OFD 与 PDF 对比说明
Comparison of OFD and PDF file formats

2016-10-17 全国信息技术标准化技术委员会 (全国信标委)

2016-10-17 China National Information Technology Standardization Technical Committee

1、OFD 与 PDF 标准对比说明 | Comparison of OFD and PDF standards

目前国际上通用的版式标准是 Adobe 公司于 1993 年首次发布现在已经成为 ISO 32000 标准的 PDF（Portable Document Format）。在标准研制过程中，我们将 OFD 和 PDF 也进行了相关的对比，如下表所示：

Currently the international file format standard is Adobe's Portable Document Format (PDF). The PDF specification was first made available for free in 1993, and is now an open standard and published by the International Organization for Standardization as ISO 32000. In our process of evaluating standards, we also compared OFD and PDF. The results are shown in the following table:

标准 Standard	**OFD**	**PDF**
产权情况 Intellectual property	自主产权 Independent intellectual property rights	ISO
是否开放 Open or not	完全开放 Open standard	完全开放 Open standard
基于 XML **XML-based**	是 Yes	否 No
打包 Packaging	是 Yes	否 No
精确版面描述 **Precision layout**	支持 Support	支持 Support
设备无关 **Device independent**	是 Yes	是 Yes
文档逻辑结构信息 **Format logical structure**	支持 Support	支持 Support
对中文排版的支持	较好	较好

Support for Chinese content lay-out	Good	Good
数据交换 Data exchange	支持 Support	支持 Support
容错性 Fault tolerance	较好 Good	较好 Good
字体类型 Font type	只支持 OTF Support only OTF	支持 OTF，TTF，TTC，Type1 Support OTF, TTF, TTC, Type1
字体嵌入 Font embedding	支持 Support	支持 Support
压缩 Compression	Zip、多种图像压缩 Zip, a variety of image compressions	多种压缩 A variety of compressions
书签 Bookmark	支持 Support	支持 Support
数字签名 **Digital signatures**	支持 Support	支持 Support
水印 Watermark	支持 Support	支持 Support
多媒体 Multimedia/Rich media	支持 Support	支持 Support
动画 Animation	不支持 Does not support	支持 Support
3D	不支持 Does not support	支持 Support
文字检索 **Index**	支持 Support	支持 Support
标注 Annotation	支持 Support	支持 Support
高质量打印 **High-resolution printing**	支持 Support	支持 Support
JavaScript 脚本 **JavaScript extension**	不支持 Does not support	支持 Support
软件支持 Supported software	较多，限于国内 Many, but limited to People's Republic of China (PRC)	很多，遍布全球 Many, all over the world
数字签名机制 **Mechanism for digital signature**	支持且支持算法定制 Support and support algorithm customization	支持 Support
标引机制 **Mechanism for indexing**	支持且与内容分离 Support and is separate from the content	标引与内容难分离 Difficult to separate indexing and content
扩展机制 **Mechanism for extensibility**	分离式扩展 Extensibility in its own style	不支持分离式扩展

		Does not support extensibility in its own style

从表中可见，对于基本的版式需求，OFD 已完全能够满足，在对国内复杂应用的适应性较好，支持国内较特殊的密码管理要求，在应用推广的推动下不断完善，必将赶超 PDF。

As shown by the results in the above table, OFD fully meets the basic file format requirements. It is better suited to work with the complexities of domestic software applications in terms of adaptability, for example, the ability to support People's Republic of China (PRC)'s special requirement with regard to password management. Driven by the continued improvement of applications, OFD will inevitably exceed PDF in functionality.

2、软件支持对比 Comparison of supported software

除了从标准的描述能力进行分析外，我们还针对同时支持 PDF 和 OFD 标准的软件进行了功能和性能对比，虽然这与软件本身息息相关，但也能从一定程度上反映了国内软件对 OFD 的支持情况。

In addition to comparing OFD and PDF as open standards, we also compared software that support PDF and OFD standards in terms of functionalities and features. Although the listed items are closely related to the software, the information reflects the support of domestic software for OFD.

（1）功能对比 Feature comparison

版式办公套件 OFD 与 PDF 功能对比

Comparison of OFD and PDF functionalities/features

功能 Functionality	**子功能 Sub-functionality**	**主流 OFD 软件 Mainstream OFD software**	**主流 PDF 软件 Mainstream PDF software**
打开 Open		√	√
最近的文档 Recent Files		√	√
关闭 Close		√	√
保存 Save		√	√

另存为 Save As	PDF	√	√
OFD	√	√	
TXT	√	√	
导出所有图片 Export all images		√	√
导出为... Export as	图片-PNG、JPG、TIF 等格式 Images-PNG, JPG, TIF formats	√	√
打印 Print		√	√
共享 Share	邮件 Mailing		√
退出 Exit		√	√
编辑 Edit			
复制 Copy		√	√
全选 Select All		√	√
水印 Watermarks	添加\删除等 Add\Delete	√	√
插入 Insert	书签 Bookmark	√	√
矩形框链接及编辑 Connect and edit rectangular shapes	√	√	
文件附件 File attachment	√	√	
	信任管理器 Trust manager	√	√
页面显示 Page display	√	√	
颜色设置 Color settings	√	√	

视图 View			
转到 Jump to	页面 Page	√	√
视图 View	√	√	
缩放 Zoom	缩放至 Zoom to	√	√
自动缩放（宽度、高度等） Auto zoom (width, height etc.)	√	√	
页面显示 Page display	单页，连续、双联、单独显示封面 Single page, continuous, two-page, display a cover page alone	√	√
旋转视图 Rotate View	顺逆时针 Counter-clock wise/clockwise	√	√
显示模式 Display mode	阅读模式 Read mode	√	√
全屏 Full screen	√	√	
文本查看器 Text file viewer	√	√	
逆序阅读 Reverse text	√	√	
菜单栏 Menu		√	√
工具栏 Tools menu	自定义工具栏 Customize tools menu	√	√

重置工具栏 Reset tool menu	√	√	
隐藏/显示工具栏 Hide/Show tool menu	√	√	
导航栏 Navigation	附件 Attachment	√	√
注释 Annotation		√	
图层 Layers (image)	√	√	
页 Page	√	√	
书签 Bookmark	√	√	
语义树 Semantic tree	√		
隐藏/显示导航栏面板按钮 Hide/Show the button for the navigation pane	√	√	
状态栏 Status bar/menu	显示状态栏 Show status bar/menu	√	√
自动隐藏状态栏 Auto hide status bar/menu	√	√	
隐藏状态栏 Hide status bar/menu	√	√	
页面调整 Page adjustment	更改皮肤颜色 Change the skin color	√	√
自定义工具栏 Customize the tools menu/bar	√	√	
更改工具栏模式 Change the tools bar mode	√	√	

工具 Tools			
手型工具 Tools panel (hand tool)		√	√
选择文本 Select text		√	√
选择标注 Select shapes		√	√
查找 Search	查找上一个 Find next (up)	√	√
注释			
文本工具 Text tools	高亮 highlight	√	√
下划线 Underline	√	√	
删除线 Delete line	√	√	
波浪下滑线 Wavy underline	√	√	
替换文本 Replace the text	√	√	
插入文本 Insert in text	√	√	
属性-外观-颜色 Property-appearance-color	√	√	
删除 Delete	√	√	
图章 Stamp	创建自定义图章 Create a customized stamp	√	√
图章管理 Stamp management	√	√	
显示图章面板 Display the dashboard for stamps	√	√	
设置常用图章 Set commonly used stamps	√	√	

绘图 Draw	绘制云型和编辑 Draw clouds and edit	√	√
绘制箭头和编辑 Draw arrows and edit	√	√	
绘制线条和编辑 Draw lines and edit	√	√	
绘制矩形和编辑 Draw rectangular shapes and edit	√	√	
绘制椭圆和编辑 Draw ovals and edit	√	√	
绘制多边形和编辑 Draw polygons and edit	√	√	
绘制折线和编辑 Draw polylines and edit	√	√	
绘制铅笔和编辑 Draw with pensils and edit	√	√	
绘制高亮区域 Draw in a highlighted area	√	√	
设当前属性为默认 Set the property as default	√	√	
删除 Delete	√	√	
电子公文标注 Official e-document annotation	删除标记 Delete logo	√	
替换标记 Replace logo	√		
插入标记	√		

Insert logo			
交换标记 Exchange logo	√		
放置签章 Place a signature		√	
验证签章 Verify signatures	离线验证签章 Verify e-signatures of fline	√	
在线验证签章 Verify signatures online	√		
离线验证所有电子签章 Verify all e-signatures offline		√	
在线验证所有电子签章 Verify all e-signatures online		√	
帮助 Help			
设为默认 PDF/OFD 阅读器 Set PDF/OFD as the default reader		√	√
激活插件 Enable plug-in		√	√
用户手册 User manual		√	√
命令行帮助 Command help		√	√

由表可见：

a. 软件对 OFD 支持的功能已经非常强大，实现对 OFD 电子公文的打开、显示、缩放、跳转、属性展示、打印、搜索、选择/复制、标注、书签等所有常用功能

b. 软件针对国内特性化的应用需求提供了特色化的功能，比如电子公文语义导览及与 OA 集成使用功能，同时支持第三方电子签章系统，提供的电子签章、验章事务；

c. 对于用户而言，产品的界面基本一致，功能设置习惯基本一致，几乎没有学习成本，很容易接受。

The following can be observed based on the table:

a. The software already has powerful capabilities that support OFD, which can open, display, zoom, jump, display properties, print, search, select/copy, annotate, bookmark and many common functionalities that are used to manipulate a OFD e-document.

b. The software focuses on the user experience that's unique to PRC and addresses these specialized needs by providing those in-demand features, for example, semantic search in a e-document, OA integration, support of a third-party e-signature system, e-signature, and signature verification.

c. The product interface is nearly the same in terms of feature settings and can be easily accepted by an end-user since no additional learning is involved.

（2）性能对比 Functionality comparison

使用相同的 WPS 文件，分别转换为 OFD 和 PDF 文件。

由表可见：从 OFD 和 PDF 文件的打开时间上看，二者几乎持平，不相上下；从 OFD 和 PDF 文件另存为时间上看，除了个别文件，二者所耗费的时间也同步。说明国内版式办公套件在完成打开和另存的功能时所展现出来的及时性，已经与对操作 PDF 文件时的支持不相上下。

Convert the same WPS file to OFD and PDF files respectively.

We can observe the following based on the table:
- The time that spent when using the **Open** functionality with a OFD or a PDF file is comparable.
- The time that spent when using the **Save As** functionality with a OFD or a PDF file (other than a few individual files) is also comparable.

Based on the finding on the **Open** and **Save As** functionalities, PRC software’s support of the domestic file format is comparable to that of PDF files.

3、文件体量对比 Comparison of file sizes after conversion

针对同样的源文件，分别生成 OFD 和 PDF 进行体量比对，结果如下：

Convert the same source file to produce resulting OFD and PDF files respectively. The results are the following:

Wps 转版文件大小对比表 Comparison of file sizes after converting from wps

序号 Item number	**wps 文件类型 wps file types**	**wps**	**OFD**	**PDF**
1	中文字符方向 Direction of Chinese characters	17	15	44
2	项目符号问题 Project bullets questionnaire	18	3	45
3	边框和底纹 Borders and shading	16	4	28
4	批注 Annotation	10	3	42
5	公文语义树问题 Office semantic tree questionnaire	46	10	64
6	关注数字 11222	21	3	55
7	纯小照片 All small images	741	124	221
8	纯表格 All tables	271	38	276
9	内容多样测试样张 Testing of proofs (different types of content)	725	677	813
10	文字表格 Text and tables	158	73	451
11	纯大照片 All large images	9128	1287	1297
12	纯扫描文件 Scanned document	12359	4665	5604
13	纯文字 All text	1759	3379	3434

14	文字扫描件 Scanned text document	4621	3221	3650
15	文字图片表格 Text, images, and tables	7002	4382	5086
16	资源引用测试 Resource reference test	2103	2063	2528
17	表格里小照片 Small images in a table	1187	200	415

由此可见：从数据上看，在 wps 转版时，生成的 OFD 文件比原 wps 文件要小，更比 PDF 文件大小还要小一点。

Based on the data in the table we can see that after converting from wps, the OFD file is smaller in size than the wps source; it's even a bit smaller than the PDF file (converted from the wps source).

4、开放性和可扩展性对比 Comparison of openness and extensibility

（1）开放性 Openness

OFD 作为国家标准，PDF 作为 ISO 标准，都采用开放技术，包括引用的资源和运用的算法，并由标准化组织维护，因而不受个别厂商的限制，所有厂商都可以依据该标准开发自己的产品，有利于标准的推广和技术的共享。

OFD (the national standard of PRC) and PDF (an ISO standard) both use open technology, which includes reference resources and algorithms that are maintained under the governance of the standardization organizations, therefore, are not subject to the limitation of individual vendors. All vendors can develop their own products based on the standard. This is beneficial for the promotion of standards and technology sharing.

虽然 OFD 和 PDF 都是开放的标准，但是，相比于 PDF 的体系庞大、技术门槛高，OFD 非常易于入门，对于使用者来说，更具开放性。

Although OFD and PDF are both open standards -- when considering the complexity of PDF file format and the high technical barrier to entry -- OFD is very easy to get started. Thus, for a user, OFD is more open.

（2）可扩展性 Extensibility

OFD 作为我们国家拥有自主知识产权的版式标准，可做到标准为应用服务，而不是像以前使用国际标准一样要削足适履，因此，在 OFD 标准制定之初，就充分考虑到了这一点，预留了可扩展入口和自定义标引入口，并设计了非接触式的引用机制，为基于 OFD 实现特性化的功能提供了强有力的支持。

As the nationally owned file format standard with its independent intellectual property rights, OFD serves the purpose as a standard for software applications, unlike before when we resorted to such measure as "cutting the foot to fit the shoe" while using the international standard. Therefore, we've fully taken such factors into consideration during the initial phase of establishing the OFD standard. We've considered extensibility entry and custom indexing entry, and designed a non-contact reference mechanism, all of which is designed to support OFD's ability to be customized.