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- ▸ Navigate to https://mdcpa.cnf.io and tap the session titled "Data Analytics"

- ▸ OR just point your phone's camera at the QR code to join directly

Data Analytics

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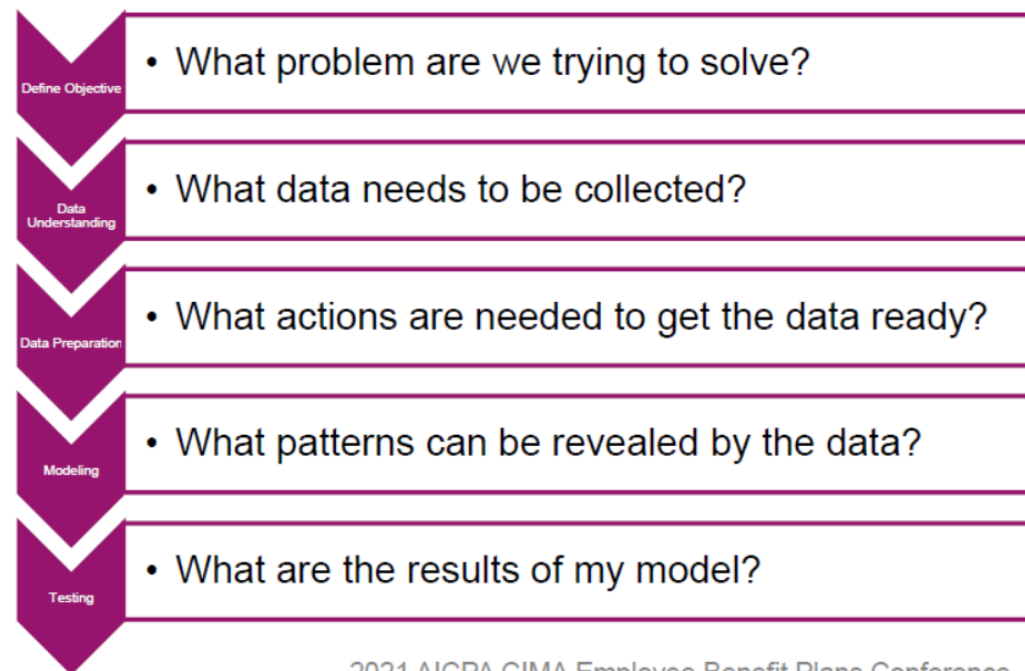
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What is it?

❑ Analyzing unmodified data to form a conclusion about specified information

YEAR	ID	DATE	CODE	UNIT	AMOUNT	YEAR	ID	DATE	CODE	UNIT	AMOUNT
2020	3272	7/1/2019	CC	1	527.85	2019	3272	7/1/2018	CC	1	528.48
2020	8998	7/1/2019	CC	1	520.63	2019	3272	1/24/2019	T1001	1	13.36
2020	42231	7/1/2019	CCT2016	1	256.95	2019	8998	7/10/2018	T1001	2	26.72
2020	43842	7/1/2019	CCT2016	1	352.41	2019	42231	6/26/2019	G0175	2	28.16
2020	13341	7/1/2019	CCT2016	1	627.56	2019	42435	9/8/2018	CC		0
2020	14745	7/1/2019	G0175	3	42.24	2019	43842	3/31/2019	CCT2016	1	353.08
2020	14745	7/1/2019	MLElig4	1	0.0001	2019	43842	4/8/2019	CCT2016	1	353.08
2020	44210	7/1/2019	CC	1	650.15	2019	43842	9/25/2018	T1001		0
2020	14749	7/1/2019	CC	1	397.04	2019	13341	9/4/2018	G0175	1	14.08
2020	9000	7/1/2019	CC	1	395.5	2019	14745	5/3/2019	CC	1	396
2020	43924	7/1/2019	CCT2016	1	361.2	2019	14749	1/24/2019	CC	1	397.81
2020	43924	7/1/2019	G0175	4	56.32	2019	9000	11/13/2018	CC	1	396.1
2020	38988	7/1/2019	CC	1	525.03	2019	9000	3/4/2019	CC	1	396.1
2020	35764	7/1/2019	CC	1	160.22	2019	43924	2/2/2019	CCT2016	1	368.04
2020	6016	7/1/2019	CC	1	397.04	2019	38988	11/30/2018	CC	1	526.05
2020	9001	7/1/2019	CC	1	395.5	2019	35764	11/18/2018	CC	1	161.16
2020	14748	7/1/2019	CC	1	520.63	2019	6016	11/10/2018	CC	1	397.81
2020	12989	7/1/2019	CCT2016	1	662.08	2019	14748	3/12/2019	CC	1	521.13
2020	12989	7/1/2019	G0175	8	112.64	2019	12989	10/3/2018	CCT2016	1	533.69

Data Flow

- What problem are we trying to solve? (Define Objective)
- What data needs to be collected? (Data Understanding)
- What actions are needed to get the data ready? (Data Preparation)
- What patterns can be revealed by the data? (Modeling)
- What are the results of my model? (Testing)

2021 AICPA CIMA Employee Benefit Plans Conference

Audit Standards for Data Analytics

❑ Recommended standards (from 2021 AICPA Conference)

- Sources of data and how it was determined appropriate (completeness)

- If tables or graphics document how they were generated

- Document steps taken to access data, how the file was accessed obtained, and how it was transformed for use

Systems MD Provides to Transform/Manipulate Data

❑ Excel
- Most practical and flexible (use of pivot tables)
- Limited by your knowledge of Excel, must prepare all required documentation

❑ TeamMate Analytics (audit specific)
- Automatically creates and audit trail, automatic data scrubbing feature, various tools provided to simply Excel formulas and apply them easily to data sets
  - Includes screenshots, inputs used, formulas applied – fully documents the process other than data source and completeness

Common examples

❑ **Large data dumps from third party software**

    I.   Various Billing software (i.e. Blackbaud, Horizon, Salesforce, Donor Pro)

    II.   Fixed asset listings retained outside of the accounting software

    III.   Payroll data from outsourced third party recordkeeper

    IV.   Raw general ledger data/adjusting journal entries

Analytics and Audit Efficiency

❑ Test complete data sets (fixed asset example)

❑ Identifies trends in large data (billings/payroll)

❑ Finding abnormalities in data(journal entries)

Future of Data Analytics

Best	• Employ an automated analytics testing routine that has access to production level data • The AI may be based on simple rules to start, but with ML the finding can be more refined
Better	• Expect all auditors to use analytics • Require your teams to use analytics on all applicable testing • Push for use of more complex pattern based testing
Good	• Avoid manual testing when possible • Use your analytics tools to test full populations, not just for sampling • Expect all auditors to know when to use analytics

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Asset listing demo

☐ Looking at completeness and testing an entire population

LONGFELLOW	3/21/2003	87,680.00	35,620.00	52,060.00	2,192.00	37,81
STEVENS STREET	6/15/2007	183,901.40	55,553.59	128,347.82	4,597.54	60,15
FARMERSVILLE	5/31/2007	169,529.40	51,211.98	118,317.43	4,238.24	55,45
RAGGED EDGE ROAD	5/2/2007	191,832.00	58,348.90	133,483.10	4,795.80	63,14
IMPROVEMENTS - WERLEY'S CORNER	5/15/2008	97,800.00	27,302.50	70,497.50	2,445.00	29,74
IMPROVEMENTS - WERLEY'S CORNER	1/19/2010	12,750.00	3,001.56	9,748.44	318.75	3,32
RADON REMEDIATION - HARRIET	11/16/2009	1,080.00	258.75	821.25	27.00	28
IMPROVEMENTS - SADDLE DRIVE	5/27/2010	2,331.65	529.48	1,802.17	58.29	58
CARPET LONGFELLOW	10/26/2007	2,140.00	1,426.68	713.32	142.67	1,56
KITCHEN RENOVATIONS - LONGFELLOW	6/22/2008	5,800.00	1,450.00	4,350.00	145.00	1,59
RENOVATIONS - LONGFELLOW	6/22/2008	5,675.00	1,560.66	4,114.35	141.88	1,70
PAN ROAD	11/9/2010	213,792.94	46,321.80	167,471.14	445.40	46,76
WEST MOUNTAIN ROAD	12/30/2010	169,741.77	36,070.11	133,671.66	4,243.54	40,31
GARAGE - WC	12/6/2010	7,284.00	1,563.03	5,720.97	182.10	1,74
ROOF & IMPROVEMENTS - WC	12/10/2010	8,777.00	1,883.42	6,893.59	219.43	2,10
IMPROVEMENTS - WARM SPRING RD	6/30/2011	147,331.56	29,466.32	117,865.25	3,683.29	33,14
CARPET - RAGGED EDGE	9/14/2010	2,725.00	1,604.73	1,120.27	181.67	1,78
IMPROVEMENTS - WARM SPRING RD	7/1/2011	990.40	198.08	792.32	24.76	22

Identify any capitalized costs that should have been expen

Duplicate sales invoices
Identify sales that may have been invoiced multiple times.

Employees with PO Box addresses
Identify employees with PO box addresses to identify pote

Fixed asset analytical review
Review counts, totals and averages for each asset category
value is changing.

Fixed asset depreciation recalculation
Recalculate straight-line depreciation on capital assets to
depreciated according to policy.

Fixed asset disclosure recalculation
Use the fixed asset register to recalculate totals for each as
financial account notes.

Fixed asset physical verification
Select a sample of fixed assets from the fixed asset register
condition.

Revenue Trends Demo

❑ Using analytical tools to summarize large data sets to be able to interpret variances over years

	2020	2019	increase in billings	percentage	average rate change	variance
	10,782,723	9,524,110	1,258,613	13.22%	16.66%	3.44%

CODE	2020	2019	TC_Abs_Diff	TC_Per_D	
CC	8,403,499.22	7,541,807.40	861,691.82	11.43%	test this code
CCT2016	2,379,224.18	1,982,302.59	396,921.59	20.02%	test this code
G0175	123,749.12	104,192.00	19,557.12	18.77%	
T1001	32,357.92	47,842.16	-15,484.24	-32.37%	

CODE	2020	2019	TC_Abs_Diff	TC_Per_D
CC	471.44	416.15	55.30	13.29%
CCT2016	480.55	400.38	80.17	20.02%
G0175	36.72	40.12	-3.40	-8.47%
T1001	32.78	19.66	13.13	66.79%

Journal Entry Findings Demo

❑ Reviewing thousands of journal entry lines for abnormalities (Criteria searches)

Payroll Pivots Demo

❑ Using Pivot tables to compare data and draw conclusions

	2019	2020	
Row Labels	Sum of amount paid	Sum of amount paid	Sum of amount paid2
Alex	2,400	3,000	600
Alice	37,000	12,000	(25,000)
Alicia	11,000	36,000	25,000
Andrew	280	58,000	57,720
Angela	36,000	11,000	(25,000)
Angus	12,000	36,000	24,000
Barb	1,000		(1,000)
Barby	30,000	45,000	15,000
Beth	31,000		(31,000)
Bob	18,000	25,000	7,000
Bon	57,000	41,000	(16,000)
Brian	50,000	40,000	(10,000)
Carson	10,000	1,000	(9,000)
Charlie	24,000		(24,000)
Chris	54,000	58,000	4,000
Clark	2,000	2,000	-
Cody	27,000	42,000	15,000
Dexter	26,000	50,000	24,000
Don	32,000	4,000	(28,000)
Dylan	19,000	16,000	(3,000)
Elyse	70,000		(70,000)
Gary	20,000	15,000	(5,000)

References

- https://www.wolterskluwer.com/en/expert-insights/the-future-of-data-analytics

- https://www.journalofaccountancy.com/issues/2016/aug/data-analytics-skills.html