



The Clinical Data  
Science Conference

# US 2024

**25-28 February**

Bethesda North Marriott Hotel  
& Conference Center



## Agile Way of Working with Azure DevOps in clinical trials

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*Source: Google; For representation purposes only*

## Disclaimer

The views and opinions expressed in this presentation belong solely to the presenter and do not necessarily reflect those of the presenter's employer, organization, committee, or any other group or individual.

The purpose of this presentation is to highlight the advantages of the Azure DevOps in clinical trials.

No data or confidential information belonging to Novo Nordisk has been utilized in this presentation.

Introduction of ADO

Kanban Boards

Version Control and GIT

Issue logs

Project Wiki

Challenges - Azure Devops

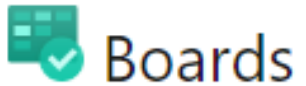
# Introduction of ADO



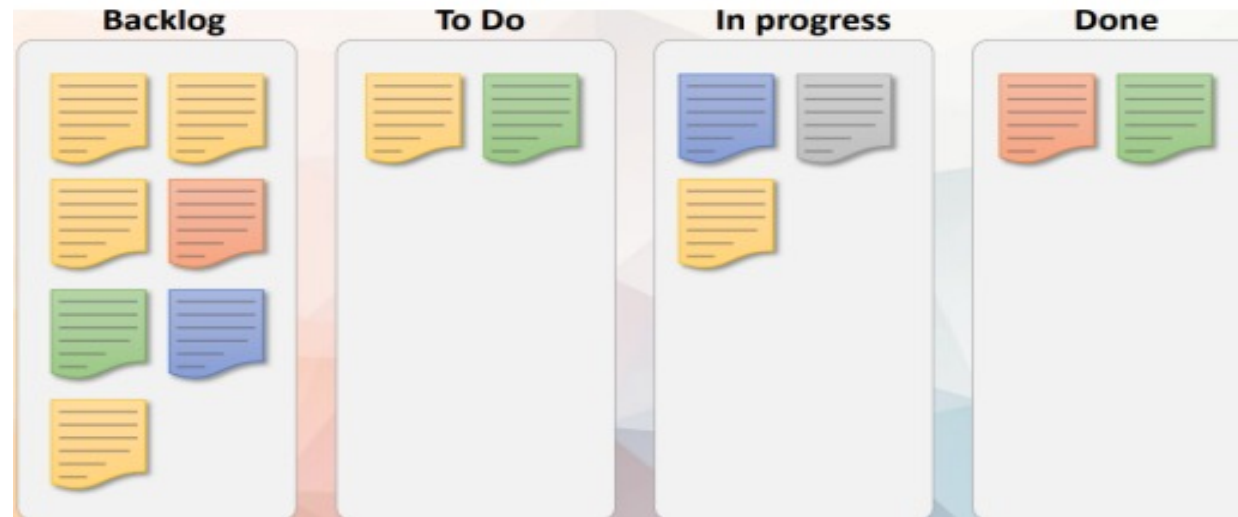
*Source: Google; For representation purposes only*

- Azure DevOps is a cloud-based suite of tool includes a range of integrated tools that can be used together or separately to support the entire development process, from planning, tracking work that can be used to support the development process.
- DevOps is the union of people, process, and products to enable continuous delivery with values.

# Kanban Boards

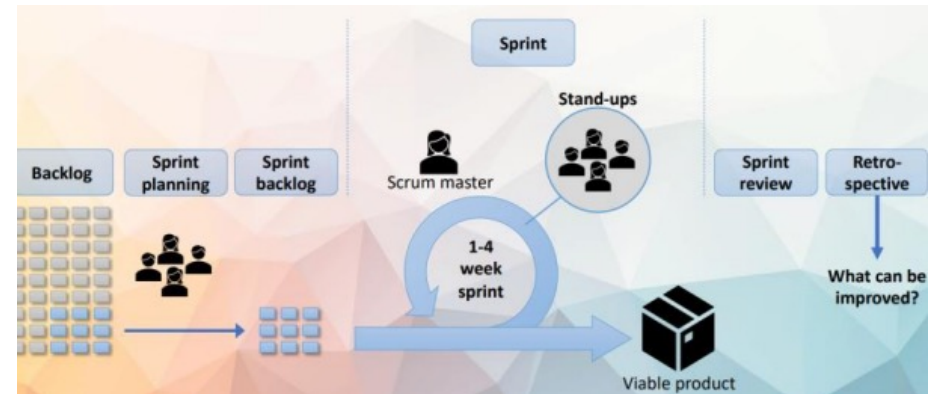
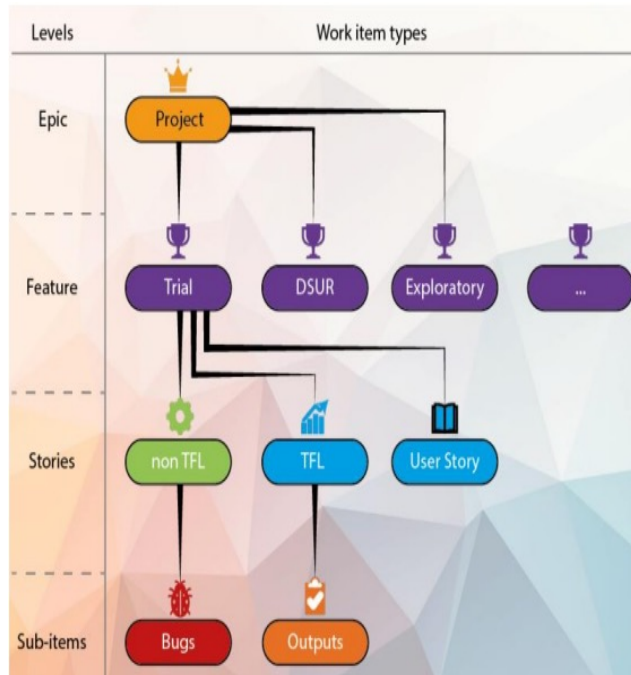


Plan, track and discuss the work across teams.



- Azure boards have components like work items, backlogs, boards, queries, sprints details.
- A visual system for tracking progress of work

# Kanban Boards



# Features of Kanban Boards



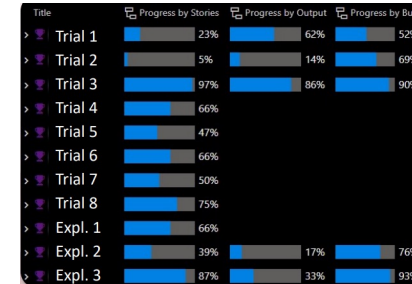
Customizable  
columns  
Drag-and-drop  
functionality



Tagging



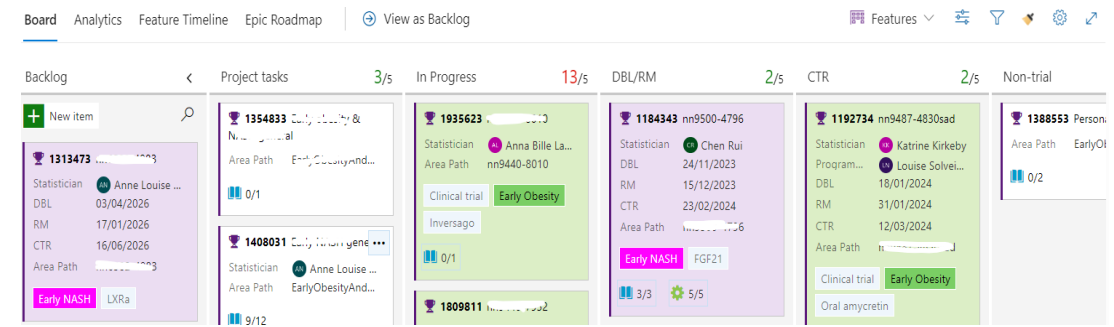
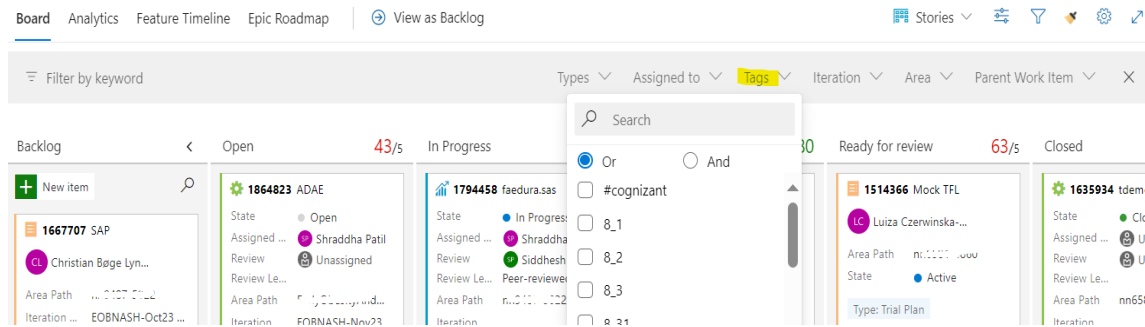
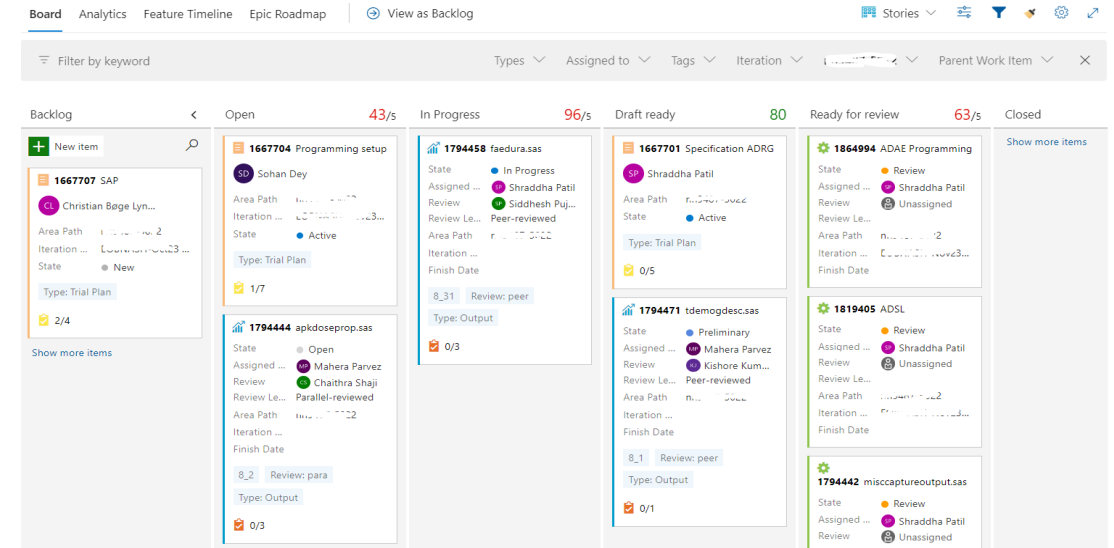
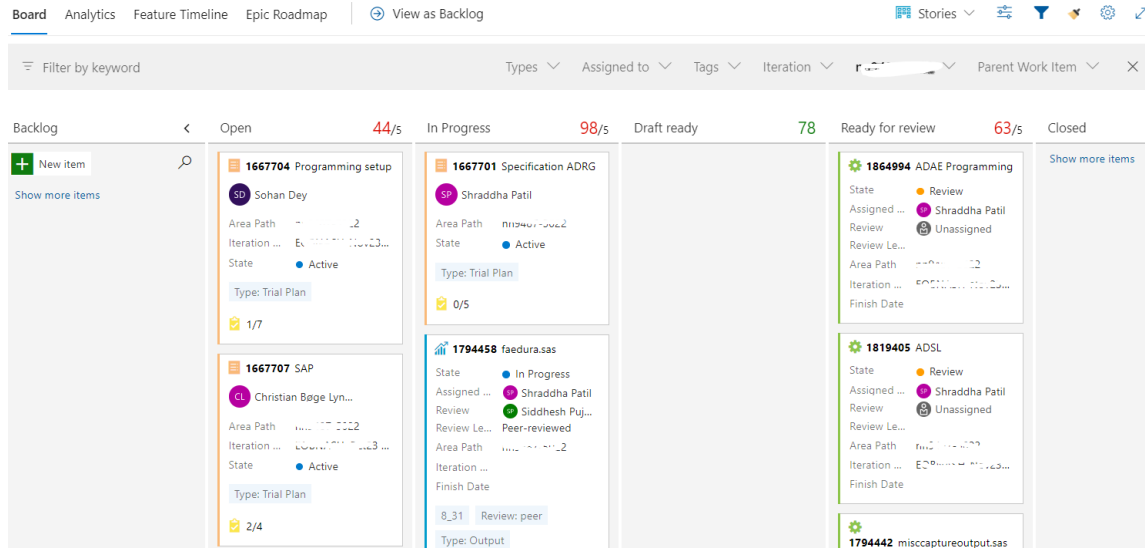
Coloring



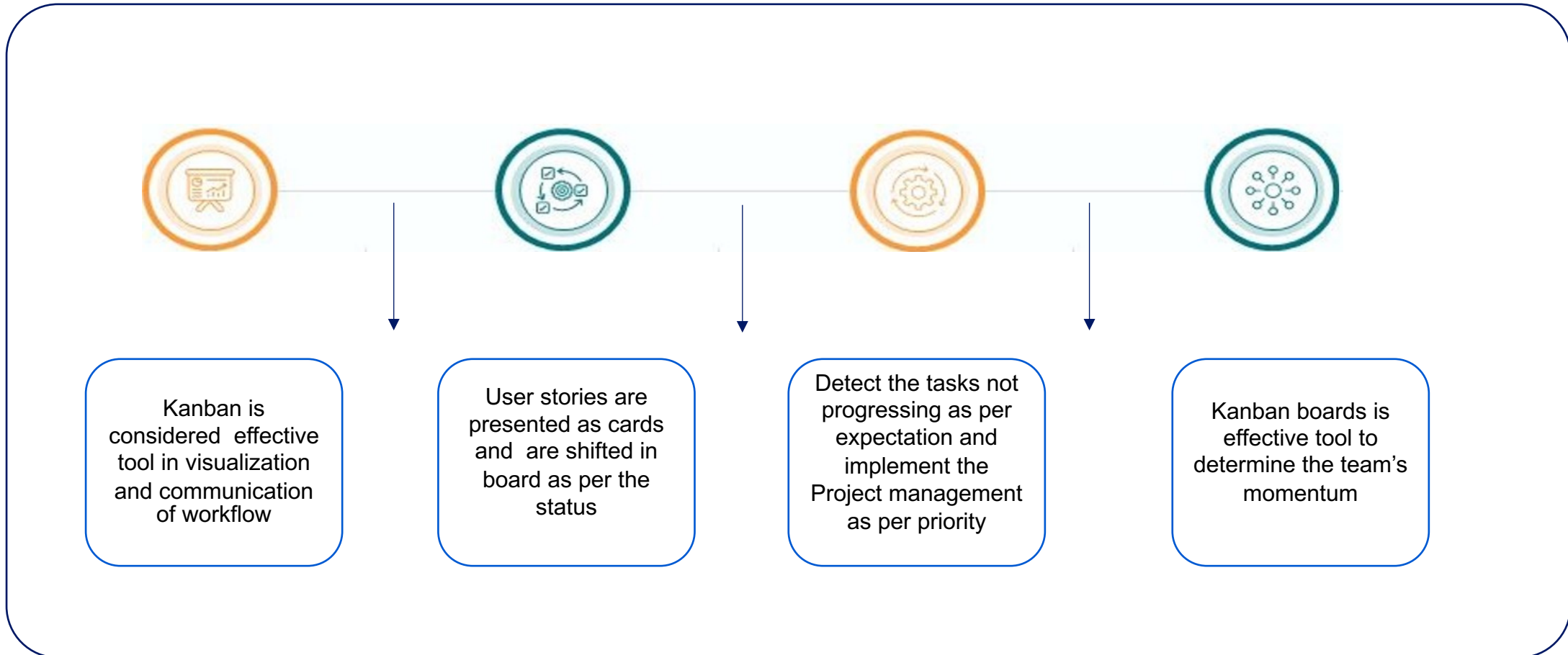
Metrics &  
Analytics

Source: Google; For representation purposes only

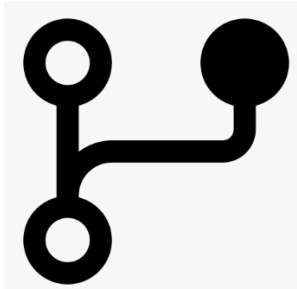
# Features of Kanban Boards



# Advantages of Kanban Boards



# Version Control and GIT

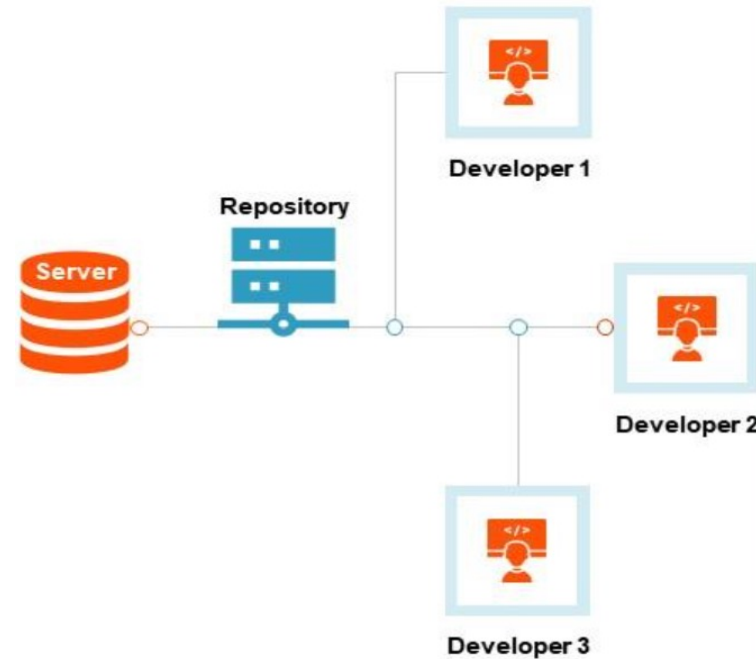


Version control is a system that allows you to keep track of the changes made to a file or set of files, and enables you to revert to earlier versions of those files if necessary



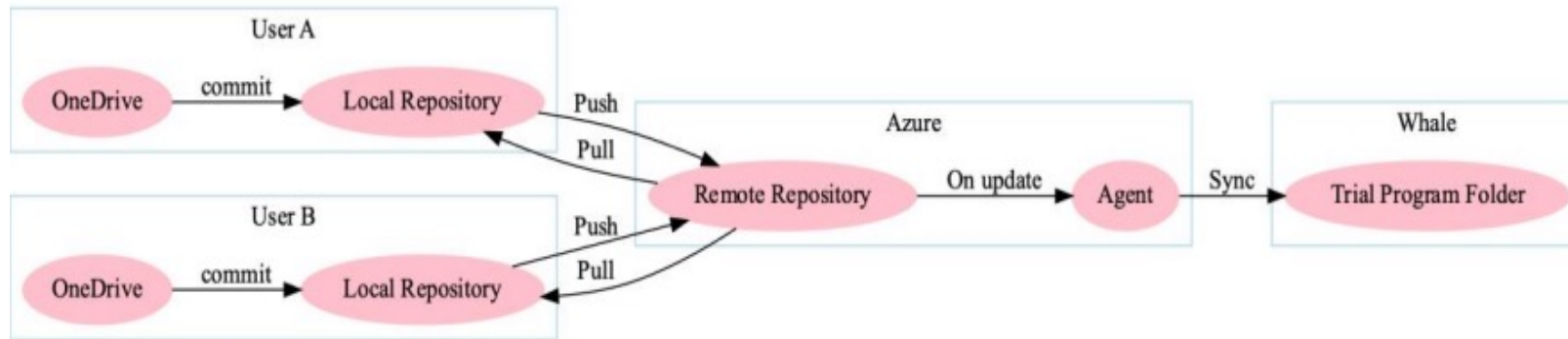
Azure  
Repos

Git is a distributed version control system which means that each user has a full copy of the repository on their local machine. When changes are made, they can be merged with the changes made by other users.



*Source: Google; For representation purposes only*

# Version Control and GIT



PULL

ADD

COMMIT

PUSH

# Version Control and GIT

Filter mk200adlb.sas -16 +40 /adamprog/mk200adlb.sas

Side-by-side

```

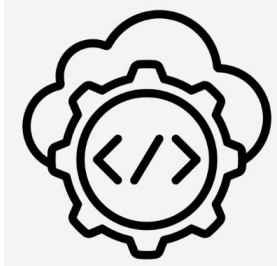
20      METADATA.MDPARAM
21      METADATA.MDFLOW
22      METADATA.MDVISIT
23      METADATA.MDCOL
24      Output      : ADAM.ADLB
25      Usage notes : This program should run after ADAM.ADSL is created
26      Programmer   : OFo
27 - Change log : Copy from 4424. Run on 14.12.2022 still with errors in
28 - Does not make sense now, as there are many entries without
29 - lbcac and thus topiccd - so the merge becomes off and ma
30 -
31      *****
32
33
34      /*****
35      /* ITR: Setup libraries
  
```

mk200adlb.sas Edit

Contents History Compare Blame

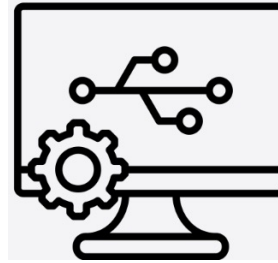
| Graph | Commit                                                                                                                        | Change | Pull Request | Status      |
|-------|-------------------------------------------------------------------------------------------------------------------------------|--------|--------------|-------------|
|       | <b>Updated anelfl = " " for measurement after t...</b><br>51181346 kstc (Kirsten Stächer Cridland)<br>May 25, 2023 at 7:37 AM | edit   |              | ✓ succeeded |
|       | <b>topiccd removed from drop list</b><br>6ef1f9c8 OFO (Ole Folmer)<br>Mar 27, 2023 at 5:58 AM                                 | edit   |              |             |
|       | <b>update conv codes and avisit2</b><br>e5bd18be OFO (Ole Folmer)<br>Mar 21, 2023 at 8:01 AM                                  | edit   |              | ✓ succeeded |
|       | <b>update</b><br>520b6d67 OFO (Ole Folmer)<br>Mar 14, 2023 at 11:26 AM                                                        | edit   |              | ✓ succeeded |

# Advantages of GIT



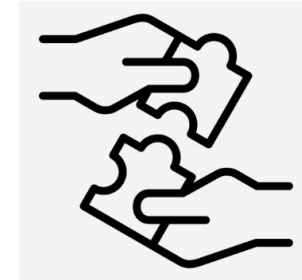
## **Code management**

Developers use Git to track changes to their code over time, collaborate with other developers, and manage code releases



## **Version Control**

Track the changes to files over time. Users can revert to an earlier version of a file if necessary, and to see the history of changes as well



## **Collaboration**

GIT allows multiple users to work on the same set of files simultaneously, and to merge their changes together when they are ready

# Issue Logs

## DETAILS OF ISSUE

The screenshot shows a web interface for an issue log. The main content area displays the details of a specific issue (ID: 1520988). The interface is annotated with five blue callout boxes:

- 1. Issue Description:** Points to the top section where the issue title and status are displayed.
- 2. Category of Issue:** Points to the 'Issue category' dropdown menu.
- 3. Details of Issue:** Points to the 'Details' section on the right, which includes fields like 'Requested Date', 'Completed By', and 'Priority'.
- 4. People Assigned:** Points to the 'Assigned To' section, showing a list of team members and their roles.
- 5. Communications:** Points to the 'Discussion' section at the bottom, which contains a list of comments and replies.

The 'Issue Description' section includes a table with columns: ID, Status, Category, Sub-category, and Action. The table shows a single row with ID 1520988, Status 'Queried To Site', Category 'Trial Execution', and Action 'Issue-log'.

The 'Resolution Comment' section has a button 'Click to add Resolution Comment'.

The 'Discussion' section shows a list of comments. The first comment is from a user with ID 1520988, dated 24-Nov-2023, stating: 'Bulk update of work item type 'DM issue' to 'CTDM issue' by ... Information was sent out by email on 23-Nov-2023. Please reach out to ... in case of any issues. No data is lost or changed in any way. Everything will remain as is, but under a new work item type.' The second comment is from a user with ID 101004, dated 29-May-2023, stating: 'Subject 101004 and 101039 is not randomized as per DS subject status is "MET ELIGIBILITY CRITERIA BUT NOT NEEDED".'



## ADVANTAGES

1. It provides centralized tracking mechanism for all the issues in a project/study.
2. Team members can collaborate more efficiently by sharing information about issues, assigning tasks, and updating the status of issues.
3. Users will receive an automatic notification when the issue log is updated with an edit or addition.
4. It helped us to share snippets, add links, and attach files to the issue log.

# Project Wiki

Trial Execution Wiki

master

Filter pages by title

Skill Areas

Cross-Skill SBP learnings

Biostatistics

**ADaM ToolBox Cheat S...**

Recordings of Courses

Clinical Pharmacology

IT

Guidelines

Data Pooling and Omic...

Scrummers network

Onboarding

Radar

Inspirational Talks

Fit4take-off

Trial Conduct

Tips and tricks

## ADaM ToolBox Cheat Sheet

Durga Ramana Majeti 8 Feb 2023

Follow 1 Edit

Contents

- [Common warnings/errors while creating define and how to handle](#)

### Common warnings/errors while creating define and how to handle

- WARNING: [CSTLOGMESSAGE.DEFINEUTIL\_SPLITWHERECLAUSE] Column in WhereClause not found:  
WhereClauseOID=WC.ARM.AR.figure 14.2.00008.R.001.ADV5.00001 ItemOID=IT.ADV5.LMWEEK Comparator=EQ  
CheckValue=68

Solution: Check for the variables mentioned in dataset. They should be present in dataset. Else you will get this warning. In above example LMWEEK was missing in ADV5
- WARNING: [CSTLOGMESSAGE.DEFINEUTIL\_VALIDATEWHERECLAUSE] Record with invalid WhereClause deleted from  
\_cstSourceAnalysisResults\_4259 : N=1 displayidentifier=RD.table 14.2.00001 displaydescription=Pharmacokinetic endpoints - descriptive statistics - full analysis set table=ADPP WhereClause="(FASFL EQ "Y") AND (ANELFL EQ "Y")"

Solution: Check for the requirements to add use a whereclause: use the below dataset to verify whereclause

```
data validate_whereclause;
length __CheckValue __RegEx_VarName $100 __RegEx_EQ_NE __RegEx_IN_NOTIN __Pattern $ 2000 __Pattern_ID valid 8;
__CheckValue = '(["^"]+)[^"]*';
__RegEx_VarName='[a-zA-Z][a-zA-Z0-9]{0,31}';
__RegEx_EQ_NE=cats('EQ|NE|LT|GT|GE')s* , __CheckValue);
__RegEx_IN_NOTIN=cats('IN|NOTIN')s* , __CheckValue, '(\s*,\s*', __CheckValue, ')*', '\s*\');
__Pattern = cats(__RegEx_VarName, '\s+', "(", __RegEx_EQ_NE, "|", __RegEx_IN_NOTIN, ")");
__Pattern = cats("(", __Pattern, "|", "(\s*", __Pattern, "\s*\)", ")");
__Pattern = cats(__Pattern, "(\s+AND\s+", __Pattern, ")");
__Pattern = cats(__Pattern, "(\s+AND\s+", __Pattern, ")");
__Pattern = cats(__Pattern, "(", __Pattern, "|", "(\s*", __Pattern, "\s*\)", ")");
__Pattern_ID=prxparse(__Pattern);
whereclause = 'PARAMCD IN ("C64849B" "HBA1CONV") AND FASFL EQ "Y" AND ANELFL EQ "Y" AND ANL01FL EQ "Y";
valid = prxmatch(__Pattern_ID, whereclause );
if valid ne 1 then put "ERROR: Where clause invalid.";
else put "Where clause is valid.";
run;
```



### ADVANTAGES

- It helps us to get an overview of all the projects in the drug development area.
- Wiki gives us a knowledge sharing platform as well as promotes collaborative environment among all the team members around the globe.
- It also helps in onboarding new joiners and smooth transition of stake holders from different projects

# Challenges - Azure Devops

## Processes



SOPs, guidelines, workflows

Azure DevOps is a complex platform with many features and capabilities, which can make it challenging for teams to follow specific SOPs, guidelines to implement and maintain the workflows

## IT



Servers, access permissions, software

Azure DevOps integrates with many other tools and services, which can make it challenging to set up and configure the integration correctly. Teams may need to spend time troubleshooting integration issues to ensure that everything works seamlessly together

## People



Change management

Azure DevOps is highly configurable, making changes to the platform can be challenging and require significant technical expertise. Azure DevOps is a complex platform with many features and capabilities, which can make it challenging for teams to learn and master. It may require significant time and effort to train team members on how to use the various tools and services effectively.

**Conclusion :** Data Analytics and Statistical Programming is a complex environment that can be benefited from implementing Kanban Boards, GIT with the help of Scrum, Agile planning, tracking work items, reporting and visualization, teams can control risk, minimize investments, and improve predictability and team collaboration. It offers native support for Scrum and Kanban for Agile on the backend. In addition to it, development team can use a group of version control tools which help to manage codes and their various versions. As a result, track changes made to the code(s) over time and between various versions makes it easy. The visual representation and documentation made the work much easier to share between programmers. Azure DevOps adoption at project level, make some enhanced results in business productivity and streamlined processes

*Thank you !*