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# Bharat Operating System Solution: A Step towards Secure India

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***Abstract:*** ***Now a days we see the cyber attacks on government servers .The cyberspace is highly vulnerable to attacks, and is a major concern for national security. The government is conscious of the shortcomings in its cyberspace. Hence, it's performing on its own OS for advanced protection of networks and private computers. In the recent past, there have been several severe attacks by Chinese hackers on key government websites, which exposed important government data. These websites are needed fully secure network for the protection . BOSS is based on codes that are unique to its system, which makes it safe and secure .The OS has been said to be developed to replace Microsoft's Windows and other OS's from government computers and systems in future. If this happens, it will reduce government's dependency on other OS's .With this OS in use, data surveillance would become much easier for government agencies and bodies, as they may have the access to all or any kinds of content and data that are accessed on this OS. Considering that this OS has been developed under government's guidelines, it'll let the government regulate social networking sites. This is made possible by the development of indigenous projects by various IT giants and government sector. These private and public sectors are investing in FOSS (Free and Open Source Software) projects to fulfill their routine needs by customizing the normal FOSS projects like LINUX to suit their own domestic environment.***
***Keyword: Operating System (OS), Bharat Operating System Solutions (BOSS), Free and open source software (FOSS), Lovable Intellect Not Using XP(LINUX),Open Source software (OSS).***

## I. INTRODUCTION

In every domain of data and Technology India contributing many things but within the OS we don't have our own OS and from security concern and tremendous cyber attack on some significant government website within the past for that Bharat OS Solutions (BOSS), a free and open source Linux distribution was developed by the National Resource Centre for free of charge of charge and Open Source Software (NRCFOSS) of India. the newest version is 6.0. BOSS is taken under consideration as India's own PC OS . it's described because the foremost vital product to return out of the Indian software industry in decades. The Government of India has approved BOSS for adoption and implementation on mass scale. it had been developed at C-DAC, Chennai INDIA. The Centre for Development of Advanced Computing popularly referred to as C-DAC is that the premier R&D organization of the Department of Electronics and knowledge Technology (DeitY), Ministry of Communications & Information Technology (MCIT). The aim of this organization is to hold out research & development within the field of data Technology, Electronics and related areas. Linux foundation has certified BOSS for compliance with the Linux Standard Base standard. Till July 2019 BOSS has seen eight (Wikipedia, 2021) major versions (Table 1).

The other countries have huge amount of data about Indians we use all foreign software and OS due to that ultimately information goes out and hackers takes the advantage by using that info they become threat for the country .In the sense of National Security we hold the utmost data and knowledge in our country and prevents the cyber attacks on personal and governments information

BOSS is available in various languages which are spoken across the country. These languages are Assamese, Bengali, Bodo, Gujarati, Maithili, Malayalam, Manipuri, Marathi, Odia, Hindi, Kannada, Kashmiri, Konkani, Punjabi, Tamil, Telugu, Urdu, Arabic, Persian, Sanskrit. The languages not supported by BOSS are Nepali, Sindhi, Dogri(Pahari).

Table 1: Various Versions of BOSS Adapted From (Wikipedia,2021)

| Version | Name | Date |
|---|---|---|
| BOSS GNU/Linux Evaluation | Sethu | -- |
| BOSS GNU/Linux v2.0 | Anant | 17/09/2007 |
| BOSS GNU/Linux Server | -- | 01/01/2008 |
| BOSS GNU/Linux v3.0 | *Tejas* | 04/09/2008 |
| BOSS GNU/Linux v4.0 | *Savir* | 02/08/2012 |
| BOSS GNU/Linux v5.0 | *Anokha* | 23/12/2013 |
| BOSS GNU/Linux v6.0 | *Anoop* | 04/03/2015 |
| BOSS GNU/Linux v7.0 | *Drishti* | 08-2018 |
| BOSS GNU/Linux v8.0 | *Unnati* | 07-2019 |

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### A. *Research Objectives*

The aim of this paper is to throw light on things concerning the implementation of BOSS in government and business in India within the present scenario, focusing on different applications/areas. The current expectations also because the experience from the previous implementations within the recent years are taken under consideration. Also, the longer term prospects for the developments are presented and discussed. To understand and examine the worth of BOSS and its influence on the professional world the varied government bodies like public administrations, education sectors etc. are taken as subjects for analysis .In order to realize this, first of all BOSS OS are going to be introduced followed by some important FOSS licenses. After this, the research method are going to be haunted , results are going to be presented. Discussion will summaries the findings then.

## II. BHARAT OPERATING SYSTEM SOLUTIONS

### A. *Features*

Following are the features of BOSS (C-DAC, 2012)

*1)* User Friendly Graphical Installer
*2)* Indian version of OpenOffice – BharateeyaOO
*3)* 3D Desktop
*4)* Auto detecting of devices
*5)* Better usability for digital cameras, printers, scanners, Bluetooth, TV tuner.
*6)* Auto mounts of all Hard disk partitions
*7)* Localization support for desktop in 22 Indian languages
*8)* Smart Common Input Method
*9)* Migration tool - Bulk document converter
*10)* Internet tools – Pidgin, Iceweasel, X-chat
*11)* Multimedia support.

### B. *Here are five key reasons why the Indian government is actively working on the BOSS OS-*

1) *Lag in data security*-The cyberspace is highly vulnerable to attacks, and is a major concern for national security. The government is aware of the shortcomings in its cyberspace, post Snowden reports highlighted India's data security lags and revealed India to be the most scrutinized nation as per the US intelligence agencies. Hence, it is working on its own OS for advanced protection of networks and personal computers.
2) *Recent attacks on government sites*-In the recent past, there have been several severe attacks by Chinese hackers on key government websites, which exposed important government data. These websites are needed to be protected from such invasions, by having a fully secure network. BOSS is based on codes that are unique to its system, which makes it safe and secure.
3) *Dependency on Windows*-The OS has been said to be developed to replace Microsoft's Windows and other OS's from government computers and systems in future. If this happens, it will reduce government's dependency on other OS's.
4) *Data Surveillance*-With this OS in use, data surveillance would become much easier for government agencies and bodies, as they may have the access to all sorts of content and data that have been accessed on this OS.
5) *Regulating data usage*-Recent reports suggested that government want to keep a tab on usage of social networking sites and other entertainment sites during work hours. Considering that this OS has been developed under government's guidelines, it will let the government regulate social networking sites. The centre might as well ban certain sites or restrict their usage by government officials.

### C. *BOSS Variants*

The BOSS has been able to mark its presence in the different areas in the software industry offering a variety of software solutions. The following is the list showing its few variants useful to different parts of society ([Online] Available: https://www.bosslinux.in,2021).

1) *BOSS Desktop*-There is an integrated search facility available with BOSS Desktop which is helpful in switching windows launching applications and opening recent documents and settings.
2) *EduBOSS*- EduBOSS is designed for schools. It is available with a set of features which suit the Primary and Secondary school environment. It is a complete usable operating system in itself carrying graphical user interface and console applications.

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3) *Advanced Server*-The architecture supported by the BOSS Advanced server is Intel and AMD x86-64 architecture. It is bundled with web server, proxy server, database server, mail server, network server, file server, SMS server and LDAP server.

a) *Webmin*-This administrative tool is used for system administration. It has a web based interface. It helps to create user accounts, file sharing, DNS, Apache and much more.

b) *Gadmin*-It is GUI based tool. It is for using server administration tools with ease.

c) *PHP myadmin*-It provides a suitable visual front end to the MySQL databases by making use of an Apache/PHP frontend.

d) *PHP LDAP admin*-It is a web-based LDAP administration interface which is used to manage LDAP server.

4) *BOSS MOOL* -The purpose of MOOL (Minimalistic Object Oriented Linux) is to redesign the Linux kernel so as to reduce coupling and increase maintainability by means of OO (Object Oriented) abstractions.

5) *Switching to BOSS*-Switching from the traditional closed source software to BOSS isn't that easy especially when people are wont to their routine software applications (proprietary) which give extensive support and documentation. The adoption of BOSS is greatly influenced by human and technological factors. It needs a correct communication and able leadership among the 2 sides i.e. between technocrats and in the commercial sector for a successful switching. When we consider replacing software, like e-mail and office applications/programs the features which are similar on two sides i.e. closed source software and open source software, help in strengthening an equivalent thinking as an employer/entrepreneur and increases the arrogance level as an employee/user. In the present scenario BOSS is capable of providing a robust foundation to any organization/ business/educational institution provided it's led by a strongly managed well organized migration project.

## III. RESEARCH METHODOLOGY

This study examines in the view National Security the BOSS's adoption in government and private sector in India. The scope is limited to this country and its government bodies and various companies/concerns/enterprises. The data collection is done mainly from existing surveys, BOSS studies and internet articles in a mixed fashion. The research methodology/method used in the present study is explanatory. The study is conducted in explanatory fashion because of the nature of data collection used in the present study.

## IV. RESULTS AND FINDINGS

Estimation of use of FOSS may be a difficult task. Whether we are talking in terms of international or national context this determination remains an uphill task. The reason behind this bitter pill is that FOSS is usually freed from cost and secondly, downloads from the internet aren't the sole source for getting such quite software and hence its use. If we look at BOSS (BOSS GNU/Linux is a Desktop and Server Linux Operating System) the scenario is somewhat different. It is a Government initiative. It is derived from Debian Linux. As it is developed by C-DAC so it are often downloaded freed from cost from its website. No doubt it's FOSS based OS and there's no restriction on its use still the most source of this software remains the website. But, it does not mean that it cannot be obtained by any other means. The department/agency which has developed the software has itself installed the software in different Government offices, organizations and institutions.

## V. DISCUSSION

If we glance at the motivation for implementation of BOSS within the country we discover that the cost/expense in terms of license fees is one among the foremost common divisor or the driving force behind this change. In general, within the developing countries like India the license fees are normally higher and wages are lower, comparatively. Furthermore, the entire amount of cash spent on various activities associated with IT operations normally remain within the country thus resulting to the benefit to local and national IT industry in general .One of the most reasons (apart from the value issues) for the adoption of BOSS is that the liberty i.e. not dependent on software manufacturers/ proprietary issues and self governance. India and other countries finds open source platforms as a great opportunity to bring better access to digital world in the country. OSS has been customized to support different languages so, it has proved to be a motivating factor for migration to BOSS in the country.

As we already know the migration to BOSS is due to cost savings and to have increased flexibility .Now a days software activities are increasingly growing in the various parts of the country, but still there is very marginal but so called successful progress in the country.

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## VI. CONCLUSION

It can be said that BOSS seems to have attained maturity during the past years as evident from its level of development and quality in the past few years. It has proved itself as a valuable alternative to various important applications including office applications and operating systems. Various state governments and public sector institutions have chosen it as a possible alternative to closed source software thanks to different and ranging reasons including low cost, being reliable and flexible, with innovative trends and freedom from manufacturers. Also, it has already been seen that migration to open source alternatives has proved to be fruitful and rewarding leading to stable solutions. Now, we will say that this success isn't only limited to servers and supercomputers any more but also includes desktop environments and applications employed by masses for his or her routine use.

### *A. Limitations*

Due to the very fact that data is collected using mixed approach therefore the information can't be considered as always accurate. Most of the info and knowledge that was collected as a neighborhood of this research was supported articles, news reports, internet sites and other such means which may be considered as not satisfy means of providing unbiased, authentic and correct information. The scope is further limited by the very fact that out of huge pool of activities related to BOSS only few of them were considered and included in the study.

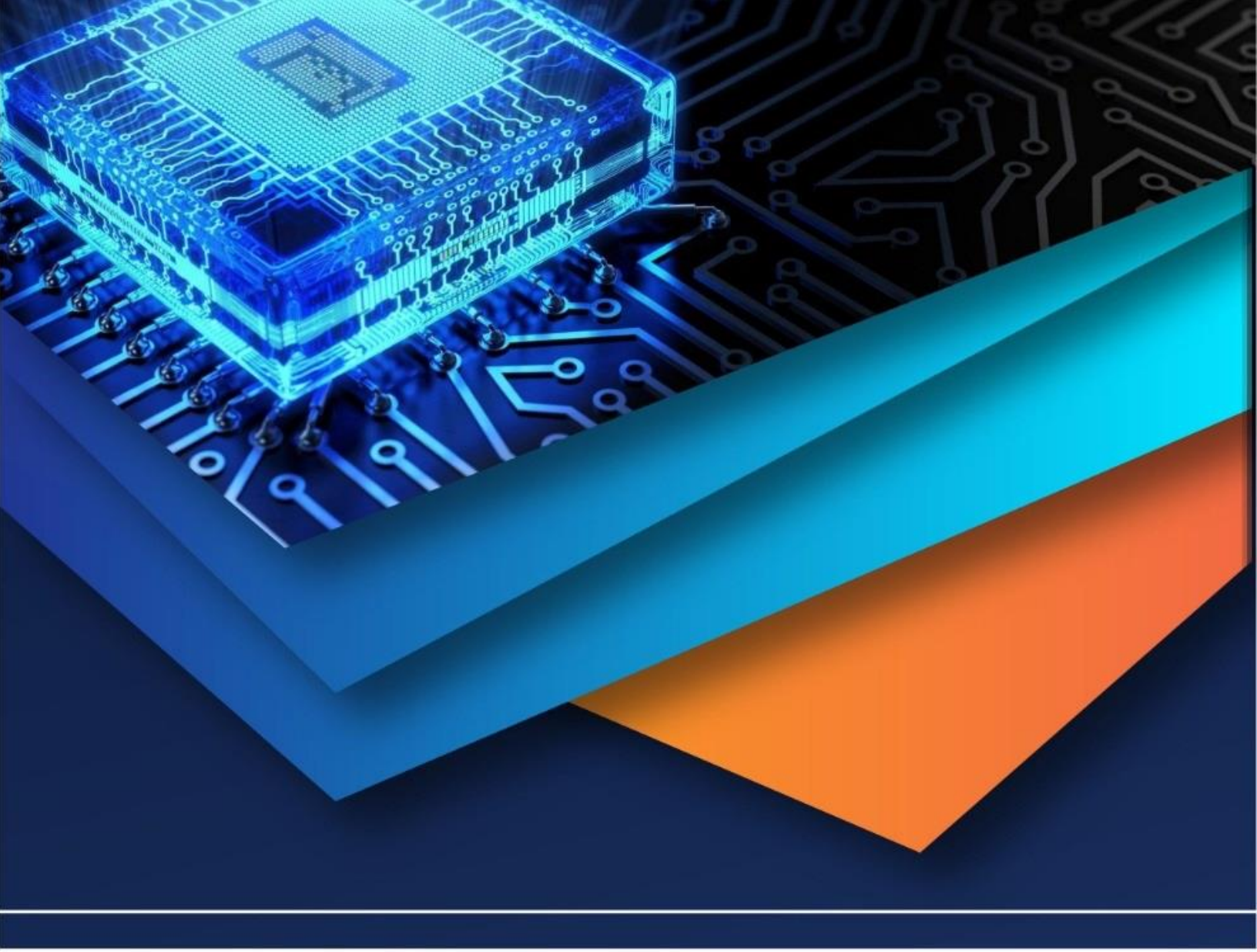
### *B. Scope for Future Research*

Overview of the BOSS Linux usage in India was presented by this study. Useful BOSS projects were discussed which became successful and have proved to be able to become milestone in the long journey that BOSS has will be cover the country to enable itself so that its role can be felt substantially. Although, various points resulting in the success of various cases were discussed, but still some details could also be missing associated with their success. Also the all success stories were not included in the current study. So, this is often one among the details which may be considered for completing further research during this regard. The other side of the picture is not taken into account in the present study. As it is said that Government's OS BOSS is dying a slow death due to lack of patronage. These cases are often haunted to possess complete analysis of impact of BOSS on India.

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