Privacy and BYOD Policies in U.S. Higher Educational Institutions: A Web-Based Content Analysis

A Thesis

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by

Afnan Alsharif

Major Professor: Conte de Leon, Daniel, Ph.D. Committee Members: Ma, Xiaogang, Ph.D.; Sarathchandra, Dilshani, Ph.D. Department Administrator: Frederick Sheldon, Ph.D.

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This thesis of Afnan Alsharif, submitted for the degree of Master of Science with a Major in Computer Science and titled "**Privacy and BYOD Policies in U.S. Higher Educational Institutions: A Web-Based Content Analysis**," has been reviewed in final form. Permission, as indicated by the signatures and dates below, is now granted to submit final copies to the College of Graduate Studies for approval.

Major Professor:		
	Conte de Leon, Daniel, Ph.D.	Date
Committee		
Members:	Ma, Xiaogang, Ph.D.	Date
	Sarathchandra, Dilshani, Ph.D.	Date
Department		
Administrator:		
	Frederick Sheldon, Ph.D.	Date

Abstract

Security, privacy, Bring Your Own Device (BYOD), and other information technology usage policies are an essential component of a cybersecurity plan and its implementation within organizations. In this thesis, we present the method and results of a web-based content analysis describing the public availability of such policies for a randomly selected set of 52 U.S. educational institutions. Method: A set of Google searches was performed within each institution's main website, in 2016, using a set of security policy terms. Results: 90.4% Privacy Policy, 34.6% Information Security Policy, 42.3% Security Policy, 1.9% BYOD Policy, 82.7% Acceptable Use Policy, 28.8% Authentication and Password Policy, 19.2% Data Classification Policy, 11.9% Incident Response Policy, 2% Mobile Device Policy, 71.7% Network and VPN, 29.2% Cloud Services Policy, 3.8% Physical Security Policy, 82.7% Data Retention Policy, 30.8% Contractor Connection Policy, 96.2% Wireless Access Policy, 80.7% A Policy Change Log.

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Dedication

I give this research to my Brother Bassam, my mother, and my father. and thank for my family, my soulmate, and my friends for supporting me.

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Chapter 1: Thesis

Introduction

Bring Your Own Device as a definition is allow the students and employees to use their own devices and stay connected, access data from, or complete tasks for their organizations. [9]. In addition, bring your own device policy is how institutions can secure students and facilities devices, when they are connected to institutions' wireless. Moreover, the U.S. higher educational institutions should care about BYOD policy, according to a recent survey by intel performed on many organization about benefits of BYOD were, 28% increased the productivity, 22% improved worker portability, and 6% minimized IT management/ problem-solving. [10]. However, A considerable lot of the disadvantages of BYOD include the loss of sensitive information and a general loss of control by IT offices. These worries are alleviated fairly in an instructive setting since every understudy just approaches their very own information. [4]. It's also important to clearly state what areas of service and support are the employees' responsibilities versus the educational institutions' responsibility in protect their own devices.

Problem:

- Organizations are being pushed to support BYOD.
- Additional Privacy and Cybersecurity Issues
- Device Ownership and Control
- Devices are Mobile.
- As it applies to Educational Institutions
 - Open and limited resources.

What will happen if the Educational Institutions refuse to have BYOD policy, the employee will be unhappy and that might decrease the productivity too.

Goal:

Help educational institutions design and implement adequate privacy, security, and BYOD policies by focusing on the data analysis on important policies.

Objective:

To Determine where do educational institutions are with respect to these policies.

Research Question:

How well do educational institutions establish security, privacy, and BYOD policies.

Chapter 2: Background

U.S. Higher Educational Institutions should know how to controls on their web sites, and Policies are an essential component of a cybersecurity program. how to identify their security policies, and what they can provide of privacy as educational institutions for employees and students.

A recent survey by SAANS Analyst Program performed on many enterprise organizations (i.e. more than 1,000 employees) about criticality of Mobile Security Policy have identified 97% of organization feels BYOD policies are important. [10] However, some education institutions don't allow their students to use their devices in the campus, most often requesting to switch them off. BYOD is the idea that provides the higher level of comfort and got widely accepted and adopted by both employers and employees. [9]. In the following section, literature review on the uses and concerns of BYOD policy, and security perspectives will be explored.

2.1 Literature review

"A recent survey by SAANS Analyst Program performed on many enterprise organizations (i.e. more than 1,000 employees) about criticality of Mobile Security Policy have identified 97% of organization feels BYOD policies are important." In addition, Consider the possibility of the worker may leaving the institution for many reasons. The workers agreed to accept BYOD arrangements have devices supported by organization [10].

The study titled "Modifying security policies towards BYOD" shows how much BYOD policy is important based on the statistics that are shown in the article. BYOD improved the institutions productivity and give the people opportunity to have a job as people would and to be comfortable.

Similarly, the student and employees in education institutions will increase their productivity then, they can finish the tasks in short time by using their own devices in institutions campus. Because of the importance of using personal devices in institutions, they need to have policies for BYOD to protect students and employees' devices.

For some institutions today, the BYOD issue is less a matter of 'No, we can't do it' and progressively an issue of 'How would we do it? What positive, responsive moves should we make to deal with the mobile devices circumstances in our institutions?' One basic subject among organizations advancing toward the act of BYOD is that there is purchase in from top administrators who are helping not only to bring the matter to the forefront in the company, but in addition drive it further [3].

However, in the study titled "BYOD: enabling the chaos" talks about the concern of implement bring your own device policy and in this study the author mentions some institutions wondering about what the positive of implement this type of policy. The answer would be in the study titled "Modifying security policies towards BYOD" explain more about positive side of bring your own device policy, which are the productive is increasable, job opportunity, and ease of worker mobility.

BYOD security concerns End User Access Model It's certain that the security issues are begun by the absence of control on the end clients' devices, so the IT needs to face with a huge number of various devices mixing personal and work usage without including complexity or risks, instead, as usual, of standardizing it operations on few of devices. [1]

In study titled "New security perspectives around BYOD" explains the different perspectives around bring your own devices policy. In addition, this study talked about how IT control is important to manage the devices security, and protect users' information on the institutions. While the students and employees are connected on institutions' WIFI, should provide an agreement that includes some recommendations to the users and what users' and institutions' responsibility.

Devices used to get to business applications 2010 2011 30.7% Personal PC, cell phone 69.3% Business PC, cell phone 40.7% Personal PC, cell phone, tablet 59.3% Business PC, cell phone, tablet Source: Unisys, IDC: "2011 Consumerization of IT Study: Closing the 'Consumerization Gap'' Personally-possessed Company-claimed 30 week September 5, 2011 more than two for everyone on the planet. [6]

In study titled "BYOD Trend Pressures Corporate Networks" shows the most devices employees used on the organizations since 2010. The highest percentage of devices have used on organizations based on this study, is for smartphone by 69.3%.

Chapter 3: Methodology

I requested a list of all educational institutions in the U.S. from the Institute of Education Sciences of the U.S. Department of Education

(http://nces.ed.gov/ipeds/datacenter/Default.aspx). This list included institution name, type, and number of full-time students, for all 7688 educational institutions in the U.S. Then, I chose 100 random numbers. These were used to select 100 educational institutions from the list of all educational institutions. In the second stage, this list was reduced to 51 by randomly selecting 51 out of the original set of 100. Then the University of Idaho was added as a reference entry.

I Surveyed all resulting 52 institutions to divide them in some categories as funding institutions, which are public or private. Moreover, policies survey is subsection of the results and analysis to show their policies through Google search and looking for the frequencies between them. then I worked to find the relationships between each variable, for example, between the educational institutions and the term of search by using SPSS function. In addition, I used the terms as variables, not definitions, because they are the most helpful to define the variables in different categories. However, as I am one of the students who are enrolled in the last three years in U.S institutions "University of Idaho" and it wasn't appear in the random selection, I used University of Idaho as a reference of Educational institutions, that assist to study my institution as a part of my research.

One of the main methods I used was the content analysis. After I did the random selections and search about institutions website policies, I compared between them and defined them as questions. The answers were found in websites policies content. I analyzed 52 institutions' websites and looked for what they cover in policies. Also, I used the questions word of terms. For Example: Does it Have an Acceptable Use Policy* Does it Have an Authentication and Password Policy*? and answered them by (yes/No) by checking each category of the policy manually.

The code book in Table 1 are explained the variables, definitions, and their values.

Variable	Descriptions\ definitions	Values
Institution	Names of Institution	Randomly
UGEnrol	Undergraduate enrolment	Number of full-time
		students' enrolment in 2 or
		3 last years
GradEnrol	Graduate enrolment	Number of full-time
		students' enrolment in 2 or
		3 last years
ProfPrac	professional practice	Number of full-time
		students' enrolment in 2 or
		3 last years
Funding Institution	Public or Private	0= Private
		1= Public
Academic Institution	University, college,	1= community college
	community college	2= college
		3= University
Privacy	Use term privacy policy	0= No
		1=Yes
Security	Use term security policy	0= No
		1=Yes
Infosec	Use term information	0= No
	security policy	1=Yes
Byod	Use term BYOD policy	0= No
		1=Yes
Acceptable	Has an Acceptable use	0= No
	policy	1=Yes
Password	Has an authentication and	0= No
	password policy	1=Yes
Classification	Has a data classification	0= No
	policy?	1=Yes

IRpolicy	Has an incident response	0= No
	policy?	1=Yes
BYODPolicy	Has a mobile device policy	0= No
		1=Yes
VPN	Has a network and remote	0= No
	access and VPN	1=Yes
Cloudservices	Has an outsourcing and	0= No
	cloud services policy	1=Yes
Physicalsec	Has a physical security	0= No
	policy	1=Yes
Retention	Has data retention policy	0= No
		1=Yes
ContractorCon	Has contractor connection	0= No
	policy	1=Yes
GuestCon	Has guest connection policy	0= No
		1=Yes
Wireless	Has wireless access policy	0= No
		1=Yes
ChangeLog	The ORG keep a policy	0= No
	change log	1=Yes

Table 1: Code Book

In Table1 are descriptive data about the sample. And How the samples represent the large population. Also, summarizing all variables that coded for this study and their definitions. In the following subsections of methodology, more descriptive details about the sample will be explored.

3.1 Institutions Background

As part of methodology, these following subsections explain the sample I found and the background lead us to know about 52 random educational institutions including University of Idaho as a reference. The background may introduce why most of educational institutions don't cover or provide bring your own devices policies. Are there any differences between public or private institutions? Or they may depend on how much of enrollments each year?

3.2 Program Types:

After working on SPSS to find the final data output, first having background information about educational institutions in the last three years. how many full-time students are enrolled in, and divided the students based on the programs types.

Program types	Minimum	Maximum
UGEnrol	7991	115375
GradEnrol	0	28202
ProfPrac	16	10746

 Table 2: minimum and maximum of students' enrollments' in different program types

 in the last three years

The minimum and maximum for full time students are real numbers show the range of full-time students' enrollments. As the Table2 shows the highest number of enrollments in undergraduate program, on the contrary the enrollments in graduate and professional practices programs are lower than undergraduate program enrollments for last three years even on the maximum.

3.3 Institutions Types:

The other dividing is Institutions Types: That divided into academic and funding types. Based on data collection there are 52 educational institutions, plus University of Idaho as a reference, divided to two types, the first is Academic institutions, and the second is Funding institutions.

Sample Characteristics	Types	Percent
Institutions Types (Academic)	University	59.6%
	College	30.8%
	Community college	9.6%
Funding Types	Private	23.1%
	Public	76.9%

Table 3: Sample Characteristics

Academic institutions are divided into 52 random institutions of universities, colleges, and community colleges. There are 59.6% universities in this study and they are highest percentage of Academic institutions, on the contrary the lowest percentage is community colleges by 9.6% however, in the middle is colleges by 30.8%.

Moreover, the Funding Types are divided into 52 random institutions of public and private institutions. The public institutions are 76.9% and the private institutions are 23.1%. The difference is the public institutions are higher than private institutions after Subtract the public and private percentage of the institutions by 53.8%.

Chapter 4: Analysis and Results

4.1 Policies Survey:

The survey policies are related to Bring your own devices policies that are collected how many educational institutions have used the Common words for their policy as terms of search through Google by citing the word of term and the institutions website for example; "Privacy Policy" site: <u>http://www.apus.edu/</u> and others term as what appearing on Table 4.

Policy Term	Yes	No
Privacy Policy	90.4%	9.4%
Information Security Policy	34.6%	65.4%
Security Policy	42.3%	57.7%
BYOD Policy	1.9%	98.1%

Table 4: The Policy terms results

The highest percentage is 90.4 % used the term privacy policy, 42.3% used the term Security Policy, 34.6% used the term Information Security Policy, 1.9% used the term BYOD Policy as the lowest percentage. After reading the educational institutions websites' policies, dividing them to different categories of policies as terms. In addition, I check each category of the policy manually by using the policies' keywords.

Institutions Websites	Yes	No
Policies		
Acceptable Use Policy	82.7%	17.3%
Authentication and	28.8%	71.2%
Password Policy		
Data Classification Policy	19.2%	80.8%
Incident Response Policy	11.9%	88.1%
BYOD Policy	1.9%	98.1%
Mobile Device Policy	2%	98%
Network and VPN	71.7%	28.3%
Cloud Services Policy	29.2%	70.8%
Physical Security Policy	3.8%	96.2%
Data Retention Policy	82.7%	17.3%
Contractor Connection	30.8%	71.2%
Policy		
Wireless access Policy	96.2%	3.8%
A Policy Change Log	80.7%	19.3%

 Table 5: educational institutions websites policies analysis

Table 5 shows the institutions websites policies' answers and show how many of educational institutions have established those types of policies. The lowest percentages beside the Physical Security Policy are for the mobile device policy and BYOD. However, the highest percentage is on wireless access policy by 96.2%.

4.2 Conclusion

In U.S higher Educational Institutions Privacy, security, and BYOD policies are an essential component of a security program. Educational institutions open and have scarce resources. Institutions are making progress on developing policies but much more needs to be done especially on the mobile and BYOD area.

However, the researchers start looking on bring your own devices in the last 5 or 6 years with development of technology. And the use of technology by people in their lives since the entry of technology to schools, universities and educational institutions in various fields. The results are personal diligence and other researchers can continue or edit my results based on the research side that they want to cover.

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Appendix A List of Educational Institutions

The table below shows the data for the 52 institutions used for the content analysis described in this thesis.

Institution Name	UG	Grad	profprac	Websites link
	enrollment 2013-14	enrollment 2013-14	2013-14	
American Public University System	34668	7468		http://www.apus.edu/privacy/index.ht m
Boston College	9268	2835	750	http://www.bc.edu/content/dam/files/o ffices/policies/pdf/policies/I/1-100- 200.pdf
California State University- Dominguez Hills	9299	1076		http://www4.csudh.edu/Assets/CSUD H-Sites/PMs/docs/all-valids/2009- 13.pdf
Chaffey College	11887			http://www.chaffey.edu/general_info/i nternet-policy.shtml
Cincinnati State Technical and Community College	8405			http://learn.cincinnatistate.edu/privacy /
City Colleges of Chicago-Harry S Truman College	8509			http://www.ccc.edu/departments/Docu ments/Responsible_Computer_Use_P olicy0806.pdf
Columbia College-Chicago	8831	355		http://www.colum.edu/privacy.html
Columbia University in the City of New York	8320	15828	2443	http://cuit.columbia.edu/it-policy- summaries \\ http://www.columbia.edu/cu/irb/polici es/documents/IRBDataSecurityPolicy FINAL.pdf
CUNY City College	10118	1821		https://www.ccny.cuny.edu/it/security
DePaul University	15657	4553	979	http://resources.depaul.edu/privacy/det ails/Pages/default.aspx
Georgia Southern University	17136	1854		http://digitalcommons.georgiasouthern .edu/cgi/viewcontent.cgi?article=1000 &context=infotech
Grantham University	8913	1094		http://www.grantham.edu/privacy- policy/
Guilford Technical Community	9943			http://home.gtcc.edu/gtcc-privacy- policy-statement/

College				
Iowa State	27208	3383	586	http://www.policy.iastate.edu/policy/it
University				/security
Lamar University	8768	5831	37	http://facultystaff.lamar.edu/policy/ma
				rketing/social-media-policy.html
Los Angeles	12373			Word File
Pierce College				
Loyola University	10597	3069	1307	http://www.luc.edu/its/itspoliciesguide
Chicago				lines/security_policy.shtml
Midlands	8585			http://www.midlandstech.edu/about/co
Technical College				nsumer-information/privacy-statement
Moraine Valley	11542			http://books.morainevalley.edu/site_te
Community				rms_of_use.asp
College				
Nassau	18061			https://www.nccgroup.trust/us/about-
Community				us/privacy-policy/
College				
North Carolina	23751	5881	618	https://www.ncsu.edu/privacy/
State University				
at Raleigh				
Onondaga	8720			http://www.sunyocc.edu/index.aspx?id
Community				=4840
College	100(2			
Palm Beach State	19863			http://www.palmbeachstate.edu/itsecu
College				rity/documents/DataClassificationProc
Dalaman Callaga	15292			edure_v1_1.pdl
Palomar College	15582			/www.2.paiomar.edu/pages/about
Deadley Callaga	0222			http://www.roodlov.collogo.odu/indov.c
Reedley College	8332			mup.//www.needleyconege.edu/index.a
Putgers	252/2	8665	2837	http://policies.rutgers.edu/7012
University New	55545	8005	2037	currentndf/
Brunswick				http://www.alumni.rutgers.edu/s/896/i
Dianswick				ndex aspx?sid=896&gid=1&pgid=230
				&cid=157
San Jose State	21201	3282		http://its.sisu.edu/docs/security/Standa
University	21201	5202		rd Network Security.pdf
				http://its.sisu.edu/docs/security/Inform
				ation%20Security%20Program.pdf
Santa Barbara	12875			http://www.sbcc.edu/security/files/An
City College				nual Security Report for PDF form
				at-10-23-13.pdf
Santa Monica	20841			https://bookstore.smc.edu/site_privacy
College				.asp
Savannah College	8087	1879		http://www.scad.edu/content/privacy-
of Art and Design				and-terms-use//

				https://www.scad.edu/blog/scad-
				snapchat-geofilter-design-contest-
				rules
Schoolcraft	9818			http://schoolcraft.edu/about-
College				us/consumer-information/college-
				policies/web-site-privacy-
				statement# V-3r8nMrKYU//
				http://www.schoolcraft.edu/about-
				us/consumer-information/college-
				nolicies/web-site-privacy-
				statement# WAi0TnMrIvk
Stockton	8079	497	112	https://stockton_edu/about_
University	0077	477	112	stockton/statements policies html
Toyog A & M	40765	9519	2040	http://www.tamus.adu/lagal/policy/pol
Liniversity	40703	0310	2940	intp://www.tanus.edu/legal/poncy/poi
Callege Station				<u>icy-and-regulation-notary/</u>
Luiversity of	20221	2722	741	letter av //www.www.ard.ard.ard.ard.ard.ard.ard.ard.ard.ard
University of	28331	3723	/41	https://www.ua.edu/privacy
Alabama	7001			
I yler Junior	/991			http://www.tjc.edu/privacy
College	00016		10.40	
University of	20316	5764	1840	http://www.uiowa.edu/homepage/onli
lowa				ne-privacy-information
University of	13958	2901	1583	https://sharepoint.louisville.edu/sites/p
Louisville				olicies/library/SitePages/Information
				%20Technology/Information%20Secu
				rity%20Responsibility.aspx
University of	28025	13669	2887	http://cio.umich.edu/policy
Michigan-Ann				
Arbor				
University of	34964	8305	10746	https://www.revisor.mn.gov/statutes/?i
Minnesota-Twin				d=13&format=pdf
Cities				http://policy.umn.edu/it/securedata#fa
				<u>qlink</u>
University of	10748	1654		http://www.unomaha.edu/campus-
Nebraska at				policies/privacy-
Omaha				policy.pdf//http://www.unomaha.edu/i
				nformation-services/information-
				security/restricted-data.php
University of	17982	3120	368	http://its.unl.edu/unlprivacypolicy
Nebraska-Lincoln				1 1 51 5
University of	9321	1536		https://uni.edu/policies/web-privacy-
Northern Iowa				statement/
University of	115375	28202		http://www.phoenix.edu/copyright-
Phoenix-Arizona				legal/privacy policy html
University of	24461	4861	3333	http://www.sc.edu/about/notices/priva
South Carolina-	21101			cv/

Columbia				
University of Southern Mississippi	12001	2415		https://www.usm.edu/about/privacy
University of Wisconsin- Madison	28522	6239	3583	http://www.wisc.edu/policies/wwwap/
University of Wyoming	9262	1370	490	https://www.uwyostore.com/site_term s_of_use.asp
Virginia Polytechnic Institute and State University	25117	5861	658	http://www.vt.edu/about/privacy.html
Western Governors University	31420	8333		http://www.wgu.edu/privacy
Western Michigan University	17195	3247	39	http://www.wmich.edu/datagovernanc e/policies/dataclassification
William Paterson University of New Jersey	9082	793	16	http://www.wpunj.edu/it/policies/inde x.html
University of Idaho	8791	1150	339	https://www.uidaho.edu/infrastructure/ its/services/professional/ecommerce/p rivacy-policy