

Feasibility Study:

Migrating from Microsoft Office to LibreOffice in an Academic Enterprise Environment

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Abstract

This study investigates the feasibility of a migration from Microsoft Office to an alternative office suite at Humboldt State University. After investigating the market for viable alternatives, it was determined that only the open source LibreOffice might be mature enough to meet the needs of a complex enterprise. A literature search was done to learn more about the suite and its development community. Use cases were drawn up and test cases were derived from them in order to compare the functionality of LibreOffice with that of Microsoft Office. It was concluded that LibreOffice is a rapidly maturing and promising suite that may be a viable replacement in one to two years, but is not an acceptable alternative to Microsoft Office in the enterprise environment today.

1. Introduction

Due to continually increasing costs associated with the CSU's contract with Microsoft for its many products, including the Office suite, Humboldt State University decided to look into other office suites (preferably open source) that can perform acceptably in place of Microsoft Office (MS Office). The Information Technology Services (ITS) department hired a team of four interns (Curran Hamilton, David Hersh, Jacqueline McPherson, and Tyler Mobray) to determine if a successful migration away from MS Office was feasible enough to warrant further research. We explored other office products currently available, decided on candidate suites, and tested the candidates. Finally, we analyzed and reported on our findings.

2. Considered Products

a. Initial Candidates

As a part of our product search, we completed a non-exhaustive Google search for alternatives to Microsoft Office and compiled the following list of products for consideration:

- Online Suites
 - Google Docs (<https://docs.google.com>)
 - Zoho (<http://www.zoho.com>)
- Locally Installed Suites
 - LibreOffice (<http://www.libreoffice.org>)
 - OpenOffice.org (<http://www.openoffice.org>)
 - SoftMaker Office (<http://www.softmaker.com>)
 - ThinkFree Office (<http://office.thinkfree.com>)

b. Pre-testing Criteria

For a product to be considered a potential replacement for Microsoft Office, it had to pass some basic tests of what we consider to be “core” office suite functionalities.

These criteria are as follows:

- Suite contains a word processor, spreadsheet, and slideshow program.
- Suite can create and edit basic MS Office 2007 or above files (docx, pptx, xlsx) that can be opened and edited in MS Office 2010 without significant errors.
- Suite can save files to PDF.

If a suite passed these general criteria, we applied the following tests specific to each part of the suite:

Word Processor

- Save, edit, and open TXT and RTF files

Spreadsheet Manager

- Make use of macros and functions
- Have pivot table functionality

Presentation Software

- Create and run a basic slideshow (formatted text, links, and images)

c. Rejected Candidates

Many of the candidates that we initially considered were rejected upon further research. Specifically, the following suites were rejected:

- Google Docs
- Zoho
- SoftMaker Office
- ThinkFree Office
- OpenOffice.org

When comparing these suites against Microsoft Office, we found that while they had fairly complete basic functionality, the first four suites in particular were lacking in advanced functionalities. Specifically, the trend among the literature on these suites suggested that they were not ready for enterprise use and were lacking in either functionality, speed, vendor support or all three. Thus, our consensus was that these suites were not mature enough for enterprise use and were not worth further consideration. (Bradley, May 2011) (Bradley, August 2011) (O'Neill, 2010) (Robinson, 2012) (Serpo, 2011)

In the case of OpenOffice.org (OOo), our reason for not considering the suite further was much different. While OOo is a very feature complete productivity suite, we were unable to ascertain the health of its surrounding development community or the pace of its development. The OOo community has not released a new version in quite some time and the transition of community support from Oracle/Sun to the Apache Foundation seems to be going quite slowly. The recent fork of LibreOffice from the OOo codebase and the following mass-migration of community and corporate support from OOo to The Document Foundation (which manages LibreOffice development) caused our team to have doubts about the future of OOo as a product. (Proffitt, 2012) Therefore we have decided not to consider OOo in our testing, even though it is a near twin of LibreOffice.

d. Final Candidates

Our final candidate for consideration as a Microsoft Office alternative was LibreOffice. Its component software titles are Writer (word processing), Calc (spreadsheet), and Impress (presentation software).

Although LibreOffice and OpenOffice.org stem from the same codebase and are very similar to each other in functionality at the moment, LibreOffice seems to offer some distinct advantages that put it ahead of OOo in our final considerations. The first advantage of LibreOffice is that it has a vibrant and healthy development community that has been rapidly and continually growing since its inception. The second advantage is that under the stewardship of The Document Foundation, the codebase is undergoing a renaissance of sorts. A much more

proactive approach to development has resulted in massive code cleanups and feature implementations, which have in turn lead to greater stability and increased functionality compared to that of OpenOffice.org. (Merrill, 2011) Finally, The Document Foundation has been enormously successful in recruiting large corporations (such as Google, Intel, Red Hat, Canonical and Novell) to contribute developers and funds to the continued development of LibreOffice. (<https://www.documentfoundation.org/supporters>)

In light of these developments at The Document Foundation, it was decided that LibreOffice would be the final candidate for consideration as a Microsoft Office alternative.

3. Summary of Relevant Literature

In our search for relevant literature, we found news articles, LibreOffice reviews and migration case studies to be the most useful. The news articles helped us keep track of LibreOffice's continued growth and reputation in the technology community. The reviews helped us in more ways than one. First, they helped us discover potential issues either with LibreOffice's interoperability with MS Office, or with LibreOffice's functionality in general. Second, they showed us what professional software reviewers think about LibreOffice. Finally, they helped us come up with use cases for our future testing. But by far, the most useful (and exciting) literature we found were the case studies.

We found multiple case studies on migrations to OpenOffice.org which showed that a migration, at the very least, has the potential to be successful. We have listed a few of these case studies in the "further reading" section at the end of this paper, and we encourage anyone who is considering a migration to look at these documents.

Since LibreOffice is a recent fork of OpenOffice.org, and they have only improved since then, these case studies are relevant. These case studies show that a migration to LibreOffice may be possible because LibreOffice is faster and more advanced than the versions of Oo that had successful migrations.

4. Testing Methods

a. Introduction

Before we began testing, we needed to construct use cases in order to derive our test cases. The use cases were constructed based on information we gathered during our research phase, including interviewing stakeholders. We interviewed staff to determine what role Microsoft Office played in completing their work, which features were most useful, and what functionality would be required in a Microsoft Office replacement. One stakeholder interviewed was Mary Ann McCulloch, a Budget Analyst in the ITS department. She provided useful information about what features were needed in accounting and budget making. Mary Ann also provided several

example spreadsheets that were helpful in our functionality and interoperability testing of LibreOffice Calc.

Also interviewed was Michael Thomas, a Professor in the School of Business, who provided more information that greatly assisted in the building of use cases for the spreadsheet manager. Finally, Cade Webb, the Specialized Application Support Director, assisted greatly in defining our test cases for MS Word and LibreOffice Writer. He also provided several documents that made extensive use of macros, which were of great use during macro functionality and interoperability testing.

While stakeholders assisted us greatly in defining and building our intermediate and advanced use cases, the basic use cases were based on our experiences as students and the resources gleaned from the literature search. Once the use cases were defined, they were reviewed and individual test cases were derived from them. Additional test cases that were not derived from use case scenarios were also added as needed to ensure a well-rounded test-plan.

The tests were carried out by testing each feature independently and recording the results. The tests were done on a variety of hardware ranging from new laptops to much older model desktops, as well as in a virtual environment. There was a difference in performance between older and newer hardware, but it was minimal, so we decided that hardware platform was not a major factor in analyzing the products.

See the appendices for the specific test cases and their results.

b. Word Processor

Use cases for word processing software came from two main sources: the experiences of our team as students, and interviews with various faculty and staff members. Our experiences were most useful when building the basic use cases, whereas our interviews with faculty and staff were most useful when building the intermediate and advanced use cases, as well as helping us validate our basic use cases.

For basic users, the following were tested:

- Write a document with basic formatting (size 12 Times New Roman, 1 inch margins, page numbers, double spaced)
- Change font type, size, color, and style (bold, underline, italic, strikethrough)
- Create bullet points and numbered lists
- Insert tables, pictures, clip-art, and page breaks
- Utilize Spell-Check
- Change Page Orientation

For intermediate/advanced users, the following were tested:

- Adding columns in a document
- Embedding images

- Footer references
- Subscript and superscript functionality
- Insert symbols
- Equation editing
- Create an index with a table of contents
- Create tables with numeric data and math functions
- View a document in outline view
- Add spreadsheets from the suite's spreadsheet program
- Digital signatures
- Mail Merge

c. Spreadsheet Manager

The basic use case for a spreadsheet program is a student or teacher doing minor data input, calculations on that data, and graphing the data. The testing for this use case reflects the simple nature of these tasks and includes manipulating the program and output.

The intermediate/advanced use case is for budget analysts, accountants, and other advanced users. These users need to use the advanced program tools, advanced formulas and data conditionals, and macro creation and usage.

For basic users, the following were tested:

- simple math functions
- simple formulas
- making graphs and charts
- basic cell formatting

For intermediate/advanced users, the following were tested:

- advanced formulas and conditionals
- macros

d. Presentation Software

Basic use cases for presentation software were derived from our experiences as students. PowerPoint lectures provided by various faculty members were analyzed for advanced features.

For basic users, the following were tested:

- usage of multiple types of slide transitions
- insertion of hyperlinks, video, sound, and images
- utilization of basic slide animations
- ease of editing slide designs

For intermediate/advanced users the following were tested:

- creation of custom slide animations (defined as specifying entrance directions and types of animations as opposed to a pre-defined animation)
- automatic slide transition timing
- slide transition timing rehearsal
- Object Linking and Embedding (OLE) functionality
- equation editing
- voice-over recording

e. Interoperability Testing

If a migration to LibreOffice was undertaken by the University, there would be many Microsoft Office format (.docx, .xlsx, .pptx, etc.) documents in use which would no longer be rendered in the program they were created in. Given that there is also a large base of staff, faculty and students who use Microsoft Office on their home machines, it was important to conduct testing to ensure that these documents would render correctly in LibreOffice.

Interoperability testing between Microsoft Office and LibreOffice was conducted in the following manner:

1. Several test documents were created with both Microsoft Office and LibreOffice, using Microsoft OOXML file formats [.docx, .xlsx, .pptx].
2. These files were then edited in the other suite and saved.
3. Finally, these files were opened in the original suite and checked for inaccuracies. We repeated steps 2 and 3 multiple times with each test file to see if formatting problems accumulated with the amount of switching between suites.

5. Analysis of Results

a. Usability

While our testing was not aimed specifically at gauging the usability aspects of Microsoft Office or LibreOffice, we found that many of the characteristics we observed and deemed worth of comment fell under this category. As such, it was decided to introduce this category in our analysis and present most of our observations and results under it.

Microsoft Office 2007 and above uses a proprietary user interface known as a “ribbon”. This interface allows many options to be presented at once to a user to minimize the amount of time a user may spend searching for a particular feature or setting. LibreOffice uses a more traditional user interface consisting of toolbars with small icons for commonly used features such as save, open, spell check, font size, etc. with various dropdown menus above the toolbars to house less commonly used features.

While these styles are quite different from each other, we did not observe that the differences were large enough to potentially hinder a migration. In fact, the majority of users in academia began with MS Office 2003 or earlier, which utilized a user interface almost identical to that of LibreOffice. Therefore, it does not seem to be an unreasonable assumption that many users would have little difficulty reverting to the old style interface if a migration occurred.

In the case of functionality, there is significant feature parity between Microsoft Office and LibreOffice. In our functionality testing, we found that while there were a few features that did not work exactly as their MS Office equivalents, these were not significant, critical, or highly advanced features. The same is true for MS Office features that have no LibreOffice equivalent. We did, however, find critical functionality that was severely broken in LibreOffice Impress. This broken functionality impacted the stability of the entire suite and is discussed in detail in the “Stability” section on the next page.

In our testing, we found that the differences between Microsoft’s “ribbon” UI and the more traditional UI used by LibreOffice, while great, were not hindrances to migration given that the user base is already accustomed to the LibreOffice UI through their familiarity with MS Office 2003 and below. While some MS Office features had no equivalents in LibreOffice, these features were not significant and any hindrances to a migration caused by their absence are likely to be trivial.

b. Interoperability

In the earlier “Interoperability Testing” section, we outlined our reasons for testing interoperability between Microsoft Office and LibreOffice. While our testing was not thorough, it did reveal that there is still much progress to be made in this area.

During the tests, it was quickly apparent that LibreOffice was able to render documents created with our basic test cases with one-hundred percent fidelity. But as the documents we tested became more advanced, the formatting problems became more frequent and noticeable.

Overall, document fidelity in LibreOffice Writer was very high; even our advanced documents experienced mostly negligible formatting loss. Most of the macros carried over from Microsoft Excel spreadsheets ran smoothly in LibreOffice Calc, even in our advanced test documents. We did note, however, that in order for Excel macros to run in Calc it was necessary to disable macro security, which could pose risks in an enterprise environment.

Impress had the most difficulties with document fidelity, although this testing was significantly hampered by a critical bug which is explained in depth in the following “Stability” section. In addition to this critical bug, not all transitions carried over smoothly, and some intermediate to advanced formatting was not rendered correctly in Impress.

Aside from the issues experienced in our Impress testing, LibreOffice appears to maintain enough document fidelity to satisfy the needs of most users. But as the documents gained more

advanced formatting, LibreOffice struggled to maintain fidelity with the consistency it had on the basic documents we tested. We also noticed that if we edited a file back and forth between the suites multiple times, larger and more noticeable formatting errors would occur.

c. Stability

Microsoft Office has been around for 21 years, having been released in 1990. (Johnston, 1990) Since that time it has grown into one of the most mature and stable productivity suites available on the market today. As such, it was important to measure the stability of LibreOffice during our testing of the suite. While we did not have specific tests designed to stress LibreOffice, our battery of functionality tests did yield some insight into the overall stability of the suite.

Generally, both LibreOffice Writer and LibreOffice Calc were very stable, and ran smoothly during our functionality testing. We observed no crashes or data loss with these programs at any time during testing, although we did observe a slight slowdown on older hardware when many instances of either were running in tandem. It should be noted that the machines that this behavior was observed on were part of a university network and there is the possibility that administrative software running on these machines may have been related to the slowdown, rather than LibreOffice itself. We were unable to verify that either was the case.

LibreOffice Impress did present a major stability issue during our testing. On all tested PC hardware, a Windows-only bug led to a crash in a few critical test cases. These test cases, related to inserting media (sound and/or video) into a slide, were unsuccessful in 100% of tries due to this bug (https://bugs.freedesktop.org/show_bug.cgi?id=45081), which caused the LibreOffice suite (Impress and all other running LibreOffice instances [i.e., Calc, Writer, Draw, etc.]) to crash. Document recovery was successful in all cases; however this was never tested with more than basic documents.

This presented an opportunity for our team to experience the LibreOffice community first-hand by filing a bug report. Our first bug was listed as a duplicate of bug 45081, listed above. While we provided some information on the bug, the issue was swiftly taken over by other community members. Since that time, there has been activity on the issue but it appears that in the month between our filing of a duplicate bug and this writing there has been little progress on fixing the issue. While it was verified that the bug was Windows-only and a test kit was made along with a request for information from a stack trace, no potential fix has been submitted for this bug (which has been open since January 22, 2012) as of this writing.

One potential reason that a bug-fix has not been submitted as of yet is due to a major effort being led by The Document Foundation to clean-up Writer and Calc code first in an ongoing effort to modernize and improve the suite. Given that the focus of The Document Foundation and its developers is on those two products at the moment, it may be some time before other products in the suite receive swift fixes for critical bugs. It should be noted, however, that while this bug remains open, LibreOffice Impress is not suitable for academic or business use which requires embedded media of any kind.

6. Conclusion

a. Overall Observations

In our functionality testing of LibreOffice, we did not encounter many issues that would hinder a migration to the suite, but the issues we did encounter are significant. For example, interoperability is not complete with Microsoft Office for documents that utilize advanced formatting or functionality. Furthermore, LibreOffice Impress has been unable to handle embedded media (certainly a critical feature) without crashing for some months as of the time of this writing. There is also an issue with the Object Linking and Embedding (OLE) functionality; changes are not synchronized between the linked object and its source document, or vice versa. This behavior was observed in all LibreOffice components where OLE functionality was tested, specifically, Writer and Impress.

However, given our assessment of the health of the LibreOffice development community, we believe that these problems are temporary. The Document Foundation has been successful in recruiting development assistance from many large corporations such as Google and Intel. This coupled with the community's proactive attitude toward seeking out and remedying bugs in the LibreOffice code base does much to inspire confidence in the community's ability to significantly improve LibreOffice in the long run. A rush to fix that which is broken or outdated in the LibreOffice codebase has already resulted in a great many improvements in the stability and feature-set of LibreOffice. (Branscombe, 2012) (Prokaza, 2012) Given this and The Document Foundation's continuing efforts to recruit developers and corporations to contribute to the project, this rapid improvement appears poised to continue for the foreseeable future.

From our testing and literature research, LibreOffice appears to be a rapidly maturing, usable productivity suite that will only continue to improve over time as the development community grows. The development community responsible for the product's growth and improvement is vibrant, growing and eager to take on the challenges of maturing and improving the LibreOffice suite over the long term. LibreOffice is more than sufficient for the average home user and will only continue to get better.

b. Final Recommendation

Our research into, and testing of, the LibreOffice suite provided us with a very good body of knowledge and insight regarding the maturity of the software, its feature set, and the feasibility of migrating an organization from a proprietary suite like Microsoft Office to an open-source suite like LibreOffice.

It is apparent that the LibreOffice suite is rapidly maturing and has a strong base of support ready to improve and maintain it well into the future. Nevertheless, there were a few, but highly-

significant, issues that negatively impacted our assessment of the feasibility of a migration to LibreOffice. These issues were as follows:

1. Impress is unable to handle embedded media.

While Writer and Calc are very stable and feature-complete programs, Impress does not appear to be a suitable replacement for Microsoft PowerPoint at this time. Impress passed much of our functionality testing, however embedded media is a critical function which Impress lacks at the moment. The development community is aware of this issue, but has been unable as of yet to fully address it and there is no timetable for when this feature will again be available on Windows.

2. Advanced documents from MS Office do not render 100% correctly

While the documents do render close to what they should render as, there are concerns that some critical data could be not shown in LibreOffice which may cause significant issues should collaboration between advanced MS Office Users and non-advanced LibreOffice users be required.

These two issues present a barrier that, while surmountable, would impede a smooth transition from Microsoft Office to LibreOffice. In its current state, LibreOffice is incredibly usable and more than sufficient for the average user. However, given the mission-critical roles that advanced users tend to play in enterprise environments, coupled with the often advanced formatting tasks required by researchers and advanced students in a university, it does not seem to be the case that LibreOffice is mature enough to satisfy the needs of all users. Therefore, we would suggest that a smooth transition to LibreOffice in its current state (May 2012) is not yet feasible. Given the rapid pace of development on the suite and the substantial gains that this development pace has garnered the suite thus far, we believe that the LibreOffice suite is close to being a suitable Microsoft Office replacement.

It is the recommendation of this group to monitor the progress of the LibreOffice project and to test the suite again in one to two years time from this writing.

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Further Reading

Karjalainen, Martti. *Large-scale Migration to an Open Source Office Suite: An Innovation Adoption Study in Finland*. Diss. University of Tampere, 2010. Tampereen Yliopisto, 2010. *Tampere University Dissertations*. Tampere University Press, 15 Oct. 2010. Web. <<http://acta.uta.fi/english/teos.php?id=11357>>

According to the abstract, "This study investigates the largest transition in Finland to an open source office suite and to an open standard for office documents. The IT environment of the open source OpenOffice.org migration involves more than 10 000 workstations in the Finnish Ministry of Justice and its administrative sector."

Karjalainen, Martti. *Migrating a Ministry to OpenOffice.org*. Rep. Ministry of Justice, 2007. *Ministry of Justice, Finland*. Ministry of Justice, 19 Feb. 2007. Web. <<http://www.om.fi/en/Etusivu/1171362109118>>.

According to the abstract, "In December 2006, the Finnish Ministry of Justice decided to migrate to the open source OpenOffice.org office suite...After the migration, OpenOffice.org will be the primary office suite for 8500 persons and Microsoft Office for 1500 persons."

Rossi, B., M. Scotto, A. Sillitti, and G. Succi. "An Empirical Study on the Migration to OpenOffice.org in a Public Administration." *International Journal of Information Technology and Web Engineering* 1.3 (2006): 64-80. Web. <<http://www.inf.unibz.it/~gsucci/publications/images/anempiricalstudyonthemigrationtoooooinapublicadministration.pdf>>.

According to the abstract, "The aim of the paper is to report the results of a migration to Open Source Software (OSS) in one Public Administration. The migration focuses on... the OpenOffice.org suite. We have analysed the transition to OSS considering qualitative and quantitative data collected with the aid of different tools. All the data have been always considered from the point of view of the different stakeholders involved, IT managers, IT technicians, and users."

Appendices

The following spreadsheets document the use cases we tested, and the results of these tests. A “yes” or “no” without an associated comment indicates that there were no issues of note with the associated functionality.

Word Processor

Basic Use Cases	Word	Writer	Comments
Write a document with basic formatting (size 12 Times New Roman, 1 inch margins, page numbers, double spaced)	yes	yes	Most of this formatting needs to be changed in the format menus for Writer
Change font type, size, color and style (bold, italicize, underline, strikethrough)	yes	yes	In Word, these options are on the Home ribbon. In Writer, all of these options are on the toolbar except strikethrough, which is in the context menu.
Change page orientation	yes	yes	
Change the margin size	yes	yes	
Insert basic tables	yes	yes	Basic table = 10x10 table
Change line spacing	yes	yes	
Insert and edit headers and footers	yes	yes	
Insert pictures	yes	yes	
Insert clip-art	yes	no	There may be an extension that gives LibreOffice clipart functionality. http://extensions.libreoffice.org/extension-center/creative-commons-clipart-gallery
Insert shapes	yes	yes	
Create page breaks	yes	yes	
Use bullet points and basic numbered lists	yes	yes	
Spell Check corrects 86 commonly misspelled words	yes	yes	Most words were underlined and the correct word was suggested. Some words (especially in 'i-before-e' cases) were automatically corrected. (http://grammar.yourdictionary.com/spelling-and-word-lists/misspelled.html)
Intermediate/Advanced Use Cases	Word	Writer	Comments
Create columns; manipulate size of columns	yes	yes	
Embed images in and behind text	yes	yes	
Index and auto build a table of contents	yes	yes	
Create page borders and text borders	yes	yes	
Create footer references	yes	yes	
Create and edit tables with numeric data and math functions	yes	yes	
Insert a spreadsheet from the spreadsheet program	yes	yes	Changes made in Writer to the spreadsheet doesn't cause the original spreadsheet to change, and changes made to the original spreadsheet don't cause the linked version in Writer to change.
Create an instance of a Drop Cap	yes	yes	
Insert equations	yes	yes	
Insert symbols	yes	yes	
Insert superscripts and subscripts	yes	yes	

View a document in outline view	yes	yes	
Insert formatted signature line	yes	no	
Utilize mail merge	yes	yes	

Spreadsheet Manager

Basic Use Cases	Excel	Calc	Comments
Insert New Sheets	yes	yes	
Rename Sheets	yes	yes	
Division	yes	yes	
Multiplication	yes	yes	
SUM	yes	yes	Each command was typed into the cell manually although both Excel and Calc have a function wizard.
AVERAGE	yes	yes	
COUNT	yes	yes	
Bar Graph	yes	yes	
Pie Chart	yes	yes	
Scatter Plot	yes	yes	
Format as Percentage	yes	yes	
Format as Date	yes	yes	
Format as Time	yes	yes	
Format for Currency (USD)	yes	yes	
Format as Financial (Accounting) (same as currency, but with dollar signs lined up on the left side of the cell and the numbers are closer to the center instead of being right-justified)	yes	no	Calc doesn't have this option by default, but it can be done by right clicking on selected cells, Click on Format Cells, Click on Numbers, Choose currency (-1,234.00) and add spaces on the Format Code before the 1st -409 [\$\$-409]#,##0.00;[RED]-[\$\$-409]#,##0.00 and then go to alignment and choose "Distributed" under Horizontal. For Neg and Pos numbers: [\$\$-409]#,##0.00; [\$\$-409](#,##0.00)
Format as Scientific Notation	yes	yes	
Format as Boolean Value	no	yes	
Insert Cells	yes	yes	
Merge cells	yes	yes	
Color cell background	yes	yes	
Zoom in/out	yes	yes	
Intermediate/Advanced Use Cases	Excel	Calc	Comments
Copy Formulas into New Cells by Dragging	yes	yes	
Sort Range	yes	yes	
Create Pivot Tables	yes	yes	
Freeze Panes	yes	yes	
Sheet References	yes	yes	
COUNTIF	yes	yes	For these function tests, the function wizard in both programs can be used, as well as typing in the function calls manually.
SUMIF	yes	yes	
VLOOKUP	yes	yes	
HLOOKUP	yes	yes	
Macros	yes	yes	To record macros in LibreOffice, you must first go into Tools > Options >General and check the box to "Enable experimental (unstable) features" Overall the macros created in Excel worked fine in Calc once the security settings were set to low.

Presentation Software

Basic Use Cases	PowerPoint	Impress	Comments
Utilize various slide transitions	yes	yes	
Insert Links	yes	yes	
Insert Sound	yes	no	In Impress, sound files can be added successfully, but if the slideshow is started, Impress crashes and causes any other running instances of LibreOffice to crash as well.
Insert Images	yes	yes	
Insert Videos	yes	no	In Impress, video files can be added successfully, but if the slideshow is started, Impress crashes and causes any other running instances of LibreOffice to crash as well.
Utilize basic animations	yes	yes	
Edit the standard slide designs	yes	yes	
Intermediate/Advanced Use Cases	PowerPoint	Impress	Comments
Creating custom animations	yes	yes	
Use automatic timing	yes	yes	
Insert voice over	yes	no	Feature does not exist in Impress.
Use rehearse timing feature	yes	yes	
Use different views	yes	yes	Can choose between Normal, Outline, Notes, Handout and Slide Sorter(Impress/PowerPoint)
Linking objects from other office programs	yes	yes	Impress cannot sync changes between an OLE object and its source document, vice versa is possible if you delete and reinsert the object (Impress)
Insert equations	yes	yes	