

# Implementation of an R Environments

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# Outline

Implementation  
of an R  
Environments

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Introduction

Environment

Application

Implementation

```
git clone https://github.com/losuilleabhain/AMORE.git
```

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# Motivation

## Implementation of an R Environments

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# Introduction

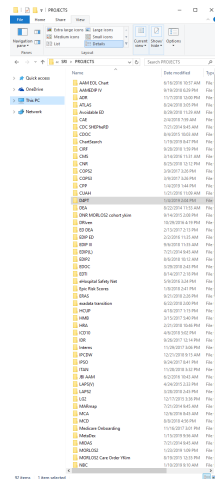
## Reproducibility necessitates a **Standard Environment**

A Project has 3 sets of information

- 1 Resources
- 2 Operations

*A Functional Program  
maps data to output*

- ### 3 Results



Many Shared Projects  
Many Project Structures

# ?Startup

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Description:

In R, the startup mechanism is as follows.

Unless `'--no-envir'` was given on the command line, R searches for site and user files to process for setting environment variables. The name of the site file is the one pointed to by the environment variable `'R_ENVIRON'`; if this is unset, `'R_HOME/etc/Renviron.site'` is used (if it exists, which it does not in a 'factory-fresh' installation). The name of the user file can be specified by the `'R_ENVIRON_USER'` environment variable; if this is unset, the files searched for are `'.Renviron'` in the current or in the user's home directory (in that order). See 'Detailsr' for how the files are read.

Then R searches for the site-wide startup profile file of R code unless the command line option `'--no-site-file'` was given. The path of this file is taken from the value of the `'R_PROFILE'` environment variable (after tilde expansion). If this variable is unset, the default is `'R_HOME/etc/Rprofile.site'`, which is used if it exists (which it does not in a 'factory-fresh' installation). This code is sourced into the `'base'` package. Users need to be careful not to unintentionally overwrite objects in `'base'`, and it is normally advisable to use `'local'` if code needs to be executed: see the examples.

Then, unless `'--no-init-file'` was given, R searches for a user profile, a file of R code. The path of this file can be specified by the `'R_PROFILE_USER'` environment variable (and tilde expansion will be performed). If this is unset, a file called `'.Rprofile'` is searched for in the current directory or in the user's home directory (in that order). The user profile file is sourced into the workspace.

# An R Environment

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1. R\_ENVIRON

R\_HOME/etc/Renviron.site

2. R\_ENVIRON\_USER

~/.Renviron

3. R\_PROFILE

GROUP\_HOME/Rprofile.site

4. R\_PROFILE\_USER

~/.Rprofile

*Files in [blue](#) are available on [github](#)*

# One R Environment



Platform	Development	Notebooks	Datasets
Machine	DOR Desktop	KPIT Server	DOR Server
Processor	2.5GHz 4 Core	2.3GHz 8 Core	3.0GHz 32 Core
Memory	16GB	64GB	256GB
Storage	Unlimited	1TB	1TB
Support	DOR IT	KPIT	DOR IT

# Example: Set Environment Variable

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## Example `~/Renv` on Unix

```
R_LIBS="~/R/library"
```

## Example `.Renv` on Windows

```
R_LIBS="C:/R/library"
```

# R\_ENVIRON - Global Environment (Optional)

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`$(R RHOME)/etc/Renviro.site`

---

Create a .Renviro file - `~/Renviro`

**Set R\_ENVIRON\_USER**



# R\_ENVIRON\_USER - User Environment

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~/.Renviron

---

Create a group profile - GROUP\_HOME/Rprofile.site

## Set R\_PROFILE

Create a shared library directory - GROUP\_HOME/R\_LIBS

## Set R\_LIBS\_SITE

Create a personal library directory - ~/R\_LIBS

## Set R\_LIBS\_USER

# R\_PROFILE - Group Profile

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GROUP\_HOME/Rprofile.site

---

Create .Rprofile - ~/ .Rprofile

## Set R\_PROFILE\_USER

Create Project .Rprofiles e.g.  
GROUP\_HOME/RPROFILE/.RPROFILE

## Create Function to source Project Environments

```
> Renv <- function(x){  
+   switch(x,  
+         RPROFILE = source(paste0(GROUP_HOME, "RPROFIL  
+   }  
> Renv('RPROFILE')  
>
```

# R\_PROFILE\_USER - User Profile (Freedom!)

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~/.Rprofile

---

Create Development Directory e.g.  
~/Development/  
**Set Development Directory**

Create Password Vault  
~/pwv.txt  
**Load Passwords**

# A Project Profile

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GROUP\_HOME/RPROFILE/Rprofile.RPROFILE

---

Create Resource Directory  
Create Code Directory  
Create Analysis Directory

**Load Libraries**  
**Set Project Options**  
**Load Project Resources**  
**Set Database Connections**

# Content Management

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The screenshot shows the D4PT web interface. At the top, there's a header with the D4PT logo and the text "Data Driven Determination of Dynamic Patient Trajectories (Project 01-01)". Below this, there are navigation tabs: "Star", "Fork", "HTTP", and a URL bar showing "http://kordy-gitlab.kaiser.org/151". There are also buttons for "Add README", "Add Changing", "Add License", "Add Contribution guide", "Add Kubernetes cluster", and "Set up CXC".

The main content area features a section titled "Auto DevOps" with a description: "It will automatically build, test, and deploy your application based on a predefined CXC configuration." Below this, there's a "distanc" section with a "D4PT" dropdown and a "History" tab. A table lists various files and their last update dates:

Name	Last commit	Last update
lymph_challenge	Updated	1 month ago
analysis_master_cohort1	Updated: rna	2 weeks ago
CODE	Updated: analysis data	1 week ago
NOTES	Notes accounting for discrepancy between number...	1 month ago
comments	Updated: code	1 month ago
AggrData-D4PT	Updated: network	2 weeks ago
gripence	Updated: gr	4 months ago
model_rna	Updated: modelling code	2 months ago
raw_phicapsseq_2018_1113na	Updated: rna	2 weeks ago
reporter	Modified: RCC_rna	1 month ago

This PC > x225967 (l\pdongsub.kaiser.org) > rsch > srl > projects > D4PT > DATA			
Name	Date modified	Type	Size
ablapr_master_cohort1	1/16/2019 3:25 PM	File	5,198 KB
ablapr_master_cohort1	1/16/2019 3:44 PM	FF File	1 KB
advance_illness	1/17/2019 9:14 AM	FF File	1 KB
alibad_mnn	1/17/2019 9:13 AM	FF File	1 KB
analysis1_master_cohort1	1/16/2019 3:25 PM	File	51,950 KB
analysis1_master_cohort1	1/17/2019 11:33 AM	Microsoft Excel C...	2,955,727 KB
analysis3der_master_cohort1	1/17/2019 12:50 PM	Microsoft Excel C...	311,744 KB
analysis3win_master_cohort1	1/16/2019 4:41 PM	FF File	54,217 KB
bad_mnn	1/17/2019 9:13 AM	FF File	1 KB
bmi_master_cohort1	1/16/2019 3:25 PM	File	25,177 KB
bmi_master_cohort1	1/16/2019 3:45 PM	FF File	1 KB
copa2_master_cohort1	1/16/2019 3:38 PM	File	11,037 KB
copa2_master_cohort1	1/16/2019 4:07 PM	FF File	1 KB
CORR_MBN_PL3_NB	1/17/2019 9:13 AM	FF File	1 KB
cost_master_cohort1	1/4/2019 4:32 PM	File	9,953 KB
D4PT	1/17/2019 9:22 AM	FF File	65,061 KB
D4PTGP_COHORT1	1/16/2019 3:35 PM	File	28,241 KB
data_use	1/17/2019 9:13 AM	FF File	1 KB
death_post	1/17/2019 9:13 AM	FF File	1 KB
diccg_master_cohort1	1/16/2019 3:25 PM	File	46,631 KB
diccg_master_cohort1	1/16/2019 3:46 PM	FF File	1 KB
gp_post	1/17/2019 9:13 AM	FF File	1 KB
gp_pre	1/17/2019 9:13 AM	FF File	1 KB
hgatc_master_cohort1	1/16/2019 3:25 PM	File	6,553 KB
hgatc_master_cohort1	1/16/2019 3:47 PM	FF File	1 KB
hudi1_master_cohort1	1/16/2019 3:25 PM	File	18,865 KB
hudi1_master_cohort1	1/16/2019 3:50 PM	FF File	10,844 KB
master_mnn_cohort1	1/16/2019 3:31 PM	File	19,710 KB
medicare	1/17/2019 9:14 AM	FF File	1 KB
mortality_master_cohort1	1/16/2019 3:25 PM	File	12,294 KB
mortality_master_cohort1	1/16/2019 3:51 PM	FF File	10,844 KB
mnn_lookup_cohort1	1/16/2019 3:33 PM	File	20,847 KB
nam_gp	1/17/2019 9:14 AM	FF File	1 KB
nam_master_cohort1	1/16/2019 3:25 PM	File	34,431 KB
nam_master_cohort1	1/17/2019 9:19 AM	FF File	10,844 KB
phnreg_master_cohort1	1/16/2019 3:25 PM	File	912 KB
phnreg_master_cohort1	1/16/2019 3:51 PM	FF File	1 KB
rcc_master_cohort1	1/16/2019 3:25 PM	File	121,183 KB
rcc_master_cohort1	1/16/2019 4:06 PM	FF File	1 KB
nutl1_master_cohort1	1/16/2019 3:25 PM	File	35,863 KB
nutl1_master_cohort1	1/16/2019 4:09 PM	FF File	10,844 KB
ucda_master_cohort1	1/16/2019 3:25 PM	File	196,316 KB
ucda_master_cohort1	1/16/2019 4:17 PM	FF File	10,844 KB

# Project Workflow

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## Option 1:

Reference Files and Operations Relative to project path e.g.  
`source("./CODE/analysis/models.r")`

## Option 2:

Separate git controlled code from the project e.g.  
`source(paste0(DATA,"analysis/models_output"))`

# Suggestions

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*Only manage code that creates data or analysis*

## Management

Content

Structure

*Maintain same format for Code and Analysis directories*

## Maintenance

Operations - Code

Output - Analysis



## **Option 1 vs. Option 2**

Option 1 is less verbose

Option 2 provides extra flexibility

Option 2 isolates code maintenance

## **Develop Packages for Healthcare Analytics**

## **Maintain git repositories with open-source code**

# Acknowledgements

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