

# FSOS: A Tool for Recommending Suitable Operating Systems to Computer Users

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**Abstract**—Operating system is essential to operate computers. Normally, computers come with preloaded operating systems. However, often the preloaded operating systems are not able to fulfill all requirements of users. The users sometimes need to change the operating system based on their needs. Although some comparative studies and tools are available on operating systems, there is still a lack of tools that provide independent and objective review and recommendation to help the users understand and select from all major operating systems. This paper propose a tool called FSOS, which analyses well-known operating systems used at domestic, commercial and industrial level and suggest suitable operating systems to the users as per their requirements.

**Keywords**—operating systems; recommendation tool; computer users

## I. INTRODUCTION

An operating system is a program that manages the computer hardware and provides an interface between hardware and software [1]. It is large and complex, and it must be created piece by piece because there are many things working in a computer system but the actual operator behind the screen handling the most important tasks is the operating system [2][9].

Normally, computers come with a pre-loaded operating system, namely Microsoft Windows or Macintosh Operating System (Mac OS). Other types of free operating systems, such as UNIX and LINUX operating systems are also available to download from the internet. All the operating systems have their own advantages and disadvantages. It can be difficult and time consuming for the users to learn about the operating systems and decide which operating system is the most suitable one for their computer tasks in terms of the effectiveness, efficiency, easy to use and security.

The main aim of this research is to develop a tool that can provide reliable information and help the users select an appropriate operating system based on their requirements.

## II. RELATED WORK

Some tools have been developed to analyze and suggest suitable operating systems. For example, Group (2010) [5] developed a tool to compare different UNIX operating systems; Intercity (2011) [7] reported a mobile phone operating system comparison tool. Networks (2010) [8] focused on Real Time Operating System (RTOS) like Symbian Operating

System, Windows Embedded Compact (Win CE) and Network Operating System (NOS) like Cisco Internetwork OS(CIOS). Further, some of the comparative studies [3, 4 and 6] on different types of operating systems have been reported in literatures (see Table 1). Although the existing work helps users to learn and compare some operating systems for specific purposes, the comparison is still limited to a couple or a few operating systems of a particular operating system type, and the aim of the most of the existing comparing systems are provided by the vendors and for the vendors to sell their operating systems to the users. There is still a lack of comparison tools that review and help users to understand of all major operating systems and can recommend suitable system for their needs from objective point of view.

Based on the existing research and work, we would like to provide an objective and effective analysis and recommendation tool for the main operating systems, which will be vendor independent and based on systematic theory research and market analysis. Table 1 shows the comparison between some of the existing works [3, 4 and 6] and the proposed work.

TABLE I. EXISTING WORK VS. THIS WORK

Citation	Existing Work	Proposed Work
1. Linux, Unix and Windows Comparison [4]	The work compared the market value based on the Total cost of ownership (TCO) of the operating systems	The proposed tool will compare the Cost and Market value in detail as part of the full comparison
2. Linux vs. Windows [6]	The work provides general comparison of Linux and Windows on License, Cost, Market Share/Usage, Distribution/Flavors.	The proposed tool compares wider characteristics of the operating systems, such as, License, Application Cost, Support, TCO, as well as technical comparison of the operating systems.
3. Windows vs. Linux : A Comparative Study [3]	In this study the comparison is on configuration, security, cost, market share and case studies, and provides limited information to the users.	The proposed tool provides comparison of 16 different criteria with detailed explanation, such as, figures and graphs, for the different types of operating systems.

### III. USER REQUIREMENT GATHERING

Apart from the related work review, user requirements gathering is also carried out. The aim of the user requirement gathering is to confirm and enrich the key features to include in the tool and key operating system to cover in the tool based on what has been learnt and proposed from reviewing the literatures and related work.

A questionnaire contains ten questions is sent to 87 users. The key questions are related to the users' experiences, the popularity of the operating systems and key information that they normally need when comparing between different operating systems. For example, what is your profession? How many years have you used the listed operating systems? How do you rate the ease of user of the listed operating systems? How to you rate the availability of the listed operating systems? What is your opinion on the reliability and support provided for each of the operating systems?

86 responses were received. The key findings of the study are: All operating systems have their own specialties; Windows, Linux and Mac OS are the three mostly used operating systems by the users, although the most of the users are more familiar with Windows than Linux and Mac OS; Only limited numbers of users know and have experience of using Netware and Solaris operating systems; Some users do not have idea which operating systems are available and which one is the most suitable for their need; The users' work task influences the most on the decision of which operating system to use; The key factors that the users consider when selecting operating systems are ease of use, service quality, ease to install and set up, cost, performance on computers, performance on server, access to support, availability in different versions namely personal, professional, enterprise, etc.

The user study results together with the findings of the related work review do not only inform the key focus and key features of the proposed tool, which is introduced in the following section, but also determine the calculation of the ranking based on the key features.

### IV. PROPOSED TOOL

The tool that we are proposing is called Find Suitable Operating Systems (FSOS), which does not only provide users the detailed information about operating systems but also recommend one or more suitable operating systems to the users based on their requirements indicated. FSOS compares three key operation systems namely Windows, Lunix and Mac OS. The comparison based on the key features that is indicated in the user requirement form (Fig. 1). Users can see this form after successful login. Here the users can select requirement (s) out of the seven requirements provided on the form.

After submitting the requirement(s), FSOS suggests the suitable operating systems to the users based on a priority table (Fig. 2). The result page (Fig. 3) shows the suggested operating systems and reasons for selection based on the requirements selected by users.

Fig. 1. User Requirement Form

Priority Table				
Requirement No.	Requirement in short	1 <sup>st</sup> Option	2 <sup>nd</sup> Option	3 <sup>rd</sup> Option
1 <sup>st</sup> Requirement	General Purpose	MICROSOFT WINDOWS	MAC OS X	LINUX & Its Descendants
2 <sup>nd</sup> Requirement	Business Purpose	LINUX & Its Descendants	MICROSOFT WINDOWS	MAC OS X
3 <sup>rd</sup> Requirement	Work in Server	LINUX & Its Descendants	MICROSOFT WINDOWS	MAC OS X
4 <sup>th</sup> Requirement	Special Graphics	MAC OS X	MICROSOFT WINDOWS	LINUX & Its Descendants
5 <sup>th</sup> Requirement	Extra ordinary Games	MICROSOFT WINDOWS	MAC OS X	LINUX & Its Descendants
6 <sup>th</sup> Requirement	Specific Purpose	MICROSOFT WINDOWS	LINUX & Its Descendants	MAC OS X
7 <sup>th</sup> Requirement	Use of many detachable devices	MICROSOFT WINDOWS	LINUX & Its Descendants	MAC OS X

Fig. 2. Priority table

Fig. 3. An example result page

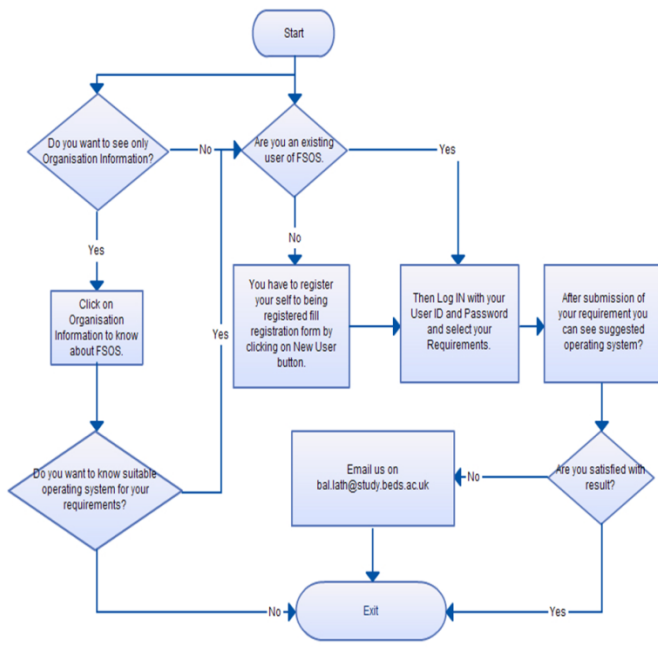


Fig. 4. Work Flow Diagram of the Tool

Fig. 4 shows the overall work flow of FSOS: Step1- Initially a user fills personal details in user registration form if all validation checks are right than system will show a message of successful registration; Step2 – the details of the user directly goes into the User Detail Table of database where system stores information of all users; Step3 – the user can login by given email ID and password. If the email ID and password is correct than system will display message of successful login; Step4 – the user can choose at least three requirements to get suggested operating system. After submission of requirements the user can see the detailed recommendation results. The results show one or more suitable suggestions with detailed explanations on the key features of the operating systems, so that the user can select the most suitable operating system for their task; Step5 – feedback will be collected from the user before exit for future improvements.

## V. EVALUATION SET UP

The main aim of this evaluation is to test effectiveness of the proposed tool. Nine users participated the evaluation, who are experienced operating system users, 24/7 network server operators, IT professionals, university students and lecturers, business men and the other regular computer users.

An information sheet was given to the users to explain how the tool works. A questionnaire was used to collect the users' opinions about the performance of the tool. For example, one question asked about the users' satisfaction on how effective the tool is in recommending suitable operating systems. Another question asked the users' suggestions to improve the produced tool to get more efficient and useful results.

## VI. EVALUATION RESULTS AND ANALYSIS

The questionnaire data collected from the evaluation was analysed using statistical software. Overall, the users were very satisfied with the solution and especially with the accuracy of

tool. Some example some users' positive feedback has been listed as follows:

"This tool is really new and good idea to solve the confusion behind selection of operating system. I have not come across such informative work before".

"I found it very useful and it has enough potential to distinguish a clear image of different operating system which is basically based on requirements. This tool can be very useful for operating system companies to see the actual scenario".

"This is a nice tool capable enough to conclude general public view behind use of different type of operating system and able to provide best suggestions based on user requirements."

"The tool is a new idea to resolve misunderstanding behind use of different operating system. It gives us a clear idea that where and which operating system is most suitable."

"The work done on research and tool is unique and very helpful for any user and for further in depth research on study problem statement."

"This is a very effective, summarized, sensible, trustworthy and excellent tool and study."

"I have seen first time in my life such an intelligent and live tool which supports user to take decision with full proved reasons."

"The best thing which I like in this study and tool the way and criteria of comparison is very straight forward and essential."

"This study enforces user to analyze their requirement of system based on the type of work they have which gives a nice understanding to see major difference of use of different type of operating systems."

From the evaluation, we have also found that the Microsoft Windows have highest value in General, Games, Flexible and Specific purpose whereas Linux have highest value in Business and Server, and the Mac OS X has higher value only in requirement of Graphics (Fig. 5).

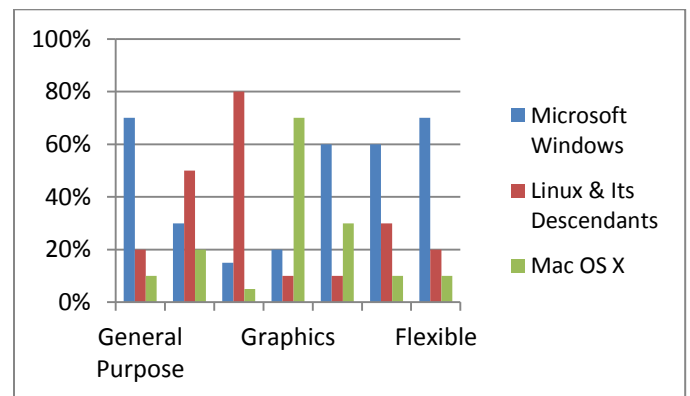


Fig. 5. Comparison of OS based on User's Requirements

Fig. 6 shows that different operating system suitable for different user level. A beginner always wants to use Windows because it is eco-friendly operating system. As per chart and

figure level of user is indirectly proportional to the use of Windows and it is directly proportional to the use of Linux.

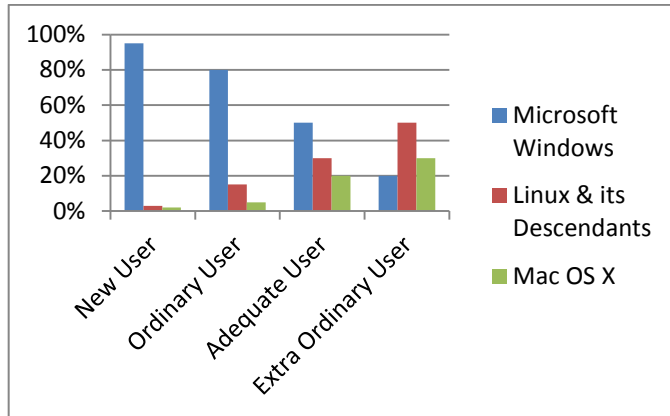


Fig. 6. Comparison based on User Levels

Apart from the above positive feedback provided by the users, some suggestions are also received for the future improvement of the tool. For example, more operating systems should be added to the recommendation tool; more choice and further functions should be provided in the user equipment page for users to indicate more accurate needs; the tool should work on the mobile devices as well; the key features can be enriched by more literature reviews and market research; to make a good use the user log in data, a personalised recommendation should be developed based on the users' profile.

## VII. CONCLUSION

The most of the existing operating comparison tools are vendor dependent and mainly used to advertise the vendors' products. There is a lack of independent review available to analyze the existing operating systems in a systematic manor to make objective recommendations for the computer users.

In this paper an operating system recommendation tool called FSOS is proposed. The main contribution of FSOS is not only helping users to learn about the different operating systems, but also provide recommendations to assist users select an operating system which is not only best suited to the users' needs objectively. With the support of the tool, a user will be able to differentiate between all possible operating system and will be able to choose the best operating system for their tasks. The feedback regarding on the tool is very positive although the research is still preliminary. In the future, we would like to develop the tool to a higher level, which can review a bigger range of operating systems and do more in-depth analysis based on the users' requirements. Furthermore, we would like to make the tool more interactive and personalized.

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