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Open Source Software: A Spoken Tutorial Case Study

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Abstract:- This paper describes the use of Spoken Tutorials, which are provided through structured self-learning workshops, to promote IT literacy in India. It also describes open source technology. The measures that were taken to further clarify and make the Spoken Tutorials appropriate for self-study are explained. Practice-based learning is possible because the Spoken Tutorial activity is limited to open-source software, making it just as effective as active learning. This study also discusses the benefits and drawbacks of open source software in various business and educational domains. Open-source software is also encouraged by Digital India in its applications. The Indian government has also taken the lead in implementing open source software, integrating it with current applications, and offering an interface for users to access these programs. There are several factors that contribute to spoken tutorials' popularity.

The user is unaware that open-source code is accessible, and the developers are not offering any assistance. These tutorials are only available in Indian languages for the spoken portion, which helps a lot of students who struggle with the English language despite its widespread usage in India. India spends a lot of money on personal computers and proprietary software like Windows, Microsoft Office, and the like, even though free software like Linux and other operating systems benefit the nation's economy. Information gathered from various sources to characterize spoken tutorial accessibility. Approximately 22 lakh educators and students from every state in India have participated in this software training. Students hailing from remote areas have gained from this instruction as well.

Keywords:- *Open Source Program, Spoken Instruction.*

I. INTRODUCTION

With the advancement of ICT came the creation of Open Source Software (OSS). Software that has the original source code included allows users to modify it to suit their needs. This type of software is known as "open source." There may be products that are based on other open source products because it also includes the right of redistribution. A developer or distributor may charge for services like installation, training, technical support, and special programming even though the software might be free. OSS source code is typically freely available, reusable, and widely accessible. The General Public License (GPL), the most widely used source license, permits practically whole and repeated usage of the source code.

II. OPEN SOURCE SOFTWARE'S PAST

Since the dawn of electronic computing, there has been open source software. When information technology first started to take off, it made perfect financial sense for programmers to share source code among a relatively small number of highly expensive computing machines. The number of developers increased and the source code generally got more complex as the machines got smaller, more varied, and cheaper. Free software development was particularly thriving in academic settings. According to Raymond (2001), Barkley Software Distribution (BSD) is a license created for the distribution of the BSD version of the Unix operating system, which was developed by the University of California Berkeley in cooperation with AT&T labs from 1977 to 1995. At AT&T and Berkeley shared code at the start of the development. It became an exclusive AT&T product in 1984 as a result of a divestment.

The concept of closed-source/proprietary software gained popularity in the early 1980s, replacing the long-standing practice of free software sharing. Supporters of open source went on to start their own groups, such as the Richard Stallman-founded Free Software Foundation (FSF), as reported by Weber (2004).

The FSF's efforts to reintroduce open source software development into the mainstream did not have the desired effect. Nevertheless, with the successful release of the Linux kernel, things were going to change.

The system was first created by Linux Torvalds as a part of a research project, with funding from the developer community produced extremely intricate, sophisticated software that was available to all users for free. Eric Raymond was so moved by this series of events that he discussed the significance of Linux in his now-famous book "The Cathedral and the Bazaar." This was the first time the open source developer community demonstrated that not only could sophisticated and complex software be developed in this manner, but that business models could also be based on this kind of software development and distribution. Raymond was a major contributor to the Open Source Initiative (OSI) in 1998. OSI is intended to be an advocacy and educational organization for open source software. Many businesses have decided to follow suit and release an open source a portion of their in-house developed software as a tactic to counter the competition. Hence, Netscape

Corporation is one of the earliest suitors. It attempted to compete with Microsoft's Internet Explorer, which was distributed freely and was closed source, by open-sourcing the Netscape web browser (Raymond, 2001). Using some of Raymond (2001)'s suggested business models, numerous companies have entered the open source business space in the last ten years. Unacquainted with the surroundings, businesses had to swiftly modify their methods of operation to capitalize on some perceived advantages of open source trends. In addition to providing software for free, businesses frequently take part in and contribute to open-source initiatives and use software development techniques like voluntary and distributed development community as it applies open source.

III. SOURCE CODE VERSUS EXCLUSIVE SOURCE

The foundation of open source software is the notion that users can alter the source code of an existing application in addition to being able to view it. Open source licenses have an impact on the distribution, modification, study, and use of software. Open source software can be used for any purpose by computer users according to the terms of most open source licenses. Closed source software allows only its original creators to lawfully copy, examine, and modify the program. Additionally, in order to use proprietary software, users must consent to using it only for the purposes for which it was created (usually by signing a license that is displayed the first time the software is used).

IV. BENEFITS OF SOFTWARE THAT IS OPEN SOURCE

A. Reduced Price

It costs less, though usually only a small portion of what it would otherwise cost. Studies show that using open source software can save companies' owners about $60 billion annually.

B. No cost to utilize

Because open-source software is free to use, distribute, and modify, open source is a relatively new idea that has become extremely popular in the IT industry in recent years. It is created by a community that is non-profit.

C. Safeguard

Since everyone can access the code, open-source software is more secure. Bugs can be fixed by anyone, and users don't have to wait for the next release to be fixed. The fact that is regularly examined by a sizable community generates stable and safe code.

D. Extremely Dependable

Open source software is dependable for two main reasons.

First of all, they are primarily created by knowledgeable professionals who strive to produce top-notch programs. Second, they are worked on by dozens or even hundreds of people, meaning that many pairs of hands can quickly fix these defects and many pairs of eyes can keep an eye out for the presence of bugs. These two elements combine to create goods with superior quality, practical features, and effective performance.

E. Liberty

Any developer with access to the source code can add to and modify open source software (OSS), in contrast to closed proprietary software. As a result, organizations are released from "vendor lock-in" and ensures sustainability over time.

F. Absence of Dependency

Open source does not rely on the organization or writer that contributed to its creation. The code is still alive and being developed by its users even in the event that the company fails.

V. DRAWBACKS WITH OPEN SOURCE

A. Required Training

The primary drawback of open-source software is its lack of simplicity in usage. Learning how to use an open-source operating system such as Linux takes time. Before you are able to master them, you will need to put in effort and possibly undergo some training. To make things easier, you might need to hire a trained individual, but this will come with extra expenses.

B. Harmony

There aren't many programs that work with both open source and proprietary software, so moving to an open-source platform entails evaluating each piece of software that is used and runs on a proprietary platform for compatibility. You are forced to use third-party drivers because a large number of modern pieces of hardware are incompatible with the open-source platform.

VI. OPEN SOURCE UTILIZATION IN TEACHING

Open source software has several advantages for educators, learners, and educational institutions. Your college or school can take charge of its IT future and computer resources with the help of open source software.

A. Reduced Total Ownership Cost

For educational purposes, the majority of open source operating systems are free or very inexpensive. They include a wide range of practical administration and user applications. Nonetheless, from an administrative perspective, these operating systems resemble Microsoft Windows or Microsoft NT quite a bit. These variations frequently necessitate hiring a system administrator or hiring a trained outside contractor to handle the system administration. It might seem that hiring an outside system administrator will strain the IT budget.

But bear in mind that you wouldn't have to pay high licensing costs for the operating system of each computer if you used an open source operating system. Furthermore, a plethora of open-source software packages exist that offer

comparable functionality to proprietary alternatives, albeit at a lower cost. For instance, the word processing assignments OpenOffice a multiplatform office productivity suite that is free. It comes with all of the essential desktop apps, including a word processor, spreadsheet, presentation manager, and Microsoft Word-like drawing program.

B. Increased Concept Learning Instead of Items

Long-term effects of exposing students to Linux will include effects on its expansion into other domains. People are aware of Microsoft software, which is the main reason why numerous businesses have invested millions of dollars in it. Today's ninth graders will be employed in five years.

It will be much simpler for open source software to spread to new industries if people are already accustomed to using it. Regretfully, proprietary software has unfortunately taken over as the industry standard everywhere at this point. Because it is not a skill that will be useful in the business world, people are reluctant to learn how to utilize alternative products.

Because switching to alternative products would require retraining expenses, businesses are reluctant to do so. This means that teaching students how to use specific products will take precedence over teaching them the fundamental ideas that underpin those products' use in the classroom.

Teachers frequently wind up teaching students how to arrange their essays using a specific product rather than the fundamentals of a good essay layout. Teachers frequently wind up teaching students how to use a specific product for presentations rather than teaching them the fundamentals of computer presentations. Although these lessons are helpful, their original goal was not met.

C. Less expensive home systems for students

Utilizing the most recent version of the Microsoft Office suite in class has negative effects on students whose home computers are too outdated to run these programs. Those without the means to upgrade. Previous versions of Microsoft Word are unable to open files saved in the most recent version. When opened in the most recent version of Microsoft Word, files saved in earlier versions lose a lot of their meticulous formatting.

A family may have to pay to upgrade their software multiple times and likely their hardware once or twice during the education of one student because Microsoft updates its Office suite frequently and none of these are especially backwards compatible with the earlier versions. Thankfully, a lot of open-source software applications function fairly well on less powerful computers. Moreover, files can be transferred between various versions of numerous products because they are saved in open formats. (and occasionally even between different products) with essentially no data loss. A lot of free and open-source word processing programs can read and store documents in Microsoft Word format.

Parents can save money by opting to run open source software on school computers instead of forcing them to upgrade their hardware and software just to enable the use of files from home and the classroom.

D. Performs admirably on older hardware

As we've already discussed, a lot of open source software works well on older computers. Although schools rarely have the funds to purchase the newest hardware, hardware upgrades are usually necessary for software updates to function as intended. Many companies frequently swap out their outdated equipment for new ones in order to maintain meet the hardware needs of their software. Although these computers are generally in good operating order, they are practically worthless in the Microsoft world. The Linux Terminal Server Project (LTSP) offers assistance in avoiding this issue. Labs can be set up using LTSP, and the majority of the machines can be configured as diskless workstations that boot from a network server. A school or college can quickly increase the number of workstations available for students by utilizing LTSP without having to pay a significant amount of money for hardware or software licensing.

Once LTSP is installed, a few quicker computers may be set up as servers—possibly one for each lab. Networked home directories are possible to set up if sufficient hardware is available. Users would effortlessly possess a browser, email, and office suite.

Admin expenses related to software There is less risk from viruses and worms, updates are decreased because of centralized control and virus updating, and hardware and software licensing expenses are decreased.

E. Personalization

When a piece of software is open source, its source code is available for viewing. You are allowed to make changes to the software, fix any issues you are having, add new features, or remove existing ones. Additionally, you are free to ask others to make these changes for you if you lack the necessary skills.

It is allowed for you to duplicate your modified software and set it up wherever you require it. Indeed, as long as you adhere to a few fairly basic guidelines, you are even allowed to distribute fresh copies of the software from all over. Since you can always alter it if you don't like it, open source software is far more customizable than propriety software. Changing the software might not always be feasible, but in many situations, entire systems can be assembled to meet the unique needs of your school by simply joining open source components.

VII. WHAT MAKES IT SIGNIFICANT FOR INDIA?

A. Economic India

Economic India spends a lot of money on computers and proprietary software, such as Windows XP, Microsoft Office, and others, even though similar software is available for free and boosts the nation's economy.

B. Assistance with Localization

Adoption is greatly influenced by localization since government can interact with citizens through technology. in their mother tongue.

Red Hat Enterprise Linux Desktop, for instance, is offered in eleven Indian languages.

C. E-Government's Power

The E-Governance spends money and resources on software development. If it uses the open source paradigm, which encourages the sharing of software code, it can be made more effective. Government departments in various states have similar needs, so rather than having each one create a unique program for the same job, they could share a common code base and make small adjustments to meet the specific requirements of each state.

D. Increased Safety

Since open source software allows for source evaluation and correction, it offers increased security and protection for the personal data used by e-governance systems. by the open-source community and the system flaws that are frequently found by the community rather than by hackers.

E. Independence from Western Nations

Our nation can become independent of Western nations through the use of open source software. Because open source software is available for free download, modification, and use for any purpose without cost, we do not have to rely on the software companies they represent.

VIII. HOW CAN INDIA GET DIGITAL HELP?

Open Source policies are part of the Government of India's flagship initiative, Digital India. Three significant open source policies were published in 2015 by the Ministry of Communication & Information Technology's Department of Electronics & Information Technology. These regulations could change the game because they are very extensive.

A. Adoption of Open Source Software Policy for the Indian Government

The Policy on Adoption of Open Source Software for Government of India is the most significant of these.

To promote the official adoption and use of Open Source Software in government organizations, the "Policy on Adoption of Open Source Software for Government of India (GoI)" was released. The policy's main goals are to lower the total cost of ownership, establish a framework for the adoption of open source software, and guarantee strategic control over e-Gov applications and systems. There is already a framework in place for the adoption of open source software in e-government systems. "Government of India shall endeavor to adopt Open Source Software in all e-Governance systems implemented by various Government organizations, as a preferred option in comparison to," the policy statement states clearly. "The source code shall be available for the community, adopter, or end-user to study and modify the software and to redistribute copies of either the original or modified software," according to the terms "Closed Source Software."

"Source code shall be free from any royalty," it adds.

B. Collaborative Application Development Policy by releasing the Government Application Source Code This is yet another crucial regulation pertaining to the open source ideology.

The Indian government hopes to encourage the reuse of already-developed applications through this policy. The Indian government wants successful, scalable, high-quality e-Government applications to be developed collaboratively, which is why they are making the source code available. Additionally, it wants new applications to be created to promote creativity by fostering joint development between entities inside and outside the government.

Departments and agencies of the government, as well as businesses, individuals, and developers, to produce cutting-edge e-Government products and services.

Through greater transparency and widespread peer review, an open source approach that uses and releases application source code to the public can lower costs and development times while improving overall quality and security. To accomplish the same C. Policy on Open Application Programming Interfaces (APIs) for Government of India, a Collaborative Application Development Platform is being created.

The Government of India intends to make all government services digitally accessible to citizens via a variety of channels, including the web, mobile, and common service delivery outlets, in accordance with the overarching vision of Digital India. An ecosystem of data, apps, and processes that are interoperable is required to achieve this goal. which will enable the appropriate user to access the appropriate information at the appropriate moment. The Government of India has already notified the "Policy on Open Standards for e-Governance" and "Technical Standards on Interoperability Framework for e-Governance" in order to promote Open Standards for software interoperability across various Government departments and agencies. Open APIs are a key component of global "Open Government" initiatives, providing easy access to data gathered by government agencies. The official use of Open APIs in government organizations is encouraged by this policy. This policy lays out how the government will use "Open APIs" to facilitate software interoperability across all e-Government systems and applications, as well as to give citizens and other stakeholders access to data and services that will encourage their participation. noteworthy contributions to the field of open While similar incidents have previously occurred in India, this is the first instance where the government of India's agencies are being directed by clear, comprehensive policies. The policy's implementation has begun, and we anticipate that open

source—as it has in other regions of the world—will play a significant and fruitful role in closing India's digital divide.

IX. THE FOSS PROMOTION INITIATIVE

The Indian government has also taken the initiative to engage in the DIGITAL INDIA project and encourage the use of FOSS in order to accomplish the previously stated goals. It has done this by asking the nation's top institutes for assistance. The idea of spoken tutorials has been initiated by the IITs to reach students and institutions in order to promote FOSS. It has been effective in reaching the intended goals. We are attempting to present the data that demonstrates the "Spoken Tutorials" project's effectiveness.

It's common knowledge that comprehension is considerably increased when one witnesses or hears someone explain a procedure. Demonstrations that combine audio and video can best convey features. Launched by the Ministry of Human Resources and Development, Government of India, the Spoken Tutorial project (January 26, 2010) is an initiative of the 'Talk to a Teacher' activity of the National Mission on Education through Information and Communication Technology (ICT). Presenting narration and animation at the same time enhances learning. The goal is to educate the millions of people in our nation who lack opportunities about technology and free and open source software (FOSS) via this website. and/or availability to acquire any software.

The Spoken Tutorial Project seeks to provide spoken tutorials on FOSS in multiple Indian languages so that learners can access the material in a language that suits them best.

Spoken tutorials are popular for a variety of reasons.

Ignorance of accessibility1. Inadequate direction 2. Absence of infrastructure facilities3. Having trouble understanding English 4. The intention is to make spoken tutorials available for use in teaching any Indian language to students at any proficiency level, be it beginner, intermediate, or advanced.

The entire community is the target audience, which includes kids in school, college students, working adults, retired adults, housewives, instructors, trainers, researchers, software developers, and users. They also carry out software training classes that use spoken tutorials and award certificates to students who successfully complete an online exam.

The goal of the Spoken Tutorial Project is to impart knowledge of a specific FOSS (Free and Open Source Software).

Fundamental IT Proficiency The Firefox web browser and the Linux operating system's Free Office Suite are used to access the internet and run basic Office applications.

Both C and C++ Programmers choose C because of its robust features, easy syntax, and portability. Drupal beneficial for developing websites and web apps.

Firefox is a widely used, free, and open-source web browser.

Net beans and Java Learn to program in Java using free and open-source, object-oriented, high-level, and simple programming. With the Netbeans IDE, creating desktop, mobile, and web applications is simple.

TuxTyping: Free operating systems for Linux and Ubuntu typing software designed primarily for kids (Source: SpokenTutorial.com)

The courses began in July 2011. These are now present in a number of establishments, including schools, NGOs, government offices, polytechnics, ITIs, degree colleges, and some corporations. According to the current survey, about 22 lakh teachers and students from all of India's states have completed this software training. This training has also helped students from rural areas. A college or university can become a RESOURCE (Robust Extensions for Spoken Tutorial project on Open Source Software Usage for Recruitment, Community, and Education) center if it wants to promote IT literacy and awareness. A Resource Center has the ability to train other colleges and schools in the delivery of Spoken Tutorial SELF training, in addition to offering remote SELF workshops for other colleges within its own college.

X. CONCLUSION

The use of open source software in various government departments is covered in the current study. Different research studies are used to determine the benefits and drawbacks of open sources. Open source software also benefits the educational system. Furthermore, it explains how spoken tutorial uses a free training program to promote open source software.

Additionally, state that the objective is to make it possible for spoken tutorials to be taught to students at all proficiency levels—beginner, intermediate, and advanced—in any Indian language.

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