



PLUSPROJECT
PARTNERSHIP

EMPLOYEE
OWNED
BIostatISTICS
CRO

Changing ODS Outputting Methods to Streamline the TLF Output Process

PHUSE EU 2024 - SM10

Rose O'Nians Michalowicz

Richard Fryer



Overview

- The problem
- Environment set-up
- Bookmarks
- Special characters
- Extra benefits

The problem

WHAT
DO
YOU NEED



The problem

- Often converting RTF to PDF
- Lots of time at key stage in delivery
- Complicated and awkward



The problem

- Issues with bookmarks
 - Especially when going straight to PDF
- Issues with outputting figures
- Issues with special characters

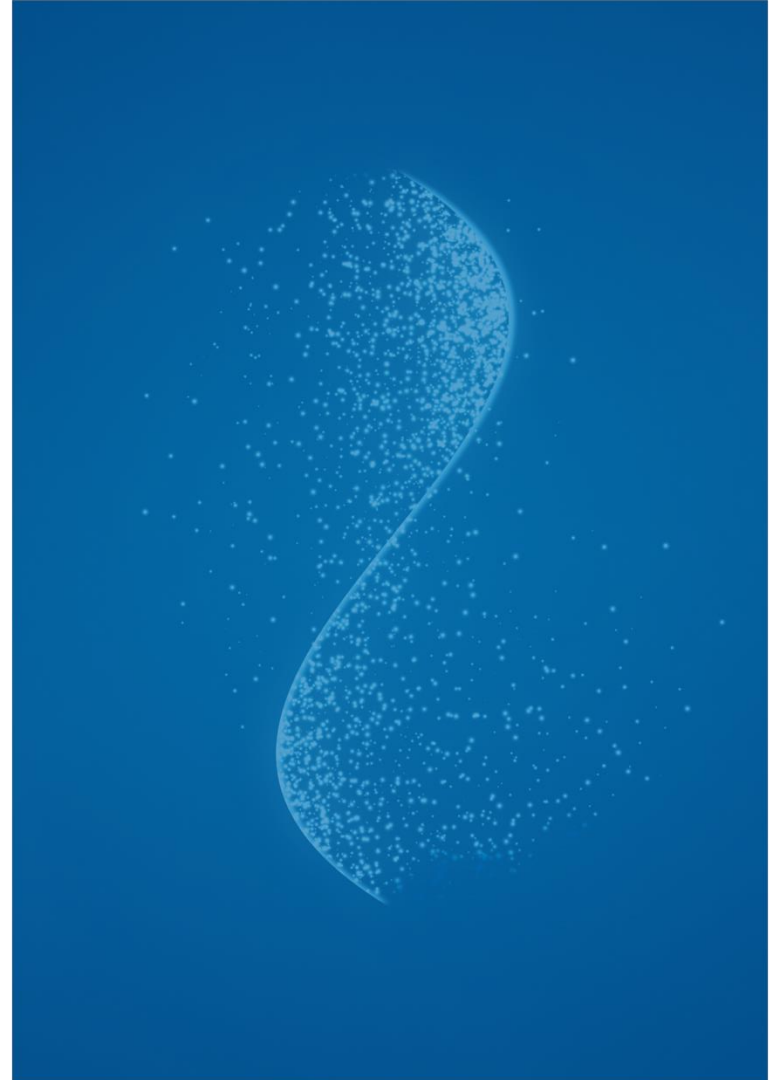
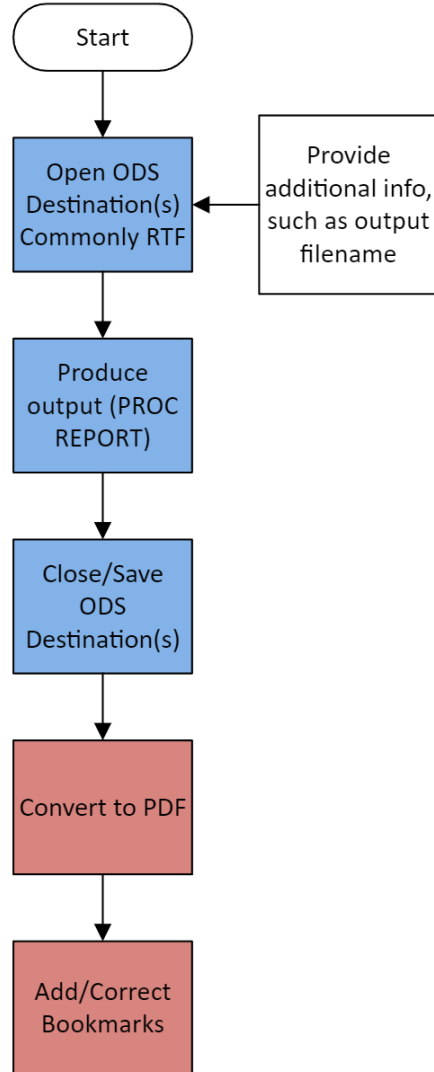


Before

```
ods rtf "<path>\output\t01.rtf";  
  
proc report data=t_01;  
    ...  
run;  
  
ods pdf close;
```



Before



Overview

- The problem
- Environment set-up
- Bookmarks
- Special characters
- Extra benefits

Improved Process

When each output is run:

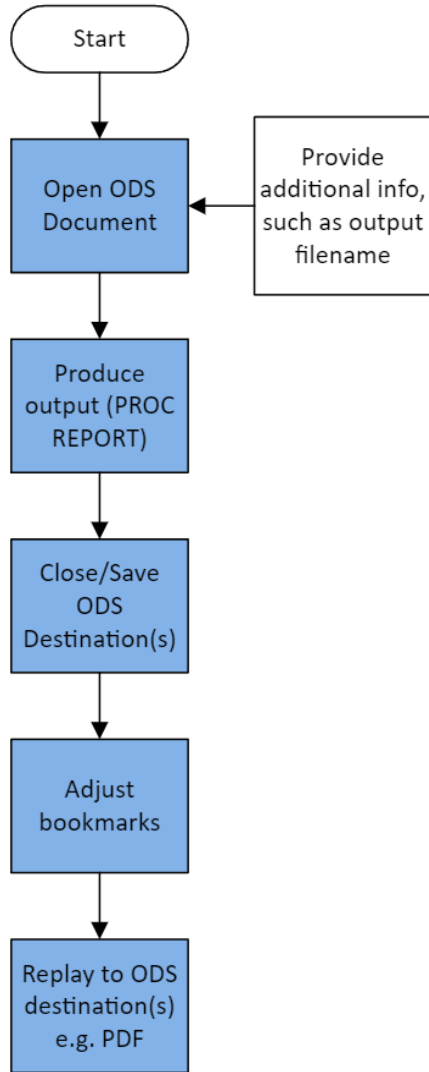


Improved Process

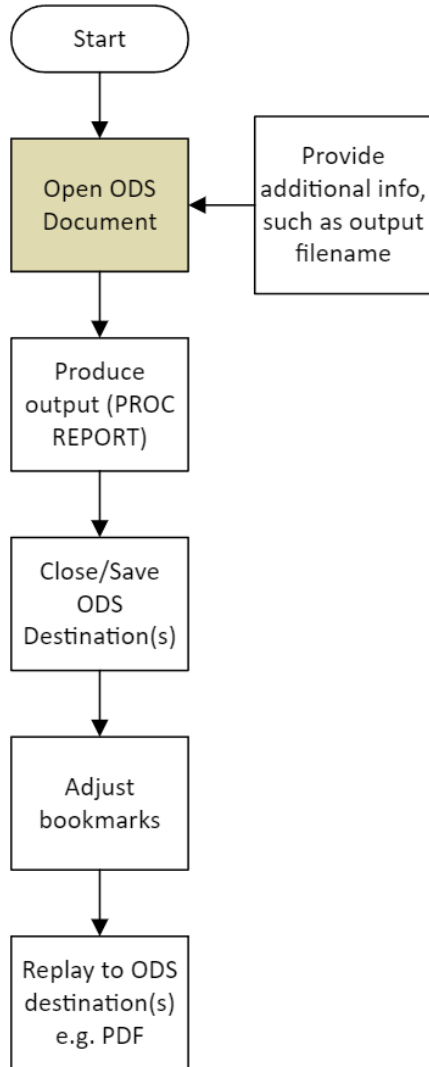
```
%odsstart;  
  
proc report  
  data=output.t_01;  
  ...  
run;  
  
%odsend(odstype=pdf rtf);
```



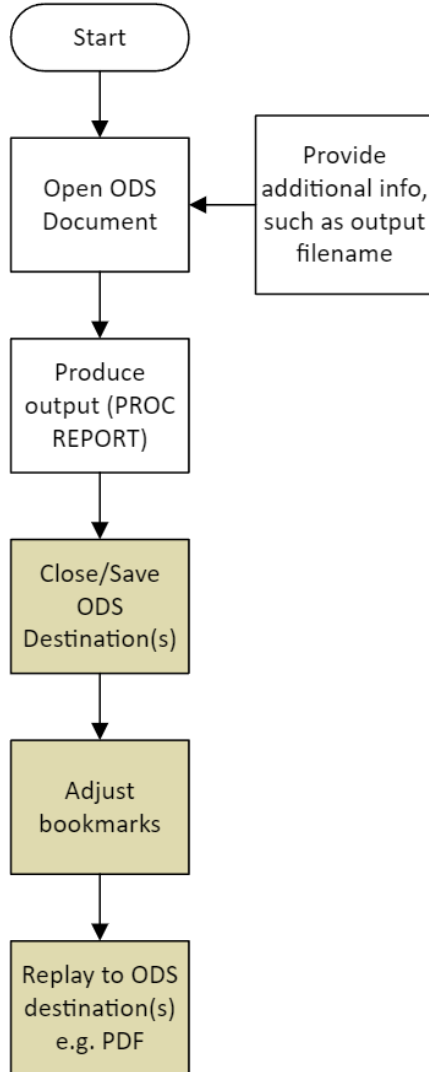
Improved Process



Improved Process



Improved Process



Main tools required

titles.xlsx

%ODSSTART

%ODSEND

titles.xlsx

A		B		C		F		
Program Name		Report Id		Report Type		Title Type		Text
Chemistry_Table		1		Table		bookmark		PHUSE Paper Table &g_reportno: %Changes in Chemistry &Haematology
Chemistry_Table		1		Table		footnote1		j= "PHUSE Paper test output footnote.";
Chemistry_Table		1		Table		title2		j= "PHUSE Paper Table &g_reportno: Percent Changes in Chemistry and H
Age_Group_Figure		1		Figure		bookmark		PHUSE Paper Figure &g_reportno: %of Subjects Screened &Treated per Ag
Age_Group_Figure		1		Figure		footnote1		j= "PHUSE Paper test output footnote.";
Age_Group_Figure		1		Figure		title2		j= "PHUSE Paper Figure &g_reportno: Percent of Subjects Screened and Ti

%ODSSTART

- `ods listing close;`
- `ods results off;`
- `ods document name = work.&odsoutputdataset
(write) dir = (path = \<file>);`

%ODSEND

- Macro call:

- `%odsend(odstype = rtf pdf);`

- `%odsend(style = ppstyle);`

- `%odsend;`

- ods document close

%ODSEND

- ods output properties = &odsoutputname
 - <PROC DOCUMENT step with all customisations>
- ods output close
- ods &odstype. style=&style file=
"&destination..&reportname..&extension."
nogtitle nogfootnote %if &odstype=pdf %then
pdftoc=&pdftoc;;
➤ **Macro call:** %odsend(pdftoc = 1)

Overview

- The problem
- Environment set-up
- Bookmarks
- Special characters
- Extra benefits

Bookmarks

- PROC DOCUMENT uses
- SGRender issues

Bookmarks

Previous Method

- ✓  PHUSE Paper Figure 1.2: %of Subjects Screened &Treated per Age Group
 -  SGRRender
 -  SGRRender

Simple Fix Attempt

- ✓  PHUSE Paper Figure 1.2: %of Subjects Screened &Treated per Age Group
 - 
 - 

Desired Result

-  PHUSE Paper Figure 1.2: %of Subjects Screened &Treated per Age Group

Bookmarks

```

proc document name=work.&odsoutput. (read);
  list ^(where=(_type_ ne 'Dir')) / levels=all;
run;
quit;

```

	 PATH	 TYPE	 OBJ	 OBJPATH
1	\file#1\Report#1\ByGroup1#1\Report#1	Table	Report#1	\file#1\Report#1\ByGroup1#1\
2	\file#1\Report#1\ByGroup2#1\Report#1	Table	Report#1	\file#1\Report#1\ByGroup2#1\
3	\file#1\Report#1\ByGroup3#1\Report#1	Table	Report#1	\file#1\Report#1\ByGroup3#1\

	 PATH	 TYPE	 OBJ	 OBJPATH
1	\file#1\SGRender#1\SGRender#1	Graph	SGRender#1	\file#1\SGRender#1\
2	\file#1\SGRender#2\SGRender#1	Graph	SGRender#1	\file#1\SGRender#2\



	⚠ PATH	⚠ TYPE
1	\file#1	Dir
2	\file#1\Report#1	Dir
3	\file#1\Report#1\ByGroup 1#1	Dir
4	\file#1\Report#1\ByGroup 1#1\Report#1	Table
5	\file#1\Report#1\ByGroup 2#1	Dir
6	\file#1\Report#1\ByGroup 2#1\Report#1	Table
7	\file#1\Report#1\ByGroup 3#1	Dir
8	\file#1\Report#1\ByGroup 3#1\Report#1	Table



	⚠ PATH	⚠ TYPE
1	\file#1\Report#1\ByGroup 1#1\Report#1	Table
2	\file#1\Report#1\ByGroup 2#1\Report#1	Table
3	\file#1\Report#1\ByGroup 3#1\Report#1	Table



	⚠ PATH	⚠ TYPE	⚠ OBJ	⚠ OBJPATH
1	\file#1\Report#1\ByGroup 1#1\Report#1	Table	Report#1	\file#1\Report#1\ByGroup 1#1\
2	\file#1\Report#1\ByGroup 2#1\Report#1	Table	Report#1	\file#1\Report#1\ByGroup 2#1\
3	\file#1\Report#1\ByGroup 3#1\Report#1	Table	Report#1	\file#1\Report#1\ByGroup 3#1\

Bookmarks

```
%do i=1 %to &last;  
  rename &&odsobjpath&i..&&odsobj&i  
        to Object&i.;  
  move &&odsobjpath&i..Object&i. to ^;  
%end;
```



PHUSE Paper Figure 1.2: %of
Subjects Screened &Treated per
Age Group



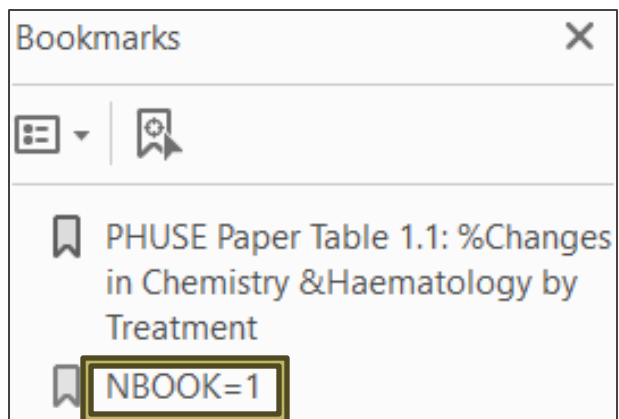
Bookmarks

```
%if %index(&odstype,%str(pdf)) %then %do;  
ods pdf(local nobookmarkgen;  
%end;
```



Bookmarks

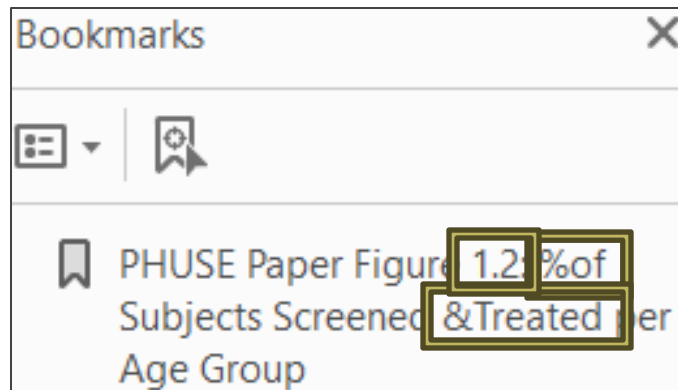
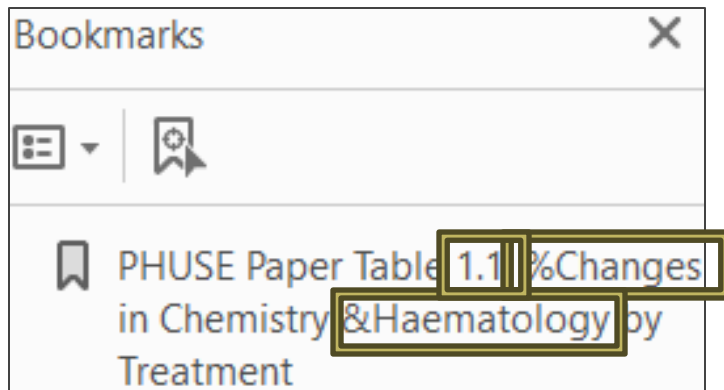
break before nbook / page contents='';



Overview

- The problem
- Environment set-up
- Bookmarks
- **Special characters**
- Extra benefits

Masking special characters



Masking special characters

➤ Checking for macros:

```
if string=: '%' then do;  
    call execute(cats('%let  
        sysmacexist=%sysmacexist ', substr(string, 2), ');'));  
    exist=input(symget('sysmacexist'), 1.);  
end;
```

Masking special characters

- Checking for macros variables:

```
else if string=: '&' then do;  
  exist symexist(substr(string,2));  
end;
```

Masking special characters

- Adjusting the bookmark:

```
bookmarknew=tranwrd(bookmark,string,  
cats('%nrstr(',string,')'));
```

Masking special characters

	BOOKMARK
1	PHUSE Paper Table &g_reportno: %Changes in Chemistry &Haematology by Treatment



	STRING		EXIST
&Haematology			0



	BOOKMARKNEW
	PHUSE Paper Table &g_reportno: %nrstr(%Changes) in Chemistry %nrstr(&Haematology) by Treatment



Bookmarks		X
	PHUSE Paper Table 1.1 %Changes in Chemistry &Haematology by Treatment	

Overview

- The problem
- Environment set-up
- Bookmarks
- Special characters
- Extra benefits

Extra benefits - Compiling

- **Faster as bookmarks are not recreated** at the compiling stage
- **No format conversions** are required
- Fewer files so **less server storage used**
- Final output **QC is quicker**

Extra benefits - Reusability

- ✓ PROC SGPLOT and PROC GPLOT ignore predefined templates when replayed to PDF
- ✓ Using GTL, PROC DOCUMENT can be used to store the style created in the template
- ✓ With GTL a template code library can be established
- ✓ %ODSSTART and %ODSEND macros can be reused with no modifications

Any questions?

Contact us:

rose.oniansmichalowicz@plus-project.co.uk

richard.fryer@plus-project.co.uk