

# A Methodology for Managing FOSS Migration Projects

Angel Goñi<sup>1</sup>, Maheshwar Boodraj<sup>2</sup>, and Yordanis Cabreja<sup>1</sup>

<sup>1</sup> Universidad de las Ciencias Informáticas (UCI),  
Carretera a San Antonio de los Baños,  
Km. 2 ½. Torrens, Municipio de La Lisa. La Habana, Cuba  
{agoni,ycabreja}@uci.cu

<sup>2</sup> Mona School of Business and Management,  
The University of the West Indies,  
Mona, Kingston 7, Jamaica, W.I.  
maheshwar.boodraj@uwimona.edu.jm

**Abstract.** Since 2005, the Free Software Center (CESOL) at the University of Information Science (UCI) in Havana, Cuba, has conducted several free and open source software (FOSS) migration projects for various organizations. The experience gained from these projects enabled the creation of a *FOSS Migration Methodology* which documented how the technical elements of a project of this kind should be executed. Despite the usefulness of this methodology, the projects that have been undertaken experienced difficulties that were, in most cases, directly related to their management. This research aims to improve the methodology and minimize management-related challenges thereby improving the quality of migration projects. The proposed methodology was applied in a project that ran in a higher education organization and the results prove that the methodology enhanced the quality of the migration project.

## 1 Introduction

The development of free and open source software (FOSS) and its advantages over the closed model that is prevalent today[1] have served as a catalyst for many organizations, including regional and national governments, to adopt FOSS. In 2005, the Cuban government decided to undertake the process of nationwide adoption of open source technologies. The implementation of different projects, in several Cuban organizations had made it possible to develop the *Cuban Migration Guide*[2], a document to govern and guide the process. This document was used in several public sector agencies to facilitate orderly and gradual migration. The number of projects executed[3] by the Free Software Center (CESOL) in Havana, Cuba, made possible the creation of a *FOSS Migration Methodology*[4] based on the most important guides released in Europe[5], Brazil[6], Peru[7], and Venezuela. It documented best practices and provided guidance for the team of specialists that would be involved in the project.

## 2 FOSS Migration Methodology

The *FOSS Migration Methodology* proposes several steps and workflows that meet the objective of efficient work organization and makes communication easier between members of the migration team and managers of the target organization. These stages and workflows can be seen in Figure 1.

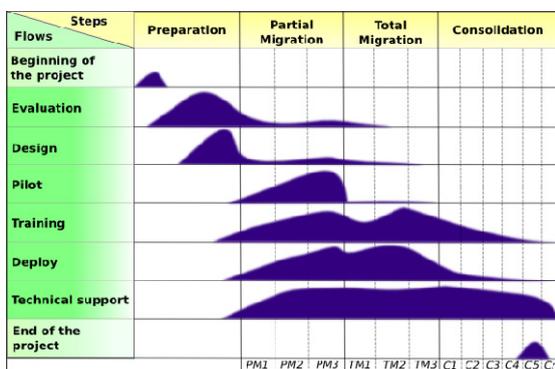


Fig. 1. Phases and workflows of the *FOSS Migration Methodology*

In 2012, several internal workshops were conducted at CESOL, in which team members shared their experiences regarding migration. The most common problems outlined were:

- Low executive commitment in the target organization;
- Unclear expectations of the target organization;
- Low staff participation in the target organization; and
- Late generation of project documentation.

These problems pointed to different areas of project management, which prompted a review of the migration methodology and project documentation, taking into account the following two critical project management challenges described in the literature[8-10]:

- Processes belonging to technology migration and training are properly identified while management processes are ignored; and
- Project management is performed as an isolated task and done experientially.

In several cases, the *Migration Plan* contained more technical details instead of focusing on planning elements. This created a voluminous document (over 100 pages), making it highly unreadable and limiting its usefulness for managers of the target organizations. The *FOSS Migration Methodology* and the migration guides[11] initially ignored the elements of project management, which necessitated the introduction of workflows (*Beginning of the project* and *End of the project*) to compensate for the lack of structured project management. To address the problems

mentioned above, the *FOSS Migration Methodology* was improved by introducing project management elements that were originally overlooked. These elements were based on the *Project Management Body of Knowledge – Fourth Edition (PMBOK Guide)*[9]. During the improvement of this methodology, several changes were made to the *FOSS Migration Methodology* including the modified use of some of the processes proposed by *PMBOK Guide*. The migration project was split into two main phases: diagnostic phase and technology migration phase. The *Human Resource Management* and *Procurement Management* knowledge areas were removed in the final methodology because the migration team members were hired and trained by CESOL, and the purchase and acquisition of technology were done by the target organizations and were outside of the scope of the migration projects.

Several *Integration Management* processes were added: *Develop diagnostic report*, *Plan consultancy*, *Plan migration*, *Develop migration plan*, *Execute consultancy*, and *Execute migration*. Additionally, the *Develop project management plan* process was substituted with the *Develop migration plan* process. In *Scope Management*, the following processes were added: *Gather hardware and software information*, *Analyze project feasibility*, *Migrate network services*, *Migrate workstations*, and *Train users*. The initiating process *Create diagnostic schedule* was added in time management, along with the unification of all the planning processes into *Develop schedule*. Hence, the methodology adapts much of the project management processes from the *PMBOK Guide* to the particular characteristics of migration projects. It also omits unnecessary processes and adds others that complement the FOSS migration activities.

### 3 Results and Evaluation

In order to evaluate the impact of the improved *FOSS Migration Methodology*, the methodology was applied to a FOSS migration project of a higher education institution which had 202 staff members, 120 workstations, and 2 servers. The purpose of the FOSS migration was to improve project efficiency while attaining high levels of user satisfaction. The efficiency of the project was measured in duration (in days) of the two main phases of the migration: the diagnostic phase and the technology migration phase.

The diagnostic phase was completed in 16 days - almost half of the average duration recorded in the schedule of several previous projects. These results support the heavy redesigning of the processes involved in this phase and the introduction of the consultancy report as the main deliverable of this stage[11]. The technology migration phase was finished in 58 days, which was significantly less than that obtained in previous comparable undertakings. However, there are many external factors that could have affected these results and the authors cannot decisively ascertain how much of the reduction in time could be directly attributed to the improved *FOSS Migration Methodology*. Two surveys were conducted in order to measure users' satisfaction with the results of the migration project. One was administered to managers and the other to staff. Six managers of the entity were surveyed, representing 100% of senior management. Four of them were satisfied, one

was neutral and another was dissatisfied with the migration results. In the case of staff, 30 teachers were surveyed, representing 55% of the academic staff involved in the migration. The results showed twenty satisfied, four neutral and four dissatisfied.

## 4 Conclusions

This research was conducted to improve the *FOSS Migration Methodology* to minimize management-related challenges and improve the quality of migration projects. The improved *FOSS Migration Methodology*, which adopts a process-based approach from the *PMBOK Guide*, was applied in a project that ran in a higher education organization and the results prove that the methodology enhanced the quality of the migration project. Specifically, the improved methodology provided increased efficiency resulting from shorter activity durations, higher levels of management and staff satisfaction, enhanced communication from more timely and comprehensive documentation, and improved project management guidance.

## References

1. Raymond, E.S.: *The Cathedral & the Bazaar*, p. 258. O'Reilly Media, Sebastopol (2001)
2. Paumier, R., Pérez, Y.: *Guía Cubana Para La Migración a Swl*, La Habana, Cuba (2007)
3. Goñi, A.: *Experiencias de la migración a NOVA del área docente de la facultad 10 de la UCI*, La Habana, Cuba: Centro Coordinador para la Formación y el Desarrollo del Capital Humano del Ministerio de la Informática y las Comunicaciones (2009)
4. Pérez, Y., Méndez, J., Goñi, A.: *Metodología cubana de migración a Código Abierto*, La Habana, Cuba (2012)
5. Hnizdur, S.: *Directrices IDA de migración a software de fuentes abiertas*. European Communities, Surrey, United Kingdom (2003)
6. Brasileño, G., Libre, G.: *Referencia de Migración para Software Libre del Gobierno Federal*, G.d.T.M.p.S. Libre, Brasilia, Brasil (2004)
7. INEI, *Guía para la Migración de Software Libre en las Entidades Públicas*. Instituto Nacional de Estadística e Informática, Lima (2002)
8. CMMI, *CMMI® for Services, Version 1.3*. Software Engineering Institute, Pittsburgh (2010)
9. PMI, *Guía de los Fundamentos para la Dirección de Proyectos*. Project Management Institute, Inc., Pennsylvania (2008)
10. IPMA, *ICB IPMA Competence Baseline Version 3*, Nijkerk, The Netherlands (2006)
11. Goñi, A.: *Metodología para la gestión de proyectos de Consultoría en Migración a Tecnologías de Software Libre y Código Abierto*, p. 106. Universidad de las Ciencias Informáticas (2012)