DSA/ISE 5103 Intelligent Data Analytics

CRISP-DM and Project Understanding

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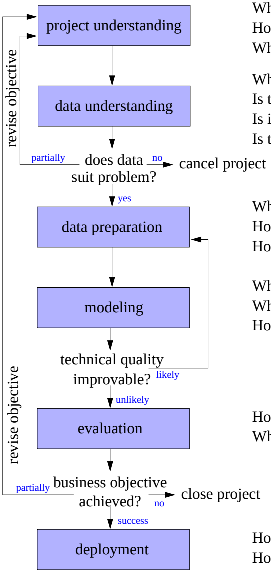
Outline

1. **Process: CRISP-DM**
2. Project Understanding

CRISP-DM

Cross Industry Standard Process for Data Mining



What exactly is the problem, the expected benefit?
How would a solution look like?
What is known about the domain?

What data do we have available?
Is the data relevant to the problem?
Is it valid? Does it reflect our expectations?
Is the data quality, quantity, recency sufficient?

Which data should we concentrate on?
How is the data best transformed for modeling?
How may we increase the data quality?

What kind of model architecture suits the problem best?
What is the best technique/method to get the model?
How good does the model perform technically?

How good is the model in terms of project requirements?
What have we learned from the project?

How is the model best deployed?
How do we know that the model is still valid?

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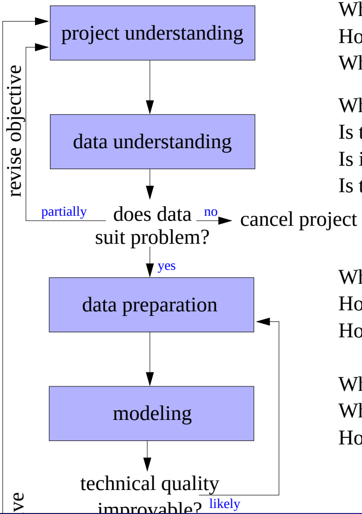
project understanding



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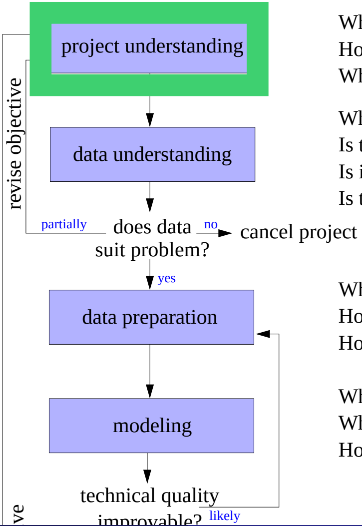

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project understanding

The 80-20 Rule!

- Average time spent for project and data understanding within the CRISP-DM model: 20%
- Importance for success: 80%

tasks in project understanding

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1. Determine business objectives

Pete Chapman, Julian Clinton, Randy Kerber, Thomas Khabaza, Thomas Reinartz, Colin Shearer, and Rüdiger Wirth (2000); *CRISP-DM 1.0 Step-by-step data mining guides.*

tasks in project understanding

1. Determine business objectives
2. Assess situation

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3. Determine data mining goals

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tasks in project understanding

1. Determine business objectives
2. Assess situation
3. Determine data mining goals
4. Produce project plan

Pete Chapman, Julian Clinton, Randy Kerber, Thomas Khabaza, Thomas Reinartz, Colin Shearer, and Rüdiger Wirth (2000); *CRISP-DM 1.0 Step-by-step data mining guides.*

determine business objectives

Tasks:

- Understand problem from a *business perspective*
- Identify critical factors, competing objectives and constraints

Output:

- Background description
- Primary objectives
- Success criteria

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  - What would you do with a solution?
  - What could you do with a solution?

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What predictive analytics solutions could be proposed to help address this business problem?

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- Use: predicted amount used to offer settlement to members
- Benefit: limits the effort/expense of undergoing claim investigations

case study: Automobile Insurance Fraud

Each also has it downsides...

- **Claim** prediction: what if investigative team does not agree, e.g., the workload is too little, too much, too different
- **Member** prediction: if you issue a warning to a good customer, you may lose that customer
- **Application** prediction: how much future revenue are you giving up from good customers?
- **Payment** prediction: settlements might be too high

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- Criteria to measure the success of the project should be defined.

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Poor examples...

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- Increase sales

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- Model loyal customers to increase sales

objectives and success

Poor examples...

- Increase sales
- Model loyal customers to increase sales
- “I read something in Forbes magazine – Walmart is doing something where they found that purchases of fishing tackle in late October is indicative of very profitable sales of decorative lamps in the Spring.” *Do that for us.*

objectives and success

Good example...

objective:	increase revenues (per customer) in direct mailing campaigns by personalized offer and individual customer selection
deliverable:	application that automatically selects a pre-specified number of customers from the database to whom the mailing shall be sent; runtime max: half-day
success criteria:	improve purchase rate by 5% or total revenues by 5%, measured within 4 weeks after mailing.

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Task:

Detailed fact-finding

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Outputs

- Inventory of resources
- Requirements, assumptions, and constraints
- Terminology
- Costs and benefits

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Map the problem to a data analysis task

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produce project plan

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Describe and document plan

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Output:

- Project plan

  This is a *dynamic* document!

- Initial assessment of tools and techniques

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project understanding

"A problem well stated is a problem half solved."

– Charles Kettering