Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Quality Review of
IT Services

12-14th March 2019

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Review Report

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1. Introduction

The authors of this document would like to express their gratitude to those who participated in this review and gave so generously of their time and experience during the three days on site. The variety and diversity of the stakeholders underlined the complexity and scale of this environment.

This review provides valuable insights into IT in Trinity and not just IT Services in Trinity. This is an extremely important point, many of the risks and opportunities encountered are at the organizational level and some risks pose Institutional risks, particularly in the compliance area.

This Report was completed over a three-day engagement with Trinity College and with extensive input from both IT Services' professionals, The Student Body, Customers of the IT Services function and other stakeholders as referenced in Appendix 1 – Schedule of Interviews in this document. Four key areas have emerged in terms of observations and recommendations as follows. These can be summarised as Strategy, Governance & Compliance, Services and Security.

Strategy

From a **People Strategy** perspective, average years of service of the team is high and with attrition rates being very low there is a need to focus on the talent pipeline into IT Services and continuous upskilling and training of the team. Communication and Collaboration within IT Services and across IT Teams in TCD is a challenge due to de-centralisation of resources and reporting lines and a review of the Organisation Structure, roles and reporting lines needs to be addressed.

A review of the **IT Strategy** for IT Services identified that the IT Organisation Structure is not optimised to drive the broader Trinity College and Trinity Digital strategies through technology enablement. Establishing strategic leadership in a new CIO role will be crucial to the overall success of both the college and IT Strategies. In addition, centralising all IT activities within IT Services and establishing clear roles and accountabilities should be prioritised - this includes both operational IT and IT Support Services for the College.

IT Services will be a key enabler in delivering on the Trinity Digital Strategy however best practice in other organisations demonstrates the need for a new role of Chief Digital Officer to champion such 'whole of organisation' change at executive level. Given the importance of this agenda for Trinity, consideration should be given to the appointment of a Chief Digital Officer role at executive level with a dedicated budget for digital transformation and the authority to integrate into the overall university strategy.

The digital strategy should address three aspects: How to advance research in the impact that digital transformation will have on society and culture in the broadest sense, how digital enablers can be utilized to expand and renew research and teaching in higher education and how all schools can contribute in educating the students to master and exploit digital opportunities and competencies relevant to their subject.

Governance and Compliance

Several challenges have been identified relating to the Governance and Compliance surrounding the IT Landscape. While IT Services have made strong progress in implementing Infrastructure standards and policies, the de-centralised organisation of IT is problematic. Ownership for Technologies and budget decision making is leading to a fragmented IT Landscape with a lack of standards adding to the Total Cost of Ownership and maintenance. The lack of an overall IT Strategy for the college and governance for the introduction of new technologies and applications into the portfolio needs to be addressed.

Services

Services for Support was consistently represented as being of a very high quality. Large strides have been made in this area in the last 2 years. The significant investment in infrastructure has provided a robust, reliable and secure environment for Trinity which has been notable. A key risk was identified in relation to the need to implement a centralised licensing register to manage all of the licenses for the college and ensure compliance.

In addition, priority should be given to the standardisation across a number of technologies such as AV equipment / e-Learning Platforms as well as the replacement of HPC[1] and CMS[2] with new or updated standardised technologies.

Risk and information security

It is notable that IT Services have established a secure, robust and reliable IT Infrastructure environment with no known breaches reported for several years. However, it is the view of the reviewers that the autonomous networks pose a security risk and should be assessed as a matter of urgency to confirm that they are being managed in line with IT Services Security policies and standards. From a GDPR perspective while the approach to GDPR is formalised from a legal perspective - from an IT application perspective GDPR audits need to be completed and overall approach formalised. Bring Your Own device (BYOD) is working well.

In summary the overall impression of IT Services by the External Examiners and internal customers was very positive. The attention of Trinity College management towards IT and their awareness of the need for IT to partner in enabling the broader Trinity College and Digital Strategies is growing and this is a positive step.

It is however clear that IT services while delivering in key areas is doing so against significant challenges in resourcing and funding and this is clearly not sustainable.

The key findings and priority recommendations have been summarised in this executive summary and full details of findings and recommendations are outlined in the following sections of this document.

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[1] High Performance Computing
[2] Content Management System

2. Strategy

People

The people in IT Services are highly valued and appreciated particularly by those who work closely with the teams. Staff in the student services, academic services, library services, finance services and others frequently complimented both the people and services supplied. There is a clear trend. The greater the proximity to and dependency of the users on IT Services, the greater the appreciation and understanding of the value added by IT Services.

There was another perspective, many consumers or users who are dependent on IT Services but in a less obvious or visible way, did not appear to understand or appreciate the true value of the services provided.

Most of the IT Services' people interviewed represented a management layer and were highly experienced in their own field. There does not appear to be any issues around retaining staff which is itself unusual in the current climate where these skills are scarce and other public sector equivalent employers are experiencing significant staff churn. It is important to note that investment in training will be critical to ensure upskilling of the team in line with a rapidly changing technology landscape.

There does not appear to be any skills deficit to support the delivery of operational IT Services. The recurrent theme which did arise was one of scarcity of resources. This was discussed by both the consumers of the services and the staff themselves. However, it was notable that newer skills required to support the execution of the Digital Trinity Strategy will need to be built within the team either through recruitment or training as a matter of urgency.

IT Services' teams are de-centralised and highly dispersed throughout the organization. Small teams of two or three people are not uncommon. There are several service support teams both for the non-IT services and IT Services'. Some staff are isolated and communication between teams is an issue. In addition, this is not conducive to building career paths, capabilities, leveraging synergies in service delivery or prioritisation of resource allocation.

The fact that Trinity College does not have a graduate entry program is perplexing given the obvious advantage Trinity would have in offering such a service and the many advantages which accrue when such a scheme is in place e.g. succession and talent development, skills enhancement, new perspectives and affordable resourcing.

Recommendations

- A Graduate program should be set up for Trinity College across all functional areas. This will provide a structured framework and career path for intake to the university and a pipeline of new talent and skills.

- An annual intake of interns should be considered to build a pipeline of future Graduates and supplement the IT Service teams at low cost.

- Co-location of teams must be considered to drive skills development, career path support structures, team collaboration and optimising resources around high priority activities for the best value to the College.

- Investment in a solid Intranet for all employees and students would significantly assist with collaboration and communications challenges.

- An Organization wide review of all IT activities in Trinity needs to take place with full skills assessment, job to role mapping and reporting lines linking TCD strategic objectives and skills.

- It is the external reviewer's recommendation that the role of IT Services is expanded to include IT activities being currently supported in other functions such as Finance, HR, Faculties thereby centralising the team and optimising resources and skills.

IT Strategy

A clearly defined strategy assumes two things, a well-defined agreed destination and a cohesive approach to reaching that destination. The current organizational structure of IT delivery does not support and arguably cannot deliver a cohesive IT strategy.

The current IT Strategy has not been embedded within the Business Strategy and the result has been a focus on the operational services but not at the strategic level. IT has grown organically across the organization with individuals creating silos of expertise and expenditure which are tailored to their own needs of the school or faculty or even individual but often at the expense of Corporate governance and compliance. There are many instances of the same systems. There are three solutions used for e-learning, ELMS[3]. There is no central register for IT assets. It is difficult to see how Trinity can determine or prove if it is indeed compliant with its software licenses. There is no hardware or software register.

IT Services does not manage or control a significant portion of the IT spend of Trinity. There is no overarching vision. IT is being treated as a utility as opposed to a strategic partner. There is no enterprise-wide view of the IT Landscape.

Several IT policies exist but without the clear authority to implement and enforce the policies, they are implemented in those areas which IT Services controls but appear to be 'optional' outside the IT Services areas leading to significant risk of security breaches, duplication and non-compliance particularly in the area of public sector procurement regulations and GDPR.

Repeatedly interviewees commented on the lack of joined up thinking. Many of the contributors particularly those who manage their own IT environments do not want change. Many are very happy with the status quo and are oblivious to the institution perspectives particularly around governance, compliance and even the threats from cyber security events.

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[3] Electronic Learning Management Systems

IT Service delivery for students is excellent and was praised by several consumers of the service. The service is well organized and successfully manages possibly one of the biggest BYOD[4] service offerings in Ireland. Regular surveys undertaken by IT Services provide valuable performance information and regular meetings with users also ensures the IT service is very responsive to the evolving needs of students.

There are several service desks for administrative staff, which support key corporate systems such as Finance, the Academic Registry, HR etc. There is an opportunity to consolidate this support into a smaller number of service desks where resources including knowledge could be shared.

Challenges exist in the IT PMO[5] delivery areas, particularly in relation to Portfolio Prioritization and project delivery. Organizations structure and span of control for roles was confusing e.g. development seemed defragmented and just about *'Coping'*.

The panel received a detailed description regarding the ongoing funding challenges faced by Trinity particularly over the last few years. There have been several new budgetary models implemented in a bid to ensure that Trinity returns from a deficit to a break even regarding the annual budget.

However, the model used to assign resources to IT Services is very different to how IT is funded in many private and public sector organizations. Typically, the funding allocated is directly proportional to consumption e.g. the number of desktops used by a department is often used to apportion annual IT costs such as broadband, anti-virus, maintenance charges etc. Apportionment of costs in accordance with usage has the immediate benefit of discouraging wastage or duplication.

In Trinity there is no direct link between the consumption of IT resources and budget allocation. The IT service is under resourced and underfunded (-24% last 10 Years non-pay, salaries increasing and cannibalizing the non-pay budget), in effect it is being set up to fail.

It is highly doubtful if TCD will be able to respond to the upcoming challenges regarding the digitization of higher education with the present budget allocation.

Recommendations

- A new role, that of CIO, Chief Information Officer, needs to be established to provide oversight and strategic partnership across all the IT Landscape in Trinity. An enterprise perspective is critical if Trinity is to maximize a return from the significant expenditure on IT, reduce duplication and to ensure corporate wide compliance with procurement, licensing etc.

- Expand the scope of the front-line IT service desks to incorporate complimentary services e.g. consolidate FIS[6] and HR.

- A full application, infrastructure assessment and inventory for Trinity should be completed to identify the IT services which can be consolidated within IT Services.

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[4] Bring Your Own Device
[5] Project Management Office
[6] Financial Information Systems

- Identify and decide on standard strategic products and establish governance for future product selection.

- A Roadmap to rationalize the existing legacy landscape needs to be put in agreed at the organisation level, communicated to all stakeholders and incorporated into a 'whole of organisation' IT strategy.

- Begin to move towards a budgetary model for IT which reflects consumption and need, perhaps beginning by ensuring all departments pay a nominal amount per desktop towards cyber security or broadband or software licensing.

Digital

Digital disruption has already occurred in many sectors where traditional products or channels have been usurped by digital innovation. This will continue and the Library services in Trinity have seen their own landscape change radically with the rise of digital content, on-line lending, RFID[7] to support on site lending and many other digital innovations. The Library service leaders have a mature appreciation for the impact of Digital change having experienced major service enhancements due to digital advances in the last 10 years. They are and could continue to act as strong leaders, advocates and exemplars of positive digital change.

Apart from the library services there appears to be a lack of appreciation for how imminent and transformative the digital agenda will be for individuals and organization alike. Not one of the interviewees mentioned artificial intelligence, robotics, virtual reality or IOT[8]. When asked who owns the digital strategy, some people were unclear; others assumed it belonged to IT Services. There was widespread confusion on the current scope and status of the Digital Trinity strategy.

In general, there is a lack of ownership of an overall Digital Strategy. Ownership if it exists resides at a project portfolio level. Ideally digital change should be understood as an inevitability for all leaders across college and incorporated into individual change agendas with one overarching strategy for the entire organisation.

The panel was supplied with the 2016 Digital Trinity strategy document, this document has been discussed across the organisation however it has yet to be formally approved by the board or assigned a budget. Best practice in other organisations has seen the role of Chief Digital Officer created to champion the digital transformation.

There is confusion around the role of a Chief Digital Officer and it is important the Trinity College considers carefully the very different roles of CDO and CIO.

The Chief Information Officer is the senior technology executive for the whole of the organisation and is accountable for the creation and execution of an IT strategy that is fully aligned with the organisations strategy and advising the executive leadership on how best to apply technology to support their objectives.

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[7] Radio Frequency Identification allows books to be tracked in and out of the library buildings.
[8] Internet of Things

The Chief Digital Officer is responsible for creating, owning and executing digital transformation of the organisation in all of its elements; this includes culture, people and process change as well as technology. It is the transformation of traditional operations using new digital processes. Unlike the CIO, this is often not a deeply technical role. This role is so significant to the entire University operation as to be owned by the executive and visibly part of the overall university strategy.

Recommendations

- There is a clear need for a Chief Digital Officer, CDO, to own, scope and lead the digital strategy at a senior level for Trinity.

- Best practice in other organisations indicates the role of the CDO is placed outside of IT, the CDO must have a particular set of skills necessary to execute the role of CDO and the strategy is owned by an executive which is fully committed to a 'whole of university' transformation, it is woven into the universities strategic vision and plans.

- The strategy should address three aspects: How to advance research in the impact digital transformation will have on society and culture in the broadest sense, how digital enablers can be utilized to expand and renew research and teaching in higher education and how all schools can contribute in educating the students to master and exploit digital opportunities and competencies relevant to their subject.

- Trinity should consult with other international Universities to observe how they are advancing the digital agenda.

- The Digital strategy should be owned and championed by the CDO; it should be publicly launched and funded separately. Consider the support of a Digital champion or Ambassador from outside the organization as recently performed by Lord David Putnam on behalf of the Irish government.

3. Governance and Compliance

The fact that IT Services has authority for only a portion of all IT spend across the organisation has manifested itself in a proliferation of technology, systems, versions and support arrangements across the organisation. One clear cut example is the fact that there is no uniform IT solution across similar teaching rooms and lecture theatres. For visiting faculty, staff and students alike, this may be their first encounter with how Trinity utilises technology in a learning environment and can leave either a positive or negative lasting impression.

At a meeting with faculty it became apparent that even in 2019 it is possible to purchase and develop a solution for a new learning management system opportunity which is not Blackboard. This decision appears to demonstrate a total disregard for the life time cost of the product and the cost of integration with the registration services etc, the long term policy, cost and integration implications do not appear to have been carefully considered.

Processes and governance for the introduction of new Technologies, Services and Applications are lacking. Policies need to be reviewed, implemented and governed. In the absence of an organisational wide governance of IT, many contributors mentioned their reliance on procurement and suppliers to keep them informed on 'what was going on'. There is consequently an over dependency on procurement to police and track assets being purchased within the IT Portfolio.

Controls surrounding change control and release management appear ill-defined or loose e.g. it appears that individuals can purchase applications which have not been security vetted and have them set into production.

Confusion exists with the Portfolio management, Prioritization and Resourcing processes. In addition, there is a lack of alignment between the College PMO[9] and IT Service PMO. Budget is significantly mis-aligned to industry benchmarks. There does not appear to be provision in any budget for the life time costs associated with purchasing new systems for example. Over 60% of non-pay IT expenditure resides outside the IT services budget. The funding model for projects particularly for IT PMO projects is very confusing, authorization for sign off on projects very unclear.

In the absence of clear ownership throughout the life time of an application it is difficult to determine who is responsible for post go-live benefits realization and product ownership.

Recommendations

- IT Services Governance needs to be broadened to include all Faculties and Departments to ensure Enterprise Architecture and Security Standards are applied consistently across the organisation.

- Purchasing Business Partners should be allocated to IT to validate and ensure alignment of technologies to the IT standards and portfolio.
- IT assessment of all new technologies needs to be completed to ensure compliance to security standards and architecture.

- There needs to be clear owners or business sponsors for new system implementations (that are not subject to CRG approval) and any major enhancements to systems to ensure those who are responsible for the short- and long-term benefits realization are clearly identified and held accountable over time for the life time costs etc

- Budgeting process needs to be critically reviewed to include the Total Cost of Ownership of applications and services.

- The overall allocation of the faculty chargebacks to Corporate Services and the relative proportion allocated to IT Services in particular, needs to be increased to reflect the actual consumption of IT services by stakeholders.

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[9] Project Management Office

4. Services

The feedback received from interviewees was very positive. Several groups acknowledged that significant improvements in Wi-Fi availability, service desks and IT Services leadership had occurred in the previous two years. This consensus was particularly evident in those consumers of the IT service who work closely with IT Services e.g. Library services, Academic Registry, The Students Union, HR etc. Similarly, there appeared to be several steering groups which governed the usage of IT services within the existing sphere and participants seemed happy with the level of consultation.

The responsive measures undertaken in recent years such as student clinics, visits to the resident's halls in advance of registration etc. have been extremely effective and IT Services management are to be commended on their initiative.

Interestingly those who are most autonomous e.g. some research groups who operate their own networks appear to have the least insight into the services on offer by IT Services and typically did not offer any suggestions for change. In summary this grouping appeared to have little suggestions for improvement with the odd negative comment regarding '……. paranoia about security'.

Some researchers did express a frustration at their inability to easily author their own web pages. This is an extremely important mode of communication for the researchers particularly when trying to show-case their research on the international stage.

In contrast the groups who work closest with IT had a more 'whole of organisation' perspective perhaps because they also offer services to both the staff and student body. Several people commented on the fact there is little or no joined up thinking across the organisation. There is a lack of understanding at all levels regarding who 'owns' an application, and this leads to delays in decision making and frustration amongst IT staff and users of the service alike.

The lack of a centralised authorised IT service for the organisation is a barrier to strategic change. The non-pay spending power of the 'silos' currently represents over 66% of the total overall annual IT spend in Trinity.

IT Services provided to AV in meeting rooms is limited to 78 of an excess of 235 Rooms ~ 33% of the actual real estate. There is a frustration with lack of standardisation and often students plus visiting faculty have wide ranging and often unsatisfactory experiences in these teaching areas as a result.

The Electronic Learning Management Systems (e.g. Blackboard, Moodle, Canvas) are perhaps the most widely used systems by everyone on campus and often accessible by international students but they are not standardised and integrated, and feedback is that this is a frustration for staff and students.

Integration of systems i.e. the ability for key systems to exchange or access relevant information, is a key issue mentioned by users. Many systems are dependent on the student administration system (SITS), and others however there is often little consideration given to the need to integrate newly purchased systems with existing systems in advance of the final procurement decision. Canvas is apparently adopted as a new e-learning platform for the new blended MBA course and the cost of integration with the existing student registration system will be significant, however this does not appear to have been considered when the decision to use Canvas was made by the business very recently.

There appears to be a wide understanding of the Trinity Cloud policy however some participants expressed frustration that it was very difficult to get their suppliers or vendors to adhere to the policy. Often this was ignored, and the key information required under the policy was not forthcoming from the vendors. This frustrates those who are genuinely keen to adhere to the cloud policy and ensure a secure hosting and retention of data. In one case a senior staff member stated the cloud policy had contributed to a significant delay of years to the replacement of a legacy system and stated the policy was too onerous for their context.

The centrally managed HPC facility is considered outdated and too small by IT Services. Several other HPC facilities exist at Trinity College and considering the ever-growing need for capacity in this field a joint and coordinated effort at college level seems highly relevant. Not at least considering the extensive European initiatives concerning open science (EOSC, FAIR principles) and HPC. However, this didn't turn up during the interviews as a theme or an opportunity to pursue.

The Trinity web site is very large and hosts many sub sites. The IT Services Training and User Communications team, that maintains the IT Services webpages is small 2.5 FTE[10]s, however the current website does not appear to support the easy editing of the many web pages. There are approximately 450 people who have access to update website content however several groups interviewed expressed frustration at their ability to update the website.

Recommendations

- In advance of any procurement exercise for IT applications, the life time cost of the new application should be defined for a min. of three years and clearly state the annual maintenance costs and where the budget for this will reside. In addition, the cost of integration must be acknowledged and budgeted for at the outset. Since almost all systems reference the student administration system, the cost of integration with this system and/or other enterprise wide systems such as the current Oracle ERP[11] or Core HR is best practice and should be adopted.

- The existing policy on Cloud appears to be onerous for smaller systems and a 'Cloud lite' version of the policy should be developed for those systems which are used to manage non personal data.

- In the short term those rooms where AV is managed and supported by IT Services should be clearly labelled as such e.g. 'This equipment is supported by IT Service, please contact XYZ in the event you have any support needs …'

- In the long term the provision of this AV service standard should be consolidated under IT Services, so a consistent high level of services is experienced by all users.

- HPC should be renewed and consolidated. There is an opportunity to leverage and collaborate with other universities nationally and internationally. This could support a new improved relationship with research and could even entail a closer integration of services between the autonomous networks and IT Services.

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[10] Full Time Equivalents

- IT Services should consider using the principles of FAIR research data as a guiding principle for consolidating infrastructure and storage services.

- Standardization of ELMS systems across faculties and divisions in Trinity is not succeeding. Where deviations from the standards are authorized the cost benefits analysis must include the long-term costs of integration with existing Institution's key systems' systems.

- As the IT real estate grows there needs to be a budget for the depreciation of this organizational asset over a three to five-year period. The Budget needs to be made available to continue to invest in support & infrastructure services which are essential to maintain a secure and robust environment for 21,500 students and staff alike. If the numbers of students continue to grow, these services must grow in proportion and be maintained to the requisite standard.

- Service desks should be consolidated to offer several IT services to the same groups. The proposed convergence of the IT and HR service desks appears to offer several advantages and this model should be extended to other areas, academic registry appears to be an obvious next step.

- The IT service survey conducted by the IT Services team is an excellent indicator of performance. This should continue to the future, it bolsters staff morale and provides clear direction for improvement. It also measures the growth in demand and provides the organization with early warnings regarding pain points.

- IT Services should continue to develop service level agreements, these have been very successful to date and clearly define joint areas of responsibility.

- A licensing register needs to be established and accountability for ownership and ongoing maintenance of all systems also registered.

- Conduct a review of the service catalogue with input from end-users. This should include an assessment of potential charge-out for identified services

- Investment in a Content Management System to support website content management editing and management.

5. Risks and information security

The risk registers are in place and are updated on a regular basis. The supporting processes to review and escalate risks are implemented. It includes project risks as well.

Based on the frequency of incidents the network infrastructure seems reliable, robust and secure. It is an impressive achievement, especially when the number of connected devices is considered. However, the low number of detected incidents should not be considered as the sole measure of the obtained level of information security. Data could be lost or compromised in many ways without leaving any trace at the infrastructure level.

Research Data Management (RDM) is progressing but it lacks management support in the form of policies which are emphasized and observed. It was unclear during the interviews who should take responsibility. It was also unclear how far systematic and documented data management planning is mandatory in research projects. RDM is a prerequisite for all successful future funding applications and must be prioritized in the short term in these areas.

The Phishing Awareness and Education Campaign was well conducted and has apparently helped to highlight risky and inappropriate on-line behaviour. Campaigns like this should continue and be extended to include types of behaviour which continue to compromise data security in general e.g. sharing data without proper agreements in place or using insecure devices to store data such as USB keys or any other unencrypted portable devices.

Implementing GDPR has been managed well according to the Self-Assessment Report. However, it was not clear during the interviews just how widespread and profound is the awareness by people of their obligations under GDRP and in general information security at TCD. The attitude of IT Services to network security was at one point described as "paranoid". This would appear to suggest at least a lack of understanding of the real and present cyber security threats experienced and managed daily by IT services.

Recommendations

- Repeat and expand awareness campaigns like the Phishing campaign and IT security week.

- Develop and enforce college wide mandatory RDM policies. Educate people to understand that information is now a corporate asset and must be respected and safeguarded like any other asset.

- Make clear that GDPR and information security is the responsibility of the top management. Engage them and stress that a satisfactory level of security only will be obtained when proper behaviour is emphasized. Technical measures alone cannot safeguard against cybercrime. Most phishing campaigns rely on social hacking, where people are tricked into revealing confidential or sensitive information later used to perpetuate a fraud.

- Complete an GDPR Audit for IT Applications in line with GDPR recommended guidelines.

- IT processes and the approach to GDPR needs to be formalised under a programme of work to include Audits, Training and ongoing technology compliance. This also needs to be formalised in assessing all new technologies going forward to ensure compliance to GDPR standards.

6. Conclusions and Recommendations

IT at Trinity College is well managed and appreciated by users and stake holders. In addition, it was demonstrated that there is impressive user satisfaction and creditable initiatives being undertaken in important areas such as investment in infrastructure, cross college initiatives and implementing shared policies. However, due to the de-centralised nature of IT services across Functions and Faculties there is a clear lack of a uniform view or a consolidated infrastructure underpinned with strict governance, procurement and implementation of services.

The above is further exacerbated by the lack of strategic leadership for Enterprise IT and digitisation due to the lack of several critical leadership roles such as the Chief Information Officer (CIO) and Chief Digital Officer (CDO) leading to a breakdown in linking the IT Strategy and Trinity College Digital Strategy to the overarching College Strategy.

The following table summarises the recommendations of the External Reviewers as they relate to People, IT, Digital, Governance & Compliance, Services and Security. A total of 39 Recommendations have been identified by the External Reviewers and these have been categorised and prioritised as High (17), Medium (15) and Low (7). A High priority indicated an opportunity which the reviewers recommend should be acted upon as a matter of priority while Low indicated an opportunity for improvement which are not of immediate criticality.

It is noted that the most significant High priority opportunities relate to Governance & Compliance and Services which also equates to 43.5% of all potential opportunities / recommendations identified.

	Priority				Total	Accountable		
	HIGH	MEDIUM	LOW			IT Services	College	Shared
Strategy - People	2	2	1		5	3	2	0
Strategy IT	2	4	1		7	6	1	0
Strategy - Digital	0	3	1		4	1	3	0
Governance & Compliance	4	2	0		6	2	1	3
Services	5	2	4		11	7	2	2
Security	4	1	1		6	3	0	3
	17	14	8		39	22	9	8

In addition, the reviewers have identified, where possible Recommendations which can be directly influenced / executed by IT Services and those which are controlled by the broader Trinity College agenda such as Budget Investment, College Strategy, Organisation / Roles. It should be noted that 57% of the recommendations are within the direct control of IT Services to execute. In addition, the College are accountable for 23% and the remaining 20% will require partnership between IT and Functions or the College.

#	Strategy – People: Recommendations		Priority
1	A **Graduate programme** should be developed and established for IT Services. This programme should be formalised and include training and development schedules, mentoring, clear career path and opportunities for job rotation across Trinity College. This will enable the college to establish a strong pipeline of talent and skills / capability at low cost. It is recommended that a number of graduates should be recruited to the IT Services team to refresh skills due to the significant average tenure of the current team.	**IT Services**	M
2	A new **CIO role** needs to be established to provide oversight and Strategic partnership across the entirety of the IT Landscape at Trinity. This recommendation was also put forward in the 2012 IT Services Quality Review and should be actioned as a priority to oversee the implementation of the recommendations outlined in this report.	**College**	H
3	An **Organisation review of IT in Trinity** should be undertaken. It is recommended that the scope of this should include Faculty IT resources. IT resources in Functions and IT Services. This needs to extend to a full skills assessment, job to role definition and mapping as well as a review of reporting lines. The recommendation of the external reviewers is that IT should be Centralised within one function with single line management to ensure a delivery of consistent services across Trinity College. In addition, this will ensure that IT Professionals skills can be developed and that resources can be prioritised against one project portfolio for Trinity College to optimise resources and Budget.	**College**	H
4	It is recommended that all IT professionals should be co-located in one building. This will improve team building and optimise capability, learning and skills development across teams and drive effective collaboration across all technology professionals. The scope of this should include IT professionals outside of the existing IT Services Team.	**IT Services**	M
5	Investment in a solid Intranet for all employees and students would significantly assist with collaboration and communications challenges. This could take the form of extending the existing intranet to include a dedicated IT Services site as a go-to for all thing's technology related. In addition, the existing investment in O365 including SharePoint should be leveraged to drive team collaboration by establishing closed team sites groups / teams to enable collaboration, content management and communications.	**IT Services**	L

#	Strategy – IT: Recommendations		Priority
6	In order to leverage the build on the investment in the Service Desk and to drive consistency in service delivery processes and standards, it is recommended that the **scope of the Service desk** is expanded to include all front-line IT support i.e. consolidate Finance, HR and Student Administration System (SITS). Thus, presenting a single face of IT to their customers.	IT Services	M
7	An overarching application assessment should be completed Trinity College, and this should result in the establishment of a centrally managed **application portfolio**. An application strategy to support the portfolio should be developed clearly identifying applications standards / systems for the College and establishing governance within IT Services for the introduction of new applications in Trinity College. A clear roadmap and milestones for de-commissioning the legacy application landscape should be created and linked to an investment budget.	IT Services	M
8	The Enterprise Architecture should be documented at Trinity College. An **infrastructure strategy** should be developed clearly identifying infrastructure standards for the College and establishing governance within IT Services for the introduction of new technologies in Trinity College. A clear roadmap and milestones for de-commissioning the legacy infrastructure landscape should be created and linked to an investment budget.	IT Services	M
9	Identify standard strategic technologies / applications and establish **governance** for future product selection to remove the proliferation of applications delivering standard functionality e.g. CRM, e-Learning.	College	M
10	All **technology spend** for the College should be Centralised under the IT Services Budget to optimise and prioritise investment spend and support governance of technology standards.	College	H
11	An **IT Strategy** for Trinity College needs to be developed under the guidance of the new CIO. This should be informed through input from the Recommendations as outlined in points # 6 through 8.	IT Services	H

#	Strategy – Digital: Recommendations		Priority
12	A separate review of the IT Services PMO and College PMO needs to be completed. It should be considered to consolidate the two PMO's and to streamline processes and methodologies. Scope should include: • Applications Portfolio Management • Project Portfolio Management • Project Management Methodologies and Tools • Investment and Prioritisation • Benefits Realisation Tracking Post go-Live • Governance to include Pipeline Management.	College	M
13	Given the strategic Digital aspirations of the College it is recommended that a new role **Chief Digital Officer (CDO)** be established. This role should own, scope and lead the Trinity Digital Strategy and be positioned outside of IT Services to ensure successful digital transformation which requires process, people and technology change ownership and leadership. This role should be positioned at a level of senior member of the university: senior academic, researcher or Fellow.	College	H
14	The **Trinity Digital Strategy** needs to be refreshed. The existing strategy represents a portfolio of digital projects as opposed to delivering a Strategy for Digital for the college. The refresh should be clearly linked to the overall Trinity College Strategy and address the three aspects mentioned above: How to advance research in the impact digital transformation will have on society and culture in the broadest sense, how digital enablers can be utilized to expand and renew research and teaching in higher education and how all schools can contribute in educating the students to master and exploit digital opportunities and competencies relevant to their subject.	College	M
15	Digital **skills** and capabilities within the IT Service team to support the Trinity Digital Strategy will need to be developed through training and education and recruitment of experience in this area.	IT Services	M
16	A programme to elevate the **Digital IQ** in Trinity College should be considered to drive education and awareness of potential for digital within the college. This could be led by a representative from Library Services.	College	M

#	Governance & Compliance: Recommendations		Priority
17	**IT Services Governance** needs to be broadened to include all Faculties, Functions and Departments across Trinity College to ensure Enterprise Architecture, GDPR and Security Standards are applied. This is critical to maintaining robust security and protecting the Trinity College network from potential breaches.	**College**	H
18	IT Services should have oversight of any new architecture / applications being introduced into Trinity College. Governance and formal **approval processes** to be established for all technology investment.	**IT Services**	H
19	A **Purchasing Business Partner** (for IT) role should be established within the Purchasing Function. This role should partner with IT to ensure technology decisions and investment are aligned to IT standards, security standards, the applications portfolio and to the Trinity Enterprise Architecture standards. In addition, this will ensure investment decisions are prioritised to drive forward the IT Strategy and Trinity Digital Strategy.	**Purchasing & IT Services**	H
20	The **Budgeting process** for investment in new technologies needs to be critically reviewed to include the Total Cost of Ownership of applications and services. The ongoing Opex cost post the introduction of new technologies and services must be estimated and built into the IT Services run budget on an annual basis.	**College & IT Services**	H
21	**% allocation of chargeback** to Corporate Services and its subsequent re-allocation to IT Services should be reviewed with the intent to increase the % made available to IT Services for investment.	**College**	M
22	The approach for **introduction of new services** and applications should be formalised to include training and change management as standard.	**IT Services & College**	M

#	Services		Priority
23	As the IT real estate grows there needs to be a **budget** for the **depreciation** of this organizational asset over a 3 to 5 -year period. Budget needs to be made available to continue to invest in support & infrastructure services which are essential to maintain a secure and robust environment for 21,500 students and staff alike.	College & IT Services	H
24	In advance of any procurement of new technologies, the **life time cost** of the new application must be defined and budgeted for. In addition, the high cost of integration must be acknowledged and budgeted for at the outset and taken into account during the application selection process.	IT Services	H
25	A central register to manage **Licensing** for the College technologies needs to be established. Governance and processes for on-going maintenance and management of the License register should be put in place to ensure compliance to vendor licensing and contracts management.	College	H
26	It is recommended that a refresh and review of the **Service Catalogue** should be complete with input from end-users of IT Services. Further an assessment to identify and scope the potential for charge-back for selected IT Services should be completed and where appropriate relevant charge-out methodology and processes put in place.	IT Services	L
27	IT services should continue to develop **service level agreements**, these have been very successful to date and clearly define joint areas of responsibility.	IT Services	L
28	Continue the practice of running IT Service **Surveys** as an indicator of performance.	IT Services	L
29	IT Services should consider using the principles of **FAIR research data** as a guiding principle for consolidating infrastructure and storage services.	IT Services	M
30	There is an opportunity to standardisation **AV equipment** in all meeting rooms to ensure a consistent experience and quality of meetings. All meeting room technology should be maintained and managed by IT Services and supported through the Service Desk.	IT Services & College	M
31	**HPC** should be renewed to ensure Trinity College avail of the opportunity to leverage and collaborate with other universities and to drive a new improved relationship with research.	College	H

#			Priority
32	Standardisation of **e-Leaning** management platforms across faculties and divisions in Trinity needs to be addressed. This will be critical to ensure reduced cost of ownership of these platforms, reduced integration to legacy systems (cost) and to drive consistency of learning experience across faculties.	**IT Services & College**	H
33	The existing policy on **Cloud** appears to be onerous for smaller systems and a 'Cloud lite' version of the policy should be developed for those systems which are used to manage non sensitive data.	**IT Services**	L

#	Security		Priority
34	Consider publish statistics and analytics on **cyber** events openly within the college to increase awareness of ongoing threats and drive behaviours.	**IT Services**	L
35	Awareness and **education campaigns** aimed at senior staff should be put in place – campaigns, flyers, posters and online learning. This will also support GDPR compliance requirements. • Continue with and expand Phishing Simulations and other campaigns.	**IT Services**	H
36	Develop and decide on college wide mandatory **RDM** policies.	**IT Services**	M
37	The existing project to ensure compliance to **GDPR** from a technology perspective needs to be formalised with the scope to include all technology and applications in Trinity College. While this is in progressing from a Legal perspective there is lack of an overarching approach across the entirety of the technology landscape in Trinity. Scope should include:- • Systems / Applications Audits and compliance • Infrastructure assessments for security validation • Security training / campaigns	**College Secretary & HR & IT**	H
38	Make clear that GDPR and information security is the **responsibility** of the top management. Engage them and stress that a satisfactory level of security only will be obtained when proper behaviour is emphasized. It isn't enough with technical measures.	**College Secretary & HR & IT**	H
39	**Autonomous networks** need to be delivered as a service to the schools by IT Services to ensure compliance with security standards • An assessment to validate certificate of compliance need to be completed urgently.	**IT Services & Faculty IT**	H

7. Appendix 1 - Schedule of Interviews

Monday 11th March 2019

Meeting	Attendees
Meet Reviewers and escort to Trinity College for Introductory Meeting	Helen Condon, Quality Office
Introductory Meeting with College Officers	Chief Operating Officer (Ms. Geraldine Ruane), Quality Officer (Ms. Roisin Smith), External Reviewers, Internal Facilitator
Dinner with College Officers	Chief Operating Officer (Ms. Geraldine Ruane), Quality Officer (Ms. Roisin Smith), External Reviewers (Ms. Noelle Watts, Ms. Ruth Buckley, Mr. Klaus Kvorning Hansen), Internal Facilitator (Mr. Leonard Hobbs).

Day 1: Tuesday 12th March 2019

Meeting	Attendees
Meet Reviewers and escort to Trinity College for first meeting	Helen Condon, Quality Office
Meeting 1: Meeting with IT Services Senior Management Team	Mr. Patrick Magee (Director IT Services), Ms. Lee Mills (Head of Central and Distributed Support), Ms. Helen O'Hara (Head of Management Services), Dr. Geoffrey Bradley (Head of Academic Services, Innovation and Digital Platforms), External Reviewers, Internal Facilitator
Tour of IT Services Sites	IT Services Management Representatives, External Reviewers, Internal Facilitator
Meeting 2: Representatives from IT Services: Support Services, Supporting Services and Administration	Service Desk Manager (Ms. Sinead Sheils), Training & User Communications Manager (Ms. Lisa Quinn), Service Delivery Manager (Ms. Nicky Cooke), Vendor Relationship Manager (Ms. Tricia Patterson), Administrator (Ms. Nicola Boutall), External Reviewers, Internal Facilitator
Meeting 3: Human Resources - People Development/Talent Management	Deputy Director HR (Ms. Paula Kennedy Hogan), Interim Learning & Organisation Manager (Ms. Michele Ryan), Corporate Services Division, HR Partner CSD, Office of the COO (Ms. Pamela Harkness), External Reviewers, Internal Facilitator
Meeting 4: Representatives from IT Services: Data, Reporting and Analytics	Enterprise Architecture Manager (Mr. Andrew Watson), Business Intelligence Manager (Mr. James Dawson), External Reviewers, Internal Facilitator
Meeting 5: Representatives from IT Services: Application Development and Support; Projects &	Business Application Support Manager (Mr. Ian Stevenson), Application Design & Development Manager (Ms. Sheila

Meeting	Attendees
Change Management	Dunphy), Programming & Integration Manager (Mr. Paul Duggan), Project Office Manager (Ms. Katrina McCall), Systems Analyst (Mr. Michael McGrath), Programmer (Mr. David Hamill), External Reviewers, Internal Facilitator
Meeting 6: Representative from IT Services: Infrastructure, Operations & Facilities	Infrastructure & Operations Manager (M. Paul Jones), ICT Facilities Manager (Mr. Cathal O'Donnell), Systems Administrator (Mr. Paddy Doyle), External Reviewers, Internal Facilitator
Meeting 7: Representatives from IT Services: Teaching, Learning & Research, Digital & Web	Teaching and Learning IT Manager (Mr. Colin McCabe), Research Fellow (Dr. Darach Golden), College Web Officer Ms. Maura Horan), External Reviewers, Internal Facilitator
Meeting 8: Student Services & Student Administration	Director of Student Services (Ms. Breda Walls), Director of Academic Registry (Ms. Leona Coady), Head of Operations Academic Registry (Ms. Jennifer Pepper), Head of Business Support and Planning Academic Registry (Mr. Peter Hynes), Head of Service Academic Registry (Phil Suffield), External Reviewers, Internal Facilitator
Return to Davenport Hotel or depart straight to restaurant	External Reviewers, Internal Facilitator
External Reviewers' private dinner	External Reviewers

Day 2: Wednesday 13th March 2019

Meeting	Attendees
Meeting 1: Research, Library and Open Scholarship	Research Strategy Officer (Dr. Jennifer Daly), Head of Strategic Research Development (Dr. Fiona Killard), Assistant Librarian (Ms. Niamh Brennan), Librarian and College Archivist (Ms. Helen Shenton), Sub Librarian (Ms. Arlene Healy), External Reviewers, Internal Facilitator
Finance Meeting	Director of IT Services (Mr. Patrick Magee), Finance Partner – Corporate Services Division (Mr. Brian O'Connor), Director of Programme Management Office College (Mr. John O'Sullivan), External Reviewers, Internal Facilitator
Meeting 2: Non 'IT Services' IT Service Owners, Infrastructure and IaaS customers	FIS Team Manager – Financial Services Division (Mr. Donal Milne), Business Applications Support Manager – Human Resources (Mr. Stephen Elster), Head of School of Mathematics (Prof John Stalker), Head of Accommodation (Mr. Tony Dempsey), Director of Operations Trinity Development and Alumni (Mr. David O'Shea), Systems Manager School of Computer Science & Statistics (Gerry O'Brien), Systems Administrator Electronic & Electrical

Meeting	Attendees
	Engineering (Conor Nolan), External Reviewers, Internal Facilitator
Meeting 3: Capital Projects & Project Governance	Director of Campus Infrastructure (Mr. Mike Clark), Procurement Officer Procurement and Contracts, Financial Services Division (Mr. Ben Hartnett), Director of Programme Management Office College (Mr. John O'Sullivan), External Reviewers, Internal Facilitator
Meeting 4: Teaching & Learning Supports	Former Associate Dean for Online Learning/Assistant Professor of Computer Science and Education (Dr. Tim Savage), Learning Technologist CAPSL (Mr. Kevin O'Connor), e-Learning Coordinator, Dental School (Mr. Niall O'Sullivan), Instructional Designer School of Pharmacy (Mr. Jonathan Walsh), Trinity Business School (Dr. Eimear Nolan), Development Manager Trinity Online Services Ltd (Mr. Mairtin O Dulain), External Reviewers, Internal Facilitator
Meeting 5: Student representatives	Student Union President (Mr. Shane De Rís), Graduate Student's Union President (Mr. Oisin Vince Coulter), Trinity College Students, External Reviewers, Internal Facilitator
Meeting 6: Administrative representatives	Faculty Administrator Arts, Humanities and Social Sciences, (Ms. Valerie Smith), Faculty Administrator Engineering, Mathematics and Science (Ms. Sandra Kavanagh), School Manager, Trinity Business School (Ms. Pamela Hennessy), School Administrator, Genetics and Biochemistry (Mr. Conor Spillane), School Administrator, English (Ms. Ruth Archbold), External Reviewers, Internal Facilitator
Meeting 7: Academic representatives	Dean of Faculty of Engineering, Mathematics and Science (Professor Vinny Cahill), Representing Dean of Health Sciences (Professor Orla Sheils), Dean of Graduate Studies (Professor Neville Cox), Vice President of Global Relations (Professor Juliette Hussey), External Reviewers, Internal Facilitator
Meeting 8: Governance, Security, & Compliance	College Secretary (Mr. John Coman), Data Protection Officer (Mr. John Eustace), Chief Risk Officer (Ms. Julia Carmichael), Information Security Manager (Ms. Sara McAneney), Chair of LIPC, Professor of Chemistry and CRANN (Professor Sylvia Draper), Systems Analyst (Ms. Laura Conway-McAuley), External Reviewers, Internal Facilitator
Reviewers return to Davenport	External Reviewers
Reviewers walk to Bang Restaurant	External Reviewers
External Reviewers' private dinner	External Reviewers

Day 3: Thursday 14th March 2019

Meeting	Attendees
Preparation time for draft report and Exit presentation.	External Reviewers. Internal Facilitator
Wrap-up meeting with Director IT Services	Director IT Services (Mr. Patrick Magee), External Reviewers Internal Facilitator
Wrap-up meeting with College Officers	Chief Operating Officer (Ms. Geraldine Ruane) **via Conference Call**, Quality Officer (Ms. Roisin Smith), External Reviewers Internal Facilitator
Exit Presentation	Invited stakeholders

IT Services: External Quality Review 2019

Response from the Chief Operating Officer and Director of IT Services

1. Introduction

The Chief Operating Officer and Director of IT Services want to thank the External Reviewers for their energy, diligence and thoroughness in performing a wide-ranging and systematic review of the IT Services directorate and for giving consideration of the broader management of IT at the University. We warmly welcome the tenure of their findings and the recommendations arising.

It is pleasing that the reviewer's comments offer many positive comments on the high level of service, professionalism, experience, skills and the protection from major cyber threats that the IT Services team offers to the entire University and particularly delighted that it records the positive feedback from the Student community. We welcome the recognition that services are delivered in a highly complex, distributed, fast changing and continuously cyber-threatened environment; and that the records reviewed demonstrate that the IT Services does not have budget and resourcing adequacy in the context of a growing number of students, staff and services supported.

This initial response does not seek to address each of the 39 individual recommendations. Many will need wider consultation to inform an implementation plan, to establish which are feasible, affordable and acceptable to the Institution. We are pleased to be able to report on activities that have been on-going since the review itself and which reflect and respond to the reviewers insightful and supportive advices.

We view the report as highlighting the inefficiencies and risk of duplicated expenses due to the levels of purchasing autonomy on IT that exist and that costs saved could be put to greater use in addressing our primary mission i.e. improving the Student Experience, increasing Academic positions, or investment in Research for impact.

2. Response to recommendations for the IT Services directorate alone.

1.1. A number of the recommendations relate to talent development, the cross-pollination of ideas and the sharing of information among the IT community.

1.2. We are delighted to have introduced an intern intake and have already started work to develop into a full graduate program, meeting four objectives – offer our students the opportunity to gain work experience working in a complex organisation; allowing students to influence the shape and priority of our student focused solutions; generating a potential talent pipeline; and offering opportunities for rotations among the existing IT Services team-members as part of a renewed commitment to reskilling / upskilling for the future.

1.3. We have continued to deliver and expand on our security awareness and education campaigns, with new learning materials on Blackboard, handouts, phishing campaigns followed with updates and advise across the Internet pages and social media.

1.4. We continue to develop Service Level Agreements with internal units and are engaged in developing a quality standard for AV equipment in teaching spaces to ensure a consistent Trinity experience.

1.5. Other recommendations that are entirely within the control of IT Services to adopt are being built into workplans and will be advanced as resources and priorities allow. These include a simplified Cloud Policy, a single University Software Asset Register, and further improvements to user support services.

It is important to clarify to the reviewers that while there are references to Finance, HR and Academic Registry as in scope for the consolidated service desk, the profile of services supported by these units goes far beyond IT support.

1.6. The progression of the Digital Trinity / Data Transformation program of work is the catalyst for IT Services to address, in part, a number of the recommendations related to digital skills and capabilities, elements of an application portfolio and infrastructure strategy as far as it related to data, and the introduction of a Web content management system.

1.7. We do agree with the reviewers that there are negative impacts from the physical distribution across the campus of the IT Services team, as did the prior Quality Review in 2012. We are hopeful that disaggregation may be achieved as a result of the Estates Strategy which references 'a medium-term plan to co-locate relevant professional services functions' and action potentially sooner as the site of our largest individual IT Services location at 199/200 Pearse Street has been identified as a potential location to be redeveloped and repurposed.

1.8. The recommendations around support for the Research community and the adoption of FAIR principles are well aligned with the current engagements we have with this community through our High Performance Computing / Research IT team, our engagement on Research committees and our relationship with the research subject matter experts and technology service leadership in the Library.

2. Service & Standardisation

2.1. We agree with the reviewer's view that the service experience of a learner, researcher, academic, other employee or visitor should be coherent and consistent with the quality standards that the Trinity reputation embodies, and the University espouses. It should not be reflective of the unit, building, room or funding source. In response, it is helpful to note a commitment to quality and central oversight of teaching and learning spaces in the draft new Strategic Plan 2020 - 2025.

3. Organisation, Governance and Resourcing of IT across Trinity College, Dublin

3.1. We note a recurrent theme across many of the recommendations is the incorporation of currently distributed services, resources, procurements, and application management with the intention that this will reduce complexity and cost, improve the protection of College assets, and the efficiency and value obtained.

3.2. These are not surprising views - the comments of the external reviewers align with those made in the course of engagements with the Controller & Auditor General, the College's external auditors and internal audit partners, and in the previous external quality review.

3.3. This recommended centralisation of responsibility and elevation of accountability as a core element of a new IT Strategy for the University runs counter to the deliberate, distributed and codified governance, compliance and budget models that are in place in the University today. Such a strategy must incorporate an approach to offer differentiated services to some Schools and units. Addressing this would require a whole-of-college response and an Executive and Board mandate to update these constructs and in addressing some of the primary concerns raised:

- Risk to the quality of services, to the University's reputation, risk of censure and financial loss through the absence of a single accountable unit with a mandate, authority, capability and capacity to enforce the required levels of compliance and protection of university digital assets.

- Risk of attritional or additional expenses or the lost opportunities of minimising costs which results in a direct reduction of available funds for education, research supports and student services.

3.4. We must also call out that the IT Services directorate does not presently have the resource capacity nor budget allocation for the transfer in of all currently distributed IT services or maintenance of the growing number of physical teaching and learning spaces on campus without a budget adjustment, albeit an adjustment that reflects on the benefits of economics of scale.

3.5. The consideration and decision on the extent of the structural and responsibility changes appropriate to the opportunity and risks highlighted is for the University leadership to take and will set the parameters for the extent and timing of the implementation plan.

4. Chief Information Officer and Chief Digital Officer

4.1. A number of recommendations are inextricably linked to the creation of new institution-level roles. This is not a decision that can be taken locally or lightly where the executive, academic pre-eminence and operational independence is codified. These recommendations must therefore be subject to further discussion and debate at College Executive level.

4.2. Regardless, we do endorse the proposal for a Chief Information Officer for the institution, a distinct role from an IT Service leadership position, and whose authority unlocks the opportunity to address many of the recommendations relating to:

- Compliance and Accountability

- Establishing, funding and executing an IT and Digital strategy for the university that is coherent, cohesive and aligned with the Institutional Strategy

- Consolidation of services, procurements and technologies to enhance the level of consistent quality and efficiencies in spending

4.3. We remind the reader that the recommendation to establish a CIO position at the University was contained in the recommendations of the 2012 external quality review, by the START program in 2014 and the absence of same was on the College risk register through 2017.

4.4. A related consideration is the establishment of a Chief Digital Officer position as an institutional-level role that is not a part of the IT Services function and which directs a significant program of work with dedicated funding. In our view, it may be premature to propose a CDO for the University before a CIO is in place, funding / budgeting reforms are introduced to support multi- programs and commitment to follow-through on transformation enablement with institutional practice and culture changes.

4.5. We do agree with the view that such a role, properly established, positioned and supported, can have the catalysing effect required to position the University to reflect its global ambitions, operating in a 21st Century / 4th Industrial Revolution environment, defined by but not constrained by its heritage, respectful but not restricted by its campus location.

5. IT and Digital Strategy of the University

5.1. We respectfully suggest that the University, through its research centres, such as ADAPT, are already focusing on the impact of digital transformation on society and culture in the broadest sense. We are proud of our role in supporting the Trinity Education Project, where the centrality of the Graduate Attributes has been promoted, including building the competencies for an increasingly digital workplace and world. The current review of the institutional supports for Technology Enhanced Learning will inform the extent of IT Services' engagement and development of the digital enablers for this Institutional strategic priority.

6. Funding

6.1. We fully endorse the recommendation that there should be a transparent link between the budget and the consumption of services / true cost of ownership, yet we must acknowledge there are concerns within the institution about the effort and cultural challenge in implementing a full chargeback model, particularly if introduced for IT Services only. We will be anxious to contribute to any review of changes to the budgeting and cost allocation mechanisms within the University.

7. Information Security & Compliance

7.1. We are particularly appreciative of the comments from the Reviewers in relation to our management of the security of the Trinity College network and the absence of major disruptions and breaches to date. As the Reviewers acknowledged, in an increasingly complex and challenging world of cyber-attacks, this does not happen by chance and is an increasingly difficult reputation to maintain when we factor that Universities, worldwide, are reputed to be among the most open and porous networks yet are a gateway to rich rewards for cyber criminals, whether individuals, researchers or state actors; whether malicious or experimental. We know that we are thwarting 1 attempted unauthorised access almost every 3 seconds – that's in excess of 1,100 attempts an hour.

7.2. We have, of course, experienced some of the attitudes towards our provision of a secure environment that so surprised and concerned our External Reviewers. Equally, we would acknowledge that there is a growing acceptance that protection of data and systems is a shared responsibility although there is still some distance to go. We are continuing with on-going education around the Cyber risks including our regular Phishing Campaigns and follow-on training.

7.3. Whether it reflects the on-going provision of a safe environments or additional controls on external access, we will continue to take this area of responsibility seriously. This is an area that we will continue to focus on and invest in on behalf of the whole university.

8. Next Steps:

The IT Services leadership team proposes to draw up an implementation plan to address the recommendations of the Quality Review that are fully within our remit and incorporate the delivery of same into our work plans.

Where institutional change or decisions are required as a pre-requisite, we will provide all appropriate information to enable the University Executive to direct fully informed course of actions.