

# **Hopewell Hospital**

Colombo, Sri Lanka

## Risk assessment Report

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### **Executive summary**

The annual Information Security Risk Assessment report was carried out regarding critical IT assets of Hopewell hospital. This risk assessment was specially recommended with the implementation of new Pacemaker system, automated oxygen supply system and the patient smart card system which operates with cutting edge technologies that gives the organization a competing advantage in the industry.

The risk assessment was done by the risk assessment team of Hopewell hospital considering how violation of three key principles (Confidentiality, Integrity, Availability) of cyber security could affect these systems and as well as existing critical IT assets of the system. This report contains recommendations to be implemented in order to overcome the threats generated by these assets.

#### Key issues and recommendations

- For databases that use older server versions, update and install the latest versions.
  - Patient information management system, Patient smart card system, HR information management system, Inventory management and drug distribution system and pacemaker system needs upgrade of server versions.
- Implement a firewall to detect unauthorized access to the internal network.
- Implement a password policy, privilege policy and a software upgrade policy.
- Implement a CCTV monitoring system for the assets, Inventory management system and automated oxygen supply system locations.
- Implement a DRP (Disaster recovery plan) and BCP (Business continuity plan) to overcome unexpected incidents.

### **Detailed analysis**

#### Introduction

Hopewell hospital is a well reputed private hospital located in Colombo, Sri Lanka. It has provided a quality service for the patients including clinical services, short-term hospitalization services, emergency room services, X-ray and laboratory services and surgery related services for the past 10 years. Hopewell has transformed their manual operational procedures to automated procedures within the past few years which owned them the assets such as a patient information system, HR management system, inventory and drug distribution management system. And, with the evolution of technology, hospital management added new automated systems containing cutting edge technology such a pacemaker system, patient information smart card system and an automated oxygen supply system.

Details and functionalities of these assets are listed below.

#### Patient information management system

A database containing patient details, medical history, and payment history. Was designed initially using Microsoft SQL server 2017 which is currently outdated. Uses a frontend software which is also outdated.

#### **Inventory management and Drugs distribution system**

All the logs of distributing drugs, details of inventory and inventory bills for purchased drugs are stored in this database. Was designed initially using Microsoft SQL server 2017 which is currently outdated. Uses a frontend software which is also outdated.

#### Pacemaker system

This is a mobile heart monitoring system which monitors critical patients with heart relate issues and includes a device which can send alerts to an emergency ambulance service and which can also give an electric shock for the patient in an emergency.

#### HR information management system

A database includes all employee details, payroll details, attendance tracking and performance details.

Was designed initially using Microsoft SQL server 2017 which is currently outdated. Uses a frontend software which is also outdated.

#### Patient Information smart card system

This is a system that manages patient information using a Smart card system which allows patients easy access to the services provided by the hospital. Uses a thin card with an embedded chip inside. The database was initially designed using MySQL server 8.0.14 (2019)

#### Automated oxygen supply system

This is an automated oxygen supply system, managed using a software program, which is used to manage the oxygen generators and distribution of oxygen through the hospital rooms.

### Risk assessment methodology and framework

For conducting this risk assessment report, Octave allegro risk assessment framework was used by the risk assessment team. This was selected because Hopewell hospital needed immediate results delivery from the risk assessment which is easier to provide the top to bottom approach that Octave allegro risk framework provides.

#### Risk assessment team

Department	Position	Name
Human resources	HR manager	Ms. H.R Dharmasena
Drug stores	Pharmacist	Mr. Asela Gunasinghe
IT department	Database administrator	Mr. G. Rajapakshe
IT department	Network administrator	Mr. K. M. Bandara
Emergency room services	Medical officer	Dr. Nimali de Silva

To address the risks with most severity a risk tolerance level was decided. And threats below that level was counted as acceptable risks.

Risk tolerance level = 10.0

# <u>Critical assets and threat profiles and their risk scores (Refer appendix A/ B) (red – acceptable risks)</u>

Patient Information management system (A1)	Patient Information smart card system (A2)	HR information management system
A1.T1 (17.5), A1.T2(19.5), A1.T3(19.5), A1.T4(14.5), A1.T5(18), A1.T6(6.5)	A2.T1(6.5), A2.T2(5), A2.T3 (17.5), A2.T4(14.5)	A3.T1 (16), A3.T2(17.5), A3.T3(17.5), A3.T4(11.5), A3.T5(15.5), A3.T6(6.5), A3.T7(6.75)
Inventory management and Drugs distribution system	Pacemaker system	Automated oxygen supply system
A4.T1 (17.5), A4.T2(17.5), A4.T3(15.5), A4.T4(6.25), A4.T5(6.5)	A5.T1 (20), A5.T2(21), A5.T3(13)	A5.T1 (10.25), A6.T2(10), A6.T3(10)

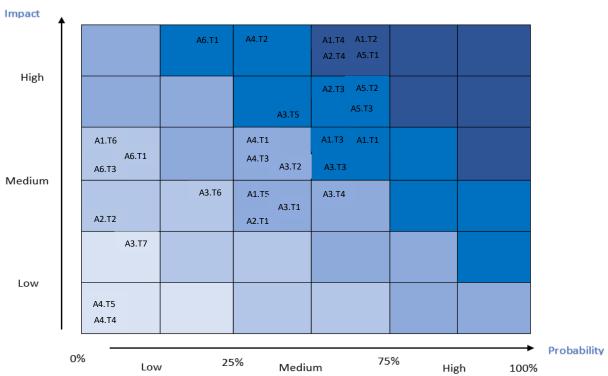
Asset	Threats and	Impact	Mitigation techniques
Asset  Patient information management system	vulnerabilities  An accidental modification of patient information can be happened. (probability – 50%)  A modification of patient information can be happened (probability – 50%)  Someone could use patient details in the system for personal gain (probability – 50%)  Internal employee	Since this database stores all the patient details including medical details of the patient, these threats could result in Potential data loss, possible financial loss, affect in organization's productivity and safety and health of patient lives also could be affected.	Install latest version of the MySQL server (8.0.23) 2021 and vulnerabilities in the server can be eliminated.  Implement a firewall to detect unauthorized access to the internal network  Implement a password policy, privilege policy and a software upgrade policy
	could use patient information for personal gain (probability – 50%)  Availability could be lost due to a DDOS attack (probability – 50%)  A natural disaster can lead to loss of availability (probability – 25%)		Maintain a database backup and recovery system in a separate location
Patient Information smart card system	Smart card can be stolen (probability – 50%)  A malicious actor could clone the smart card (probability – 25%)  Smart card details in the database could be disclosed. (probability – 50%)  Internal employee could use patient	Since this database stores all the patient details including medical details of the patient, these threats could result in Potential data loss, possible financial loss, affect in organization's productivity and safety and health of patient lives also could be affected.	Increase the awareness about the smart card's safety among card owners.  Install latest version of the MySQL server (8.0.23) 2021 and vulnerabilities in the server can be eliminated.  Implement a password policy and a software upgrade policy

	information for personal gain (probability – 50%)		
HR information management system	_	Since this database includes all the critical employee details if any disclosure or a modification of the data could result in disclosure to unauthorized parties or can be traded to third parties. This will affect hospital's productivity and a financial loss.	Install latest version of the MySQL server (8.0.23) 2021 and vulnerabilities in the server can be eliminated.  Implement a password policy, privilege policy and a software upgrade policy  Maintain a database backup and recovery system in a separate location  Implement a firewall to detect unauthorized access to the internal network

Γ	T					
Inventory management and Drugs distribution system	Inventory logs can be changed by an internal employee (probability – 50%)	and drugs distribution details are handled by this system, a disclosure or a modification can risk patients' lives due to lack of medical supplies. And it can affect the reputation and the financial status of the hospital. Fines and legal penalties could be applied if a patient's life is threatened due to a modification of medical supplies.  The MySQL set (8.0.23) 2021 vulnerabilities server can be eliminated.  Implement a policy, privile, and a software policy  Maintain a dat backup and results system in a segulation of medical supplies.  Implement a findetect unauthor access to the innetwork  Implement a Company of the MySQL set (8.0.23) 2021  The MySQL set (8.0.23) 2021	and drugs distribution details are handled by this system, a the MySQL s (8.0.23) 2021 vulnerabilities	Install latest version of the MySQL server (8.0.23) 2021 and vulnerabilities in the server can be		
	Inventory logs can be changed by an external malicious actor (probability – 50%)		Implement a password policy, privilege policy and a software upgrade			
	Availability of system can be lost because of a DDOS attack (probability – 50%)		of the hospital. Fines and legal penalties could be applied if a patient's life is threatened due to a modification of medical supplies.  Implement detect unau access to the	Maintain a database backup and recovery system in a separate		
	External actor could harm the server hardware (Physical threat) (probability – 25%)			Implement a firewall to detect unauthorized access to the internal		
	A natural disaster can lead to loss of availability (probability – 25%)		Implement a CCTV monitoring system			
Pacemaker system	Deliberately reprogram the system that can disrupt the patient's heart rhythm (probability – 50%)	connected directly with a patient's heart, a modification or a disclosure could be life threatening for the patient. This could affect the hospital's reputation and in a financial loss as well.  Since patient's lives are	Install latest version of the MySQL server (8.0.23) 2021 and vulnerabilities in the server can be eliminated.			
	Disclosure of patient's sensitive information (probability – 75%)  Modification of		patient. This could affect the hospital's reputation and in a financial loss as well.	patient. This could affect the hospital's reputation and in a financial loss as well.	patient. This could affect the hospital's reputation and in a financial loss as well.	Implement a password policy, privilege policy and a software upgrade policy for the database use.
	patient information in database tables (probability – 50%)		Maintain a database backup and recovery system in a separate location			
			Implement a firewall to detect unauthorized access to the internal network			

Automated oxygen supply system	Modification of oxygen supply level (Probability – 25%)  A natural disaster can lead to loss of availability (probability – 25%)  External actor could harm the oxygen generators (Physical	Since this system manages the oxygen supply for the patients, a modification could be life threatening for the patient. This could affect the hospital's reputation and in a financial loss as well.  Since patient's lives are affected fines and legal penalties could be applied.	Implement a password policy, privilege policy and a software upgrade policy for the database use.  Maintain a recovery system in a separate location
	threat) (probability – 25%)		Implement a firewall to detect unauthorized access to the internal network  Implement a CCTV monitoring system

## **Heat Map (6 x 6)**



### **Overall recommended mitigations**

• For databases that uses MySQL older versions, update and install the latest MySQL server 8.0.23 2021 version.

In older MySQL 2017 version this has several critical vulnerabilities,

CVE-2019-1068 (remote execution code vulnerability)

CVE-2019-0819 (information disclosure vulnerability)

CVE-2019-1332 (XSS vulnerability)

CVE-2018-8273 (buffer overflow vulnerability)

• Implement a firewall to detect unauthorized access to the internal network.

Since 5 out of 6 critical assets selected suggests implementing a firewall, an overall firewall covering inbound and outgoing network traffic in the internal network should be implemented.

• Implement a password policy, privilege policy and a software upgrade policy.

A strong password policy for employees is needed.

Suggestions are: A password contains more than 8 characters including both lowercase uppercase letters, special characters and numbers.

A privilege policy should be implemented defining which employees can access which critical data stored in the databases.

A policy on software upgrades should be implemented suggesting how frequently that database server software and frontend software should be updated.

• Maintain database backup and recovery system in a separate location

To countermeasure the consequences of natural disasters, maintaining database and recovery system in a separate location is recommended.

- Implement a CCTV monitoring system for the assets, Inventory management system and automated oxygen supply system locations.
- Implement a DRP (Disaster recovery plan) and BCP (Business continuity plan) to overcome unexpected incidents.

# **Appendix A (Asset profiles)**

Allegro Worksheet 8	et 8 ASSET PROFILE A.1			
(1) Critical Asset  What is the critical information asset?	(2) Rationale for Selection  Why is this information asset important to the organization?	(3) Description  What is the agreed-upon description of this information asset		
Patient Information management system (Database)	Includes patient details therefore a disclosure or modification can be critical for both patient	Includes a database contains patient details, medical history, and payment history.		
(4) Owner(s) Who owns this information of	asset?			
Director – Hopewell ho	ospital			
(5) Security Requirements  What are the security require	rements for this information asset?			
□ Confidentiality	Only authorized personnel can view this information asset, as follows:		Information cannot be disclosed to unauthorized parties since critical details on patients are stored including prescriptions and medical history	
☐ <mark>Integrity</mark>	Only authorized personnel can modify this information asset, as follows:		A modification of patient details can even be life threatening.	
☐ Availability	This asset must be available for these personnel to do their jobs, as follows:		Information should be available to treat patients in an effective manner	
	This asset must be available for <b>24</b> hours, <b>7</b> days/week, <b>52</b> weeks/year.		99.99%	
□ Other	This asset has special regulatory compliance protection requirements, as follows:			
(6) Most Important Security Requirement  What is the most important security requirement for this information asset?				
☐ Confidentiality	☐ Integrity ☐ A	Availabi	lity	

Allegro Worksheet 8	ASSET PROFILE A.2			
(1) Critical Asset	(2) Rationale for Selection	(3) Description		
What is the critical information asset?	Why is this information asset important to the organization?	What is the agreed-upon description of this information asset?		
Patient Information smart card system	This manages patient information in a smart card, a disclosure can affect confidentiality of patient details.	This is a system that manages patient information using a Smart card system which allows patients easy access to the services provided by the hospital		
(4) Owner(s) Who owns this information of	asset?			
Director – Hopewell l	nospital			
(5) Security Requirements What are the security requir	rements for this information asset?			
□ Confidentiality	Only authorized personnel can this information asset, as follo	<u> </u>		
□ Integrity	Only authorized personnel can modify this information asset, follows:			
□ Availability	This asset must be available for these personnel to do their job follows:			
	This asset must be available for hours, 7 days/week, 51 weeks/			
☐ Other	This asset has special regulato compliance protection require as follows:			
(6) Most Important Security Requirement  What is the most important security requirement for this information asset?				
☐ Confidentiality	☐ Integrity ☐ A	Availability		

Allegro Worksheet 8	ASSET PROFILE A.3		
(1) Critical Asset	(2) Rationale for Selection	(3) Description	
What is the critical information asset?	Why is this information asset important to the organization?	What is the agreed-upon description of this informasset?	
HR information management system	Include employee details therefore a disclosure or modification can be critical for the organisation.	This is the database includes all employee details, payroll details, attendance tracking and perform details	
(4) Owner(s) Who owns this information	on asset?		
HR manager			
(5) Security Requirements What are the security requirements	nts quirements for this information ass	set?	
☐ Confidentiality	Only authorized personnel can view this information asset, as follows:		Information cannot be disclosed to unauthorized parties since critical employee details are stored including payroll details
☐ <mark>Integrity</mark>	Only authorized personnel can modify this information asset, as follows:		A modification of employee details can result in operational malfunction  Ex: changes of employee bank details can result in financial loss
A recitability	This asset must be available for these personnel to do their jobs, as follows:		HR team need the system running to run their operations.
□ Availability	This asset must be available for <b>24</b> hours, <b>7</b> days/week, <b>51</b> weeks/year.		Should be available 95.3% 0f time
☐ Other	This asset has special regulatory compliance protection requirements, as follows:		
(6) Most Important Security Requirement What is the most important security requirement for this information asset?			
Confidentiality	☐ Integrity ☐ A	vailabi	lity

Allegro Worksheet 8	ASSET PROFILE A.4			
(1) Critical Asset  What is the critical information asset?	(2) Rationale for Selection  Why is this information asset important to the organization?	(3) Description  What is the agreed-upon description of this information asset.		
Inventory management and Drugs distribution system	Flaw of operations can be affected by a modification of the asset, which will lead to a financial loss or can	All the logs of distributing drugs, details of inventory and inventory bills for purchased drugare stored in this database.		
(4) Owner(s) Who owns this information of	asset?			
Manager - supplies				
(5) Security Requirements What are the security requir	rements for this information asset?			
☐ Confidentiality	Only authorized personnel car view this information asset, as	1		
☐ Integrity	Only authorized personnel can modify this information asset, as follows:		modification can be affecting the hospital to n the drug stock that they possess which can entually fail the operations of the hospital. eputation also can be affected.	
☐ Availability	This asset must be available for these personnel to do their jobs, as follows:		nould be available to check the current ocks when needed.	
	This asset must be available for 20 hours, 7 days/week, 50 weeks/year.		9%	
☐ Other	This asset has special regulatory compliance protection requirements, as follows:			
(6) Most Important Security Requirement  What is the most important security requirement for this information asset?				
☐ Confidentiality	☐ Integrity ☐ Availability ☐ Other			

Allegro	Worksheet 8	ASSET PROFILE A.5	
(1) Cri	tical Asset	(2) Rationale for Selection	(3) Description
	s the critical ation asset?	Why is this information asset important to the organization?	What is the agreed-upon description of this information asset?
Pacema	aker system	Since this a mobile heart monitoring system for patients, a malfunction can be life threatening for a patient and can cause reputation loss for the	This is a mobile heart monitoring system which monitors critical patients with heart relate issues and includes a device which can send alerts to an emergency ambulance service and which can also give an electric shock for the patient in an emergency.
(4) Ow Who ov	ner(s) wns this information	n asset?	
Manag	ger – pacemaker sy	ystem	
	urity Requiremen	ts uirements for this information asse	rt?
	<b>Confidentiality</b>	Only authorized personnel can we this information asset, as follow	
	<u>Integrity</u>	Only authorized personnel can in this information asset, as follow	
	Availability	This asset must be available for personnel to do their jobs, as fol	
		This asset must be available for hours, 7 days/week, 52 weeks/y	
	Other	This asset has special regulatory compliance protection requirem	
	_	arity Requirement  at security requirement for this info	ormation asset?
	Confidentiality	☐ Integrity ☐ .	Availability

Allegr	o Worksheet 8	ASSET PROFILE A.6		
What	itical Asset is the critical nation asset?	(2) Rationale for Selection  Why is this information asset important to the organization?		scription  s the agreed-upon description of this information asset?
	nated oxygen y system	Oxygen supply should be continuous for the treatment of patients. And any modification or loss of availability can be life threatening for patients,	softwar	an automated oxygen supply system, managed using a re programme, which is used to manage the oxygen tors and distribution of oxygen through the hospital
(4) Ov	wner(s)	1		
Who o	wns this information	n asset?		
Mana	ger - supplies			
	curity Requirement	nts uirements for this information asse	et?	
	Confidentiality	Only authorized personnel can verthis information asset, as follow	1	
	Integrity	Only authorized personnel can rethis information asset, as follow	- 1	A modification can be life threatening for patients. This can cause a reputational loss and eventually a financial loss for the hospital.
	Availability	This asset must be available for personnel to do their jobs, as fol		System should be available because loss of oxygen supply can be life threatening for patients. This can cause a reputational loss and eventually a financial loss for the hospital.
		This asset must be available for hours, 7 days/week, 52 weeks/ye		99,99%
	Other	This asset has special regulatory compliance protection requirement		
	ost Important Secu	nrity Requirement  nt security requirement for this info	ormation	asset?
	<b>C</b> Confidentiality	☐ Integrity ☐ 2	Availabil	ity

# Appendix B (Threat profiles)

,	Allegro - Wo	orksheet 10	INFORMATION ASSET RISK	WORKSHEET (A1	L.T1)			
		Information Asset	Patient information manageme	nt				
		Area of Concern	An accidental modification of pa	tient information can l	be happened.			
		(1) Actor		Internal employee				
	(7) Conset What are result of a Reputation data which well.  A change therefore It can affect changed.	Who would exploit t	the area of concern or threat?					
		(2) Means  How would the actor do it? What would they do?		Change patient info	rmation in the database tabl	es		
	Threat	(3) Motive What is the actor's i	reason for doing it?	Accidental				
Area of Concern  An accidental modification of patient information can be happened.  (1) Actor  Who would exploit the area of concern or threat?  (2) Means  How would the actor do it? What would they do?  (3) Motive  What is the actor's reason for doing it?  (4) Outcome  What would be the resulting effect on the information  asset?  (5) Security Requirements  How would the information asset's security requirements be breached?  (6) Probability  What is the likelihood that this threat scenario could occur?  (7) Consequences  What are the consequences to the organization or the information asset owner as a result of the outcome and breach of security requirements?  Reputation of the hospital can be affected severely because of a change of a patient data which can even be life threatening. This can be affective in a financial manner as well.  Reputation of the hospital can be affected severely because of a change of a patient data which can even be life threatening. This can be affective in a financial manner as well.  Productivity  A change in database can moderately affect operational procedures in hospital therefore a value 6 was given.  It can affect safety and health of patients because the medical details have been changed.  If a life threating situation occurred because of a modification in tables, fines and legal penalties can be occurred.  Fines & Legal Penalties  User Defined Impact Area								
	Information Asset  Area of Concern  An occidental modification of potient information can be happened.  (1) Actor  Who would exploit the area of concern or threat?  (2) Means  How would the actor do it? What would they do?  (3) Motive  What is the actor's reason for doing it?  (4) Outcome  What would be the resulting effect on the information asset?  (5) Security Requirements  How would the information asset's security requirements be breached?  (6) Probability  What is the likelihood that this threat scenario could occur?  (7) Consequences  What are the consequences to the organization or the information asset owner as a result of the outcome and breach of security requirements?  Reputation of the hospital can be affected severely because of a change of a patient data which can even be life threatening. This can be affective in a financial manner as well.  A change in database can moderately affect operational procedures in hospital therefore a value 6 was given.  It can affect safety and health of patients because the medical details have been changed.  If a life threating situation occurred because of a modification in tables, fines and legal penalties can be occurred.  User Defined Impact Area							
		(5) Security Require	ements	Integrity can be viol	ated since patient details are	modified.		
ion Asset Risk			•					
Asset		(6) Probability		☐ High	☐ <mark>Medium</mark>	□ L	ow	
mation			od that this threat scenario could	75%	50%	25%		
Infor	(7) Conse	equences			(8) Severity	I		
		(1) Actor  Who would exploit the area of concern or threat?  (2) Means  How would the actor do it? What would they do?  (3) Motive  What is the actor's reason for doing it?  (4) Outcome  What would be the resulting effect on the information asset?  (5) Security Requirements  How would the information asset's security requirements be breached?  (6) Probability  What is the likelihood that this threat scenario could occur?  (7) Consequences  What are the consequences to the organization or the information asset owner as a result of the outcome and breach of security requirements?  (8) Severity  How severe are organization or the information asset owner as a result of the outcome and breach of security requirements?  (8) Severity  How severe are organization or the information asset owner as a result of the outcome and breach of security requirements?  (8) Severity  How severe are organization or the information asset owner as a result of the outcome and breach of security requirements?  (8) Severity  How severe are organization or impact Area  Reputation of the hospital can be affected severely because of a change of a patient chata which can even be life threatening. This can be affective in a financial manner as well.  A change in database can moderately affect operational procedures in hospital therefore a value 6 was given.  It can affect safety and health of patients because the medical details have been changed.  Safety & Health of patients because the medical details have been safety and health of patients because the medical details have been safety and health of patients because the medical details have been safety and health of patients because the medical details have been safety and health of patients because the medical details have been safety and health of patients because the medical details have been safety and health of patients because the medical details have been safety and health of patients because the medical details have been safety and health of patients because the medical details have	How severe are these con	_	a?			
					Impact Area	Value	Score	
	data whice					9	4.5	
	Weiii.				Financial	7	3.5	
			erately affect operational procedur	es in hospital	Productivity	6	3	
		· · · · · · · · · · · · · · · · · · ·	of patients because the medical def	tails have been	Safety & Health	8	4	
			rred because of a modification in t	ables, fines and legal	Fines & Legal Penalties	5	2.5	
					_			
					Relat	tive Risk Score	17.5	

А	Reputation patient da financial number of the change therefore  If a life this	orksheet 10	INFORMATION ASSET RISK WORKSHEET (A1.T2)						
		Information Asset	Patient information managem	nent system					
Information Asset Risk  Rel particular to the characteristic and the		Area of Concern	A modification of patient infor	rmation can be happened					
		(1) Actor		External					
			the area of concern or threat?						
		(2) Means How would the act	or do it? What would they do?	Change patient info	ormation in the database t	tables			
Information Asset Risk  Right  Here  It ch	Threat	(3) Motive What is the actor's	reason for doing it?	Deliberate					
		(4) Outcome		D D:1	D D4	ruction	Low  to the organization or  Score  4.5  4.5  4  2.5		
			resulting effect on the	<ul><li>□ Disclosure</li><li>□ Modification</li></ul>					
		(5) Security Requir	rements	Integrity can be vio	Low 25%  Score 4.5 4 4 2.5				
Information Asset Risk  A control of the control of		1	ormation asset's security						
Asset		(6) Probability		☐ High	□ <mark>Medium</mark>		Low		
mation		What is the likeliho could occur?	ood that this threat scenario	75%	50%	25%			
Infor	(7) Conse	equences		1	(8) Severity		Low 25%  ces to the organization or  Score 4.5 4.5 4		
	(7) Consequ What are th	the consequences to	the organization or the information of security requirements?	How severe are these consequences to asset owner by impact area?			he organization or		
					Impact Area	Value	Score		
	patient d		n be affected severely because o be life threatening. This can be a		Reputation & Customer Confidence	9	4.5		
					Financial	9	4.5		
p fi		e in database can mo e a value 8 was given	derately affect operational proce	edures in hospital	Productivity	8	4		
			of patients because the medica	ıl details have been	Safety & Health	8	4		
		nreating situation occurre	curred because of a modification decause of a modification	in tables, fines and	Fines & Legal Penalties	5	2.5		
Rep pat final					User Defined Impact Area				
					Relati	ive Risk Score	19.5		

	Allegro - Wo	orksheet 10	INFORMATION ASSET RIS	K WORKSHEET (A1	Т3)				
		Information Asset	Patient information managem	ent system					
		Area of Concern	Someone could use patient details in the system for personal gain						
		(1) Actor Who would exploit	the area of concern or threat?	External malicious a	actor				
		(2) Means  How would the actor do it? What would they do?		Gaining access to the network	ne database tables through a	vulnerability in	the server or		
	Threat	(3) Motive What is the actor's reason for doing it?		Deliberate					
		(4) Outcome  What would be the resulting effect on the information asset?		□ Disclosure □ Modification	□ Destru □ Interr	uction ruption			
: Risk		How would the info	(5) Security Requirements  How would the information asset's security requirements be breached?		Confidentiality could be violated because of disclosure of confidentia data.				
Information Asset Risk		(6) Probability  What is the likeliho	od that this threat scenario	☐ High	□ <mark>Medium</mark>		Low		
ormati		could occur?	ou mu mis mi cui scenumo	75%	50%		25%		
Ĭ		the consequences to t	he organization or the information the information of security requirements?	(8) Severity  How severe are these consequences to the organization or asset owner by impact area?					
					Impact Area	Value	Score		
			onfidential patient data was disc But not relatively a critical financ		Reputation & Customer Confidence	9	4.5		
					Financial	8	4		
	Safety an harm the		ected if the malicious actor uses t	the obtained data to	Productivity	6	3		
				Safety & Health	8	4			
		alties can be occurred gainst the hospital.	d if the owner of disclosed data c	decides to take legal	Fines & Legal Penalties	8	4		
					User Defined Impact Area				
					Relative	Risk Score	19.5		

	Allegro - Wo	orksheet 10	INFORMATION ASSET R	ISK WORKSHEET	(A1.T4)				
		Information Asset	Patient information manage	ment system					
		Area of Concern	Internal employee could use patient information for personal gain						
		(1) Actor Who would exploithreat?	it the area of concern or	Internal employee	9				
		(2) Means  How would the actor do it? What would they do?		An internal emplo view.	yee could view data that	they are not al	lowed to		
	Threat	(3) Motive What is the actor	's reason for doing it?	Accidental/ Delibe	erate				
		(4) Outcome  What would be th information asset	e resulting effect on the ?	□ Disclosure □ Modification					
Information Asset Risk		(5) Security Requ How would the in requirements be b	formation asset's security	Confidentiality could be violated because of disclosure of conpatient data.			confidential		
n Ass		(6) Probability		☐ High	□ <mark>Medium</mark>		Low		
ormatio		What is the likelihood that this threat scenario could occur?		75%	50%	25%			
Inf	What ar		to the organization or the inforceme and breach of security re		(8) Severity  How severe are these consequences to the organization or asset owner by impact area?				
					Impact Area	Value	Score		
			if confidential patient data wa ss. But not relatively a critical f		Reputation & Customer Confidence	9	4.5		
					Financial	8	4		
		nd health could be a e patient.	affected if the actor uses the o	btained data to	Productivity	2	1		
					Safety & Health	6	3		
		nalties can be occur al actions against th	red if the owner of disclosed on the control of the	data decides to	Fines & Legal Penalties	4	2		
					User Defined Impact Area				
					Relativ	ve Risk Score	14.5		

Α	(2) Means How would the do?	INFORMATION ASSET R	isk <b>V</b>	VORKSHEET	(A1.T5)				
			Patient information manage	ment	system				
			Availability could be lost due	Availability could be lost due to a DDOS attack					
		Who would explo	it the area of concern or	Нас	ker				
		How would the actor do it? What would they		Lauı	nch a DDOS ati	tack against the server			
	Threat	(3) Motive What is the actor's reason for doing it?		Deli	berate				
		(4) Outcome  What would be the resulting effect on the information asset?		<u> </u>	Disclosure Modification		ruction rruption		
Information Asset Risk		(5) Security Requirements  How would the information asset's security requirements be breached?			Availability is affected because authorised parties could not access the system.				
on A		(6) Probability			☐ High	□ <mark>Medium</mark>	۵	Low	
ıformati		What is the likelihood that this threat scenario could occur?			75%	50%	25%		
=	(7) Cons	nsequences				(8) Severity			
		re the consequences to the organization or the information asset is a result of the outcome and breach of security requirements?				How severe are these consequences to the organization or asset owner by impact area?			
						Impact Area	Value	Score	
			be lost because required servi financial loss as well.	ces w	ill not be	Reputation & Customer Confidence	8	4	
						Financial	9	4.5	
		vity can be loss bed data of patients.	ause hospital staff does not ha	ive ac	cess to the	Productivity	8	4	
	Safety a	nd health of patient	ts could be affected as well.			Safety & Health	7	3.5	
						Fines & Legal Penalties	4	2	
						User Defined Impact Area			
						Relativ	ve Risk Score	18	

	Allegro - Wo	orksheet 10	INFORMATION ASSET R	ISK WOF	RKSHEET (	(A1.T6)			
		Information Asset	Patient information manage	ement syst	em				
		Area of Concern	A natural disaster can lead t	o loss of a	vailability				
		(1) Actor Who would exploit threat?	it the area of concern or	Natural					
		(2) Means  How would the actor do it? What would they do?			-	fire or a similar natural di n hosts the database.	saster can dest	roy the	
	Threat	(3) Motive What is the actor	's reason for doing it?	acciden	tal				
		(4) Outcome  What would be the resulting effect on the information asset?		<ul> <li>□ Disclosure</li> <li>□ Destruction</li> <li>□ Modification</li> <li>□ Interruption</li> </ul>					
set Risk		How would the in	(5) Security Requirements  How would the information asset's security requirements be breached?		Availability is affected because authorised parties could not access the system.				
on As		(6) Probability			High	☐ Medium		Low	
Information Asset Risk		What is the likelih could occur?	What is the likelihood that this threat scenario could occur?		5% 5%	50%	25%		
=	What ar		to the organization or the inforceme and breach of security re	110W severe are these consequences to the					
						Impact Area	Value	Score	
		could be financially inavailability of the	raffected since the operations asset.	could be	failed	Reputation & Customer Confidence	2	0.5	
						Financial	8	2	
			ed since the required data is u treatment procedures of patie		e for	Productivity	9	2.25	
						Safety & Health	7	1.75	
						Fines & Legal Penalties	0	0	
						User Defined Impact Area			
						Relativ	e Risk Score	6.5	

А	llegro - Wo	orksheet 10	INFORMATION ASSET R	ISK WORKSHEET	(A2.T1)			
		Information Asset	Patient information smart ca	ard system				
		Area of Concern	Smart card can be stolen					
		(1) Actor  Who would explo	it the area of concern or	Thief / Hacker				
		(2) Means  How would the actor do it? What would they do?		An actor can steal	the card from the owner	for personal g	ain	
	Threat	(3) Motive What is the actor's reason for doing it?		Deliberate				
	-	(4) Outcome  What would be the resulting effect on the information asset?		□ Disclosure       □ Destruction         □ Modification       □ Interruption				
Information Asset Risk		(5) Security Requirements  How would the information asset's security requirements be breached?		Availability could l benefit from the s	be lost due to the actual or ystem properly.	owner of the ca	rd could not	
on A		(6) Probability		☐ High	□ <mark>Medium</mark>		Low	
ıformati		What is the likelihood that this threat scenario could occur?		75%	50%		25%	
-	What ar	sequences re the consequences to the organization or the information asset us a result of the outcome and breach of security requirements?			(8) Severity  How severe are these consequences to the organization or asset owner by impact area?			
					Impact Area	Value	Score	
		ne responsibility of the smart card belongs to the card owner, this doesn't affect severely to the hospital's reputation.			Reputation & Customer Confidence	2	1	
					Financial	2	1	
		ivity could be affect atient data effectiv	ed because the hospital staff cely.	could be unable to	Productivity	5	2.5	
	access pr				Safety & Health	4	2	
					Fines & Legal Penalties	0	0	
					User Defined Impact Area			
					Relativ	ve Risk Score	6.5	

	Allegro - Wo	orksheet 10	INFORMATION ASSET R	isk <b>V</b>	ORKSHEET (	(A2.T2)			
		Information Asset	Patient information smart ca	ard sys	stem				
		Area of Concern	A malicious actor could clone	e the s	mart card				
		(1) Actor  Who would exploithreat?	it the area of concern or	Hac	ker				
		(2) Means  How would the actor do it? What would they do?				could clone the smart car a particular patient	rd and could ch	ange the	
	Threat	(3) Motive What is the actor	's reason for doing it?	Deli	berate				
		(4) Outcome  What would be the resulting effect on the information asset?		<u> </u>	Disclosure Modification	☐ Destruction ☐ Interruption			
Information Asset Risk		How would the in	(5) Security Requirements  How would the information asset's security requirements be breached?		Integrity could be affected because a modification of patient medical details can cause in improper treatment which can be life threatening for the patient.				
on As		(6) Probability			] High	☐ Medium		Low	
formati		What is the likelihood that this threat scenario could occur?			75%	50%		25%	
드	(7) Cons	sequences		I		(8) Severity	1		
		What are the consequences to the organization or the information owner as a result of the outcome and breach of security requires				110W severe are these consequences to the			
						Impact Area	Value	Score	
			if the sensitive patient data wass. But not relatively a critical f			Reputation & Customer Confidence	2	0.5	
						Financial	2	0.5	
	which ca	an be life threatenir	edical details can cause in imp og for the patient. Therefore, p nts could be affected.			Productivity	8	2	
	Поэрна	and safety of paties	its could be directed.			Safety & Health	8	2	
						Fines & Legal Penalties	0		
						User Defined Impact Area			
	•					Relativ	ve Risk Score	5	

	Allegro - Worksheet 10		INFORMATION ASSET R	ISK WORKSHEET	(A2.T3)			
		Information Asset	Patient information smart ca	ard system				
		Area of Concern	Smart card details in the dat	abase could be discl	losed.			
		(1) Actor Who would exploit threat?	it the area of concern or	Hacker				
		(2) Means  How would the actor do it? What would they do?		Gaining access to server or network	the database tables throu	ugh a vulnerabi	lity in the	
	Threat	(3) Motive What is the actor	's reason for doing it?	Deliberate				
		(4) Outcome  What would be the resulting effect on the information asset?		□ Disclosure       □ Destruction         □ Modification       □ Interruption				
Information Asset Risk		(5) Security Requ How would the in requirements be b	formation asset's security	Confidentiality could be violated because of disclosure of confidenti patient data.				
on A		(6) Probability		☐ High	☐ <mark>Medium</mark>		Low	
ıformati		What is the likelihood that this threat scenario could occur?		75%	50%	25%		
느	(7) Cons	sequences		1	(8) Severity	:		
		•	to the organization or the inforce one and breach of security re		How severe are these consequences to the organization or asset owner by impact area?			
					Impact Area	Value	Score	
			if confidential patient data wa ss. But not relatively a critical f		Reputation & Customer Confidence	9	4.5	
					Financial	6	3	
	,	nd health could be a	affected if the malicious actor	uses the obtained	Productivity	4	2	
					Safety & Health	8	4	
		enalties can be occur al actions against th	rred if the owner of disclosed on the control of th	data decides to	Fines & Legal Penalties	8	4	
					User Defined Impact Area			
					Relativ	ve Risk Score	17.5	

ı	Allegro - Worksheet 10		INFORMATION ASSET R	ISK WORKSHEET	(A2.T4)			
		Information Asset	Patient information smart co	ard system				
		Area of Concern	Internal employee could use	patient information	n for personal gain			
		(1) Actor		Internal employee	e			
		Who would explo	it the area of concern or					
		(2) Means		An internal emplo	yee could view data that	they are not al	owed to	
		How would the addo?	ctor do it? What would they	view.				
	Threat	What is the actor's reason for doing it?		Accidental/ Delibe	erate			
	Ę							
		(4) Outcome		☐ Disclosure	☐ Dest	truction		
		What would be the information asset	e resulting effect on the ?	□ Modificatio		rruption		
<b>~</b>		(5) Security Requ	irements	Confidentiality could be violated because of disclosure of confidenti patient data.				
Information Asset Kisk		How would the in requirements be l	formation asset's security breached?					
ion ⊿		(6) Probability		☐ High	□ Medium		Low	
Informa		What is the likelih could occur?	hood that this threat scenario	75%	50%		25%	
	(7) Cons	sequences			(8) Severity			
		*	to the organization or the inforcome and breach of security rea		How severe are these consequences to the organization or asset owner by impact area?			
					Impact Area	Value	Score	
			if confidential patient data wa		Reputation & Customer	8	4	
	Could le	ad for a financial lo	ss. But not relatively a critical f	inancial loss.	Confidence			
					Financial	5	2.5	
		nd health could be a e patient.	affected if the actor uses the o	btained data to	Productivity	4	2	
					Safety & Health	4	2	
		nalties can be occu al actions against th	rred if the owner of disclosed on the comment of th	data decides to	Fines & Legal Penalties	8	4	
					User Defined Impact Area			

,	Allegro - Wo	orksheet 10	INFORMATION ASSET RISK	WORKSHEET (A3.T	1)			
		Information Asset	HR information management sy	stem				
		Area of Concern	Cause an accidental modification	of employee personal i	information			
		(1) Actor		Internal employee				
		Who would exploit t	he area of concern or threat?					
		(2) Means How would the acto	r do it? What would they do?	Internal employee ca database table.	n accidentally change emplo	oyee persona	l data in the	
	eat	(3) Motive		Accidental				
	Threat	What is the actor's r	reason for doing it?					
		(4) Outcome	,		□ Destr	uction		
		What would be the rasset?	hat would be the resulting effect on the information set?		☐ Intern	ruption		
Information Asset Risk		(5) Security Require	ements	Integrity is violated due to the modification of employee information car result in operational malfunction.				
		How would the infor	rmation asset's security ached?	result in operational	munumedon.			
		(6) Probability		☐ High	□ <mark>Medium</mark>		Low	
matior		What is the likelihoo occur?	od that this threat scenario could	75%	50%	25%		
Infor	(7) Conse	quences			(8) Severity	i		
		•	he organization or the information hof security requirements?	asset owner as a	How severe are these consequences to the organization or asset owner by impact area?			
					Impact Area	Value	Score	
	If change:	s happen in employee	bank details can cause severe fina	ncial damage and	Reputation & Customer Confidence	7	3.5	
	they coul	d misuse accounts.			Financial	9	4.5	
	Productiv	ity could be affected s	since the required data is unavailab	ole and changes in	Productivity	8	4	
	database	can affect operationa	l procedures.		Safety & Health	5	2.5	
		legal penalties could ion of employee infor	be applied because of incorrect de mation.	tails due to	Fines & Legal Penalties	3	1.5	
					User Defined Impact Area			
					1	1		

16.0

Relative Risk Score

A	illegro - Wo	orksheet 10	INFORMATION ASSET RIS	K WORKSHEET (A	3.T2)				
		Information Asset	HR information management	system					
		Area of Concern	Cause purposely modification	of employee persona	l information				
		(1) Actor Who would exploit threat?	the area of concern or	External employee					
		(2) Means How would the act	or do it? What would they do?	External employee can purposely change employee personal data in the database table					
	Threat	(3) Motive What is the actor's	(3) Motive What is the actor's reason for doing it?		Deliberate				
		(4) Outcome  What would be the information asset?	hat would be the resulting effect on the		□ Destru □ Interr				
t Risk		(5) Security Required How would the information requirements be by	Cormation asset's security	Integrity is violated due to the modification of employee information can result in operational malfunction.					
λ Asse		(6) Probability		☐ High	☐ <mark>Medium</mark>		l Low		
Information Asset Risk		What is the likeliho could occur?	ood that this threat scenario	75%	50%		25%		
Info	What are	•	o the organization or the informates?	ition asset owner as	(8) Severity  How severe are these con or asset owner by impact	•	the organization		
					Impact Area	Value	Score		
	regardin	g employee privacy.	n be affected severely due to ba	·	Reputation & Customer Confidence	9	4.5		
		es happen in employ could misuse accou	ee bank details can cause severents.	e financial damage	Financial	9	4.5		
			derately affect operational produce of patients because the medical	·	Productivity	8	4		
	changed		·		Safety & Health	5	2.5		
		d legal penalties coul tion of employee inf	d be applied because of incorre ormation.	ct details due to	Fines & Legal Penalties	4	2		
					User Defined Impact Area				
					Relative	e Risk Score	17.5		

ı	Allegro - W	orksheet 10	INFORMATION ASSET R	ISK WORKSHEET	(A3.T3)				
		Information Asset	HR information managemen	nt system					
		Area of Concern	External person could use en	mployee confidentia	al details in the system fo	r personal gain			
		(1) Actor Who would exploithreat?	it the area of concern or	External malicious	ternal malicious actor				
		(2) Means  How would the ac	ctor do it? What would they	Gaining access to the database tables through a vulnerability in the server or network.					
	Threat	(3) Motive What is the actor	's reason for doing it?	Deliberate					
		(4) Outcome  What would be th  information asset	e resulting effect on the ?	□ Disclosure       □ Destruction         □ Modification       □ Interruption					
		(5) Security Requ How would the in requirements be b	formation asset's security	Confidentiality co confidential infor	uld be violated because o mation.	of disclosure of	employee		
		(6) Probability		☐ High	☐ <mark>Medium</mark>		Low		
		What is the likelil could occur?	nood that this threat scenario	75%	50%	25%			
	What ar	•	to the organization or the infor come and breach of security rec		(8) Severity  How severe are these organization or asset of	•			
					Impact Area	Value	Score		
	disclose	d and bad impression	if employee confidential inforr on regarding employee privacy		Reputation & Customer Confidence	9	4.5		
	But not		loyee bank details can lead for inancial loss. They could misus		Financial	5	2.5		
			affected if the malicious actor e employee confidentiality.	uses the obtained	Productivity	4	2		
					Safety & Health	9	4.5		
		enalties can be occur al actions against th	rred if the owner of disclosed one of the owner of disclosed one hospital.	data decides to	Fines & Legal Penalties	8	4		
					User Defined Impact Area				
	-				Relative 1		17.		

	Allegro - Wo	orksheet 10	INFORMATION ASSET R	ISK WORKSHEET (	(A3.T4)				
		Information Asset	HR information manageme	nt system					
		Area of Concern	Internal employee could use	e employee confiden	tial information for perso	onal gain			
		(1) Actor Who would exploit threat?	it the area of concern or	Internal employee					
		(2) Means  How would the ac	ctor do it? What would they	An internal emplor view.	yee could view data that	they are not al	lowed to		
	Threat	(3) Motive What is the actor	's reason for doing it?	Accidental/ Delibe	rate				
		(4) Outcome  What would be th information asset	e resulting effect on the ?	□ Disclosure □ Modification		ruction			
Information Asset Risk		(5) Security Requ How would the in requirements be b	formation asset's security	ormation asset's security employee data.		ould be violated because of disclosure of confidenti			
n Ass		(6) Probability		☐ High	□ <mark>Medium</mark>		Low		
rmatio		What is the likelil could occur?	nood that this threat scenario	75%	50%	25%			
Infe	(7) Cons	sequences		I	(8) Severity	I			
			to the organization or the inforce one and breach of security re		How severe are these organization or asset of	•			
					Impact Area	Value	Score		
	disclose	d and bad impression	if employee confidential inform on regarding employee privacy	<b>'</b> .	Reputation & Customer Confidence	6	3		
	But not		loyee bank details can lead for inancial loss. They could misus		Financial	3	1.5		
			affected if the malicious actor e employee confidentiality.	uses the obtained	Productivity	4	2		
					Safety & Health	6	3		
		nalties can be occui al actions against th	rred if the owner of disclosed on the disclosed of the di	data decides to	Fines & Legal Penalties	4	2		
					User Defined Impact Area				
					Relativ	ve Risk Score	11.5		

Allegro - W	orksheet 10	INFORMATION ASSET R	ISK W	ORKSHEET (	(A3.T5)		
	Information Asset	HR information managemen	nt syste	em			
	Area of Concern	Availability of system can be	e lost be	ecause of a DE	OOS attack		
	(1) Actor Who would explo	it the area of concern or	Hack	er			
	(2) Means  How would the addo?	ctor do it? What would they	A DD datal		be carried out to crash	the server cont	taining th
Threat	(3) Motive What is the actor	's reason for doing it?	Delib	erate			
	(4) Outcome  What would be the information asset	ne resulting effect on the	_ _	Disclosure Modification		truction erruption	
	(5) Security Requ	nirements  If ormation asset's security	I		ted to authorised partie toppable interruptions.	es could not acc	ess the
	(6) Probability			High	□ <mark>Medium</mark>		Low
	What is the likeling could occur?	hood that this threat scenario		75%	50%		25%
What ar	•	to the organization or the inforcome and breach of security re			(8) Severity  How severe are these organization or asset	_	
					Impact Area	Value	Score
by the r	A financial loss can be occurred since the employee data cannot be accessed by the required parties, which will lead to operational malfunction. Due to operational malfunction employee's confidence and hospital reputation car			n. Due to	Reputation & Customer Confidence	9	4.5
be affec	cted as well.				Financial	9	4.5
	tivity can be reduced the required parties	d due to the fact of unavailabili 5.	ity of er	mployee	Productivity	8	4
Safety o	of employee could b	e affected.			Safety & Health	5	2.5
					Fines & Legal Penalties	0	0
					User Defined Impact Area		
_					Relati	ve Risk Score	15

	Allegro - Wo	orksheet 10	INFORMATION ASSET R	ISK WORKSHE	ет (АЗ.Т6)				
		Information Asset	HR information managemen	nt system					
		Area of Concern	A natural disaster can lead t	o loss of availabil	ity				
		(1) Actor  Who would exploit threat?	it the area of concern or	Natural					
		(2) Means  How would the ac	ctor do it? What would they		an earthquake or a similar n ever room which hosts the d		could		
	Threat	(3) Motive What is the actor	's reason for doing it?	accidental					
		(4) Outcome  What would be th information asset	e resulting effect on the ?	□ Disclosur	isclosure				
Information Asset Risk		(5) Security Requ How would the in requirements be b	formation asset's security	Availability is a system.	ffected because authorised	parties could no	ot access the		
on As		(6) Probability		☐ High	☐ Medium		Low		
ıformatic		What is the likelih	nood that this threat scenario	75%	50%	25%			
=	(7) Cons	sequences		: -	(8) Severity	:			
			to the organization or the inforceme and breach of security re			evere are these consequences to the ization or asset owner by impact area?			
					Impact Area	Value	Score		
	due to u	inavailability of the		could be failed	Reputation & Customer Confidence	8	2		
	Reputat	ion also affected du	e to bad impression.		Financial	8	2		
			ed since the required data is unthe employees' data.	navailable for the	Productivity	7	1.75		
					Safety & Health	3	0.75		
					Fines & Legal Penalties	0	0		
					User Defined Impact Area				
					Relativ	ve Risk Score	6.5		

Allegro - V	Vorksheet 10	INFORMATION ASSET RIS	K WORKSHEET (A	3.T7)			
	Information Asset	HR information management	system				
	Area of Concern	External actor could harm the	server hardware (Phy	sical threat)			
	(1) Actor Who would exploit	the area of concern or threat?	External malicious a	actor			
	(2) Means How would the act	or do it? What would they do?	Actor could harm the runs the database.	ne server hardware which	will destroy the s	erver tha	
Threat	(3) Motive What is the actor's	reason for doing it?	Deliberate				
	(4) Outcome  What would be the information asset?	resulting effect on the	□ Disclosure       □ Destruction         □ Modification       □ Interruption				
	(5) Security Require How would the inforequirements be br	ormation asset's security	Availability could be lost due to destruction of the asset.				
	(6) Probability		☐ High	☐ Medium		Low	
	What is the likeliho could occur?	ood that this threat scenario	75%	50%		25%	
What a	•	the organization or the informat ach of security requirements?	ion asset owner as a	(8) Severity  How severe are these coorganization or asset on	•		
				Impact Area	Value	Score	
accesse	ed by the required part	ed since the employee information ies, which will lead to operation inployee confidence can be affec	al malfunction. Due	Reputation & Customer Confidence	8	2	
				Financial	8	2	
	tivity can be reduced d uired parties.	lue to the fact of unavailability o	f employee data to	Productivity	7	1.75	
Safety	of employee could be a	affected.		Safety & Health	4	1	
				Fines & Legal Penalties	0	0	
				User Defined Impact Area			
				Rela	tive Risk Score	6.7	

	Allegro - W	orksheet 10	INFORMATION ASSET R	isk <b>V</b>	ORKSHEET (	A4.T1)				
		Information Asset	Inventory management and	drugs	distribution sy	stem				
		Area of Concern	Inventory logs can be change	ed by	an internal emp	oloyee				
		(1) Actor Who would exploit threat?	it the area of concern or	Inte	rnal employee					
		(2) Means  How would the ac	ctor do it? What would they		rnal employee abase table.	can accidentally change	inventory logs	in the		
	Threat	(3) Motive What is the actor	's reason for doing it?	Accidental						
		(4) Outcome  What would be th  information asset	e resulting effect on the ?		Disclosure Modification		ruction			
Information Asset Risk		How would the in	(5) Security Requirements  How would the information asset's security requirements be breached?			due to modification of operational procedures	latabase logs which can			
on As		(6) Probability		C	] High	□ Medium		Low		
ıformati		What is the likelih could occur?	nood that this threat scenario		75%	50%	25%			
느	(7) Cons	sequences				(8) Severity	1			
			to the organization or the inforceme and breach of security re			How severe are these consequences to the organization or asset owner by impact area?				
						Impact Area	Value	Score		
			red due to modification of dat ils of inventory items.	ta bec	ause the	Reputation & Customer Confidence	9	4.5		
						Financial	8	4		
			s could be affected because or ity of the organisation can be			Productivity	8	4		
						Safety & Health	6	3		
			uld be applied because of inco of reliable billing information	rrect a	accounting	Fines & Legal Penalties	4	2		
						User Defined Impact Area				
						Relativ	ve Risk Score	17.5		

	Allegro - Wo	orksheet 10	INFORMATION ASSET R	isk <b>W</b>	ORKSHEET (	(A4.T2)			
		Information Asset	Inventory management and	drugs	distribution sy	vstem			
		Area of Concern	Inventory logs can be change	ed by a	ın external mo	alicious actor			
		(1) Actor Who would exploit threat?	it the area of concern or	Hack	ker				
		(2) Means  How would the ac	How would the actor do it? What would they		external actor could change inventory logs in the database table for heir personal gain.				
	Threat	(3) Motive What is the actor	's reason for doing it?	Delik	perate				
		(4) Outcome  What would be th  information asset	e resulting effect on the ?	<u> </u>	Disclosure  Modification		ruction		
set Risk		(5) Security Requ How would the in requirements be b	affect hospital affect hospital			d due to modification of perational procedures	database logs v	vhich can	
Information Asset Risk		(6) Probability  What is the likelih could occur?	nood that this threat scenario		l High	□ <mark>Medium</mark>		Low	
드	What ar	•	to the organization or the infor come and breach of security rec			(8) Severity  How severe are these organization or asset of	•		
						Impact Area	Value	Score	
			red due to modification of dat ils of inventory items.	a beca	use the	Reputation & Customer Confidence	9	4.5	
						Financial	8	4	
			s could be affected because of ity of the organisation can be a			Productivity	8	4	
						Safety & Health	6	3	
	details o	lue to modification of scould be applied if	uld be applied because of inco of reliable billing information . a patient's life is threatened c	Fines a	and legal	Fines & Legal Penalties	4	2	
	modifica	ation of medical sup	plies.			User Defined Impact Area			
						Relati	ve Risk Score	17.5	

ļ	Allegro - Wo	orksheet 10	INFORMATION ASSET RIS	K WORKSHEET (A4	I.T3)				
		Information Asset	Inventory management and d	rugs distribution system	m				
		Area of Concern	Availability of system can be lo	ost because of a DDOS	attack				
		(1) Actor		Hacker					
		Who would exploit	the area of concern or threat?						
		(2) Means		A DDOS attack can be carried out to crash the server containing the database.					
		How would the acto	or do it? What would they do?						
	eat	(3) Motive		Deliberate					
	Threat	What is the actor's	reason for doing it?						
		(4) Outcome		□ Disclosure	☐ Destr	ruction			
		What would be the information asset?	resulting effect on the	☐ Modification ☐ Interruption					
		(5) Security Requir	ements	Availability is lost due to unavailability of the database log fo parties. This can lead to cease operational procedures of the					
Information Asset Risk		How would the info requirements be br	ormation asset's security eached?	paraes. This can lea	a to cease operational pro	occurred of the h	ospitui.		
Asse'		(6) Probability		☐ High	□ <mark>Medium</mark>		Low		
rmatior		What is the likeliho could occur?	od that this threat scenario	75%	50%	50% 25%			
Info	(7) Conse	equences			(8) Severity				
			the organization or the informate ich of security requirements?	How severe are these consequences to the organization or asset owner by impact are					
					Impact Area	Value	Score		
	required	parties, which will lea	d since the inventory logs canno ad to operational malfunction. D nce can be affected as well.		Reputation & Customer Confidence	6	3		
					Financial	8	4		
	Since hos reduced.	spital's operations are	e affected due to unavailability, p	productivity can be	Productivity	9	4.5		
	_	ribution is affected. T for patients.	herefore, necessary medical iter	ms could not be	Safety & Health	4	2		
					Fines & Legal Penalties	4	2		
					User Defined Impact Area				
					Relat	tive Risk Score	15.5		

	Allegro - Wo	orksheet 10	INFORMATION ASSET R	ISK WORKSHEET	(A4.T4)				
		Information Asset	Inventory management and	drugs distribution sy	ystem				
		Area of Concern	External actor could harm th	ne server hardware (	Physical threat)				
		(1) Actor Who would exploithreat?	it the area of concern or	External malicious	actor				
		(2) Means  How would the addo?	ctor do it? What would they	Actor could harm that runs the data	the server hardware which base.	ch will destroy	the server		
	Threat	(3) Motive What is the actor	's reason for doing it?	Deliberate on for doing it?					
		(4) Outcome  What would be th information asset	e resulting effect on the ?	<ul><li>□ Disclosure</li><li>□ Modification</li></ul>		truction erruption			
Information Asset Risk		(5) Security Requ How would the in requirements be b	formation asset's security	Availability could b	be lost due to destruction	destruction of the asset.			
ion Asse		(6) Probability		☐ High	☐ Medium		Low		
formati		What is the likelih could occur?	nood that this threat scenario	75%	50%		25%		
드	(7) Cons	sequences			(8) Severity	!			
			to the organization or the inforceme and breach of security re		110W severe are these consequences to the				
					Impact Area	Value	Score		
	by the re	equired parties, whi	red since the inventory logs ca ch will lead to operational mal stomer confidence can be affe	function. Due to	Reputation & Customer Confidence	8	2		
					Financial	6	1.5		
	Since ho		are affected due to unavailabil	ity, productivity	Productivity	7	1.75		
		tribution is affected able for patients.	. Therefore, necessary medica	l items could not	Safety & Health	4	1		
					Fines & Legal Penalties	0	0		
					User Defined Impact Area				
	•				Relativ	ve Risk Score	6.25		

	Allegro - Wo	orksheet 10	INFORMATION ASSET R	ISK W	ORKSHEET	(A4.T5)			
		Information Asset	Inventory management and	drugs	distribution sy	ystem			
		Area of Concern	A natural disaster can lead t	o loss o	of availability				
		(1) Actor Who would exploithreat?	it the area of concern or	Natu	ıral				
		(2) Means  How would the ac	ctor do it? What would they		=	fire or a similar natural di n hosts the database.	saster can dest	roy the	
	Threat	(3) Motive What is the actor	's reason for doing it?	accio	lental				
		(4) Outcome  What would be th  information asset	e resulting effect on the ?	<u> </u>	Disclosure Modification				
Information Asset Risk		(5) Security Requ How would the in requirements be b	formation asset's security	Avail syste		cted because authorised	parties could n	ot access the	
on As		(6) Probability			l High	☐ Medium		Low	
formati		What is the likelil could occur?	nood that this threat scenario		75%	50%	25%		
드	(7) Cons	sequences		ı		(8) Severity	I		
			to the organization or the inforceme and breach of security re-			How severe are these consequences to the organization or asset owner by impact area?			
						Impact Area	Value	Score	
		could be financially could be financially control to the financial could be financially as a second	affected since the operations asset.	could	be failed	Reputation & Customer Confidence	2	0.5	
						Financial	8	2	
		ees to carry out the	ed since the required data is u drugs distribution and invento			Productivity	9	2.25	
	procedu					Safety & Health	7	1.75	
				1100111100111100111100		Fines & Legal Penalties	O	0	
						User Defined Impact Area			
						Relativ	e Risk Score	6.5	

	Allegro - Wo	orksheet 10	INFORMATION ASSET RISK	WORKSHEET (A5.T	1)				
		Information Asset	Pacemaker System						
		Area of Concern	Deliberately reprogram the system that can disrupt the patient's heart rhythm						
		(1) Actor Who would exploit t	he area of concern or threat?	Hacker/external user	r/internal employee (for personal gain – bribery)				
		(2) Means  How would the actor do it? What would they do?		A hacker can reprogra	ogram the software and change the device algorithm thin the world				
	Threat	(3) Motive What is the actor's	reason for doing it?	Deliberate					
		(4) Outcome  What would be the tasset?	esulting effect on the information	□ Disclosure □ Modification	□ Destruction □ Interruption				
Information Asset Risk		(5) Security Require  How would the information requirements be bre	rmation asset's security	Integrity is violated since system has been reprogramed		gramed			
		(6) Probability		☐ High	☐ Medium	O L	ow		
mation		What is the likelihoo occur?	od that this threat scenario could	75%	50%	25%			
Inforn		the consequences to the	he organization or the information hof security requirements?	asset owner as a	(8) Severity  How severe are these consequences to the organization or asset owner by impact area?				
					Impact Area	Value	Score		
	successfu		al and the manufacture company woccurs. This will seriously affect the		Reputation & Customer Confidence	8	4		
	Illiances	more than the nospita	•		Destruction Interruption  ce system has been reprogramed  Medium 50%  (8) Severity How severe are these consequence organization or asset owner by im, Impact Area  Reputation & Customer Confidence  Financial  5  Productivity  6  Safety & Health  8  Fines & Legal Penalties  7  User Defined Impact Area  Interruption  2  4  4  4  6  Considering Area  Confidence  7  User Defined Impact Area  6	5	2.5		
			will be dangerous if it's hacked. Th harm or kill the patient	e reprogram of the	Productivity	6	3		
					Safety & Health	8	4		
	if a life-th	nreatening incident oc	cur, there will be definite legal repo	ercussions	Fines & Legal Penalties	7	3.5		
					User Defined Impact Area	6	3		
					I Relat	ive Risk Score	20.0		

Allegro - Worksheet 10 INFO			INFORMATION ASSET RIS	K WORKSHEET (A	.5.T2)					
		Information Asset	Pacemaker – patient informat	maker – patient information database						
		Area of Concern	Disclosure of patient's sensitive information							
		(1) Actor		External hacker or i	internal employee					
		Who would exploit the area of concern or threat?								
		(2) Means  How would the actor do it? What would they do?		The actor would have to hack into or use already in possession authentication codes (internal employee) to get access to the patient information system						
	Threat	(3) Motive What is the actor's reason for doing it?		Deliberate						
		(4) Outcome  What would be the	resulting effect on the	□ Disclosure		struction				
		information asset?		☐ Modification		tinformation has	hoon disclosed to			
et Risk		(5) Security Requirements  How would the information asset's security requirements be breached?		Confidentiality is violated since the patient information has been disclosed to unauthorised parties.						
n Asse		(6) Probability		☐ High	☐ Medium		Low			
Information Asset Risk		What is the likeliho could occur?	ood that this threat scenario	75%	50%	25%				
Info	What are		o the organization or the informareach of security requirements?	(8) Severity  How severe are these consequences to the organization or asset owner by impact area?						
					Impact Area	Value	Score			
		on will be severely d Itial data gets disclos	amage and it can take a small to ed	oll on the finance if	Reputation & Customer Confidence	7	5.25			
					Financial	6	4.5			
		ion to another entity	ay that can harm patient's health y who intents to use the informa	Productivity	5	3.75				
					Safety & Health	6	4.5			
		compensation will b	formation impacts negatively to e demanded and legal action m		Fines & Legal Penalties	4	3			
	Relative Risk Score									
					Kela	HIVE MISK SCOPE	21			

Al	legro - Wo	orksheet 10	INFORMATION ASSET R	isk <b>V</b>	VORKSHEET (	(A5.T3)			
		Information Asset	Pacemaker – patient inform	ation	database				
Information Asset Risk		Area of Concern	Modification of patient information in database tables						
		(1) Actor  Who would exploit the area of concern or threat?		Inte	rnal employee	•			
		(2) Means  How would the actor do it? What would they do?		An employee can unintentionally modify/delete an entry in the system					the
	Threat	(3) Motive What is the actor	's reason for doing it?	Accidental					
		(4) Outcome  What would be th  information asset	e resulting effect on the ?	_ _	Disclosure Modification	<u> </u>	<b>Destruction Interruption</b>		
set Risk		(5) Security Requ How would the in requirements be b	formation asset's security	Integrity could be violated due to modification o patient data in database tables.				a in	
on As		(6) Probability			☐ High	☐ Mediur	n l	u L	ow
ıformati		What is the likelih could occur?	nood that this threat scenario		75%	50%		25%	D
=	(7) Cons	equences			(8) Severity				
	What are the consequences to the organization or the information asset owner as a result of the outcome and breach of security requirements?					How severe are these consequences to the organization or asset owner by impact area?			
						Impact Area	Value	•	Score
			verely damage since there is a ne public, therefore there will b		Reputation & Customer Confidence	6		3	
						Financial	6		3
	Productivity of the database might be less effective that before. It might be dangerous if the change/deletion of data is relating to the patient's health/medication					Productivity	5		2.5
		nealtn/medication					5		2.5
		hreating situation o e legal action might	ccurred because of a modifica be taken.	n the	Fines & Legal Penalties	4		2	
						Rela	tive Risk Sc	ore	13

,	Allegro - Wo	orksheet 10	INFORMATION ASSET RISK	WORKSHEET (A6.T	1)				
Information Asset Risk		Information Asset	Automated oxygen supply system						
		Area of Concern	Modification of oxygen supply level						
		(1) Actor	I	Internal Employee					
		Who would exploit the area of concern or threat?							
		(2) Means		An employee can acc	cidently change the oxygen	supply settings			
	Threat	How would the actor do it? What would they do?							
		(3) Motive  What is the actor's reason for doing it?		Accidental					
	F	(4) Outcome	resulting effect on the information	<ul><li>□ Disclosure</li><li>□ Modification</li></ul>		uction ruption	Low %6  Score 2.25 1.75 2.25 1.75		
t Risk		(5) Security Requirements  How would the information asset's security requirements be breached?		Integrity and availab	ility both could be affected				
Information Asset Risk		(6) Probability		☐ High	☐ Medium	□ L	ow		
mation		What is the likelihoo occur?	od that this threat scenario could	75%	50%	25%			
Information Asset Risk		the consequences to the	he organization or the information th of security requirements?	asset owner as a	(8) Severity  How severe are these consequences to the organization or asset owner by impact area?				
					Impact Area	Value	Score		
			take a toll regarding this situation. depending on the modification.	The situation might	Reputation & Customer Confidence	9	2.25		
					Financial	7	1.75		
		m will not work as it is a health hazard as we	s indented to work and depending II	on the modifications	Productivity	9	2.25		
Information Asset Risk					Safety & Health	9	2.25		
			eatening situation occurs due to the nsibility, and this can cause legal p		Fines & Legal Penalties	7	1.75		
						Di La	40.00		
					Relat	tive Risk Score	10.25		

Allegro - Worksheet 10		INFORMATION ASSET RISK	WORKSHEET (A6.T	2)					
	Information Asset	Automated oxygen supply system							
	Area of Concern	Damage to the oxygen supply system due to natural disaster							
	(1) Actor Natural disaster								
	Who would exploit t	the area of concern or threat?							
	(2) Means  How would the actor do it? What would they do?		A natural disaster damaging the oxygen supply system (machinery)						
Threat	(3) Motive What is the actor's reason for doing it?		Accident						
	(4) Outcome  What would be the resulting effect on the information asset?		<ul><li>□ Disclosure</li><li>□ Modification</li></ul>	<ul><li>Destruction</li><li>Interruption</li></ul>					
	(5) Security Require  How would the information requirements be breed.	rmation asset's security							
	(6) Probability		☐ High	☐ Medium	☐ Low				
	What is the likelihoo occur?	od that this threat scenario could	75%	50%	50% 25%				
	the consequences to the	he organization or the information ch of security requirements?	asset owner as a	(8) Severity  How severe are these conorganization or asset own	_	a?			
				Impact Area	Value	Score			
		take a toll regarding this situation. will take a high toll on the financia		Reputation & Customer Confidence	7	1.75			
			Financial	9	2.25				
	stem will not work as it is indented to work until the repairs and as a result, the and safety of patients might be endangered			Productivity	8	2			
				Safety & Health	9	2.25			
	th problem or a life-threatening situation occurs due to this distruction th will have to take responsibility, and this can cause legal penalties and fine			Fines & Legal Penalties	7	1.75			
				Relat	tive Risk Score	10			

Allegro - W	orksheet 10	INFORMATION ASSET RISK	WORKSHEET (A6.T	3)					
	Information Asset	Automated oxygen supply system							
	Area of Concern	Vandalising the oxygen supply pumps/generators							
	(1) Actor Who would exploit t	he area of concern or threat?	Internal employee/ external actor						
	(2) Means  How would the acto	(2) Means  How would the actor do it? What would they do?		An actor can vandalise the oxygen supply systems (pumps/generator)					
Threat	(3) Motive What is the actor's r	•	Deliberate						
-	(4) Outcome  What would be the resulting effect on the information asset?		☐ Disclosure ☐ Destruction ☐ Modification ☐ Interruption						
	(5) Security Require How would the infor requirements be bre	rmation asset's security							
	(6) Probability  What is the likelihoo occur?	od that this threat scenario could	□ High 75%	☐ Medium	□ L 25%				
What are	sequences re the consequences to the organization or the information asset owner as a f the outcome and breach of security requirements?			(8) Severity  How severe are these consequences to the organization or asset owner by impact area?					
				Impact Area	Value	Score			
	n the organizations' reputation is low, however the cost of repairing or ng the oxygen supply system is high			Reputation & Customer Confidence	6	1.5			
			Financial	9	2.25				
		used until repairs/replacement is the system and also the health and	Productivity	9	2.25				
patients				Safety & Health	9	2.25			
	Ith problem or a life-threatening situation occurs due to this modification the I will have to take responsibility, and this can cause legal penalties and fines			Fines & Legal Penalties	7	1.75			
				Relat	ive Risk Score	10			
				-102111					