Data Analysis

Chapter 7

Communicating Results

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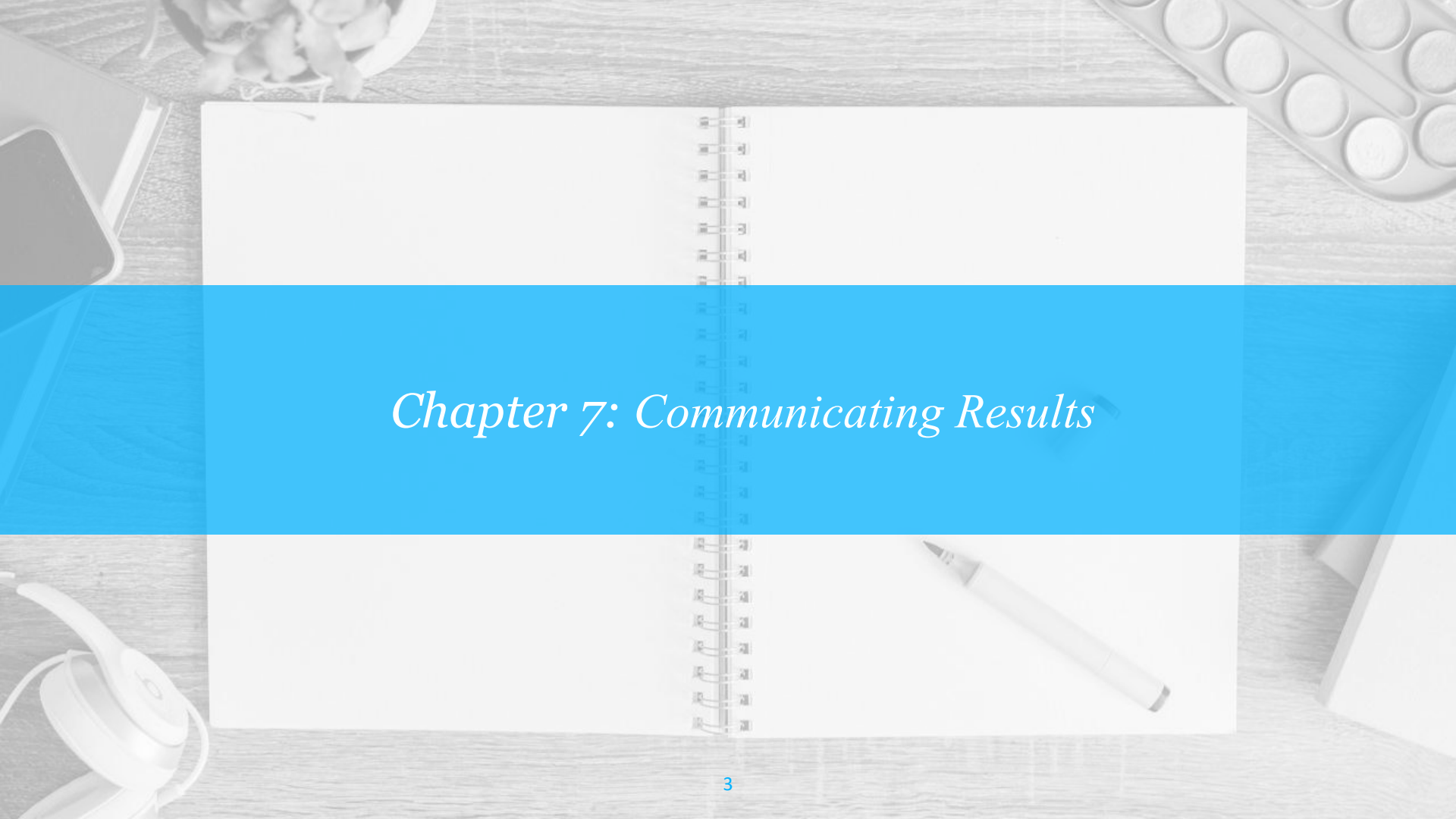

Chapter 7: Communicating Results

Learning Objectives

- By the end of this lecture, students should be able to:

1- Understand the role of communication in the data analysis process.

2- Identify the different audiences (technical vs. non-technical).

3- Apply best practices in creating clear, accurate, and impactful reports.

4- Use data visualization to tell a story.

5- Select appropriate tools and formats for presenting results.

6- Develop skills in writing reports, giving presentations, and storytelling with data.

1. Introduction: Why Communication Matters

- Data analysis is not complete until insights are shared.
- Poor communication = wasted analysis.
- Example: If a model predicts customer churn but stakeholders don't understand results, **no action will be taken**.
- Key principle: **"Don't just present data — tell a story with it."**

2. Knowing Your Audience

➜ Different audiences require different levels of detail:

- **Technical audience (data scientists, engineers)**

  Focus: algorithms, code, accuracy, confidence intervals.

  Example: “The Random Forest achieved 89% accuracy, outperforming SVM by 7%.”

- **Business audience (managers, executives)**

  Focus: key takeaways, ROI, impact on decisions.

  Example: “We can reduce customer churn by 20% by targeting high-risk groups.”

➜ Activity: Practice rewriting the same result for two different audiences.

3. Formats for Communicating Results

Written Reports

→ Structure:

Executive Summary (short, non-technical)

Methodology (how data was collected/cleaned/analyzed)

Key Findings (main results, supported by tables/figures)

Recommendations (actions based on findings)

→ Best practices:

Keep it concise.

Use visuals over text-heavy explanations.

Include appendices for detailed statistics.

3. Formats for Communicating Results

Data Visualization

- ➜ “A picture is worth a thousand words.”
- ➜ Goals: simplify complex data, highlight trends, show comparisons.
- ➜ Common charts:

    Line charts → trends over time

    Bar charts → comparisons across categories

    Scatter plots → relationships between variables

    Heatmaps → correlations

    Dashboards (Tableau, Power BI) → interactive exploration

3. Formats for Communicating Results

➜ Golden Rules of Visualization:

Choose the right chart for the message.

Don’t overload with too much information.

Use consistent colors and labels.

Avoid misleading scales (e.g., truncated axes).

3. Formats for Communicating Results

🎤 Presentations

➜ Oral communication + slides.

➜ Best practices:

Keep slides minimal (visuals > text).

Start with a problem → show analysis → deliver solution.

Practice storytelling (Beginning–Middle–End).

Engage audience with questions.

➜ Example flow:

Problem: “Customer churn is increasing.”

Analysis: “We identified 3 key predictors.”

Solution: “A targeted retention strategy could save $1M annually.”

3. Formats for Communicating Results

📊 Dashboards & Interactive Tools

→ Tools: Tableau, Power BI, Google Data Studio.

→ Pros: allow stakeholders to explore data themselves.

→ Use cases: real-time monitoring (sales dashboards, KPIs, website traffic).

4. Storytelling with Data

➜ Beyond reporting numbers → **craft a narrative**.

➜ Framework:

Context → What is the problem?

Conflict → What challenge does the data reveal?

Resolution → What insights/solutions does analysis provide?

Call to Action → What should stakeholders do next?

➜ Example:

Context: “Our sales dropped 15% last quarter.”

Conflict: “Data shows highest churn among young customers.”

Resolution: “Personalized marketing can improve retention.”

Action: “Launch a campaign targeting customers aged 18–25.”

5. Common Mistakes in Communicating Results

- ➜ Using too much jargon with non-technical audiences.
- ➜ Overloading slides/reports with numbers and tables.
- ➜ Cherry-picking data to fit a narrative.
- ➜ Misleading visualizations.
- ➜ Not linking results to decisions.

6. Case Studies

- **Case 1: Healthcare**
- Data scientists analyzed patient readmissions.
- Poor communication: “Model A has AUC = 0.81.”
- Better communication: “Our model can predict readmission risk with 81% accuracy, helping hospitals save costs and improve patient care.”
- **Case 2: Retail**
- Analyst discovered peak sales are driven by promotions.
- Poor communication: “Regression coefficient for promotion = 0.65.”
- Better communication: “Running promotions increases weekly sales by 20%, suggesting we should increase marketing investment.”

7. Tools for Communicating Results

- **Visualization**: Tableau, Power BI, Matplotlib, ggplot2
- **Reports**: Word, LaTeX, Jupyter Notebooks, R Markdown
- **Presentations**: PowerPoint, Google Slides
- **Dashboards**: Looker, Qlik, Shiny (R)

7. Summary

- ➜ Data analysis is only valuable if results are communicated clearly.
- ➜ Tailor message to the audience (technical vs. non-technical).
- ➜ Use reports, visualizations, presentations, and dashboards effectively.
- ➜ Apply storytelling to turn data into actionable insights.
- ➜ Always ensure clarity, accuracy, and honesty in communication.

Thanks!

Any questions?