**DATA COMMUNICATION CONCEPTS**

**STORY - TECH OR NON TECH (APPROACH) - DATA - VISUALISATION - PRESENT**

**STORYTELLING WITH DATA**

**Practice of building a narrative around a set of data and its accompanying visualisations to help convey the meaning of that data in a powerful and compelling fashion**

* **Benefits**
  + Focus attention
  + Meaning and concept
  + Retain insights
  + Better-informed decision making
  + Persuade change-resistant stakeholders
* **Power**
  + Anecdotes - imagination
  + Stories - memorable
  + Add value - provide context
  + Capture audience's attention
  + Facilitate decision-making
  + Drive change
* **Data storytelling concepts**
  + 3-minute story
  + What would you say in 3 minutes
  1. Big idea:
  + Unique point of view
  + One sentence
* **Data || Visuals || Narrative = Data Story**
  1. Insightful
  2. Explanatory
  3. Clear
  4. Concise
  + Results (predictions) and findings (data analysis)
  + Relevant
  + Accurate and reliable
  + Actionable insights
* **Narrative**
  + Compelling and easy to understand
  + Prioritise essential points
  + Drive change
  + Main point:
    - Avoid disconnected facts
    - Central insight
  + Explanatory context:
    - Understand background and audience
    - Clarify facts to that audience
  + Linear sequence
* **Visuals**
  + Simple
  + Engaging
  + Not misleading

**TRANSLATING TECHNICAL RESULTS**

* **Translating technical results into stories**
  + Easy to understand
  + Engage audience
  + Decision-making
  + Drive change
* **Strategies**
  + Awareness - consider audience
    - What do they know - Adjust content
    - What do they need to understand - Be conversational
    - What level of information do they need - Serve audience
* **ADEPT**
  + Analogy
  + Diagram
  + Example
  + Plain English
  + Technical definition
    - Acronyms can help or hurt communication
    - Introduce the term and acronym and translate terminology
    - Simple terms
    - Be receptive and proactively ensure understanding
    - Provide guide / definitions
    - Be prepared to explain differently

**IMPACTING THE DECISION MAKING PROCESS**

**Compelling narrative is a descrption of connected events that organises information to engage the audience and make them care for the results or information shared**

* **Compelling narrative**
  + Meanigful to target audience
  + Priorotize key points
  + Drive change
* **Narrative structure**
  + Background
    - What motivated the analysis
    - What changed
    - Who is the focus of the analysis (Customers? Employees? Something else?)
  + Insight 1, 2
    - What contributed to the problem
    - Only relevant information
    - Add supporting evidence if helps better explain the cause of the problem
  + Climax
    - Central insight
    - What would happen if there is no change
  + Next steps
    - Potential solutions
    - Course of action
    - Proactive

**SELECTING THE RIGHT DATA**

**Include enough contextual insights in a story to better support the main point without overloading with information. Include the minimal amount of results that will support the story.**

* Stakeholders
  + Technical
  + Non technical
* Identifying personas
  + Description
    - Interests
    - Knowledge
* Selcet tailored findings
* Audience skepticism
  + Different levels of skepticism
  + Different levsls of argumentation
    - Convince yourself
    - Convince friend
    - Convince a skeptic

**SHOWING RELEVANT STATISTICS**

* Variations of data
  + Absolute - Difference between 2017 and 2018 sales
    - ok for 1 value
  + Relative - Percentge variatiojn 2018 from 2017
    - ok to compare different scales
* Ratio
* Aggregates
  + Total / Count / Mean / Median / Mode
* p-value
  + Convention
    - Value less than 0.05: Statistical significance
    - Value close to 0.05: Weak indicator
  + Not proof of evidence
    - Reject or accept hypothesis: But not that it is right or false
  + Condiser alternatives or complementary metrics

**VISUALISATIONS FOR DIFFERRENT AUDIENCES**

* Best Practices:
  + **PARETO PRINCIPLE**
    - Aggregate less relevant data
  + Approachable and engaging visulals
  + How many / how quickly
  + Less in more
* **MCCANDLESS METHOD**
  + Introduce visualisation by name
  + Graph headline
  + Clear and obvious
  + y vs x technique

1. Ancicipate audience's questions

* Where did this data come from / why are we focussing on this data
* Focus on story not decoding graph

1. State insights
2. Help the audience relate

* Importance
* Action items

**CHOOSING THE APPROPRIATE FORMAT**

1. Written reports
2. Oral presentation

* Presentation strategy
* **Audience - Content - Requirements - Channel => Presentation format**
* Audience / Stakeholders
  + Who
  + Why
    - Accountability
    - Methodology
  + How
    - Make a decision
    - Start a new project
  + What
    - Results
    - Impact
* Which content to use
  + Results?
  + Conclusions?
  + Recommendations?
  + Methods?
* Special requirements
  + Time
  + Authority
  + Time zone
* Channel / Consumption
  + Format
    - Document
    - Slides
  + Delivery mechanism
    - Live
    - Asynchronous
  + Audience
    - Conference room
    - Ballroom
* Oral communication
  + Advantages
    - Relationship with audience
    - Immediate feedback
    - Non-verbal cues
  + Disadvantages
    - No permanent record of communications
    - Not suitable for long messages
* Written communication
  + Advantages
    - Prmanent record of communications
    - Shared easily with large audience
    - Less emotional reaction
    - Suitable to share code with colleagues
  + Disadvantages
    - Hard to see if message understood
    - No immediate feedback

**TYPES OF REPORTS**

* Informational
  + factual information
  + Short
  + Not strict structure
  + Inform about fats
* Analytical
  + Analysis (relationships / recommendations)
  + Varies (short or long)
  + Strict structure
  + data-driven decisions
* Final report
  + Data analysis
  + Findings and results
  + Visuals
  + Long
  + Details (usually needed for audiences that need technical details)
* Summary report
  + Key findings and recommendations
  + Visuals
  + Short (< 5 pages)
  + Summary of final report
  + Link to main document
  + No nned for details (usually needed for audiences that do not need technical details)

**REPORT STRUCTURE (DATA REPORTS IN JOURNALS)**

* Introduction
  + Purpose
  + Contexual information
  + Question of analysis
* Body
  + Data (description and tables)
  + Methods
  + Analysis (model and visuals)
  + Results (description and visuals)
* Conclusions
  + Restate question
  + Suammarize important results
  + Add recommendations

**REPORT STRUCTURE (BUSINESS CONTEXT)**

* **1-3-25 APPROACH**
  + 1 page of abstract
  + 3 pages of executive summary
  + 25 pages of detail

**REPRODUCIBILITY AND REFERENCES**

* Prevents duplication effort
* Build upon pre-existing work
* Focus on new challenges
* Peer review
* Tool agnostic
* **Best Practices**

1. Keep track of how results were produced

* Well documented scripts
* Code comments
* List packages and environment used
* Version control (GIT)

1. Avoid manual data manipulation

* Data versioning
* Store raw data and intermediate steps
* Adapt and resolve problems

1. Document randomness

* Random seeds for ML pipelines
* Controls confounding variables

1. Interpretability

* Understand the cause of a decision or predict model results
* Story with complelling narrative
* Link with reprocibility

1. Cite bibliography correctly

* Citing
  + APA style: In text citations (author, date)
* Reference
  + Reference management tools (EndNote, Mendeley, RefWorks)
* Simpler in business context - use hyperlinks to source

**WRITE PRECISE AND CLEAR REPORTS**

* Empty phrases
* Concrete nouns
* Business contect: Active voice
* Academic context: Passive voice
* Redundant adjectives and adverbs
* Run-on sentences

**PLANNING AN ORAL PRESENTATION**

* Plan
* **Presentation structure**
  + Purpose
    - Informative
    - Instructional
    - Persuasive
  + Audience
    - Technical
    - Executive
    - Customer
    - How big (small | conference | workshop)
  + Message
    - Opening statement (capture attention)
    - Central message (One sentence)
    - Closing statement (sum of presentation and strengthen central message)
* **Presentation structure**
  + Introduction
  + Methids, analysis, model outputs (avoid for non-technical audience)
  + Conclusions and takeaways
* **Outline**
  + Graphs and visuals
  + Sections (5 or less)
    - Reason for analysis
    - Explorartory analysys
    - Sentiment analysis
    - Conclusions
    - Follow-up actions

**BUILDING SLIDES**

* One message per slide
  + Timing (1 minute per slide + time for questions)
* Color
  + No more than 3
  + Contrast
  + Inclusive
* Font
  + Serif: Scren
  + Sans-serif: Print
  + Short sentence
  + large font
* Text slide
  + Less text
  + Headline
  + Layering: Each point presented and explained on its own
  + Replace too much text with graph
  + Graph headlines if needed
  + 1 or 2 full-size graphs

**DELIVERING THE PRESENTATION**

* Practice
* Rehearse
* Aware of emotions
* Talk to, not at audience
* Attention span (5 - 20 minutes)
* Timing
* Pace
* Questions

**AVOIDING COMMON ERRORS**

* State purpose at beginning
* Do not leave all findings to the end
* Engage and involve audience
* Strong introduction
* State key assumptions
* Allow audience to ask questions
* Reiterate to main idea
* Voice tonality