The Validation of R
Secure and compliant access to the world’s richest analytic language
Compliant open-source

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

Flexible, capable and cost-effective, it’s no wonder R is the most popular analytic language in the world today, delivering commercial advantage across an ever-expanding range of industries. Continually evolving, this open-source software is 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. Package quality can vary and without careful control, businesses potentially expose themselves to increased risk from efficiency-draining bugs to malicious attacks.

Why choose a validated version of R?

Mango’s ValidR product suite offers a validated version of R that helps organisations to have more stringent controls over the use of open-source software. Offering the flexibility of a validated group of packages to a fully validated business environment for regulation and compliance, ValidR provides a solution to meet the demands of your users, IT, quality teams and their respective environments.

The ValidR suite enables open-source access, whilst:

• Maximising assurance and minimising security risk
• Using R with confidence knowing code is robust and effective
• Ensuring compliance to stringent industry regulation
• Enabling efficient processes, maximising project ROI

Which organisations would benefit from the validation of R?

Organisations:

• Striving for consistency of package quality
• Seeking enhanced control over the use of R
• Wishing to reduce the risk that open-source software presents to their business
• Highly regulated industries, such as:
  • Life sciences - satisfies FDA guideline 21 CFR Part 11, enabling use in drug design, development and trials
  • Finance - in alignment with FCA requirements
  • Other industries such as Government & Energy sectors - takes advantage of ValidR’s robustness for modelling quality and efficiency

“Provides a standardised analytic environment for global teams”
How does the validation process mitigate risk?

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. Mango 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. The validation process continually monitors both functionality and performance aspects of the package updates, thus providing complete customer assurance.

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

7-STEP VALIDATION PROCESS
Validation options – ValidR and ValidR Enterprise

ValidR

ValidR comprises validation of the most essential and commonly used 150 R packages across all sectors, including package collections on CRAN such as the Tidyverse. ValidR mitigates the risk of adopting and managing open-source software saving vital time and resources across the organisation.

ValidR Enterprise

For an additional layer of security, the validation of the environment is incorporated within the validation process to meet the demands of IT and compliance teams, supported by over 400 validated packages from CRAN, GitHub and Bioconductor that can be tailored to meet your needs.

The ValidR suite offers varying levels of assurance aligned to your organisation’s requirements.

<table>
<thead>
<tr>
<th>Validation Level</th>
<th>ValidR</th>
<th>ValidR Enterprise</th>
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</thead>
<tbody>
<tr>
<td>150 commonly used R packages</td>
<td>150 commonly used R packages</td>
<td>Client environment plus over 400 available R packages</td>
</tr>
<tr>
<td>Package Sources</td>
<td>CRAN</td>
<td>CRAN, GitHub, Bioconductor</td>
</tr>
<tr>
<td>Supported Operating Systems</td>
<td>RedHat/CentOS 7</td>
<td>RedHat/CentOS 7 and client request</td>
</tr>
<tr>
<td>Package validation reports</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>IQ/PQ/OQ qualification reports</td>
<td>✗</td>
<td>✔</td>
</tr>
<tr>
<td>Validated and tested environment</td>
<td>✗</td>
<td>✔</td>
</tr>
<tr>
<td>RStudio Package Manager integration</td>
<td>✔</td>
<td>✗</td>
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</tbody>
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Benefits at a glance

ValidR

- A curated, validated group of the most commonly used and essential 150 R packages on CRAN
- Trust in the use of R, minimising the risk and compliance issues as defined by IT and quality teams
- Saves vital time and resources for evaluating software with IT and compliance
- Ensures reproducible results and best practice adoption for Data Science professionals, alongside documented assurance for legal and InfoSec teams
- Integration with RStudio Package Manager to organise and centralise validated R packages across your organisation

ValidR Enterprise

- Over 400 validated packages to choose from allowing tailoring to specific team/industry needs
- An effective, tested 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
Delivery designed around you

ValidR complements internal systems in many ways, either as a stand-alone package, as an integral part of RStudio Package Manager or integrating into your chosen analytic environment.

**Typical ValidR Configuration**

ValidR is delivered as a single set of packages, easy-to-install bundle of 150 of the most essential and commonly used R packages with the option to integrate with RStudio Package Manager to manage across your organisation. This provides a high degree of assurance, consistency and efficiency across any organisations’ analytical capability.

**Typical ValidR Enterprise Configuration**

ValidR Enterprise is delivered as a single package with client environment IQ, OQ and PQ test reports as part of the installation. This provides a repeatable analytical environment, ensuring a high degree of quality, ensuring consistency of use, productivity and providing dependable and results across any organisation.

**Your annual licence**

As part of your annual ValidR license you will receive:

- Validated R packages bundle
- Validation status reports for each validated R package
- Installation Guide
- All dependencies for the validated packages, each of which are subjected to a lower-level acceptance process

**Your annual licence**

As part of your annual ValidR Enterprise license you will receive:

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

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Learn more about the right ValidR option for you
Mango Solutions have been empowering organisations to make informed decisions using data science and advanced analytics since 2002.

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