valtools : : CHEAT SHEET

Validation Framework

{valtools} implements a convention for organizing information referenced during validation of R packages to generate reports. This framework is consistent for all five (5) validation modes.

Validation Modes
separate from package
from source code
at installation
after installation
for distribution

Validation Elements

```
- validation/
|   |- requirements/
|   |- test_cases/
|   |- test_code/
|   |- validation.yml
|   |- change_log.md
|
|- report.Rmd
```

Getting started

vt_create_package() Start an R package with validation enabled.
analogue to `usethis::create_package()`

vt_create_packet() Initiate just the validation framework. Use when adding to an existing package or validating separate from package.

USERNAMES

{valtools} tracks `Sys.getenv("USERNAME")` to quickly tag validation elements with extended details including names for authorship credit, title and role.

vt_add_users_to_config() Add additional username details to the configuration file.

vt_get_all_users() See a list of usernames already present

Validation Markdown Components

{valtools} populates each component file with some basic info in the header

```
#' @title Test_Case_002
#' @editor An Author
#' @editDate 2021-05-20
```

Filename; username; Current date; don't edit!! {roxygen2} tags

REQUIREMENTS

vt_use_req() initiates and opens a markdown file in the correct folder. Requirements may have additional header info regarding risk assessment.

```
#' @riskAssessment
#' 1.1:1, High Risk, High Impact
#' 1.2:2, Medium Risk, Medium Impact
```

{roxygen2} tag; Requirement identifier; Risk description

TEST CASES

vt_use_test_case() initiates and opens a markdown file in the correct folder. Test cases may have additional header info regarding coverage, which maps test cases to requirements. A single test case may span multiple requirements

```
#' @coverage
#' 2.1: 2.1
#' 2.2: 2.1, 2.2
```

{roxygen2} tag; Test case identifier; Requirement identifier(s)

Validation Test Code

vt_use_test_code() initiates and opens an R script in the correct folder. Each test is a call to testthat::test_that().

```
#' @editor A Different Author
#' @editDate 2021-05-20
test_that("T2.1", {
  test_data <- data.frame(number = 1:3,
                          color = c("red", "black", "blue"))

  testthat::expect_type(test_data$color, "character")
  testthat::expect_equal(test_data$number[1], 1)

})
```

{roxygen2} header tags provided for first test. Add manually for any subsequent tests

Test identifier

Each expectation result will be displayed individually in report

Report Code

vt_use_report(*template*) Initiate a report from one of the {valtools} templates. The report references content captured in markdown components and test code.

`template = "validation"`: Full validation report.
`template = "requirement_adoption"`: Only details needed for acceptance of requirements.

REPORT ELEMENTS

{valtools} include pointer functions to capture the environment, scraping {roxygen2} header information and maintaining flexibility across validation modes. Use these to customize a report.

vt_path() Path to the validation/ folder. Used in place of here::here().

vt_get_child_files() list of files in markdown component and test code

vt_file() – for a vector of markdown component and/or test code files, render as child document in the report. Used in place of setting {knitr} chunk option "*child*".

vt_scrape_* family of functions to scrape info into data.frames:

- **vt_scrape_sig_table() –** usernames and roles
- **vt_scrape_val_env()** – environment details
- **vt_scrape_change_log()** – changelog details
- **vt_scrape_risk_assessment()** - summarize all risk assessment tags in requirements files
- **vt_scrape_coverage_matrix()** – summarize all coverage tags in test case files
- **vt_scrape_function_editors()** - function editor info
- **vt_scrape_requirement_editors()** - requirement editor info
- **vt_scrape_test_case_editors()** – test case editor info
- **vt_scrape_test_code_editors()** - test code editor info

vt_kable_* - converts the output of a **vt_scrape_*** call in a kable object for embedding in report

Validation

Running validation compiles the report code to an eye-readable report suitable for sharing, including evaluation of test code and pointers in the current environment.

separate from package	from source code	at installation	after installation	for distribution
vt_validate_report() Uses only code that has already been installed to current workspace to render report.	**vt_validate_source()** Installs package code to temp location to render report. Does not alter current workspace.	**vt_validate_install()** Installs package to run report. Persistent update to workspace.	**vt_validate_installed_package()** Re-run validation report for package that was built/installed under {valtools} paradigm	**vt_validate_build()** Build a R package tarball bundle suitable for distribution via CRAN. Users will be able to re-validate after installation.

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Learn more at https://phuse-org.github.io/valtools/ • package version 0.3.0 • Updated: 2021-09-19

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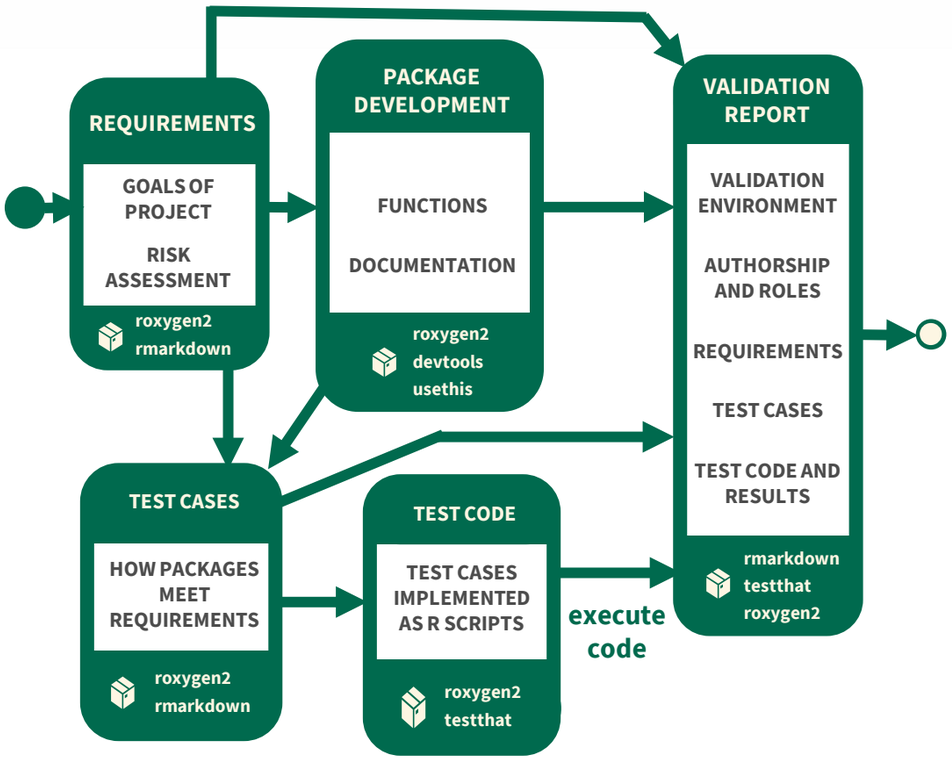
Step 1: Populate the validation content

Choose initiation mode	separate from package	add to existing package skeleton	at package creation
Initiate the validation framework	**vt_create_packet()**	**vt_use_validation**	**vt_create_package()**
R development add functions, documentation, unit testing	**NA**	**Refer to {usethis}, {roxygen2},{devtools} and {testthat} packages**	**Refer to {usethis}, {roxygen2},{devtools} and {testthat} packages**
Add validation requirements	**vt_use_req()**	**vt_use_req()**	**vt_use_req()**
Add test cases	**vt_use_test_case()**	**vt_use_test_case()**	**vt_use_test_case()**
Add test code	**vt_use_test_code()**	**vt_use_test_code()**	**vt_use_test_code()**

Where are validation elements?	`-this_validation_proj/`
	`  |- validation/`
	`  |- report.Rmd`
	`  |- …`
		`-this_package/`
		`  |- R/`
		`  |- vignettes/`
		`  |  |- validation/`
		`  |  |- report.Rmd`
		`  |  |- …`
		`  |- inst/`
		`  |- …`
			`-this_package/`
			`  |- R/`
			`  |- vignettes/`
			`  |  |- validation/`
			`  |  |- report.Rmd`
			`  |  |- …`
			`  |- inst/`
			`  |- …`



Step 2: Generate validation report

	No validation elements in installed package	**Requires access to package source code that includes validation elements**			**Installed package must have validation elements**
Choose validation location	separate from package	from source code	at installation	for distribution	after installation
Run the validation report	**vt_validate_report()**	**vt_validate_source()**	**vt_validate_install()**	**vt_validate_build()**	**vt_validate_installed_package()**
Look for output	`|-validation/` `|  |- report_v[x].pdf`	`|-inst/` `|  |- report_v[x].pdf`	`system.file("validation", "report_v[X].pdf", package = "PACKAGE")`	1 `|-inst/` `|  |- report_v[x].pdf` 2 `package_[X].tar.gz`	In designated location
What environment was used?	Current workspace, no changes introduced	Source code is installed to temp workspace; report is added to package skeleton	Package is installed to current workspace while rendering report	Source code is installed to temp workspace. Report is added to package skeleton and tarball.	Current workspace, no changes introduced

Development contributions by: