



# Divisional Quality Report Automation

## For

# QUALA

Project: Divisional quality report Automation  
Client: Quala  
Original Date: 02/05/2021  
Version Date: 03/24/2021  
Version No.: 4  
Author: Mauricio Arreola-Garcia  
Owner: ARS Analytics



## Table of Contents

1. Project Summary.....	3
2. Core Features of Reporting Solution: .....	3
3. Detailed Project Description .....	3
4. Project Timeline .....	<b>Error! Bookmark not defined.</b>
5. Missing Features / Performance Bugs: .....	<b>Error! Bookmark not defined.</b>
6. Remaining Gaps in Accuracy Accepted:.....	<b>Error! Bookmark not defined.</b>
7. List of Project Deliverables .....	6
8. Recommended Next Actions for Workstream: .....	7
9. Approval Signatures: .....	<b>Error! Bookmark not defined.</b>
10. APPENDIX – Screenshots of Final Version of Report.....	9

ARS Analytics



## 1. Project Summary

Quala is a leading clean solution company based in the USA. Maintenance division at Quala, uses the Divisional Quality Report to centrally maintain operations at various stores in the QMS Division. Even though some existing reporting and analysis covers many areas, some specific business reporting needs are not fully covered, and the Divisional quality report was built using Excel-based tools to fill the needs. This development was primarily driven and developed by VP of the maintenance.

However, the current Excel-based tool has begun to show several disadvantages, including locking up system resources on the laptop that refreshes it, an opaque and slow data model that is difficult to modify, and a large file size that prevents easy sharing with store managers who would benefit from viewing the report. Quala contacted ARS analytics to provide a solution to automate the report refresh process and improve the reporting experience using a leading BI tool. Power BI was selected to give automated control over the end-to-end refresh, visibility into the refresh process, and easy delivery of a dynamic dashboard to end-users. The report was constrained to mimic the original Excel dashboard as close to 100% as possible.

## 2. Core Features of Reporting Solution:

- Report hosting on a high-performance server, freeing up user computers and resources
- Manual data entry provided through Google Sheets
- Web-hosted report with user access management
- Automated report updates 8x a day
- Data model inside Power BI to combine inputs and prepare metric outputs
- 27 KPIs, provided at the Store, Division, Goal, and Year-to-Date level
- User Acceptance Test (UAT) reviewing metric accuracy between Excel and PBI metric outputs

## 3. Detailed Project Description

To develop the Divisional quality report, this project accomplished several technical challenges. Below, these challenges and their solutions will be described in detail.

### **Combining multiple data sources in a single data model:**

The Divisional quality report uses data collected from many different data sources, including an active database (TMWAMS), an inactive database (Sales Manager, SM), some proprietary data sources (ADP, TMW), and some data processed offline in an Excel. The existing report refresh process requires combining data from all of these sources, which significantly increases the ongoing manual effort and refresh time. It also obscures the root cause of a break-down in any sub-step of the refresh process. In addition, the existing SQL queries inside the Excel were written with some buffer in query size, but this also imported some data on a regular basis that was either redundant or unused in the metric calculations.

Power BI was chosen for its strengths in data modelling and flexible import processes. The new solution was to import the data from all different data sources into a single data model contained inside the Power BI report, which reveals much more information about the source of individual data elements. Several Google Sheets were created as a front-end for users to enter the raw or partially processed data of individual different sources. If more data sources need to be added to the data model, creating a new Google Sheet or adding a new tab to an existing sheet is a quick and simple way to import more data for use in the Power BI report.



#### Issue Log:

- Establishing access to spreadsheets, databases, other data sources as necessary
- Replication of TMWAMS database image and spreadsheet Divisional quality report to begin analysis
- Creation of consistent primary and foreign keys to accurately connect datasets
- Data modeling the import of data sources inside Power BI for predictable, scalable metric calculations
- Creating Google Sheets for other ad-hoc data

#### Hosting the Large Report File and Automated Refreshes on External Resources:

The existing Excel version of the report runs from the laptop of the main user, VP of maintenance. Due to the size of the report (50 – 100 MB), Excel locks down his laptop for the duration of the update, which can exceed 15 minutes and significantly disrupt his productivity. One of the major goals of this project was to choose a reporting tool that uses external, dedicated resources for processing refreshes, which will restore his freedom of use over his laptop and enable more frequent refreshes.

Power BI was selected for its low-cost availability of external, online refresh resources for even single Power BI Pro licenses. Power BI also provides functionality to refresh the report automatically on a regular schedule, as well as provide the user with the ability to initiate ad-hoc refreshes whenever needed. In recent tests, refreshing the Power BI version of the Divisional quality report takes 2 minutes when performed on Power BI Desktop and 11 minutes when performed on Power BI online. While the Power BI online refresh is ongoing, users can still view the report and change the filters without disruption.

#### Issue Log:

- Gaining access to QUALA APP server to run Power BI Desktop
- Developing a simple Power BI Online workspace for hosting the report
- Providing URL links to conveniently share and embed the report for daily access or other use cases
- Modifying Power BI Online view and formatting to meet user needs

#### Sharing Access to Multiple Users:

The ideal state of the Divisional quality report includes easy delivery of the report to shop managers for their use in ongoing management conversations. The existing approach was to export a PDF screenshot of the Excel dashboard and embed it on the Intranet Quala web portal. Hosting the report online and providing access through a browser URL is an effective solution for simplifying delivery across devices and platforms. As a requirement, the solution was to continue this effective delivery method in addition to eliminating the manual work involved in delivery.

When the project was originally scoped, ARS Analytics considered Tableau, Power BI and Google Data Studio for their flexible advantages in online hosting and delivery. During the early project planning in March 2020, it was understood that Quala's existing software vendor TMW had the ability to host and embed Power BI reports in their web portal, which would deliver the Divisional quality report in a single location that Quala users already visit for other consolidated information. This expectation influenced the selection Power BI as the report tool to take advantage of this synergy. Although it was later determined that TMW did not have this hosting functionality, Power BI's native Power BI Online services were still capable of meeting this requirement. The Power BI report can now be accessed directly through a URL link or embedded into other web-based apps (both links provided below).



- [Link to directly access Divisional quality report through browser](#) (browser cookie from valid Quala Power BI login required)
  - o Note: the report can also be downloaded and analyzed in an Excel version by accessing the browser version and selecting Export > Analyze in Excel
  - o For security reasons, this downloaded Excel provides access to the aggregate metrics but not the underlying data, which includes associate names and contact info
  - o The [BI@quala.us.com](mailto:BI@quala.us.com) account is the owner of the report and can change this security setting
- [Link to embed Divisional quality report in other web-based apps](#) (browser cookie from valid Quala Power BI login required)

#### Issue Log:

- Analyze embedding capabilities of Google Site-based Quala web portal
- Investigate embedding capabilities of TMW
  - o In May 2020, we spoke with a TMW consultant and realized that TMW does not currently have the functionality to accept and host any externally built Power BI reports. This led to a re-design of the report pipeline where the Divisional quality report would be hosted and delivered through Power BI Online. This also led to updating the cost estimate to purchase 2 Power BI licenses (one for BI reporting and one for BI viewing) to access Power BI Online.
- Analysis of Developer/User model for delivery and access with 2 Power BI Pro licenses

#### Developing and Validating KPIs/Metrics:

Developing the Divisional quality report in another reporting tool required accurately replicating all of the key performance indicators (KPIs). The Divisional quality report calculates 27 different KPIs / Metrics to provide information for managing the QMS division. These metrics range significantly from simple to complex, and some refer to other metrics in a recursive approach. Some sources of this complexity are listed below in the Issue Log.

During the replication of the KPIs, we identified some intermediate processing steps used to create the KPIs that were currently done manually but which were more efficiently done inside Power BI. In addition, some metrics were broken down into atomic sub-metrics using Power BI's "measure tree" framework, which enables easier identification of logical intent and more flexible logic branching for calculating a metric differently at the Store, Goal, Division, or Year-to-Date levels.

To validate the accuracy of the Power BI version of these metrics, a set of accuracy testing tools was developed in R to automatically compare the output values of the Excel version and Power BI version of the Divisional quality report. The results of these accuracy tests supported investigation into accuracy gaps. Despite Power BI's expressive functionality for defining logic, some metrics could not be accurately replicated due to the Power BI's strict constraints on filter contexts and data model connections, which particularly affected Goal-level metrics that recursively reference actual store-level performance in previous months. In these cases, a "blank" value was used to replace the inaccurate calculations as a sub-optimal compromise.

The metrics, their logic, and a significant portion of context behind their calculations is provided in a separate "Business Logic Documentation" document. That document is meant to serve as a reference for investigating the logic behind any particular metric, to debug new reporting issues, to expand existing metrics, or to assist in developing new metrics later.

#### Issue Log:



- Analyzed definitions and logic for the Excel implementation of the metrics
- Broke metrics into sub-metrics to use Power BI's "measure tree" approach
- Expanded metric logic to report monthly values for Divisional-level metrics
- Developed flexible option to hard-code the value of several metrics, or default to modeled value
- Developed experimental snapshot method for process-intensive Inventory On-Hand metric. **This did not meet accuracy constraints and is left in the report as purely experimental**
- Created testing tools in R to compare Excel and Power BI output

#### 4. List of Project Deliverables

1. Power BI report version 1.0
2. Sign-Off and Deliverables document (this document)
3. Business Logic Documentation document

ARS Analytics



## 5. Recommended Next Actions for Workstream:

### Expand TMWAMS's ETL Process with Parts of the Power BI Report's Data Model:

Several Google Sheets were created as front-ends to allow users to input raw or partially processed data. This data is imported directly into Power BI for metric calculation and reporting. Although the flexibility and simple usability of these spreadsheets served their purpose, Google Sheets provides limited data quality protections against accidental typos or inconsistencies in column headers. These have been the root cause of several issues where the Power BI report fails to refresh. In most cases, the last valid version of the report has still been available for users to view while the debugging occurs. In some cases, the Power BI report has displayed a gray screen that renders the report unusable to all users until a report maintainer logs in to identify and solve the underlying issue.

In contrast, the existing TMWAMS SQL database provides significant functionality for standardizing inputs through its Extract-Transform-Load (ETL) process. SQL databases also allow a "graceful failure" mode where incorrect or invalid inputs are rejected before import, so that the most recent valid version of the data is used to refresh the Power BI report. These 2 features explain the widespread use of SQL databases in enterprise applications where accuracy and consistency is a key constraint. It would be an improvement to pass the Google Sheet through the TMWAMS database and then to the report instead of directly to the Divisional quality report.

In addition to these benefits for the stability of the Power BI report, some of the elements of the (such as the Inventory On Hand metric) are not located anywhere in the database and would be valuable to make more broadly available for other users and use cases.

- Convert Google Sheet inputs to database tables to boost report stability and reduce refresh time
- Make some report elements available in database for other reporting use cases

### Develop Sub-Reports:

To create the 27 metrics of this report (and the sub-metrics used in the process), the Divisional quality report has an extensive data model that uses many different inputs. Some of these metrics have simple logic and only use 1 or 2 inputs, while some metrics have several steps and combine several different sources. The latest refreshes of the Power BI report have been running in 3 minutes when performed on the Desktop client and 12 minutes when performed on the Power BI Online server. This time may be reduced if the more process-intensive metrics were reported separately from the quicker ones. In addition, the effects of changing 1 data input will not impact the refresh of other unrelated metrics, which will isolate the impact of a bug to only some metrics (instead of the whole report).

- To improve run-time, split report into broad categories and separate reports
- Business logic and data model tracking would be more straightforward to manage and predict

### Dedicate Report Maintenance Resources:

The report has occasional stability issues primarily due to unexpected changes to the underlying data. Repairing these bugs and restarting the automated refreshes has not been time-intensive but does require an



intentional manual effort from an associate with enough contextual knowledge of Power BI to quickly locate and correct the issue. To ensure the value and longevity of the report, Quala should identify an individual or team with enough Power BI experience to be responsible for repairing any issues. The Business Logic Documentation (separate document) contains significant information and context to assist with training or for reference during debugging attempts. In addition, Power BI Online allows adding Quala email addresses to be notified automatically if this report ever fails a refresh.

ARS Analytics



## 6. APPENDIX – Screenshots of Final Version of Report

All screenshots as of 2021-03-24. Current version of report has completed 4+ automated refreshes successfully and is deemed to be sufficiently stable for use.

Summary Page tab (QMS), (not all metrics visible)

QMS Daily Scorecard ... | Data updated 3/24/21

File | Export | Share | Chat in Teams | Comment

Shop ID:  Select all,  0601 - Charleston SHOP,  0602 - Conley SHOP,  0603 - Devita SHOP

Month Selection:  Select all,  Jan-20,  Feb-20,  Mar-20

Year: Multiple ...

Division Name	OBSERV	OBSERV PER HC	TRI	DIRECT HC	OPEN INVOICES	OPEN RO's	WOPO \$\$\$	COMP RO's	# NCR's	AVG CDP %	REVENUE ACTUAL	LABOR REV	PARTS REV	REVENUE BUDGET	REV/DAY ACTUAL	REV/DAY BUDGET	EBITDA ACTUAL	E BU
QMS																		
Jan-20	0	0.0	0	55	185	71	\$37.3K	1,458	2	31.7 %	596.5K	\$393.4K	\$137.8K	\$529.3K	\$27.1K	\$24.1K	\$112.1K	\$
Feb-20	4	0.1	0	57	166	93	\$44.8K	1,562	1	30.2 %	712.4K	\$455.9K	\$180.5K	\$623.8K	\$35.6K	\$31.2K	\$209.8K	\$1
Mar-20	2	0.0	0	58	51	61	\$19.0K	1,789	1	33.2 %	775.0K	\$577.4K	\$234.6K	\$675.8K	\$35.2K	\$30.7K	\$169.5K	\$1
Apr-20	1	0.0	0	56	63	38	\$20.1K	1,826	4	48.9 %	837.0K	\$587.1K	\$239.2K	\$713.6K	\$39.9K	\$34.0K	\$286.2K	\$1
May-20	3	0.1	0	51	84	56	\$26.9K	1,378	1	57.0 %	730.2K	\$520.3K	\$187.9K	\$753.3K	\$36.5K	\$37.7K	\$234.1K	\$1
Jun-20	6	0.1	0	48	88	56	\$42.5K	1,561	3	63.8 %	745.0K	\$485.9K	\$208.5K	\$778.3K	\$33.9K	\$35.4K	\$253.7K	\$2
Jul-20	5	0.1	0	47	110	58	\$53.6K	1,456	4	65.3 %	632.5K	\$429.6K	\$185.0K	\$811.2K	\$28.7K	\$36.9K	\$151.4K	\$2
Aug-20	7	0.1	0	50	93	61	\$37.9K	1,495	2	62.4 %	707.7K	\$470.5K	\$226.7K	\$817.0K	\$33.7K	\$38.9K	\$238.3K	\$2
Sep-20	13	0.3	0	49	98	63	\$48.5K	1,538	3	59.3 %	773.8K	\$533.6K	\$197.6K	\$808.8K	\$36.8K	\$38.5K	\$222.1K	\$2
Oct-20	15	0.3	0	54	86	50	\$32.0K	1,745	0	65.6 %	800.6K	\$552.2K	\$235.5K	\$794.2K	\$36.4K	\$36.1K	\$260.8K	\$2
Nov-20	8	0.2	0	49	145	91	\$75.9K	1,419	0	74.1 %	622.4K	\$388.8K	\$164.3K	\$736.0K	\$32.8K	\$38.7K	\$150.9K	\$1
Dec-20	12	0.2	0	53	132	55	\$48.7K	1,673	1	74.1 %	721.2K	\$501.6K	\$236.0K	\$680.5K	\$34.3K	\$32.4K	\$215.2K	\$1
Jan-21	164	3.0	0	54	121	52	\$66.5K	1,614	0	74.1 %	816.7K	\$535.0K	\$204.9K	\$797.1K	\$40.8K	\$39.9K	\$267.2K	\$2
Feb-21	210	3.9	1	54	180	50	\$104.3K	1,473	2	74.1 %	687.2K	\$479.5K	\$204.7K	\$810.0K	\$34.4K	\$40.5K		\$2
Mar-21	210	3.9	0	54	146	0	\$93.9K	1,297	1	74.1 %	643.4K	\$410.2K	\$189.1K	\$941.0K	\$28.0K	\$40.9K		\$2
I GOAL I		4.0	0							50.0 %								\$5
Total	660	0.8	1	49	100		\$41.1K	23,284	25	59.2 %	9470.9K	\$7,386.8K	\$3,059.8K				\$2,771.2K	\$3
Total	660	0.8	1	49	100		\$41.1K	23,284	25	59.2 %	9470.9K	\$7,386.8K	\$3,059.8K				\$2,771.2K	\$3

Summary Page | Summary Page (QMS) | QMS - 2020 Only | QMS - 2021 Only





Summary Page tab, (all metrics visible over 2 images):

QMS Daily Scorecard ... | Data updated 3/24/21

File | Export | Share | Chat in Teams | Comment

Shop ID: Select all (0601 - S Charleston SHOP, 0602 - Conley SHOP, 0603 - La Brea SHOP)

Month Selection: Select all (Jan-20, Feb-20, Mar-20)

Year: Multiple

SHOPID	OBS	OBS /HC	TRI	DIR HC	OPEN INV	OPEN RO%	WOPO \$\$\$	COMP RO%	# NCRs	AVG GDP %	REV ACTUAL	LABOR REV	PARTS REV	REV BUDGET	REV/DAY ACTUAL	REV/DAY BUDGET	EBITDA ACTUAL	EBITDA BUDGET	
<b>0601</b>																			
Jan-20	0	0.0	0	2	0	0	\$1.0K	44	0	41.7%	33.3K	\$20.5K	\$13.7K	\$28.5K	\$1.5K	\$1.3K	\$5.9K	\$5.9K	
Feb-20	0	0.0	0	2	0	6	\$0.0K	49	0	41.7%	36.6K	\$23.2K	\$13.4K	\$31.7K	\$1.8K	\$1.6K	\$11.4K	\$11.4K	
Mar-20	0	0.0	0	2	4	4	\$1.8K	53	0	41.7%	36.3K	\$16.9K	\$16.6K	\$29.0K	\$1.7K	\$1.3K	\$12.6K	\$12.6K	
Apr-20	0	0.0	0	2	0	5	\$0.0K	46	0	71.8%	36.4K	\$21.3K	\$13.5K	\$34.0K	\$1.7K	\$1.6K	\$11.0K	\$11.0K	
May-20	0	0.0	0	2	0	0	\$0.0K	55	0	67.9%	29.7K	\$17.7K	\$10.5K	\$34.2K	\$1.9K	\$1.7K	\$7.9K	\$7.9K	
Jun-20	1	0.5	0	2	0	0	\$0.0K	60	0	84.0%	32.9K	\$19.3K	\$11.8K	\$33.0K	\$1.5K	\$1.5K	\$19.1K	\$19.1K	
Jul-20	0	0.0	0	2	9	0	\$8.0K	49	0	84.0%	23.9K	\$11.1K	\$3.7K	\$33.0K	\$1.1K	\$1.5K	\$8.9K	\$8.9K	
Aug-20	1	0.5	0	2	0	2	\$0.0K	40	0	84.0%	24.8K	\$20.6K	\$10.3K	\$32.2K	\$1.2K	\$1.5K	\$8.1K	\$8.1K	
Sep-20	0	0.0	0	2	10	2	\$3.5K	41	0	84.0%	21.1K	\$10.7K	\$6.0K	\$34.0K	\$1.0K	\$1.6K	\$4.4K	\$4.4K	
Oct-20	0	0.0	0	2	2	0	\$0.6K	32	0	84.0%	15.0K	\$14.5K	\$2.2K	\$34.0K	\$0.7K	\$1.5K	\$3.7K	\$3.7K	
Nov-20	0	0.0	0	2	4	2	\$0.9K	24	0	100.0%	10.7K	\$8.3K	\$1.5K	\$32.0K	\$0.6K	\$1.7K	\$0.6K	\$0.6K	
Dec-20	0	0.0	0	2	8	1	\$2.5K	35	0	100.0%	18.1K	\$11.4K	\$4.1K	\$29.4K	\$0.9K	\$1.4K	\$5.1K	\$5.1K	
Jan-21	9	4.5	0	2	3	0	\$0.4K	46	0	100.0%	23.7K	\$17.7K	\$6.5K	\$21.8K	\$1.2K	\$1.1K	\$8.3K	\$8.3K	
Feb-21	8	4.0	0	2	13	2	\$7.5K	28	0	100.0%	17.8K	\$11.7K	\$4.5K	\$21.8K	\$0.9K	\$1.1K	\$5.1K	\$5.1K	
Mar-21	4	2.0	0	2	2	0	\$1.9K	19	0	100.0%	16.8K	\$9.5K	\$10.6K	\$25.1K	\$0.7K	\$1.1K	\$5.1K	\$5.1K	
I GOAL I	4.0	2.0	0							50.0%									\$103.6K
<b>Total</b>	<b>23</b>	<b>0.8</b>	<b>0</b>	<b>2</b>	<b>3</b>		<b>\$1.6K</b>	<b>621</b>	<b>2</b>	<b>79.8%</b>	<b>\$42.5K</b>	<b>\$235.4K</b>	<b>\$129.4K</b>						<b>\$104.1K</b>
<b>0602</b>																			
Jan-20	0	0.0	0	3	16	2	\$7.1K	64	1	50.9%	36.2K	\$17.9K	\$7.5K	\$37.5K	\$1.6K	\$1.7K	\$3.7K	\$3.7K	
Feb-20	0	0.0	0	5	11	5	\$2.1K	86	0	30.5%	46.8K	\$37.1K	\$11.1K	\$39.2K	\$2.3K	\$2.0K	\$12.9K	\$12.9K	
Mar-20	0	0.0	0	5	13	8	\$4.6K	120	0	33.5%	73.9K	\$40.5K	\$32.8K	\$43.4K	\$3.4K	\$2.0K	\$26.2K	\$26.2K	
Apr-20	0	0.0	0	4	0	3	\$0.0K	97	0	45.0%	62.0K	\$38.5K	\$29.5K	\$44.9K	\$3.0K	\$2.1K	\$23.2K	\$23.2K	
May-20	0	0.0	0	4	4	1	\$1.3K	90	0	49.2%	58.3K	\$39.3K	\$18.0K	\$47.4K	\$2.9K	\$2.4K	\$21.9K	\$21.9K	
Jun-20	1	0.3	0	4	17	8	\$9.2K	109	0	61.0%	61.9K	\$31.1K	\$12.4K	\$50.0K	\$2.8K	\$2.3K	\$21.5K	\$21.5K	
Jul-20	0	0.0	0	4	4	7	\$2.5K	118	0	74.6%	49.8K	\$43.5K	\$16.4K	\$51.2K	\$2.3K	\$2.3K	\$8.6K	\$8.6K	
Aug-20	0	0.0	0	4	16	13	\$6.4K	90	1	80.8%	45.8K	\$27.1K	\$13.2K	\$51.0K	\$2.2K	\$2.4K	\$15.7K	\$15.7K	
Sep-20	1	0.3	0	4	6	14	\$2.2K	80	1	64.6%	48.0K	\$32.7K	\$17.3K	\$50.0K	\$2.3K	\$2.4K	\$8.1K	\$8.1K	
Oct-20	0	0.0	0	5	1	7	\$0.2K	106	0	64.6%	53.1K	\$38.7K	\$13.3K	\$51.9K	\$2.4K	\$2.4K	\$19.7K	\$19.7K	
Nov-20	1	0.3	0	3	25	12	\$12.6K	89	0	45.8%	34.2K	\$14.7K	\$6.7K	\$48.5K	\$1.8K	\$2.6K	\$1.6K	\$1.6K	
<b>Total</b>	<b>660</b>	<b>0.8</b>	<b>1</b>	<b>49</b>	<b>100</b>		<b>\$41.1K</b>	<b>23,284</b>	<b>25</b>	<b>59.2%</b>	<b>\$470.9K</b>	<b>\$7,386.8K</b>	<b>\$3,059.8K</b>						<b>\$2,771.2K</b>

Summary Page | Summary Page (QMS) | QMS - 2020 Only | QMS - 2021 Only

QMS Daily Scorecard ... | Data updated 3/24/21

File | Export | Share | Chat in Teams | Comment

Shop ID: Select all (0601 - S Charleston SHOP, 0602 - Conley SHOP, 0603 - La Brea SHOP)

Month Selection: Select all (Jan-20, Feb-20, Mar-20)

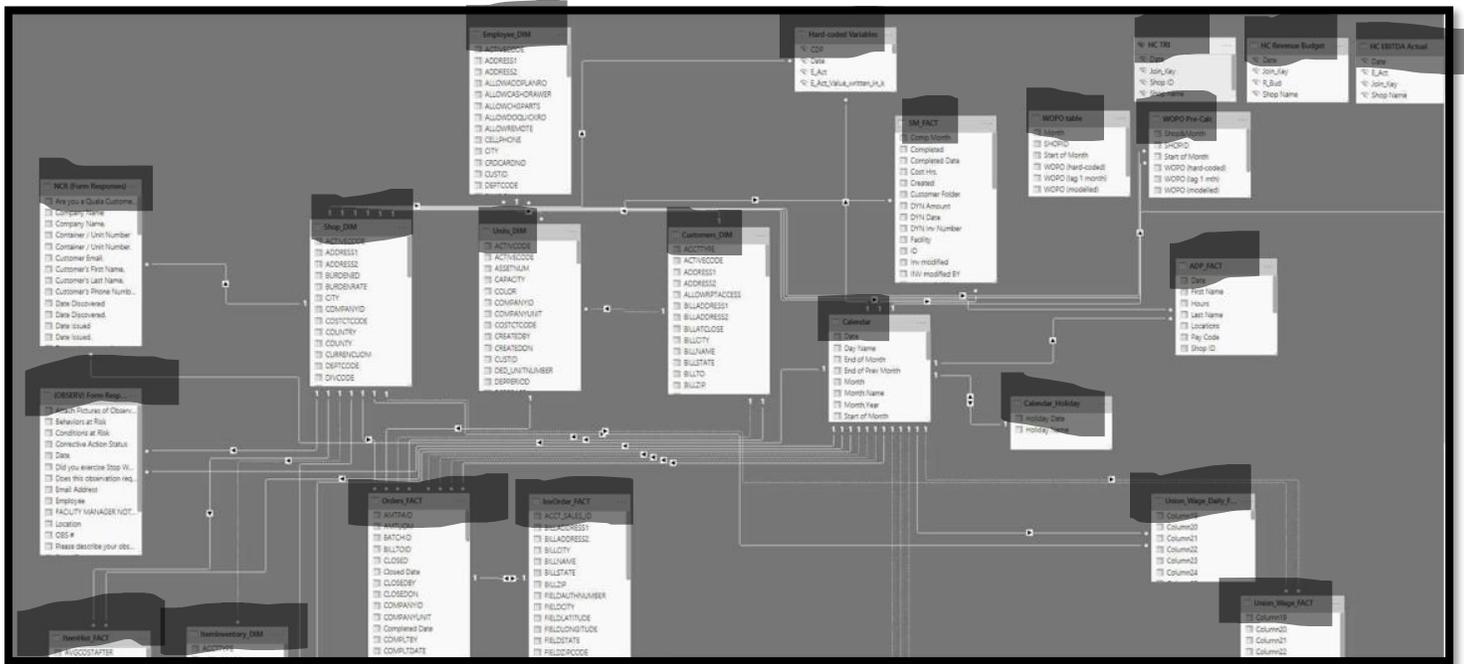
Year: Multiple

SHOPID	REV TUAL	LABOR REV	PARTS REV	REV BUDGET	REV/DAY ACTUAL	REV/DAY BUDGET	EBITDA ACTUAL	EBITDA BUDGET	EBITDA %	REV / HC	PAID HOURS	OT HOURS	BILLABLE HOURS	UTILIZ %	OT %	INVENT O/H	
<b>0601</b>																	
Jan-20	3.3K	\$20.5K	\$13.7K	\$28.5K	\$1.5K	\$1.3K	\$5.9K	\$7.4K	16.8%	\$16.7K	367	20	145	39%	5.4%	50.5K	
Feb-20	6.6K	\$23.2K	\$13.4K	\$31.7K	\$1.8K	\$1.6K	\$11.4K	\$8.2K	31.1%	\$18.3K	345	28	243	71%	8.0%	39.5K	
Mar-20	6.3K	\$16.9K	\$16.6K	\$29.0K	\$1.7K	\$1.3K	\$12.6K	\$7.5K	34.7%	\$18.2K	343	12	199	58%	3.4%	35.8K	
Apr-20	6.4K	\$21.3K	\$13.5K	\$34.0K	\$1.7K	\$1.6K	\$11.0K	\$8.8K	30.2%	\$18.2K	346	5	250	72%	1.4%	38.0K	
May-20	7.7K	\$17.7K	\$10.5K	\$34.2K	\$1.9K	\$1.7K	\$7.9K	\$8.9K	24.6%	\$14.9K	340	21	210	62%	6.1%	37.8K	
Jun-20	2.9K	\$19.3K	\$11.8K	\$33.0K	\$1.5K	\$1.5K	\$19.1K	\$8.6K	58.1%	\$16.5K	348	15	228	65%	4.3%	39.4K	
Jul-20	3.9K	\$11.1K	\$3.7K	\$33.0K	\$1.1K	\$1.5K	\$8.9K	\$8.6K	34.5%	\$12.0K	308	11	131	42%	3.7%	38.5K	
Aug-20	4.8K	\$20.6K	\$10.3K	\$32.2K	\$1.2K	\$1.5K	\$8.1K	\$8.3K	32.6%	\$12.4K	326	13	244	75%	3.9%	36.5K	
Sep-20	1.1K	\$10.7K	\$6.0K	\$34.0K	\$1.0K	\$1.6K	\$4.4K	\$8.3K	20.8%	\$10.6K	238	3	126	53%	1.2%	38.7K	
Oct-20	5.0K	\$14.5K	\$2.2K	\$34.0K	\$0.7K	\$1.5K	\$3.7K	\$8.8K	24.4%	\$7.5K	366	13	171	47%	3.6%	39.9K	
Nov-20	0.7K	\$8.3K	\$1.5K	\$32.0K	\$0.6K	\$1.7K	\$0.6K	\$8.3K	5.9%	\$5.4K	271	13	98	36%	4.8%	38.9K	
Dec-20	8.1K	\$11.4K	\$4.1K	\$29.4K	\$0.9K	\$1.4K	\$5.1K	\$7.6K	28.7%	\$9.0K	328	7	134	41%	2.2%	37.4K	
Jan-21	7.7K	\$17.7K	\$6.5K	\$21.8K	\$1.2K	\$1.1K	\$8.3K	\$3.8K	34.8%	\$11.9K	340	20	208	61%	5.9%	39.1K	
Feb-21	7.8K	\$11.7K	\$4.5K	\$21.8K	\$0.9K	\$1.1K	\$4.0K	\$4.0K	38.9%	\$8.9K	317	14	137	43%	4.6%	36.5K	
Mar-21	6.8K	\$9.5K	\$10.6K	\$25.1K	\$0.7K	\$1.1K	\$5.1K	\$6.1K	23.7%	\$8.4K	248	6	125	51%	2.5%	20.5K	
I GOAL I							\$103.6K	\$156.0K	23.7%	\$15.0K						75%	10%
<b>Total</b>	<b>2.5K</b>	<b>\$235.4K</b>	<b>\$129.4K</b>				<b>\$104.1K</b>	<b>\$113.7K</b>	<b>30.4%</b>	<b>\$171.2K</b>	<b>4,832</b>	<b>200</b>	<b>2,647</b>	<b>55%</b>	<b>4.1%</b>	<b>20.5K</b>	
<b>0602</b>																	
Jan-20	5.2K	\$17.9K	\$7.5K	\$37.5K	\$1.6K	\$1.7K	\$3.7K	\$9.0K	10.2%	\$12.1K	714	99	219	31%	13.9%	42.5K	
Feb-20	5.8K	\$37.1K	\$11.1K	\$39.2K	\$2.3K	\$2.0K	\$12.9K	\$9.4K	27.6%	\$18.3K	921	131	457	50%	14.3%	51.8K	
Mar-20	3.9K	\$40.5K	\$32.8K	\$43.4K	\$3.4K	\$2.0K	\$26.2K	\$10.4K	35.5%	\$14.8K	999	111	491	49%	11.1%	46.3K	
Apr-20	2.0K	\$38.5K	\$29.5K	\$44.9K	\$3.0K	\$2.1K	\$23.2K	\$10.8K	37.4%	\$15.5K	745	31	454	61%	4.1%	53.1K	
May-20	3.3K	\$39.3K	\$18.0K	\$47.4K	\$2.9K	\$2.4K	\$21.9K	\$11.4K	37.6%	\$14.6K	733	83	481	66%	11.4%	53.5K	
Jun-20	1.9K	\$31.1K	\$12.4K	\$50.0K	\$2.8K	\$2.3K	\$21.5K	\$12.0K	34.7%	\$15.5K	742	56	389	52%	7.6%	51.4K	
Jul-20	3.8K	\$43.5K	\$16.4K	\$51.2K	\$2.3K	\$2.3K	\$8.6K	\$13.0K	17.3%	\$12.4K	735	77	537	73%	10.4%	48.8K	
Aug-20	5.8K	\$27.1K	\$13.2K	\$51.0K	\$2.2K	\$2.4K	\$15.7K	\$12.9K	34.2%	\$11.5K	526	98	320	61%	18.6%	53.4K	
Sep-20	3.0K	\$32.7K	\$17.3K	\$50.0K	\$2.3K	\$2.4K	\$8.1K	\$12.3K	16.9%	\$12.0K	533	32	390	73%	6.0%	54.0K	
Oct-20	3.1K	\$38.7K	\$13.3K	\$51.9K	\$2.4K	\$2.4K	\$19.7K	\$13.4K	37.0%	\$10.6K	664	31	466	70%	4.7%	52.9K	
Nov-20	4.2K	\$14.7K	\$6.7K	\$48.5K	\$1.8K	\$2.6K	\$1.6K	\$11.5K	4.6%	\$11.4K	502	39	174	35%	7.8%	50.0K	
<b>Total</b>	<b>70.9K</b>	<b>\$7,386.8K</b>	<b>\$3,059.8K</b>				<b>\$2,771.2K</b>	<b>\$3,036.5K</b>	<b>29.3%</b>	<b>\$192.1K</b>	<b>130,254</b>	<b>9,328</b>	<b>86,657</b>	<b>67%</b>	<b>6.8%</b>	<b>583.1K</b>	

Summary Page | Summary Page (QMS) | QMS - 2020 Only | QMS - 2021 Only



Data model (visible in power BI Desktop):



ARS ANALYTICS