

**Reasons for the non-adoption of OpenOffice.org  
in a data-intensive public administration****Philip Huysmans, Kris Ven  
and Jan Verelst****Abstract**

Several academic studies have already been conducted to investigate the reasons influencing the adoption of open source desktop software such as Linux and OpenOffice.org. However, few studies have been devoted to determine the reasons for not adopting open source desktop software. In order to address this issue, we present a case study on the Belgian Federal Public Service (FPS) Economy which considered the use of OpenOffice.org, but eventually decided not to adopt OpenOffice.org as their primary office suite. This decision was to a large degree influenced by the fact that a large number of users within the FPS Economy perform data-intensive tasks such as statistical data analysis and reporting on a daily basis. Notwithstanding the fact that several reasons were actually in favor of the migration, we have identified several barriers that may discourage the use of OpenOffice.org in similar environments.

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**Introduction**

In the past few years, open source software has received increasing interest from organizations. Many organizations have therefore already decided to adopt open source software. Given the maturity of open source software in horizontal domains, the most often adopted type of open source software is infrastructure software, such as Linux, Apache and Bind (e.g., Dedrick and West, 2003; Lundell, *et al.*, 2006; Ven and Verelst, 2008). Recently, however, there is an increasing interest in the adoption of open source desktop software, such as OpenOffice.org, or the use of Linux as operating system for desktop computers. This trend appears to be primarily driven by public administrations (Ven, *et al.*, 2007b). Previous research has suggested two main reasons for the interest of public administrations in open source desktop software. First, since public administrations are dependent on taxpayers' money for financing their IT infrastructure, they should be conscious about their IT investments (Applewhite, 2003; Brink, *et al.*, 2006; Fitzgerald and Kenny, 2003; Waring and Maddocks, 2005). Second, many public administrations have argued for using open standards in their communication with citizens. Otherwise, citizens are obliged to use specific software in order to be able to communicate with the public administration (Applewhite, 2003; Kovács, *et al.*, 2004; Rossi, *et al.*, 2005).

Several academic studies have already been devoted to studying the organizational adoption of open source desktop software (for an overview, see Ven, *et al.*, 2007b). These studies have primarily focused on *why* organizations have adopted open source desktop software, and *how* the migration should be undertaken. The large majority of these studies have therefore been conducted in organizations that decided to adopt open source desktop software. Relatively few studies have investigated the issue of non-adoption. As a result, the important question of *whether* to adopt open source desktop software has been addressed to a lesser degree.

This is quite consistent with the general trend in information systems innovation literature, in which it has been noted that most studies focus on the adoption of an innovation, instead

of non-adoption (Nabih, *et al.*, 1997). Rogers (2003) also noted the existence of *pro-innovation* bias in many innovation studies. This term refers to the fact that authors — implicitly or explicitly — supposed that adoption of an innovation is always a positive decision that may result in certain benefits for the organization. Nevertheless, research has shown that adoption and non-adoption are two distinct phenomena (Gatignon and Robertson, 1989; Nabih, *et al.*, 1997). As noted by Gatignon and Robertson:

*"the variables accounting for rejection are somewhat different from those accounting for adoption; rejection is not the mirror image of adoption, but a different form of behavior."* [1]

Hence, the absence of any drivers towards the use of open source desktop software is not the only possible reason for non-adoption. Instead, other factors may limit the tendency of the organization to adopt. As will be shown, even in the presence of several drivers towards the use of open source desktop software, other factors in the context of the organization may have a negative influence, resulting in non-adoption.

Given the increased interest in the adoption of open source desktop software, we argue that additional research on non-adoption is required. This research will offer a richer description of this phenomenon, and will allow decision-makers to decide on *whether* to adopt open source desktop software. This, combined with insight into *why* and *how* to migrate, will contribute to mindful decision-making (Swanson and Ramiller, 2004). To this end, we present a case study on the Belgian Federal Public Service Economy (FPS Economy), that considered the use of OpenOffice.org, but eventually decided to adopt Microsoft Office instead of OpenOffice.org as their primary office suite. Nevertheless, the organization opted for a hybrid approach, in which OpenOffice.org is installed on users' workstations as a document converter. This ensures that users can correctly open ODF documents on their workstations. OpenOffice.org is, however, not supported by the IT department.

The rest of the paper is structured as follows. We start by describing the methodology of our study. We continue with a description of the FPS Economy and present several drivers that triggered the interest in OpenOffice.org. Next, we describe the evaluation process that took place. We identify several barriers that eventually resulted in the rejection of OpenOffice.org as the primary office suite. This is followed by a comparison of the barriers identified in this study to those suggested by previous research. The technology-organization-environment framework is subsequently used to classify barriers in their respective context. Finally, our conclusions are offered.



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## Methodology

We conducted our research using the descriptive case study approach. This allowed us to study the phenomenon in its real-life context (Benbasat, *et al.*, 1987; Yin, 2003). It has been suggested that using a single informant can lead to unreliable results (Benbasat, *et al.*, 1987; Phillips, 1981). We therefore interviewed multiple informants in the organization who were actively involved in the evaluation of OpenOffice.org. We selected three informants in the organization based on their substantial knowledge about the adoption decision. The informants were the CIO of the FPS Economy, the project manager and the account manager responsible for the communication between business units and IT. Based upon our previous research conducted in this area (Ven, *et al.*, 2007a, b), a questionnaire was crafted. The questions in this list addressed the different issues involved in the adoption decision, and included topics such as the background of the project in which the decision was taken, how the feasibility study was conducted, the cost considerations involved in the decision, and practical issues including training and support. These questions served as the basis of the interview, and were elaborated upon whenever necessary. A face-to-face interview was conducted by two researchers. During this interview, all three informants were present. We have found that this approach allows informants to supplement each other, and to resolve any possible disagreements in consensus (Marshall and Rossman, 2006). One researcher focused on posing the interview questions, while the other researcher took notes and supplemented the interview with additional questions. This strategy allowed us to view the case from two perspectives and to compare the impressions of both researchers afterwards (Eisenhardt, 1989; Yin, 2003). The interview was digitally recorded for future reference. Follow-up questions were sent as an electronic questionnaire by e-mail. A draft copy of the case study report was reviewed by our informants to increase the validity of our findings.



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## Case description

The Federal Public Service Economy, SMEs, Independent Professions and Energy (FPS Economy, <http://economie.fgov.be/>) is the Belgian public administration supporting the federal Minister for Economy, the Self-employed and Agriculture and the Minister for Climate and Energy. The FPS Economy consists of nine departments, each of which has a different responsibility (e.g., energy, market regulation, and information society). The ICT department of the FPS Economy is an infrastructural service unit that supports these various departments.

One of the largest departments is the Directorate-General Statistics Belgium (DSB), which is more commonly known as the National Statistical Office. This department is responsible for collecting, processing, exploiting and offering relevant, reliable and updated statistics on the Belgian economy. It is Belgium's official statistical body which also provides information to the European authorities. The DSB employs many statisticians whose daily tasks include data analysis and reporting. As a result, the DSB — and the FPS Economy — is a data-intensive environment, which requires a supporting IT infrastructure. Therefore, many users in the DSB rely extensively on the advanced functionality of Microsoft Access and Excel. Much of the data is extracted from a mainframe running DB2, and is automatically converted to Microsoft Access and/or Microsoft Excel. In addition, business intelligence software is used to further analyse and process the data.

This data-intensive nature of the FPS Economy creates a rather unique environment. In the remainder of this section, we provide background information on the IT infrastructure of the FPS Economy, and describe several factors that triggered the interest in OpenOffice.org.

### Context

The IT infrastructure of the FPS Economy consists of around 3,000 personal computers. The approximate numbers of users to be supported is 2,700. The maintenance of these computers and support of its users is complex because of the diversity of hardware and software. Therefore, three key projects had been initiated to reconsider the overall IT strategy. The first project addressed the introduction of a target platform for *business critical application development*. It was decided that development would take place in the Java Enterprise Edition framework, using DB2 as database server. The second project consisted of selecting a *business intelligence platform*. In this area, SAS Business Intelligence software was selected. This choice was guided by the fact that SAS offers powerful integration with Microsoft Office, that was used by many statisticians at the DSB. The third project addressed the standardization of the office suites and was called the COSMOS project (Computer Operating System Migration to Optimize the Service). In the first two projects, the decision on which software packages to adopt was already made. Concerning the office suite, a choice still had to be made between OpenOffice.org and Microsoft Office. This paper focuses on this latter decision. At the time of the evaluation, several versions of Microsoft Office were used as the office productivity suite. Although the majority of desktop computers had Microsoft Office 97 installed, some desktops were still running Microsoft Office 95, while others already had Microsoft Office 2003 installed. Additionally, several users in the organization used the development platform provided by Microsoft Office (i.e., Microsoft Access and macros in Microsoft Excel). The timing for the standardization of end user equipment in the COSMOS project is described in [Table 1](#).

<b>Date</b>	<b>Activities</b>
December 2006–January 2007	A feasibility study was conducted to test the functionality of OpenOffice.org.
March–April 2007	The decision on whether to adopt Microsoft Office or OpenOffice.org was made.
April–May 2007	An image was created that would be used for installation on desktop computers.
July 2007	A pilot was started to test the image.
September 2007	The image was installed on all desktop computers in the FPS Economy.

A distinction has to be made between two groups of end users in the FPS Economy. One group of end users performs their daily tasks by using the standard functionality of an office suite. We will refer to this group as "regular" users. Another group performs tasks that are more data-intensive. This group includes the statisticians working at the DSB. These users need to integrate the functionality offered by business intelligence software with the office suite. Additionally, they used the development platform provided by Microsoft Office (i.e.,

Visual Basic for Applications) to develop macros and applications to automate their tasks. We will refer to this group as “*advanced*” users.

### Triggers for investigating open source software

The investigation of OpenOffice.org was triggered by several factors. A first trigger was the existence of government guidelines. The CIO stated that the European Commission advocates the use of open source software, and that the Belgian government has issued a guideline which states that an ISO standard should be used for exchanging documents between governmental institutions, starting in September 2009. At the moment the decision was taken, only the ODF format — the native format used by OpenOffice.org — was approved as an ISO standard. Second, the use of open source software was considered a means to realize cost savings, since the license of OpenOffice.org is free of charge. Third, the ICT manager had a personal belief that open source applications such as OpenOffice.org can be successfully deployed in an organization.

These reasons are very similar to the motivation of other Belgian public administrations to consider the use of OpenOffice.org. Both cost reductions and government guidelines were mentioned by the FPS Justice (Ven, *et al.*, 2007a) and the Brussels Public Administration (Ven, *et al.*, 2007b). Both these latter public administrations have decided to adopt OpenOffice.org. Hence, it could be expected that the FPS Economy would also have decided to adopt OpenOffice.org. This was, however, not the case, as the FPS Economy eventually decided to upgrade to Microsoft Office 2003, with the ODF plugin developed by Sun. This indicates that other factors had an impact on the adoption decision. Although some drivers — and willingness — towards the use of OpenOffice.org were present, these triggers obviously did not suffice for the FPS Economy to decide to adopt OpenOffice.org.



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## Findings

Given the interest in open source desktop software — and OpenOffice.org in particular — the FPS Economy decided to initiate a feasibility study. The aim of this study was to support the decision on whether to adopt OpenOffice.org or not. We start by describing the overall design of the study, and then focus on several criteria that were taken into account in the evaluation.

### Feasibility study

In order to gain a more profound knowledge and understanding of OpenOffice.org, as well as its acceptance by end users, the FPS Economy has conducted two studies.

One study was conducted between December 2006 and January 2007 to test the ease of use of OpenOffice.org for daily use in the FPS Economy. Participants were selected to represent the various roles of users which exist at the FPS economy, and ranged from users who needed to perform simple editing of documents (the so-called regular users) to developers and engineers (the advanced users). A total of 50 users took part in this study. Participants had to perform their daily office-related tasks using OpenOffice.org. In addition, they were requested to try out more advanced functionality of the office suite, and to test the conversion of a number of existing Microsoft Office documents. Users did not receive any training beforehand. Instead, they were given list of Internet sites they could use to obtain documentation and extra information on how to use OpenOffice.org. As OpenOffice.org was believed to be suitable for daily tasks, management expected a positive outcome of this test. The results indeed indicated that end users had a positive view on the ease of use of OpenOffice.org, and that they were able to perform their daily tasks. Furthermore, they were able to find the information they needed on the Internet, which would indicate that a lack of training was not a major obstacle. In addition, it may indicate that users would only require minor training to be able to use OpenOffice.org. On the other hand, a drawback reported by users was the perceived lower performance, which was thought to be caused by the Java Virtual Machine that is used by some components of the office suite. Users who tried out more advanced functionality did report some shortcomings of OpenOffice.org, for example with respect to the use of macros and pivot tables.

In a second study, which lasted 70 person-days, the primary workflows of the FPS Economy were simulated using various collaboration tools in order to test the user acceptance of the various tools. Two proof-of-concepts were conducted using Microsoft SharePoint and the Collaboration platform of IBM Lotus Notes and Domino. Microsoft SharePoint was found to be the best accepted collaboration tool, given its ease of use. End users declared that the Microsoft Office look and feel and its ability to function as an extranet were its most distinguishable features.

### Evaluation criteria

We will now describe the different criteria which have been taken into consideration during the decision process. In order to structure our findings, we adopted the Technology-

Organization–Environment (TOE) framework developed by Depietro, *et al.* (1990). According to the TOE framework, the adoption and implementation of technological innovations is influenced by three elements. First, the *technological context* refers to characteristics of the technologies which are available for possible adoption by the organization, and the current state of technology in the organization. This current state of technology can be expressed in both material (*e.g.*, equipment owned by the organization) and immaterial (*e.g.*, methods currently in use). Second, the *organizational context* consists of the organizational structure, the presence of innovation–enabling processes such as informal communication and strategic behavior of top management, and the size and slack resources of the organization. Third, the *environmental context* combines elements such as market structure and characteristics, the external support available for adopting new technologies and government regulations. TOE does not provide concrete model describing the factors that influence the organizational adoption decision; it is rather a taxonomy for classifying adoption factors in their respective context. The TOE framework has been used by a large number of studies to investigate the adoption of, for example, Electronic Data Interchange (EDI) (Kuan and Chau, 2001), open systems (Chau and Tam, 1997), and e–business (Zhu and Kraemer, 2005).

Although the TOE framework has primarily been used to study the adoption of innovations, we believe that it is also well-suited to study the non–adoption of an innovation. The main contribution of TOE is that it encourages the researcher to take the broader context into account in which innovation takes place. This context is also important to understand the non–adoption decision. Therefore, we believe that the TOE framework provides a solid foundation to study the non–adoption of OpenOffice.org. By using the TOE framework, we are able to provide a more structured analysis, and are able to integrate this case study with other research. The criteria relevant to the adoption decision of the FPS Economy, classified using the TOE framework, are displayed in [Table 2](#).

<b>Table 2: Evaluation criteria structured using the TOE framework.</b>	
<b>Context</b>	<b>Evaluation criterion</b>
Technology	Conversion and compatibility
	Tools and integration
	Costs
Organization	End user acceptance
	Training and support
Environment	Networking effects

### **Conversion and compatibility**

The issue of conversion and compatibility is quite complex. Previously created documents, macros and applications saved in Microsoft Office format need to be readable by OpenOffice.org. If this is not possible, it should at least be possible to convert these documents to ODF format. In addition, documents which are created by external parties and which are saved in Microsoft Office format need to be readable by the FPS Economy as well. During the feasibility study, a lot of attention was paid to this compatibility issue. Tests showed that opening Microsoft Office documents in OpenOffice.org sometimes resulted in errors in both layout and content when handling complex documents. This is consistent with the results of previous research (COSPA, 2005; Drozdik, *et al.*, 2005; Zuliani and Succi, 2004a, b). Given the presence of advanced users in the organization, special attention was paid to the conversion of macros and applications. To this end, converter plugins from both Sun and Microsoft were evaluated. Results showed that the plugin developed by Sun provided the best results, although it was not possible to convert complex macros and applications written for Microsoft Office to OpenOffice.org. This was an important issue, since advanced users regularly developed custom macros or applications to automate their tasks. As a result, many developments are spread throughout the organization, which made it difficult for IT management to keep track of these developments and to ensure the continuity of these applications. If employees were obliged to redevelop their applications and macros, it would be impossible for management to realistically plan the time needed for this conversion. Hence, data conversion appears to be a much more complex issue in a data–intensive environment such as that of the FPS Economy, than in organizations in which macros are seldom used. It has to be noted that the Base application of OpenOffice.org has not been checked for compatibility with Microsoft Access, since both packages were considered to be too different from each other to be compatible.

As previously mentioned, the FPS Economy eventually decided to adopt Microsoft Office. Since the Belgian government issued a guideline mandating the use of the ODF document format for external communication, it is necessary that the ODF format is supported. However, Microsoft Office is natively not able to open documents stored in the ODF format. Hence, a converter needed to be available to users. It was therefore decided to use the Sun ODF plugin. However, the results of the feasibility study showed that this plugin did not

work flawlessly. Management therefore decided to provide an installation of OpenOffice.org along Microsoft Office, to ensure that end users were able to adequately handle ODF documents. OpenOffice.org should only be used by end users to convert or open ODF documents they receive. Therefore, it is not officially supported as an office suite by the IT department. However, it does provide users with the opportunity to decide for themselves whether they prefer to work with Microsoft Office or OpenOffice.org.

### **Tools and integration**

Software vendors are inclined to develop tools or other software products that are interoperable with the Microsoft Office suite because of its large market share. Examples of such applications which are used by the FPS Economy are SAS, which integrates with Microsoft Excel, and a tool to assist with installation, management and version control of desktop licenses. In addition, the FPS Economy uses Microsoft Sharepoint and Active Directory. Both products integrate more easily with Microsoft Office than with OpenOffice.org. If OpenOffice.org had been adopted, the organization would have lost this integration, which would have resulted in a loss of productivity of the end users. Alternatively, this functionality would have needed to be developed, which would probably have been rather expensive.

### **Costs**

Open source software has often attracted interest from organizations for its potential to realize cost savings. Given the fact that many open source software products are available free of charge, organizations may be able to reduce their expenses on software licenses. Several studies have shown that organizations seem to consider this an important characteristic of open source software (Dedrick and West, 2003; Fitzgerald and Kenny, 2003; Lundell, *et al.*, 2006; Morgan and Finnegan, 2007). The license costs were a trigger for the FPS Economy to consider the adoption of OpenOffice.org. Given the large number of desktop licenses for Microsoft Office, the organization could realize considerable savings in software licenses. These potential cost savings were indeed one of the main reasons why the evaluation of OpenOffice.org was conducted.

It should be noted, however, that some factors obscured the actual level of these potential cost savings. First, some of the licenses for Microsoft Office had already been purchased, and were considered to be sunk costs by the FPS Economy. Second, our informants indicated that the TCO of OpenOffice.org could not be estimated precisely, due to the uncertainty regarding the cost of the conversion of applications and macros. Hence, during the project, no detailed TCO analysis was made. This is consistent with the results of previous studies that showed that organizations found it difficult to assess the TCO of OpenOffice.org, even after having performed the migration (COSPA, 2005; Drozdik, *et al.*, 2005; Russo, *et al.*, 2003; Ven, *et al.*, 2007a, b; Wichmann, 2002).

### **End user acceptance**

Since regular users and advanced users differ substantially from each other concerning their required functionality, we will discuss these groups separately. Regular users were found to be rather indifferent with respect to which particular office suite was to be adopted. The concern of deskilling, in which employees are afraid to lose their experience with Microsoft Office (Fitzgerald and Kenny, 2003), did not appear to be present either. However, most end users used Microsoft Office at home. This stimulates *self-learning* in which end users further develop their proficiency in using the office suite at home. It also allows end users to exchange documents with their home computer. This allows them to further work on office documents at home.

Advanced users require more advanced statistical functionality. As a result, their main use of an office suite resembles more a development environment than a word processor. Several applications that assist in statistical analysis had been developed in Microsoft Office, which was used as the standard office suite. If OpenOffice.org had been adopted, this would have led to conversion problems. Moreover, Microsoft Excel 2007 offers more analytical and business intelligence features than OpenOffice.org Calc. This could have been an important argument for advanced users to prefer Microsoft Office. However, it was decided by management to adopt SAS to provide the end users with an advanced business intelligence platform. Hence, the limited functionality of OpenOffice.org could be compensated by the functionality offered by SAS. However, SAS only integrates with Microsoft Excel and adds functionality to import and convert data.

### **Training and support**

Currently, IT training is provided by a federal governmental institute. If OpenOffice.org had been adopted, this institute could have provided training as well. However, given the limited capacity of the institute, training should have been spread over a long period, which would have meant that some users would have received their training some time after the migration. It has been suggested that users should receive their training shortly before or after the migration (COSPA, 2005; Ven, *et al.*, 2007b; Zuliani and Succi, 2004a, b). Since training facilities are provided by the government, the impact of the training costs on the total cost of ownership could be limited compared to other organizations. However, a detailed TCO analysis should have been made in order to be able to estimate the impact of

training costs.

The main aim of the COSMOS project was to simplify and standardize the support concerning the IT infrastructure. Therefore, support will be provided for only one office suite. Management decided to provide support entirely internally. This option was chosen over purchasing external support for three reasons. First, existing knowledge of the support desk can be elaborated upon. According to management, investments already made in the training of the support staff should be leveraged, instead of being made obsolete by purchasing external support. Second, the cost of external support is higher compared to an internal support desk. This is partly due to the type of contract used by the Belgian government to hire employees. Since contracts are unlimited in time, it is difficult to adjust the number of employees according to the current (short-term) needs. Therefore, existing human resources should be used whenever possible, and external support should only be acquired if the internal resources do not suffice. Third, management was concerned that if external support had been used, it could have been difficult to transfer the knowledge on OpenOffice.org to the internal help desk. This could be very important if it would be decided to provide the support internally at a later time.

### Network effects

Some external influences triggered the interest in OpenOffice.org, such as the guidelines issued by the European Commission and the Belgian government. The choice made by the peers of the FPS Economy, *i.e.*, other FPSs, could also be important. While the decisions made by other FPSs did not have a direct impact on the decision of the FPS Economy, management acknowledges that if many other FPSs had adopted OpenOffice.org, this would have made a migration to OpenOffice.org more likely. However, no indications existed to suggest such a large-scale adoption of OpenOffice.org. As a result, management did not see any drivers in the immediate business environment of the FPS Economy to migrate.



## Discussion

The reasons for migrating from Microsoft Office to OpenOffice.org should be considered carefully by any organization, given the significant impact on end users. Our study of the FPS Economy identified various aspects that were in favor of the adoption of OpenOffice.org. When comparing our results to other case studies conducted in this area, a large resemblance can be found between the factors which are considered facilitators for adoption. Two of the three facilitators identified in previous case studies in Belgian organizations (Ven, *et al.*, 2007a), namely cost and government guidelines, reoccur literally in this case study. Moreover, results of the feasibility study conducted by the FPS Economy, showed that user attitude regarding OpenOffice.org was positive. Training could be requested with an external federal governmental institution. If necessary, users could easily find information on the Internet, as indicated by the feasibility study. Support could be provided by the internal support staff, which would have to receive additional training for the new office suite. The required functionality by regular users was covered by OpenOffice.org.

However, these reasons were not sufficient for management to decide to adopt OpenOffice.org. This indicates that additional elements in the decision-making process need to be considered to understand the decision on *whether* to adopt open source desktop software. In addition to understanding the facilitators which lead to the interest in open source software, barriers or inhibitors to the adoption of open source software need to be examined as well.

We will first consider the various issues mentioned in the previous section from a *change management* perspective. We then compare our results to previous studies. We subsequently use the TOE framework to structure our findings.

### Change management

Overall, several of the issues elaborated upon in the previous section highlight the invasive character of a potential migration towards OpenOffice.org. Hence, we can summarize these issues under the term *change management*. The relationship between the various issues and the implications for change management are summarized in [Table 3](#).

<b>Factor</b>	<b>Implications for change management</b>
End user experience	Existing knowledge in the organization should be leveraged. End users have experience with the current Microsoft Office suite. Moreover, they use Microsoft Office at home, which facilitates

	self-learning effects.
Support staff experience	Another source of existing knowledge is the support desk, that has experience with problems related to the Microsoft Office suite. In case a different office suite should be adopted, no internal expertise would be present to offer internal support. New internal expertise is not easy to acquire: the whole process of hiring a new employee for the FPS takes approximately 200 working days.
Conversion	End users have developed macros and applications using the Microsoft Office suite, which are difficult to convert to OpenOffice.org.
Cost	Given previous investments in training, support and licenses, the total cost was perceived to be lower than when a complete new solution had been acquired.
User perceptions	Management and end users do not have a specific preference towards any of the two office suites. The successful result of a potentially difficult migration to OpenOffice.org was not perceived to be more beneficial than an upgrade of the current Microsoft Office suite.

Change management was considered the most important factor in the decision to adopt Microsoft Office. In order to maximize the chances of making the COSMOS project a success, management opted for the strategy to remain rather compatible with the current solution, as this would minimize the impact of the migration on the business. The CIO expressed this as follows:

*"[Change management] has been the decisive factor in our decision. The COSMOS project already resulted in a large number of changes for both the IT department as the business users. These changes needed to be implemented and assimilated in a short time span. One of the criteria of successful change management projects is that you should try to keep a few basic components stable, to ensure that not everything changes at the same time!"*

This comment reflects the idea that both the IT department and users in the organization are expected to be able to cope with only a limited degree of change at once. By making changes to all components of the IT infrastructure, users may experience several difficulties in adapting to the software. At the same time, IT employees may not be able to provide users with the support they require.

Given the fact that the introduction of the development platform and business intelligence software already represented a significant change to end users, it was expected that a change to OpenOffice.org would be too invasive. Given the fact that users were already familiar with Microsoft Office and Microsoft Windows XP, it was decided to keep using with these products. This would keep the desktop environment of users as stable and compatible with the existing configuration as possible, which reduces the risk of the project and made the changes better manageable.

The CIO further noted that

*"The choice for OpenOffice.org versus Microsoft Office was not taken in isolation, but rather in the context of an organization-wide migration project which included many more aspects than just a change of the office platform."*

This indicates that the adoption decision on the use of OpenOffice.org was strongly interconnected with the adoption decision on other components of the IT architecture in the organization. Migrating towards OpenOffice.org while also changing other components in the IT architecture may represent a too large change for the organization, especially in a complex environment. For the FPS Economy, this was the main reason to remain with Microsoft Office instead of adopting OpenOffice.org.

#### **Comparison to previous studies**



Few studies have investigated the non-adoption of open source software. The only study that performed a more detailed analysis of the barriers to the adoption of open source software by public administrations was conducted by Morgado, *et al.* (2007). They distinguish four different areas in which barriers may occur: technical, administrative, financial and legal. We will map the barriers identified in this case study to the barriers reported by the Morgado, *et al.* (2007). This mapping is shown in [Table 4](#). A detailed analysis of the potential barriers aids in understanding reluctance and problems concerning the migration.

<b>Table 4: Comparison of inhibitors identified by Morgado, <i>et al.</i> (2007) and in the FPS Economy.</b> Note: * Barrier was not identified by Morgado, <i>et al.</i> (2007).	
<b>Morgado, <i>et al.</i> (2007)</b>	<b>FPS Economy</b>
<b>Technical barriers</b>	
Development platform	Developers and power users can develop extensions to MS Office using Visual Basic for Applications. OpenOffice.org has its own macro engine. Management is aware that such extensions are used by its employees, mainly for data-intensive statistical work.
Integration with Windows system	While the integration with other MS tools was not explicitly mentioned as a barrier, it has to be noted that MS SharePoint was selected as collaboration tool. This choice was motivated by the ease of use and the well-known look and feel.
Incompatibility of document formats	Converters will be provided to handle both open and proprietary document formats.
Lack of integration with third party software*	The business intelligence software from SAS integrates with Microsoft Office, but does not offer integration with OpenOffice.org. Software vendors seem to prioritize integration with Microsoft Office because of its widespread use.
<b>Administrative barriers (Decision-maker's view point)</b>	
Lack of awareness	Management is aware of alternatives for currently used office suite software and triggered the investigation of open source software.
Lack of standardization	The COSMOS project has been started in order to achieve standardization.
Resistance to change	Management evaluated different options to migrate to a different office suite solution.
<b>Administrative barriers (End user's view point)</b>	
Poor usability	Users can perform daily tasks without difficulties, as tested in the feasibility study.
Resistance to change	Users have an open attitude towards open source software.
Lack of standard document formats	Government guidelines advocate open communication standards.
<b>Financial barriers</b>	
Interoperability costs	Interoperability recommendations are issued by the Belgian government and are not the responsibility of the FPS Economy.

Marketing costs	The office suite will be installed on every PC, therefore no marketing costs to ensure individual adoption should be made.
Training costs	Training costs can be kept under control by the FPS Economy.
<b>Legal barriers</b>	
Procurement	No procurement issues were raised.
Patent issues	No patent issues concerning OpenOffice.org are known.
Responsibility taking	Management takes responsibility for the choice of office suites.
Vendor lock-in	Contracts which prohibit use of other software or not made with Microsoft or other companies.

In this case, *technical barriers* are barriers which are inherent to the OpenOffice.org software package. Several technical barriers identified by Morgado, *et al.* (2007) were encountered in this case study. Most of these barriers were due to incompatibilities with the operating system, development platform or document format. However, we also discovered an additional barrier, namely integration with third party applications. Few third party applications currently include support OpenOffice.org. The *administrative barriers* are subdivided in the viewpoints of the decision-maker and the end user. None of the administrative barriers identified by Morgado, *et al.* (2007) were discovered in the FPS Economy. Although the main reason not to adopt OpenOffice.org was to minimize change management implications, management of the FPS Economy did initially not resist adopting OpenOffice.org. In fact, the ICT manager had a favorable position towards it. Nevertheless, results of the feasibility study showed that a migration was not desirable. The *financial barriers* mainly refer to the difficulties in assessing the real cost of an open source software solution. Cost reductions are expected to be an important driver for open source adoption. However, it has been noted that the calculation of Total Cost of Ownership (TCO) is not straightforward (Morgado, *et al.* 2007). The financial barriers identified by Morgado, *et al.* (2007) were also applicable in the FPS Economy. However, it should be noted that none of these financial barriers were insurmountable to the FPS Economy. Finally, some *legal barriers* may be involved in using open source software. Vendor lock-in may, for example, occur when contracts closed with a vendor prohibit the use of software provided by another vendor (including those of an open source software vendor). In addition, some organizations may be concerned about possible violations of patents by open source software. Some organizations may also be required to rely on an external party for support, which is currently not available for all open source software. However, none of these legal barriers were identified in the FPS Economy.

Although the comparison in [Table 4](#) shows several similarities, it should also be noted that several of the barriers identified by Morgado, *et al.* (2007) were not encountered in the FPS Economy. In fact, none of the administrative barriers were applicable to the FPS Economy. Conversely, it appears that the decisive arguments against migrating to OpenOffice.org depended on a broader organizational context than is captured by the categories distinguished by Morgado, *et al.* (2007). The data-intensive nature of the FPS Economy, for example, puts more emphasis on change management of data and user applications, and requires integration with third party software. In addition, network effects within the organizational ecosystem cannot be clearly classified under the categories identified by Morgado, *et al.* (2007).

#### Classification using TOE

Based on the previous analysis, we chose to categorize the barriers using the TOE framework. In our opinion, the TOE framework is well suited to categorize the different identified barriers, since it is quite generic. The categories distinguished by Morgado, *et al.* (2007) can be mapped to the TOE framework. The technical barriers can be assigned in the technological context. The administrative and financial barriers can be classified in the organizational context. The legal barriers can be placed in the environmental context. However, the three contexts distinguished by the TOE framework are more generic, and can include additional barriers or inhibitors. Following the TOE framework, we can now structure the barriers relevant for the FPS Economy as shown in [Table 5](#).

<b>Table 5: Barriers to the adoption of OpenOffice.org by the FPS Economy using the TOE framework.</b>		
<b>Context</b>	<b>Barrier</b>	<b>Issue</b>

Technology	Development platform	Conversion and compatibility
	Integration with third party software	Tools and integration
Organization	Knowledge and previous investments	Change management
	Data-intensive organization	End user acceptance
	Sunk costs	Cost
	Lack of internal knowledge	Training and support
Environment	Decision of other FPSs	Network effects

In this case study, change management was the main barrier. Since the primary goal of the project was to evolve from a complex, heterogeneous environment to a standardized environment, management chose to implement the office suite which required the least complex change management. The data-intensive nature of the organization was the underlying cause for technological barriers, which would not exist in an organization with less advanced requirements with respect to office productivity. Such an environment poses less demands on the functionality of the office suite. These technological issues arise mainly because of the different development framework offered by OpenOffice.org which would oblige users to redevelop their own macros and applications. Although several factors, such as government guidelines, did trigger the interest in open source desktop software, they were not sufficient to warrant the migration, given a difficult and hazardous change management process.

Our analysis also illustrates the importance of context in the decision-making process. Although some important barriers existed in the technological context, our analysis also showed the importance of the organizational and external context. Decision-makers should therefore not only consider characteristics of the technology, but those of the organization and environment as well, to assess whether adopting open source desktop software is feasible. The knowledge on open source software available to the organization appears to be an important factor in this decision. The presence or absence of network effects can also play a role in the adoption decision.

This case study also shows the difference between promoting open document standards, and open source software. The Belgian government strongly encourages the use of open document standards, but only suggests the use of open source software as an alternative to proprietary software. A positive attitude towards open source software was nonetheless present at the FPS Economy. Despite the promotion of open document standards and the positive attitude towards open source software, OpenOffice.org was not adopted.



## Conclusion


The adoption of open source desktop software by public administrations has been studied by a considerable number of studies. However, most of these studies have focused on public administrations who have decided to adopt an open source software solution. In this paper, we have argued that the issue of non-adoption is also worth studying. To this end, we have presented the results of a case study in the FPS Economy that did consider a migration towards OpenOffice.org, but that eventually decided against this. Several drivers towards the use of open source software were identified in this case study (e.g., cost reduction and government guidelines in favor of the ODF format). These drivers were also found in several other studies on the adoption of open source desktop software. However, our results also show that there were several additional barriers that prevented the organization from migrating towards OpenOffice.org. Given the fact that existing document converters could not offer a satisfactory solution, it was decided to take a hybrid approach. Microsoft Office was installed as the main office productivity suite with the Sun ODF plugin. In addition, OpenOffice.org was also installed to enable users to properly handle ODF documents in case the plugin would not work properly when processing complex documents. However, no support is provided for OpenOffice.org. Our results have several important implications.

First, organizations should carefully consider their own environment before deciding on a possible migration towards open source desktop software. The presence of several factors that are common drivers towards the use of open source software should not be considered sufficient for deciding to adopt. Instead, the organization should investigate whether the claimed benefits of using open source software can be realized, and whether elements in the organization's context could limit the possibilities for deploying open source software. Hence,

organizations should be mindful in their adoption decision (Swanson and Ramiller, 2004).

Second, our results seem to indicate that the adoption of open source desktop software in an advanced, data-intensive organization is still problematic. Most studies on the adoption of open source desktop software have focused on public administrations with rather simple and generic requirements with respect to an office productivity suite. However, the job description of a large proportion of the users within the FPS Economy was very data-intensive. Several users wrote advanced macros and even developed their own applications in Microsoft Access. Converting these macros and applications to OpenOffice.org would be a time-consuming task. The integration of OpenOffice.org with third party applications (e.g., SAS) also proved to be rather cumbersome.

Third, the hybrid approach taken by the FPS Economy may prove to be an interesting alternative for other organizations. As document converters do not yet work flawlessly at this moment, opening ODF documents in Microsoft Office — and opening Microsoft Office documents in OpenOffice.org — can sometimes cause issues, especially with complex documents. Hence, providing users access to OpenOffice.org next to Microsoft Office should allow them to open most files without difficulties. This scenario also minimizes change management issues for the organization. Users will not require extensive training to be able to use OpenOffice.org for casual use. It is, however, essential that users are clearly instructed that no support will be available for OpenOffice.org, otherwise the IT department would need to support two different office suites, which would increase the cost of support. A disadvantage of this method is that the organization cannot realize any potential cost savings by using open source software.

Overall, our study has provided more insight into the difficulties in adopting open source desktop software in an advanced environment. It appears that although OpenOffice.org can be a viable alternative for the average organization, its functionality may not suffice for advanced users. We feel that additional research on non-adoption of open source desktop software could obtain useful insight into these specific issues. Based upon our results, it would appear that the increasing standardization of document formats, and the support of the ODF format — and OpenOffice.org — by third party vendors will be important in order for OpenOffice.org to become a viable solution in advanced environments. 

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## Note

[1.](#) Gatignon and Robertson, 1989, p. 42.

## References

Ashton Applewhite, 2003. "Should governments go open source?," *IEEE Software*, volume 20, number 4, pp. 88–91.

Izak Benbasat, David K. Goldstein, and Melissa Mead, 1987. "The case research strategy in studies of information systems," *MIS Quarterly*, volume 11, number 3, pp. 368–386.

Daniel Brink, Llewelyn Roos, James Weller, and Jean-Paul van Belle, 2006. "Critical success factors for migrating to OSS-on-the-desktop: Common themes across three South African case studies," In: Ernesto Damiani, Brian Fitzgerald, Walt Scacchi, Marco Scotto, and Giancarlo Succi (editors). *IFIP International Federation for Information Processing*, volume 203, *Open Source Systems*. Boston, Mass.: Springer, pp. 287–293.

Patrick Y.K. Chau and Kar Yan Tam, 1997. "Factors affecting the adoption of open systems: An exploratory study," *MIS Quarterly*, volume 21, number 1, pp. 1–24.

Consortium for Open Source Software in the Public Administration (COSPA), 2005. "Work Package 4, Deliverable 4.3 – Experience Report on the Implementation of OS Applications in the Partner PAs," at <http://www.cospa-project.org/workplan.html>, accessed 9 October 2008.

Jason Dedrick and Joel West, 2003. "Why firms adopt open source platforms: A grounded theory of innovation and standards adoption," In: John L. King and Kalle Lyytinen (editors). *Proceedings of the workshop on standard making: A critical research frontier for information systems* (Seattle, Wash.), pp. 236–257; version at [http://www.si.umich.edu/misq-stds/proceedings/145\\_236-257.pdf](http://www.si.umich.edu/misq-stds/proceedings/145_236-257.pdf), accessed 9 October 2008.

Rocco Depietro, Edith Wiarda, and Mitchell Fleischer, 1990. "The context for change: Organization, technology and environment," In: Louis G. Tornatzky and Mitchell Fleischer (editors). *The processes of technological innovation*. Lexington, Mass.: Lexington Books. pp. 151–175.

Sylvester Drozdik, George L. Kovács, and Pál Zoltán Kochis, 2005. "Risk assessment of an open source migration project," In: Marco Scotto and Giancarlo Succi (editors). *OSS2005: Proceedings of the First International Conference on Open Source Systems* (11–15 July, Genova, Italy), pp. 246–249.

Kathleen M. Eisenhardt, 1989. "Building theories from case study research," *Academy of Management Review*, volume 14, number 4, pp. 532–550.

Brian Fitzgerald and Tony Kenny, 2003. "Open source software in the trenches: Lessons from a large scale implementation," In: Salvatore T. March, Anne Massey, and Janice I. DeGross (editors). *Proceedings of 24th International Conference on Information Systems (ICIS)* (14–17 December, Seattle, Wash.), pp. 316–326.

Hubert Gatignon and Thomas Robertson, 1989. "Technology diffusion: An empirical test of competitive effects," *Journal of Marketing*, volume 53, number 1, pp. 35–49.

George L. Kovács, Sylvester Drozdik, Paolo Zuliani, and Giancarlo Succi, 2004. "Open source software for the public administration," In: *Proceedings of the Sixth Computer Science and Information Technologies (CSIT)* (Budapest); version at <http://www.cospa-project.org/Assets/documents/Articles/Open%20Source%20Software%20for%20the%20Public%20Administration.pdf>, accessed 9 October 2008.

Kevin K.Y. Kuan and Patrick Y.K. Chau, 2001. "A perception-based model for EDI adoption in small businesses using a technology-organization-environment framework," *Information & Management*, volume 38, number 8, pp. 507–521.

Björn Lundell, Brian Lings, and Edvin Lindqvist, 2006. "Perceptions and uptake of open source in Swedish organisations," In: Ernesto Damiani, Brian Fitzgerald, Walt Scacchi, Marco Scotto, and Giancarlo Succi (editors). *IFIP International Federation for Information Processing*, volume 203, *Open Source Systems*. Boston, Mass.: Springer, pp. 155–163.

Catherine Marshall and Gretchen B. Rossman, 2006. *Designing qualitative research*. Fourth edition. Thousand Oaks, Calif.: Sage.

Guadalupe Morgado, Manon van Leeuwen, Bülent Özel, and Kaan Erkan, 2007. "Current Status of F/OSS," tOSSad Deliverable D18 (18 March).

Lorraine Morgan and Patrick Finnegan, 2007. "How perceptions of open source software influence adoption: An exploratory study," In: Hubert Österle, Joachim Schelp, and Robert Winter (editors). *Proceedings of the 15th European Conference on Information Systems (ECIS 2007)* (7–9 June, St. Gallen, Switzerland). St. Gallen, Switzerland: Universität St. Gallen, pp. 973–984.

Mohamed I. Nabih, Sjaak G. Bloem, and Theo B.C. Poesz, 1997. "Conceptual issues in the study of innovation adoption behavior," *Advances in Consumer Research*, volume 24, number 1, pp. 190–196.

Lynn W. Phillips, 1981. "Assessing measurement error in key informant reports: A methodological note on organizational analysis in marketing," *Journal of Marketing Research*, volume 18, number 4, pp. 395–415.

Everett M. Rogers, 2003. *Diffusion of innovations*. Fifth edition. New York: Free Press.

Bruno Rossi, Marco Scotto, Alberto Sillitti, and Giancarlo Succi, 2005. "Criteria for the non invasive transition to OpenOffice," In: Marco Scotto and Giancarlo Succi (editors). *OSS2005: Proceedings of the First International Conference on Open Source Systems* (11–15 July, Genova, Italy), pp. 250–253.

Barbara Russo, Paolo Zuliani, and Giancarlo Succi, 2003. "Toward an empirical assessment of the benefits of open source software," In: Joseph Feller, Brian Fitzgerald, Scott A. Hissam, and Karim Lakhani (editors). *Taking stock of the bazaar: Proceedings of the Third ICSE Workshop on Open Source Software Engineering* (3 May, Portland, Ore.), pp. 117–120; see <http://opensource.ucc.ie/icse2003/>, accessed 9 October 2008.

- E. Burton Swanson and Neil C. Ramiller, 2004. "Innovating mindfully with information technology," *MIS Quarterly*, volume 28, number 4, pp. 553–583.
- Kris Ven and Jan Verelst, 2008. "The impact of ideology on the organizational adoption of open source software," *Journal of Database Management*, volume 19, number 2, pp. 58–72.
- Kris Ven, Philip Huysmans, and Jan Verelst, 2007a. "The adoption of open source desktop software in a large public administration," In: *Proceedings of the 13th Americas Conference on Information Systems (AMCIS2007)* (9–12 August, Keystone, Colo.). Atlanta, Ga.: Association for Information Systems.
- Kris Ven, Dieter Van Nuffel, and Jan Verelst, 2007b. "The migration of public administrations towards open source desktop software: Recommendations from research and validation through a case study," In: Sulayman K. Sowe, Ioannis Stamelos, and Ioannis Samoladas (editors). *Emerging free and open source software practices*. Hershey, Pa.: Idea Group.
- Teresa Waring and Philip Maddocks, 2005. "Open source software implementation in the UK public sector: Evidence from the field and implications for the future," *International Journal of Information Management*, volume 25, number 5, pp. 411–428.
- Thorsten Wichmann, 2002. "Use of open source software in firms and public institutions – Evidence from Germany, Sweden and UK,". FLOSS Final Report – part 1, International Institute of Infonomics, Berlecon Research.
- Robert K. Yin, 2003. *Case study research: Design and methods*. Third edition. Thousand Oaks, Calif.: Sage.
- Kevin Zhu and Kenneth L. Kraemer, 2005. "Post-adoption variations in usage and value of e-business by organizations: Cross-country evidence from the retail industry," *Information Systems Research*, volume 16, number 1, pp. 61–84.
- Paolo Zuliani and Giancarlo Succi, 2004a. "An experience of transition to open source software in local authorities," In: *Proceedings of E-challenges on Software Engineering* (Vienna).
- Paolo Zuliani and Giancarlo Succi, 2004b. "Migrating public administrations to open source software," In: Pedro Isaias, Piet Kommers, and Maggie McPherson (editors). *Proceedings of E-society 2004 IADIS International Conference*. Avila, Spain: IADIS Press, pp. 829–832.

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