MANGO SOLUTIONS

VALIDR

ValidR

Secure and compliant access to the world's richest analytic language

Open-source on lockdown

All organisations have incredible value in their data.
R is the natural choice to unlock it.

Mango has nearly two decades of expertise in data science services and software solutions, backed by a world-class team of independent real-world data scientists, data engineers and software developers. R is a vital tool for data science and we support global companies to use this open-source technology to deliver commercial value from within their teams. We are founding members of the RConsortium, partners with RStudio and highly respected members of the R and data science communities.

Flexible, capable and cost-effective. Boasting high-quality graphics and visualisations, together with excellent third-party integrations; it's no wonder R is one of the most popular analytic languages in the world today, delivering commercial advantage across an ever-expanding range of industries.

R is open-source software; continually evolving, driven by a global community of innovative coders. There's just one problem. When you welcome the wealth of their cumulative expertise into your organisation, an inherent level of risk is introduced.

Core R itself comprises less than 20 packages. The power of R arises due to the volume and scope of additional packages developed by members of the R community and made available via a number of public repositories. However, there are minimal quality checks enforced on packages submitted to any of these repositories and less than 30% of packages on CRAN have a visible formal test framework.

Package quality can also vary considerably. Without careful control, businesses expose themselves to increased risk, from efficiency-draining bugs to malicious attacks.

Protect yourself and explore new potential with ValidR

ValidR offers a validated version of R that helps organisations to have more stringent controls over the use of open-source software.

Perfect for a business environment, this production ready version of R is investigated, validated and reviewed by Mango's industry-leading R experts to meet the demands of users, IT and Quality teams.

ValidR enables you to:
- Maximise assurance whilst minimising security risk.
- Operate with confidence knowing code is robust and effective.
- Ensure compliance to stringent industry regulation.

Unlike a standard R download, ValidR is delivered as a single, easy-to-install bundle for both Linux and SUSE server environments and includes all validated R packages, together with their dependencies and associated tests developed by Mango Solutions.

ValidR also provides documentary evidence in the form of validation reports for each package, which are generated on-site as part of the product installation. These offer a high degree of assurance that R scripts will function as expected and will be reliably repeatable, ensuring consistency of use and dependable results across any organisation.

> "Provides a standardised analytic environment for global teams."

Which organisations would benefit from ValidR?
- Any organisation seeking enhanced control over the use of R.
- Any organisation wishing to reduce the risk that open-source software presents to their business
- Highly regulated industries, such as:
  - Pharma - satisfies FDA guideline 21 CFR Part 11, enabling use in drug design, development and trials.
  - Finance - meets requirements of FSA, ensuring modelling reproducibility and enhances business objectives.
  - Other industries such as Government & Energy sectors - takes advantage of ValidR's robustness for modelling quality and efficiency.

Benefits at a glance
- An effective, tested user environment that meets the demands of IT and quality teams.
- Documented evidence which provides a high degree of assurance and consistency of process and reduces risks associated with using open-source software within your organisation.
- Meets regulatory compliance requirements across a range of sectors.
- Provides a standardised analytic environment for global teams - ensuring R can be made part of standard IT rollouts and reducing the burden of providing ad hoc environments to users.
- Faster standardised user environment for quicker effective communication.
- Over 400 validated packages to choose from, allowing tailoring to specific team/industry needs.

How does Mango ensure peace of mind?

Our rigorous validation process fully complies with industry best-practice, including ISO 9001 quality requirements and R Foundation for Statistical Computing guidance on regulatory compliance and validation issues.

Our expert consultants subject each package to a thorough risk assessment, technical testing and peer review, to minimise any risks and ensure functionality is fully aligned to package intent and customer needs.

Mango's in-house ValidR build infrastructure continually monitors both functionality and performance aspects of the package updates in real time, thus providing complete customer assurance.

7-STEP VALIDATION PROCESS

1. INVESTIGATION
Assesses intended use of package, its maturity and quality, and define functionality by creating requirements

2. INVESTIGATION REVIEW
Confirm the requirements cover all essential functionality

3. REMEDIATION
Write unit tests to ensure the package satisfies the requirements raised by the investigation

4. REMEDIATION REVIEW
Test scripts peer-reviewed to confirm requirements have been met

5. FINAL REVIEW
Independent check to ensure everything is in line with validation best practices

6. APPROVAL
Reviews all aspects of the validation process and provides final verdict on the package validation

7. MAINTENANCE
Continual maintenance of the testing and production servers and design and build deployment architecture
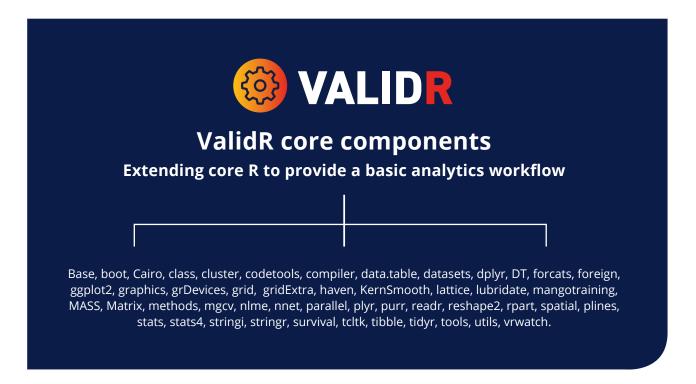
Package options

ValidR comprises around 50 core components, a choice of industry specific packages and further optional packages from the 400+ validated open-source R packages.

400+ packages being validated

VALIDR

ValidR core components
Extending core R to provide a basic analytics workflow

Base, boot, Cairo, class, cluster, codetools, compiler, data.table, datasets, dplyr, DT, forcats, foreign, ggplot2, graphics, grDevices, grid, gridExtra, haven, KernSmooth, lattice, lubridate, mangotraining, MASS, Matrix, methods, mgcv, nlme, nnet, parallel, plyr, purr, readr, reshape2, rpart, spatial, plines, stats, stats4, stringi, stringr, survival, tcltk, tibble, tidyr, tools, utils, vrwatch.
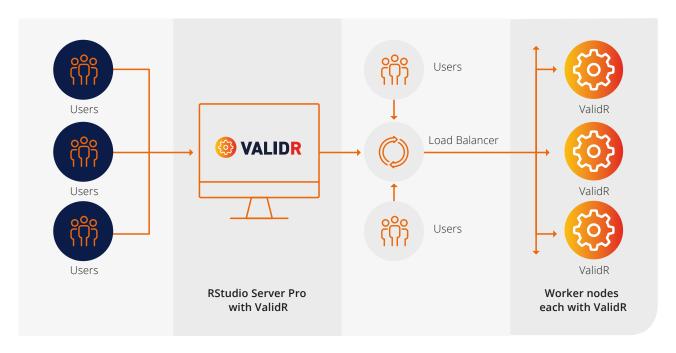
Alongside your core offering, simply select your industry and/or feature modules in addition to any further optional or custom packages as required.

Core	+ Select your industry/ feature modules	+ Select any further package/s
The 'core components module' consists of essential and recommended R packages, enhanced with what we consider to be the 'gold standard' R packages in the world today. You can then build a unique and cost-effective delivery on top, with sector specific and optional bundles aligned to your organisation's requirements.	This includes packages for specialised industry tasks such as finance and PKPD modelling. Feature modules include data connectivity, automated reporting, machine learning and Shiny.	Additional packages – packages can be tailored in accordance to your needs analysis and specific requirements. The VrWatch package helps you identify and choose the optimal packages for your organisation.

Delivery designed around you

How ValidR complements internal IT systems

Users · Users · Users → **RStudio Server Pro with ValidR** (VALIDR) → Load Balancer ↔ Users / Users → ValidR · ValidR · ValidR — **Worker nodes each with ValidR**

A typical ValidR configuration

ValidR can be integrated with your existing infrastructure and environment. For short-running scripts and interactive use, ValidR can be installed and made available via an RStudio Server Pro instance. Configuration is exactly the same as it would be for any other instance of R. This offers the benefit of being able to run scripts against a validated version of R direct from the desktop, in readiness for subsequent execution in the production environment. For longer-running, more complex scripts, ValidR can be installed on a high-performance compute (HPC) cluster, either on-premise or hosted in the cloud. Jobs can be submitted to the HPC environment either directly from the command line, or through a suitable third-party tool such as the RStudio Launcher.

ValidR is delivered as a single, easy-to-install validated bundle - including all required packages - that can be ready for acceptance in your chosen analytic environment in minutes. The installation process ensures the software has been installed and operates correctly as well as meeting performance requirements every time.

As part of your annual license you will receive:

· Validated R packages and their tests.
· All dependencies for R packages within the validated environment, each of which are subjected to a lower-level acceptance process.
· Validation status reports for each validated R package.
· A full suite of product documentation (including requirements specification, functional specification, installation guide, user guide and release notes).

Custom packages

ValidR includes all the best-performing R packages, but we recognise organisations sometimes require specific packages for specialised tasks. Get in touch to discuss our validation service for additional packages.

Licensing and upgrades

ValidR is licensed as an annual subscription. If you are under contract, you are eligible for any new versions of ValidR, which are expected annually in line with the current R release cycle. Please note: this does not include deployment, but we are happy to carry out upgrades for a fee.

Environment creation – if you do not have the appropriate environment, as a Full Certified RStudio Partner we can deliver your installation, support and operating model. These services enable your organisation to adopt and grow the use of R for advanced analytics, using the full suite of RStudio products.

ValidR in action

> "ValidR allows any organisation to confidently use R in production-grade environments. Fully complying with industry standard regulations, such as those specified by the FDA or the FSA, as well as satisfying the internal user, IT and QA communities, ValidR provides an easy to adopt, cost effective, independently validated and auditable delivery of open source R."
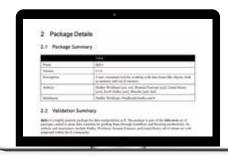
Richard Kaye
Product Manager, Mango Solutions

Metrics are gathered during the validation process to assess each package's maturity and quality.

The stringent validation process followed for each package is fully documented and supplied to the customer, providing assurance that the ValidR delivery is both robust and stable.

That's everything you need to evolve your capabilities and apply R to its fullest potential.

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Learn more about the right ValidR package for you.

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Mango Solutions have been empowering organisations to make informed decisions using data science and advanced analytics since 2002.

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