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Assessment of Cybersecurity Effectiveness in Serving Maqasid Al-Shariah

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Abstract: ***This paper evaluates cybersecurity effectiveness in preserving Maqasid al-Shariah most valuable assets through measuring its ability to protect them from modern cyber threats and cyber-attacks. In order to perform this evaluation we proposed a model that uses Maqasid al-Shariah to decide on the priorities and assets that should be safeguarded and protected from cyber-attacks.***

Keywords: Maqasid Shariah Cybersecurity; Islam and Cybersecurity; Islam and Cyberattacks; Islam and Cyber threats; Maqasid Shariah; Cybersecurity capability maturity model; C2M2;MS-C2M2; Cybersecurity;

1. Introduction

Maqasid al-Shariahare the main goals and objectives of Islamic Shariah, their aim is to promote the well-being of people by protecting their five most important assets which are their faith, self, intellect, posterity and wealth.

These assets which Maqasid al-Shariah strives to protect like any other asset are exposed to threats and danger, and if not well secured can lead to great damage for the Muslim as an individual and the society as a whole.

One of the major threats which those five necessities can be exposed to in the modern era are known as cybercrimes. A cybercrime can be defined as a crime committed in the cyber space or a crime committed with the assistance of the internet. (Sindhu, 2012)

For this reason aroused the need to secure the cyber space through cybersecurity. Cybersecurity can be defined as the actions and measures both technical and non-technical, with the express purpose of protecting computers, networks, software, data and other related digital technologies from all threats.(Lee, 2016)

In this paper our target is to assess the cybersecurity degree of effectiveness in serving Maqasid al-Shariahby preserving its most valuable assets and securing them from cyber threats and cyber-attacks.

2. Literature Review

A. Related Work

There have been several studies that measured cybersecurity and its efficiency to mankind. These studies primary focus is about providing protection to the cyber world.

"A cybersecurity capability maturity model based on Maqasid al-Shariah(MS-C2M2)" tries to understand the exposure of assets (As defined by Maqasid al-Shariah) to cyber threats, and then proposes a framework that measures cybersecurity protective capability to preserve the assets related to Maqasid al-Shariahfrom cyber threats.

"Security metrics a practical framework for measuring security and protecting data" proposes a framework that helps to situate security and security metrics within the context of business process improvement.

B. Cybersecurity capability maturity model

A maturity model is a conceptual framework that comprises a collection of best practices that help organizations to improve their processes in a particular area of interest. (Turetken, 2016)

The United States department of energy in collaboration with Carnegie Mellon University developed the Cyber security Capability Maturity Model, which is a voluntary evaluation process utilizing industry-accepted cyber security practices that can be used to measure the maturity of an organization's cybersecurity capabilities.

We selected the C2M2 as our method of evaluation due to its efficiency, flexibility and maturity. In this paper we will incorporate Maqasid al-Shariahto a simplified version of C2M2 to create an MS-C2M2 (Maqasid al-Shariah Cybersecurity Capability Maturity Model) framework to measure cybersecurity maturity within the scope of Maqasid al-Shariah.

C. Maqasid al-Shariah

Maqasid al-Shariahhave been either directly stated in the Quran and the Sunnah or inferred from these by a number of scholars, all of these address the reason for existence of Shariah which is to serve the interests (Jalb al-masalih) of all human beings and to save them from harm (daf al-mafasid).

Imam Abu-Hamid al-Ghazali classified the maqasid into five major categories stating that: the very objective of the Shariah is to promote the well-being of the people, which lies in safeguarding their faith (deen), their self (nafs), their intellect (aql), their posterity (nasl) and their wealth (mal).whatever ensures the safeguard of these five serves public interest and is desirable, and whatever hurts them is against public interest and its removal is desirable. (Chapra, 2010)

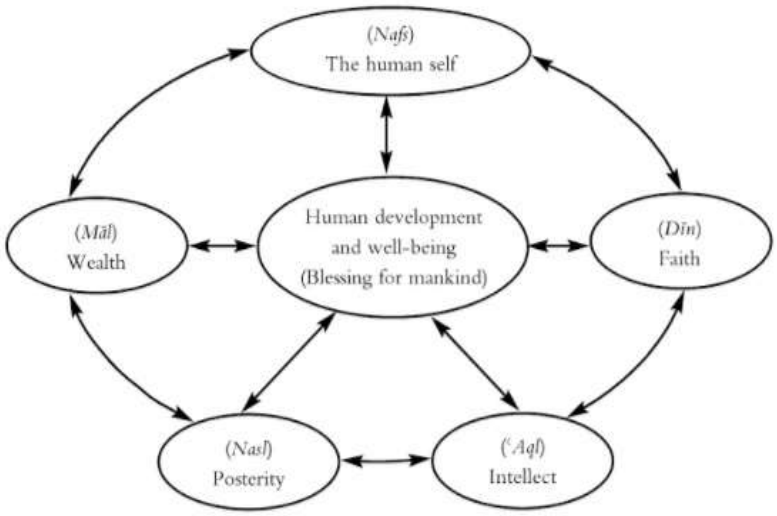

Figure 1: Maqasid al-Shariah: Human development and well-being to be realized by ensuring the enrichment of the following five ingredients for every individual (Chapra, 2010)

3. MS-C2M2 Conceptual framework

The concept of MS-C2M2 at the identification stage is to identify assets and relevant sub assets, threats and criticalities. This is illustrated in figure 2:

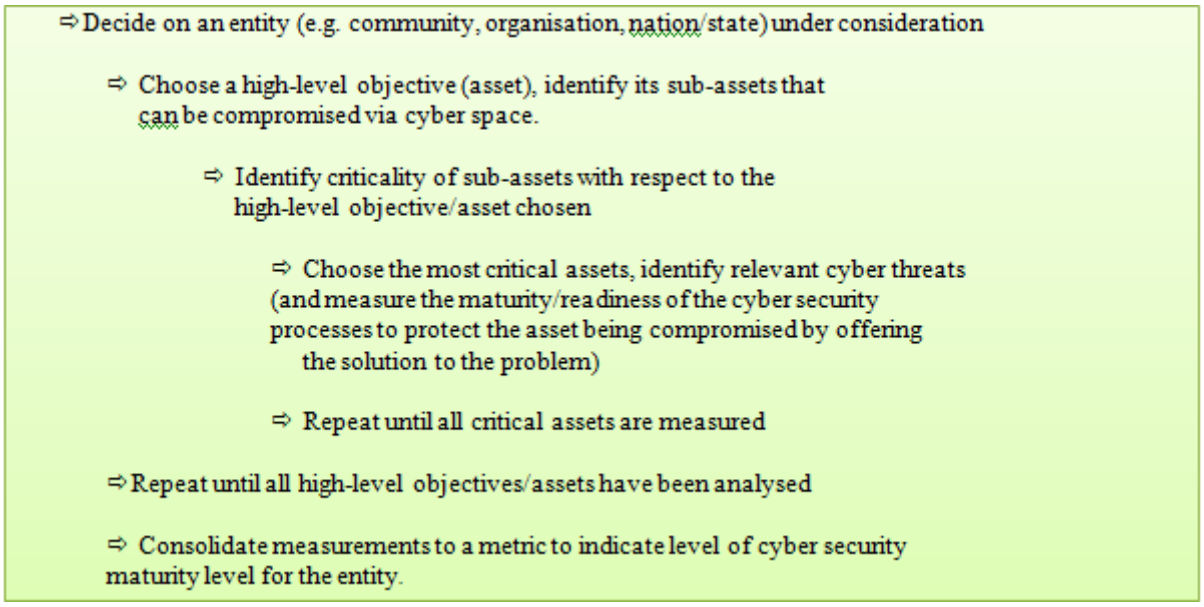

Figure 2: Steps of the MS-C2M2 framework at the Identification Phase (Jamaludin Ibrahim, 2015)

The table that follows shows the mapping of possible cyber threats at the asset identification phase:

Table 1: MS-C2M2 Cyber Threats Mapping (at Asset Identification Phase) (Jamaludin Ibrahim, 2015)

Maqasidal-Shariah Assets	Examples of Sub-Assets–that support the asset/objective	Examples of Critical Sub-Assets–critical to the asset/objective	Cyber security Threats–that will exploit vulnerability of the Critical Sub-Assets
Deen-Faith	Access to guided principles, knowledge, examples and scholars	Access to guided principles, knowledge, examples and scholars	Influence by misguided/distorted/addictive online lifestyle e.g. pornography, stalking/voyeurism, gambling
	Faith Conducive Environment	Faith Conducive Environment e.g. faith building/strengthening, enjoining good forbidding evil, convey message of Islam to all	Online influence by unhealthy/stealthily ideologies norms, practices and environment e.g. satanic worship, subliminal suggestion, anti-religion/faith, deviant teachings, non-Islamic/western liberalism
		Strong society, family and peer support structure	Strong society, family and peer support structure

		Healthy Socialization	Healthy Socialization
	Security of community/national security in order to defend faith	Critical infrastructure related to security(e.g. power, food & water, weather, transportation, financial/monetary systems, communications)	Cyber attacks such as cyber warfare, and cyber espionage that are driven by economic, financial, military or political agenda
Nafs-Life	Health, Foodand Environment	Healthy lifestyle and medical treatment	Attack to online systems that health and medical related information e.g. hospital systems Misguided online health advices Addiction to online activities e.g. social networking
		Food security	Threats to online systems related to agriculture, food production and food distribution
		Physical Conducive Environment	Attack of online systems related to environment protection, pollution monitoring, weather
	Strong society, family and peer support structure	Strong society, family and peer support structure	Society's attachment to 2nd life, Lost touch of reality, natural and physical environment
	*Personal Safety	* Ensuring safety on air flights, space crafts, trains etc…	* Cyber attacks on in flight displays to change information such as altitude and location, control the cabin lightening and hack into the announcement system, Lost touch of reality, natural and physical environment
'Aql–Intellect	Ability to: Read, Reason, Formulate meaning (which involves Judgement, Discrimination, Clarification), Communicate, Teaching &Learning	Ability to reason	Influence by dissemination of distorted information
		Ability to formulate meaning	Influence by dissemination of distorted information
		Ability to communicate	Attacks that deny accessibility of communicating the right information or ideology, Distributed Denial of Services (DDoS)
'Aql–Intellect *(Cont.)*		Promotion of intellectual culture and love of knowledge	Glorification of hedonism through cyber channels and media
Nasl–Progeny Ensuring good family lineage	Marriage and family building	Marriage, birth and death registration	Attacks to systems that manage marriage, births and death records
	Strong society, family and peer support structure	Strong society, family and peer support structure	Influence by misguided/distorted/addictive online examples e.g. Pornography, Stalking/Voyeurism, Gambling
	Choice of compatible& healthy marriage partner (from opposite sex)	Choice of compatible& healthy marriage partner (from opposite sex)	Influence by unhealthy/stealthily online norms, practices and environment e.g. online dating, random partner, hedonistic criteria, glamor, anti-family friendly suggestions
	Family Friendly/Conducive Environment	Family Friendly/Conducive Environment e.g. simple & affordable marriage process	Family data privacy compromised by giving full trust to social networking sites
	Healthy family oriented lifestyle	Healthy relation among family members and relatives	Promotion of individualistic lifestyle
Mal–Wealth	Financial and tangible wealth assets	Financial wealth and assets	Threats to information systems related to banking, financial and wealth assets management leading to theft, fraud, scams
Mal-Wealth (Cont.)	Human &intellectual capital	Human and intellectual capital	Ideology that misguide or corrupt ones' principles of life, Cyber espionage, abuse of intellectual capability for the wrong purpose. The loss of the international intellectual property regime as an effective system to stimulate innovation and investment.
	Critical infrastructure	Critical infrastructure that supports: Power, Food& water, Transportation, Communication, Financial system, Education system, Health system	Cyber attacks such as cyber warfare, and cyber espionage that are driven by economic, financial, military or political agenda. Single-point system vulnerabilities trigger cascading failure of the critical information infrastructure and networks.
	Strategic digital resources, intellectual propertyand intangible wealth assets	Strategic digital resources that support the socio-economic development and well being of a nation. Data on citizen, consumer, industry& provider. Patents, copyrights, trademarks, reputation& brand, trade secrets, processes, partner network	Criminal or wrongful exploitation of public &private data of unprecedented scale. Hijacked/stolen digital resources, IP theft Deliberately provocative, misleading or incomplete information disseminates rapidly and extensively with dangerous consequences affecting socio- economic development and well being of a nation *Ransomware: Locking data on a victim's computer by encryption and demanding payment before ransomed data is decrypted
	Natural resources	Land, forest, oil and gas, minerals, etc.	Threats to systems of government authorities / organisations that manage and control natural resources.

*** This is my personal addition to the table**

4. Analysis and Evaluation

Maqasid al-Shariahcritical assets are exposed to several cyber threats which if not protected against could lead to disastrous results on the individual level and on the society level as a whole. Cybersecurity can perform a good job in protecting these critical assets from the threats of the cyber world, however these cyber threats continue evolving and new forms of cyber threats always appear, so cybersecurity needs to be improved continuously to keep up with this fast paced challenging cyber world.

5. Conclusion

This paper evaluates the effectiveness of cyber security in serving Maqasid al-Shariahby measuring its potential to protect the five critical assets that Shariah seeks to preserve.

Maqasid al-Shariahis used to create a framework for cybersecurity capability maturity model. This model measures the effectiveness of cybersecurity within the goals and objectives of Maqasid al-Shariah.

References

[1] Sindhu, K. K., & Meshram, B. B. (2012). *Digital Forensic Investigation Tools and Procedures*. International Journal of Computer Network and Information *Security*, *4*(4), 39-48. doi:10.5815/ijcnis.2012.04.05

[2] Lee, I. (2016). *Encyclopedia of e-commerce development, implementation, and management: Volume 1*. Hershey, PA: Business Science Reference.

[3] Turetken, O., Stojanov, I., & Trienekens, J. J. (2016*). Assessing the adoption level of scaled agile development: a maturity model for Scaled Agile Framework.* Journal of Software: Evolution and Process, *29*(6), e1796. doi:10.1002/smr.1796

[4] Chapra, M. U. (2010). *The Islamic vision of development in the light of Maqasid al-Shariahh*. India: Islamic Fiqh Academy.

[5] Jamaludin Ibrahim, Aznan Zuhid Saidin, Abdul Rahman Ahmad Dahlan, Normaziah Abdul Aziz, Mohamed Ridza Wahiddin, Rahmah Ahmad H. Osman. (n.d.). *A Cybersecurity Capability Maturity Model Based on Maqasid Shariah*. 2015.

[6] United States of America Department of Energy, Office of Electricity Delivery and Energy Reliability,*Cybersecurity CapabilityMaturity Model (C2M2).*Retrieved 13October 2017 from: https://energy.gov/sites/prod/files/2014/02/f7/C2M2-FAQs.pdf