



# Implementing Agile Methodologies: Using Trello™ to Generate and Optimize Kanban Boards for Recurring SAS Programming Tasks



Gina Boccuzzi, PROMETRIKA, LLC. & Patrick Dowe, PROMETRIKA, LLC.

Abstract

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## ABSTRACT

Managing Data Management programming requests in a CRO environment presents multiple challenges. Data Management requests come in all shapes and sizes, but they all have one thing in common – the sponsor wants the results as soon as possible. While most requests are on a recurring schedule (quarterly, monthly, weekly), the exact timing of each request is partly dependent on the receipt of external data, either from the sponsor or a third-party vendor. The importance of completing the requests in a timely manner while the data is still current makes prioritization and resource planning difficult. With varying frequencies and timelines coming from multiple sponsors, a robust system for tracking is needed to fulfill project requirements. Trello™ is one online application that allows the generation and optimization of Kanban Boards in the Agile methodology. A Kanban Board is a visual representation of the life cycle of a task from start to finish. Creating a board to manage requests optimizes work flow and communication, and automates many processes. The use of Kanban Boards works well for Data Management requests, which are a contained set of requests with some regular frequency and limited updates after the initial programming. Successful use in this somewhat limited application suggests that the process can be scaled up for even more complex challenges.

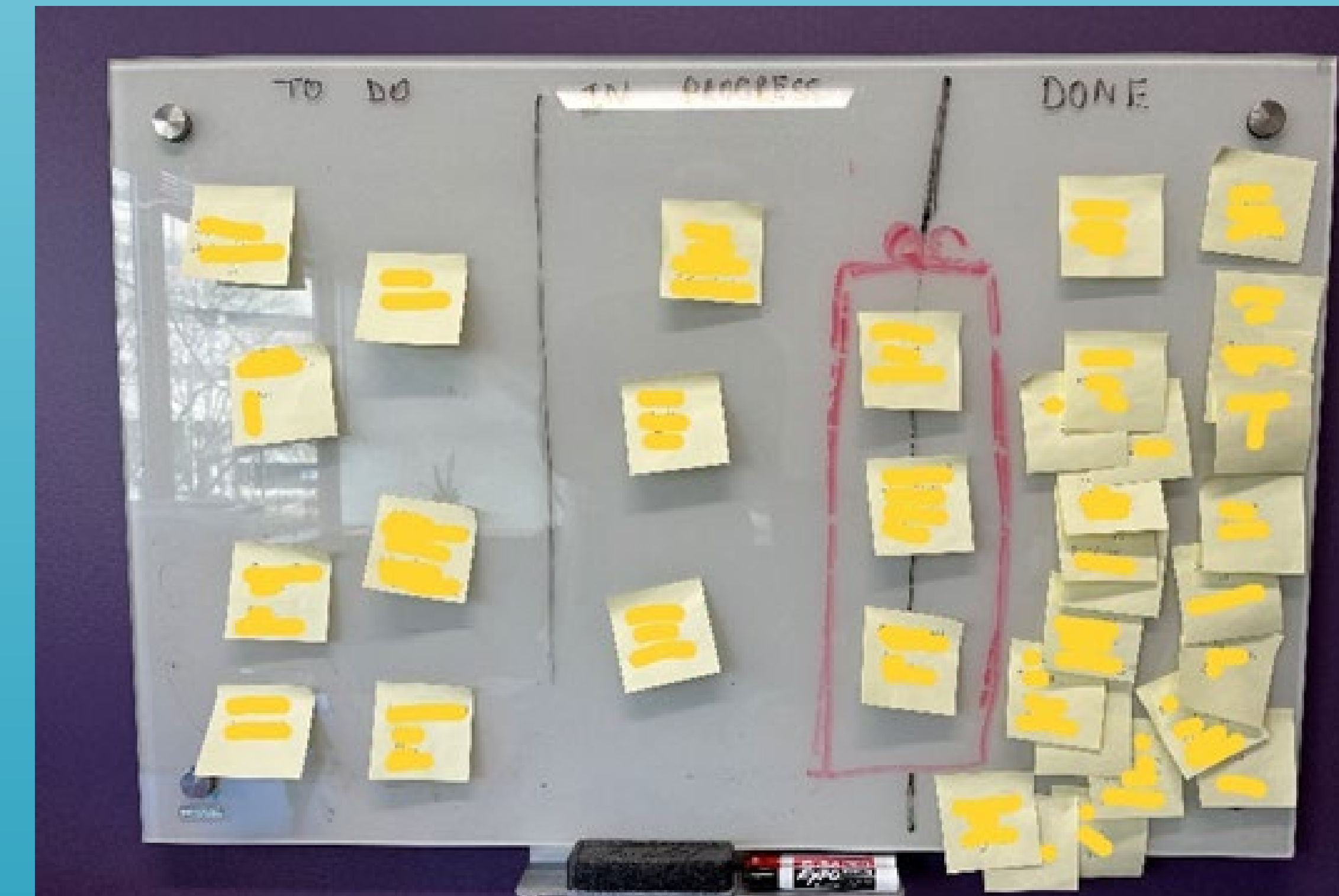
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## INTRODUCTION

- Needed a solution to manage programming tasks
  - Recurring Data Management reruns of programs with new data cuts
  - Organize deadlines, responsibilities, data cuts, and file locations
- Leveraged Agile backgrounds to optimize workflow
  - Create a Kanban board to manage tasks
  - Use features to automate parts of the process
- Simple enough to start as sticky notes on a whiteboard





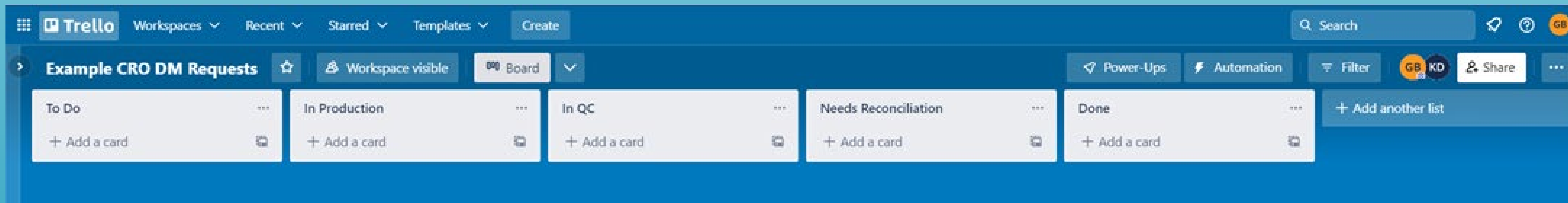
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## THE BOARD

- We migrated the sticky notes to digital a Kanban board to track recurring programming tasks
  - Kanban boards typically feature columns like “To-Do”, “In-Progress”, and “Done”
  - Kanban allows the flexibility to tailor each board to the user’s needs

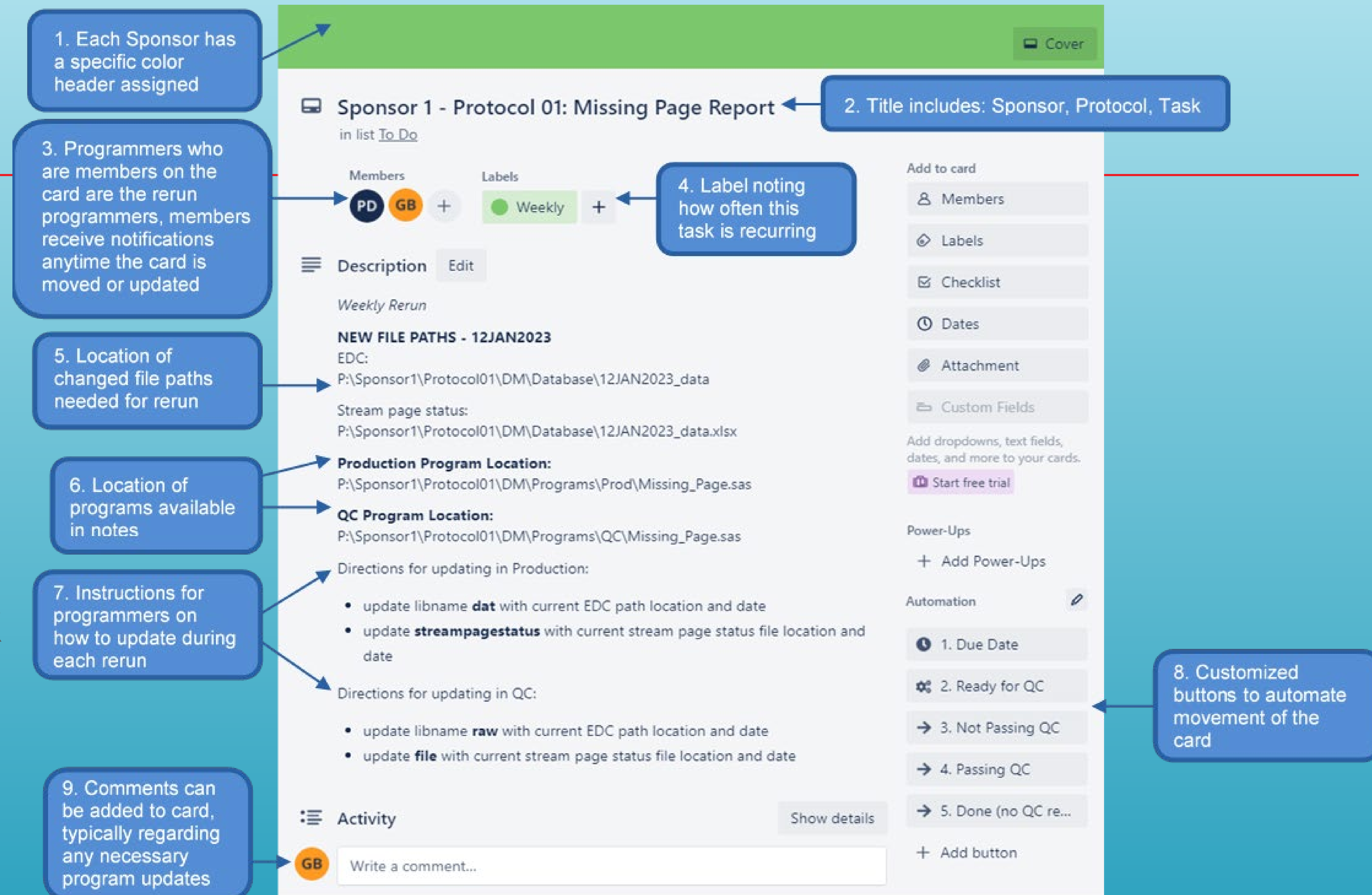


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## THE CARDS

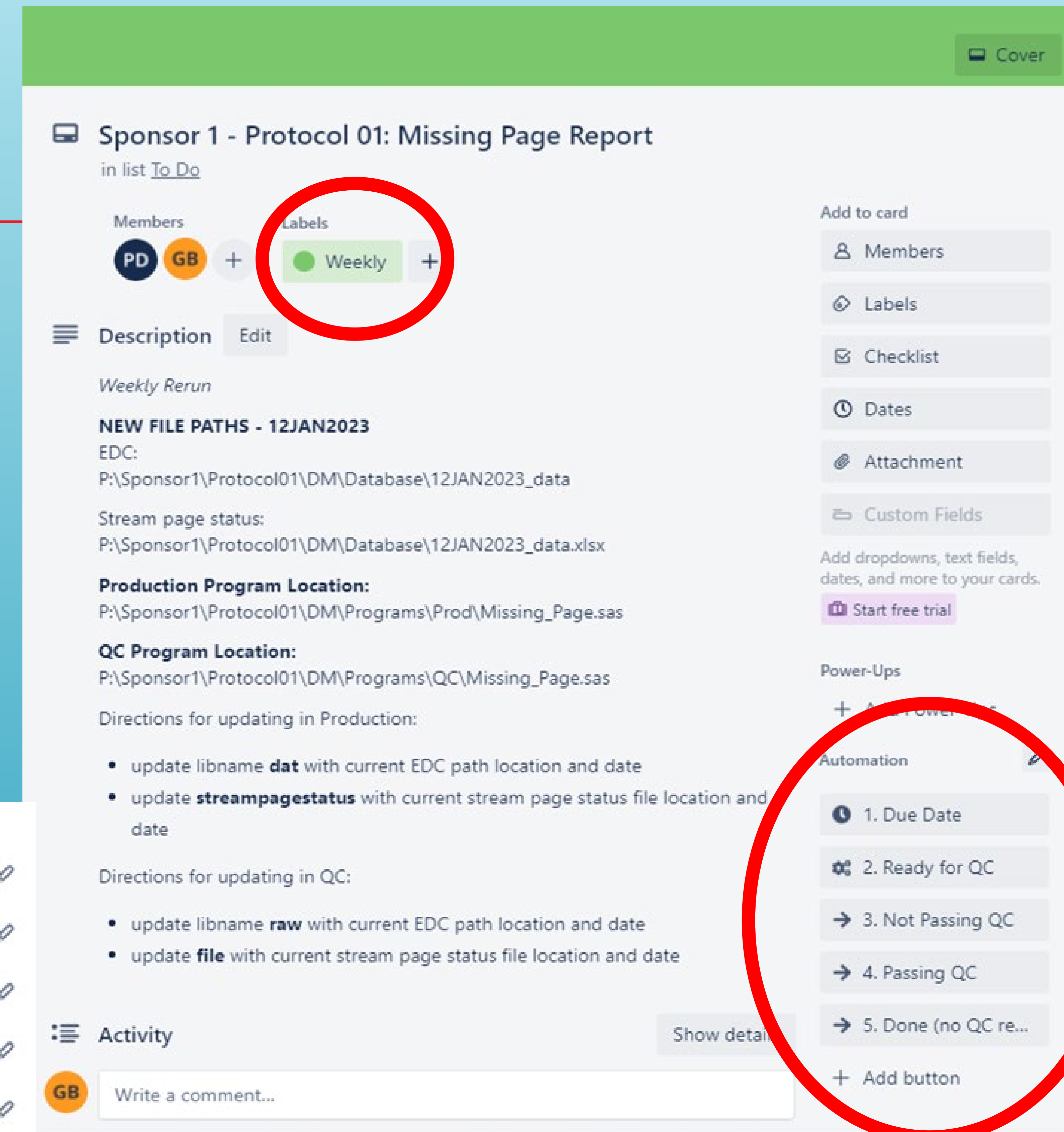
- Each recurring task has its own card
- These cards contain all the information about a task and what needs to be completed
- Each card is written in a way that anyone can pick up and complete the task





## THE FEATURES

- Trello™ enables us to
  - Label each card with how often it needs to be rerun
  - Set a due date for when this card need to be completed by
  - Buttons to automate the movement of the cards between columns, clicked by the appropriate programmer when the status of the card changes
    - Ready for Quality Check (QC)
    - Not Passing QC
    - Passing QC
    - Done
  - Send automatic emails to notify programmers of status changes as the buttons are used to move the cards though the board



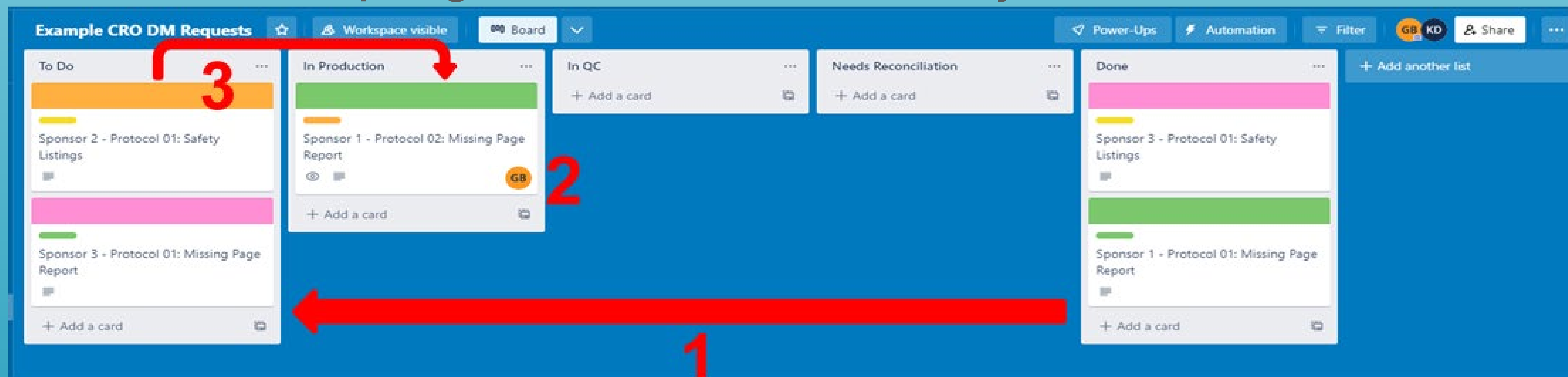
The screenshot shows a Trello card titled "Sponsor 1 - Protocol 01: Missing Page Report" in the "To Do" list. The card has a green cover and a red circle highlighting the "Labels" section, which includes a "Weekly" label. The card's description contains file paths and instructions for updating in Production and QC. A red circle highlights the "Automation" section, which includes a checklist with five items: "1. Due Date", "2. Ready for QC", "3. Not Passing QC", "4. Passing QC", and "5. Done (no QC re...)".



The screenshot shows the "Labels" menu in Trello, which includes a list of labels: "Weekly" (checked), "Bi-Weekly", "Monthly", "Quarterly", and "Ad Hoc". Each label has a corresponding colored circle and a pencil icon for editing.

## INITIATING THE LIFE CYCLE

- The “To-Do” column contains tasks where a rerun is needed
- “In Production” column indicates when a Production Programmer has begun work on a task
- Tasks that have been programmed but currently don’t need to be run, live in “Done”

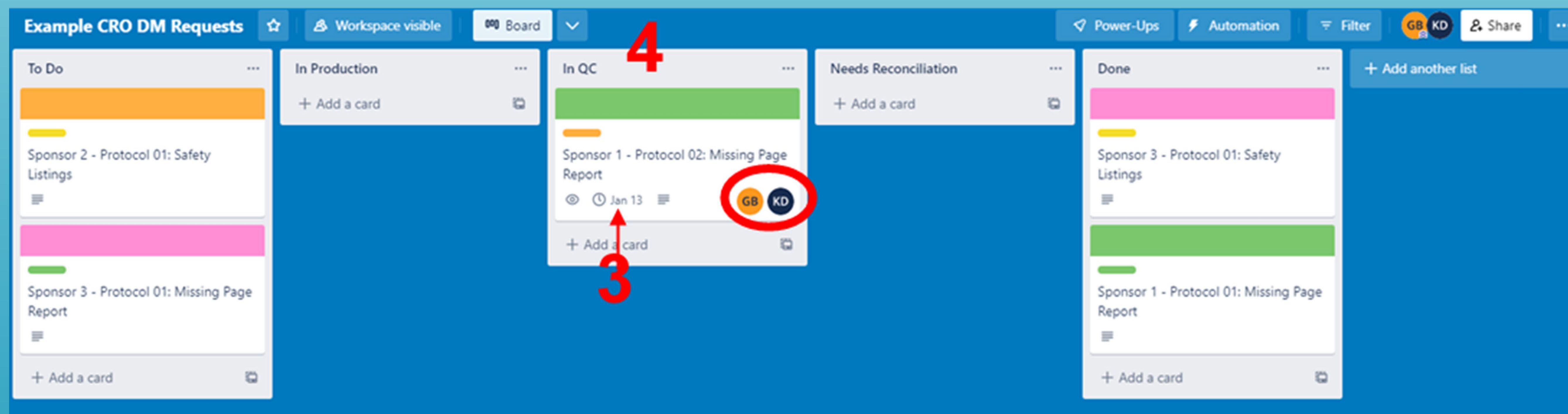


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## PRODUCTION LIFE CYCLE

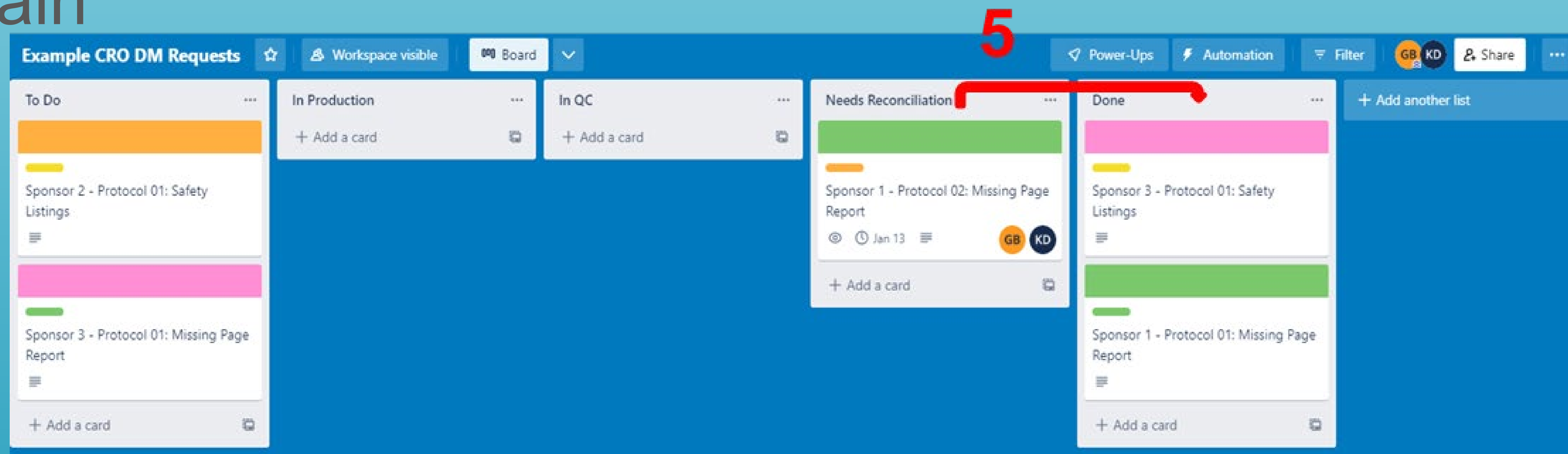
- When the Production Programmer has completed work, the card moves to “In QC” and a QC Programmer is assigned
- Any due dates are set on the card so programmers know the urgency



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## QC LIFE CYCLE

- If the task doesn't pass QC initially, the card moves to "Need Reconciliation" to indicate that more work is needed for this rerun
- When the task is passing QC, the card moves into "Done" until it is needed again



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## ACTIONS LOG

- All cards keep a log of all the actions done to them
- Any comments can be added to a card, typically when changes beyond a standard rerun are needed



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## CONCLUSIONS

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- Created a custom Kanban board using Trello™
- All of our current Data Management tasks are represented on the board with individual cards
- This was a self-contained trial, as these tasks are not dependent on anything else in the company
- Success in managing work flow and hope to adapt to improve other existing processes
  - Visual representation and documentation made it easier to share the work between programmers
  - Automations built into the board helped keep communication open
  - Tasks were much more organized and easier to keep track of due dates



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## **Implementing Agile Methodologies: Using Trello™ to Generate and Optimize Kanban Boards for Recurring SAS Programming Tasks**

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Patrick Dowe, PROMETRIKA, LLC, Cambridge, MA

### **ABSTRACT**

Managing Data Management programming requests in a CRO environment presents multiple challenges. Data Management requests come in all shapes and sizes, but they all have one thing in common – the sponsor wants the results as soon as possible. While most requests are on a recurring schedule (quarterly, monthly, weekly), the exact timing of each request is partly dependent on the receipt of external data, either from the sponsor or a third-party vendor. The importance of completing the requests in a timely manner while the data is still current makes prioritization and resource planning difficult. With varying frequencies and timelines coming from multiple sponsors, a robust system for tracking is needed to fulfill project requirements. Trello™ is one online application that allows the generation and optimization of Kanban Boards in the Agile methodology. A Kanban Board is a visual representation of the life cycle of a task from start to finish. Creating a board to manage requests optimizes work flow and communication, and automates many processes. The use of Kanban Boards works well for Data Management requests, which are a contained set of requests with some regular frequency and limited updates after the initial programming. Successful use in this somewhat limited application suggests that the process can be scaled up for even more complex challenges.

### **INTRODUCTION**

After authoring a paper last year on Agile Methodologies, Gina was looking for more opportunities to implement these practices. After being assigned to assist Patrick with managing Data Management programming requests, they saw an opportunity to reorganize the current system to be more efficient. Patrick, having previously worked in a fully Agile work environment, suggested they apply some Agile methodologies here, as this work was a closed loop, independent of all other programming occurring with a sponsor. For these Data Management requests, most programs had already been completed in SAS® but need to be rerun and QC'd on a recurring basis, with some new programming requests occasionally coming in.

### **PROBLEM STATEMENT**

While these tasks exist in a closed environment, keeping them organized and executed in a timely manner presented an opportunity for optimization. Data Management requests come in many shapes and sizes from different sponsors with different recurrences and different programmers. Keeping these wide-ranging tasks organized was a challenge, previously handled solely by Patrick. Patrick was the only programmer managing these requests as they came in from Data Management. His initial approach was organizing them on a whiteboard with sticky notes, moving the sticky notes around as emails came in indicating that a new data cut was available and the programs could be rerun. He was also independently responsible for notifying QC programmers when their programs needed to be rerun and reporting back to Data Management when the tasks has been completed and the sponsor could be notified. This was in conjunction with an Excel sheet that roughly specified the frequency at which all tasks recurred. Gina was added to this work to help alleviate the burden on Patrick, so that he was not the only programmer with the knowledge on Data Management requests. This process was very repetitive and predictable but limiting since Patrick was the middle man for all requests; Gina and Patrick both recognized that there must be a way to optimize it.

### **APPROACH**

Inspired by Patrick's whiteboard covered in sticky notes, Gina and Patrick saw the opportunity to formalize this approach and create a digital Kanban Board to manage these requests.

## WHAT IS A KANBAN BOARD?

A Kanban Board is a tool often used when applying Agile Methodologies. “Kanban” is Japanese for “visual signal”, and the goal of the board is to visually represent the work life cycle of a task through each step of the completion process. Each programming task is independently represented in a card, which contains all the necessary information to complete the request. The cards are the key to tracking the work in progress, including who is assigned to the task, the due date, the location of the data and any other relevant information needed to complete the request. The columns provide a visual representation of the current state of each request as it progresses through the different stages of the workflow. These columns are highly customizable and can be adapted by the lead programmer or project manager to suit the needs of the job at hand, but may simply consist of columns such as “To-Do”, “In Progress”, and “Done”. The cards normally flow from left (“To Do”) to right (“Done”), but if issues arise then cards may move backwards to an earlier stage, before resuming their normal progression. The Kanban board is an ongoing process; in our approach we use it cyclically, though typically tasks only make their way across the board once.

## IMPLEMENTING KANBAN BOARDS

Our first attempt was to rework the miscellaneous sticky notes on the whiteboard into a Kanban board with three initial sections: To Do, In Progress, and Done. A fourth section of the board was quickly carved out to capture requests that were in a QC stage. The physical Kanban board, while helpful, had some severe limitations, such as:

If you were a remote employee working off-site assigned to a task, you had no way of viewing the board, or moving the sticky from one stage to another. Even if you were working in the office, you might need to walk over and view the board to notice if it had been updated, and to make any updates.

The sticky notes had limited space, so they weren't able to contain vital information like file paths programming notes and due dates.

The sticky notes had a tendency to fall off the board.

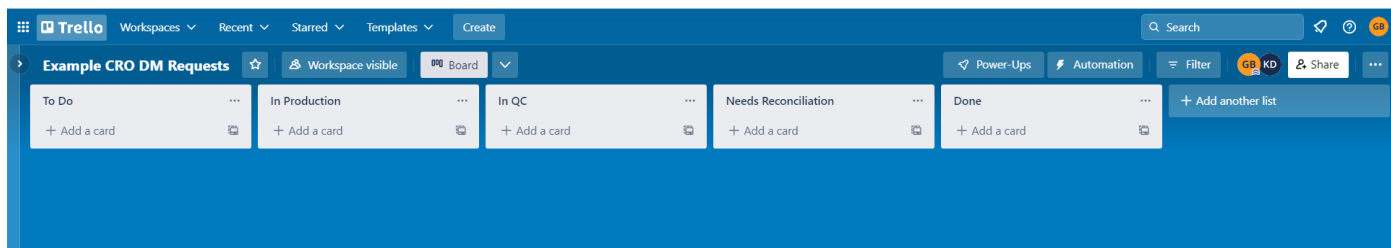
The physical board was a good proof of concept but left us looking for a more robust solution. A digital Kanban board was our next logical progression and has proven to be a giant leap forward in terms of functionality.



**Display 1. The origin of our project, with a physical Kanban board to track tasks**

We began by creating our board in Trello™, see Display 2.





## Display 2. Empty Trello™ board

All of the columns are completely customizable, but for our purposes we went with:

To-Do: tasks that have been initiated by the sponsor and need to be rerun, but no Production programmer has begun work on yet

In Production: tasks that a Production programmer has begun work on

In QC: tasks that are currently awaiting QC

Needs Reconciliation: tasks that have been run by both Production and QC but are not matching upon the initial run and need more work resolve

Done: tasks that have passed QC and completed the work cycle

For each Data Management request, a card was created to visualize all of the details about that task, Display 3 shows a breakdown of what goes into each card with all details annotated.

1. Each Sponsor has a specific color header assigned

2. Title includes: Sponsor, Protocol, Task

3. Programmers who are members on the card are the rerun programmers, members receive notifications anytime the card is moved or updated

4. Label noting how often this task is recurring

5. Location of changed file paths needed for rerun

6. Location of programs available in notes

7. Instructions for programmers on how to update during each rerun

8. Customized buttons to automate movement of the card

9. Comments can be added to card, typically regarding any necessary program updates

**Sponsor 1 - Protocol 01: Missing Page Report**  
in list [To Do](#)

Members: PD, GB

Labels: Weekly

**Description** Edit

*Weekly Rerun*

**NEW FILE PATHS - 12JAN2023**  
EDC:  
P:\Sponsor1\Protocol01\DM\Database\12JAN2023\_data  
Stream page status:  
P:\Sponsor1\Protocol01\DM\Database\12JAN2023\_data.xlsx

**Production Program Location:**  
P:\Sponsor1\Protocol01\DM\Programs\Prod\Missing\_Page.sas

**QC Program Location:**  
P:\Sponsor1\Protocol01\DM\Programs\QC\Missing\_Page.sas

**Directions for updating in Production:**

- update libname **dat** with current EDC path location and date
- update **streampagestatus** with current stream page status file location and date

**Directions for updating in QC:**

- update libname **raw** with current EDC path location and date
- update **file** with current stream page status file location and date

**Activity** Show details

Write a comment...

**Add to card**

- Members
- Labels
- Checklist
- Dates
- Attachment
- Custom Fields

Add dropdowns, text fields, dates, and more to your cards.  
[Start free trial](#)

**Power-Ups**

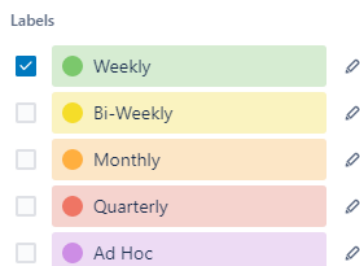
- + Add Power-Ups

**Automation**

- 1. Due Date
- 2. Ready for QC
- 3. Not Passing QC
- 4. Passing QC
- 5. Done (no QC re...)
- + Add button

## Display 3. An example task card with all customizable fields annotated

Each card includes the Sponsor name, protocol name and title of the report (Display 3. Annotation 2). Additionally, each Sponsor is assigned their own color so that they can be distinguished when looking at the board (Display 3. Annotation 1). Custom labels can be attached to the cards; we customized our labels to indicate the recurrence of the task (Display 3. Annotation 4).

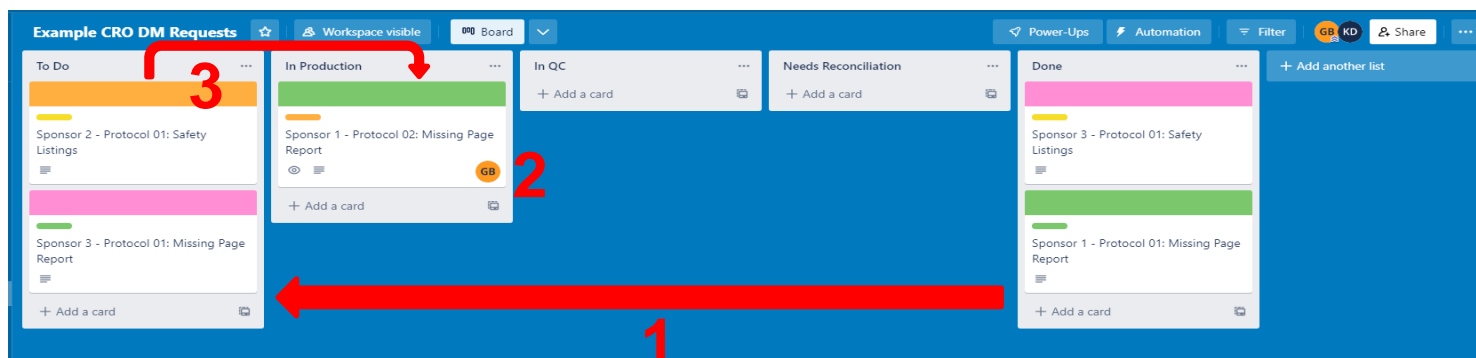


**Display 4. Labels are color coded according to frequency**

Members are assigned and removed as the card moves through the cycles (Display 3. Annotation 3) either manually or with custom rules; cards typically have two members, the Production programmer and the QC programmer. The automation buttons (Display 3. Annotation 8) can remove programmers as they are no longer needed, automatically move cards, and trigger notification emails. The data file locations are typically updated between each run, we have listed the new locations at the top of the card so it is available for both programmers to find (Display 3. Annotation 5). The location of the program is available (Display 3. Annotation 6), as well as instructions for updating the program during a rerun (Display 3. Annotation 7) so that any programmer with availability has the necessary information to rerun the program. Users can add comments to the cards as needed (Display 3. Annotation 9), this is typically used when a program required additional updates beyond the scope of the regular change of data paths.

## LIFECYCLE OF THE CARD

Cards move through the board as they are in different phases of the work cycle, this is shown in Display 5.

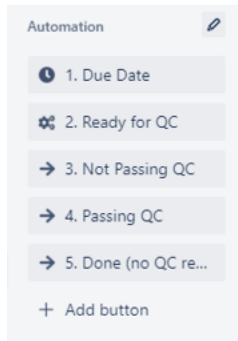


**Display 5. A Trello™ board with several cards in various stages of the life cycle**

Cards that are not currently in Production live in the “Done” column. This is somewhat atypical of Kanban boards, as cards would normally cease being used after they have been moved to the done column. Due to the cyclical nature of our tasks, we found this to be a useful place to house the cards until they are needed again. When a new request comes in, whether from Data Management or the Sponsor, the card is moved from “Done” to “To-Do” (Display 5. Annotation 1).

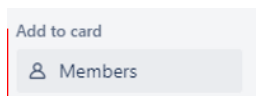
Trello™ allows for many customizations; one custom rule we included was when a card is moved from “Done” to “To-Do”, an email is triggered to all Production programmers to notify them that a new request is available. They are then able to assign themselves to the card (Display 5. Annotation 2) if they have the time to manage this request and move it to the “In Production” column (Display 5. Annotation 3) when they begin work on it. Once the card is in Production, the programmer can complete the necessary work and then use one of the automated buttons to move the card through the lifecycle, see Display 6.





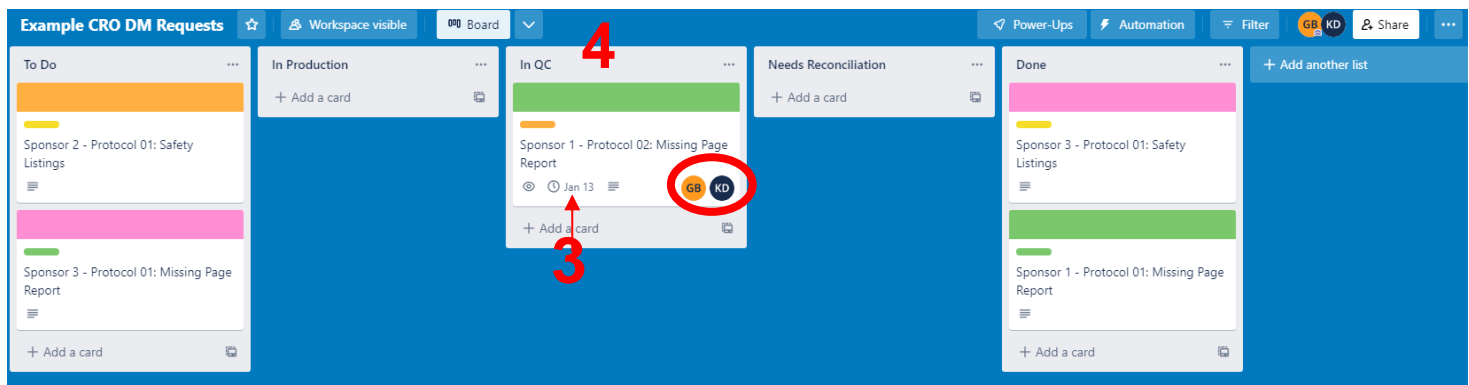
### Display 6. Custom button to automate the movements of cards

The buttons from Display 6 can also be seen in Display 3. Annotation 8. If the program does not require QC, the programmer can click “5. Done (no QC required)” and all members of the card will be removed, any due dates will be reset, and the card will be moved to the “Done” column, effectively resetting the card. If the card does require QC, the Production programmer would assign a QC programmer to the card, see Display 7. The button to add members to a card can also be seen in Display 3.



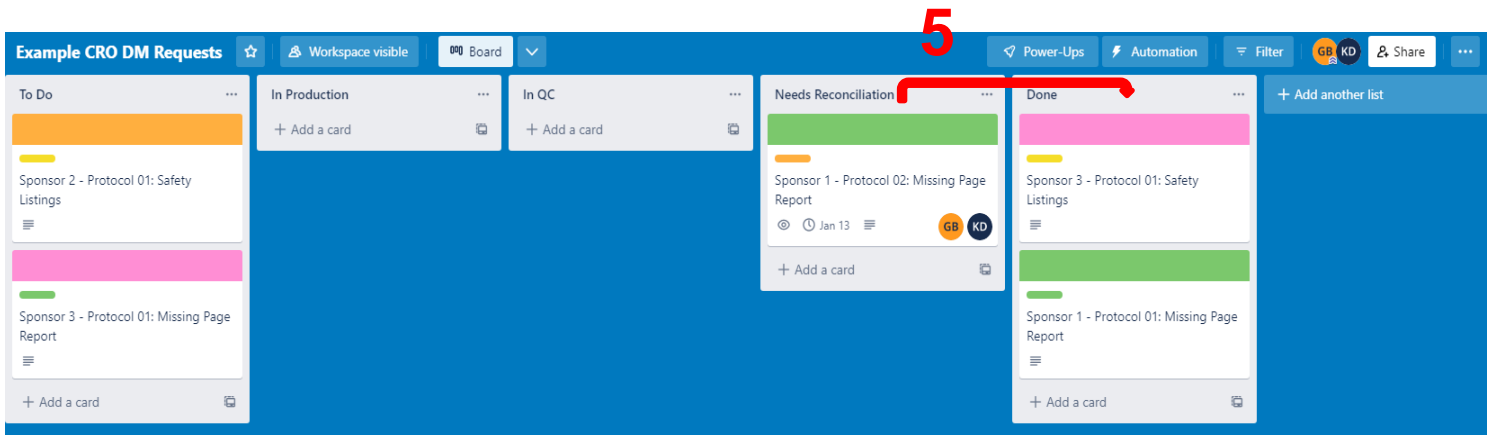
### Display 7. The button to add members to the card

The Production programmer would click the automation button “2. Ready for QC”. This will automatically move the card to the “In QC” column and send an email to the QC programmer to notify them that a card they are a member on is ready for QC.



### Display 8. The Trello™ board as a card moves into QC

The Production programmer can also set a due date so that the QC programmer is aware of the urgency of the request (Display 8. Annotation 3). The Production programmer can also set reminder emails based on the due date. The two members of the card, Production and QC, are circled in the bottom right corner of the card. When the automation button “4. Passing QC” is clicked, the members of the card will be removed, any due date will be removed, and the card will be moved to the “Done” column. When “3. Not Passing QC” is clicked, the card moves to the “Needs Reconciliation” column and an email to the Production programmer is triggered to notify them that the program is not passing QC initially and more of their time may be required in assisting with solving the mismatches.



### Display 9. The Trello™ board as a card moves out of Need Reconciliation

Once in “Needs Reconciliation”, the Production and QC programmer collaborate until the program passes QC and the run is completed. The QC programmer can now click “4. Passing QC” and the card will be reset. New cards can be created as needed when new tasks arise and old cards that are no longer actively being used can be archived. Each card also stores a history of all actions done to it, see Display 10.



### Display 10. The log of actions attached to a card



## CONCLUSION

We were presented with a unique problem, as we had a set of recurring tasks coming from multiple sponsors, with varying frequencies and updates needed. We needed a way to keep these tasks organized and optimize the work flow. As two Agile oriented programmers, we saw this as an opportunity to leverage our knowledge into a Kanban board. Trello™ allowed us to create a custom board, optimizing it for our needs.

This project was self-contained within our company, as these Data Management requests are not dependent on nor do they impact anything else. We were able to test out this idea and flush out all of the challenges with a small team to see if the concept worked in practice. We found that it did, as the visual representation and documentation made the work much easier to share between programmers, as they had varying availability. The automations built into our board also help keep communication open, as most of it is now being automatically generated so no one is left wondering. This pilot was very successful and we hope to scale it up and apply it different types of projects and work.

## CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the authors at:

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