

Data Analytics Transformation for Internal Audit



Crowe

Data Analytics Transformation for Internal Audit



Learning Objectives

Identify the potential value of integrating data into your audit approach.

Define data analytics within internal audit.

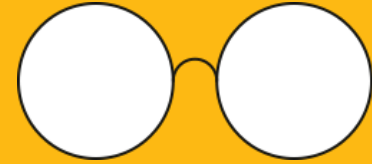
Identify common challenges of integrating data into your audit approach.

Learn the approach to developing analytics for an audit area.

Data Analytics can enable you to do all of this.



Be more proactive
about risks.



See trends
more clearly.



Be a trusted advisor
to the business.

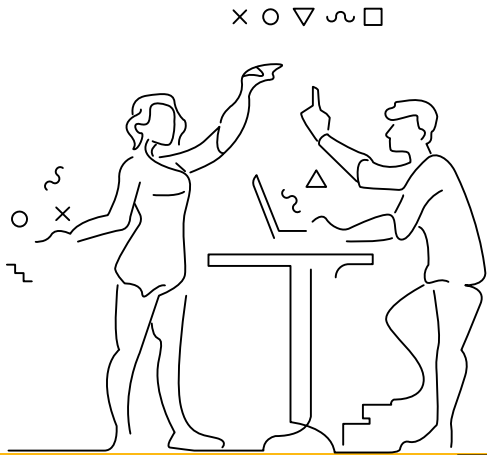


Put the control in the
hands of management.



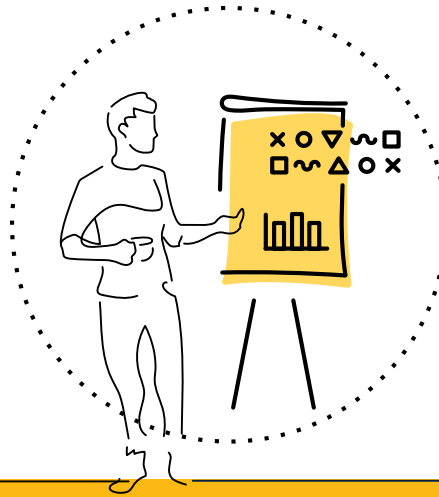
Facilitate
continuous audit.

Data Analytics helps propel the individual, the business, and the industry.



Plan

for the year and your audit scope



Identify

where to focus the audit using data and select samples



Evaluate

effectiveness of controls and data governance

Polling Question #1:

Which of the following can data analytics NOT enable you to do?

- a. See trends more clearly
- b. Incorporate data into your audit
- c. Be more proactive about risks
- d. Eliminate the need for professional judgement
- e. Create visualizations and reports

Traditional audit process



Primary Risk Assessment

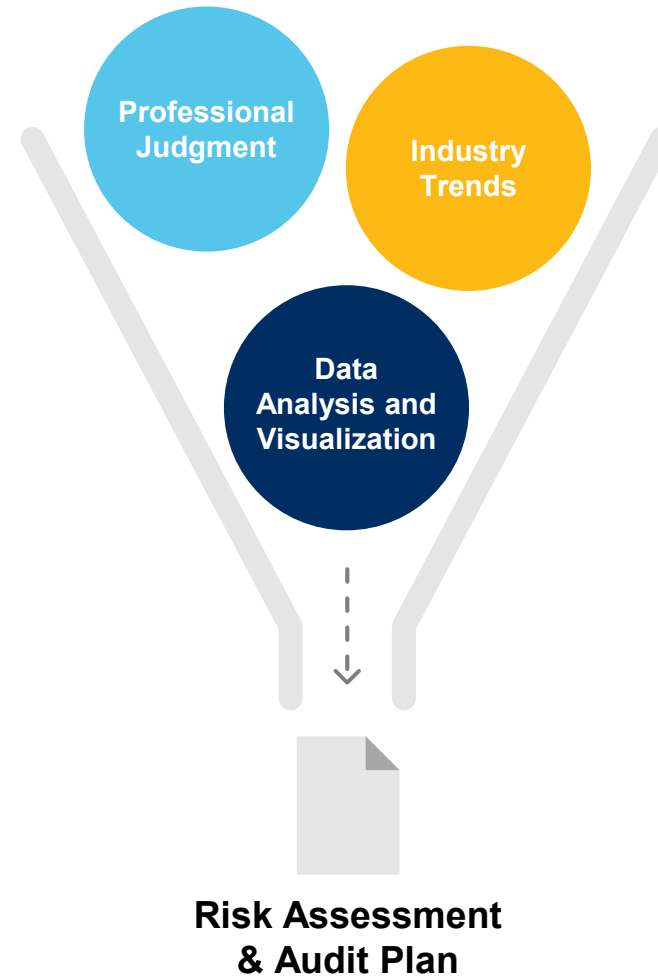
Improved with data analytics



01

Risk Assessment
and Audit Plan

Portfolio-level data
visualization to support
the risk assessment
process



Secondary Risk Assessment

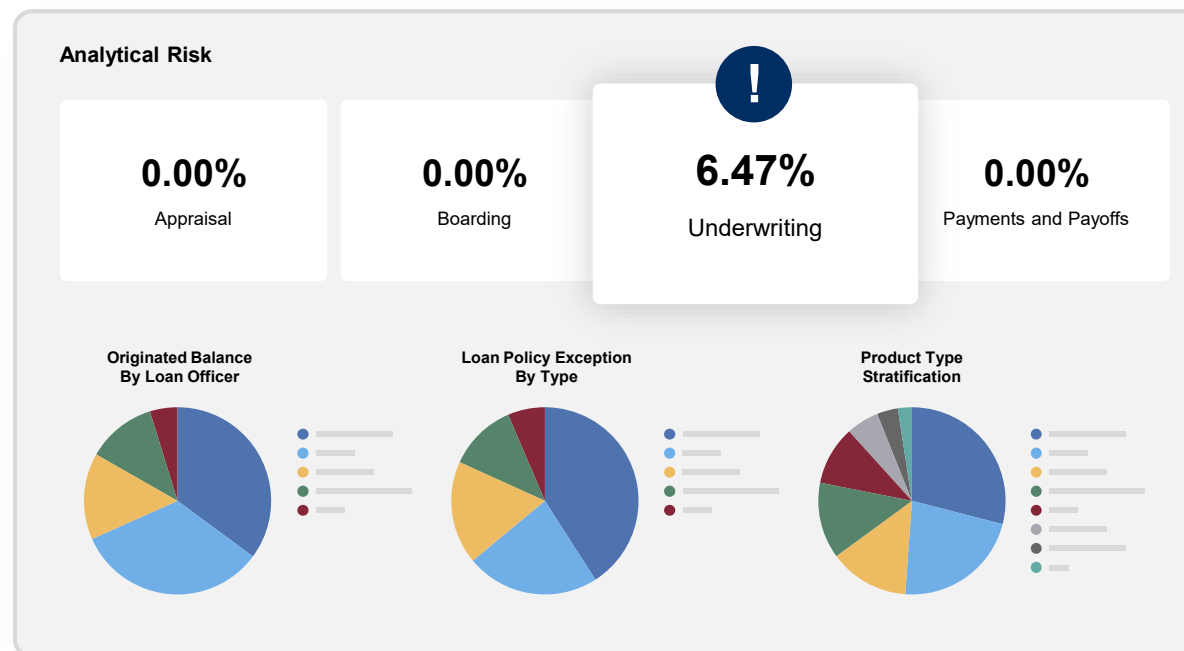
Improved with data analytics



02

Secondary Risk Assessment /
Audit Planning

Portfolio- and account-
level data visualization
to support the risk-
based scoping process





Sampling

Improved with data analytics



03

Sampling

Rules-based analytics at the transaction and/or account level to identify anomalies and outliers

| Borrower | Product | Interest Rate |
|----------|---------|---------------|
| _____ | _____ | 2.05% |
| _____ | _____ | 3.10% |
| _____ | _____ | -.05% |
| _____ | _____ | 2.9% |
| _____ | _____ | 11.5% |

Audit Execution

Improved with data analytics



04

Audit Execution

Analytical results that
can be shared with
management



Reporting

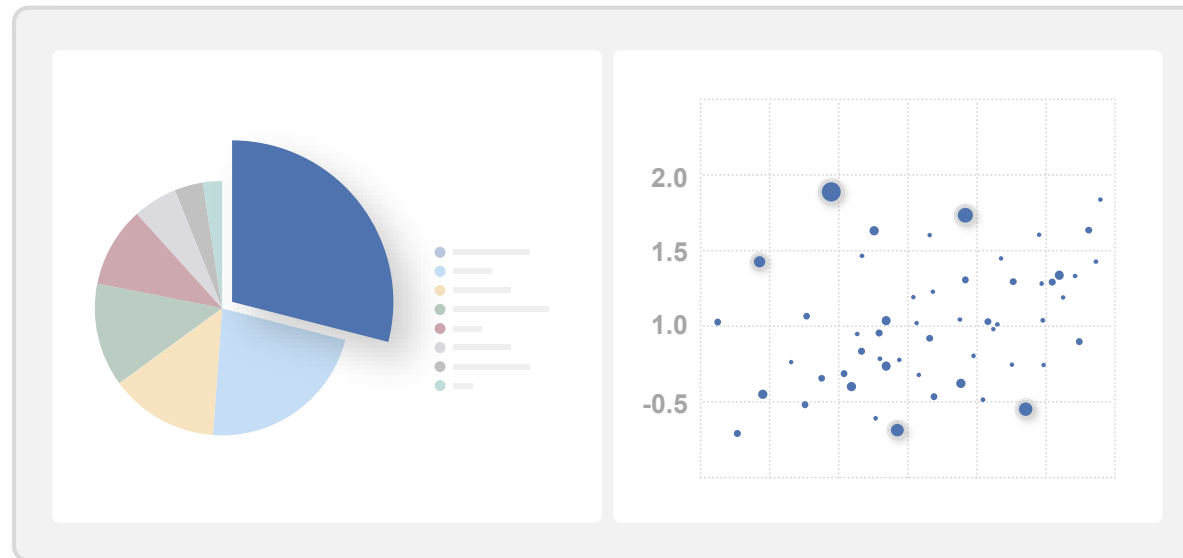
Improved with data analytics



05

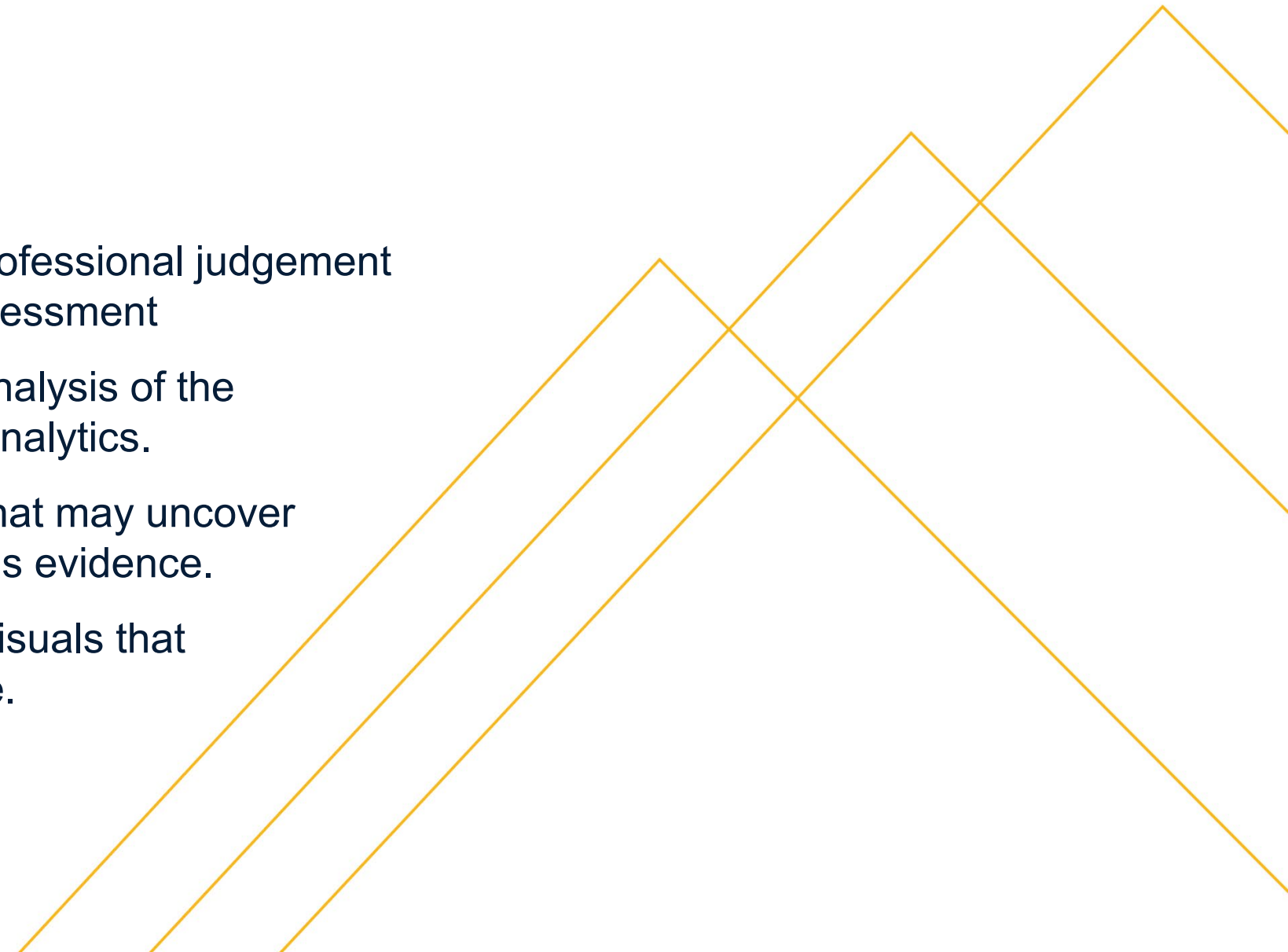
Reporting

Visualizations to support
audit approach; detailed
results to qualify risk
exposure





Future audit process

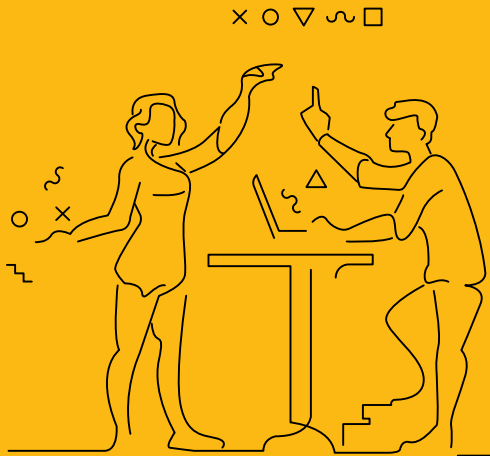
- Combine data analytics and professional judgement to create a data driven risk assessment
 - Select samples based on an analysis of the population using rules-based analytics.
 - Identify anomalies or outliers that may uncover underlying issues. Data used as evidence.
 - Present dynamic reports and visuals that contextualize the risk exposure.
- 

Polling Question #2:

Where can you integrate data analytics during an audit?

- a. Planning
- b. Sampling
- c. Risk Assessment
- d. Testing
- e. All of the above

Approach & Implementation to developing data analytics



Start with the fundamentals.

Data Analytics doesn't just mean 'automation.'

You must take one step at a time.

**RAW DATA /
SYSTEM
REPORTING**

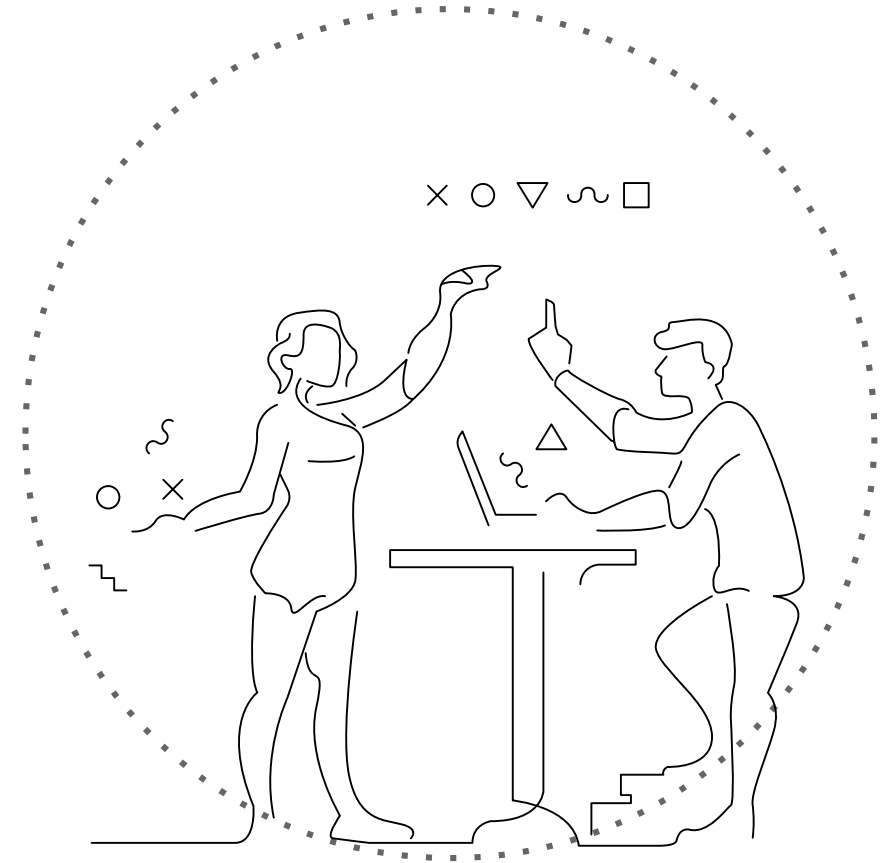
**AD HOC
ANALYSIS**

**REPEATABLE
DATA ANALYSIS**

**CONTINUOUS
AUDITING**

When developing a Data Analytics plan:

- ✓ Define your goals as an organization.
- ✓ Identify what data you have available.
- ✓ Create analytics that map back to risks and controls.



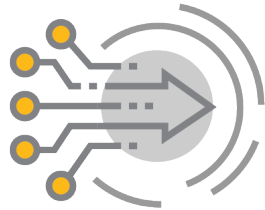
Here's what you need



Internal
Audit SME



Security &
Accessibility



Standardized
Data Set



Reporting
Tool

Here's how to develop data analytics

- Evaluate your risk and controls to understand what is quantifiable
- Translate test procedures into rules around the data
- Write your analytics to uncover attributes that bypassed the control
- Pinpoint the data fields required for the analysis
- Determine if it is a repeatable process

Here's how to develop data analytics (cont.)

- Define who is the audience or end user
- Tailor the report's organization and functionality for intended use
- Ensure you are using complete, accurate, and reliable data

The approach

Roadmap to incorporating data analytics



Our Approach

- Audit area SME's reviewed our entire methodology and RCM's.
- Assessed which of these relied on data
- Crafted rules, detailed requirements, and relevant data fields for applicable areas.
- Standardized data ingestion
- Incorporated data management and storage
- Designed reports in Power BI to visualize these results.
 - Reports specific to each auditable area.
 - Pages in those reports dedicated to sub-process areas.
 - Analytics that evaluate populations down to the individual account or transaction level.

Using Power BI

Here's how we used Power BI to implement DA in IA with CAA.

- We use a combination of visuals and tabular data to present the analytical results to the user.
- The visuals are shown at a high-level view to give a comprehensive overview.
- The supporting tables give granular details to identify exact accounts / transactions to further investigate or sample.
- Power BI is dynamic in nature so you can filter, slice and dice the data.
- We use the export functionality to:
 - Select samples
 - Provide management a list of accounts that need attention
 - Incorporate visuals into final reports

Polling Question #3:

Which of the following is a crucial step in your data analytics journey?

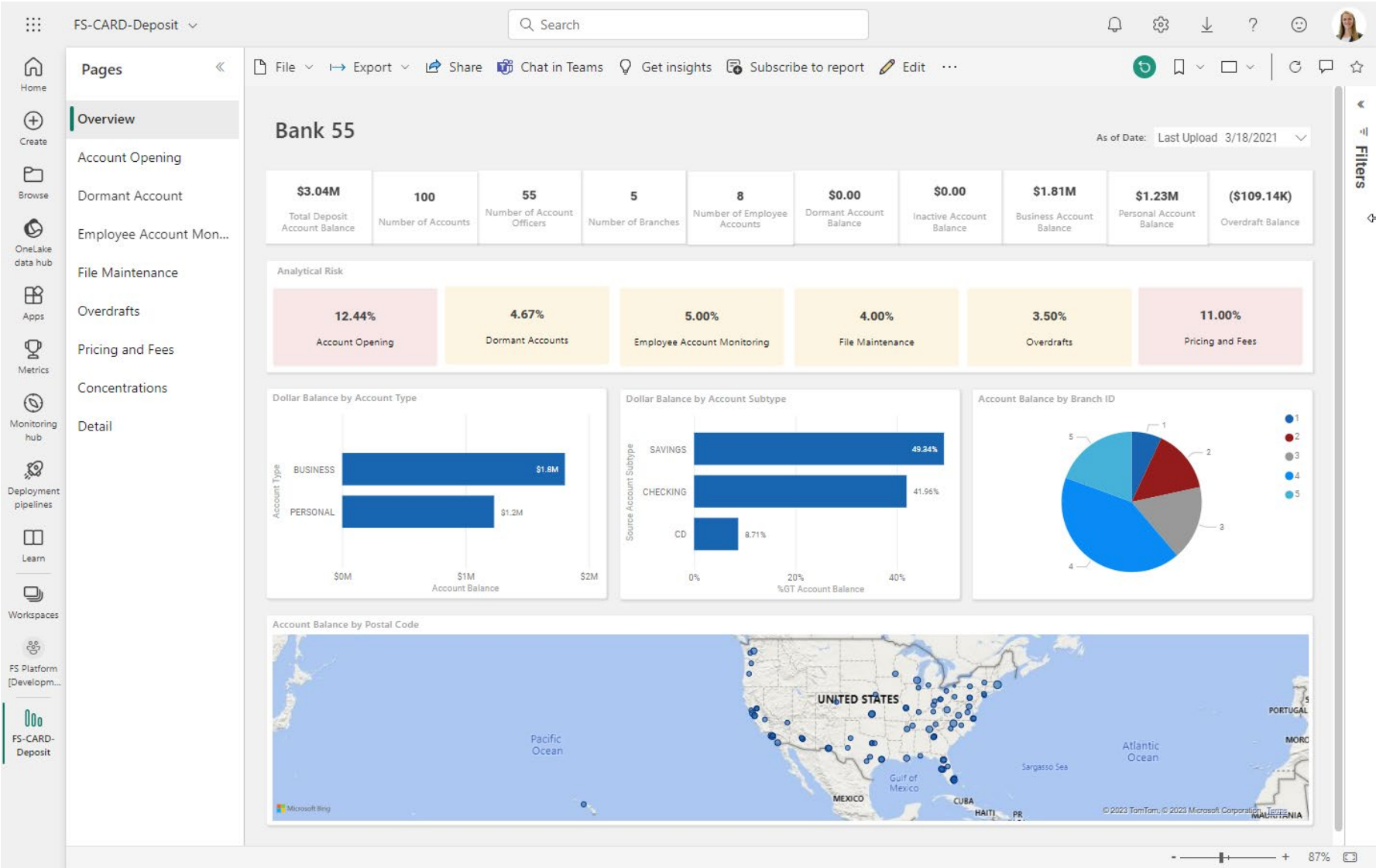
- a. Building fancy reports
- b. Ensuring your data is complete, accurate, and reliable
- c. Giving access to everyone
- d. Posting your analytics online
- e. Asking everyone what they want

The approach

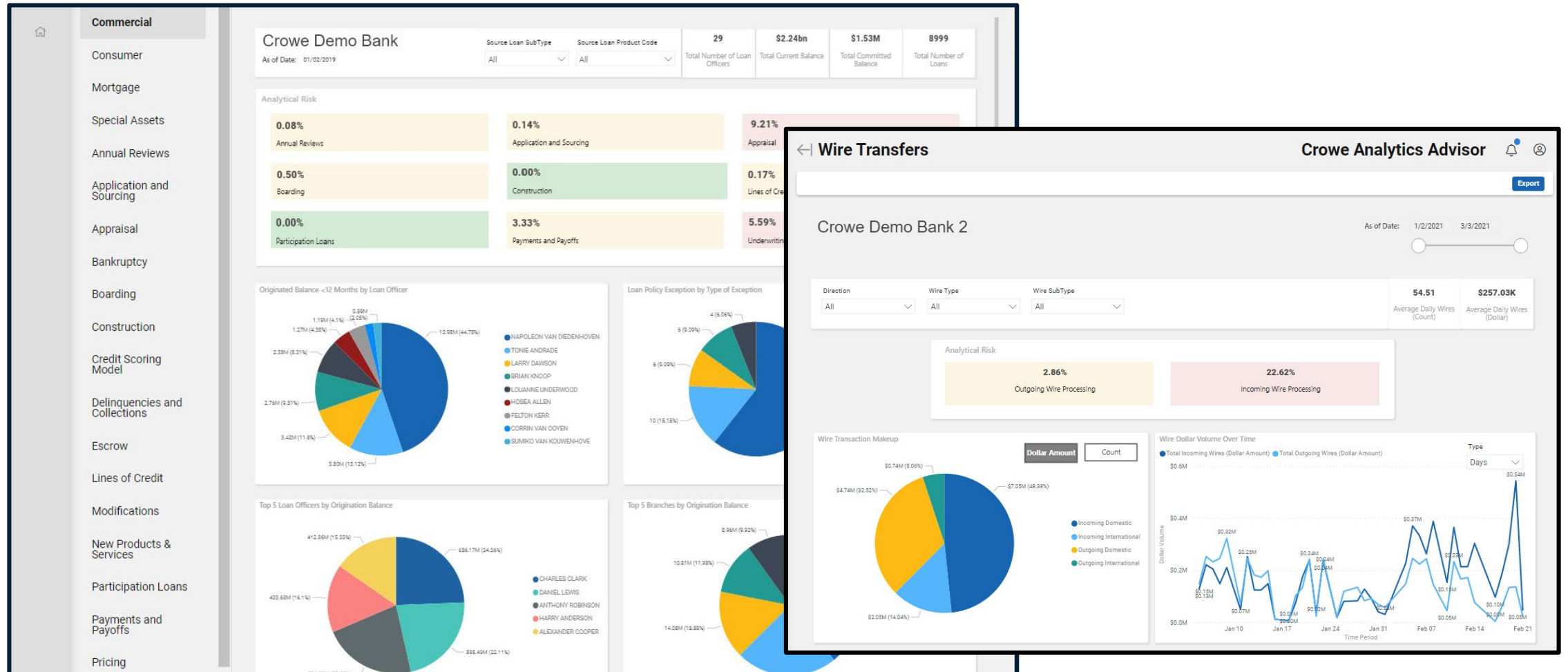
Utilizing full portfolio data extracts in excel

| | D | F | G | J | K | L | M | N | W | X | Y | Z | AA | AB | AE | AG | AI | AK | AL | AP |
|----|----------------|---------------------------|-------------------|-----------|-----------|------------|------------|----------------------|-----------------|-----------------|-------------------|---------------|---------------|---------------------|--------------------|-----------|-----------|------------|---------------------|----------------|
| | Account Number | Account Description | Account Open Date | Source Ac | Source Ac | Source Pit | Source Bri | Account Officer | Account Balance | Account Balance | Last Renewal Date | Maturity Date | Interest Rate | Interest Rate Index | Last Activity Date | Fees Waiv | Account S | Mail State | Fee Waive Full Name | Tax |
| 1 | 96077225 | Individual | 4/13/2020 | P | COD | 210152 | 10 | Jen Hellings | 6/30/2020 | 698.25 | 8/11/2019 | 8/11/2020 | 0.00748 | 4024 | 8/11/2004 | N | Active | N | FALSE | Juliana Fla 00 |
| 2 | 81558980 | Individual | 5/13/2019 | P | COD | 200367 | 4 | Jania Andrag | 6/30/2020 | 6494.02 | 4/30/2019 | 6/30/2020 | 0.00648 | 22 | 6/29/2006 | N | Active | N | FALSE | Cristal Din 26 |
| 3 | 15047638 | Individual | 8/31/2015 | P | COD | 210152 | 12 | Ambrose Dyzant | 6/30/2020 | 218986.67 | 11/27/2019 | 11/27/2020 | 0.00748 | 4024 | 1/24/2007 | N | Active | N | FALSE | Benito Adm 49 |
| 4 | 17359091 | Personal Joint | 4/2/2019 | P | COD | 200367 | 3 | Leticia Kerr | 6/30/2020 | 2259.8 | 4/15/2020 | 4/15/2021 | 0.00498 | 4024 | 4/15/2008 | N | Active | Y | FALSE | Cooke Ma 60 |
| 5 | 81083375 | Individual | 4/13/2020 | P | COD | 200390 | 3 | Kariotta Easterfield | 6/30/2020 | 8484.32 | 7/3/2018 | 7/3/2021 | 0.0065 | 4009 | 7/3/2009 | N | Active | Y | FALSE | Bina Scra 52 |
| 6 | 82488149 | Personal Joint | 2/28/2015 | P | COD | 210152 | 12 | Gina Borg | 6/30/2020 | 6767.27 | 1/8/2020 | 2/8/2021 | 0.0205 | 59 | 4/12/2010 | N | Active | Y | FALSE | Rag Dewi 30 |
| 7 | 37679534 | Individual | 10/5/2019 | P | COD | 200109 | 4 | Courtney Gregoretti | 6/30/2020 | 68539.04 | 6/7/2015 | 6/7/2020 | 0.018 | 4011 | 6/7/2010 | N | Active | Y | FALSE | Valerika S 31 |
| 8 | 28859237 | Individual | 2/12/2016 | P | COD | 210152 | 10 | Junina Kinane | 6/30/2020 | 4801.77 | 10/15/2019 | 10/15/2020 | 0.00846 | 63 | 10/15/2010 | N | Active | Y | FALSE | Jo Dedon 49 |
| 9 | 49392404 | Limited Liability Company | 3/2/2010 | B | Checking | 200112 | 7 | Jen Hellings | 6/30/2020 | 15773.09 | | | 0.0005 | 9 | 11/12/2010 | N | Active | Y | FALSE | Willard W 25 |
| 10 | 62895372 | Individual | 8/30/2011 | P | COD | 210307 | 12 | Harcourt Gellely | 6/30/2020 | 3412.53 | 11/22/2019 | 11/22/2022 | 0.0085 | 4029 | 11/22/2010 | N | Active | Y | FALSE | Cyndi Sys 76 |
| 11 | 16675407 | Individual | 5/20/2019 | P | Checking | 200102 | 4 | Lammond Stolte | 6/30/2020 | 13068.5 | | | 0 | 0 | 5/20/2020 | N | Dormant | Y | FALSE | Abram Dyr 62 |
| 12 | 107280931 | Individual | 10/1/2015 | P | COD | 210152 | 12 | Bertie Bagot | 6/30/2020 | 24970.02 | 3/13/2017 | 3/13/2022 | 0.0125 | 4011 | 3/13/2008 | N | Dormant | N | FALSE | Demetre O 73 |
| 13 | 106001516 | Revocable Trust | 6/24/2019 | P | COD | 210305 | 13 | Jaymee Aluard | 6/30/2020 | 2378.14 | 5/19/2020 | 5/19/2021 | 0.00590 | 4004 | 5/19/2011 | N | Active | Y | FALSE | Colin Hagc 43 |
| 14 | 50662618 | Individual | 3/18/2019 | P | COD | 200367 | 4 | Silas Vasyukhin | 6/30/2020 | 28515.18 | 8/1/2017 | 8/1/2020 | 0.00995 | 59 | 8/1/2011 | N | Active | Y | FALSE | Emmott Al 54 |
| 15 | 92095269 | Revocable Trust | 8/23/2019 | P | COD | 200367 | 1 | Kariotta Easterfield | 6/30/2020 | 40256.91 | 9/22/2017 | 9/22/2020 | 0.0065 | 4009 | 9/22/2011 | N | Active | Y | FALSE | Frederick T 38 |
| 16 | 82588477 | Personal Joint | 9/12/2017 | P | COD | 210303 | 12 | Estella Biven | 6/30/2020 | 11074.95 | 11/21/2017 | 11/21/2020 | 0.01636 | 59 | 11/21/2011 | N | Active | Y | FALSE | Adelina M 57 |
| 17 | 49694855 | Individual | 5/19/2009 | P | COD | 210152 | 11 | Junina Kinane | 6/30/2020 | 108577.2 | 11/25/2019 | 11/25/2020 | 0.00846 | 55 | 11/25/2011 | N | Active | Y | FALSE | Aleda Roll 60 |
| 18 | 5126681 | Limited Liability Company | 1/15/2020 | B | COD | 200112 | 7 | Ingeborg Neil | 6/30/2020 | 56502.92 | 1/9/2017 | 1/9/2022 | 0.017 | 4011 | 1/9/2012 | N | Active | Y | FALSE | Summer Br 63 |
| 19 | 74930165 | Personal Joint | 10/3/2019 | P | COD | 210152 | 13 | Jaymee Aluard | 6/30/2020 | 15964.57 | 5/30/2018 | 5/30/2021 | 0.0085 | 4009 | 5/30/2012 | N | Active | Y | FALSE | Letia Esc 74 |
| 20 | 16116849 | Revocable Trust | 11/22/2011 | P | COD | 200367 | 3 | Jania Andrag | 6/30/2020 | 27389.1 | 7/16/2018 | 7/16/2020 | 0.0265 | 4007 | 7/16/2012 | N | Active | Y | FALSE | Dallas Shc 74 |
| 21 | 89355500 | Revocable Trust | 10/26/2018 | P | Checking | 200357 | 3 | Estella Biven | 6/30/2020 | 5000 | | | 0 | 0 | 2/26/2013 | N | Active | Y | FALSE | Dodie Mac 29 |
| 22 | 94370330 | Individual | 12/9/2019 | P | COD | 210152 | 10 | Raanan Valant | 6/30/2020 | 5257.56 | 4/16/2020 | 4/16/2021 | 0.00498 | 4024 | 4/17/2013 | N | Active | Y | FALSE | Artemus A 59 |
| 23 | 105947576 | Revocable Trust | 4/12/2010 | P | COD | 200367 | 2 | Kariotta Easterfield | 6/30/2020 | 26863.98 | 5/21/2018 | 5/21/2023 | 0.01451 | 4011 | 5/21/2013 | N | Active | Y | FALSE | Lexi Cruce 36 |
| 24 | 104025550 | Revocable Trust | 2/3/2020 | P | COD | 200367 | 2 | Brett Cattell | 6/30/2020 | 27439.59 | 6/19/2018 | 12/19/2020 | 0.01981 | 58 | 6/19/2013 | N | Active | Y | FALSE | Lexi Leyr 63 |
| 25 | 11936762 | Limited Partnership | 12/5/2017 | P | COD | 200112 | 2 | Lissa Ridout | 6/30/2020 | 52131.95 | 8/31/2019 | 10/31/2020 | 0.00690 | 22 | 10/30/2013 | N | Active | Y | FALSE | Alex Geor 19 |
| 26 | 87413122 | Personal Joint | 1/20/2010 | P | Checking | 210240 | 10 | Othelia Albers | 6/30/2020 | 1027.27 | | | 0.0005 | 9 | 1/14/2013 | N | Active | Y | FALSE | Paula Gik 43 |
| 27 | 8424607 | Personal Joint | 12/23/2019 | P | Savings | 200361 | 5 | Mary Rehme | 6/30/2020 | 278.46 | | | 0 | 0 | 12/20/2013 | N | Active | Y | FALSE | Brady Suc 28 |
| 28 | 78624106 | Personal Joint | 6/22/2009 | P | Checking | 210152 | 12 | Lissa Ridout | 6/30/2020 | 17.47 | | | 0 | 0 | 5/27/2014 | N | Active | Y | FALSE | Willy Orkn 30 |
| 29 | 39607421 | Business/Corporate | 1/28/2020 | B | Checking | 200112 | 5 | Jaymee Aluard | 6/30/2020 | 3.95 | | | 0 | 0 | 7/22/2014 | N | Active | Y | FALSE | Nanci Wig 64 |
| 30 | 72378605 | Personal Joint | 10/5/2016 | P | COD | 200367 | 3 | Leticia Kerr | 6/30/2020 | 18599.57 | 8/28/2017 | 8/28/2020 | 0.007 | 4009 | 8/28/2014 | N | Active | Y | FALSE | Clemmy Ji 20 |
| 31 | 93587075 | Business/Corporate | 1/10/2018 | B | Savings | 210165 | 12 | Debor Grinley | 6/30/2020 | 97.43 | | | 0 | 0 | 9/11/2014 | N | Active | Y | FALSE | Wren Boar 14 |
| 32 | 22854566 | Individual | 3/9/2011 | P | Checking | 200372 | 3 | Perry Cawkwell | 6/30/2020 | 3.35 | | | 0 | 0 | 2/2/2015 | N | Active | Y | FALSE | Corella Po 45 |
| 33 | 101362343 | Custodial | 7/6/2018 | P | COD | 210241 | 10 | Jen Hellings | 6/30/2020 | 209690.89 | 3/16/2020 | 3/16/2021 | 0.00747 | 55 | 3/16/2015 | N | Active | Y | FALSE | Dale Leve 66 |
| 34 | 50687874 | Revocable Trust | 8/23/2017 | P | Checking | 200116 | 1 | Junina Kinane | 6/30/2020 | 0 | | | 0 | 0 | | N | Dormant | Y | FALSE | Janette Pa 47 |
| 35 | 80699477 | Personal Joint | 5/1/2020 | P | Checking | 200357 | 2 | Merissa Keerl | 6/30/2020 | 73979.32 | | | 0.0005 | 9 | 6/12/2015 | N | Active | Y | FALSE | Sibley Mc 34 |
| 36 | 11435395 | Business/Corporate | 8/1/2011 | B | COD | 200112 | 4 | Leticia Kerr | 6/30/2020 | 1067.79 | 10/18/2019 | 11/18/2020 | 0.0205 | 67 | 6/18/2015 | N | Active | Y | FALSE | Sally Heth 20 |
| 37 | 4210019 | Individual | 12/17/2004 | P | COD | 210152 | 10 | Alard Augar | 6/30/2020 | 1930.62 | 7/1/2015 | 7/1/2020 | 0.0095 | 4011 | 7/1/2015 | N | Active | Y | FALSE | Kanya Mal 37 |
| 38 | 27277781 | Business/Corporate | 5/4/2010 | B | COD | 200112 | 1 | Brett Cattell | 6/30/2020 | 96399.91 | 11/21/2019 | 12/21/2020 | 0.0205 | 67 | 7/21/2015 | N | Active | Y | FALSE | Feliks Spt 37 |
| 39 | 78535540 | Personal Joint | 8/27/2004 | P | Checking | 210156 | 10 | Quincy Freyne | 6/30/2020 | 1100.96 | | | 0 | 0 | 8/18/2015 | N | Active | Y | FALSE | Ferdy Gan 42 |
| 40 | 79198677 | Limited Liability Company | 6/30/2017 | B | COD | 200112 | 2 | Mary Rehme | 6/30/2020 | 12845.9 | 9/8/2019 | 9/8/2021 | 0.00995 | 69 | 9/8/2015 | N | Active | Y | FALSE | Sigismund 13 |

Crowe Analytics Advisor - Deposits



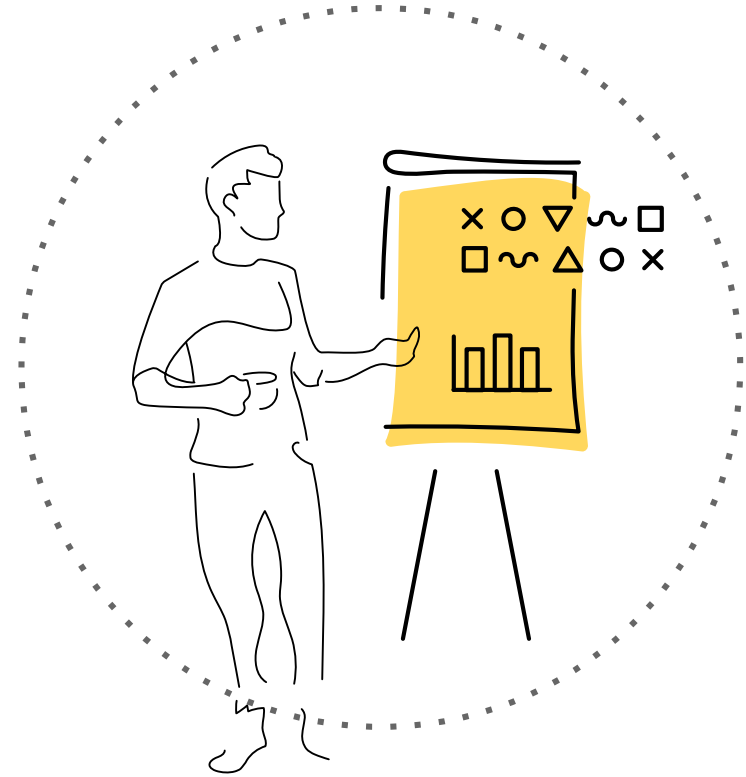
Example of how we used Power BI to implement data analytics.



Demo recap

When using Data Analytics to focus an audit:

- ✓ Understand what's available and what you have going for you already.
- ✓ Get creative when making connections between data and audit procedures.
- ✓ Allow the data to point you in new directions.



Evaluate effectiveness of controls and data governance



**Developing a proactive process
benefits everyone.**

Polling Question #4:

In internal audit, what does the term “continuous monitoring” refer to?

- a. Real-time monitoring of controls and transactions
- b. Annual monitoring of financial statements
- c. Quarterly review of compliance regulations
- d. Assessment of internal policies
- e. Constantly watching the business

We know there's fear, skepticism, and challenges to overcome when it comes to Data Analytics.

Challenges

- Organization adoption
- Data quality & availability
- How strong is your data governance?
- Developing relevant content
- Build something people will use
- Talk to your users (usability testing)
- Technical knowledge / skill set



Open Forum

Questions?



