

DIGITAL INDIA AND CYBER SECURITY

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Abstract: In the age of information, communication, and technology, cybersecurity has become a complex and fast changing security challenge (ICT). Cyber threats appear to be infiltrating every nook and cranny of national economies and infrastructure as ICT dependence spreads around the world; in fact, the increased use of computers and Internet-based networking has been accompanied by an increase in cyberattack incidents targeting individuals, businesses, and governments. Certain governments are increasingly viewing ICT as both a battleground for strategic warfare and a strategic asset to be leveraged for national security purposes. This paper examines the role of cybersecurity in the present security discussion, deepening the analysis by looking at the cybersecurity area from India's perspective.

Index Terms – Cyber Security, Information Technology.

I. INTRODUCTION

One of the most important concepts in the study of international relations is security. Security analysis has historically, and up until recently, been primarily concerned with state security, considering it as a result of the degree of threats that states confront from other states, as well as the style and efficacy of their responses (Rather and Jose 2014). But following the end of the Cold War, researchers broadened the definition of security to include the protection of the individual, shifting their attention away from the state-centric perspective (Buzan 1991). Around the same period, dangers shifted from external invasion to internal conflicts caused by civil wars, environmental degradation, economic hardship, and human rights abuses.

Because of this, national security has expanded to include concerns beyond territorial defence, such as poverty, industrial competitiveness, educational challenges, environmental risks, human trafficking, and resource shortages. Finally, the recent Information, Communication, and Technology (ICT) revolution has transformed every aspect of human life and presented fresh challenges to national security. ICT includes the Internet, email, social media, and satellite communications.

In fact, new threats to national security are being introduced by the digital era that aim to destroy a nation's technological infrastructure.

It goes without saying that the Internet and ICTs are crucial for economic and social development in the globalised world. They form a crucial digital infrastructure on which societies, economies, and governments rely to carry out their fundamental duties. The Internet is a risky environment on many levels due to its relatively open nature (Pillai 2012). As a result, cybersecurity has expanded to include a variety of issues, including the protection of critical infrastructure, cyberterrorism, cyber threats, privacy concerns, cybercrime, and cyber warfare.

Cyber threats are developing and growing quickly in the second decade of the twenty-first century. They are still started by criminal actors, but they also emerge from new places like foreign states and political organisations, and they might not just be done for financial gain. These latter activities could involve political destabilisation (such as what occurred in Estonia in 2007), cyberespionage, sabotage (such as Stuxnet), and even military actions (OECD 2012, 12). Cyberattacks appear to be growing more organised and sophisticated, showing obvious symptoms of professionalisation, as a result of the sophistication of cybercriminals, the advent of cyberespionage, as well as the widely publicised actions of hacker collectives.

II. CYBERSECURITY: TERM AND DEFINITION

Because the majority of government and financial institutions, military organisations, corporations, hospitals, and other businesses store and process a great deal of confidential information on computers, network outages, computer viruses, data conceded by hackers, and other incidents have a significant impact on our lives in ways that range from troublesome to life-threatening. As a result, there is a greater need to secure sensitive data, personal information, and the nation's security due to the frequency and sophistication of cyberattacks.

As a result, "cybersecurity" refers to a group of technologies, policies, guidelines, training, actions, security concepts and safeguards, risk management techniques, assurance, and tools that can be used to secure and protect both organisation and user assets as well as the cyber environment.

Cybersecurity also focuses on protecting computer programmes, networks, and data, along with preventing access to information by unauthorised users, as well as preventing unintended change or intended/unintended destruction. It also aims to secure information technology.

Additionally, the continued advancement of information technology and Internet services depends on cybersecurity (UNODA 2011). The successful safeguarding of crucial information infrastructures has thus become more crucial to national security and nations' economic prosperity. Making the Internet as secure as feasible is now essential to the creation of both new services and government policy in many nations (Gercke 2009). The remainder of this article looks at how well India has, up until now, handled this new problem.

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Cybersecurity in India: Background

The need for a strong cybersecurity apparatus in India is growing, but policymakers haven't given the problem much attention. As a result, the government hasn't been able to address this need. India has both offensive and defensive cybersecurity capabilities, which is made worse by its inability to access key tools for fending off sophisticated malware like Stuxnet, Flame, and Black shades (Kaushik 2014).

Additionally, compared to other wealthy countries, India has much less cybersecurity projects and activities. The Indian government has only implemented a small number of the pertinent projects that had originally suggested. The National Critical Information Infrastructure Protection Center (NCIPC) and the National Cyber Coordination Center (NCCC) of India are two other projects that have been approved but have so far failed to materialize. At the same time, India must urgently safeguard crucial infrastructure from cyberattacks, including banks, satellites, automated power grids, and thermal power plants. The Indian government has acknowledged that there has been a significant increase in cyberattacks targeting organisations like the banking and financial services industry. In India, malicious online behaviour has included everything from viruses to hacking to identity theft to spamming to email bombing to web defacing to denial of service.

Cyber Security in India: In-Depth

India's IT industry has become a key driver of the nation's economic expansion as well as an essential component of its commerce and government. Through direct or indirect contributions to the improvement of numerous socioeconomic criteria, such as the standard of living, employment, and diversity, the sector is

favourably affecting the lives of Indian inhabitants. Additionally, IT has been crucial in making India a worldwide leader in the provision of top-notch business services and technological solutions (DEITY 2011).

The requirement to safeguard the computing environment and to establish sufficient confidence and trust in it has grown significantly along with the development of the IT industry. For instance, the majority of financial institutions and the banking sector have integrated IT into their operations, creating countless opportunities for growth while also making these institutions vulnerable to cyberattacks in their daily operations, making the apparent lack of strategies to deal with these types of threats particularly concerning.

For its part, the government sector has facilitated the increased adoption of IT-enabled services and programs, such as the National e-Governance Programs (NeGP) and the Unique Identification Development Authority of India (UIDAI), by building a sizable IT infrastructure and encouraging corporate participation. Computer networks are currently heavily used in crucial sectors like defence, banking, energy, telecommunication, transport, and other public services to relay data for business transactions, as well as a source of information and for communication. The government currently has ambitious goals to increase cyber connectivity, e-commerce services, and overall IT communications use. The ambitious "Digital India" programme, which aims to connect every gram panchayats by broadband internet, promote e-governance, and turn India into a connected knowledge economy, has been approved by the cabinet, according to Indian Prime Minister Narendra Modi, in this respect (The Economic Times 2014b). All of this public investment in emerging technology encourages the implementation of strict regulations that will deliver reliable services. Notably, a growing reliance on IT has left the crucial defence and intelligence systems underpinning India vulnerable to cyberattacks. Attacks on government infrastructure do, in fact, raise the risk of state and military secrets being stolen (Aiyengar 2010). Therefore, it is not unexpected that a number of organisations under the purview of the Indian Ministry of Defence have taken on the task of managing cybersecurity. As an illustration, the Indian Army established the Cyber Security Establishment in 2005 to safeguard the army's networks at the divisional level and to carry out secure cybersecurity audits (Pandit 2005). In order to give commanders specialised training in security, the army has created a cybersecurity laboratory at the Military College of Telecommunications Engineering in Madhya Pradesh in 2010.

Energy and Cybersecurity

India's energy security has become a crucial non-traditional security concern. The nation consumes the fourth-most primary energy in the world, although its average per-person consumption is quite low (TERI 2013). Information on cyberattacks and equipment vulnerabilities in the Indian energy sector is essentially nonexistent due to inadequate regulation of information sharing and inadequate structures to promote it. However, trends in global cybersecurity lead us to believe that the industry is increasingly the target of sophisticated assaults, particularly now that India has started connecting it to contemporary technologies to fulfil its expanding energy needs (Walstrom 2016).

Indeed, a number of difficulties started to emerge as a result of the introduction of new technology in this field. For instance, a gang of hackers placed anti-India and anti-nuclear remarks on the Bhabha Atomic Research Center (BARC) website following India's nuclear test in May 1998. (Patil and Bhosale 2013). Additionally, an internet hacker by the name of PhrOzenMyst compromised the BARC's official website and released some of its sensitive data in retaliation for ongoing government activities in the occupied region of Kashmir (The Pioneer 2013).

Defence and Cybersecurity

India has the third-largest armed forces in the world and has a sizable defence industrial base (KPMG 2010). At the same time, it has integrated its defence industry with modern technology, exposing the nation to a number of constantly changing threats as a result of its reliance on these technologies and the need to integrate networks. For instance, in 2012 hackers launched a cyberattack against the Indian Navy's eastern command computer systems, which are in charge of managing maritime operations in the South China Sea and testing

of India's ballistic missile submarines. A virus that secretly collected and transmitted private files and documents to Chinese IP addresses infected the naval computers.

Finance and Cybersecurity

The use of IT has acted as a catalyst for India's enormous growth, making it one of the economies in the world with the quickest growth rates. However, new vulnerabilities have been created as a result of growing reliance on IT. Most cyberattacks are said to be motivated by money or financial gain, which has generally been the case (KPMG 2014). Actually, due to their complexity, modern banking and financial institutions are open to cyberattacks from both state-sponsored and non-state entities (Singh 2013). The issue has been made worse by the interconnected nature of contemporary technologies, which has given rise to numerous chances for theft, fraud, and other types of exploitation (Bamrara et al.2013). As a result, the former Indian Minister of Telecom, Kapil Sibal, has stated that "cyber security is important for economic security, and any failure.

Telecommunications and Cybersecurity

In India, telecommunications has become a major force for social and economic advancement. India is currently considered to be one of the fastest expanding telecom markets in the world, with 943 million telephone connections in February 2012 alone. In the same month, the nation had 911 million mobile phone connections (NTP 2012), and there were almost 160 million Internet users, with nearly half of them using social media. The Indian government has declared that it will have 600 million broadband connections and 100 percent teledensity by 2020.

The significant expansion of this industry has also been accompanied by a number of cyberthreats and attacks. Due to the rise in cyberfrauds, it is stated that information poses the greatest risk to the telecommunications industry. As an illustration, on August 7, 2013, malware was put into the systems of Bharat Sanchar Nigam Limited (BSNL), an Indian company, after hackers broke into its database. On October 12 of that year, BSNL's Office Domain was once again compromised, and some crucial data was taken (Dilipraj 2014). Similar to this, on June 9, 2013, some unidentified hackers used the DDoS technique to infiltrate the website of Mahanagar Telephone Nigam Limited (MTNL). The attack's motivation was to protest alleged Internet censorship supported by MTNL.

III. CONCLUSION

As is evident from the pages that precede it, cyberattacks aimed at India's important information infrastructure, including its energy, financial, defence, and telecommunications sectors, have the potential to have a negative effect on the country's economy and public safety. According to regulations already taken by other digital nations, the protection of the essential information infrastructure has been elevated to a high priority from the standpoint of national security (DSCI 2013). In fact, the increasing cross-border interdependence of the digital sphere has prompted the development of cybersecurity as a key element of national security strategies. India should not wait to emulate the policies that have been implemented in nations around the world (Kumar and Mukherjee 2013).

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