#### INFORMATION SECURITY CHALLENGES?

## improving information security













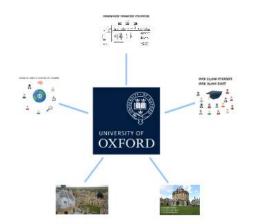












#### HOW TO SECURE A COLLEGIATE UNIVERSITY



#### RISK MANAGEMENT









QUESTIONS





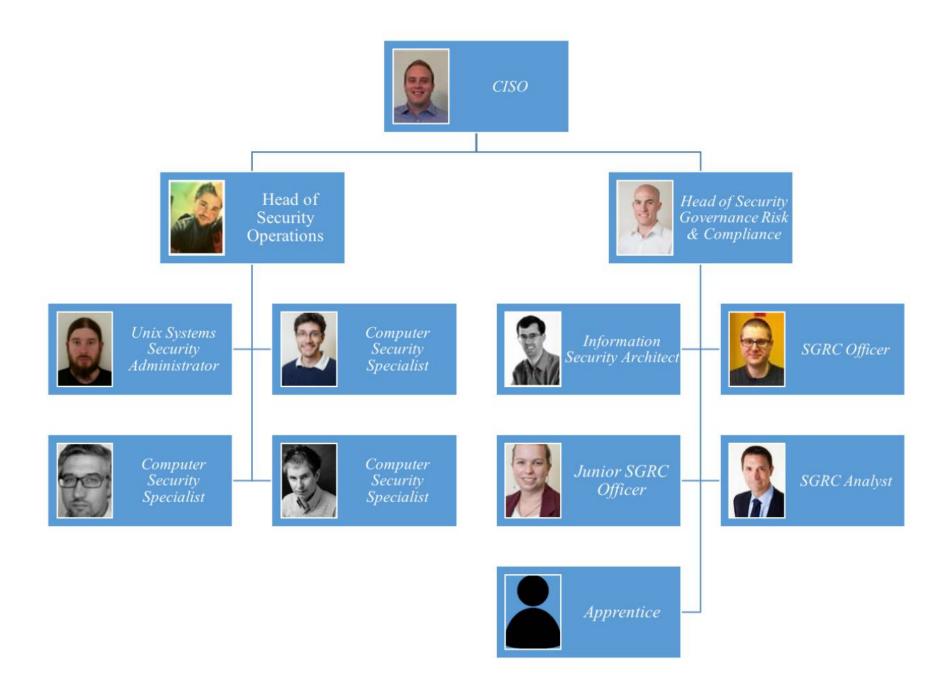
COMPLIANCE AND ASSURANCE



# HOW TO SECURE A COLLEGIATE UNIVERSITY



## INFORMATION SEGURITY TEAM



#### INFORMATION SECURITY CHALLENGES?













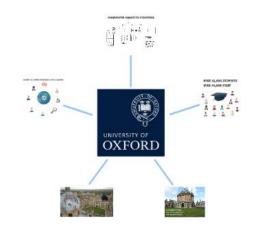












#### HOW TO SECURE A COLLEGIATE UNIVERSITY



#### RISK MANAGEMENT









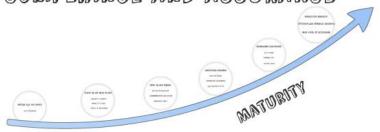
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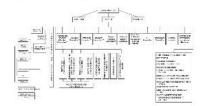




#### COMPLIANCE AND ASSURANCE



#### COMPLICATED COMMITTEE STRUCTURE



Leading the world in besearch and education





OVER 22,000 STUDENTS OVER 10,000 STAFF







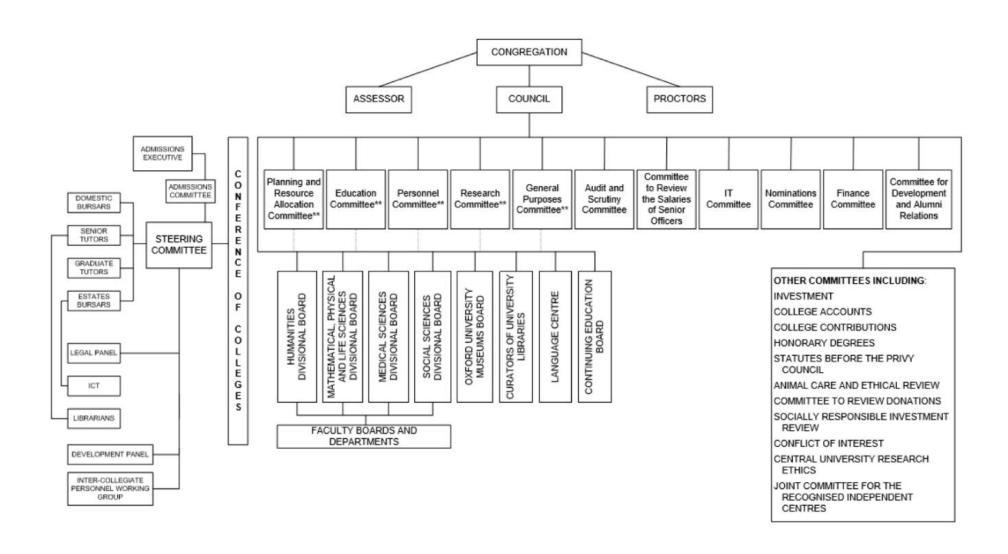




# OVER 22,000 STUDENTS OVER 10,000 STAFF



## COMPLICATED COMMITTEE STRUCTURE



## LEADING THE WORLD IN RESEARCH AND EDUCATION



# INFORMATION SEGURITY CHALLENGES?



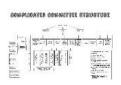












# CHALLENGING LANDSCAPE



# REAL THREATS



# REAL INCIDENTS



# HEADLINE NEWS

# Oxford University college sorry for rejection email errors

(1) 14 January 2017 UK





An Oxford University college has apologised after sending rejected potential undergraduates details of all their fellow unsuccessful applicants.

**Hertford College** sent out rejection emails, but included copies of letters with the names, addresses and subjects of all the failed candidates.

# VARYING REQUIREMENTS









# WALKING A FINE LINE

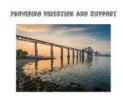


# IMPROVING INFORMATION SECURITY







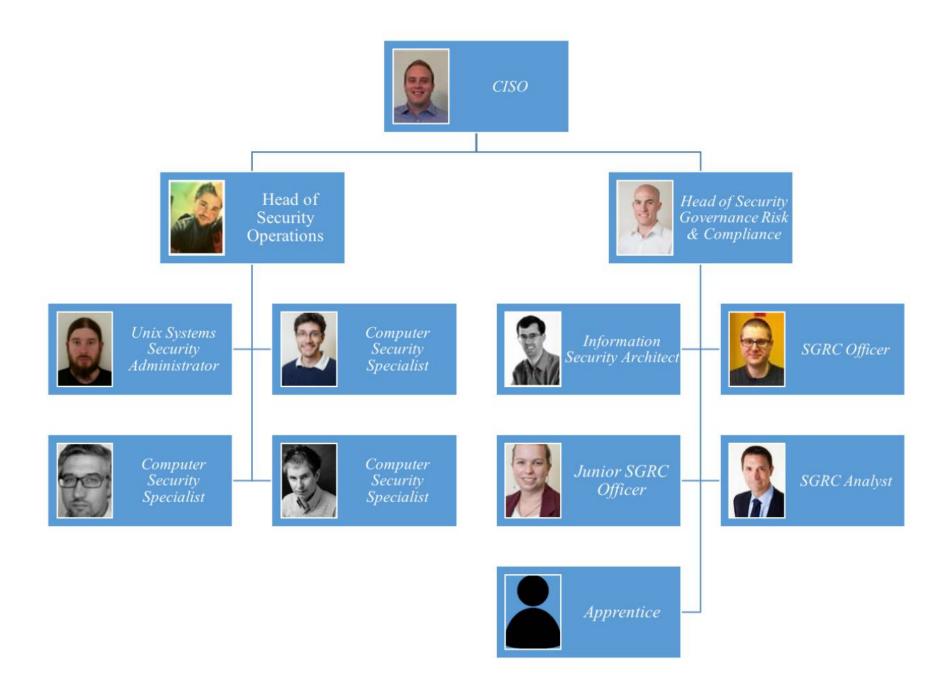




## IDENTIFYING GROWN JEWELS



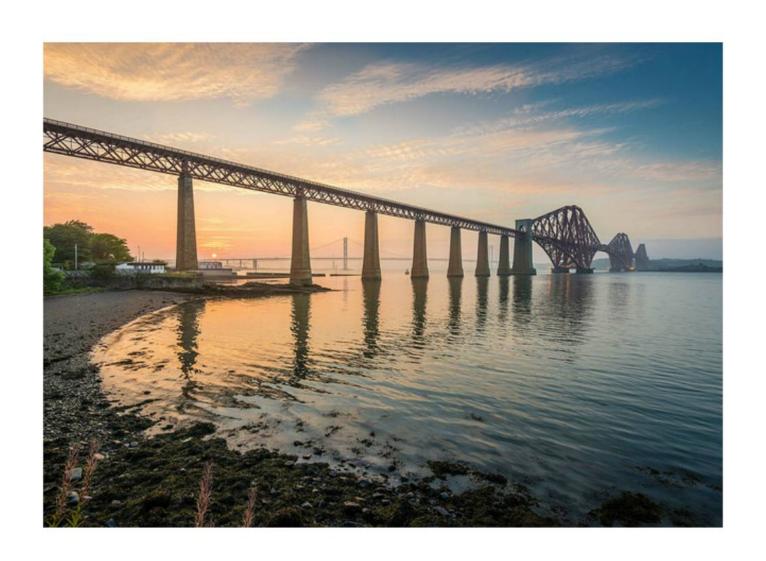
## INFORMATION SEGURITY TEAM



## DEVELOPING CAPABILITY AND CAPACITY



## PROVIDING DIRECTION AND SUPPORT



# CREATING CONFIDENCE



# RISK MANAGEMENT

#### OLD APPROAGH





#### FOGUS ON ACTION



BASELINE SEGURITY GONTROLS



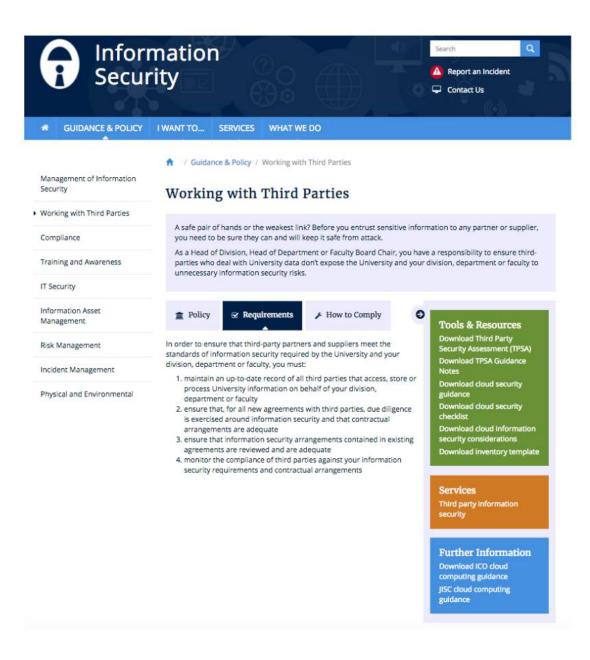


# OLD APPROACH

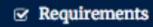


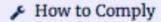


## FOGUS ON ACTION











In order to ensure that third-party partners and suppliers meet the standards of information security required by the University and your division, department or faculty, you must:

- maintain an up-to-date record of all third parties that access, store or process University information on behalf of your division, department or faculty
- ensure that, for all new agreements with third parties, due diligence is exercised around information security and that contractual arrangements are adequate
- ensure that information security arrangements contained in existing agreements are reviewed and are adequate
- monitor the compliance of third parties against your information security requirements and contractual arrangements

#### **Tools & Resources**

Download Third Party Security Assessment (TPSA)

Download TPSA Guidance Notes

Download cloud security guidance

Download cloud security checklist

Download cloud information security considerations

Download inventory template

#### Services

Third party information security

#### **Further Information**

Download ICO cloud computing guidance
JISC cloud computing guidance

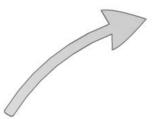
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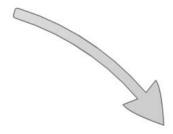
## BASELINE SECURITY CONTROLS



#### ARGMITECTURE PRINCIPLES







project security requirements





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SEGURITY SCHEDULE





Third-party security assessment



## ORGANISATIONAL CONTROLS

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# ANISATIONAL CONTR

			LEVEL 0	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5		
	Tags	DESCRIPTION OF REQUIREMENTS	No controls in the description exist	Some of the controls exist but are not applied consistently across the unit	All controls are in place to some degree but are not all applied consistently across the unit	All controls exist and are applied consistently across the unit but assurance of controls is ad-hoc	All controls exist and are applied consistently across the unit; assurance activities take place to confirm the effectiveness of controls	All controls exist and are applied consistently across the unit; assurance activities take place to confirm the effectiveness of all controls and evidence exists to demonstrate improvements from lessons learned	UNIT LEVEL	
nent of on		MIS.01 Assign overall ownership of information security within your division, department or faculty:  - Define and document any specific information security, regulatory or legal requirements for your division, department or faculty;  - Identify and assign specific roles and responsibilities related to Information Security within your division, department or faculty;  - Embed Information Security into your management framework.	No management ownership of information security exists.	Information security responsibilities are included in some job descriptions and issues are considered by management on an ad-hoc basis.	Information security responsibilities are included in most relevant job descriptions and issues are considered by management regularly. Regulatory requirements have been articulated.	Information security responsibilities are included in all relevant job descriptions and security issues are considered by management termly. All requirements have been articulated.	As at Level 3, with responsibilities within job descriptions and information security requirements being reviewed by management on an annual basis.	As at Level 4, with evidence that output from reviews has been acted upon. Assurance over the effectiveness of controls is provided through independent review.	0	
raining reness	TrainingAndAwa reness	TAA.01 Arrange and annually repeat a compulsory information security awareness training to ensure staff fully understand their Information Security responsibilities: - Include information security awareness training as an integral part of the process for new joiners; - Maintain up-to-date records of awareness training completion.	No information security training exists.	Information security training exists but it is not part of the process for new starters.	Some information security training exists and is part of the process for new joiners. Refresher training is available and completion records are maintained but not all staff regularly receive equivalent training.	All new staff complete equivalent information security training. There is annual refresher training and completion records are maintained.	As level 3, with staff periodically completing and passing a test to monitor their understanding.	As level 4, with additional activities to test awareness (e.g. phishing campaigns). Training offerings are adjusted based on the responses to awareness activities and current threats.	0	

8

# TECHNICAL CONTROLS

TITLE	DESCRIPTION	EXPECTED TESTING	IMPLEMENTED	COMMENTS	CONSTRAINTS	MITIGATION
ACC.01 Access	ACC.01 Restrict access to all systems to	- Review access control policies	INFLEMENTED	SUMMERIS	CONSTRAINTS	WITGATION
Control	authorised users and admins for appropriate	- Examine roles and access requirements - Interview management				
ACC.02 Access Control	ACC.02 Set access control systems to 'deny-all' access by default and only allow access that is specifically authorised.					
ACC.03 Access Control	ACC.03 Authenticate access via secure authentication protocols.	Review authentication procedures     Examine system configuration settings     Observe authentication process				
ACC.04 Access Control	ACC.04 Ensure that sessions are terminated after a defined period of inactivity.	- Review authentication procedures - Examine system configuration settings				
ACC.05 Access Control	ACC.05 Use individual accounts with unique identifiers for the identification of all users, including administrators.	- Review account provisioning procedures - Examine list of accounts - Interview personnel				
ACC.06 Access Control	ACC.06 Disable or delete default vendor, anonymous and guest accounts.	- Review vendor documentation - Examine configuration and account settings - Interview personnel				
ACC.07 Access Control	ACC.07 Change all default passwords, including administrator or root passwords, and ensure new passwords meet minimum requirements.	- Examine configuration and account				
ACC.08 Access Control	ACC.08 Configure system settings to enforce the change or creation of passwords at the first log- on.					
ACC.09 Access Control	ACC.09 Use passwords which are at least 12 characters long OR have at least equivalent strength and complexity.	- Review policies and procedures - Examine configuration settings - Interview personnel				
ACC-10 Access Control	ACC.10 Document users with authorised system administrator privileges.	- Examine documentation - Interview personnel				
ACC.11 Access Control	ACC.11 Manage all access via security groups or roles to ensure alignment between their access rights and their job functions.					

# TECHNICAL CON

TITLE	DESCRIPTION	EXPECTED TESTING	IMPLEMENTED	COMMENTS
ACC.01 Access Control	ACC.01 Restrict access to all systems to authorised users and admins for appropriate and authorised activities only, in accordance with business requirements.	Review access control policies     Examine roles and access requirements     Interview management		
ACC.02 Access Control	ACC.02 Set access control systems to 'deny-all' access by default and only allow access that is specifically authorised.	- Review vendor documentation - Examine system configuration settings		
ACC.03 Access Control	ACC.03 Authenticate access via secure authentication protocols.	<ul> <li>Review authentication procedures</li> <li>Examine system configuration settings</li> <li>Observe authentication process</li> </ul>		
ACC.04 Access Control	ACC.04 Ensure that sessions are terminated after a defined period of inactivity.	- Review authentication procedures - Examine system configuration settings		
ACC.05 Access Control	ACC.05 Use individual accounts with unique identifiers for the identification of all users, including administrators.	<ul><li>Review account provisioning procedures</li><li>Examine list of accounts</li><li>Interview personnel</li></ul>		

## ORGANISATIONAL CONTROLS

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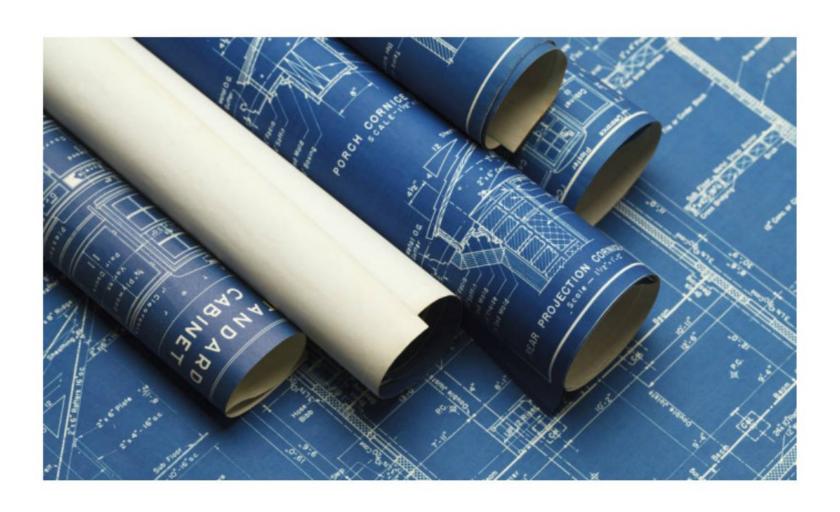
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## PROJECT SECURITY REQUIREMENTS



## ARCHITECTURE PRINCIPLES



## CLOUD SECURITY ASSESSMENT



## THIRD-PARTY SECURITY ASSESSMENT



# SECURITY SCHEDULE



## ORGANISATIONAL CONTROLS

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# COMPLIANCE AND ASSURANCE

CONSISTENT SECURITY

effective and efficient gontrole

THEN LEVEL OF ASSURANCE

INGREASING ASSURANCE

MEASURIMS SUGGESS

where are we now? COLF ASSESSMENT

What do we need to do?

NOW TO SET THEREY

MATURITY

## CONSISTENT SECURITY

## Effective and efficient controls

HIGH LEVEL OF ASSURANCE

# WHERE ARE WE NOW?

SELF ASSESSMENT

## WHAT DO WE NEED TO DO?

Analysis of results

WHERE IS THE RISK

WHERE TO FOGUS EFFORT

## HOW TO GET THERE?

REPORTS ON COMPLIANCE

RECOMMENDATIONS AND ACTIONS

PROVIDING SUPPORT

## MEASURING SUCCESS

RINSE AND REPEAT

DEMONSTRATE IMPROVEMENT

LINK TO INCIDENT STATS

# INCREASING ASSURANCE

SPOT CHECKS

INTERNAL AUDIT

EXTERNAL AUDIT

## CONSISTENT SECURITY

## Effective and efficient controls

HIGH LEVEL OF ASSURANCE

# COMPLIANCE AND ASSURANCE

CONSISTENT SECURITY

effective and efficient gontrole

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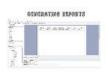
# TOOLING





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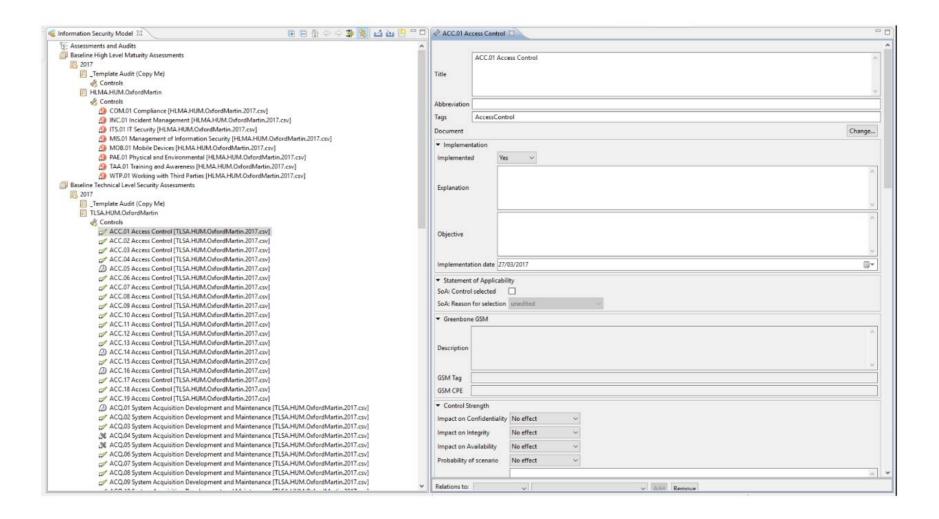


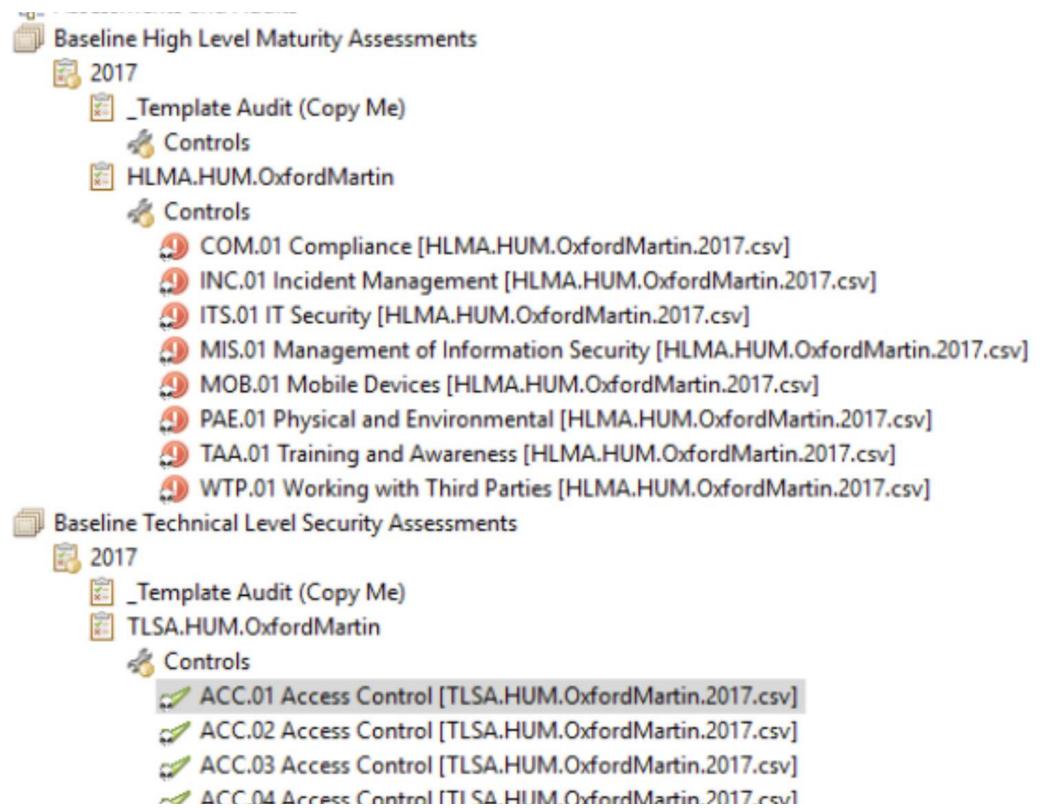




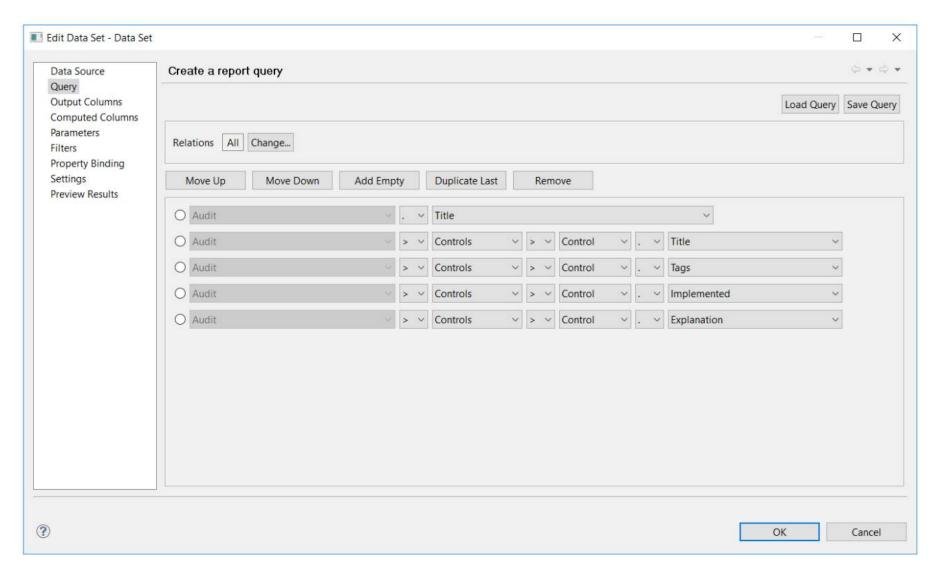


## DATABASE OF AUDITS AND COMPLIANCE

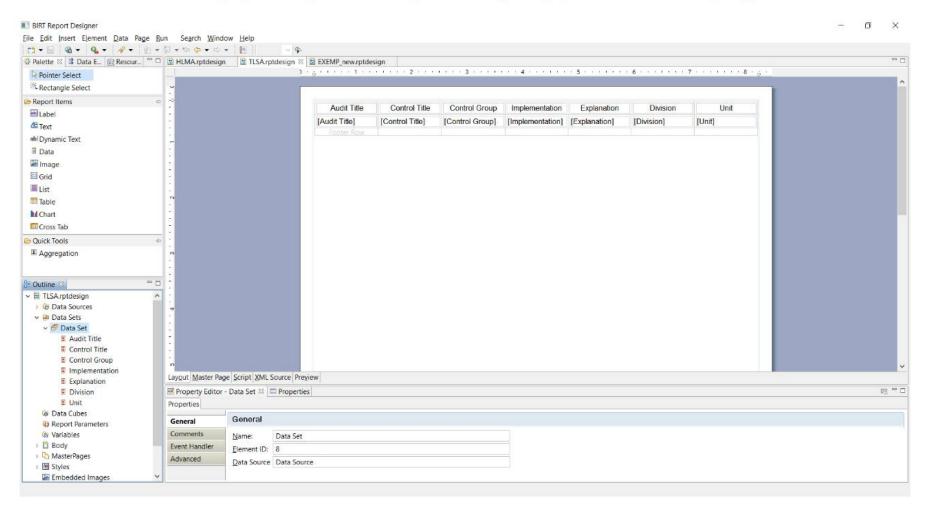




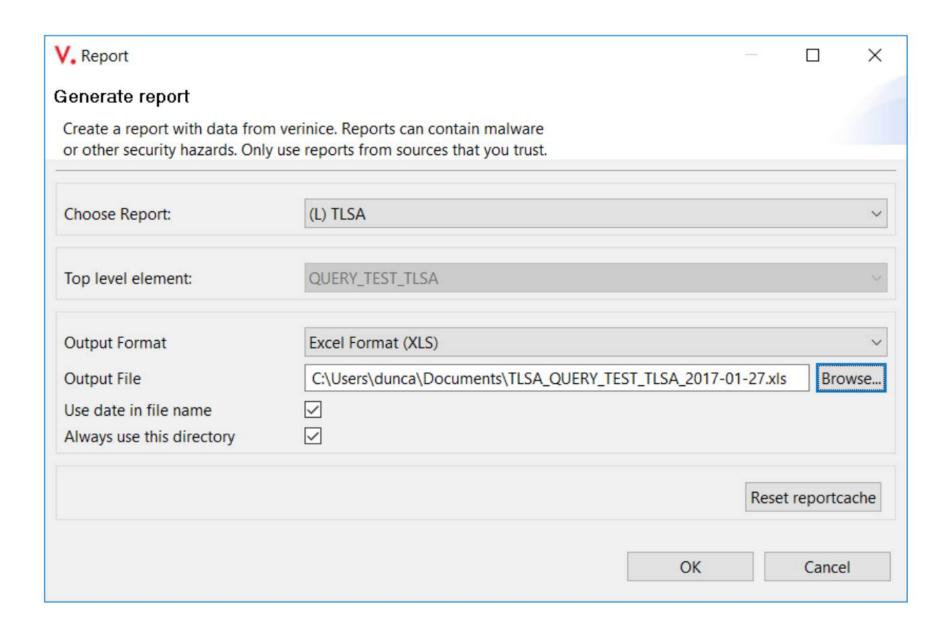
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# GENERATING REPORTS



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# GENERATING REPORTS

Maturity Comment

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HLMA.MPL.Hogwa rts	COM.61 Compliance	CCM.01 - Perform regular compliance reviews of your division, department or faculty's information security arrangements against University policy: - Report on compliance within your division, department or faculty to your Divisional information Security Working Group and the Jaint Information Security Working Group and the Jaint Information Security Advancy Groups	2		MPL	Hogwarts
HLMA.MPL.Hogwa rts	INC.01 Incident Management	ING.II Ensure local procedures are in place for the management of information search) incidents within your division, department or feasibility incidents within your division, department or feasibility incidents within your division, department or procedures exist to reduce the inpact of incidents; — procedures exist for the communication of incidents or reterent attacknoiders; — incidents are incidents are recorded storing with leapons learned to prevent re-opcommence.	2	We are alent to the need to report incidents but our procedures are not as formidised as required at level 3. We have acted on lespons learned though including mitating a division-wide training session following an incident.	MPL	Hogwarts
HLMA.MPL.Hogera rts	ITS:01 IT Security	TS at Enuire all systems within your division, department or tearthy comply with the University's baseline' information security control for .  - Access Control  - Access Control  - Coperations  - Universities' Management  - Ind plant Management  - Ind dent Management  - Monitoring and Lugging  - Monitoring and Lugging  - Change Management		See technical assessment for further defails.	MPĹ	Hogwarts
HLMA.MPL.Hogwn rts	MIS.01 Management of Information Security	MIS.01 Assign overall awnership of information security within your division, department or laculty.  - Define and document any specific information security, regulatory or legal requirements for your division, security or laculations and the security of the security into your management framework.	1	The importance of information Security is recognised at Serior Management level. issues are considered by management regularity but further work is required to embed a systematic approach including aspects suchs as listing information security responsibilities in job descriptions.	MPL	Hogwarts
HLMA.MPL.Hogwa	MCB.01 Mobile Devices	MCB.0.1 - Ensure that any mobile devices within your division, department of soutly hive appropriate controls in place:  - Pretented from unauthorised access by at least a 4-digit PIN or a passphraso;  - Configured to ensure they automatically lock after a period of inscribity;  - Configured to ensure they automatically lock after a period of inscribity;  - Configured in sects a way that they can be remotely wiped in the event of loss;  - Other period after a first and applications from reputable sources installed.  - Currently receiving software updates from the manufacturer and other 3rd particip; and  - Receive collective puddes for sometry patches within a	0	Our practice has been to give advice and provide sentrops such a enhanced from the enhanced such as enhanced for the enhanced from the enhanced from the process of formalising this advice into a policy which will be communicated to all members of the Department.	MPL	Hogwarts
HLMA.MPL.Hogwa rts	PAE.01 Physical and Environmental	reasonable timetrame. PAE 01 - Ensure that any IT facilities within your division, department or faculty have appropriate emiscennential and physical security arrangements in place:  - Citakin assurances, where third particle have responsibility for hading or processing University information on your behalf, that appropriate arrangements are in place.			MPL	Hogwarts
HLMA.MPL.Hagwa rfs	TAA.01 Training and Awareness	TAA.01 Arrange and annually repeat a compulsory information security awareness variety is ensure staff tuty understand their Information Security responsibilities: - include information security awareness training as an integral part of the process for new joiners: - Maintain up-to-date records of awareness training completion.	2	We are finding it difficult to move from level two to three because of limited resources. Monitoring and reminding individuals would take staff time. It would be helpful if the monitoring reports from the system were robust and even before if the system could send annual reminders.		Hogwarts
HLMA.MPL.Hogwa	WTP.01 Working with Third Parties	WIFEOT - Exercise a due disjence process, including a risk arrestment, around information security when engaging their parties to ensure that new contractual arrangements and expedition of the security of the security of the - Marishin up-bodder records of all third parties that accesses, allow or process University information, - Marishin and periodically review existing agreements with third parties to ensure their adequator; - Worlingth the compliance of third-prints against your information Security requirements and contractual arrangements.	G.	We do have the need for third party services e.g. electronic tib notebooks and other cloud services. We are concerned about our lack of compliance in this area but resource and expertise is a real issue for us.	MPL	Hogwarts

Audit Title	Control Title	Control Description	Maturity	Maturity Comment	Division	Department
HLMA.MPL.Hogwarts	COM.01 Compliance	COM.01 - Perform regular compliance reviews of your division, department or faculty's information security arrangements against University policy: - Report on compliance within your division, department or faculty to your Divisional Information Security Working Group and the Joint Information Security Advisory Group.	2		MPL	Hogwarts
HLMA.MPL.Hogwarts	INC.01 Incident Management	INC.01 Ensure local procedures are in place for the management of information security incidents within your division, department or faculty: - formal incident response procedures exist to reduce the impact of incidents; - procedures exist for the communication of incidents to relevant stakeholders; - incidents are investigated to identify root causes; - incidents are recorded along with lessons learned to prevent re-occurrence.	2	We are alert to the need to report incidents but our procedures are not as formalised as required at level 3. We have acted on lessons learned though including initiating a division-wide training session following an incident.	MPL	Hogwarts
HLMA.MPL.Hogwa rts	TTS.01 IT Security	ITS.01 Ensure all systems within your division, department or faculty comply with the University's 'baseline' information security controls for: - Access Control - Network Security - IT Operations - Vulnerability Management - Incident Management - System Acquisition and Development - Monitoring and Logging - Change Management	2	See technical assessment for further details.	MPL	Hogwarts
HLMA.MPL.Hogwarts	MIS.01  Management of Information Security	MIS.01 Assign overall ownership of information security within your division, department or faculty:  - Define and document any specific information security, regulatory or legal requirements for your division, department or faculty;  - Identify and assign specific roles and responsibilities related to Information Security within your division, department or faculty:	1	The importance of Information Security is recognised at Senior Management level. Issues are considered by management regularly but further work is required to embed a systematic approach including aspects suchs as listing information security responsibilities in job descriptions.	MPL	Hogwarts

# CREATING WRITTEN REPORTS

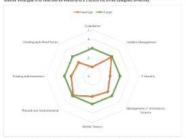




#### Executive Summary

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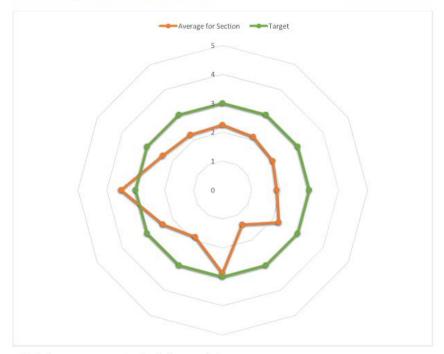




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## Information Security Team Baseline High Level Security Assessment





Individual scores are summarised in the heat map below:

	Hogwarts	Aardvark	Endeavour	St Barnaby's	Science department	Cardinal's College	Foxe College	Jordan College	Queen Phillipas		Shakespeare	Average
Compliance	0	0	1	1	0	2	3	0	3	0	1	1.0
Incident Management	1	3	2	3	4	1	4	2	3	5	4	2.9
IT Security	2	2	2	2	2	1	2	3	2	2	2	1.9
Management of Information Security	3	2	2	2	4	2	3	2	1	4	1	2.4
Mobile Devices	3	3	2	1	0	1	2	2	3	5	2	2.2
Physical and Environmental	4	4	3	3	3	2	4	2	3	4	4	2.9
Training and Awareness	4	2	2	2	2	1	3	1	0	4	4	2.3
Working with Third Parties	1	1	2	1	3	1	2	3	4	4	1	2.1
Average for Section	2.3	2.1	2.0	1.9	2.3	1.4	2.9	1.9	2.4	3.5	2.4	2.2



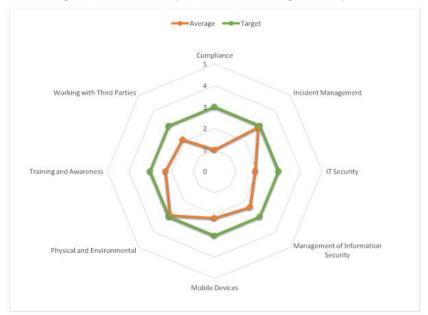
### **Executive Summary**

#### Overview

This report summarises the baseline self-assessments completed by the sections of UAS as part of the Information Security Team (IST) review of information security maturity across the collegiate university. These assessments measured each section's current maturity level against a 5-point scale for each of 8 security domains. The assessments will be repeated on an annual basis to enable the university to demonstrate steady improvements to information security maturity.

#### **UAS** maturity

The average maturity of all UAS sections in each of the security domains is between 1 and 3 out of 5 with an overall average of 2.2. This is not unexpected: the IST trialled the assessment process with 6 university units over the long vacation and the average score was roughly comparable. It is also important to note that a realistic initial goal is to raise overall maturity to a 3 across the entire collegiate university.



Specific maturity scores varied significantly, both across sections for security domains and across security domains for individual sections, with many instances of extremely low and high levels of maturity. Despite this, average maturity scores for sections do not differ by large amounts but rather show the same 1 to 3 maturity rating observed previously.

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### Page 3 of 12

## Information Security Team Baseline High Level Security Assessment



#### Incident management

#### Requirements

Ensure local procedures are in place for the management of information Security incidents within your division, Section or faculty:

- · formal incident response procedures exist to reduce the impact of incidents;
- · procedures exist for the communication of incidents to relevant stakeholders;
- · incidents are investigated to identify root causes;
- · incidents are recorded along with lessons learned to prevent re-occurrence.

#### Results

Maturity Level	Description	Sections
Level 0: Non- existent	No security incident response plans are in place.	
Level 1: Initial	Security incident procedures are in place but are not formalised.	Wordsworth, Foxe
Level 2: Repeatable	Incident response procedures exist and incidents are investigated and reported to senior management on an ad-hoc basis.	Howwarts
Level 3: Defined	Incident response procedures are documented and followed by all. Records of incidents are maintained along with root causes and lessons learned. Incidents are periodically reported to senior management	Cardinal's
Level 4: Managed	evel 4: As at level 3, with evidence of validation of incident detection	
Level 5: Optimised	As at level 4, with evidence of a repeatable process to validate and test incident response plans and procedures.  Documented evidence of lessons learned and adjusted plans.	Wykeham

#### Comments

Overall maturity is generally high in this area, though the IST has identified that there is no formal UAS incident management process for sections to follow.

#### Actions

Action	Owner	Target
Take forward the actions in individual reports from the IST and report back to the divisional working group	All sections	July 2017
Formalise and document incident management procedures and work within IT Services to ensure they are followed to internally	IST	July 2017
Investigate future recording of incidents within planned Governance Risk and Compliance software	IST	July 2017
Follow-up on areas of good practice and disseminate this information across the whole of UAS	IST	July 2017

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# CREATING WRITTEN REPORTS

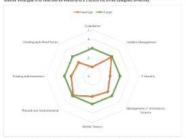




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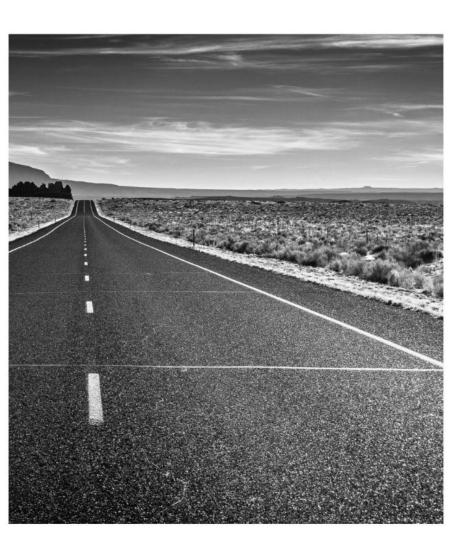
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## LOOKING AHEAD



BETTER AUTHENTICATION SUPPORT

IMPROVED WEB INTERFACE

PER-SCOPE RISK ASSESSMENTS

MORE COMPLEX REPORTING OPTIONS

# QUESTIONS



## INFORMATION SECURITY CHALLENGES?

## IMPROVING INFORMATION SECURITY













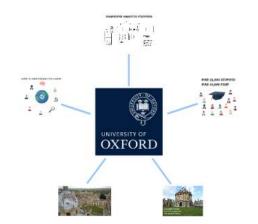












### HOW TO SECURE A COLLEGIATE UNIVERSITY



## RISK MANAGEMENT









QUESTIONS









## COMPLIANCE AND ASSURANCE

