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Olivier Glassey, José Formaz

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## **Exchange Formats for Office Documents - A Survey of Swiss Public Administrations**

Olivier Glassey, José Formaz

Swiss Graduate School of Public Administration (IDHEAP), Lausanne, Switzerland

[olivier.glassey@idheap.unil.ch](mailto:olivier.glassey@idheap.unil.ch)

[jose.formaz@idheap.unil.ch](mailto:jose.formaz@idheap.unil.ch)

**Abstract:** In April 2010 the IT department of the Canton of Vaud decided to migrate its whole office workstations' park (10'000 machines) from Microsoft Windows XP and Office XP to Windows Seven and Office 2010. In parallel they decided to establish recommendations in terms of exchange of office document and mandated us for a survey on the situation of office document formats in use at the Swiss Federal and Cantonal levels. In our paper we will present a brief panorama of the international situation (based on a literature review) and the results of the survey we conducted between January and March 2011. We sent out an online questionnaire through the Swiss Conference on Information Technology, an association grouping the IT departments of all Cantons and cities in Switzerland. The respondents were mostly IT managers from various public departments and offices, amongst which 156 completed the survey on behalf of their organization (88 from the French-speaking part of Switzerland and 68 from the German-speaking part). We found out that barely more than 25% of the public administrations we surveyed had recommendations in terms of office document formats, whereas almost 70% of the respondents do often or sometimes have compatibility problems when they exchange documents. When civil servants exchange documents that are read-only, they use the .pdf format and this usually does not raise any major issue. However when these documents have to be modified as well, it can quickly become quite complicated depending on office suites and versions being used, and on operating systems. Our phone interviews largely confirmed that a large number of issues were related to the use of advance functions such as merging, macros or VBA scripts, and that these functions are very widely used within administrative processes.

**Keywords:** office documents, survey, open format, public sector, strategy, recommendation, exchange

### **1. Introduction**

In April 2010 the IT Department of the Canton of Vaud in Switzerland decided to migrate about 10'000 workstations from Microsoft Windows XP and MS-Office XP to Windows Seven and MS-Office 2010. In parallel they decided to investigate the matter of office document exchange within the administration of the Canton of Vaud and with external partners. Indeed they had identified compatibility problems between various versions of office suites and various operating systems. They mandated us to investigate the issues of office document exchange in Switzerland, in particular at the level of cantonal administrations (there are 26 Cantons in Switzerland). By office document we mean documents produced by word processors, spreadsheets, and presentation software, as well as drawing, database, or project management software.

We set up an online survey, both in French and in German, that we sent out through the Swiss Conference on Information Technology, an association grouping the IT departments of all Cantons and cities in Switzerland, and through our personal contacts in IT departments of Swiss public administrations. The survey took place between January and March 2011 and we got 156 complete questionnaires (88 from the French-speaking part of Switzerland and 68 from the German-speaking part). We completed this online survey by six phone interviews of representatives of the IT departments of the Cantons of Geneva, Fribourg, Jura, Neuchâtel and Valais.

This paper is organised as follows: in section 2 we will discuss the context of documents exchange (existing formats, international situation, etc.) and in section 3 we will discuss the main results of the survey. Section 4 will summarize the recommendations we made to the Canton of Vaud.

## 2. Context

As we started researching the topic of office document exchange we quickly realized that there were only two options for document formats: Office Open XML (OOXML) supported by Microsoft, and Open Document Format (ODF). Furthermore we found out that there were almost no work specifically dedicated to document formats (apart from technical comparisons), but that actually most work was on the office suites (e.g. Microsoft Office vs. OpenOffice.org). This confusion between formats and suites turned up many times during our survey as well. Without going into details let us just mention that it is possible to work with the ODF format in MS-Office and with OOXML in OpenOffice; this shows that formats and suites are not completely bound to each other. Of course most users stick with their office suite's native format, i.e. OOXML in MS-Office and ODF in OpenOffice.

Until the beginning of the years 2000, office document formats were usually proprietary, with the .doc format from Microsoft being a de facto standard for word processing. Indeed a report published in 2003 estimated the Microsoft market share of office documents at 95% (Valoris, 2003). However it became more and more difficult to read older documents (e.g. created in the 90's) and this situation led to the development of open formats such as ODF and OOXML. Open Document Format (ODF) was originally developed by Sun Microsystems and became an ISO standard in 2006. This format is used in the OpenOffice.org and in the LibreOffice suites (these are open source alternatives to the ubiquitous Microsoft Office Suite), as well as in Google Docs. On the other hand Microsoft developed its own format called Office Open XML (OOXML) that was certified by another standardisation body, namely the ECMA. OOXML also became an ISO standard in 2008. However there are several branches of OOXML: the ECMA-376 First Edition, that was refused by ISO; the ISO/IEC 29500 Strict that was accepted by ISO; and the ISO/IEC 29500 Transitional that was proposed in order to allow Microsoft to move towards the ISO Strict Version. As MS-Office 2010 is still largely based on the Transitional standard, some doubt that Microsoft is seriously willing to respect the strict version of OOXML (Ryan, 2010). For practical reasons we will not distinguish the various OOXML flavours in this study. Although both these standards are ISO certified and XML-based, there are known interoperability issues (Shah & Kesan, 2008). As mentioned above, the focus of this study is not on the technical aspects of office documents formats, for more on this see e.g. (Eckert, Ziesing, & Ishionwu, 2009). Regarding the market share of these formats we have not found any figures, but as estimation we can guess that OpenOffice users use the default ODF format. Table 1 shows a very rough estimation (based on a web statistics service) of OpenOffice market share. Here we should also mention that Oracle discontinued OpenOffice after buying Sun Microsystems (in May 2011) and that a new branch of the open source office suite appeared under the name of LibreOffice. For more on Microsoft's market dominance and open standards, see (Casson & Ryan 2006).

**Table 1:** Estimated Market Share of MS-Office and OpenOffice in 2010, adapted from (Thomas H., 2010)

<i>Country</i>	<i>OpenOffice (%)</i>	<i>MS Office (%)</i>
Poland	22	68
Czech Republic	22	76
Germany	21	72
France	19	76
Italy	18	81
Spain	15	80
Norway	18	71
Denmark	14	79
Belgium	14	85
Sweden	13	68
Austria	12	85
Luxembourg	12	81
Switzerland	11	85
Canada	11	79
Hungary	11	77
Australia	10	78
United States	9	75
United Kingdom	9	80
Netherlands	8	88

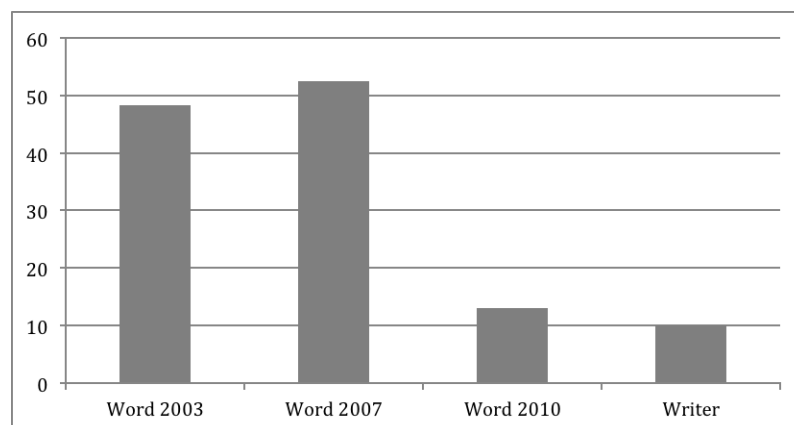
Many governments published recommendations in terms of office document formats and almost all of them strongly recommend ODF (see OpenDocument Adoption). However several governments also include OOXML in their watch-list as the MS-Office market share makes it impossible to leave it aside (see Office Open XML Adoption)

### 3. Survey

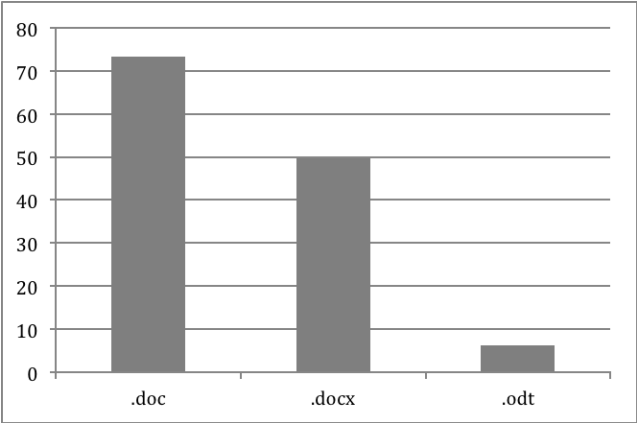
We produced the online questionnaire with SurveyMonkey.com, both in French and in German. The survey took place between January and March 2011 and we got 156 complete questionnaires (88 from the French-speaking part of Switzerland and 68 from the German-speaking part). The questionnaire was sent to public administrations from all Swiss Cantons and from a selection of large cities (by Swiss standards, i.e. small cities for the rest of the world). The channels that were used were the Swiss Conference on Information Technology, an association grouping the IT departments of all Cantons and cities in Switzerland, and our personal contacts in IT departments of Swiss public administrations. This explains the over-representation of the French-speaking part of Switzerland, as we have much more contacts there. Although the online survey was anonymous, one of the questions was whether respondents would agree to be contacted to discuss these issues further on (in which case they could give us their contact details). 25 respondents did so and we selected six of them from the French-speaking Cantons of Geneva, Fribourg, Jura, Neuchâtel and Valais. We also got close to 450 comments and precisions. For each type of tools (word processor, spreadsheet, presentation, diagramming, project management, database management system, image editor) we asked questions on the software and on the document format in use. A second part of the questionnaire was dedicated to recommendations and IT strategies regarding office documents, as well as issues such as compatibility, permanence, security or back-ups. As word processing documents make for the bulk of office documents (see Table 2), we will only show these results here.

Figure 1 and 2 show that most public administrations in Switzerland have not yet migrated to Office 2010 (which supports OOXML as a native format, with the .docx file name extension) and are still using older versions where the native format is the proprietary .doc and where filters have to be installed in order to work with OOXML. However about 70% of the respondents not yet using Office 2010 stated that a migration to this suite was planned in the coming two years. OpenOffice Writer and ODF are used by under 10% of the respondents (15% in the French-speaking part of Switzerland and 5% in the German-speaking part), but they are almost systematically used in parallel with MS-Office. Some comments also indicate the use of cloud solutions such as Google Docs, mostly for ad-hoc collaboration projects. By cross-tabulating answers we also found a tiny proportion of MS-Office users on Mac computers. Figure 3 shows that most respondents (around 80%) use either .doc or .pdf formats to exchange word processing documents with partners (usually .pdf is used when documents are “read-only” and .doc when documents have modifiable).

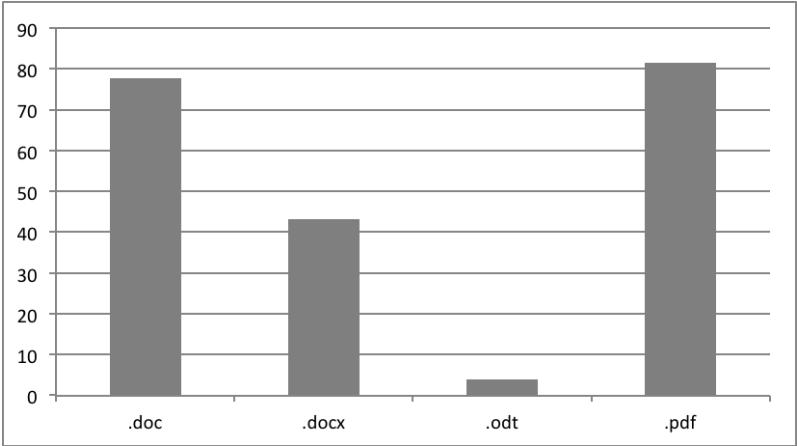
**Figure 1:** Which word processor do you use? (% , several answers possible)



**Figure 2:** What format do you use to save word processing documents? (% , several answers possible)



**Figure 3:** What format do you use to exchange word processing documents? (% , several answers possible)



**Figure 4:** Have you ever had compatibility issues between various formats of office documents? (%)

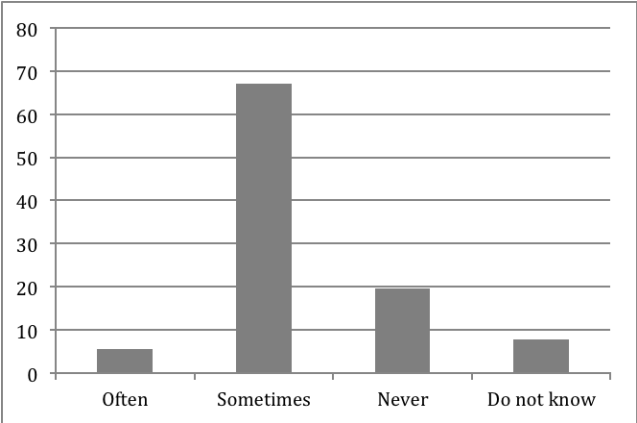
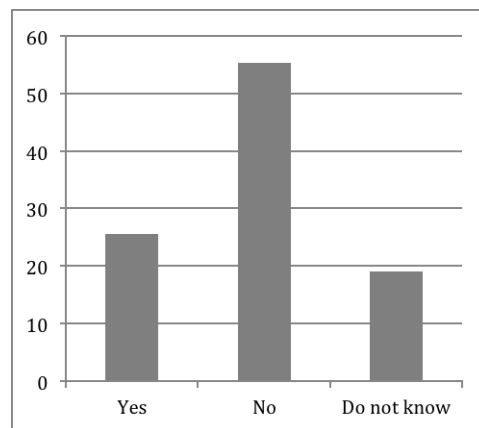


Figure 4 shows that compatibility problems are an issue for more than 70% of the respondents (often or sometimes). Interestingly comments show that problems occur most of the time between various MS-Office document formats and versions rather than between ODF and OOXML. Some comments also indicate problems between office documents produced on a Windows PC and on a Mac computer.

It also quite clear that most respondents work in organizations where no recommendations are available or that they are not aware of them if they do exist (Fig. 5).

**Figure 5:** Does your organization have recommendations in terms of office document formats? (%)



Our phone interviews brought several interesting additions to the online survey. The number one issue in terms of compatibility for the small sample we interviewed was the use of advance functions such as Visual Basic for Applications (VBA) scripts, macros, or mail merge tools. These are rather widely used in public administrations, e.g. to generate forms, authorizations, certificates, etc. A second finding is that all respondents doing real “office” work (i.e. clerical) use MS-Office and proprietary formats, whereas OpenOffice and ODF are used mostly in schools. Indeed the Education departments of several Swiss Cantons recommend these and even install these by default on all computers of the pedagogical domain (typically the NeoOffice version of OpenOffice on Mac computers). Most interviewees also stated that open formats were recommended at the political/strategical level but that it was extremely difficult to migrate towards these, as many business applications interact with MS-Office (e.g. in the Canton of Vaud all business authorizations are generated as .xls files by the dedicated business software). Regarding document exchange, it turned out that native formats (.doc and .docx) are used mostly to exchange data within a given organisation and that .pdf documents are used to exchange documents outside of the organisation. Finally there seems to be a will to delete Access and Filemaker office applications “whenever possible” as these usually give headaches to IT departments.

#### 4. Conclusions

Nowadays there is basically the choice between two families of office document formats, ODF and OOXML, both being ISO standards. Although some authors such as (Blind, 2011) question the economic rationality of having two competing standards, the main issue is certainly the level of interoperability offered by each format. As technical qualities of ODF and OOXML are not differentiated enough to allow for a recommendation based on these criteria only, interoperability is thus a factor of the market share of each format. Table 2 contains numbers provided by one of the surveyed canton: they show the number of files and the space they use of the servers of this public administration. Of course these numbers cannot be generalized but we think they give a good picture of the situation in public administrations. MS-Word and Excel files make for 98% of the total number of stored documents, and OOXML is not used at all. Instead the proprietary .doc and .xls format are being used. Furthermore most of the Swiss Cantons have already migrated their workstations to Windows Seven / Office 2010 (or were planning on doing so in the coming year when we conducted the survey), and OpenOffice is used by only about 10% of the respondents. It is rather safe to say that although most governments recommend the use of open standards and open source tools, the reality of public administrations is completely different. A pragmatic approach is certainly to stay with the most widely used formats and office suites, i.e. OOXML and MS-Office. At the time of writing, OpenOffice has been available in version 3.3 for about a year and given by Oracle to the Apache Foundation. LibreOffice is in version 3.4.5 since January 2012, but the fact that there is no large company behind it might be a barrier for some public administrations.

**Table 2:** Number and Size of Files per Format in one of the Surveyed Canton (September 2010)

<i>File format</i>	<i>Number of files (%)</i>	<i>Used space (%)</i>
.doc (Word)	78.6	46.4
.dot (Word)	1.7	0.6
.xls (Excel)	17.7	19.2
.ppt (PowerPoint)	1.5	22.2
.mdb (Access)	0.2	10.9
.vsd (Visio)	0.07	0.25
.mpp (Project)	0.03	0.05
.pub (Publisher)	0.2	0.4

The conclusion of our survey and our recommendations to the Canton of Vaud was thus to adopt OOXML as a standard, as long as .odt (ODF word processing) and .ods (ODF spreadsheet) are well under 10% of usage.

### **Acknowledgement**

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