

A Preliminary Study of Risk Assessment of Mobile Workers for Improvement of Work-Life Balance

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Abstract— The way work is carried out has changed in the last couple of decades. Mobile workers are increasingly becoming the norm for many enterprises. With the benefits of productivity and cost-effective labor, more and more companies/enterprises are having employees work outside of office premises. According to Strategy Analytics reports on Mobile Workforce, the global mobile workforce is set to increase to 1.87 billion in 2022, accounting for 42.5% of the global workforce. However, with the workers remaining outside of the office perimeter and with the increasing daily security threats, mobile workers present various risks to enterprises. Mobile workers themselves are also associated with risks due to changes in their working environment. Therefore, it is imperative that enterprises understand and address the challenges associated with mobile workers. This paper discusses a risk assessment of Mobile Workers in an enterprise. So far, 20 different risks are extracted via a literature review of past research and surveys on mobile workers and the mobile workforce.

Keywords— Mobile Worker; Mobile Workforce; Work-life Balance; Risk Breakdown Structure

I. INTRODUCTION

With the advancement of technology and fast connectivity, enterprises are witnessing a potential change in the workforce. Workers are no longer confined within the office premises as enterprises' critical data shift into the cloud; they can now access data from all networks and any location.

The use of mobile workers is reaping benefits in terms of productivity for businesses and reduced budgets for technological consumption. In terms of real estate too, it can provide benefits to small businesses. It is also beneficial for the workers themselves as they can continue to work from any desired location which significantly reduces the cost and environmental effects of travel [1]. With increased business competitiveness, enterprises all over are taking advantage by enabling workers to work remotely and by introducing new workspace environments outside of the office premises.

According to Strategy Analytics reports on Mobile Workforce, the global mobile workforce is set to increase from 1.45 billion in 2016, accounting for 38.8% of the global

workforce, to 1.87 billion in 2022, accounting for 42.5% of the global workforce [2]. Mobile working is increasingly becoming the norm for many enterprises.

However, despite all the apparent benefits, it has significantly increased the risk of data breach. For example, mobile workers' use of personal devices, along with their engagement in risky online behavior and use of free unsecured Wi-Fi networks, carries the risk of exposing their companies' confidential information to several other vulnerabilities. Moreover, with the workers operating beyond the layered defense security of offices [3], enterprises are facing difficulties in managing the workers and their confidential data are at a constant risk of being disclosed to unauthorized groups or individuals.

Mobile workers also encounter different physical and psychological risks due to changes in working environment and routine. They often find it difficult to separate personal and professional life, i.e., to maintain a work-life balance.

This paper describes a risk assessment of Mobile Workers in different environments. The risks are listed through a literature review of past papers and surveys.

II. CURRENT ISSUES AND STATUS

Mobile workers are defined as individuals who move to and from different locations utilizing information and communication technology [4]. With mobile workers predicted to account for almost 50% of the global workforce by 2022, this trend implies a huge challenge to enterprises.

A recent survey on mobile security reports by iPass states that in a poll of 500 CIOs and senior IT decision makers from the U.S., U.K., and Germany, more than half (57%) of respondents suspect that one or more of their mobile workers have been hacked or caused a mobile security threat[5].

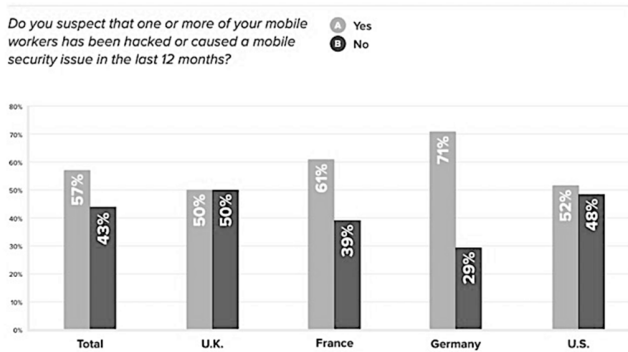


Fig 1. iPass Mobile Security report [5].

Further study shows that:

1. 81% of CIOs said their company had experienced a Wi-Fi related security incident in the last year and 62% of Wi-Fi related security incidents occurred in cafés and coffee shops.
2. 94% of CIOs believe the rise of BYOD has increased mobile security risks.
3. Only 46% of enterprises were confident that mobile workers were using a VPN.

Major security issues are mainly caused by workers' irresponsibility. A survey by Apricon states that 18% of the

employees believe that their mobile workers do not care about security at all, meaning workers often prioritize convenience over security [6].

A 2008 Cisco survey conducted by InsightExpress states that remote workers were more negligent about security and less vigilant in practicing secure online behavior due to their belief that the Internet was becoming more secure [7].

III. RISK ASSESSMENT OF MOBILE WORKERS

Generally, risk assessment is conducted in the following order: (1) risk specification, (2) risk analysis, and (3) risk evaluation. This paper only conducts risk specification. Risk analysis and evaluation are steps to be carried out in future.

A. Risk Specification

Here, the risk factors were systematically extracted from a comprehensive viewpoint with the RBS method.

Specifically, the risk factors are divided into risk of mobile workers and outsiders to enterprises. A third risk factor is social and environmental risks generally acquired by the workers due to changes in their working environment and routine.

So far, 20 different risks are extracted by means of a thorough review of past research and surveys on mobile workers and the mobile workforce.

TABLE I. Risk specification of mobile workers.

No.	Level 1	Level 2 (Risk Factors)	Contents
1		1.1 Access of work files with personal, non-IT-protected device	Risk of accidental loss of data, misuse of data
2		1.2 Access of unapproved sites, consumer apps, suspicious emails	Risk of malware attacks, computer virus infection
3	1	1.3 Non-compliance with security practices	Risk of security breach
4	Workers	1.4 Leaving confidential documents unattended	Risk of mismanagement of confidential documents
5		1.5 Leaving devices unattended	Risk of exposing confidential data to unauthorised person
6		1.6 Sharing of computer and devices	Risk of unauthorised access and misuse of information by individual
7		1.7 Use of unsecured Wi-Fi communications	Leakage of information during connection to public wifi
8		1.8 Use of work devices for personal use	An employee private data mixture with work device
9		2.1 Physical loss and theft of devices	Loss of confidential data or data in hand of malicious person
10	2	2.3 Shoulder hacking	Procurement of personal and confidential data by shoulder surfing
11	Outsiders	2.4 Intruders gaining access to sensitive information	Easy to hack and gain information via various means
12		2.5 Eavesdropping attacks	Easy to eavesdrop over use of unsecured network and obtain data
13		3.1 Work-life balance	Hard to separate personal life and professional life
14		3.2 Lone working	Risk of stress, feeling isolated
15	3	3.3 Invasion of personal space	Invasion of personal space by office-related work
16	Social and Environment	3.4 General health and safety hazards	Risk of suffering an accident, illness while working alone
17		3.5 Feeling of exclusion in decision-making about their work	Risk of feeling distant and insignificant
18		3.6 Inadequate resources	Lack of required resources may lead to inability to work
19		3.7 Lack of face-to-face communication	Risk of social isolation
20		3.8 Lack of self-motivation and encouragement from employer	Feeling unmotivated and unproductive

IV. CONCLUSION AND FUTURE WORK

This paper extracted 20 different risks through a literature review of past research. A more exhaustive risk extraction will involve psychological risk on workers. This research is carried out in order for enterprises to better understand and implement the mobile workforce. Its objective is also to acknowledge psychological risks to workers due to lack of work-life balance.

Further study will involve risk analysis and risk evaluation of mobile workers and then countermeasures to extracted risk will be proposed. A detail risk analysis and categorization of mobile workers' risk on the basis of workers' location (homes, cafeterias, airports, hotels and so on) will be conducted in future.

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