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SECURITY REGULATIONS & INTERNET BANKING

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ABSTRACT

Internet technology has given an opportunity to improve the performance of many businesses. Banks are no exception and providing online services has greatly enhanced their efficiency. Internet banking customers have increased a lot during the last decade. However, with this increased use of online banking, many security threats have also emerged. Because of the attractive financial benefits, attackers are continuously targeting the online services provided by various banks. Protecting the customer's data is very important for the banks to gain their confidence and secure their financial transactions. In this paper, we have analysed various security regulations for internet banking and its implementation by banks.

Keywords: Internet banking, security, framework, , comparative analysis, security checklist

INTRODUCTION

The evolution in Internet and its associated technology, the internet has become an important element in almost every business, particularly in banking. Just like other industries banks also expanded the use of internet technologies in their business operations. Using internet by banks for their business operations is called “Internet Banking” [1] [2]. In internet banking the bank’s customers access their bank account using internet and make online bank transactions. Internet banking consists of designing a web page to provide information about its product and services. On the other hand, the advance level includes providing facilities like accessing accounts, funds transfers, paying bills and purchasing various financial products/services via internet.

Internet banking systems have associated information security threats and risks which can be assessed as low, medium and high. Privacy and security of Internet banking transactions and confidentiality of personal information are among the biggest concerns for both the banking industry and the Internet banking customers [1].

There are various threats related to internet banking security, e.g., phishing, viruses, adware, malware, etc. [3]. Other threats include lack of security awareness of customers, Internet banking customers’ online behavior, threats (both authentication and authorization). All these things affect the customers of the banks to avoid the Internet banking [4] [3].

In Pakistan, 26 banks are offering Internet Banking Services. There are 2.9 million Internet banking users registered with banks as per the statistics of the State Bank of Pakistan (SBP). Around 8.4 million transactions valued at Rs.332.8 billion were processed through Internet banking services. These transactions showed a growth of 13.4% and 13.7% in volume and value of transactions respectively. [propakistani.pk]

The purpose of this paper is to conduct a literature review regarding the security regulations and the services offered by banks via internet. We perform this work on the banks working in Pakistan. Also, the aim is to analyze the existing regulations on the security of the banks and to give them recommendations on how they can improve their security. The regulations are made by State Bank of Pakistan.

LITERATURE REVIEW

This section describes some of the famous security breaches on internet banking, bank categories in Pakistan and the related literature on the analysis of the security of internet banking.

The related work with ours is that of [5] [6] [7] [8]. Subsorn and Limwiriyakul [5] [6] [7] have performed security assessment of various banks in Thailand and Australia for Internet Banking. Similarly, A. Hamid [8] have analyzed the security of the banks of Malaysia and Thailand.

Internet Security breaches for banking

- **Cyber attack on Tesco Bank:** This happened in 2016 in the month of November. It resulted in the loss of around £2.5 million from the accounts of 9000 customers [9].
- **Bangladesh Bank:** Around \$1 billion was stolen from Bangladesh bank in February 2016 [10].
- **Cosmos Bank:** The cosmos Bank of India was attacked in 2018 where the attackers stolen around \$13.5. The attackers planned this attack by targettign 28 countries [11].

- **Credit/Debit Cards of Pakistani Banks:** Pakistani banks were also attacked in 2018 where approximately 30000 debit cards were stolen and sold on dark web.

Categories of the Banks in Pakistan

There are total 53 banks in Pakistan divided into 7 categories on the basis of functions. The table is given below.

- Cat 1: Public Sector Schedule Banks
- Cat 2: Public Sector Non-Schedule Banks
- Cat 3: Specialized Schedule Banks
- Cat 4: Private Banks
- Cat 5: Islamic Banks
- Cat 6: Foreign Banks
- Cat 7: Micro-Finance Banks

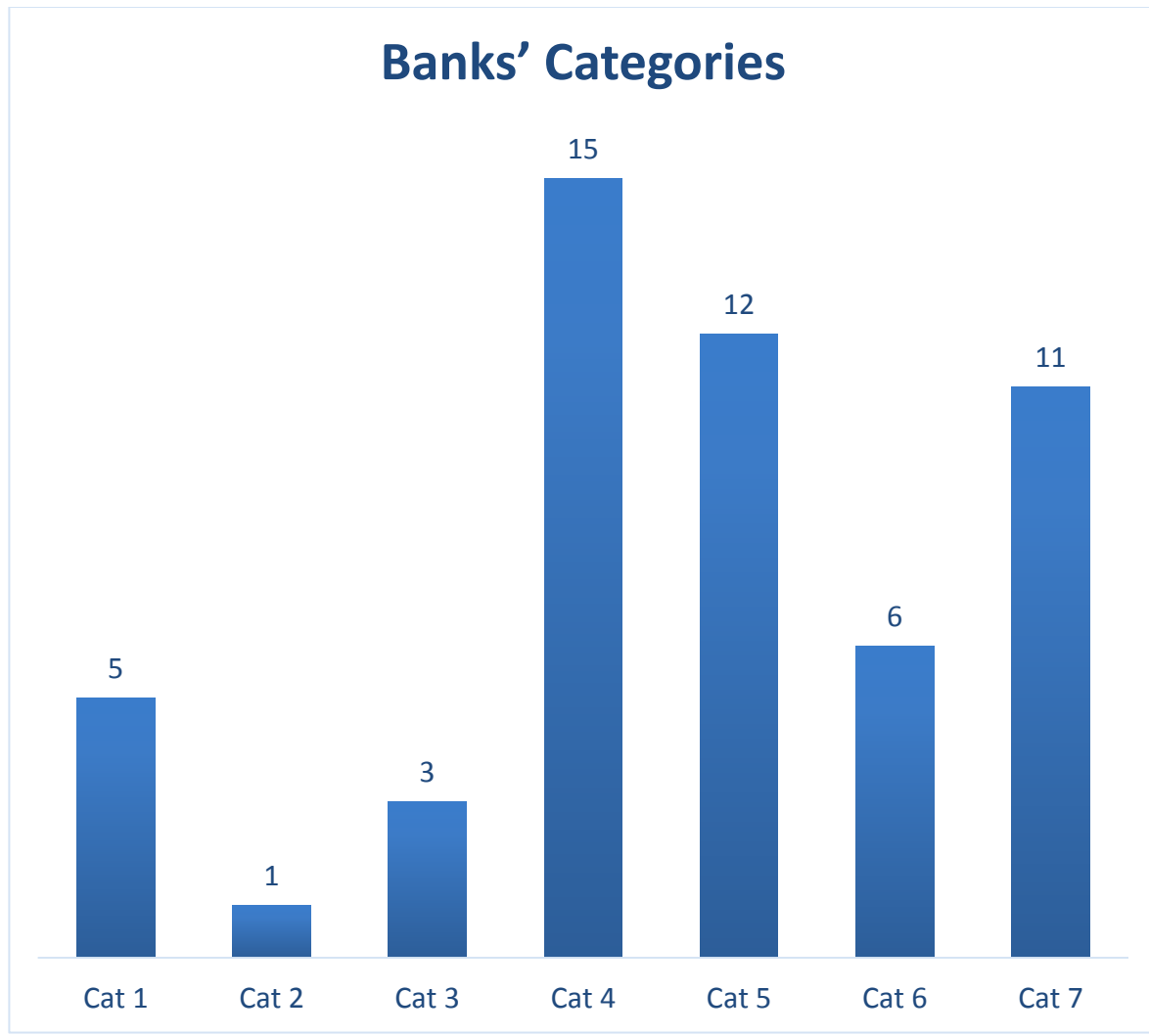


Figure 1: Banks categories in Pakistan

Table 1: List of all Pakistani banks

Count	Banks	Headquarters
Cat 1: Public Sector Schedule Banks		
1	National Bank of Pakistan	Karachi
2	The Bank of Punjab	Lahore
3	Sindh Bank	Karachi
4	First Women Bank	Karachi
5	Zarai Taraqati Bank Limited	Islamabad
Cat 2: Public Sector Non-Schedule Banks		

6	Bank of Azad Jammu & Kashmir	Rawalakot
Cat 3: Specialized Schedule Banks		
7	Industrial Development Bank	Karachi
8	SME Bank	Islamabad
9	Zarai Taraqati Bank limited	Islamabad
Cat 4: Private Banks		
10	Askari Bank	Islamabad
11	Allied Bank Limited	Karachi
12	MCB Bank limited	Lahore
13	Bank Alfalah	Karachi
14	Bank Al Habib	Karachi
15	Faysal Bank	Karachi
16	Habib Bank Limited	Karachi
17	Habib Metropolitan Bank	Karachi
18	JS Bank	Karachi
19	Samba Bank Limited	Karachi
20	Silk Bank Limited	Karachi
21	Standard chartered Pakistan	Karachi
22	Soneri Bank	Lahore
23	Summit Bank	Karachi
24	United Bank Limited	Karachi
Cat 5: Islamic Banks		
25	Meezan Bank Limited	Karachi
26	Dubai Islamic Bank	Karachi
27	Al Baraka Bank	Karachi
28	Bank Alfalah Islamic	Karachi
29	Bank Islami Pakistan Limited	Karachi
30	Askari Bank Limited	Islamabad
31	MCB Islamic Banking	Lahore
32	UBL Islamic Banking	Karachi

33	HBL Islamic Banking	Karachi
34	National Bank of Pakistan	Karachi
35	Bank Al Habib Islamic Banking	Karachi
36	Allied Islamic Bank	Karachi
Cat 6: Foreign Banks		
37	Deutsche Bank AG	Karachi
38	Bank of Tokyo-Mitsubishi UFG	Karachi
39	Citi Bank N. A	Karachi
40	Industrial and Commercial Bank of China Limited	Karachi
41	Bank of China	Karachi
42	Samba Bank Limited	Karachi
Cat 7: Micro-Finance Banks		
43	Advans Microfinance Bank	Karachi
44	Finca Microfinance Bank	Lahore
45	The First Microfinance Bank	Islamabad
46	Khushhali Microfinance Bank	Islamabad
47	NRSP Microfinance Bank	Bahawalpur
48	Telenor Microfinance Bank	Karachi
49	Apna Microfinance Bank	Lahore
50	Mobilink Microfinance Bank	Islamabad
51	Pak-Oman Microfinance Bank	Karachi
52	Sindh Microfinance Bank (SMFB)	Karachi
53	U Microfinance Bank	Faisalabad

Security regulations for Internet Banking:

Some of the regulations for internet banking security in different countries are discussed below:

- **Pakistan Regulations**

Regulations are developed by the State Bank of Pakistan for the banks working in the country on how to improve their security [12]. These regulations cover the following three areas:

- **Risk assessment of security:**

This requires that all banks should perform assessment of their security for internet banking.

- **Security controls implementation:**

This area covers what technical security measures are taken by the banks.

- **Monitoring of security controls:**

In this, the monitoring mechanisms for securing online banking is discussed.

- **US Security regulations for Internet Banking**

It covers how various banks and other finance related companies should develop a program for internet security of their financial systems [13].

- **Indian Regulations:**

India has also developed a detailed list of regulations for the security of internet banking and other government laws [11]. It covers the banks responsibilities as well as customers responsibilities.

SECURITY CATEGORIES FOR INTERNET BANKING

We propose the following categories of security for internet banking.

1. Security Information for Customers:
2. Technical Measures for Security
3. Requirements Hardware and Software
4. Security of Applications used for Internet Banking

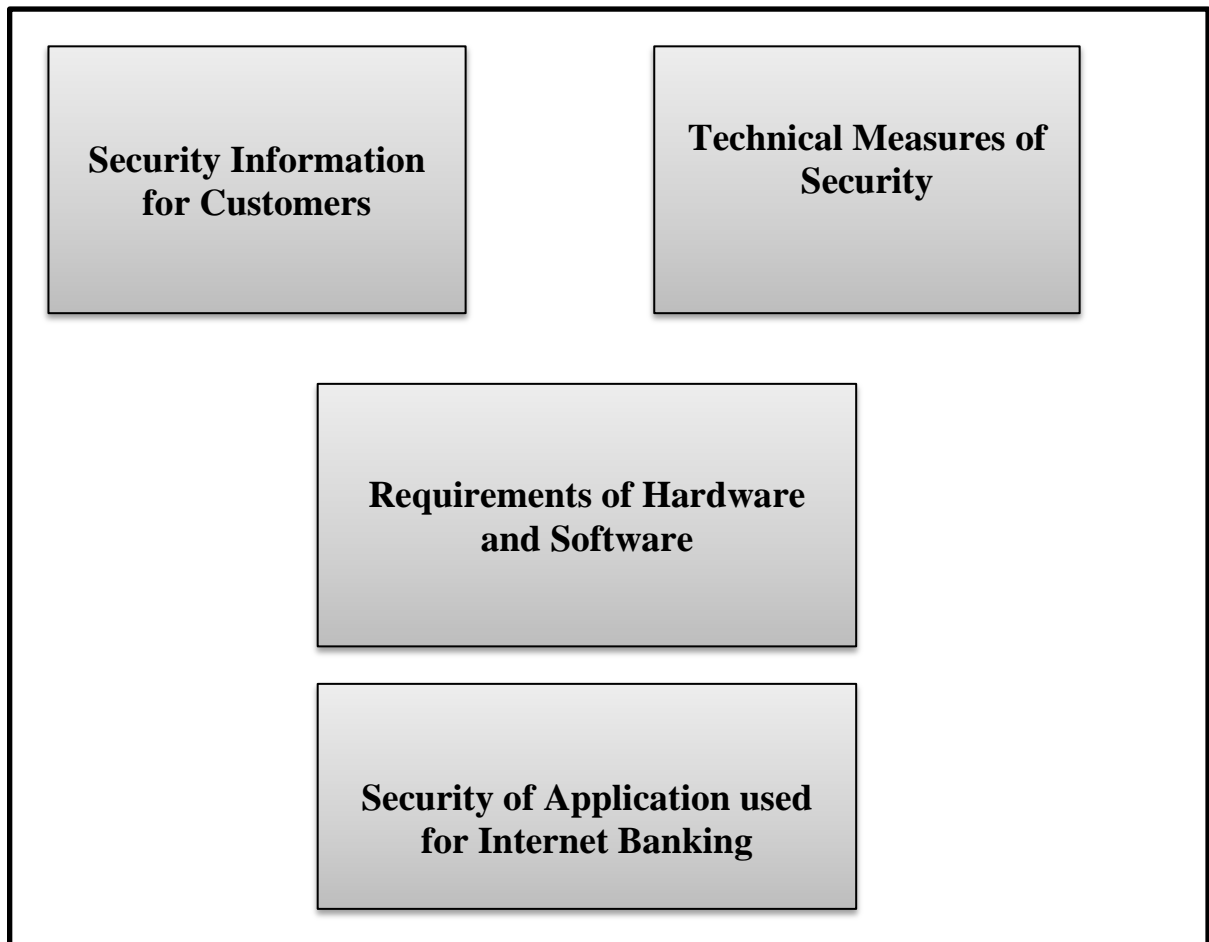


Figure 2: Security Categories

RESULTS

We analyzed a total of 10 banks providing internet security services based on our proposed security categories. We have anonymized the data because of confidentiality reasons.

As described in the previous section, we proposed 4 categories. However, we further defined 4-8 features in each category and then checked whether these features exist in the bank or not.

Total Security Categories: 4

Total Security Features: 22

Table 2 shows the results of our data collection.

Table 2: Result of data collection from 10 banks

S. No	Security features categories	Service 1	Service 2	Service 3	Service 4	Service 5	Service 6	Service 7	Service 8	Service 9	Service 10
1	Security Information for Customers (sub features: 8)	4	2	1	3	2	3	4	5	2	1
3	Technical Measures of Security (sub features: 4)	1	1	1	1	2	1	1	1	2	1
4	Requirements Hardware and Software (sub features: 4)	1	2	1	1	1	2	2	1	1	2
5	Security of Applications used for Internet Banking (sub features: 6)	3	2	3	3	2	2	2	2	1	1

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