The 21st Century Leadership: Convergence and Divergence

Date: 2nd October 2019

Venue: Sarova White Sands, Mombasa

TIME: 11am to 1pm

"Data driven decision making for leaders (Big data, data mining, analytics, metrics, BI)"

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In God we trust; all others must bring data.

Data-Driven Decision Making

Leadership

The ability to look around the corner, galvanize others, and take action.

Data-Driven Decision Making

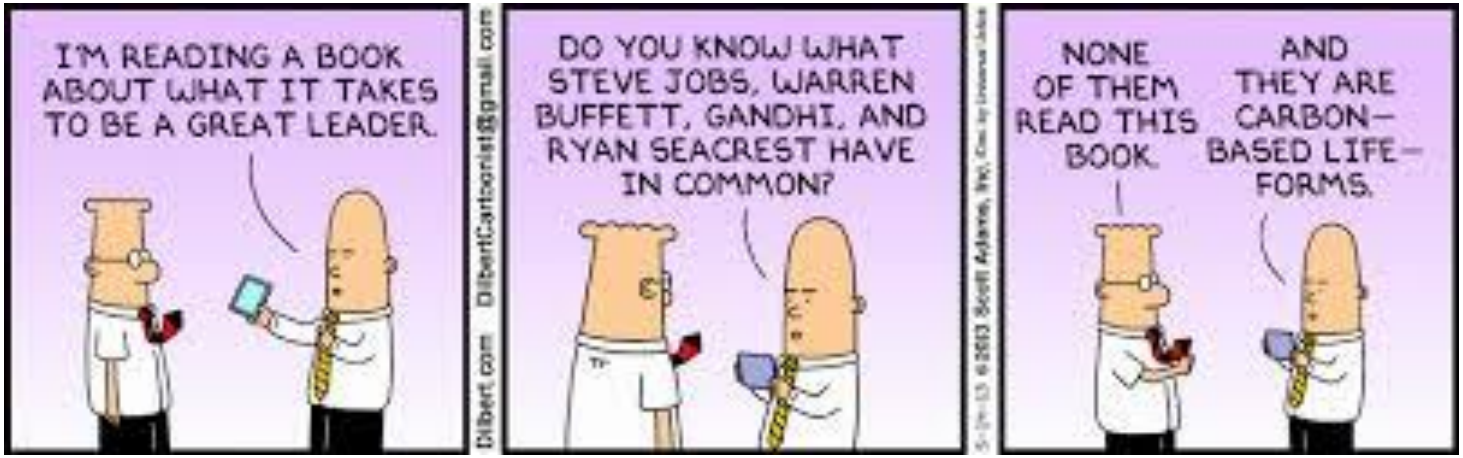
The ability to use existing data in a new way or obtain new data to make decisions with confidence that creates meaningful change

Data-Driven Decision Making

- Rational economic models (how decisions should be made)
- Behavioral models (how decisions are made)
- implicit favorite models (where decisions are made before the process even begins!).
- Political models (where decisions are neither rational nor objective)

Data-Driven Decision Making

What do great leaders have in common?



Data-Driven Decision Making

How should decisions be made?

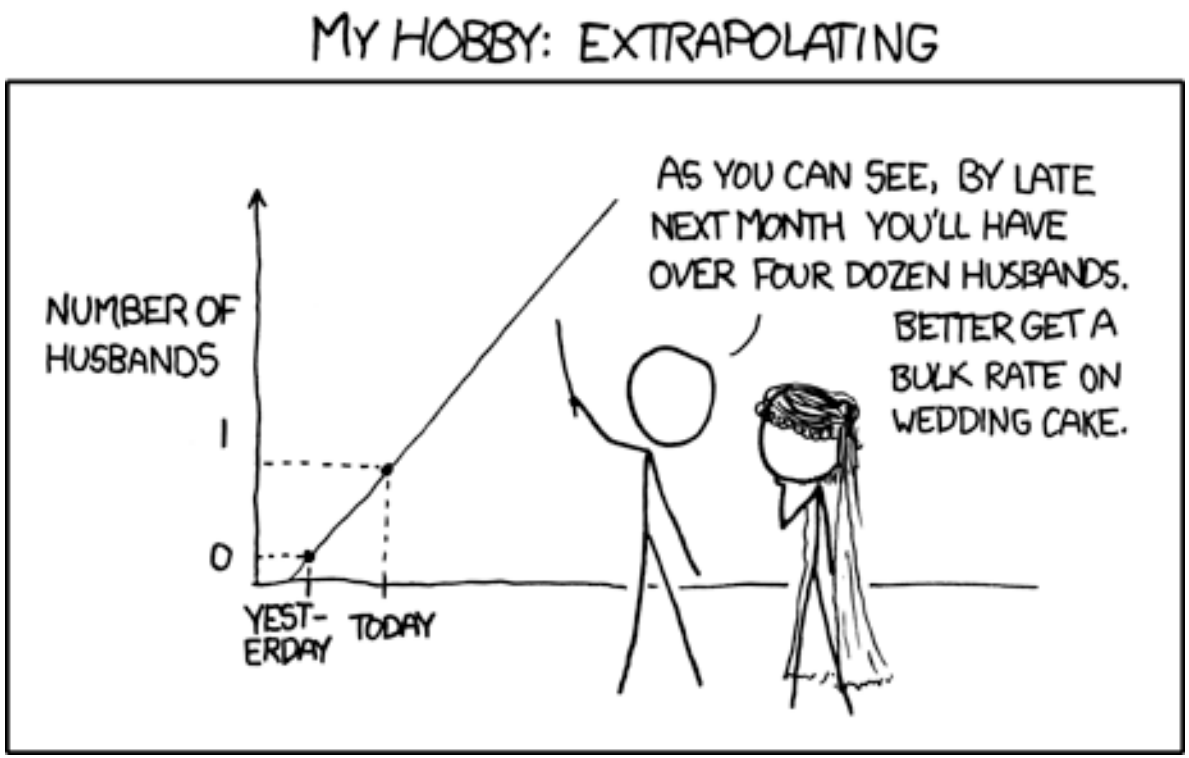
Highest paid person's opinion

Or

Flipping a coin ?

Google-Flu

Does data solve all the questions?

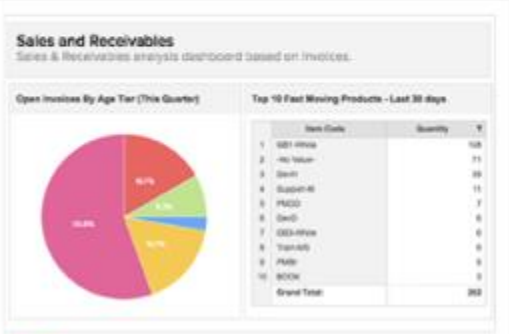


Reports data driven?

Teamwork projects Advanced Anal...

Zoho Finance Advanced Analytics

QuickBooks Advanced Analytics



IXero Advanced Analytics

Stripe Advanced Analytics

Zoho Recruit Advanced Analytics

Having a lot of reports/ Dashboards doesn't make you data driven

What is Data-Driven Decisioning?

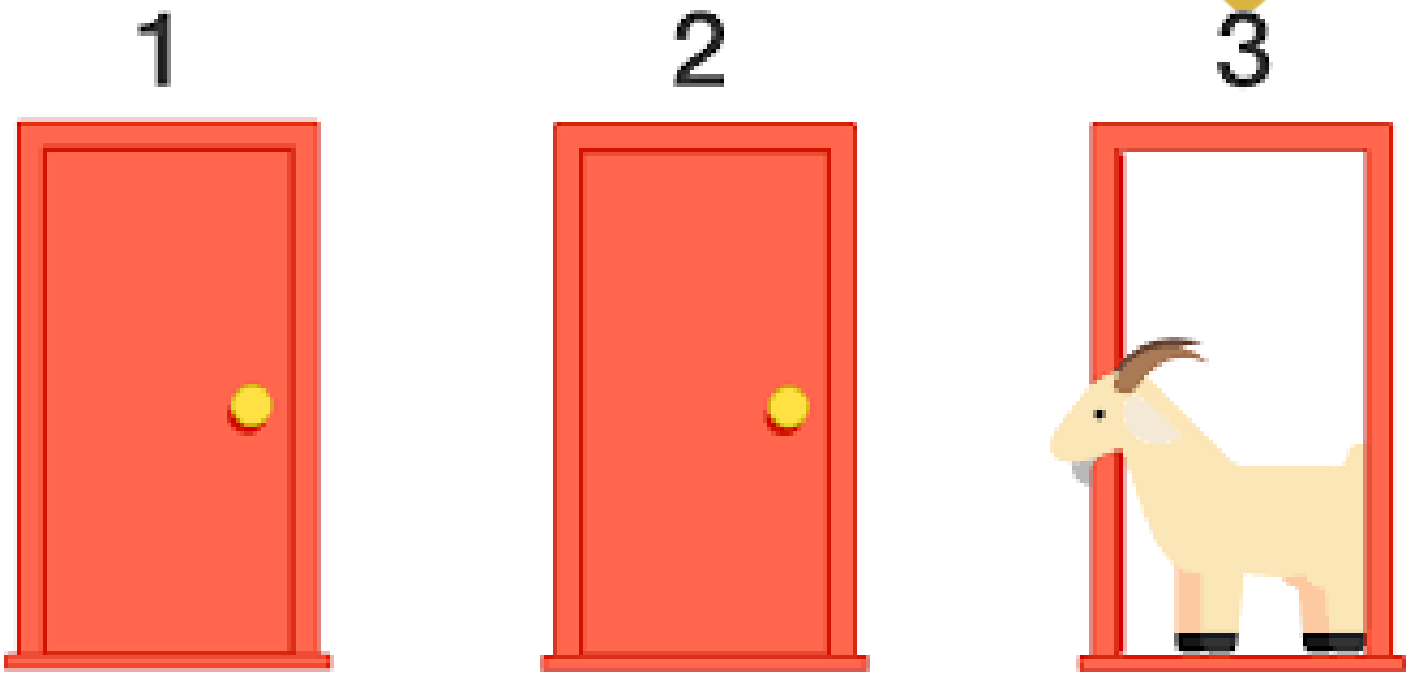
Number of years it took each product to gain 50 million users

neilluminatinigga

Airlines	Cars	Telephones	Electricity	Credit Cards	TV	ATMs
68yrs	62yrs	50yrs	46yrs	28yrs	22yrs	18yrs

Computers	Mobiles	Internet	iPods	YouTube	Facebook	Twitter	Pornhub
14yrs	12yrs	7yrs	4yrs	4yrs	3yrs	2yrs	19 days

Monty Hall Problem



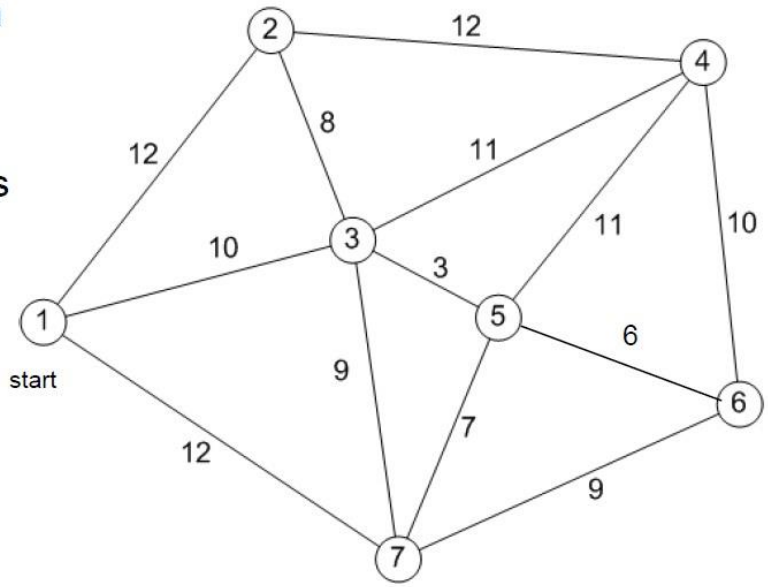
92% of the general public and 65% of the university graduates (many of them with PhDs) **SAID NO**

Decision tree argument prove that the probability of winning increases to **2/3** when the contestant changes his/her initial choice

The travelling salesman problem (TSP)

The Traveling Salesman Problem

- Starting from city 1, the salesman must travel to all cities once before returning home
- The distance between each city is given, and is assumed to be the same in both directions
- Only the links shown are to be used
- Objective - Minimize the total distance to be travelled



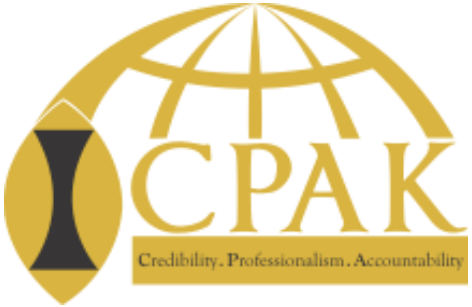
Factorial of 7! 5,040

Data-Driven Decision Making

In today's world, data-driven decision making through business analytics is not an option, but an essential capability that every organization should acquire irrespective of its size.

The human mind lacks the ability to choose the right decisions due to the complexity of the problems that the organizations are facing and the limited time available for decision making

Predictive Analytics



If you torture the data long enough,
it will confess.

3Vs

Volume, Variety, Velocity

It is estimated that 2.5 exabyte of data is created every day

Increase in Internet penetration and autonomous data capturing, the velocity of data is also increasing at a faster rate.

As the velocity of the data increases, traditional models such as regression and classification techniques may become unstable and invalid for analysis.

Hidden facts in the data

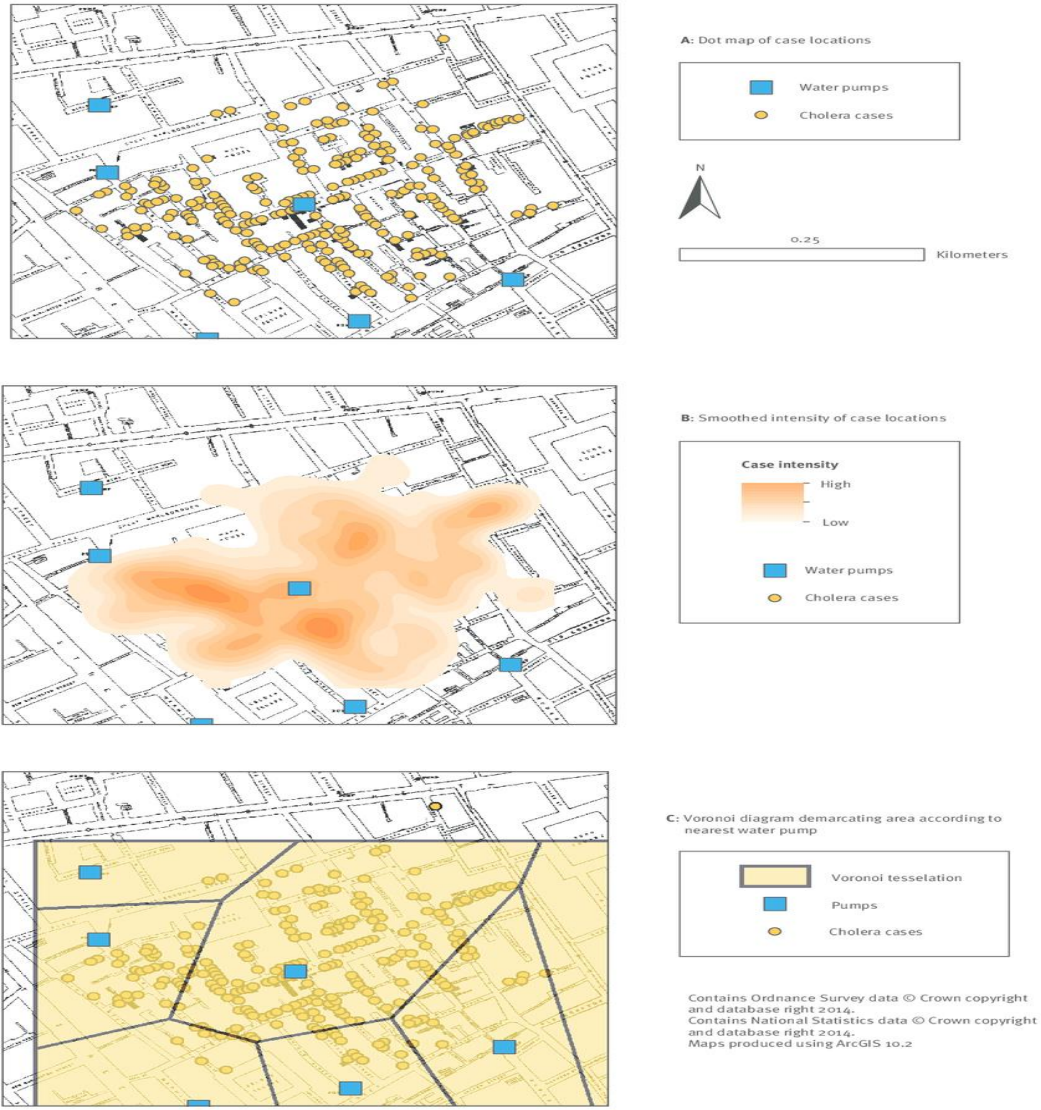
Uncover inefficiencies and eliminate them

RadioShack and Best Buy found a high correlation between the success of individual stores and the number of female employees in the sales team

China Eastern Airline found that a man had booked a first-class ticket more than 300 times in a year and cancelled it before its expiry for full refund so that he could eat free food at the airport's VIP lounge

Forecast the demand for their products or services and understand the causes of demand fluctuations: Walmart's hurricane sales rate

Cholera Outbreak in London, 1854



- 1845 – 1856 over 700 articles published on the causes of cholera and how the epidemic could be prevented.
- Breakthrough by Dr. John Snow based on the data of cholera outbreak in central London in 1854
- The most striking difference between this area and the other districts of London was the source of water Snow established that water contamination was the main source of cholera.

The world is a big data problem

Big data a big volume of data (in excess of 1 terabyte) generated at high velocity and high variety. 3 Vs

10 billion photos are uploaded on Facebook every hour

Google processes 24 petabytes (1 peta byte = 10^{15}) every day

Google was the first company to exploit big data for targeted advertising using clickstream data

Google also predicted the spread of H1N1 flu based on the search terms entered by Google users

We created 500 times more data in the last 10 years than what we had done since the beginning of humanity

Every Boeing 787 Dreamliner flight creates half a terabyte of machine-generated data

Predictive Analytics Applications

Organisation	Predictive Analytics Model
Polyphonic HMI	Predicts whether a song will be a hit using machine learning algorithms. Their product "Hit Song Science" uses mathematical and statistical techniques to predict the success of a song on a scale of 1 to 10. [9]
Okcupid	Predicts which on-line dating message is likely to get a response from the opposite sex (Siegel, 2013).
Amazon.com	Uses predictive analytics to recommend products to their customers. It is reported that 35% of Amazon's sales is achieved through their recommender system (Siegel, 2013).
Hewlett Packard (HP)	Developed a flight risk score for its employees to predict who is likely to leave the company (Siegel, 2013).
University of Maryland	Claimed that dreams can predict whether one's spouse will cheat. [10]
Flight Caster	Predicts flight delays 6 hours before the airline's alerts.
Netflix	Predicts which movie their customer is likely to watch next.
Capital One Bank	Predicts the most profitable customer.
Google	Predicted the spread of H1N1 flu using the query terms.
Farecast	Developed a model to predict airfare, whether it is likely to increase or decrease, and the amount of increase/decrease. [11]

How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did

Kashmir Hill Former Staff
Tech
Welcome to The Not-So Private Parts where technology & privacy collide

Every time you go shopping, you share intimate details about your consumption patterns with retailers. And many of those retailers are studying those details to figure out what you like, what you need, and which coupons are most likely to make you

Prescriptive Analytics

Every Decision has a consequence

Framework for Data-Driven Decision Making

Data-driven decision making

Problem and opportunity identification

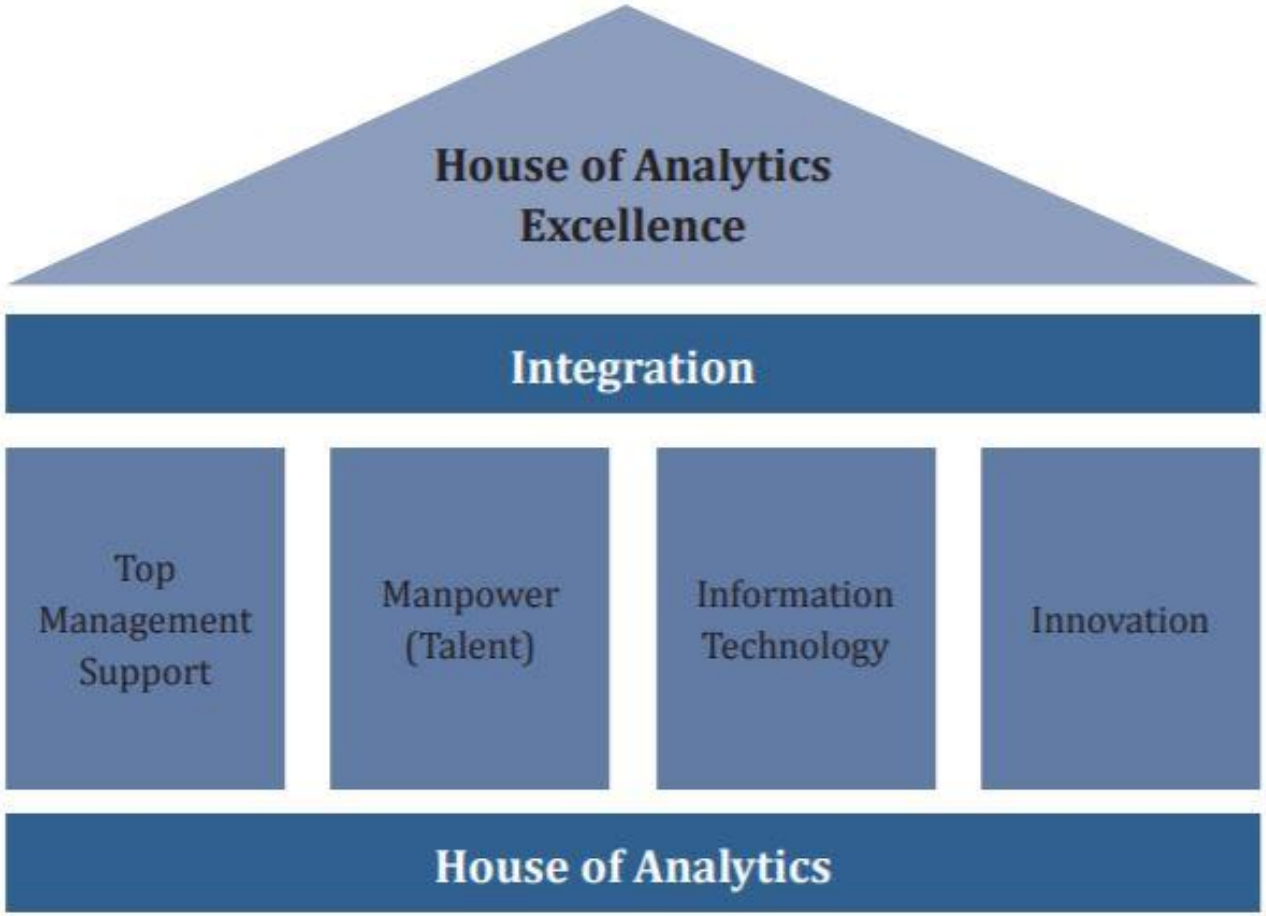
Collection of relevant data

Data Pre-processing : creation of additional variables

Analytics model building

Communication of data analysis : output to the top management and clients

House of Analytics Excellence



Industry data problems

Industry Sector	Sample Analytical Problems	Data Sources
Manufacturing	**Supply chain analytics:** Inventory management, procurement, vendor selection, distribution management **Quality and Process improvement:** Product Quality, Manufacturing quality, process improvement **Revenue and Cost Management:** Revenue maximization and cost minimization. **Warranty Analytics:** Manage end customer warranty and after sales support data.	Procurement, sales and production data. Warranty and after sales service data. Commodity price data Manufacturing data. Macroeconomic parameter data.
Retail	**Assortment Planning:** Category and SKU (stock keeping unit) management that will maximize the revenue and improve loyalty. **Promotion Planning:** Decide promotion strategy such as temporary price cuts, markdowns, bundling etc **Demand Forecasting:** Forecast demand at SKU level for managing supply chain. **Market Basket Analysis:** Association among SKUs in customer purchase. **Customer Segmentation:** Identify the customer segmentation for target marketing.	Price data. Demand data at SKU and at category level. SKU level sales data with and without promotions. Planogram Customer demographics data. Point of Sales (PoS) data. Loyalty program data.

Healthcare	**Clinical Care:** Data related to clinical care and treatment required for improving quality of care. **Hospitality related data:** Data related to issues such as registration process, housekeeping, nursing, utility, diagnostic data etc.	All patient care related data Hospitality related data Patient feedback data
Service	**Demand Forecasting:** Forecast demand for the service **Service Quality Analysis:** Analyse quality for benchmarking and improvement **Customer Segmentation:** Used for Target Marketing **Promotion:** Data related to promotion and its impact	Transactional and feedback data Pricing and demand data Promotional data

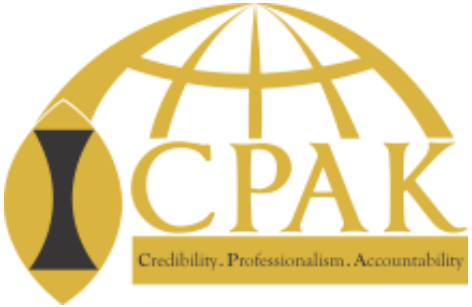
Banking and Finance	**Service Demand Analysis:** Demand for different services **Customer Transaction Analysis:** Used for many different Analytics and decision making insights. **Credit Scoring:** Important for managing different portfolios.	Customer transactional data Loan originating data Credit scoring data
IT and ITES (IT enables services)	**Demand for Analytics Services:** Identify demand for analytics products and services **Software Development Cycle Time:** Cost and Time reduction	Customer interaction and market research data Internal product development data

Data

Leverage on Data as a strategic Asset

Big Decisions

Big Decisions



Every Decision has a consequence.

Coca-Cola Enterprises (CCE) *2 billion physical cases containing 42 billion bottles*

Netflix: *Big Data and giving people what they want*

Amazon *360-degree customer profiles*

Evangelize data driven

Strong data leadership

Bake in a Data driven culture early

Data-driven

Data-driven means a strong

Testing Culture

Domino's

CREATE LEGEND THE LEAGUE OF PIZZA LEGENDS

1 CREATE IT

Choose from a selection of tastilicious toppings to create your own pizza

2 NAME IT

Give it a worthy title and a logo

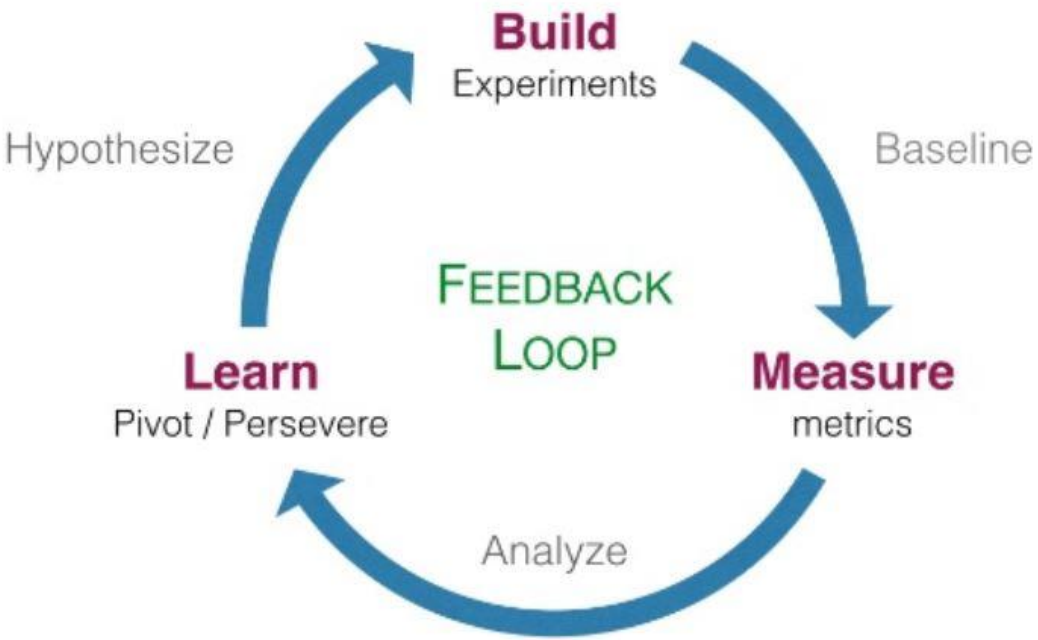
3 FAME IT

Claim your place in Greatness

CREATE YOUR LEGEND

Optimize on the right things

Iterate


Build
Experiments
Baseline
Measure
metrics
Analyze
Learn
Pivot / Persevere
Hypothesize
FEEDBACK
LOOP

No Data Hoarding

Bring data together to create a rich contexts.

Connect the Dots

Invest in quality data

1/3 of business leaders make decision with data they cannot trust

Data Literacy

A Broad Data Literacy

All decision makers have appropriate skills to use and interpret data

Data Driven

A Goals First approach

Set out metrics before experiments. What does success mean? Have an analysis plan. Prevent gaming the system

Change is not Top Down

But Bottom up Too

Everyone in the organization has a role and responsibility to ***leveling up*** their data skills and embedding data into their processes

Not all Data is Good

Thankyou

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