R "Validation" Hub Meeting

28 Feb 2019

Attendees:

Andy Nicholls (GSK) – Meeting Chair
Lyn Taylor (Phastar) – Meeting Secretary
Alexander Lock-Achilleos (GSK)
Alun Bedding (Roche)
Anthony William (Fred Hutchinson CRC)
Doug Kelkhoff (Roche)
Greg Cicconetti (Abbvie) – ASA BIOP Software
Jack Elkes (IQVIA)
Joseph Rickert (R-Studio)
Juliane Manitz (Merck Serono)
Keaven Anderson (Merck) – ASA BIOP Software
Kieran Martin (Roche)
Martin Gregory (Merck)
Min Lee (Amgen) - TransCelerate
Nash Delcamp (Cognigen)
Patrice Kiener (InModelia)
Patric Stracke (Sanofi)
Paul Meyvisch (Galapagos)
Paul Schuette (FDA CDER)
Paulo Bargo (JnJ)
Phil Bowsher (R studio)
Rebecca Krouse (RHO Inc.)
Satish Murthy (J&J)
Tilo Blenk (GSK)
Tomas Drgon (FDA)
Xiao Ni (Novartis)
Yilong Zhang (Merck)

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Previous Action Items

Action Item	Assigned team member(s)	Deadline	Status
Communication, dissemination of information about the project to the wider group Possible Funding discussion if we need to write a package to pull metrics	Andy Nicholls/ Lyn Taylor/ Joe Rickert	12th Feb	Ongoing
dplyr through metrics gathering process	Andy	4th March	Open
Review of the website content: Direct review back to Andy or message via slack as you prefer.	Kieran Martin, Min Lee, Juliane Manitz, John Simms, Keaven Andersen, Alex lock-Achileos	8th Feb	Open
Look into how to automate the package metrics and provide feedback at next meeting (currently "risk assessment" channel on Slack for discussion but we can rename it)	**Yilong Zhang,** Rebecca Krouse, Doug Kelkhoff, Matthias Trampisch, Eric Nantz	4th March	Open
Start to look at the Manage requirements / tests stream. No slack channel yet for this but we can create one.	Nate Mockler, Keaven Anderson, Tilo Blenk.	4th March	Open
Validation white paper	Andy Nicholls, Paulo Bargo	4th March	Open
Present to the group at the next meeting on how R Shiny may be used to push the live metrics from GitHub to a website.	Matthias Trampisch	4th March	Postponed till next meeting

Meeting Agenda

- Action items
- Streams Progress updates
- Funding discussion

Discussion

Mattias Trampisch was unable to attend the meeting, hence his presentation on the R Shiny App to push the live metrics from GitHub to a website will be postponed until the next meeting.

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There is a PSI article going out in SPIN regarding the Validation Hub working group and PharmaR website. Now is the time to spread the word in your companies and organisations (such as ASA Biop).

Website updates and review stream update

Min Lee highlighted the need for an overview section on the website. Andy Nicholls has added to the preview website an overview page with headings (See below) but it's not on the live site yet and needs some further work.   Min agreed to add more detailed text under the headings and then ask the rest of people in the review team to review/contribute.
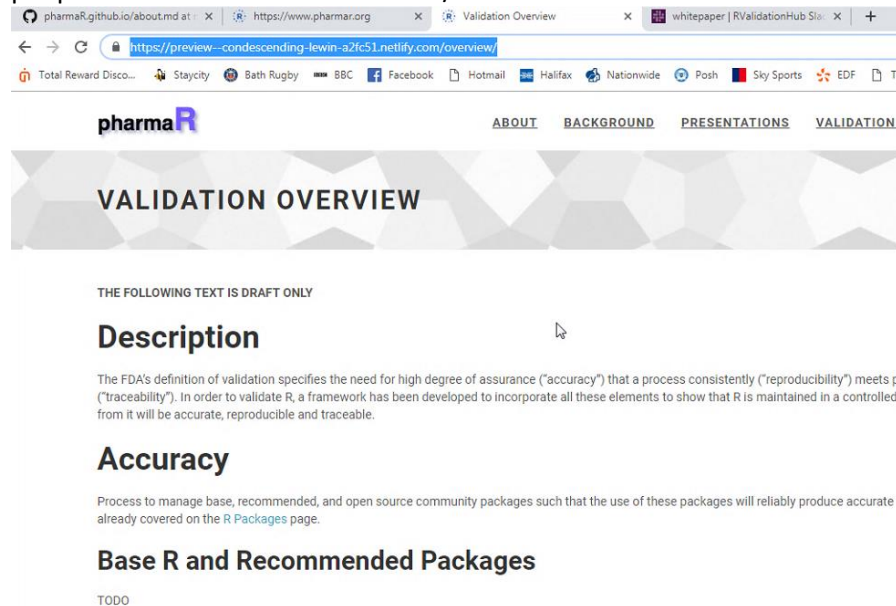
Andy requested that the team do all website updates on the preview branch first so that we can have an initial review before pushing to the main website.

Julianne Manitz sent some pull requests of website changes and those have been incorporated into the current site.

Kieran Martin highlighted that the website could be improved by a restructure because fundamentally the content people want to look at is under the Validation tab and this gets lost amongst the other less important tabs. Kieran suggests to put the "References" & "Minutes" Tabs under the "About" page and expand the "Validation" tab to be the key focus of the website.

Andy agreed and said that he's received similar comments to also put the "Minutes" & "Presentations" tabs together.

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Risk Assessment steam update

Yilong Zhang gave an update regarding the metrics work stream. There has been conservation on the slack channel about the code coverage and how this can be obtained for every CRAN package. This would be a challenge and not feasible to run every package on an individual lap top due to the time it would take. The general consensus would be to gather the metrics in a central repository, perhaps create a repo directly on the pharmaR.GitHub.IO account.

If we need code coverage for every package, then we'd need our own CI build that looks at the CRAN packages and runs our own code coverage collection. For example, to run Tidyverse code coverage would be fine, but to cover all packages will take an unfeasible amount on time on a single computer.

Joe Rickert thought that the R Hub's idea was to select just a subset of packages to focus on rather than run through all packages on CRAN and discussion ensued about how a subset would be selected. Joe thought that a reasonable approach would be to prioritize the packages which are most useful to "R in Pharma" or perhaps to those doing a specific analysis and pilot the approach on those.

Yilong's concern was that we'd need an automatic system that updates based on all new versions. Joe agreed that this would be a long term objective, but as it would need a lot of resources, he'd recommend selecting some packages as a proof of concept, then apply for more resources to be able to have a automated system that collects all metrics including code coverages.

Andy and Juliane Manitz agreed that the ideal would be to have an automated system but that this would require more resources and applying a proof of concept first would be the way forward.

Rebecca Krouse confirmed that she has approached the team responsible for PackageMetrics and they are now aware of our group and our hopes to look at an extension to that package. No further progress at this stage.

Andy asked the team if they were happy with the list of metrics proposed on the website and everyone was in agreement.

Doug Kelkhoff suggested we should write a script that collects the metrics locally and creates a CSV to show that we can automate this metric collection for a small set of packages. This could act as a proof of concept and useful next steps for the project.

Min Lee suggested we may want to get feedback from the wider quality teams to see if they approve of our approach. However, Joe Rickert highlighted that we may need to be careful not to impede progress, by having a long review/comment period. Instead Joe suggested we review/approve internally and then put it out in a public manner and welcome comments.

Andy Nicholls confirmed that he has been in contact with Quality Assurance at GSK but they requested that we put together a proposal and then they would review it.

It was generally agreed, that in the future, when we have our proposal, we would look to take it to our own company quality team and see if they can think of anything we missed, but not now since this may take a long time and impede progress.

Joe suggested that when we have an internally approved draft, we publish it on the R- blog and open it up for public comment. Joe can help with this but not the technical content part. Doug offered to help

write but asked what peoples thoughts were about QA departments actually writing back publicly as this seemed unlikely. Joe responded that we can send a blast out and then get private feedback so as to encourage response.

Min lee added that QA departments may not respond with clear opinions, but instead would want us to post something and then they react to it. So for each Dept / company we may have to identify a responsible QA person to ask if they would be confident in accepting the framework in their organization and if it would give them confidence to allow the use of R. It's likely to be a Business decision by management and the quality group will not commit to directing us what to do.

Joe Rickert suggested the following approach that our group should take:
1) Be an authority from the start as this will help QA departments see us as such. We have to presume that we are the experts and that what we are offering is of quality
2) See who is using the repo (track downloads from our repo) and get indirect measurements of the frequency of use.

Juliane Manitz highlighted the smaller company point of view. It the consensus of the big companies is to adopt the framework then this often defines the way the smaller companies are likely to take. Joe and Andy agreed and added that this is the benefit of what we are doing, since it allows us to collaborate in a competitive environment. We are the voice that people will look to for guidance given few people are placed to understand the regulatory environment & R.

Manage Requirements / Tests Stream
Nate Mockler, Keaven Anderson and Tilo Blenk have formed a new stream to look at the requirements and tests. Discussion will start shortly on Slack to progress this further.

White Paper Stream
Andy Nicholls, Paulo Bargo need some more team members to be involved and join the group who will work on creation of a white paper that describes everything we are trying to do on the website.   Please let Andy know if you want to join.

Additional Discussion
Phil Bowsher informed the group that he is just back from PhUSE conference, and the overwhelming feeling was that people do not understand the R package environment. Once the testing and validation associated with packages such as tidyverse and ggplot2 are explained then people realize the testing goes beyond industry standard and above other purchased off the shelf software. Once they understand it's tested, they think they don't need to further test the package, but instead still see the need to ensure it is installed correctly locally and they are also interested in how to test their own code that they write. Phil has written a paper which includes highlighting the work being done by our validation hub team.

Martin Gregory pointed out that the reassurance that some packages are well validated is only applicable to some packages, since others packages you may want to use, really don't have present tests to provide validation. Juliane Manitz agreed and pointed out that this is the purpose of what we are doing as then you can use our metrics to see how much evidence there is before you use a package.

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Joe Rickert suggested that the idea of the team using tidyverse as a proof of concept, may not be the best idea and instead we should use a lesser known, less tested/validated package. One concern of Yilong is that we'd spend lots of time testing other authors packages and the author themselves should contribute these tests. Joe agreed but this would take time so if we produced a framework and example, then we can ask authors to conform to our standard. Yilong agreed

Keaven Andersen is going through this process now with GSDesign which has 20% code coverage. Perhaps this could be used as a proof of concept of what we are trying to do.

Patrice Kiener added into the chat window that we could do as per NIST. The page for validating nonlinear regression algorithm. See https://www.itl.nist.gov/div898/strd/nls/nls_info.shtml.

The team agreed to take this discussion offline with two objectives:
1) Select appropriate packages to use as proof of concepts prior to getting additional resource for expanding the task
2) Investigate how to educate people in the structure of R packages. Yilong suggested including on the website an overview of the structure – so if someone has high level questions we can direct them to the information. Andy added this could be in the form of a FAQ page.

Funding discussion

The deadline for application of further ISC funding is April 1st (midnight). However, there will be a further opening in Q3 if we don't have time now to put an appropriate plan together.
Andy's ideas for potential deliverables to apply for extra resource to achieve could be:
- Updates to package metrics
- Shiny app/ dynamic website for package assessment
  - Database backend
  - Ability to generate reports

Andy identified that we have the metric plan, but further down the line we want to automate the metrics, store the information and build a database back end. The transcelerate project will kick off in Q3 and they will have deliverables, but to what extent do we want to accelerate what we are doing by potentially getting additional funding.

Joe Rickert informed the team that the ISC welcome proposals with small requests for funding to support achievable objectives and that this is more likely to be awarded than large requests for a single large task. Options for the funding request could be to pay for an intern to do some work, or we could ask for infrastructure.

Andy pointed out that to achieve 1st April deadline for the application, then we'd need testing and package metrics streams/teams to think quickly about what it is we want to do, what to build and what it will look like, so we can apply for help to achieve it.

The teams should consider if you think a funding application would help accelerate our objectives and if so what should we ask for funding for. Doug Kelkhoff suggested infrastructure; since it is inevitable that we have to store the metrics separate from the website itself so that will be required.

Joe suggested that one option would be to limit the request to infrastructure right now and there would be opportunities to apply for other things later. However, Andy identified that we are not experts in development operations/ infrastructure assessment and we don't really know what we'd need.

Gabor Csardi– would be a good place to start and we could even ask for financial help to get someone in for an infrastructure assessment.

AOB:
- Some members of the team found it difficult to access via Skype and preferred the Webex method. Lyn to set up a poll and to send with the meeting minutes to see how many people have an issue and if here is preference for Webex then we can try to move back to that method.

- Andy wants to put the company logo's on the website rather than a list of the companies. All to contact their company to ask if this is permissible. Andy to ensure that the text on the website states that the listed companies participate in the project rather than any endorsement.

Actions

Action Item	Assigned team member(s)	Deadline	Status
Communication, dissemination of information about the project to the wider group Possible Funding discussion if we need to write a package to pull metrics	Andy Nicholls/ Lyn Taylor/ Joe Rickert	28th March	Ongoing
Put a package through metrics gathering process and develop prototype report	Andy	28th March	Ongoing
Review of the website content: Direct review back to Andy or message via slack as you prefer.	Kieran Martin, Min Lee, Juliane Manitz, John Simms, Kieven Andersen, Alex lock-Achileos	28th March	Ongoing
Risk assessment workstream – set objectives + milestones	**Yilong Zhang,** Rebecca Krouse, Doug Kelkhoff, Matthias Trampisch, Eric Nantz	28th March	Ongoing
Requirements/tests workstream – appoint spokesperson and set objectives + milestones	Nate Mockler, Keaven Anderson, Tilo Blenk.	28th March	Ongoing
Validation white paper workstream – appoint spokesperson and set objectives + milestones	Andy Nicholls, Paulo Bargo	28th March	Ongoing
Present to the group at the next meeting on how R Shiny may be used to push the live metrics from GitHub to a website.	Matthias Trampisch	4th March	Postponed till next meeting

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Write text for the overview website page and request review by website review team	Min Lee (and then Kieran Martin, Juliane Manitz, John Simms, Kieven Andersen, Alex lock-Achileos to review)	28th March	Open
Update website to put the Validation as the main focus and bring minutes/presentation/ About us more together.	Andy	28th March	Open
Select appropriate packages to use as proof of concepts prior to getting additional resource for expanding the task	Yilong / risk assessment workstream	28th March	Open
Write blog post on gathering metrics and using these in a risk assessment	Doug Kelkhoff	TBC	Open
Investigate how to educate people in the structure of R packages. Yilong suggested including on the website an overview of the structure – so if someone has high level questions we can direct them to the information. Andy added this could be in the form of a FAQ page.	TBC	28th March	Open
Some members of the team found it difficult to access via Skype and preferred the Webex method. Lyn to set up a poll and to send with the meeting minutes to see how many people have an issue and if here is preference for Webex then we can try to move back to that method. Once poll returned, will set up next meeting.	Lyn	28th March	Open
Andy wants to put the company logo's on the website rather than a list of the companies. All to contact their company to ask if this is permissible. Andy to ensure that the text on the website states that the listed companies participate in the project rather than any endorsement.	All	28th March	Open