requires improvement	System has weaknesses that could prevent it achieving control objectives.
Unacceptable	System cannot meet control objectives.

3. Impact and implications

Refer to internal audit report.

City of Glasgow College

IT Systems Development / Implementation

Internal Audit Report No: 2020/06

Draft issued: 7 September 2020

Final issued: 10 September 2020

LEVEL OF ASSURANCE

Satisfactory

Now, for tomorrow

Contents

Page No.

Section 1	Management Summary	
	• Overall Level of Assurance	1
	• Risk Assessment	1
	• Background	1
	• Scope, Objectives and Overall Findings	2
	• Audit Approach	3
	• Summary of Main Findings	3
	• Acknowledgements	3
Section 2	Main Findings and Action Plan	4 - 9

Level of Assurance

In addition to the grading of individual recommendations in the action plan, audit findings are assessed and graded on an overall basis to denote the level of assurance that can be taken from the report. Risk and materiality levels are considered in the assessment and grading process as well as the general quality of the procedures in place.

Gradings are defined as follows:

Good	System meets control objectives.
Satisfactory	System meets control objectives with some weaknesses present.
Requires improvement	System has weaknesses that could prevent it achieving control objectives.
Unacceptable	System cannot meet control objectives.

Action Grades

Priority 1	Issue subjecting the College to material risk and which requires to be brought to the attention of management and the Audit and Assurance Committee.
Priority 2	Issue subjecting the College to significant risk and which should be addressed by management.
Priority 3	Matters subjecting the College to minor risk or which, if addressed, will enhance efficiency and effectiveness.

Management Summary

Overall Level of Assurance

Satisfactory

System meets control objectives with some weaknesses present.

Risk Assessment

There are no specific risks on City of Glasgow College's ('the College') Strategic Risk Register that directly relate to this area however if appropriate controls were not in place it could impact on a number of risks including:

- Failure to support successful student outcomes (net risk: amber);
- Failure to achieve improved business development performance with stakeholders (net risk: red);
- Failure to achieve improved performance (net risk: amber);
- Failure of compliance with the General Data Protection Regulations (net risk: amber);
- Failure of Business Continuity (net risk: red); and
- Failure of IT system security (net risk: amber).

Background

As part of the Internal Audit programme at the College for 2019/20 we carried out a review of the College's arrangement for IT systems development and implementation. The Annual Plan, approved by the Audit and Assurance Committee in November 2019, identified this as an area where risk can arise and where Internal Audit can assist in providing assurances to the Board of Management and to the Principal that the related control environment is operating effectively, ensuring risk is maintained at an acceptable level.

The College has spent significant resources in developing, acquiring, and maintaining application and business systems. These systems in turn manage critical information and should be considered an asset that needs to be effectively managed and controlled. The appropriate use of a formal systems development methodology is essential for mitigating project failure risks associated with systems development projects.

Scope, Objectives and Overall Findings

The scope of this audit was to carry out a review of the ICT project management controls in place within the College, along with a review of the ICT strategic planning process.

The table below notes each separate objective for this review and records the results:

Objective	Findings			Actions already planned	
	1	2	3		
The specific objectives of this audit were to obtain reasonable assurance that:					
1. the College has established formal documented project management standards and policies, which reflect best practice.	Requires Improvement	0	1	0	
2. project teams and managers receive adequate project management training.	Good	0	0	0	✓
3. all requests for new projects are supported by a detailed business case and, where approved, a feasibility study, project initiation document and detailed project plan are established.	Satisfactory*	0	0	0	✓
4. a functional specification is prepared which sets out users' requirements and a technical specification prepared based on this.	Satisfactory*	0	0	0	
5. an outline testing plan with acceptance criteria is written at the functional specification stage and complied with during the implementation phase.	Satisfactory*	0	0	0	
6. relevant staff are appropriately trained at the right time in the new system and operational guides, user manuals and support are supplied to system users.	Good	0	0	0	
7. post-implementation reviews are carried out by project teams to compare the actual costs and benefits etc. with those originally expected.	Requires Improvement*	0	0	0	
Overall Level of Assurance	Satisfactory	0	1	0	
		System meets control objectives with some weaknesses present			

Note:

* recommendation made under Objective 1 also links across into these Objectives.

Audit Approach

From discussion with the IT Director and senior members of the IT Development team, and review of project documentation for a sample of recent ICT projects, we considered whether the above objectives are being met.

Summary of Main Findings

Strengths

- Several members of the IT team have received project management training.
- For each IT project a Project Team is created with involvement by relevant College staff and any external contractors brought in where necessary.
- Where applicable a functional specification is prepared which sets out users' requirements and a technical specification prepared based on this.
- Testing plans are incorporated into the project development and implementation phases.
- Relevant staff are appropriately trained at the right time in the new system and operational guides, user manuals and support are supplied to system users.

Weaknesses

- For a sample of completed IT development projects reviewed we noted evidence that project management documentation had been maintained which demonstrated that project management principles had been applied. However, the College had not developed a formal suite of systems development project documents aligned with PRINCE2 or another recognised methodology. Whilst it is not realistic or practical to expect that a full project management methodology is applied for smaller projects there should be guidance that sets out the minimum requirement for projects of different sizes as well as the basic information required for all projects e.g. Business Case and PID (project initiation document). In order to ensure that staff are aware of the College's requirements for initiating and managing projects there should be guidance available to staff that provides a high-level summary of the minimum documentation that must be prepared for projects, details the methodology that should be applied and the circumstances in which it should be applied. This will enhance consistency in the approach to project management across the organisation and across projects.
- Post-implementation reviews are not carried out to compare the actual project benefits with those originally anticipated.

Acknowledgment

We would like to take this opportunity to thank the staff at the College who helped us during our audit.

Main Findings and Action Plan

Objective 1: The College has established formal documented project management standards and policies, which reflect best practice.

To achieve the College's strategic aims in relation to large IT projects, development plans are presented, and consulted on, through the College's Executive Team. These are then reflected in the operational plans for the IT Team and / or other relevant teams within the College, as appropriate. For smaller IT development projects a formal project request system has been established, which requires the project scope to be outlined and explicitly linked to one of the College's strategic aims. A high-level feasibility review is then undertaken by the Development team to determine resources, timing, existing capability, and compatibility.

PRINCE2 (an acronym for PProjects IN Controlled Environments) is a process-based method for effective project management which is used extensively by the UK Government. Although several members of the IT team are PRINCE2 certified, and apply PRINCE2 principles to project management, the College has not formally developed a suite of project management templates which are aligned with the approach followed under the PRINCE2 project management methodology. Typically, this would include:

- Business Case, which includes justification for the project based on costs and anticipated benefits. The Business Case should include a WHY, HOW and WHAT approach and identify timescales, risks, and investment appraisal.
- Project checkpoint report for providing progress updates.
- Communication plan.
- End of project report (from project manager to project team at the end of the project) – includes a review of the original Business Case, review of project objectives, review of project team performance, review of outcomes and any follow up actions identified.
- End of stage report (i.e. scope and review stage reflecting on Business Case, objectives and outcomes) identifying lessons learned and any forecast outcomes.
- Issues log: project issues that require any change approvals or any other issues raised during the project.
- Lessons learned report: produced at the end of the project covering what went well / not so well etc, measurements review and significant lessons.
- Project mandate: identifies the Executive sponsor, project manager and the subject matter – used to inform the Business Case.
- Plan: a statement of how and when the projects objectives are to be achieved by showing the major outcomes, activities and resources (including budgets) required on the project.

IT Systems Development / Implementation

Objective 1: The College has established formal documented project management standards and policies, which reflect best practice (continued)

- PID (project initiation document): used to form the basis for the project management and the assessment of its overall success. Includes: background, approach; Business Case outline; project management team structure; role descriptions; quality management strategy; configuration management strategy; risk management strategy; communication strategy; initial project plan; project controls (e.g. stage boundaries, tolerances, monitoring, reporting).
- Risk register: project risks including impact, probability, mitigation and risk owner.
- Works package: Includes agreed standards; reporting arrangements; agreement between project manager and recipient on what is to be done; agreement on project constraints; problem handling and escalation and approval requirements.

For a sample of two projects reviewed we found that the projects were managed using key elements of recognised project management methodologies, such as Agile and PRINCE2. These included:

- establishing project teams;
- producing project briefs, although we found that these did not fully document the project outcomes and intended benefits;
- developing detailed system and user specifications;
- producing project plans, although these could be further enhanced by formally identifying project dependencies and key milestones such as stop, review and test phases;
- Sprint timeboxed development activity; and
- undertaking user training before projects go live.

IT Systems Development / Implementation

Objective 1: The College has established formal documented project management standards and policies, which reflect best practice (continued)

Observation	Risk	Recommendation	Management Response
<p>For the sample of completed IT development projects reviewed, we reviewed evidence that project management documentation had been maintained which demonstrated that project management principles had been applied and documented within JIRA, a development issue tracking and project management application. However, the College had not yet developed and embedded a formal suite of systems development project documents aligned with PRINCE2 or other recognised methodology. Whilst it is not realistic or practical to expect that all of the project documents identified above are completed for smaller projects there should be guidance that sets out the minimum requirement for projects of different sizes as well as the basic information required for all projects e.g. Business Case and PID.</p>	<p>Staff may not be aware of the requirements for initiating and managing projects resulting in an inconsistent approach to project management across the organisation and across projects. There may be insufficient project documentation in place on projects which could lead to difficulties in project delivery or completion.</p>	<p>R1 Consider producing a suite of systems development project documents, as outlined in this report, and develop summary guidance for staff in relation to the College's approach to project management. Guidance should outline: the methodology to be adopted; in what circumstances the methodology should be applied; the governance arrangements and standard documentation which should be prepared (including outline business case; PIDs; system and user specifications; project plans; and post-implementation reviews).</p>	<p>Agreed.</p> <p>The College are planning to develop a College wide Project Management methodology with additional Project Management capability.</p> <p>The IT methodology will be based on 2 formats; "waterfall"\PRINCE 2 for "infrastructure-based" projects and "agile" which was noted has started to be embedded within the Team using JIRA for requirements gathering and timebox\sprints for System development.</p> <p>The key improvement opportunity is to develop a robust "benefits realisation plan" which will be based on metrics agreed as part of the business case and revisited after project delivery. (continued below)</p>

IT Systems Development / Implementation

Objective 1: The College has established formal documented project management standards and policies, which reflect best practice (continued)

Observation	Risk	Recommendation	Management Response	
<p>(continued) In order to ensure that staff are aware of the College's requirements for initiating and managing projects there should be guidance available to staff that provides a high-level summary of the minimum documentation that must be prepared for projects; details the methodology that should be applied; and the circumstances in which each approach should be applied. This will enhance consistency in the approach to project management across the organisation and across projects.</p>	<p>See above</p>	<p>See above</p>	<p>(continued) The newly created IT Business Engagement Manager Role will have responsibility for the robust development of business cases, co-ordination of the IT Development pipeline and formalising customer project "sign off" and measurement of project benefits. A new Digital Futures Forum (formally proposed as Digital Steering Group) has now been formed and will major input on College-wide IT/Digital projects and shape project scope (including funding) and benefits to be delivered.</p> <p>To be actioned by: Director of IT</p> <p>No later than: 28 February 2021</p>	
			<p>Grade</p>	<p>2</p>

IT Systems Development / Implementation

Objective 2: Project teams and managers receive adequate project management training.

Although the College does not currently have a dedicated in-house project management resource, several members of the IT team have undertaken PRINCE2 training. A project team is created for each IT project, with involvement provided by relevant College staff and any external contractors brought in where deemed necessary. Prior to the Covid-19 lockdown the College had planned to recruit an IT Engagement Manager who would be responsible for the project management of development activity. Although recruitment for this post is currently on hold there are plans to resume this recruitment activity later in 2020.

Objective 3: All requests for new projects are supported by a detailed business case and, where approved, a feasibility study, project initiation document and detailed project plan are established.

The project management approach adopted by the College considers the scale and risks associated with each project. However, the absence of a standard suite of systems development project documents means that intended benefits, outcomes and associated risks are not always formally recorded. Large scale projects, which are conducted jointly with external agencies and suppliers, are progressed through a formal process designed to ensure that a business case, feasibility study, project initiation and project plan are all considered and defined. Where significant work is tendered the College will prepare a user and technical specification based on a project brief and this forms the basis for suppliers to bid on.

Smaller in-house projects that require no external agencies / suppliers (and where the costs are limited to internal developer time only) are progressed through an internal evaluation process which follows the completion of a project request form and where approval has been provided by the Executive Team, for larger strategic projects, or by the Development team, for smaller projects.

As outlined at **R1** under Objective 1 above, the College's approach to development projects would benefit from a suite of systems development project documents which ensures that the business case for all projects fully captures the intended benefits, costs, outcomes and risks and for the results of feasibility studies to be formally recorded.

At the time of our audit the College did not have an IT / Digital Steering Group in place which would be responsible for reviewing initial IT project proposals. Depending on the scale of the project proposal, once approved by the Steering Group the proposal should be forwarded to the Senior Management Team (SMT) or Executive for wider strategic consideration. An action to establish an IT / Digital Steering Group is included on the IT Operational Plan for 2019/20. We understand that discussions regarding a Steering Group have taken place at Executive level, however the impact of the Covid-19 lockdown has resulted in delays in implementing this action. As there is already an action to establish a Steering Group we have not raised a separate recommendation in this regard.

IT Systems Development / Implementation

Objective 4: A functional specification is prepared which sets out users' requirements and a technical specification prepared based on this.

For in-house development projects users' requirements are established through direct discussion between the Systems Analysts and other College teams or staff groups. The Systems Analysts subsequently develops a technical specification which is shared with users to obtain feedback and further input, with the technical specification then subject to further refinement. From a review of a sample of projects we identified that this feedback loop is often informal and the improvement action raised earlier in this report (refer to **R1**) is intended to formalise this process through standardisation and consistent completion of the College's project management documentation.

For projects with third party involvement, such as the procurement of a business system from a vendor (for example the iTrent human resources system) a high-level user specification and detailed technical specification is prepared by the relevant College department identified as the business system owner. This process is supported by the IT team and both specifications are included within tender documents. The supplier then provides a system which best satisfies the prescribed criteria within the identified resource parameters.

Objective 5: An outline testing plan with acceptance criteria is written at the functional specification stage and complied with during the implementation phase.

For larger IT or systems projects, testing is incorporated throughout the project plan and is usually conducted at key milestones. Records of testing performed, including results, are formally documented. Results are then used to inform the next stage of development or are used to loop back to the previous stage and make technical adjustments before re-testing.

For smaller in-house development projects, we noted evidence that testing activity was being undertaken although the precise testing conducted was not always formally recorded. Recommendations raised earlier in this report (refer to **R1**) seek to formalise this process through standardisation and consistent completion of the College's project management documentation.

IT Systems Development / Implementation

Objective 6: Relevant staff are appropriately trained at the right time in the new system and operational guides, user manuals and support are supplied to system users.

Systems testing is performed in a secure environment with a target group of stakeholders used to confirm that the system is achieving the desired benefits. Procedures are in place to ensure that users are notified in advance of any systems implementation. User guidance notes are made available to staff and, if required, workshops are run to provide further opportunities for training on the system or application. We noted that responsibility for developing user manuals of work instructions for new systems is not always defined from the outset and usually agreed at hand-over prior to implementation. Recommendations raised earlier in this report (refer to **R1**) seek to formalise this process through standardisation and consistent completion of the College's project management documentation.

Objective 7: Post-implementation reviews are carried out by project teams to compare the actual costs and benefits etc. with those originally expected.

Under the PRINCE2 methodology a stop and review process is built into development projects, which includes regular review points before the system or application goes 'live'. The suggested suite of project management documents noted under Objective 1 includes both an End Stage Report and End Project Report. Our review noted that post-implementation reviews are not typically undertaken as part of a standardised approach to projects. Any lessons learnt are not formally documented and the opportunity to use these to inform future phases of the project or future projects is not leveraged (refer to **R1**).

In addition, where business cases or PIDs have not been prepared it may be difficult to evaluate the interim project outcomes, through the stop and review process, or final realised project outcomes against those originally expected.

Due to the nature of large systems implementation projects, which tend to be one-off in nature and involve dealing with specific vendors and systems, there is limited risk that system specific issues or supplier issues will be taken forward into future projects.

For smaller in-house systems development projects the College's approach is to allow systems to be monitored in a live environment to provide the project teams with the opportunity to identify any issues which users may have with the systems or applications, with any issues flagged and addressed as they arise.

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