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## DataFax Reporting Tools (dfRTools)

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## dfRTools

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The DataFax R-based Reporting Tools (dfRTools) package is a set of modules developed using the R-Project statistical software environment for creating data management reports revealing patterns, trends or discrepancies, and providing study metrics in a comprehensible fashion.

## Objectives

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- Eliminate data transfer between systems
- Enhance functionality.
- Provide consistent function names and directory structures.
- Clean up UNIX environment variables for portability.
- Improve source distribution package.

## Objectives – Continued

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- Utilize ANT to simplify integration with DataFax system.
- Expand portability and report production using the Open Office Suite.
- Design as community tools.
- Distribute as an open source package.

## Background

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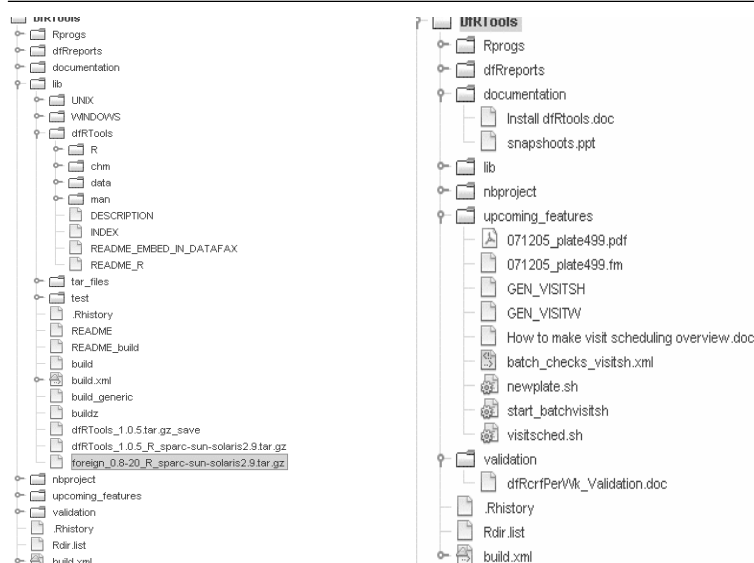
- Standard DataFax reports have limitations
  - Layout of DataFax reports
  - Requires Out-of-environment applications, e.g. SAS®, Excel
  - Data Management receives many requests from
    - Sponsors – Study metrics
    - CRAs – Study metrics, detailed visit scheduling
- Gulati V. and Green K. (DFUG-2001); Using DataFax Reports to Monitor and Improve Site Performance.
- Otles Z. et al. (DFUG-2007); DataFax Reporting Tools Using R.

## Background – Continued

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- R is an open source statistical computation and graphics software (<http://www.r-project.org/>).
- Open Office is open source office suite (<http://www.openoffice.org/>).
- Ant as a glue to establish dir. structures, etc. <http://ant.apache.org/>

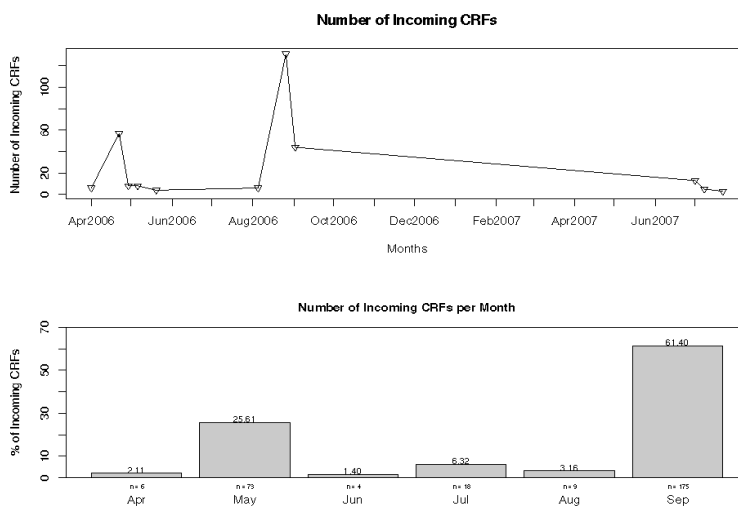
## Directory Structure in dfRTools



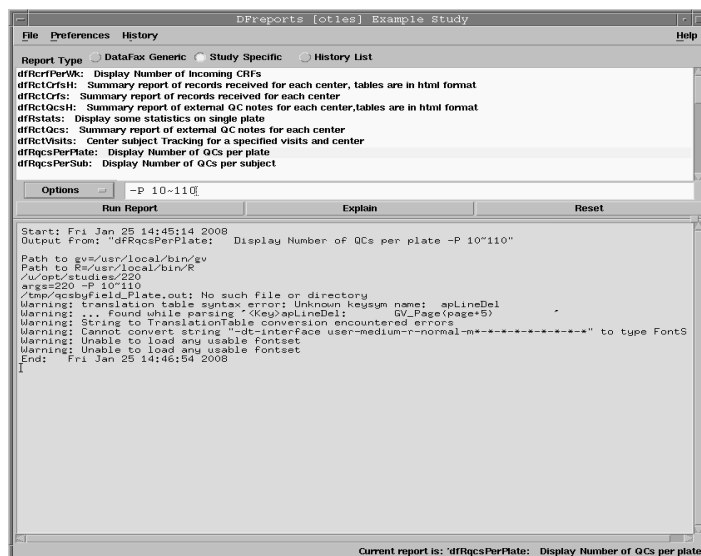
## Functions In dfRTools

dfRbarPlot	Creates simple bar plot/histogram or stack bars.
dfRbarPlotM	Creates simple bar plot/histogram or stack bars for data in matrix format.
dfRbarprobs	Returns the colors, angles, and densities to be used in the stack bar.
dfRcolPercentsPie	Display summary visit tables columns in pie charts.
dfRcrfBarPlot	Creates bar plot for data.
dfRcrfBarPlotM	Creates bar plot for data in matrix format.
dfRcrfPerWk	Creates time plot and bar plot for incoming CRFs.
dfRctCrfs	Creates multiple plots showing summary of records received from each center.
dfRctQcs	Creates multiple plots showing summary of QCs for each center.
dfRctVisits	Creates plot of number of subjects reached each visit at each center.

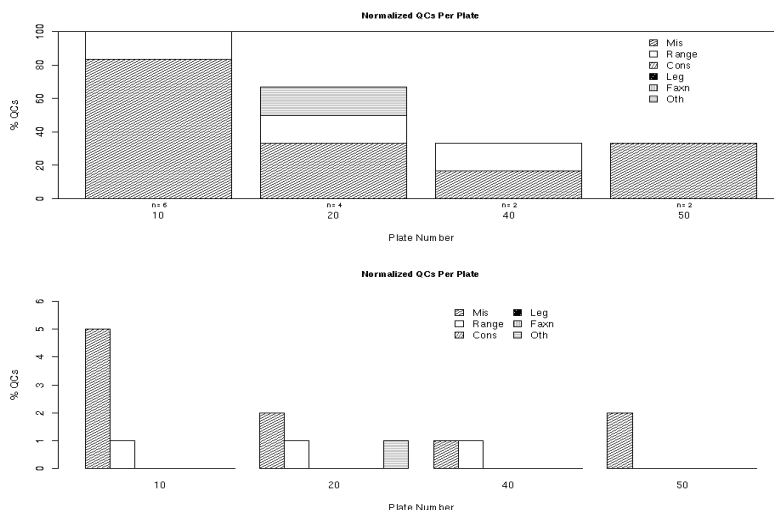
## Weekly Incoming CRFs (dfRcrfperwk)



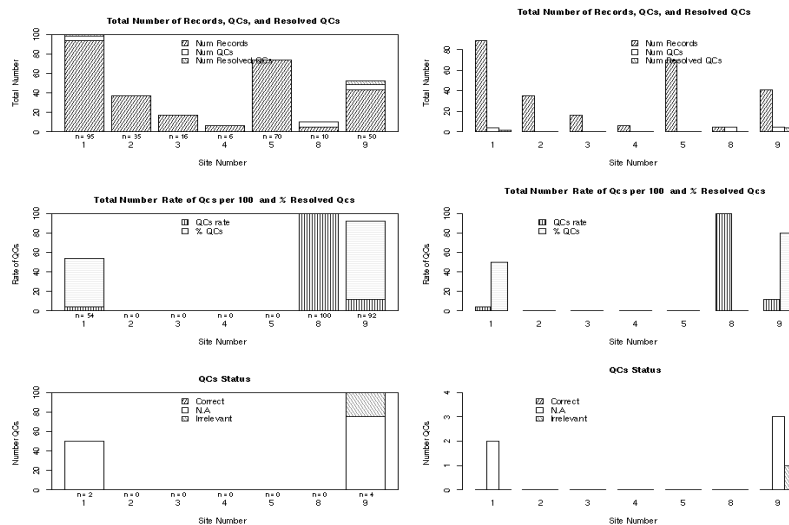
## dfRqcsPerPlate — Summary Report of QC Notes for Each Center



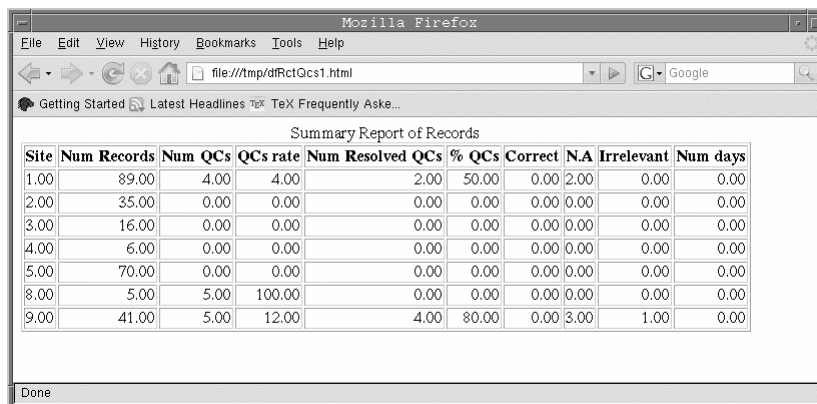
## dfRqcsPerPlate — Summary Report of QC Notes for Each Center



## dfRctQcs — Summary of External QC Notes for Each Center



## dfRctQcs — Summary of External QC Notes for Each Center



The screenshot shows a Mozilla Firefox browser window with the address bar set to 'file:///tmp/dfRctQcs1.html'. The page content is a table titled 'Summary Report of Records' with the following data:

Site	Num Records	Num QCs	QCs rate	Num Resolved QCs	% QCs	Correct	N.A	Irrelevant	Num days
1.00	89.00	4.00	4.00	2.00	50.00	0.00	2.00	0.00	0.00
2.00	35.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5.00	70.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.00	5.00	5.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
9.00	41.00	5.00	12.00	4.00	80.00	0.00	3.00	1.00	0.00

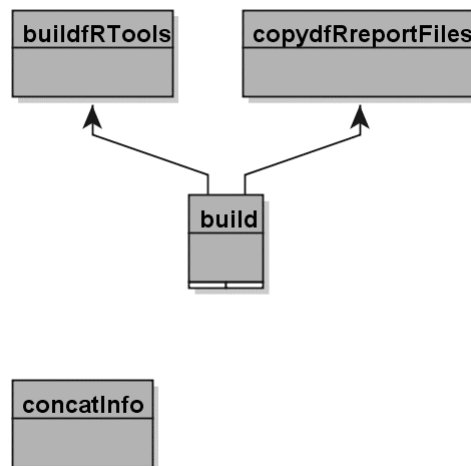
## ANT

- Why Ant?
- Ant as a glue to establish dir. structures, etc. <http://ant.apache.org/>
- Ant to build the dfRTools library.
- Copy directories and files.
- Concatenation of Info file as an example .

## ANT – build.xml Segment

```
<target name="copydfRreportFiles" >  
  <echo>copying dfRreports script files</echo>  
  <copy todir="${reports.dir}" >  
    <fileset dir="${dfRreports.dir}" includes="dfR*,ct*,vis*" />  
  </copy>  
</target>  
  
<target name="buildfRTools" >  
  <echo>Build and installing dfRTools</echo>  
  <ant antfile="./build.xml" dir="${lib.dir}" target="installPkg" />  
  
</target>  
  
<target name="concatInfo" >  
  <echo> "reports.dir"=${reports.dir} </echo>  
  <echo> "dfRreports.dir"=${dfRreports.dir} </echo>  
  <concat destfile="${reports.dir}/.info" append="true">  
    <fileset dir="${dfRreports.dir}" includes="*.info"/>  
  </concat>  
  
</target>
```

## ANT – build.xml Visualized



## Open Office Suite

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- The dfRTools embedded in DataFax reporting system displays tables and graphs within the application, but not saved in a convenient, structured way.
- Difficulty managing all the output files could reduce the use of the dfRTools system.
- Open Office template utilized with extended (“odfWeave”) R-package to create DataFax report to complete snapshots of data for the sites or subjects.

## odfWeave

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- R-Package merges Open Office document templates with R function outputs.
- Template document created in Open Office.
- OdfWeave function uses the open office template with required structure as an input.
- Outputs the open office document.

## odfWeave Template

# - *DfRTools Reporting Output- Test Study 220*

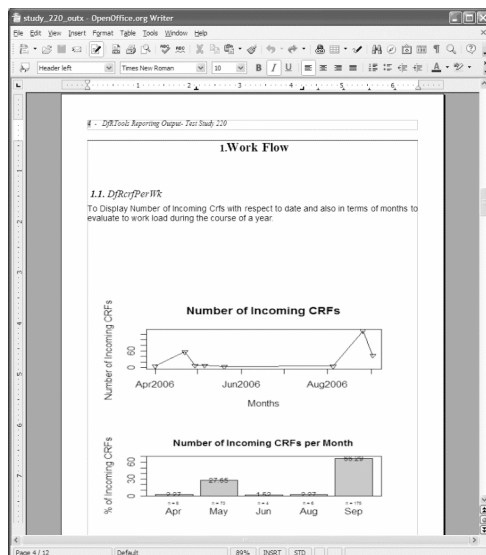
### 1.Work Flow

#### 1.1. *DfRcrfPerWk*

To Display Number of Incoming *Crfs* with respect to date and also in terms of months to evaluate to work load during the course of a year.

```
<<loadLibs,echo=FALSE,results=hide>>=  
# I usually load the libraries first so that any output produced  
# by loading the library does not end up in the document  
library("odfWeave")  
library("dfRTools")  
data("dfRToolsData")  
  
@  
  
<<dfRcrfPerWk,echo=FALSE,results=xml,fig=TRUE>>=  
# I usually load the libraries first so that any output produced  
# by  
out<-dfRcrfPerWk(crfPerWkDat)  
print(out)  
@
```

## Open Office/odfWeave Output



## Summary

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- DataFax reports produced in a comprehensible way.
  - Create snapshots of data.
  - Monitor accrual rates and performance of the sites.
  - Detail information to manage visit scheduling.
- Eliminate data transfer between systems and applications.
- Collaborative effort between Frontier Science and Factory CRO.

## Summary – Conclusion

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- The dfRTools package implemented at Factory and FSTRF-madison and used in production studies.
- Added optional external tools to make dfRTools simpler and more functional.
  - ANT makes it easier to integrate dfRTools with the DataFax system.
  - Open Office allows creation of customize reports, which can be saved as pdf or html documents.

## All Warmed Up? Get Your Copy Here

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- Download the dfRtools at  
<http://www.pg76.com/dfrtools>
- dfRTools released for public use under  
GPL
- Provide us with your feedback (no  
guarantees) and/or support
- Email us:  
[otles@fstrf-wi.org](mailto:otles@fstrf-wi.org)  
[p.groenen@factory-cro.com](mailto:p.groenen@factory-cro.com)

## Questions?

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