

LibreOffice: the story of cleaning and re-factoring a giant code-base

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*“Stand at the crossroads and look; ask for the ancient paths, ask where the good way is, and walk in it, and you will find rest for your souls...” -
Jeremiah 6:16*



How we did it – an overview ...

- ▼ Culture as a vital foundation
- ▼ Making it easy to contribute
 - ▼ Quality through sharp tooling
 - ▼ Making the code comprehensible
- ▼ The history of LibreOffice
- ▼ Cleanups past & future
- ▼ Quality measurements
- ▼ LibreOffice 4.0
- ▼ Getting involved

Culture – it's power and reach
indebted to “The wealth and Poverty of Nations” (Landes)

What is different about LibreOffice ?

Free Software is primarily about people:



And not about software.

Ethos / Reciprocity / Licensing / Friendship / Fun

The importance of culture

- ▼ Historical accident or cultural consequence ?
 - ▼ eg. Japan – the only Asian nation to Industrialize fast.
- ▼ Early / Ming China:
 - ▼ Invented ~everything ... paper, printing, gunpowder,
 - ▼ Would send huge navies to other nations:
 - ▼ to show them how wonderful they were.
 - ▼ (today China has a different ethos of course.)
- ▼ The West:
 - ▼ Greedy / rapacious (of course)
 - ▼ Also greedy for new ideas, better ways of doing things
 - ▼ Syndicates saving to buy clocks in the UK: hungry to optimise their lives by measurement.

A snapshot of a dead culture

- ▼ Change is dangerous
 - ▼ Rapid change might loose us control ...
- ▼ Past Orientation: things were better previously
 - ▼ Things should be like they were but more so.
- ▼ Mandatory process must be used to deter changes that might cause problems.
- ▼ Development must be done professionally
- ▼ Get permission first
 - ▼ Code owners should approve changes in their area
- ▼ External patches distract me from my more important work
- ▼ Over-design, under-implement

“A problem for every solution”

Of course, the big picture is complicated by a lot of outstandingly friendly & open individuals.

Attempting a cultural rupture ...

- ▼ Change is mandatory
 - ▼ Without it we will die.
 - ▼ Future Orientation: things are going to get better
 - ▼ LibreOffice's best days are in the future ...
 - ▼ Will you join us getting there ?
 - ▼ Inclusion is more important than outright perfection
 - ▼ under-design and iterate
 - ▼ Breakage is a normal part of development, fix it if we find it.
 - ▼ Unnecessary process annoys us too: lets fix that together !
 - ▼ Hacking LibreOffice should be a fun, rewarding, relational experience.
- “can-do attitude & if not: a really, really good reason”***

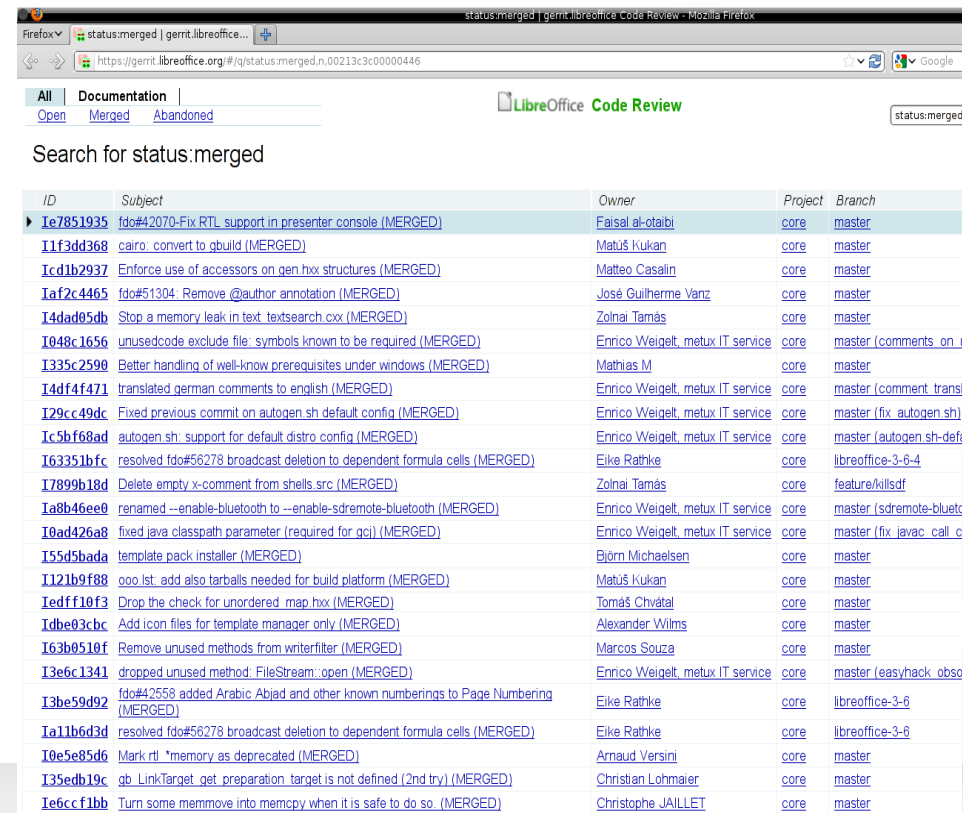
Making it *easy* and fun to contribute

Permission free, low friction on-ramp

- ▼ Easy hacks page
 - ▼ We want your first patch to be non-controversial, and easy, so you're up-to-speed and included outright:
 - ▼ http://wiki.documentfoundation.org/Development/Easy_Hacks
 - ▼ **changes are most welcome !**
- ▼ Open Mailing lists
 - ▼ No subscription required
 - ▼ No Reply-To: mangling – *'I get a reply not just the list'*
 - ▼ Mail your patch and you're done ...
- ▼ Documentation <http://docs.libreoffice.org/>
 - ▼ 200+ READMEs files with overview in git modules ...
 - ▼ migration of comments to doxygen format

Gerrit – permission free commmits

- ▼ Gerrit - <https://gerrit.libreoffice.org>
 - ▼ Magic to turn an openID account (eg. Gmail)
 - ▼ Into **no-ask** git commit / push access to gerrit
 - ▼ Submit to patch queue backed by mailing-list
 - ▼ Code inclusion is: git fetch / cherry-pick FETCH_HEAD
 - ▼ Test build integration on it's way.
 - ▼ *Thanks to*
Norbert Thiebaud
Bjoern Michaelsen
David Ostrovsky



The screenshot shows the LibreOffice Code Review interface in a Mozilla Firefox browser. The page title is "status:merged | gerrit.libreoffice.org". The URL is "https://gerrit.libreoffice.org/#/q/status:merged,n.00213c3c00000446". The page has tabs for "All", "Documentation", "Open", "Merged", and "Abandoned". A search bar contains "status:merged". Below the search bar is a table of merged patches.

ID	Subject	Owner	Project	Branch
Ie7851935	fdo#42070-Fix RTL support in presenter console (MERGED)	Faisal al-otaibi	core	master
I1f3dd368	cairo: convert to qbuild (MERGED)	Matuš Kukan	core	master
Icd1b2937	Enforce use of accessors on gen.hxx structures (MERGED)	Matteo Casalin	core	master
Iaf2c4465	fdo#51304: Remove @author annotation (MERGED)	José Guilherme Vanz	core	master
I4dad05db	Stop a memory leak in text_textsearch.cxx (MERGED)	Zolnai Tamás	core	master
I048c1656	unusedcode exclude file: symbols known to be required (MERGED)	Enrico Weigelt, metux IT service	core	master (comments on)
I335c2590	Better handling of well-know prerequisites under windows (MERGED)	Mathias M	core	master
I4df4f471	translated german comments to english (MERGED)	Enrico Weigelt, metux IT service	core	master (comment trans)
I29cc49dc	Fixed previous commit on autogen.sh default config (MERGED)	Enrico Weigelt, metux IT service	core	master (fix autogen.sh)
Ic5bf68ad	autogen.sh: support for default distro config (MERGED)	Enrico Weigelt, metux IT service	core	master (autogen.sh-def)
I63351bfc	resolved fdo#56278 broadcast deletion to dependent formula cells (MERGED)	Elke Rathke	core	libreoffice-3-6-4
I7899b18d	Delete empty x-comment from shells.src (MERGED)	Zolnai Tamás	core	feature/killsdf
Ia8b46ee0	renamed --enable-bluetooth to --enable-sdremote-bluetooth (MERGED)	Enrico Weigelt, metux IT service	core	master (sdremote-bluet)
I0ad426a8	fixed java classpath parameter (required for qci) (MERGED)	Enrico Weigelt, metux IT service	core	master (fix javac call c)
I55d5bada	template pack installer (MERGED)	Björn Michaelsen	core	master
I121b9f88	ooo.lst: add also tarballs needed for build platform (MERGED)	Matuš Kukan	core	master
Iedff10f3	Drop the check for unordered_map.hxx (MERGED)	Tomáš Chvátal	core	master
Idbe03cbc	Add icon files for template manager only (MERGED)	Alexander Wilms	core	master
I63b0510f	Remove unused methods from writerfilter (MERGED)	Marcos Souza	core	master
I3e6c1341	dropped unused method: FileStream::open (MERGED)	Enrico Weigelt, metux IT service	core	master (easyhack_obs)
I3be59d92	fdo#42558 added Arabic Abjad and other known numberings to Page Numbering (MERGED)	Elke Rathke	core	libreoffice-3-6
Ia11b6d3d	resolved fdo#56278 broadcast deletion to dependent formula cells (MERGED)	Elke Rathke	core	libreoffice-3-6
I0e5e05d6	Mark rti_*memory as deprecated (MERGED)	Arnaud Versini	core	master
I35edb19c	qb_LinkTarget_get_preparation_target is not defined (2nd try) (MERGED)	Christian Lohmaier	core	master
Ie6ccf1bb	Turn some memmove into memcopy when it is safe to do so. (MERGED)	Christophe JAILLET	core	master

Reliable out-of-master builds ...



Lots of big / fast /
ccache enabled
tinderbox slaves.

Android (x86, ARM),
iOS, (many) Linux
x86, x86_64,
Windows, Mac

Building &
up-loading binaries
as well for QA.

Thanks to
Norbert Thiebaud
Bytemark & more

More powerful static checking ...

- ▼ Clang: `compilerplugins/`

- ▼ eg. Adding custom compile-time verification hooks

```
SAL_INFO( "bridges.ios", "info message to output...");
```

- ▼ Compile-time parse doxygen docs & verify "**bridges.ios**"

- ▼ eg. Or sensible whitespace paranoia:

- ▼ Body of if/while/for not in {}

```
if( a != 0 )
```

```
    b = 2;
```

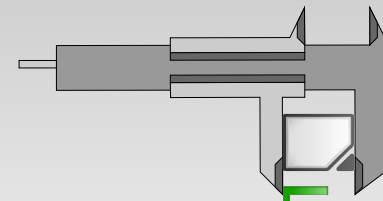
```
    c = 3; // tinderbox death here ...
```

- ▼ Helps reduce scope for manual mistakes ...

- ▼ Thanks to *Lubos Lunak* !

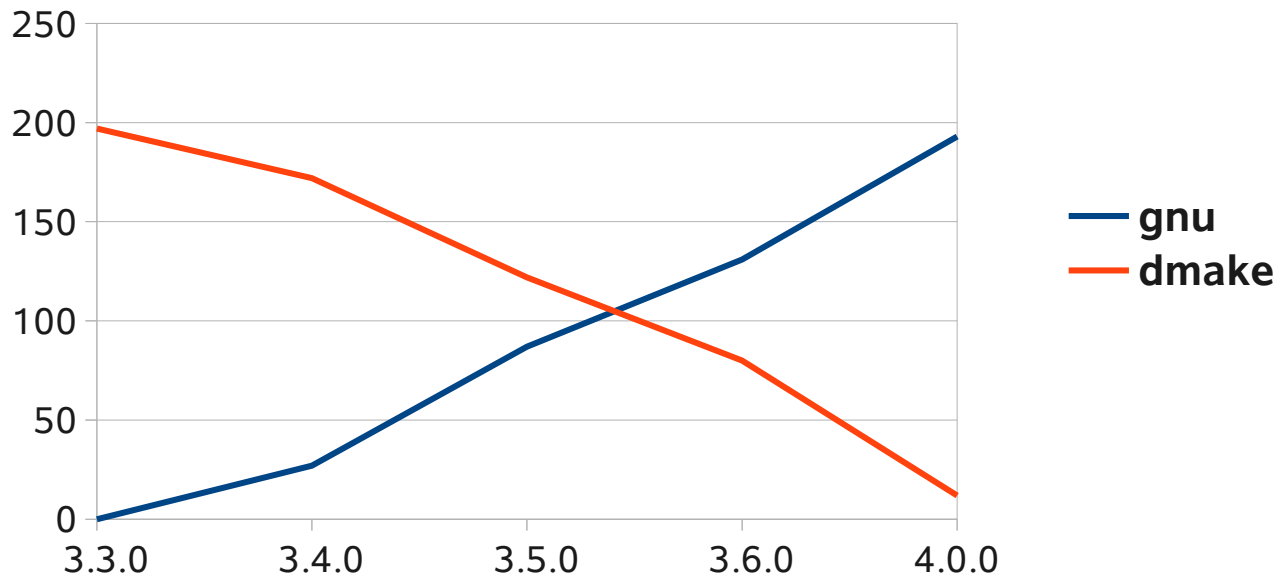
Making the code readable / hackable

Using a standard make tool (gnumake)



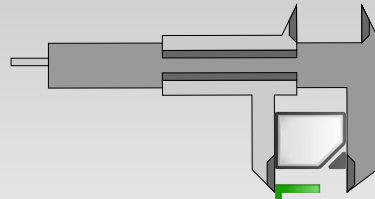
- ▼ Near-complete work to kill '**dmake**'
 - ▼ Faster, more standard & hack-able
 - ▼ Huge parallelism possible for builds on big-iron.
 - ▼ Enables library merging → one monster lib.

gnumake vs. dmake by module count



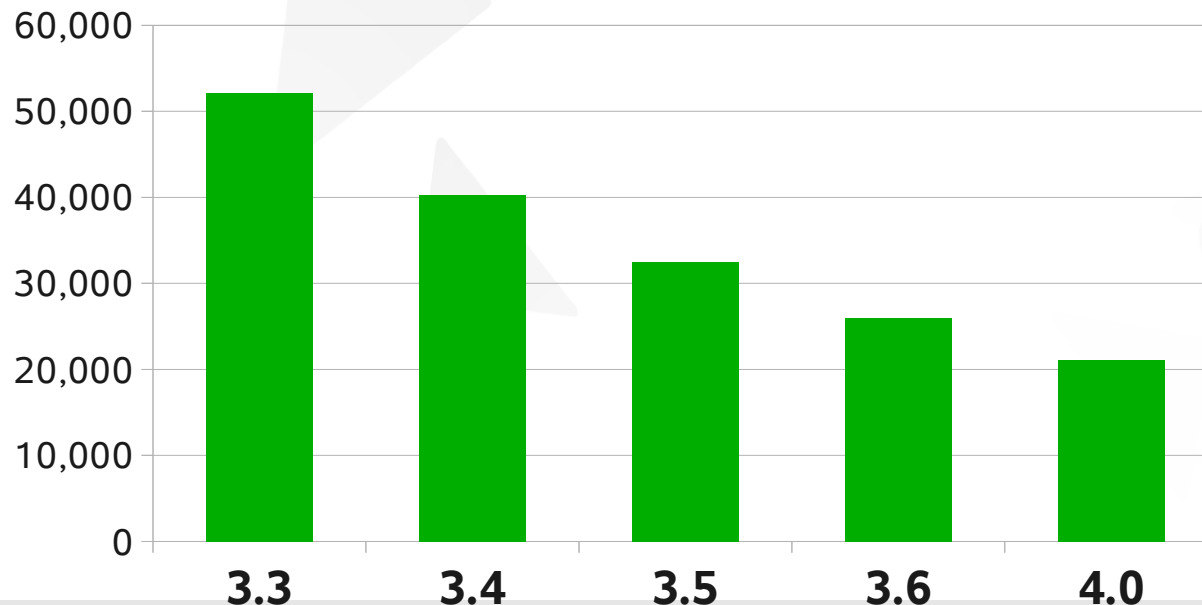
With thanks to
David Tardon
(RedHat)
Peter Foley,
Matúš Kukan
David Ostrovsky
Pierre-Eric
Pelloux-Prayer
(Lanedo)
and more ...

Translating German Comments



- ▼ Makes things **significantly** easier for non-Germans ...
- ▼ **~20k lines** done - **~20k to go** ~40%...
- ▼ **Making the code more internationally accessible ...**
 - ▼ Lots of comment translators distracted by code hacking...

Detected lines of German comment



With thanks to (recent translators):

Philipp Weissenbacher
Philipp Riemer
Samuel Mehrbrodt
Enrico Weigelt
Lennard Wasserthal
Albert Thuswaldner
Oliver Günther
Markus Maier
Peter Baumgarten

and many more !

Four+ String classes: cleanup for readability ...

- ▼ Killed ByteString completely
- ▼ Tools' UniString well on it's way out ...
 - ▼ many modules completely clean
- ▼ rtl:: prefix not required for OUString / OUStringBuffer etc.
- ▼ Kill horrible string macros & generate more efficient code:
 - ▼ Template driven goodness; readability finally ...

```
- if( aModuleId.equalsAsciiL( RTL_CONSTASCII_STRINGPARAM(  
-                               "com.sun.star.text.TextDocument" ) ) ||  
-   aModuleId.equalsAsciiL( RTL_CONSTASCII_STRINGPARAM(  
-                               "com.sun.star.text.GlobalDocument" ) ) )  
+ if( aModuleId == "com.sun.star.text.TextDocument" ||  
+   aModuleId == "com.sun.star.text.GlobalDocument" )
```

- ▼ Thanks to: *Caolan McNamara, Lubos Lunak, Jean-Noël Rouvignac, Ricardo Montania, Matteo Casalin, Christina Rossmann, Noel Grandin, Marcos Paulo de Souza + many*

Other cleanups & general changes ...

- ▼ cppcheck - ~1000 patches
 - ▼ Thanks to *Julien Nabet, Radu Ioan, Christophe Jaillet & more ...*
 - ▼ Also a number of cppcheck fixes ...
- ▼ Dead code removal
 - ▼ ~all certainly-dead code (from callcatcher) removed ...
 - ▼ unused virtual methods need hunting: (a clang plugin?)
 - ▼ Thanks to *Caolan McNamara, Julien Nabet, Marcos Paulo de Souza, Paula Mannes, Enrico Weigelt, Matúš Kukan* and others for finishing the job ...
- ▼ Adopting new UNO technologies
 - ▼ Actually deploy cool new things across the code-base.
 - ▼ Compile-time checked component names not fragile strings.
 - ▼ - ... `"com.sun.star.embed.EmbeddedObjectCreator"`
+ `embed::EmbeddedObjectCreator::create()`

Completed STL porting ...

- ▼ Danger for readability / learnability's sake ...
- ▼ Binning internal stlport copy: use boost + system STL
- ▼ Legacy C++ code-base pre-dates STL, and even templates ...
- ▼ Tools classes: List, Container, Table, DynArray and derivatives
 - ▼ large scale code clean-up
- ▼ Benefits:
 - ▼ readability, performance (?), less generated bloat (?)
 - ▼ finding fragile code & fixing it
 - ▼ checking iterators / OOB issues
- ▼ Thanks to: *Noel Grandin, Michael Stahl, Caolán McNamara, Ivan Timofeev, Fridrich Strba, Nigel Hawkins*, and many others

More risky re-work / cleanup / re-factoring

- ▼ Binning obsolete libraries: 'libvos' (*Norbert Thiebaud*)
- ▼ Enforced whitespace cleanup: tabs → spaces
- ▼ Windows installer:
 - ▼ NSIS → clean .msi with .msp patching (*Andras Timar - SUSE*)
- ▼ Killed horrible SDF translation intermediate
 - ▼ Direct .po → .res / .xml etc. (*Zolnai Tamás*)
- ▼ LanguageTags extending country/lang
 - ▼ All language features: Serbian: Cyrillic / Latin etc. (*Eike Rathke – RedHat*)
- ▼ VCL re-factor: (*Michael Meeks - SUSE*)
 - ▼ Share more backend / generic code + partial gtk3 impl.
 - ▼ improved 'headless' backend for servers (*Ricardo Cruz*)
- ▼ Wizards Java → Python Migration (*Xisco Fauli*)

Lightning History of the codebase

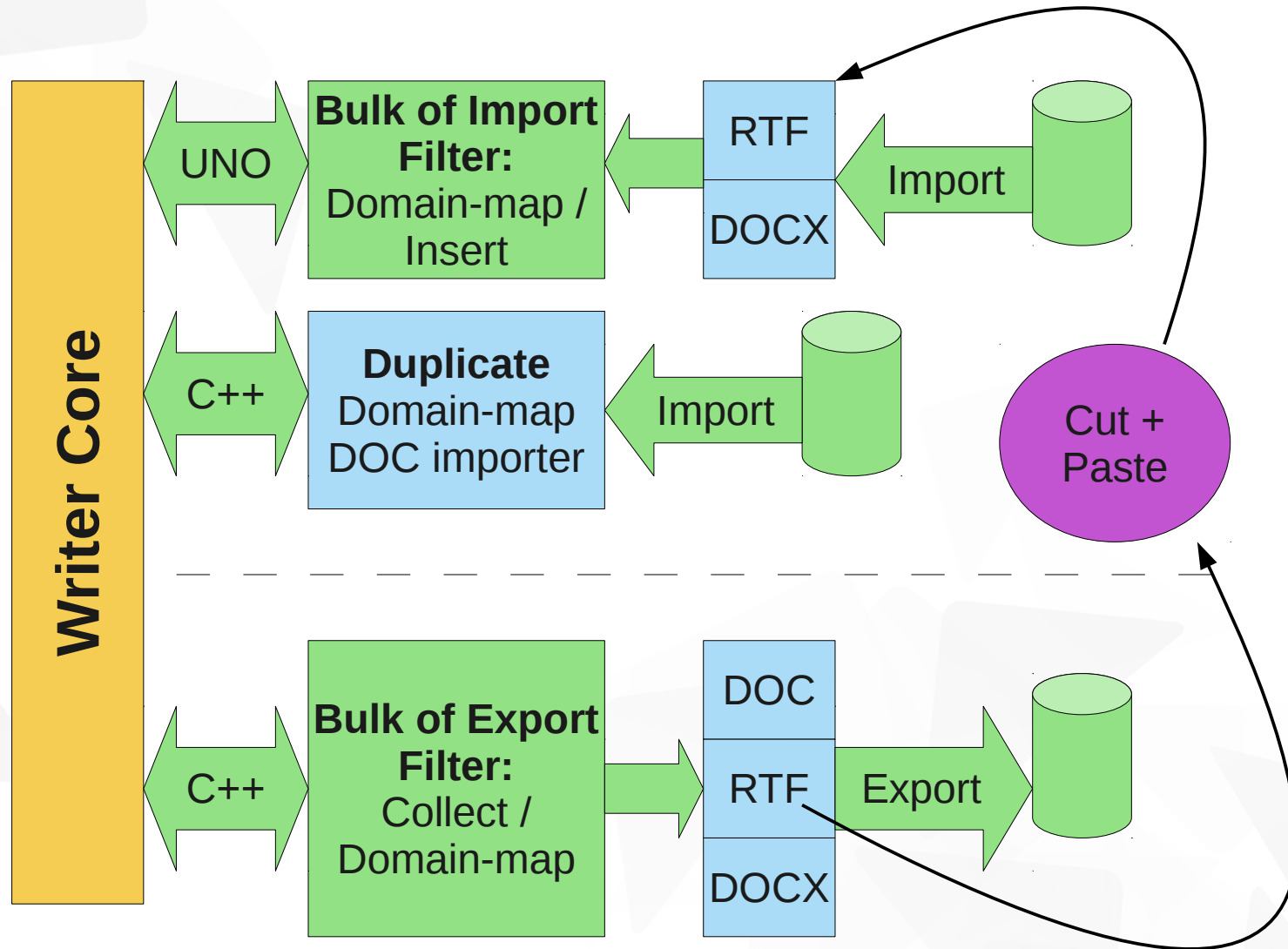
A quick potted history of LibreOffice' code ..

- ▼ Many decades ago,
 - ▼ A very talented programmer sat his shed and created a C++ Object Oriented toolkit ...
 - ▼ Then some demo apps ...
 - ▼ Fast forward to today, those demo apps are LibreOffice
 - ▼ Many key architectural considerations made without careful thought of knock-on consequences today ...
- ▼ In latter history:
 - ▼ Architect-led, cargo-cult, UNO component-model fetishism
 - ▼ Galloping inefficiency; UNO not focused on what it' could excel at ie. scripting bindings
 - ▼ Un-necessarily opaque, over-generic code: hard to extend.
 - ▼ Rampant duplication for the sake of 'UNO'-isation ...
 - ▼ Scattered / incomplete UNO migrations ...

Example larger re-factorings

Completed Microsoft filter re-factoring ...

- ▼ Re-factored RTF to share domain-mapping logic for import + export
 - ▼ Much richer feature compatibility.
- ▼ Previously
 - ▼ Three duplicate import filters
 - ...
 - ▼ One to go ...



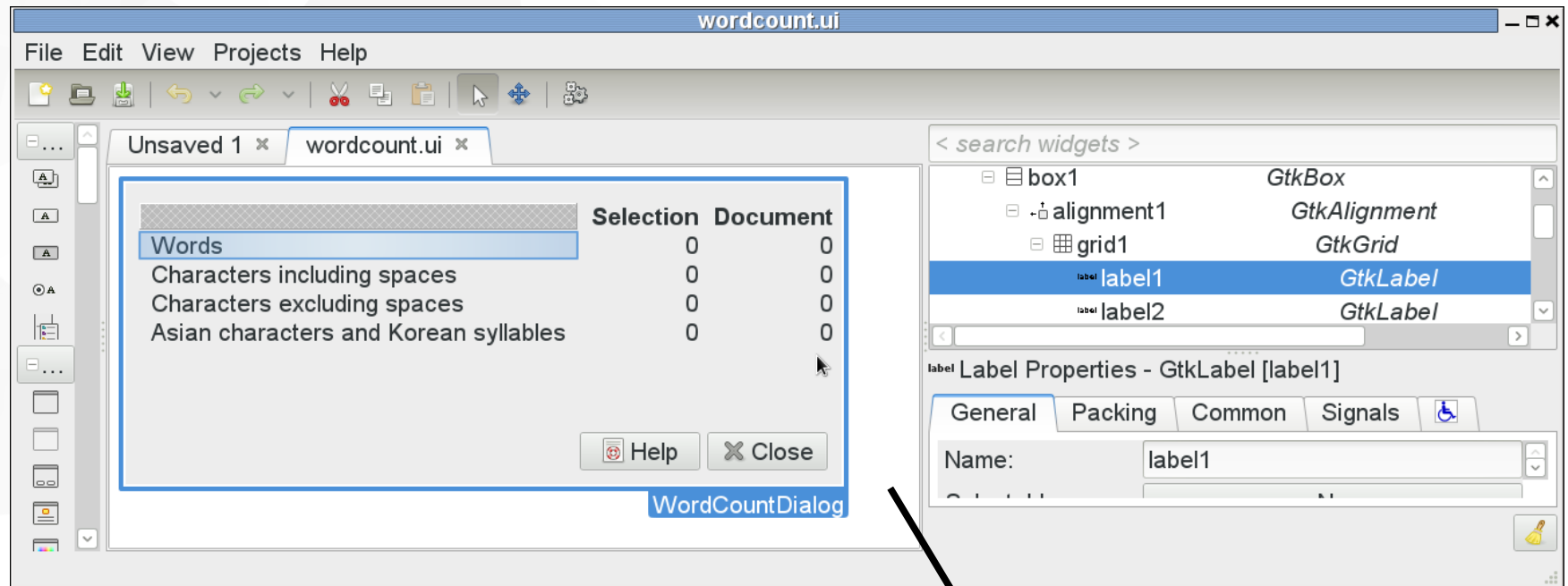
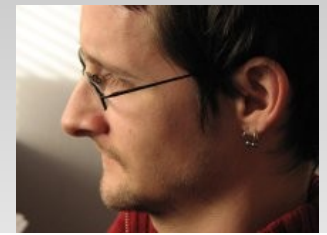
Thanks to *Miklos Vjana*

Calc: re-factoring issues out ...

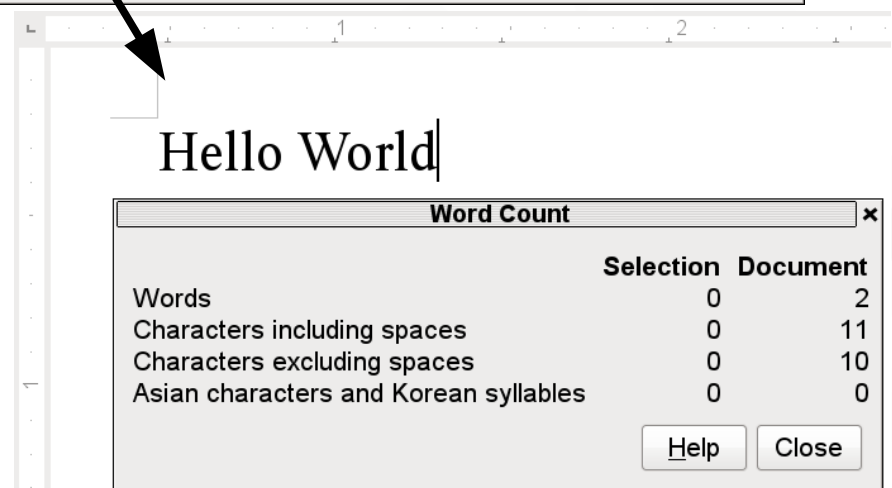
- ▼ eg. Cell Storage / notes
 - ▼ Wasting 4-8 bytes per cell for a note that is ~never there
 - ▼ $O(\text{num-cells} * \text{num-notes})$ performance in export code
 - ▼ Re-worked note storage / copy/paste/undo/redo – big savings.
 - ▼ Thanks to *Markus Mohrhard*
- ▼ Targetted de-UNO-isation & re-work of XLSX filter
 - ▼ Substantial performance wins: thanks to *Daniel Bankstone*
- ▼ Multi-Dimensional Data Structures (MDDS)
 - ▼ Split-out, re-usable C++ template library for calc core structures
 - ▼ `mdds::flag_segment_tree`
 - ▼ column & row flags / widths, pivot table cache
 - ▼ big memory savings & scalability wins
 - ▼ multi-type containers coming for more wins ...

Ongoing heavy lifting ...

Catching up to 1995: layout



- Thanks to **Caolan McNamara, Gokul, Joren De Cuyper**
- Sizing, positioning, Designer tweaking, much improved l10n
- Start of a long process:
 - 100 (of 500) dialogs converted

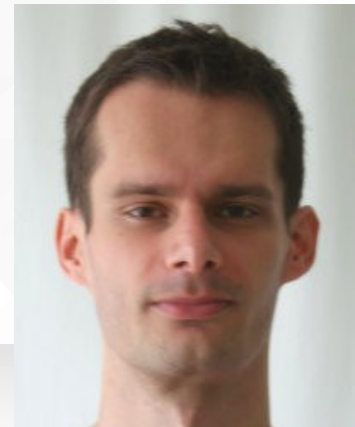


Other ongoing work ...

- ▼ Extreme VCL / toolkit lameness
 - ▼ no sensible lifecycle handling – Clang re-writing needed
 - ▼ Re-rendering should happen at idle
 - ▼ main-loop has no true 'idle' or priority concept.
- ▼ Writer:
 - ▼ BigPtrArray – a real pain, type at the start of a big word doc.
 - ▼ Try using red-lining in a large document
 - ▼ Dense B+ Tree replacement in progress (*feature/bplustree*)
 - ▼ $O(\log(N))$ operations. Thanks to *Kendy*
- ▼ Code cleanliness re-working
 - ▼ `com::sun::star::` namespace ~done – waiting for big merge window to open post 4.0.2 thanks to *Lubos Lunak*.
- ▼ There should be no “no-go areas” in the code-base ...

Clang code cleanups ...

- ▼ Auto-generated patching using compiler semantics
- ▼ Bulk-change merge window opens ~2 months out
 - ▼ after 4.0.2 and era of busy cherry-picking closes ...
- ▼ Wish-list / in-progress:
 - ▼ help appreciated
 - ▼ Misc. function renames
 - ▼ SvStream << operator re-writing to 'writeInt16' etc.
 - ▼ Protect binary file-formats from unexpected type changes.
 - ▼ Global fix of OUString("foo") to "foo" wherever possible
 - ▼ And many other scattered annoyances
- ▼ Tutorial: how to write plugins ...
 - ▼ http://wiki.documentfoundation.org/Clang_plugins
- ▼ Thanks to *Lubos Lunak (SUSE)* for mentoring.



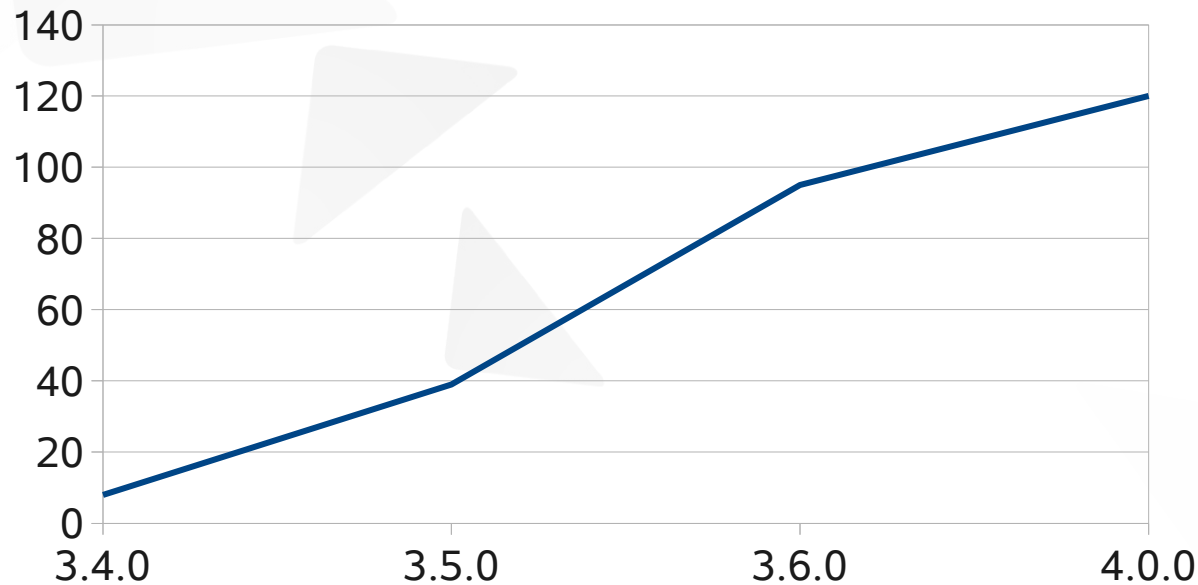
Retaining / Improving Quality
How can we do that ?

Unit testing for quality ...



- ▼ Improved quality through unit testing
 - ▼ Coverage & number of tests increasing rapidly
 - ▼ security regressions, document layout, formulae calcs etc.

Count of types of gnumake enabled unit tests
(each runs a battery of tests)



With many thanks to
Markus Mohrhard
(above)
Miklos Vjana
Kohei Yoshida
(SUSE)
Artur Dorda
Daniel Bankstone
(GSOC)
Caolan McNamara
Michael Stahl
(Redhat)
And many more
Who got tired of fixing
The same bugs ...

Bugzilla Assistant on freedesktop

- Connected to Help menu “Send Feedback”
- pre-populates version, component, etc. for you
- Avoids ~unusable default bugzilla / file bug UI
- Thanks to:
Loic Dachary & Rob Snelders



Bug

Bug Submission Assistant

Thank you for using LibreOffice. We regret that you seem to have found a bug in our software, but we are glad that you decided to report it. This assistant will lead you step by step through the bug reporting process.

1 Sign in

2 Component

3 Details

4 Description

5 Submit

Select component: Spreadsheet

Component Spreadsheet

For problems concerning the spreadsheet application. If applicable, please use one of the following key words in the Summary for more detailed specification: [CONFIGURATION](#), [EDITING](#), [FILEOPEN](#), [FILESAVE](#), [FILTER](#), [FORMCONTROLS](#), [FORMATTING](#) [Read more ... >](#)

Sub component: EDITING

Version: 4.0.0.0.beta1

Operating system: All

Latest known-working version: None

Subject:

Long description:

Problem description:

Steps to reproduce:

1.
2.
3.

All your contributions will be public in WWW! By clicking the 'Submit' button you irrevocably agree to release your contribution under the CC-BY-SA 3.0 License and the GFDL. If you can't agree to these terms for documents you planned to attach you can state in this report that such a document exists. QA team will discuss with you further proceeding in the bug.

Bug Submission Assistant is published under GNU GPLv2+. Download the sources with git clone <http://cgit.freedesktop.org/libreoffice/website>.

Th
!..



Release often, and predictably on-time ...

- ▼ A **time based, six-monthly** release train ...
 - ▼ **synchronized** with the Linux distributions cadence
 - ▼ ie. a normal Free Software project
 - ▼ rapid fire, (**monthly**) bug-fix releases: ~1x per 2 weeks.
- ▼ Any bugs only **partially fixed**: can be re-fixed in < a month.

LibreOffice Releases

By using a time-based release schedule and maintaining two parallel branches, LibreOffice will always be available both for early adopters and conservative users, with the most appropriate version for each group's specific needs and habits.

3.3 Family	3.3.2		3.3.3			3.3.4					
3.4 Family		3.4.0		3.4.1	3.4.2		3.4.3		3.4.4		
3.5 Family								3.5.0		3.5.1	3.5.2
Developers	daily snapshots of master / self-built versions										
Bleeding Edge	3.3.2	3.4.0		3.4.1			3.4.3	3.5.0		3.5.1	
Stable			3.3.3	3.4.1	3.4.2				3.4.4	3.5.1	3.5.2
Very Stable	3.3.2						3.4.3		3.4.4		
Rock Solid			3.3.3		3.3.3	3.3.4			3.4.4		3.4.4

QA / BiBisection – amazingly powerful



- ▼ Chasing regressions:
 - ▼ Highly coupled, fragile code in many places
 - ▼ Large scale changes going on all around ...
 - ▼ How can we find what broke it ?
- ▼ Git bisection prohibitively slow:
 - ▼ 4+ hour build time each time
- ▼ Bi(nary)Bisect (thanks to *Bjoern Michaelsen - Canonical*)
 - ▼ A single git repository ...
 - ▼ 1000's of (relocatable) binary builds of LibreOffice
 - ▼ just run “git bisect” ...
 - ▼ An non-developer can point to the ~20 commits
 - ▼ Few skills required: 10 tests in <10 minutes.
 - ▼ The magic of git packing makes this reasonable small

Sane debugging with gdb ...

- ▼ LibreOffice uses UTF16 to represent 90%+ ASCII strings
 - ▼ gdb can't cope with that – without some extra python:

```
...
#5  0xb7a4b220 in createTypeRegistry
(libraryDirectoryUri="file:///data/opt/OOInstall/ure/lib",
 uris="file:///data/opt/OOInstall/ure/lib/./share/misc/types.rdb ?
file:///etc/opt/ure/types.rdb ?file:///home/michael/.ure/types.rdb
<file:///data/opt/OOInstall/program/types>*  ") at
cppuhelper/source/defaultbootstrap.cxx:2132
#6  cppu::defaultBootstrap_InitialComponentContext
(iniUri="file:///data/opt/OOInstall/ure/lib/unorc") at
cppuhelper/source/defaultbootstrap.cxx:2181
```

- ▼ Massive improvement to debugging speed ...
- ▼ Uses Tom Tromey's awesome gdb / python work – checkout:
 - ▼ <http://sourceware.org/gdb/wiki/PythonGdbTutorial>
- ▼ Many thanks to *David Tardon* (RedHat)
 - ▼ This makes life incredibly sweeter ... and quicker.

Pure Hard-working Manual QA ...

- ▼ Amazing work done by the QA team ...
 - ▼ Particular thanks to: Rainer Bielenfeld, Joel Madeo, Joren De Cuper, Petr Mladek, Urmas and many others ...
- ▼ Triageing incoming bugs ...
 - ▼ Resolving duplicates
 - ▼ Correctly tagging / marking them 'most annoying'
 - ▼ Please get involved – see the [BugTriage](#)
- ▼ Running master builds ...

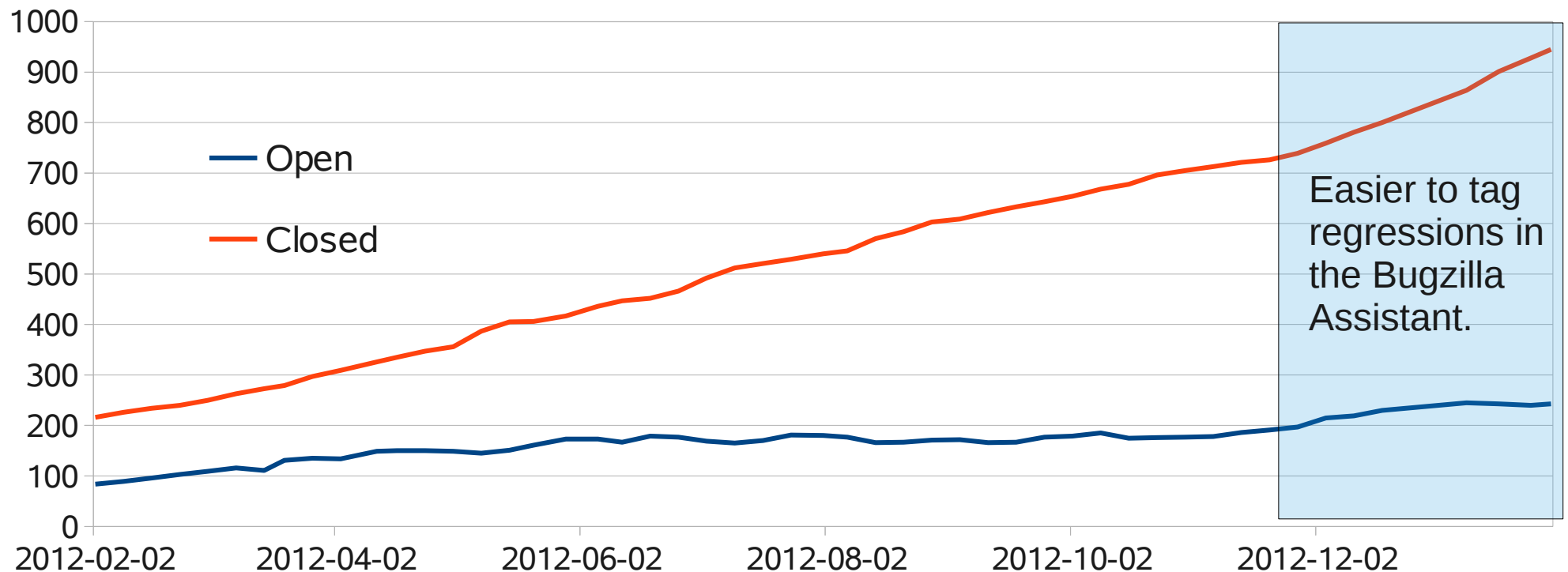
But Does it work ?

Can you really do significant, gratuitous, esthetic code change and re-factoring, and have fun without dying of regressions ?

Metrics help – watching the stats...

- ▼ Always nice to have a longer series but ... looks good:
- ▼ Generate these numbers for the ESC meeting each week ...

Regression bugs over time



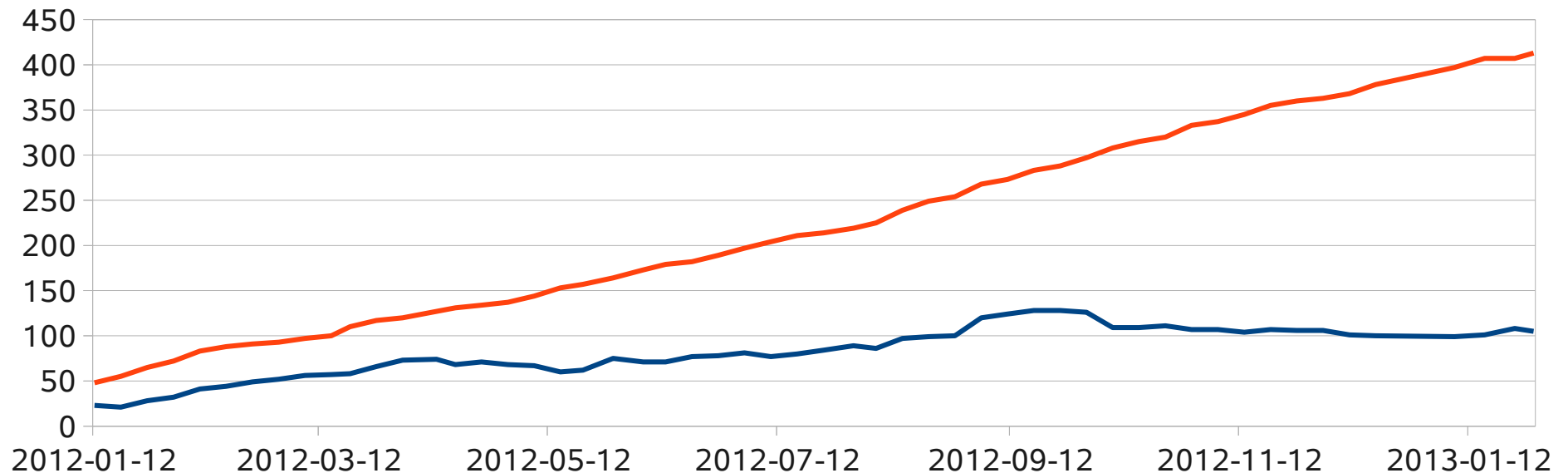
More prosaically in numbers ...

- ▼ We average ~1570 commits per month in the last 6 months
 - ▼ ~50 commits per day
- ▼ We've tracked ~450 regressions in the last 6 months
 - ▼ 2.5 per day
- ▼ **Iff** 1:1 commits:regressions
 - ▼ ~5% of commits cause a regression
 - ▼ Prolly fewer – some may cause several.
- ▼ Many regressions are fixed before we ship
 - ▼ More research appreciated on escaped regressions ...
 - ▼ some are inevitable
- ▼ Even one regression is too many
 - ▼ But cost/benefit wise we seem to do well.

Most Annoying bugs ...

- ▼ QA's prioritisation of the most serious bugs out there ...
 - ▼ Reflected in a set of tracker issues
- ▼ Shows a remarkable similarity to the regressions (why?)

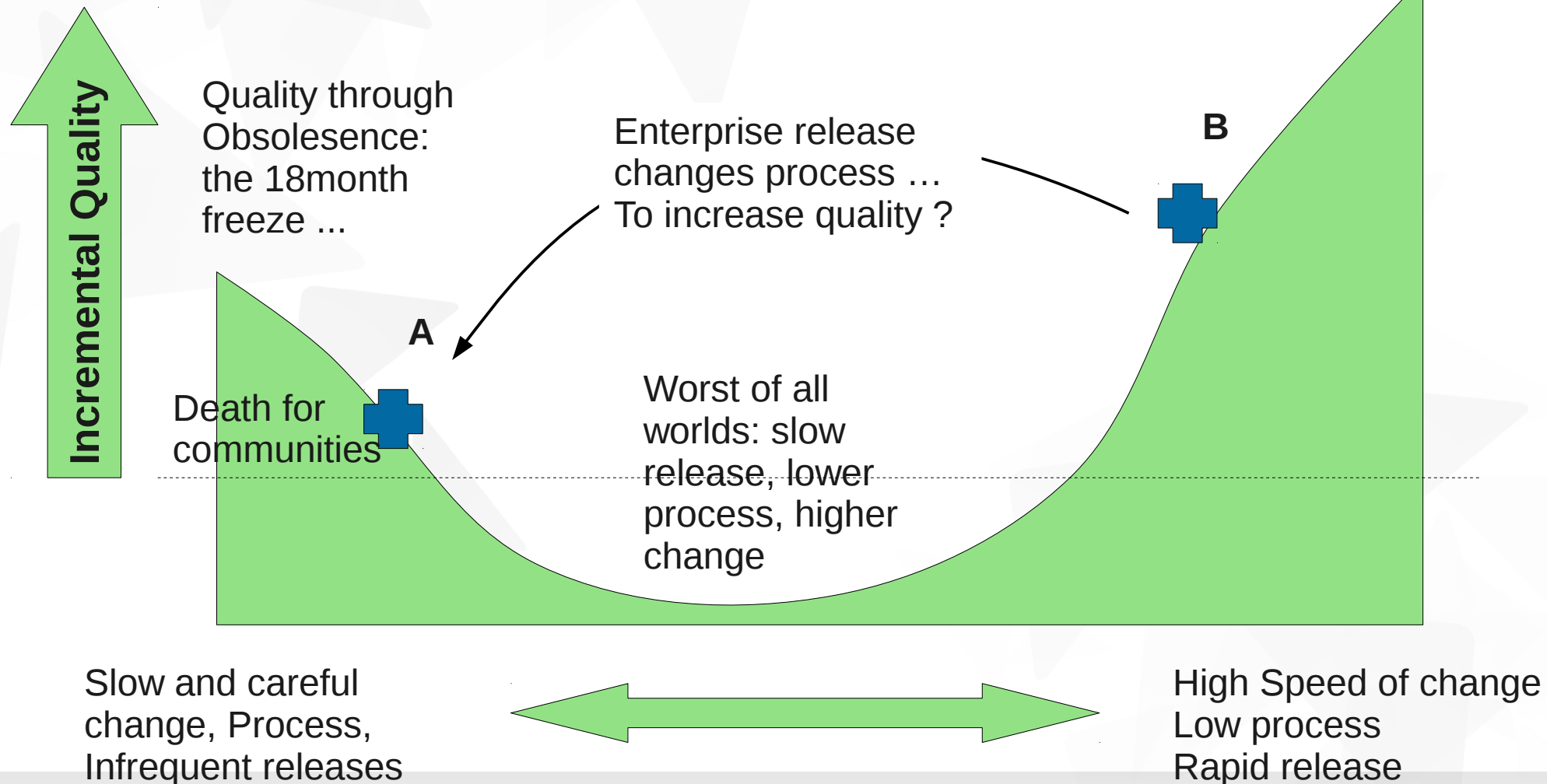
Total Most Annoying Bugs across all versions



A crazy picture of the space ...

- ▼ A hugely multi-variate problem space transected

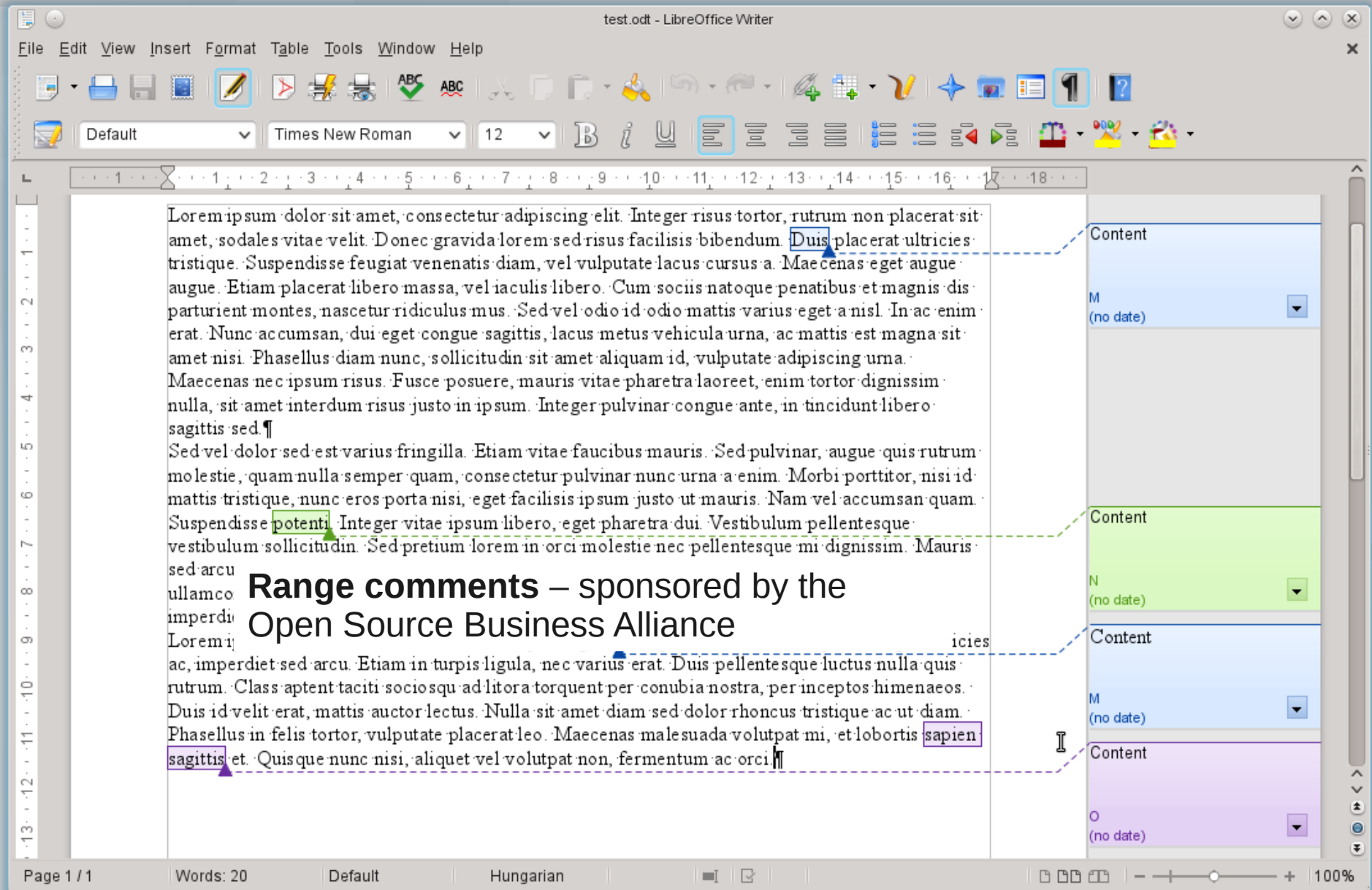
Bugs get fixed faster than you can create them.



**Applying the fun to features:
LibreOffice 4.0 – due next week.**
*a very quick & partial snapshot of
some of the new features*

Interoperability in 4.0

Core interoperability features



The screenshot shows the LibreOffice Writer interface with a document titled "test.odt". The document contains several paragraphs of Lorem Ipsum text. A range comment is applied to a section of the text, highlighted in light blue. The comment text is "Range comments – sponsored by the Open Source Business Alliance". The comment is visible in the right-hand pane, which shows a list of comments with their respective colors and dates. The comment is dated "M (no date)".

Range comments – sponsored by the Open Source Business Alliance

Page 1 / 1 | Words: 20 | Default | Hungarian | 100%

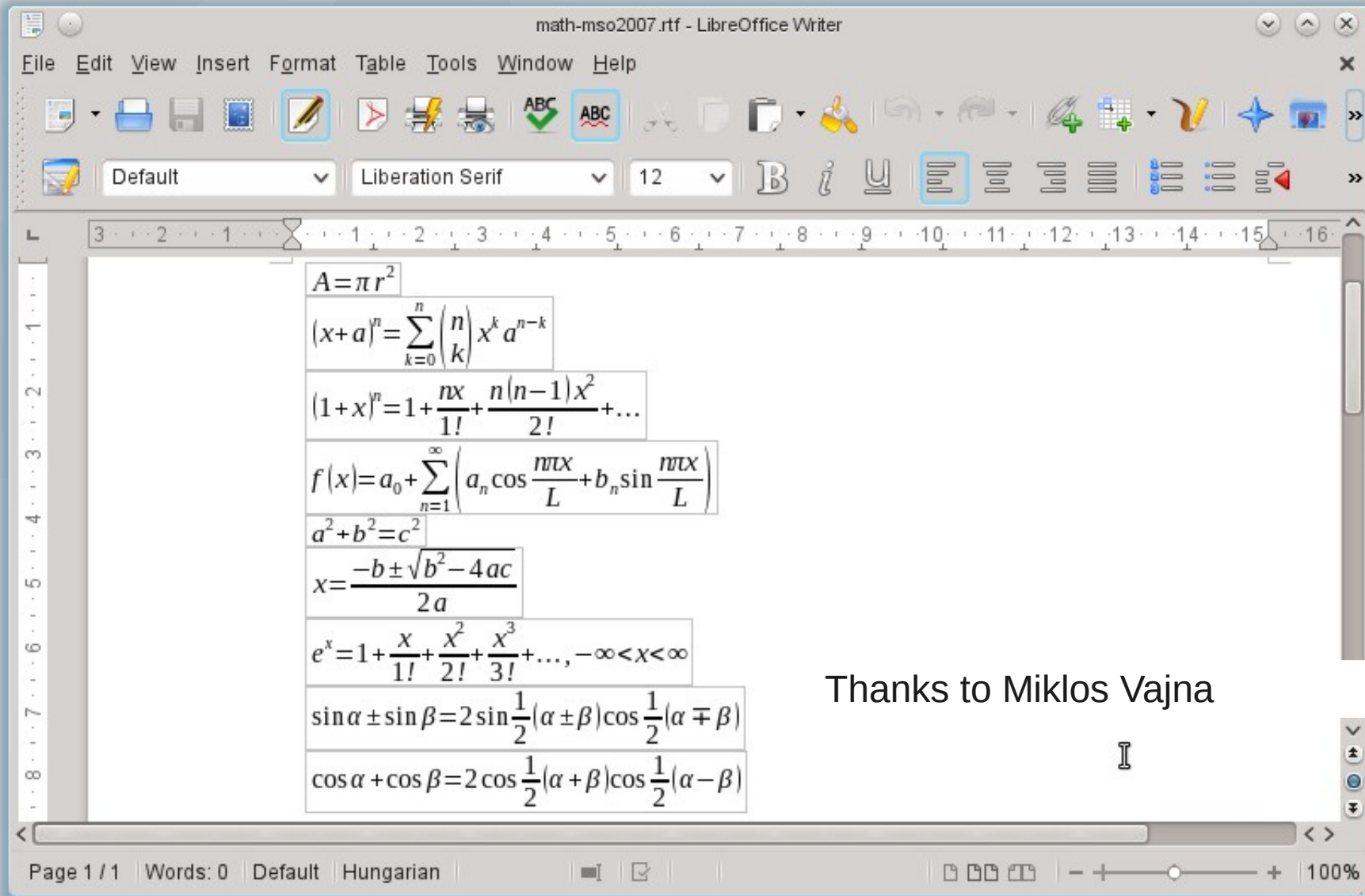
RTF: Drawing Object import

Same document in
LibreOffice 3.6

4.0

11 St' Menachem Begin Ramat Gan Israel 972-3-6339999 972-3-6296355		HRG Lachish Tours LTD		
		עוסק מורשה: 510817018		
To:	Mr. KAPLAN/LIOR	Co. Vat#:	510817018	
Address:		IATA No.	37-21078-4	
		Issue date:	24-Oct-11	
			337768	
		Start date:	27-Sep-11	
		Due date:	24-Oct-11	
ORIGINAL				
Invoice		60027		
For: Mr. KAPLANLIOR				
Service	Description	Amount	Tax	Cur
<input checked="" type="checkbox"/> Flight	Dep: 27-Sep-11 17:00 TEL AVIV - BGN APT ELAL 325T Arr: 27-Sep-11 PARIS - C. DE GAULLE	625.00	111.25	USD
<input checked="" type="checkbox"/> Flight	Dep: 16-Oct-11 00:20 PARIS - C. DE GAULLE ELAL 328V Arr: 16-Oct-11 TEL AVIV - BGN APT	0.00	0.00	USD
Total:		625.00	111.25	USD
Remarks:		+ Tax:	111.25	←
		TOTAL:	736.25	USD
		ETTI		

RTF improved eg. Formulae

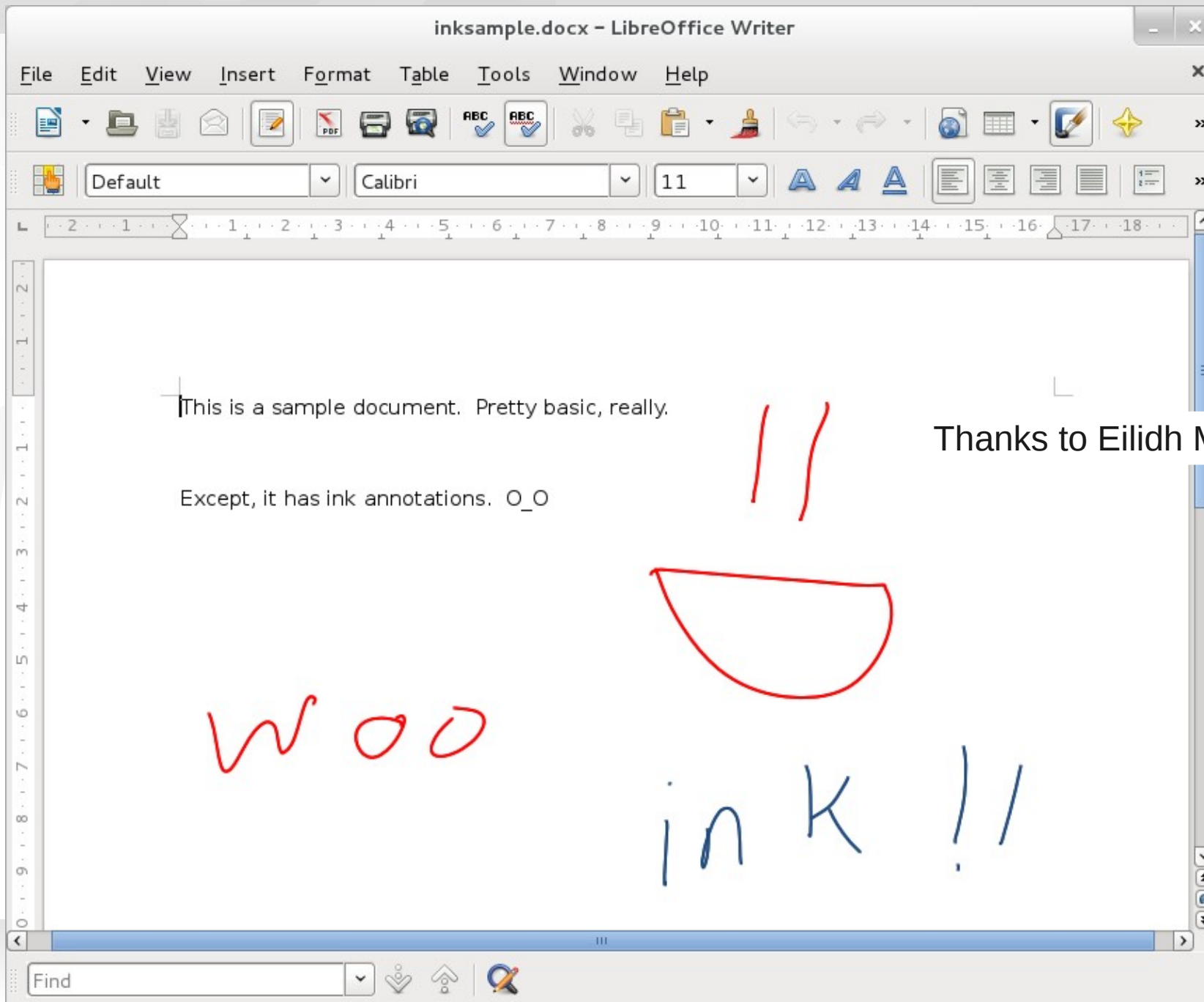


The screenshot shows the LibreOffice Writer interface with a document titled "math-mso2007.rtf". The document contains a table with eight rows, each containing a mathematical formula. The formulas are:

1	$A = \pi r^2$
2	$(x+a)^n = \sum_{k=0}^n \binom{n}{k} x^k a^{n-k}$
3	$(1+x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \dots$
4	$f(x) = a_0 + \sum_{n=1}^{\infty} \left(a_n \cos \frac{n\pi x}{L} + b_n \sin \frac{n\pi x}{L} \right)$
5	$a^2 + b^2 = c^2$
6	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
7	$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots, -\infty < x < \infty$
8	$\sin \alpha \pm \sin \beta = 2 \sin \frac{1}{2}(\alpha \pm \beta) \cos \frac{1}{2}(\alpha \mp \beta)$
	$\cos \alpha + \cos \beta = 2 \cos \frac{1}{2}(\alpha + \beta) \cos \frac{1}{2}(\alpha - \beta)$

Below the table, the text "Thanks to Miklos Vajna" is displayed. The LibreOffice Writer interface includes a menu bar (File, Edit, View, Insert, Format, Table, Tools, Window, Help), a toolbar with various icons, and a status bar at the bottom showing "Page 1 / 1", "Words: 0", "Default", "Hungarian", and a zoom level of "100%".

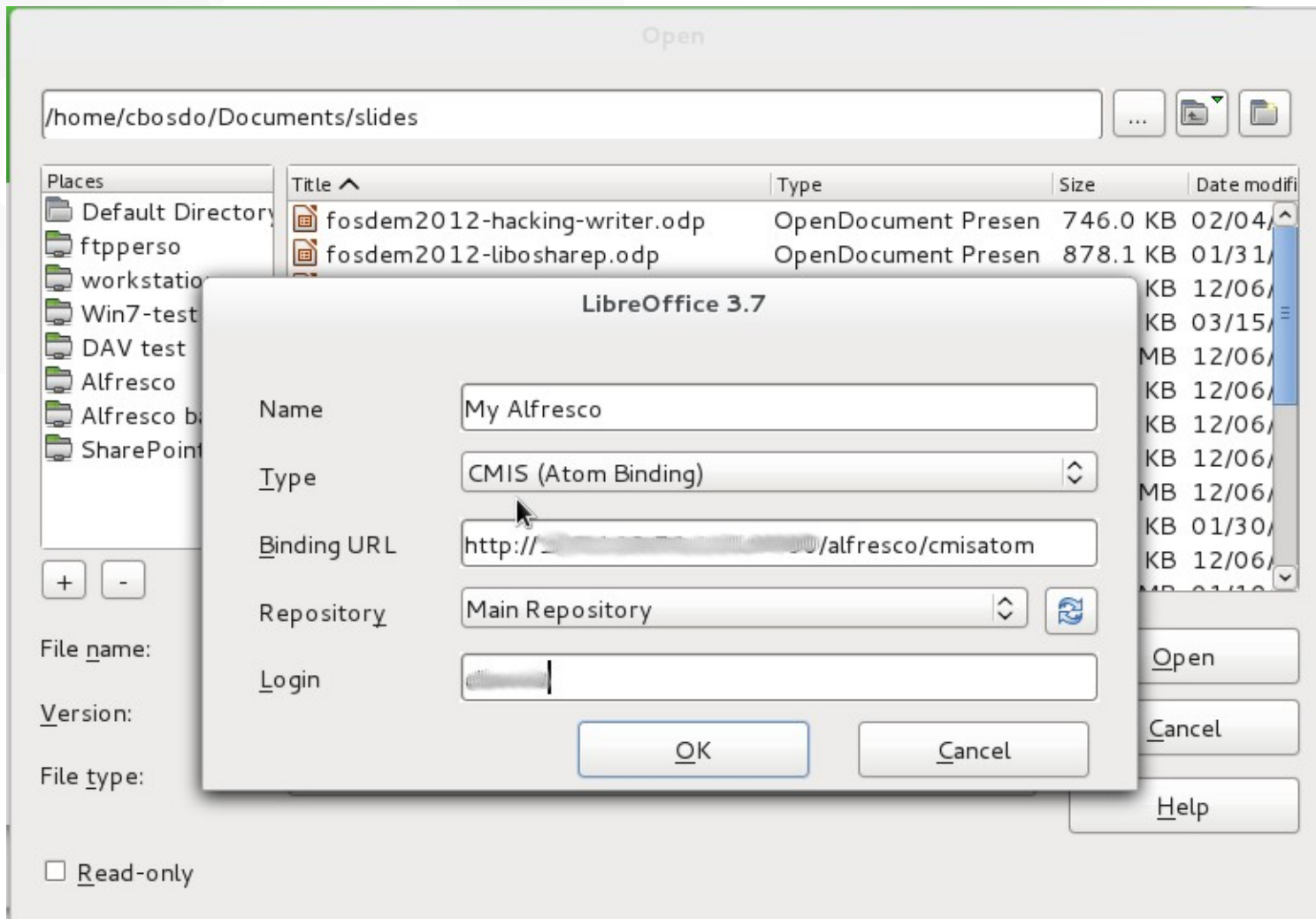
DOCX – ink annotation import



Thanks to Eilidh McAdam / Lanedo

CMIS: Sharepoint / Alfresco / Nuxeo ...

- Using the CMIS protocol – load / save / checkout to your favourite content / document management system:



Proprietary → ODF continues

Wordperfect, Works, Visio, Corel Draw ...

The screenshot shows a presentation slide within a software interface. The slide features a central image of a child's hands holding yellow daffodils. To the right of the image is a yellow box containing the text: "Развивать коммуникативность. Формировать основы нравственных знаний." Below the image is another yellow box with the text: "Партнёрские способы взаимодействия взрослого и ребёнка." To the right of this box is a third yellow box with the text: "Обучение детей средствам общения через игру." Below that is a fourth yellow box with the text: "Усвоение социальных норм и правил поведения." At the bottom left of the slide is an illustration of a man in a white lab coat pointing at a green chalkboard. To the right of the slide is a large white box containing the text: "Microsoft Publisher import thanks to Brennan Vincent (GSOC) Valek Filippov Fridrich Strba". The software interface includes a menu bar (File, Edit, View, Insert, Format, Tools, Modify, Window, Help), a page number indicator (1-30), and a status bar at the bottom showing "Layout / Controls / Dimension Lines", "16.49 / -2.03", "0.00 x 0.00", "Slide / Default", and "116%".

Visio: all file formats now imported

The screenshot shows the LODEV application window titled "Rack.vsdX - LODEV Draw". The main workspace contains a diagram of a server rack labeled "Site 5 Building F First Floor". The rack is 42 U high and contains the following components from top to bottom:

- 1 U: Patch Panel
- 5 U: (Empty)
- 1 U: Keyboard
- 8 U: Server 1 - 10.1.1.20
- 8 U: Server 3 - 10.1.1.24
- 8 U: Server 4 - 10.1.1.26
- 8 U: Primary Router
- 8 U: Mgmt Port: 10.1.1.15
- 8 U: Primary Addresses: 10.1.1.0/255.255.255.0, 10.1.2.0/255.255.255.0, 10.1.6.0/255.255.255.0, 10.1.7.0/255.255.255.0
- 2 U: Power Supply

An "LOdev" dialog box is open in the foreground, displaying the following text:

LOdev
Version 4.0.0.0.beta1 (Build ID: 87906242e87d3ddb2ba9827818f2d1416d80cc7)
LOdev is a modern, easy-to-use, open source productivity suite for word processing, spreadsheets, presentations and more.
This release was supplied by The Document Foundation
Copyright © 2000 - 2012 LibreOffice contributors and/or their affiliates
LOdev is derived from LibreOffice which was based on OpenOffice.org

Buttons for "Credits", "Website", and "Close" are visible at the bottom of the dialog.

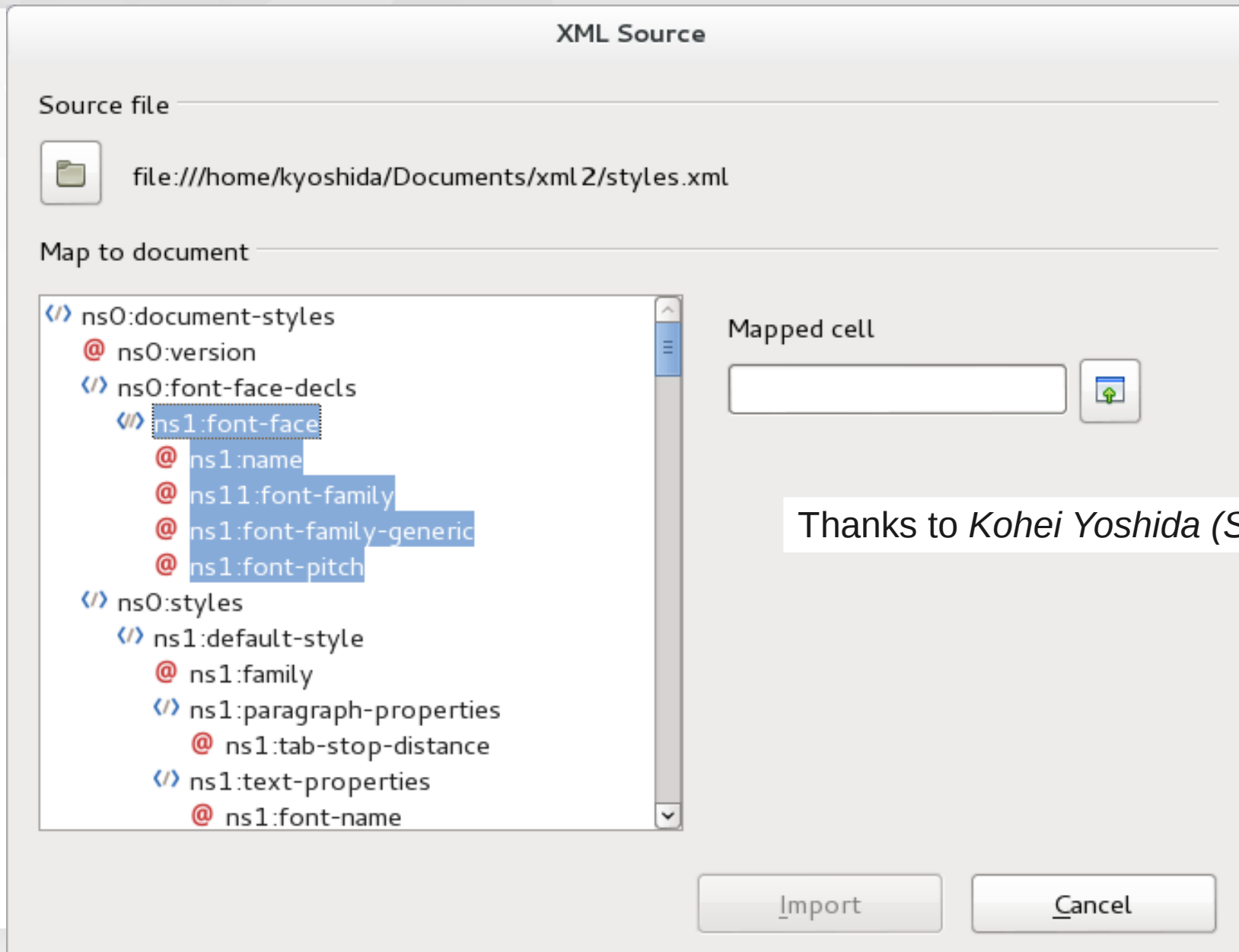
Thanks to
Fridrich Strba
Valek Filippov

Includes the **just-release**
Visio 2013 format.

Calc improvements ...





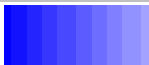





a few details on one component

Arbitrary XML → spreadsheet



Thanks to *Kohei Yoshida (SUSE)*

Conditional fmts: bars + icons

	A	B	C
1	Name	Score A	Score B
2	Mary	 16.38%	 65.98%
3	Bob	 22.35%	 32.36%
4	Abdul	 22.61%	 13.90%
5	Holly	 49.00%	 77.50%
6	Oak	 17.57%	 18.98%
7			

Many thanks to:
*Markus Mohrhard &
Stefan 'Astron' Knorr*

Stock option pricing formulae ...

pricing.ods - LibreOffice Calc

File Edit View Insert Format Tools Data Window Help

Sans 10

MAX =E\$17*OPT_BARRIER(B\$7,B\$8,B\$12,B\$13,E\$9,E\$10,E\$11,E\$12,E\$13,E\$14,E\$15,E\$16,H12)

OPT_BARRIER(spot, vol, r, rf, T, strike, barrier_low, barrier_up, rebate, put/call, knock in/out, barrier_type, greek)

1 **Black Scholes Model: $dS/S = (r-rf) dt + vol dW$**

2 **Option value: $exp(-r T) E[payoff(S_T)]$**

3 valuation of barrier options

4 payment happens at maturity T

market		contract	
spot	1.2	today	1-Oct-2012
vol	12.0%	maturity	1-Dec-2012
rate (domestic)	1.0%	T	0.167
rate (foreign)	3.0%	strike K	1.1
		barrier lower	0
		barrier upper	1.5
		rebate	0
		(p)ut or (c)all	c
		knock-(i)n or knock-(o)ut	g
		(c)ontinuous or at the (e)nd barrier	c
		notional	1000

		market quotation		
		domestic	foreign	
vanilla put/call	price	96.924	96.924	80.770
	delta	953.472	953.472	1144.166
	gamma	872.703	872.703	1047.243
	theta	1497.247	17.967	14.972
	rho	7.876	0.022	0.018
	vanna	43.239	0.432	0.360
	volga	-1262.911		
	rho	175.020	1.733	1.444
	rhof	-191.218	-1.856	-1.547
	hit barrier	0.00%		
	S_T in money	95.37%		

Thanks to Tino Kluge

=E\$17*OPT_BARRIER(B\$7,B\$8,B\$12,B\$13,E\$9,E\$10,E\$11,E\$12,E\$13,E\$14,E\$15,E\$16,H12)

19

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26

27

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touch, barrier, hedging, compare with saved

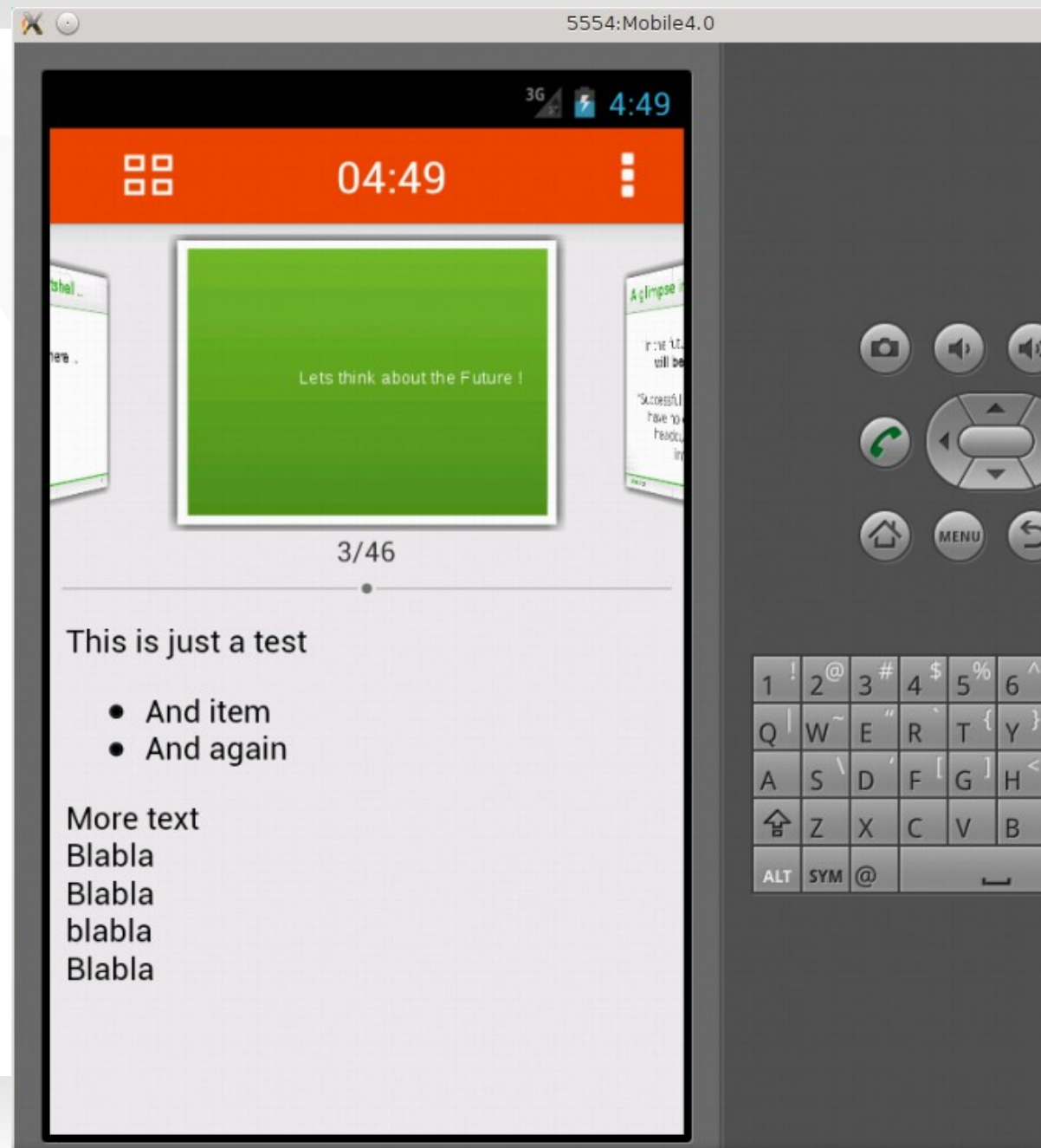
Sheet 2 / 4 PageStyle_barrier Sum=1013.769 100%

Fun improvements ...

Those features that make life better

Android remote control ...

- Thanks to *Andrzej J. R. Hunt (and GSOC)*
- Use your smart-phone as a powerful remote control
 - see your notes
 - switch slides
 - up-load your slides ?



Android remote control ...

5554:Mobile4.0

- ▶ Pretty slide sorter / selector
- ▶ Clock / count-down etc.
- ▶ Potential future work
 - ▶ accelerometer / laser pointer ?
 - ▶ fuse with viewer code to allow projection from a tablet ?
- ▶ Should ship in 3.7/4.0

Lets think



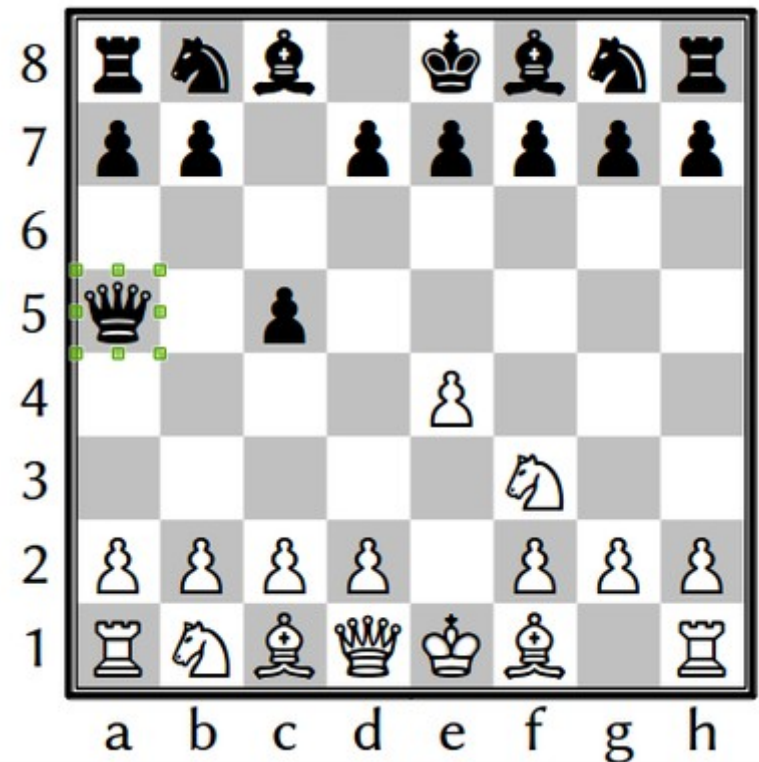
Schools: LibreLogo integration ...



A tiny Python implementation

If schools teach 'typing' instead of programming: ensure they have no excuse: add a localised, pretty training language in the office-suite !

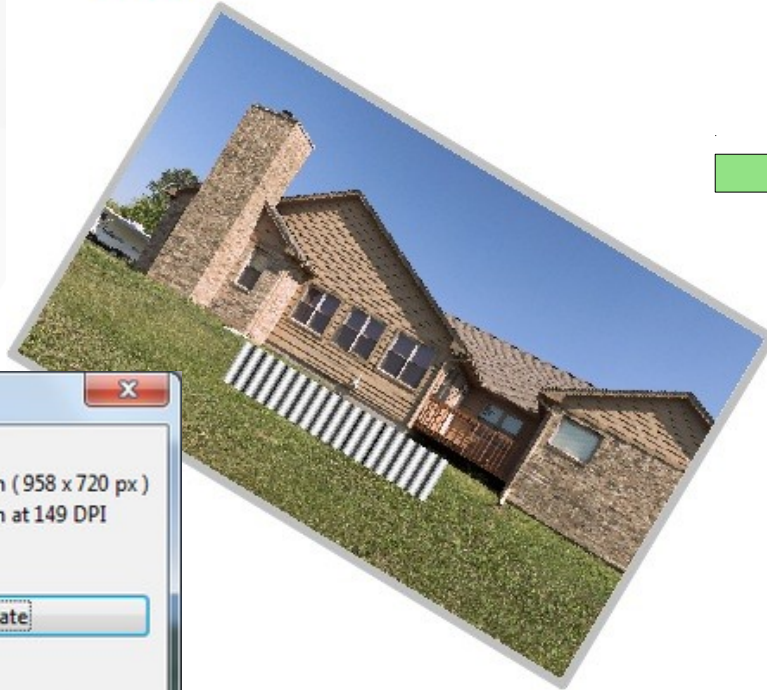
Thanks to Laszlo Nemeth



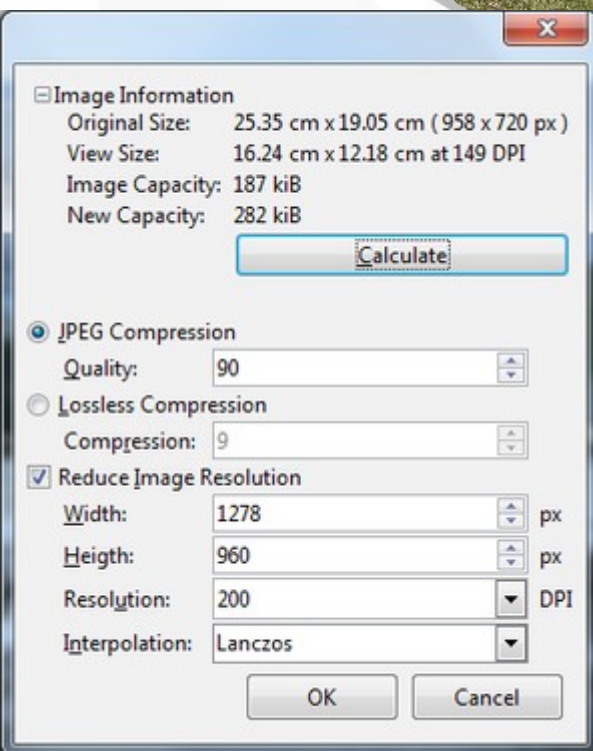
UI improvements ...
or how we're looking less awful

Improved graphics scaling

OLD:



NEW:



Higher quality image rendering

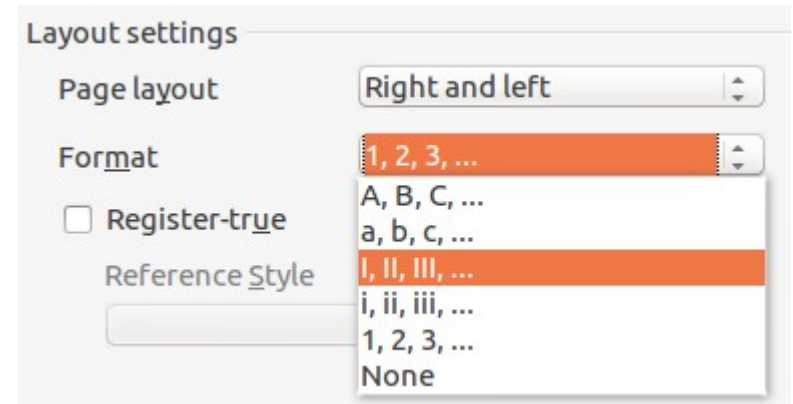
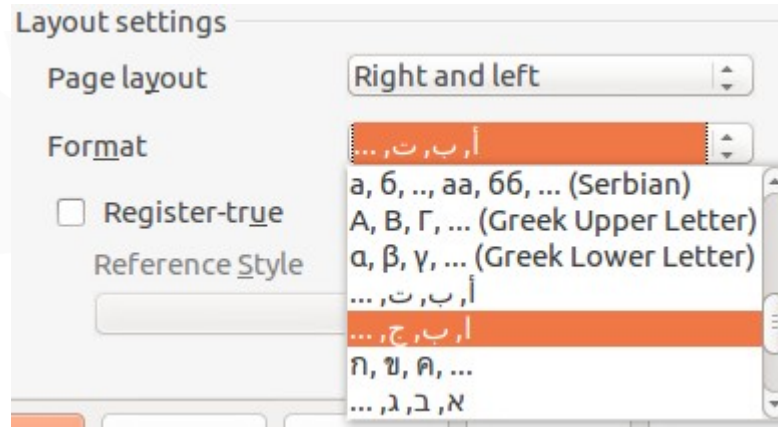
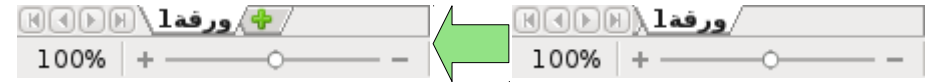
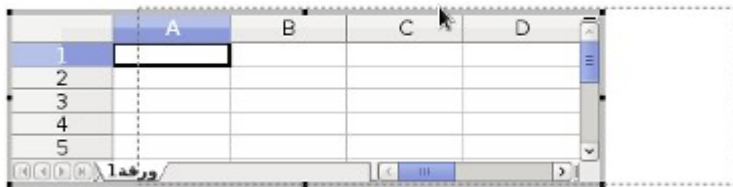
Improved image smoothing tool

Re-sizing, re-scaling, and adapting compression of embedded objects now possible during editing.

Thanks to Tomáš Vajngerl

Snapshots of the great work from KACST : Motah Getting Arabic & Right-To-Left right.

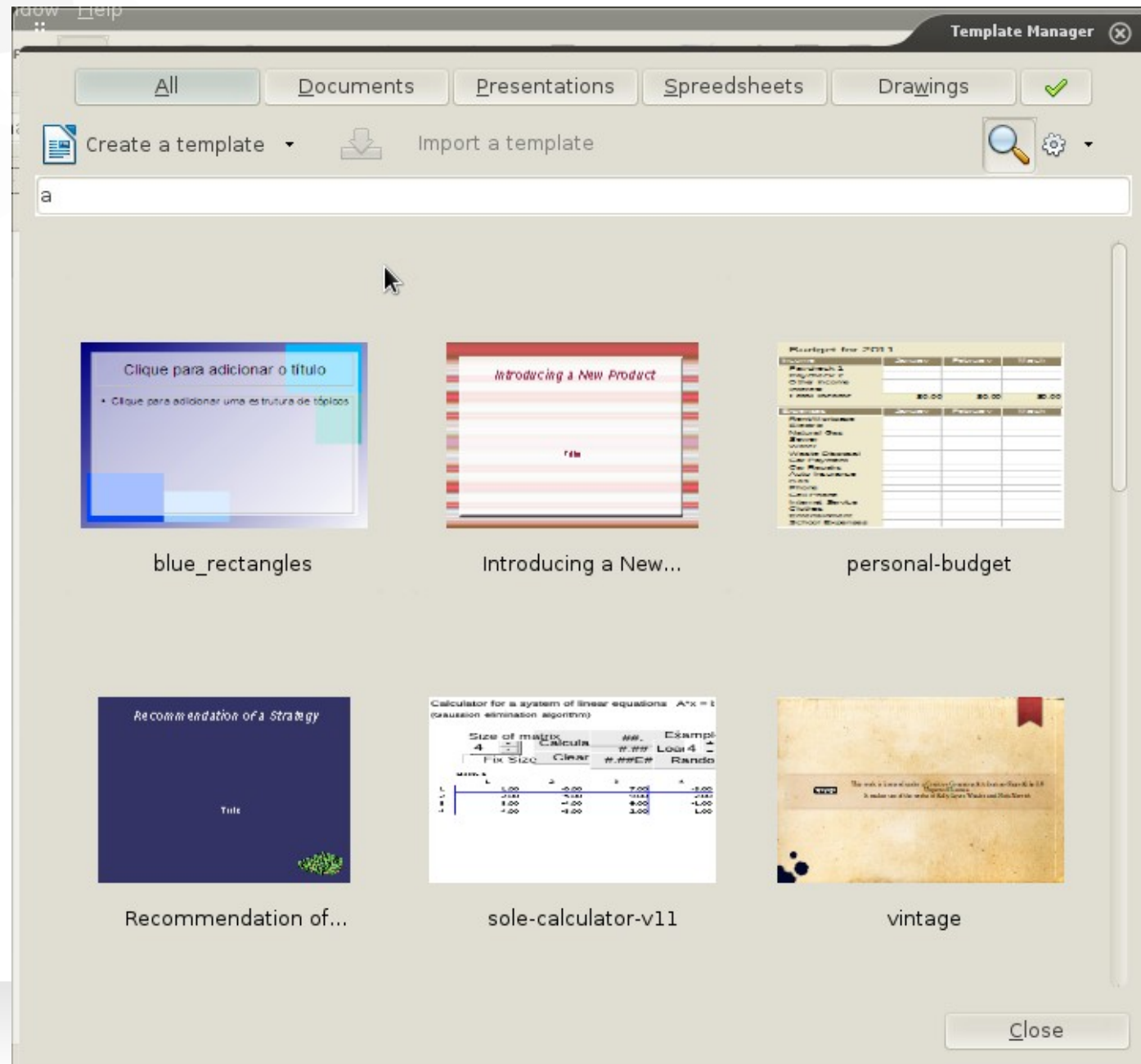
Funky OLE object dragging fixed.



And much more; see above link.

New Template selection UI

- Thanks to *Rafael Dominguez (GSOC)* and *Cedric Bosdonnat & Design team*
- Making template selection and search prettier & simpler.



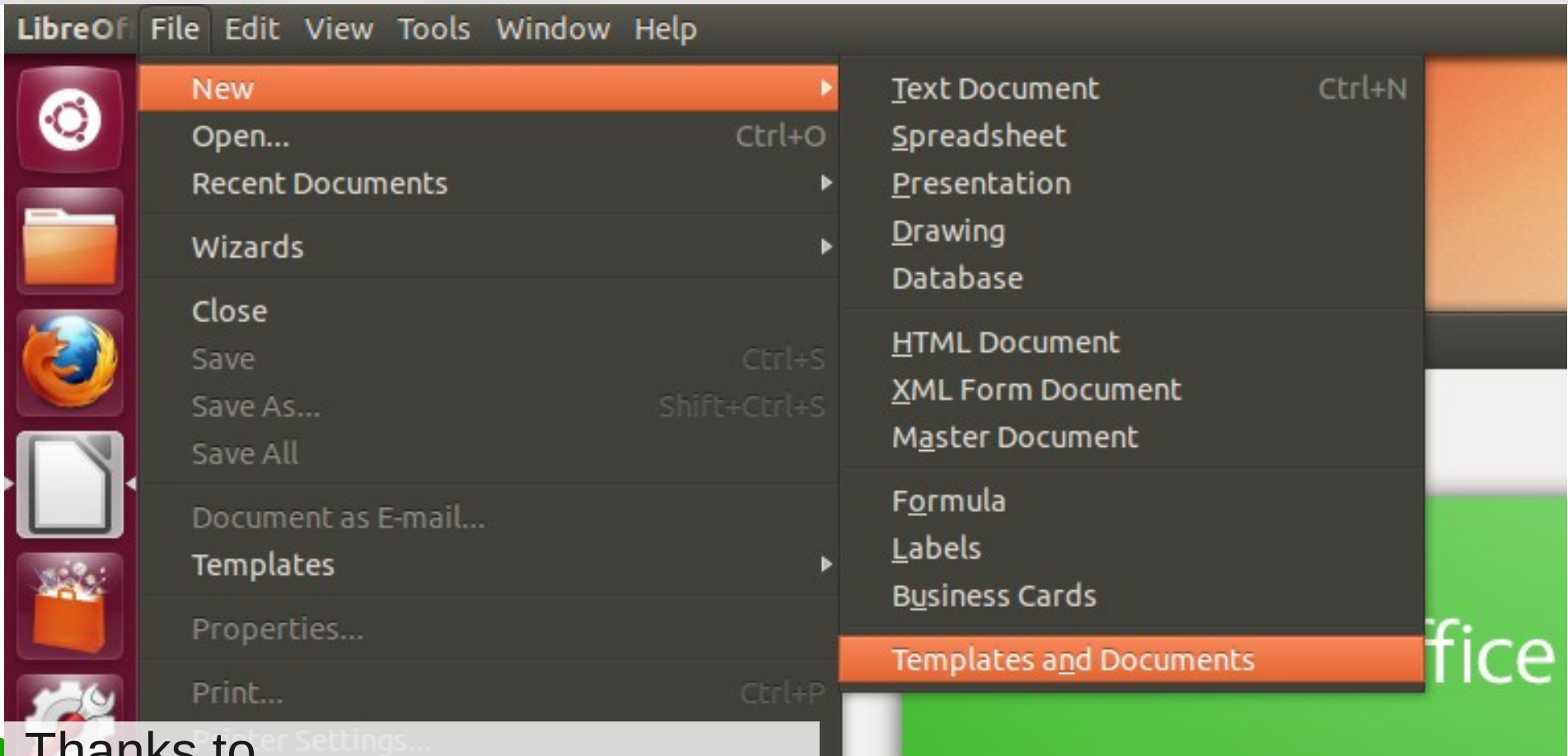
Style previews in drop-down

- Thanks to *Jan Holesovsky*
- Making styles easier to use.



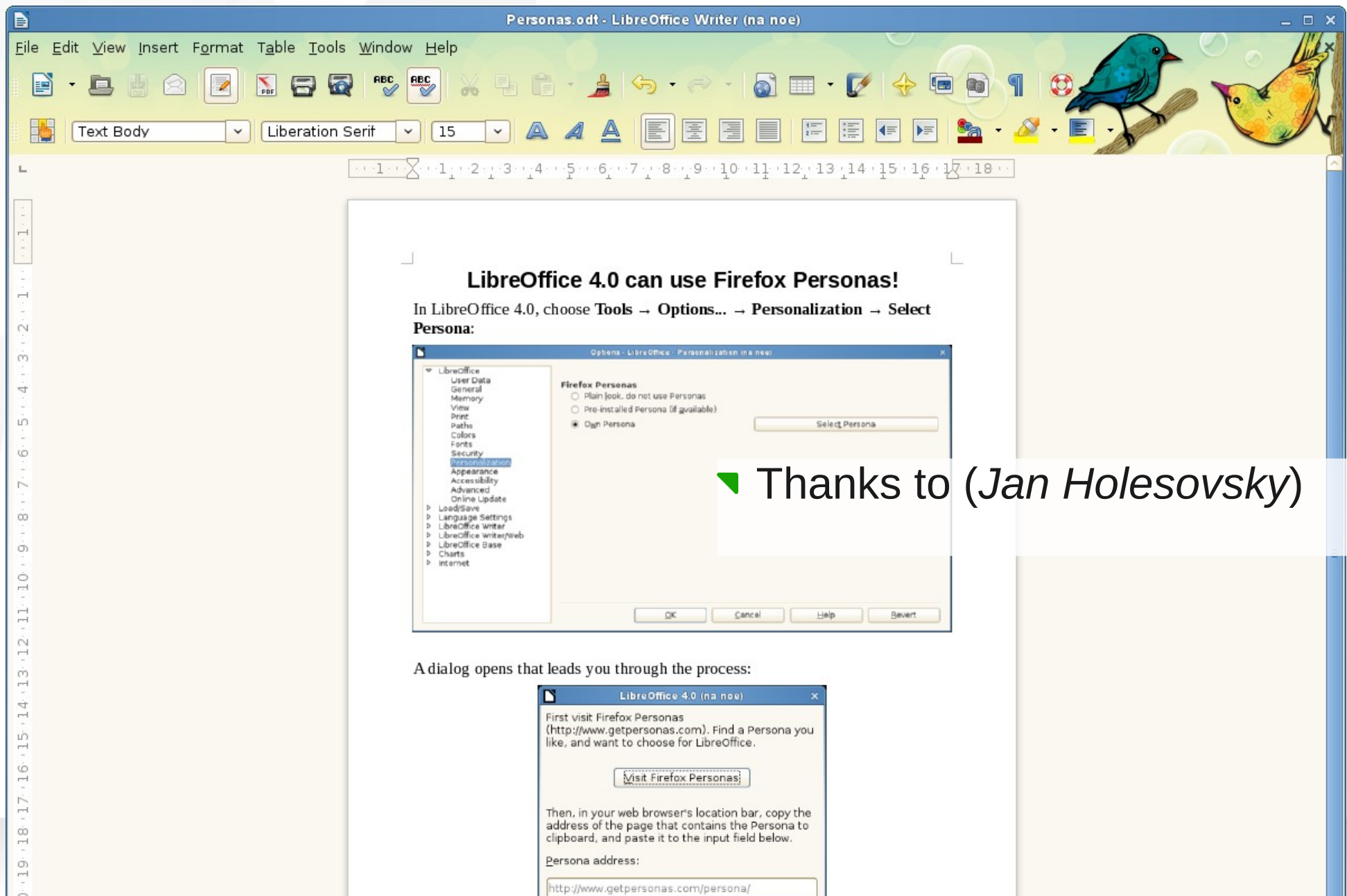
The screenshot shows the LibreOffice Writer interface. The title bar reads "Untitled 1 - LibreOffice". The menu bar includes File, Edit, View, Insert, Format, Table, Tools, Window, and Help. The toolbar contains various icons for file operations and editing. The style selection area shows "Text Body" selected in the style dropdown, "Liberation Serif" in the font dropdown, and "12" in the size dropdown. A drop-down menu is open, showing the following options: "Clear formatting", "Default Style", "Heading", "Heading 1" (with a red underline), "Heading 2" (with a teal underline), "Heading 3", "Text Body" (highlighted in blue), and "More...". To the right of the menu, three lines of text demonstrate the styles: "This is Heading 1" (red, underlined), "And under that, Heading 2" (teal, underlined), and "Heading 3" (black, bold). Below the bold heading, the text "And of course, the Text Body here..." is shown in the default text body style.

Unity menu integration



Thanks to
(Antonio Fernandez, Björn
Michaelsen, Alberto Ruiz, Ryan
Lortie, Ted Gould)

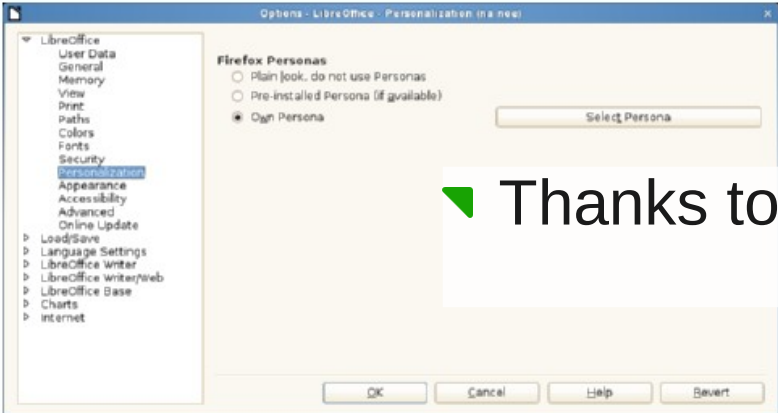
Personas ... shared with Firefox



The screenshot shows the LibreOffice Writer interface with a document titled "Personas.odt - LibreOffice Writer (na noe)". The document content includes the following text:

LibreOffice 4.0 can use Firefox Personas!


In LibreOffice 4.0, choose **Tools** → **Options...** → **Personalization** → **Select Persona**:



The dialog box shows the "Personalization" section selected in the left sidebar. Under "Firefox Personas", the "Own Persona" option is selected, and a "Select Persona" button is visible.

▼ Thanks to *(Jan Holesovsky)*

A dialog opens that leads you through the process:



The dialog box contains the following text:

First visit Firefox Personas (<http://www.getpersonas.com>). Find a Persona you like, and want to choose for LibreOffice.

[Visit Firefox Personas](#)

Then, in your web browser's location bar, copy the address of the page that contains the Persona to clipboard, and paste it to the input field below.

Persona address:

Conclusions & Thanks ...



- **LibreOffice continues to grow & execute**
 - paying down decades of technical debt
 - Adding features / function and re-factoring
- **Accelerating change using sharp tools & good QA**
 - without introducing regression spikes
- **We have fertile work for new contributors**
 - Want to make a real difference ? Apply here ...
- **Thank you for your support !**

Oh, that my words were recorded, that they were written on a scroll, that they were inscribed with an iron tool on lead, or engraved in rock for ever! I know that my Redeemer lives, and that in the end he will stand upon the earth. And though this body has been destroyed yet in my flesh I will see God, I myself will see him, with my own eyes - I and not another. How my heart yearns within me. - Job 19: 23-27



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