

# **INFLUENCE OF FREE AND OPEN SOURCE SOFTWARE (FOSS) ON THE WORKPRACTICES OF USER COMMUNITIES: A STUDY OF PUBLIC SCHOOLS IN FIVE STATES IN INDIA**

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## **Abstract**

Free and Open Source Software (FOSS) works on the principle of collective ownership. Users have the freedom to install, inspect and change the code. They also have the freedom to distribute the modified or unmodified software. Research related to FOSS, especially in the field of Information Systems, has largely focussed on economic and business models, legal aspects, motivation of individual developers to contribute to FOSS projects, dynamics within FOSS developer communities and FOSS as an example of open innovation. There is very little research pertaining to its influence on the processes and practices within user communities that use FOSS without contributing to FOSS code. In this dissertation, we have looked at the usage of Information and Communication Technologies (ICTs) in public schools in India. More specifically we have studied the influence of FOSS on the processes related to leadership, teachers, curriculum and students.

The research question that we have addressed in this study is:

## **How does using FOSS influence processes in the public school education environment in India?**

We have compared public schools that have used FOSS with those that have used proprietary software. We have studied the influence of FOSS on educational processes in public schools. The national policy for ICT in school education is the context here. The policy was formulated to set up ICT labs in all government and government-aided schools throughout India to build the ICT capacity of school students (MHRD-GoI, 2012). In order to study the phenomenon in its natural context, we have used the case study method (Yin, 2009a). We interviewed teachers, government officials and vendors to understand the ICT implementation processes in schools. This study pertained to Assam, Goa, Karnataka, Kerala and Assam. The choice of states was based on two considerations: prior implementation of a FOSS-based curriculum and variation in the size of the states. Kerala was actively using FOSS to build its school ICT curriculum; Goa and Assam are small in size and they had tried to use FOSS in school education; Karnataka and Maharashtra are large states that use proprietary software in school education. We have supplemented interview data with secondary data collected from various sources. These include academic literature, reports, articles from the popular press and websites. We have also examined the ICT curriculum documents in these states. Our data analysis has led to the uncovering of generative mechanisms that explain the influence of FOSS on the processes followed in schools. Generative mechanisms are causal explanations of macro-level observations that are generated by micro-level interactions between entities. There can be multiple mechanisms active at a given time (Henfridsson & Bygstad, 2013).

Our findings indicate that there are four generative mechanisms that emerge from the analysis:

### **1. Mechanism of awareness**

When the decision to use FOSS was being deliberated, the leadership considered initial cost savings as an important factor. With regular FOSS usage, the leadership took cognizance of long term benefits like control over piracy and freedom to make better policy decisions.

## 2. Mechanism of ownership

This enabled teachers in a FOSS-based system to be an active community, by voicing concerns and sharing ideas. The challenges of adopting a FOSS-based ICT curriculum were handled by having an organized training process for the teachers. The passive involvement of teachers in schools using proprietary software was observed.

3. Mechanism of feedback-based curriculum design FOSS enabled experimentation and a feedback-based environment, which resulted in an updated ICT curriculum. This helped the students and teachers build better ICT capability when compared to a proprietary software-driven ICT curriculum.

4. Mechanism of transfer of responsibility to students In schools having a FOSS-based curriculum, some students were given opportunities to learn beyond what was prescribed in the textbooks. The students were trained to handle minor software and hardware problems. They were also encouraged to take up more responsibilities. This is a unique study involving the application of generative mechanisms to elicit causal factors that explain the sustained implementation of FOSS-based curriculum in schools. Our research contributes to the emerging field of open development using participatory methods (M. Smith & Elder, 2010). Here, a community of users collaborate towards a common societal goal. The goal, in this case, is quality ICT education in schools.

## References

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