



BUILDING A LIBREOFFICE DEVELOPMENT TEAM

László Németh team leader LibreOffice dev. team NISZ Zrt., Hungary nemeth@numbertext.org TIRANA | 25 September 2018



BUILDING A LIBREOFFICE DEVELOPMENT TEAM





Agenda

- Gallery of our nice results
- Our mentoring program with the secret sauce
 ;-)



KEYWORDS sustainability brain gain* growth mindset

* https://en.wikipedia.org/wiki/Human_capital_flight



LibreOffice is a GREAT office suite





UNIQUE COMBO

- · Full-featured
- Open source
- Community-driven development
- · Cross-platform and online!
- Standard formats
- Broad spectrum of services: from free TDF LibreOffice builds to L3 support and private cloudbased solutions from certified developers





WITH GREAT SOCIAL BENEFITS

- For public sector, against monopoly (see Microsoft scandals in different countries)
- Against social inequality in wealth (freeware builds), knowledge (open source) and language (broad l10n support)
- Against software piracy (see data & civic, corporate and governmental responsibility)





"Anything that can go wrong, will go wrong."

- Lots of features
- · Huge code base
- Under active development
- By relatively small developer community (hundreds of code contributors, but only a few dozen full-time developers)
- New bugs & regressions



Every user needs continuous, sustainable LibreOffice development



Anyone can become a LibreOffice developer



Build your own LibreOffice development team!



Solve your own problems



Creating a more powerful developer community, sharing the costs and results of the development

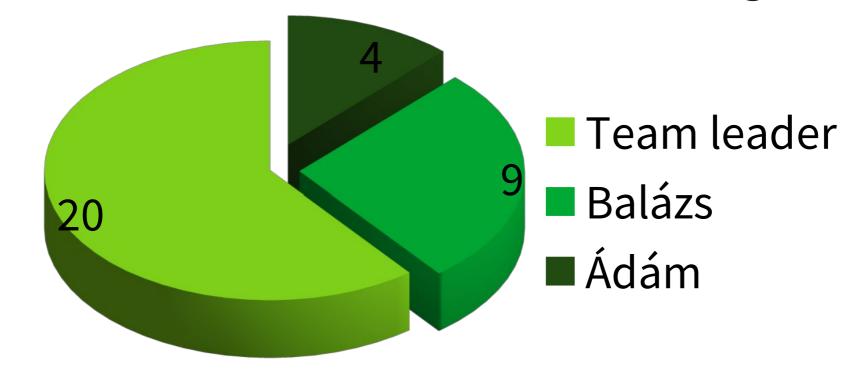


Increasing LibreOffice's popularity, catching the upward spiral



Our team

3 developers, NISZ Zrt., Hungary
3-month trial period from June, 2018
33 fixes (from our selected 300 bugs):





OUR RESULTS



Better interoperability by bug fixing and workarounds



No missing e-mails

Blocked e-mails with DOCX export of LO containing "EMF" metafile images

Bug in LibreOffice file export: automatic and unnecessary renaming of image extension .emf to .wmf

Solution: keep the original .emf extension #103913





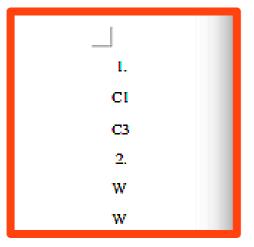
No table loss by CRs

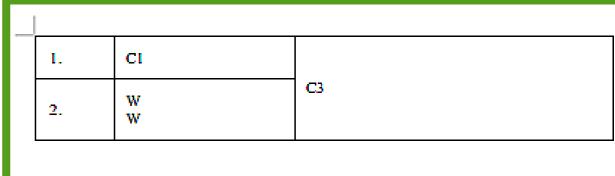
1981 MS-DOS adopts CR LF line ending

2010 MSO: OOXML gets <w:cr>

201x LO DOCX import: table loss by CRs

2018: fix ooxml/model.xml @#118691









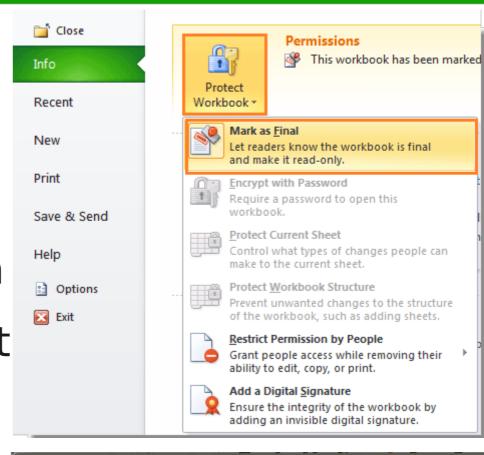
Protect our documents

"Mark as final"

Basic MSO protection

Custom XML extension

Solution: import/export pairing of the similar "Open as Read-Only" document setting of LibreOffice #107690

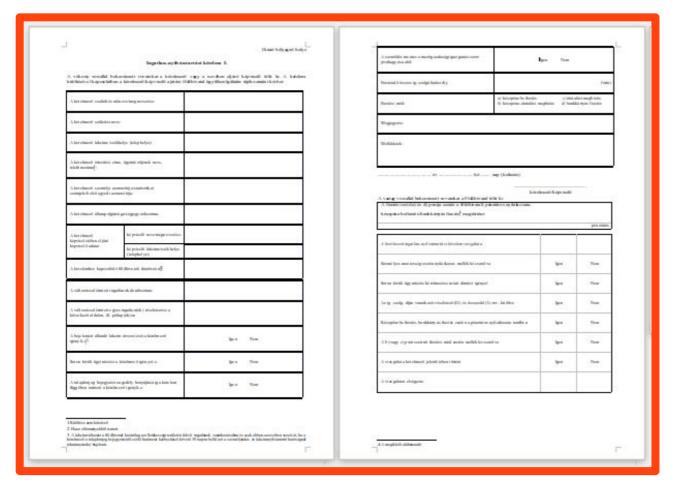








No broken forms ...



After: correct 1-page form

Before: broken 2-page form

			tk	tato bely quo
	Ingattan-nytiva	intartisi kërelem I.		
	cretezett rovatolast a kerelme		a banda a	and the second
	a k crelmezo k epviselo a janto			
A lerelment cudadi és utáneve/megneventse		II o		
A lérelment artilette nev		3		
A lérelmező laketmelerék	hdye (tdephdye):			
A lévelment értestése etre tide fonotimal:	e, ügantézőjének neve,	10		
A lérelman szemdyi sze szánjelobdső gyedi szo		i i		
A lerelment allampolgan		3		
A lévelment	képrisélő nevelmegnevezése			
kepriselenben eljaro kepriselo adata	képviselő lakarne/welchdye (telephdye):			
A lérelembez kapsolódó				
A willtonised crinitati inga				
következő oldalon, ill. pót		4		
A bejelestet állandó lakei igtnyli el:	m strone kiet a kerelmező	To To	n Nem	
Soron levüli ügyintézést a		lp.		
Blagg/ben tagtastt a kerdre	ngoddy henytijtaatig a kêrelan eatigenylse:	T _D	n Nem	
A sterződésmentesa mez jóráhagyása aldi:	Specially special sory	To .	n Nem	
Piactendo assess ig scolg	latte de	3		5
Piactos mod		 a) késepénz hefizzáés b) késepénz-átatalás meg 	c) statu	dai moghizas detyda foxtós
Megegyzex				
Mclicklack				
McEcklotek				
	- h	em (feileste)		
	oho	nup (k ciłozóx)		
······································		kerelm	colkprisch	-
A vastag vonallal bekore	er ho	k črelm dti k i	co-k-pvich	
A vastag v on allal bekeet A factore med a) es d)	cects revate kat a Poldhivatal to	k črelm dti k i	co/kopvách	
A vastag v on allal bekeet A factore med a) es d)	ecett rov stokat a 10 kh ivatal ti ponija esetin a 10 kh ivatali pen	k črelm dti k i	cat-kapviscit	
A vantag v omaliki bekeze A fizeten mod u) es d) kenpen abefizete/bud	icaett revutelat a 19 ldi ivatal 0 poetja caetta a 19 lliko stali pen klainyas foetolf meg@eteni	k črelm dti k i	co kovich	pčrota
A vastag vonalihi bekace A factos mod a) ord) koopen abefactosbani	iczett rovatokat a 1934h irostal ti postja czecni a 1944h irostal pen i kintyda fizetieł meg@steni simortal kirolon stratalata	k črelm dti k i		
A vantag vonallal bekere A faceten med a) es d') kesspén abefacetes/ban A berdecart ingarlassen/i Strendyo-mentacióg cos Sona bord/o-facetes-la	ceett rovatokat a 193di ivatal 0 pontja eseen a 194li svatal pen ikatiyas faretol meg Ørtent sismariat kirolon fizitista et neplalikost, melikki esativa rofonete mali dasti steret	k erelm hir k i prince sen y shriko sastu:	lgen lgen	Nem Nem
A vastag vonalial bekeel A fareten mod a) es d) keupen abefaret injuleasmil A beinheart injuleasmil Sternel/en instentionig exi- Soun in volid (nymetees). Ar 1g. oxid; faira vonalia	icenti novatolati a 10 Ministali ili pontija esetti a 16 Ministali pen klastytas functosi megili oteni simoratai kireleni implatasa en neglialikusat mellekkit osativa refinencija mati dostoti genyel um endratori ili je nimuratio ili je nimuratio ili	kerelm hiski kerelm ntarosmy vlako satu	lipn lipn lipn	Nem Nem Nem
A vaning vormilled bedeered A fineteen med a) or d) k coopen abe finetee/basi A beinferant ingualisassyrii Sternellyon menteoolig ook Sternellyon in the sternell ook Sternellyon in the sternell ook Sternellyon in the sternell ook Keepteen bellig a (ik.) basili Keepteen bellig a (ik.) basili A bi vage; olposit sternell	icacti novatolest a 10 Ministratal to pontija caccin a 6 Ministrati pen ikiattyste functorij meg to etent simoretal kirelom impliatora transplatikovat, med kikit ostalova refinencja mati dostoti gatyci om redutero 10 J. i ostavensto 11 J. Jatyja functio cactin a primitarom functio mati etentim albiteti saste	his ke seelm kerelm manoony slako zata:	ligan ligan ligan ligan	Nem Nem Nem Nem
A vastag vonalisi bekeel A fintten mad a) (n d) k koopen abefinete/bari A beinkeret injanisamii Sternelyo menteni g cel seun ikviji (gyrete exis ke vijek ja kijanisamii	icacti novatolest a 10 Ministratal to pontija caccin a 6 Ministrati pen ikiattyste functorij meg to etent simoretal kirelom impliatora transplatikovat, med kikit ostalova refinencja mati dostoti gatyci om redutero 10 J. i ostavensto 11 J. Jatyja functio cactin a primitarom functio mati etentim albiteti saste	his ke seelm kerelm manoony slako zata:	lgen lgen lgen lgen	Nem Nem Nem Nem
A vastig vorallid bekeer A factor med a) er dij kessperabefacter bard A herbezer lingulasmyil Sternelyesterinsing exi- Som bordi agyrizerska Charles and a sternelyesterinsing exi- Som bordi agyrizerska A bi vay optost acurin A vasagida factriensio ja	icacti novatolest a 10 Ministratal to pontija caccin a 6 Ministrati pen ikiattyste functorij meg to etent simoretal kirelom impliatora transplatikovat, med kikit ostalova refinencja mati dostoti gatyci om redutero 10 J. i ostavensto 11 J. Jatyja functio cactin a primitarom functio mati etentim albiteti saste	his ke seelm kerelm manoony slako zata:	ligan ligan ligan ligan	Nem Nem Nem Nem
A vantag v sanillal bekeete A fasten und al ved J keopénabefasten/base Marchaete fasten/base Marchaete fasten/base Marchaete fasten/base Marchaete fasten/base Marchaete fasten/base Marchaete fasten/base fasten/	icacti novatolest a 10 Ministratal to pontija caccin a 6 Ministrati pen ikiattyste functorij meg to etent simoretal kirelom impliatora transplatikovat, med kikit ostalova refinencja mati dostoti gatyci om redutero 10 J. i ostavensto 11 J. Jatyja functio cactin a primitarom functio mati etentim albiteti saste	his ke seelm kerelm manoony slako zata:	ligan ligan ligan ligan	Nem Nem Nem Nem
A vastig vorallal bekeer A factors med aj ci-dj k cuperarbefacterboar A hovelezar inganianoji Sternelyeamentosi g cet Soma lavrit digrateza-lav Kongren bekaret-lavak A vastigila kateriari A vastigila kateriari A vastigila kateriari A vastigila kateriari A vastigila kateriari A vastigila kateriari Kateria maniariari	schett novatoloit a 10 Min install per mittigs schett a 10 Min and pen skartyste floretoit meg thirties skartyste floretoit meg thirties skartyste floretoit meg talletoit in myllallovat schett estalvia reflerecte mest detect getred startystistics controlletoit estalvia skartystistics controlletoit estalvia floretoit mest detect getred skartystistics controlletoit estalvia floretoit mest detect estalvia floretoit mest detect estalvia floretoit mest detect estalvia floretoit mest detect estalvia floretoit mitigat.	hi ki kerelm maso any dalao zata: may katoline may katoline may katoline may katoline	lipan lipan lipan lipan lipan lipan	Nem Nem Nem Nem Nem
A vaning vansilal bekeer A finction and a) of d) keepenabeefunctohuse A bevious displayment Soundy-stratesing out Soundy-stratesing out Soundy-stratesing out Soundy-stratesing out Soundy-stratesing out And by a going displayment Keepena befaste, belong Keepena befaste, belong An vangilal of belong An vangilal of An vangilal of Soundy-stratesing Keepena belong Keep	conti novatolosta Polidi instala el protegio cescia a Bolidia sidali per generale del protegio del dicatopia funcio il megatinto dissortidi divedori dispoliata in replializzota mellolita ciudira in replializzota del consistenzia di l'informatibi il intripia funcio cantino intripia funcio intripia intripia funcio intripia intripia funcio intripia intripia funcio in	his ki kerelm namoun y historonan manoun y historonan manoun y historonan manoun namoun namou	Sport Sport Sport Sport Sport	Nem Nem Nem Nem Nem
A vantag v omaliki bekere A finesen med ni oc di) k copera she finesen med ni oc di) k copera she finesen med ni oc di) k copera she finesen finese	schett novatoloit a 10 Min install per mittigs schett a 10 Min and pen skartyste floretoit meg thirties skartyste floretoit meg thirties skartyste floretoit meg talletoit in myllallovat schett estalvia reflerecte mest detect getred startystistics controlletoit estalvia skartystistics controlletoit estalvia floretoit mest detect getred skartystistics controlletoit estalvia floretoit mest detect estalvia floretoit mest detect estalvia floretoit mest detect estalvia floretoit mest detect estalvia floretoit mitigat.	his ki kerelm namoun y historonan manoun y historonan manoun y historonan manoun namoun namou	Sport Sport Sport Sport Sport	Nem Nem Nem Nem Nem





... by "Auto" margins

Special paragraph margins: do it as MSO Keeping layout of our forms

Solution: fix import filter #104354

Thanks for the help of

Justin Luth (co-author), Collabora and

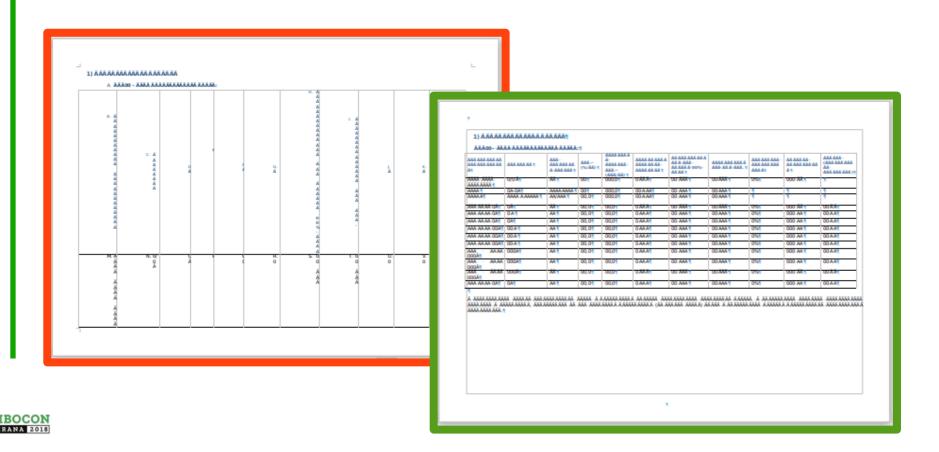
Xisco Faulí (testing and bug reports), TDF





... by bad numbering

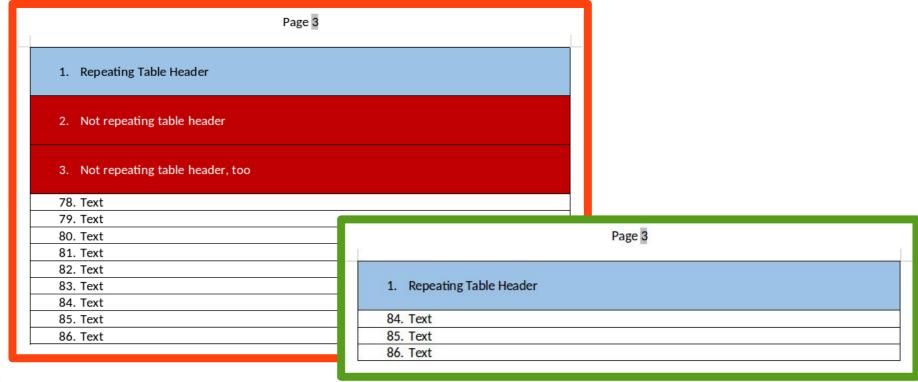
tdf#113608 numbering of invisible "w:r-less" paragraphs inherited in next table





No random table header

tdf#64264 DOCX import: fix row count of repeating table header (a typical problem of importing joined tables)







tdf#58944 handle MSO's workaround (all rows are headers) for Word's bug (non-modifiable header) in LibreOffice, too

RM to Visual COBOL Questionnaire	MICRO	RM to Visual COBOL Questionnaire	FOCUS	
Document version: n.n Last Updated: dd/mmm/yyy y	Up date d By:	Document version: n.n.Last Updated: ddm:nm/yyyy U	opdated By:	
A. Business Situation and Environment Information		A Business Situation and Environment Information		
Customer Information	N.R. Advantagion Plan E. V.	Customer & farmation	N.R. Adamstonia Physics	
CompanyName		Company Name		
ContactName (TitleRolo/Responsibility Lavelrelated to CxO)	Michal Scules Issis / Fred Flaminosipe	Contact Name (Title/Ride/Responsibility Level related to Carl)	Michael Krainstroin / Proof Planetonicja	
Other Team Members a. Name b. Tible c. Rute-Tessurs billtes		Other Team Membes a. Name b. Title c. RiceResponsibilities		
Business Orners Related to Application to be Converted?	ransformed to Visual COBOL	Business Orivers Related to Application to be Converted To	instamed to Visual COROL	
What does the application do for what business area and how critical is it to the business?	Very efficial EPP against in the Herbodiesal Expert Sustainess	What does the application do for what business area and how official is (1 to the business?)	Very critical EPP systems in the Harticultural Cope for stress.	
Whatbusiness /lechnicaleverts are diving the need for an application upgedor?	Notingwell working the PSTA perioductio. CUL -UTP0 chandles by/oil stremaches congress.	 What busines of behind alevents are driving the need for an application apgrade? 	- Support middig for PMV products - GUA - UTP 4 phones to/as character support	
What happens if this application upgrade does NOT occur	7 D'acoditie: (non of two branch send errores.	 What happens if his application upgede does NOT occur? 	Presidence of Instrumentations	
4. How many developers are maintaining the application(s)		 Howmany developes are maintaining the application(s). 	6	
Application Ownersity and Packaged Application Information		Application Ownership and Packaged Application Information		
Do you own all fights to application and did it originate from any 3rd party application provided?	Yes /No	 Doyou own all rights to application and did it originate from any 3rd party application provider? 	Yes /Yes	
6. Do you set or teaseapplication crustizers an ASP model	7 642	6. Doyousell or lease application or utilize in an ASP motel?	76s	
Current Environment Information (Where application is running today)		Current Environment Information (Witere application is naming today)		
What is the existing hardware platform? Fullow Princept Blade Prince RF 201		White the desting hardware platform? Paliss through that the BF300		
Whatis the existing Operating System?	Mixed: Suse Linux Server SLES10 and Windows Server 2003 / 2008	What is the existing Operating System?	Mixed: Suse Linux Server SLES10 and Windows Server 2003 / 2008	
What is the Micro Focus COBOL product being used bday?	1964 Calesi, 1964 InfoEngrass, Calco CGCK (Sch. England)	What is the Micro Focus COBOL product being used today?	PM/Colei, PM/Infolhgress, CaleOS/X (Sub Eng	
B. Yeomecal & Application information		B. Technical & Application Information		
Source code languages involved, approximate number of programs and rough indication of LOC	Larguage Appets Approx time of code 6.0°C; or programs Steps (K)	 Source adentinguages involved, approximate number of programs and rough Indication of LOC 	Language Approx Approx to code(0,00) programs Days (0)	
	CC-8CS. 2900 201.000		GDBGL 2500 280.000	
11. What type of user interfaces are utilized today and how	- material strayings of discouring	 What type of user interfaces are utilized hodey and how many of these interfaces are present? 	- mil. - resided single på skremte	

RM to Visual COBOL Questionnaire	D MICRO	RM to Visual COBOL Questionnaire	DF		15
COBOL to COBOL L10 Document version: n.n Last Updated: 45 mmmyyyy U		What type of use interfaces are utilized today and how many or these interfaces are present? Are you using any yets technologies? Windows CUI, or, other CUI? Character No.I?	revisated simple gal -charact entent	dersets	
A. Business Situation and Environment Information		 Panelsor Accept@splay? 			
Customer Information		 Home grown screenhander? 			
CompanyName	MAK Automateming Plus B.V	Data Access	-		
Contact Name (Title/Ride/Responsibility Level related to CirO)	Marted Statisticals (Freel Filosophus Ips	EDITORITA E			
Other Team Members	1	 Describe the data storage model used today. What data storage is used? 	Type	Approx No.	Appro
a Neme		Howmany databases files are involved?	Sindersed Districts	700	2508
b. Tile c. ReioRegorability		Howmuch data is stored?	Line Separatelial	160	SOM
Business Drivers Related to Application to be Conserted Tra	conferenced to Visconi COSOV		Strany Separate	30	LONE
			36.6	0	
 What does the application-do-for what business area and how critical is it to the business? 	- Viey-citizal CPP systems in the Horizostana Expert Incoress.		Other (Please specify)		
What business/ technical events are driving the need for an application upgrade?	- Supplier develop for PMV products - GLA - UTP -5 elabate byte/character outputs	Application? Application? Application?		Notice of the Common of the Co	
What happens if this application-upgrade does NOT occur?					
4. Howmanydevelopers are marketringthe applicationes		 Are you using other Data Access technologies? If so, press e disortis. CISAN 	PREMISTS CONTRACT		
Application Ownership and Fackaged Application Internation		b. Brieve			
Do you own all rights to application and did it originate from any limit party application provider?	Year (No.	c. Other ISAM d. Callable Rile Handlers			
6. Do you sell or lease application or utilize in an ASP model?		15. Do you use one of these portiuds or technologies?	VenCal ^(a) n's PROPIns de 10's Danne d s Danne		
Current Environment Information (Where application is running today)					
7. What is the existing hardware plottern? Fullow Principle Blade Francis (F200)			is Faddison	_	\vdash
			Ris Copress Flamm (CO	100	+
What is the existing Operating System?	Mixed: Suse Linux Server SLES10 and		Henseld V	**	\pm
- A	Windows Server 2003 / 2008	16. Whill Lant Products do you use foliar?	Perdusta	Geunt	Let
 What is the Micro Focus COBOL product being used today? 	PM/Cdrist, PMV/refd/bgrvins, Cider CCW (Bell England)		PRICOBOL Comple		1
R. Technical & Application information			PROCECL PLANT		\top
 Sout e code languages involved approximate number of programs and rough indication of LOC 	Language Approx Approx State of Ma. of mode 5, OCI or		PREVALENDED (NO.	rute 2	\Box
program are not present to the	pegrera Steps (K)		Coppe COST®	. t.	+
	028CL 2001 201,000		Comp. HPIC To.		T





Fix Calc→Writer copy

Most wanted usability fix (@108 votes)

Insert Calc data in Writer native text tables cell by cell instead of OLE object

For 1-cell tables: don't use OLE at all, ie. neither in normal body text #37223

	Data1	Data2	Data3
Foo 1 3	₽	2 4	3 5
Bar			

	Data1	Data2	Data3
Foo	1	2	3
Bar	3	4	5



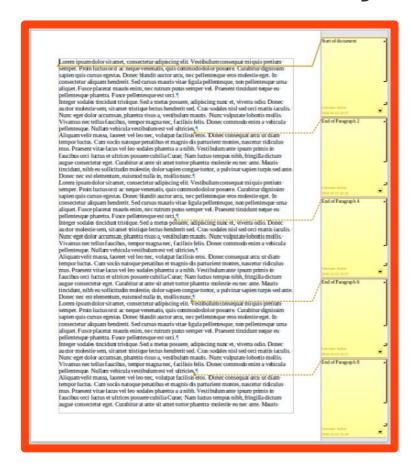
Track changes & annotations





Fix comment bloating

tdf#105444 new and new empty lines in comments in every import/export cycle









Handle text relocation

Content loss!: reappearing deletion

Tracking loss: unmarked insertion

Solution: w:MoveFrom is deletion, and

w:MoveTo is insertion @#104797

Will this sentence be duplicated?

This is a filler sentence. Will this sentence be duplicated ADDED STUFF?

Will this sentence be duplicated?

This is a filler sentence. Will this sentence be duplicated ADDED STUFF?





Fix empty line deletion

tdf#115521 all empty paragraphs of a multiparagraph deletion lose tracking

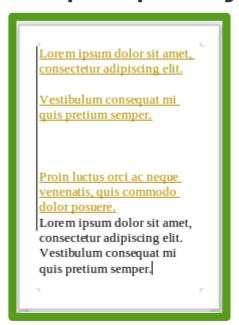
tdf#119848 change tracking of a single deleted empty paragraph is removed on save, if it has no other property change

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

Vestibulum consequat mi quis pretium semper.

Proin luctus orci ac neque venenatis, quis commodo dolor posuere.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vestibulum consequat mi quis pretium semper.







Fix invisible changes

tdf#119019 show deletion and insertion

Tracked paragraph change (numbering) hides content modification. Workaround: accept style change automatically at changing of the text of that paragraph.

- 1. → Nunc viverra · imperdiet · enim. · Fusce · est. · Vivamus · a · tellus · ¶
- 2. → Pellentesque habitant-morbi-tristique senectus et netus et malesuada fames SOMETHING NEW ac turpis egestas. Proin pharetra nonummy pede. Mauris et orci. ¶
- 1. → Nunc viverra imperdiet enim. Fusce est. Vivamus a tellus.
- 2. → Pellentesque habitant morbi tristique senectus et netus et malesuada fames SOMETHING NEW ac turpis egestas. Proin pharetra nonummy pede. Mauris et orci.¶





WYSWYG paragraphs

"Show change tracking" mode didn't show the style changes after tracked paragraph join until saving the document (not an OOXML problem)

tdf#119571 show changes correctly

Heading 1

Body text joined with the first paragraph, so it has got Heading 1 style.

Heading 1

Body text joined with the first paragraph, so it has got Heading 1 style.





Paragraph deletion

tdf#54819 It wasn't possible to delete a full paragraph without copying its style to the next one (bug of change tracking)

Lorem IPSUM

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vestibulum consequat mi quis pretium semper. Proin luctus orci ac neque venenatis, quis commodo dolor posuere. Curabitur dignissim

sapien quis cursus egestas. Done c consectetur aliquam hendrerit. Sec aliquet. Fusce placerat mauris eni pellentesque pharetra. Fusce pelle

Lorem IPSUM

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vestibulum consequat mi quis pretium semper. Proin luctus orci ac neque venenatis, quis commodo

Lorem-IPSUM¶

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vestibulum consequat mi quis pretium semper. Proin luctus orci ac neque venenatis, quis commodo dolor posuere. Curabitur dignissim sapien quis cursus egestas. Donec blandit auctor arcu, nec pellentesque eros molestie eget. In consectetur aliquam hendrerit. Sed cursus mauris vitae ligula pellentesque, non pellentesque urna aliquet. Fusce placerat mauris enim, nec rutrum purus semper vel. Praesent tincidunt neque eu pellentesque pharetra. Fusce pellentesque est orci.



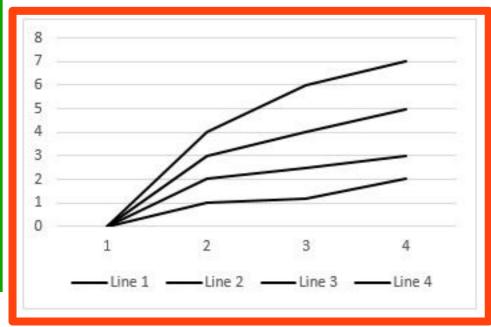
IMPROVED CHARTS by our novice developers

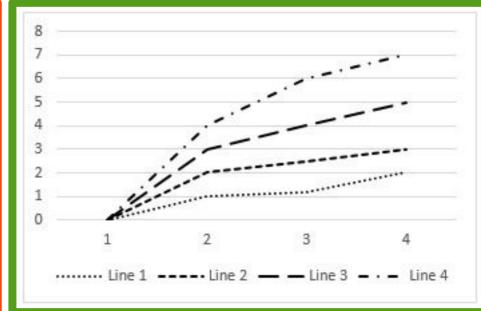




Save our dashed lines

tdf#108064 OOXML export: keep MSO preset dashes in charts, instead exporting solid lines (by Ádám Kovács)



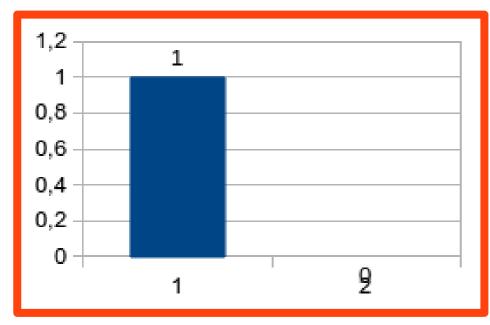


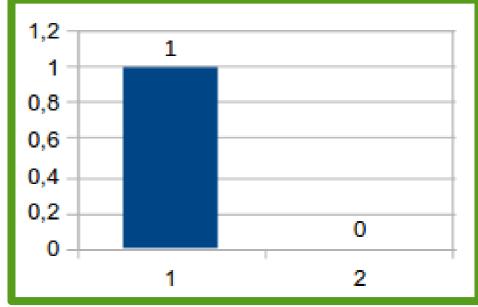




Zeros on the right side

tdf#118705 fix placement of zero data label with different column and bar chart settings (fixed by Balázs Varga)



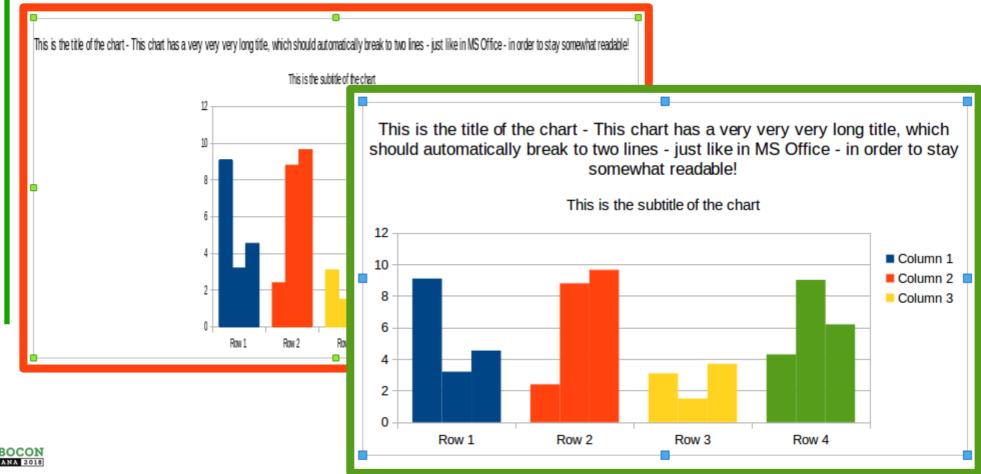






No distorted charts

tdf#108028 break chart title automatically instead of distortion of the chart and their titles (by Balázs Varga)

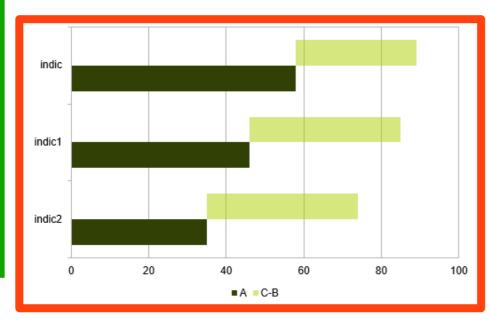


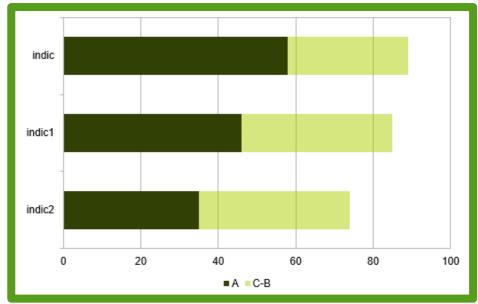




No broken chart bars

Tdf#94502 OOXML: fix overlap export of stacked bar chart (by Balázs Varga)



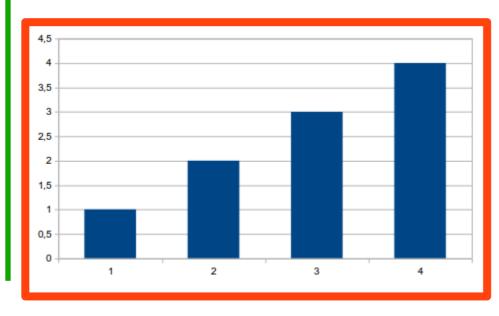


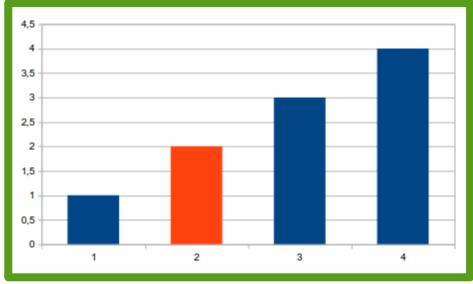




Keep custom format

tdf#96469 OOXML: export custom data point properties (by Balázs Varga)









Other improvements

tdf#119562 Fix export of AutoFit property of shapes

tdf#108078 Export Chart shapes area fill properties

tdf#118651 OOXML ActiveX textbox: fix multiline

tdf#118153 VBA Macro: XLSX in Workbooks.Open

tdf#118127 fix date format duplications in Hungarian locale



MENTORING



LibreOffice bug fixing is an active and continuous learning process



MENTORING Learn to self-study LibreOffice by hacking, active code reading (eg. causing new bugs) and minor bug fixing



OUR MISSION Learning LibreOffice by bug fixing, and developing competitive features





Elements of mentoring

Formal education by a LibreOffice expert

Basics: OOXML/ODF, building, bug fixing & unit testing, Developer's Guide

Working on real problems, first together,

Later in virtual machine with guidance

Asking help via Telegram and IRC

Motivating (badges, LiboCon etc.)





Learning materials

TDF Wiki pages & Apache OpenOffice.org materials, and knowledge of the expert(s)

Learn UNO via macro programming by using inspector extensions and reading IDL API

Git repository of LibreOffice is a readable and documented collection of sample bug fixes. Master it for searching and code re-use.

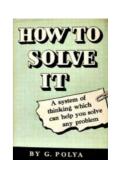
Use opengrok, git, bibisecting, SW_DEBUG, SAL_DEBUG and gdb (for code reading, too)





How do I solve it?

Heuristic techniques of LibO development See *How to solve it* (by George Pólya, 1945)



- 1. Understand the interoperability problem: check it in different office suites, during import/export cycles, changes in XML content of OOXML or ODF documents, read related part of the OOXML and ODF standards.
- 2. Devise and carry out the plan; simplify the test document also for the unit test; search the related code parts (opengrok, git, gdb); read it by SAL_DEBUG test modifications; think of simple workarounds and parallel solutions for part of the problem; solve it; add unit tests





Experience matters

Help your students by encouraging, code reading, hints, and code snippets

Mentoring is a learning process for you

Be a pioneer by learning new parts of LibreOffice during mentoring and later

Plan long-term competitive features and learn the related parts of LibreOffice

Share and keep your growth mindset





Growth mindset

The power of believing that you can improve (Carol Dweck) https://www.ted.com/talks/carol_dweck_the_power_of_believing_that_you_can_improve

No one understands the whole code, but everyone would be able to fix bugs, only with partial understanding



Gain this partial understanding! Test it!





Prepare for learning

There is no prohibited method in problem solving

1 Choose the best: New day is a new challenge; Selfeducation. "So do not fear, for I am with you…" (Isaiah 41:10). "What you aim at determines what you see." (Jordan Peterson). Trial and error. Learning is an active process: "You cannot understand a system until you try to change it" (Kurt Lewin), "There is no royal road to geometry." (Euclid); Read the code as your own. Practice makes the master. Go at your own pace; Stay on the golden middle way; Take a break; Switch task; Ask for help; "Repetitio est mater studiorum".

2 If it doesn't work, GOTO 1



SUMMARY



All text and image content in this document is licensed under the Creative Commons Attribution-Share Alike 4.0 License (unless otherwise specified). "LibreOffice" and "The Document Foundation" are registered trademarks. Their respective logos and icons are subject to international copyright laws. The use of these thereof is subject to trademark policy.





As we did

- Invest in LibreOffice
- Hire an expert (team or developer):
 - https://www.docume ntfoundation.org/get help/developers/
- To mentor your team
- By fixing your real problems





Acknowledgements

Balázs Varga & Ádám Kovács junior LibreOffice developers of our team

NISZ LibreOffice support team, lead by Gábor Kelemen (see his presentations, too)

Experts of Collabora Productivity, Red Hat Linux and TDF, reviewing our bug fixes

LibreOffice users, contributors and developers around the globe



