Problem Solving

November 2015
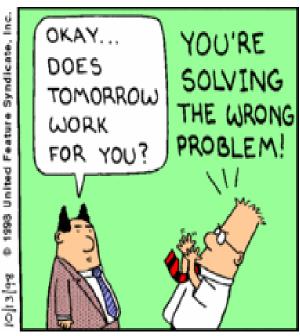
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Solving the wrong problem... Are you listening?

🏆 **How can ABC Bank make its credit card portfolio best in the market?**

Definition of best?
- Bank/ Customer standpoint?
- By profitability, customer loyalty or number of cards

In what time frame?
- 2/3/5 years?

Best in what geography?
- Locally?
- Globally?

⚠️ **Challenge**
- Enough ambiguity to stall further process

How can we reduce a XYZ hospital's patient readmission rate in the next 90 days by X%?

We have understanding of the business metric i.e. patient readmission rate

We also have information of the target value of the business metric i.e. *by X%*

We have information on the time period for which we need to observe behavior (patient readmission)

Challenge
- Not enough domain knowledge

ABC is a leading bank in US and offers various products –

- **Assets (home loan, mortgage, credit card),**
- **Liabilities (savings account) &**
- **Wealth management**

It is looking to increase product penetration amongst its customer base and wants to identify a sequence of next best products for each customer. The current PPC, on an average, is 1 and the bank wants to increase this to 3 over the next 2 years. You need to arrive at a strategy that will help the bank achieve this objective.
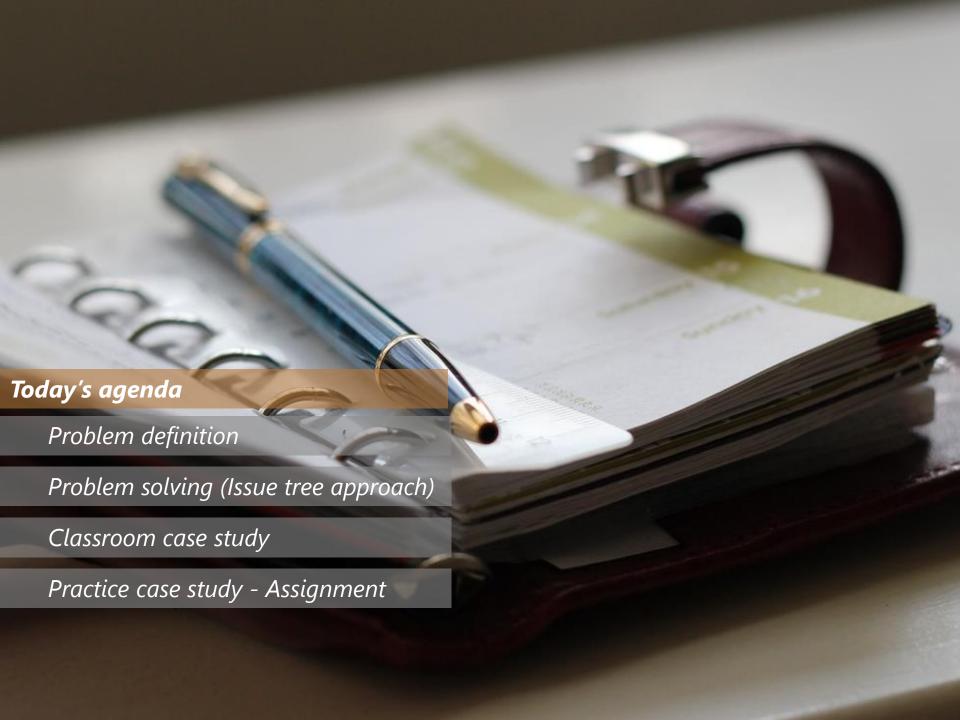
- A clear problem statement
- Good domain knowledge
- Familiarity with the products

Any ideas on how do we approach this problem? Multiple ideas ringing in the head?

......and many more challenges before we begin to solve any business problem!

Today's agenda

Problem definition

Problem solving (Issue tree approach)

Classroom case study

Practice case study - Assignment

A typical problem solving process

Implement the solution

Solve the problem

Define the problem

Research and Context

Focus area for this training

Key learning outcomes from the session

... define a S.M.A.R.T. problem statement

... understand the Problem Statement Worksheet (PSW)

... develop a MECE Issue tree to identify solutions for a problem statement

... solve a business problem through structured problem solving methodology

Today's agenda

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Problem solving (Issue tree approach)

Classroom case study

Practice case study - Assignment
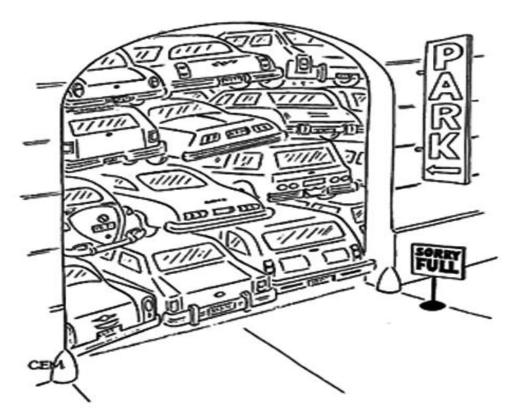
Framing a problem itself is a tricky exercise
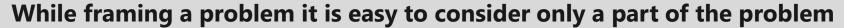
"If I had an hour to solve a problem I'd spend 55 minutes thinking about the problem and 5 minutes thinking about solutions."

Situation:

The parking lot of XYZ company is not large enough to accommodate cars of all the employees

How should the question be framed here?

While framing a problem it is easy to consider only a part of the problem

How can we increase the capacity of the parking lot?

How can we reduce the number of cars?

So it is important to frame a problem statement that addresses the complete problem and not a part of it

Key Question : How can we solve the parking problem for XYZ company?

- Option # 1: How can we increase the capacity of the parking lot?
- Option # 2: How can we reduce the number of cars?

What is a good problem statement?

S	M	A	R	T
Specific	Measurable	Action-oriented	Relevant	Time-bound

E.g. How can ABC bank **increase** its **market share by volume** of their credit card portfolio in the **Australian** market from **6% to 10%** in **2 years** time?

Tells us the "Key problem to be solved"

✓ One or two sentences long

✓ Does not suggest a solution

✓ Is unambiguous and devoid of assumptions

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Problem Definition | Common Pitfalls
1. *The Loop Trap*

How does the company earn more revenues?

Increase production

How to increase production?

Earn more revenues

Avoid **Problem-Solution-Problem** trap while solving the problem

Improve technology

How to invest more in R&D?

Invest more in R&D

How to improve technology?

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Problem Definition | Common Pitfalls
2. *The Obvious Solution Trap*

A software development company supplies products and services to wireless carriers. They had issues deploying new software releases into the production environment. The company failed to deploy the releases on-schedule for more than half of the releases

How do we develop a robust quality check process?

How do we identify and address the reasons for failure in deployment?

Patient suffering from multiple ailments visits a doctor

How do I reduce my back pain?

How do I cure my headache?
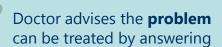
How do I prevent burnout?

How do I cure insomnia?

Patient confuses doctor by citing **all problems**

Doctor realizes the **problem** is **work-load pressure**

Doctor advises the **problem** can be treated by answering

"How do I stay fit with the given work-load pressure?"

- *Don't include multiple problems*
- *Problem statement should not lead to multiple interpretations*

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Problem Statement Worksheet

BASIC QUESTION TO BE RESOLVED
The question should be SMART (as is possible)

1. Background

- What is the current situation?
- What has happened so far?
- Why is this problem being addressed now?

2. Desired outcome

- What will be the impact on the business?
- What will the final outcome/product look like?
- What will be deliver at the end?

3. Scope

- What will be included in the final solution/analysis?
- What will be outside the purview of this study?

4. Constraints

- What can be the potential barriers to this study?
- What are infeasible solution set answer the problem?

5. Stakeholders

- Who are the decision makers?
- Who needs to be involved?

6. Resources

- Where does expertise & knowledge exist (Internal & External)?
- What technology would be used?
- What would be the team size/structure?

Example:

The incidence of suspicious and fraudulent auto claims is on the rise. This increases the challenges for the claim adjusters during investigation & settlement.

Our client, an auto insurance company called XYZ Insurance, is worried as the fraud capture rate for them has been found to be alarmingly low. Currently, there are certain methods employed to uncover potentially fraudulent claims. However, given the industry benchmark for the fraudulent claims, XYZ feels there is a room for improvement.

Problem Statement Worksheet

How can we develop a regression model to identify fraudulent claims for XYZ Insurance?

1. Background

- According to a recent study, XYZ P&C fraud capture rate ($50MM in 2014) is only at 15-20% of industry peer benchmark; The estimated impact in Commercial Auto BI (Body Injury) is $24.6M and PD (Property Damage) is $5M in US
- There is a need to develop a multi-layer fraud detection framework

2. Desired outcome

- Good logistic regression model resulting in better fraudulent claim identification

3. Scope

- Model will be used by the insurance team to identify fraudulent claims

4. Constraints

- Solution to complement existing process of manual adjuster referrals
- Solution to convince investigators on reason for investigation

5. Stakeholders

- SIU (Special Investigation Unit) manager & investigators
- Claims director

6. Resources

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Problem Statement Worksheet

How can we reduce financial loss to XYZ Insurance from suspicious claims in the Auto segment?

1. Background

- According to a recent study, XYZ P&C fraud capture rate ($50MM in 2014) is only at 15-20% of industry peer benchmark; The estimated impact in Commercial Auto BI (Body Injury) is $24.6M and PD (Property Damage) is $5M in US
- There is a need to develop a multi-layer fraud detection framework

2. Desired outcome

- X% incremental new frauds detected by SIU
- Saving in investigation cost and detection time by Y%

3. Scope

- Commercial auto (both BI and PD) claims in US

4. Constraints

- Solution to complement existing process of manual adjustor referrals
- Data constraints (not all parameters captured electronically. For e.g. number of units in policy, etc.)

5. Stakeholders

- SIU (Special Investigation Unit) manager & investigators
- Claims director

6. Resources

- Global investigative services (GIS) and SIU from business
- External data: ISO cross-carrier claim information

Importance of defining the right problem

	Initial Definition	**Updated Definition**

Problem Definition

How do we develop a regression model to identify fraud claims to reduce losses?

How do we reduce financial loss from suspicious claims ?

Potential Solution

1. Develop a logistic regression model to predict fraud claims

1. Develop a regression model to predict fraud claims
2. Do pattern analysis to identify out of pattern transactions
3. Do link analysis to identify common threads in a claim/ across claims
4. Track new fraud trends in market and take preventive actions
5. Participate in Fraud Bureau
6. Do application seeding to check process robustness
7. Have better referral guidelines
8. Improve adherence to guidelines
9. Improve investigation
10. Train investigators
11. Have appropriate capacity
12. Reduce cost of investigations

Today's agenda

Problem definition

Problem solving (Issue tree approach)

Classroom case study

Practice case study - Assignment
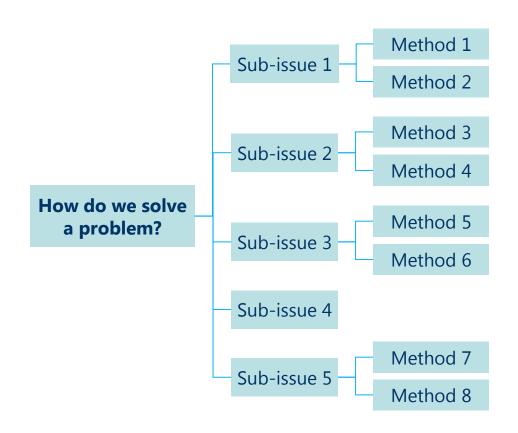
What is an issue tree & why is it important?
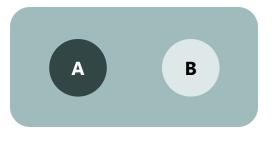
A problem solving tool that breaks down a problem into smaller sub-issues

Why use issue trees?
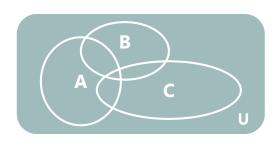
- To solve the problem in a structured and well thought manner

- To build a common understanding within the team of the problem solving framework

- To yield a sound and relevant solution to the underlying problem statement

How do we solve a problem?

Sub-issue 1 → Method 1, Method 2

Sub-issue 2 → Method 3, Method 4

Sub-issue 3 → Method 5, Method 6

Sub-issue 4

Sub-issue 5 → Method 7, Method 8
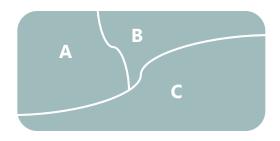
Issue trees rely on MECE groupings
MECE = Mutually Exclusive and Collectively Exhaustive
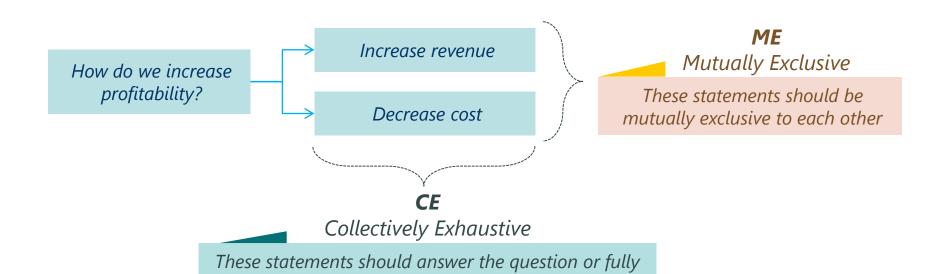
Mutually exclusive sets

Collectively exhaustive sets

MECE sets

How do we increase profitability?

Increase revenue

Decrease cost

ME
Mutually Exclusive

These statements should be mutually exclusive to each other

CE
Collectively Exhaustive
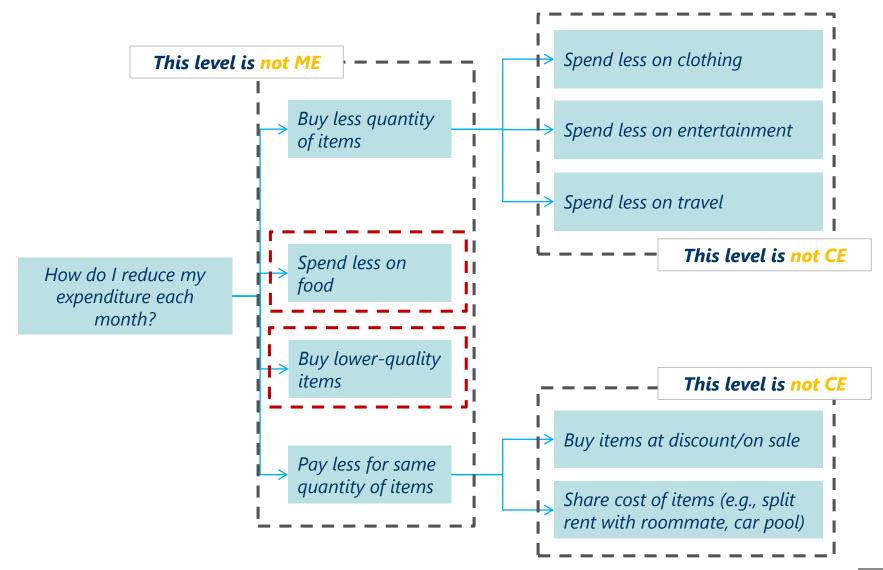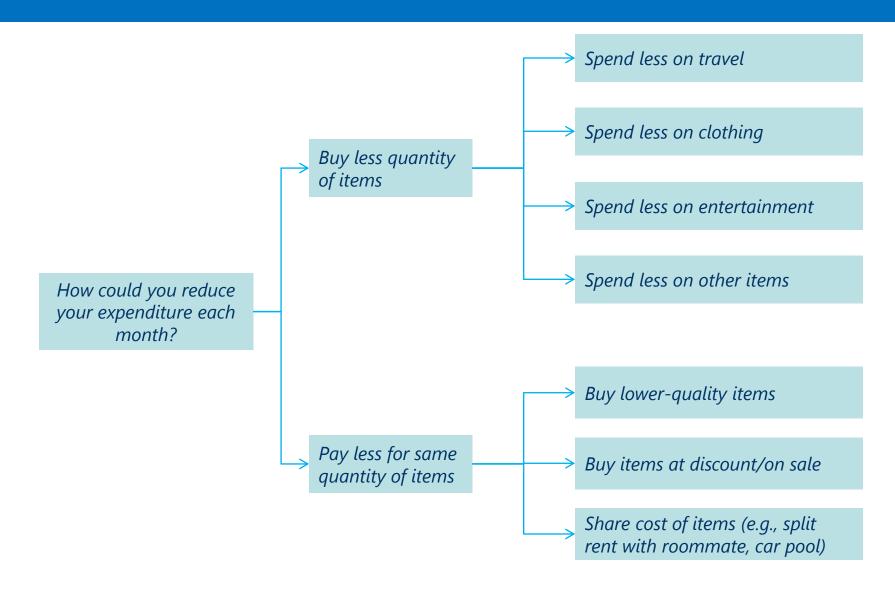
These statements should answer the question or fully describe the idea on the level immediately before

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Is this issue tree MECE?

This level is not ME

This level is not CE

This level is not CE

How do I reduce my expenditure each month?

- Buy less quantity of items
  - Spend less on clothing
  - Spend less on entertainment
  - Spend less on travel
- Spend less on food
- Buy lower-quality items
- Pay less for same quantity of items
  - Buy items at discount/on sale
  - Share cost of items (e.g., split rent with roommate, car pool)

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Example of a MECE Issue tree

Issue tree diagram:

How could you reduce your expenditure each month?

- **Buy less quantity of items**
  - Spend less on travel
  - Spend less on clothing
  - Spend less on entertainment
  - Spend less on other items

- **Pay less for same quantity of items**
  - Buy lower-quality items
  - Buy items at discount/on sale
  - Share cost of items (e.g., split rent with roommate, car pool)

A few tips to help improve your issue trees

Tip # 1
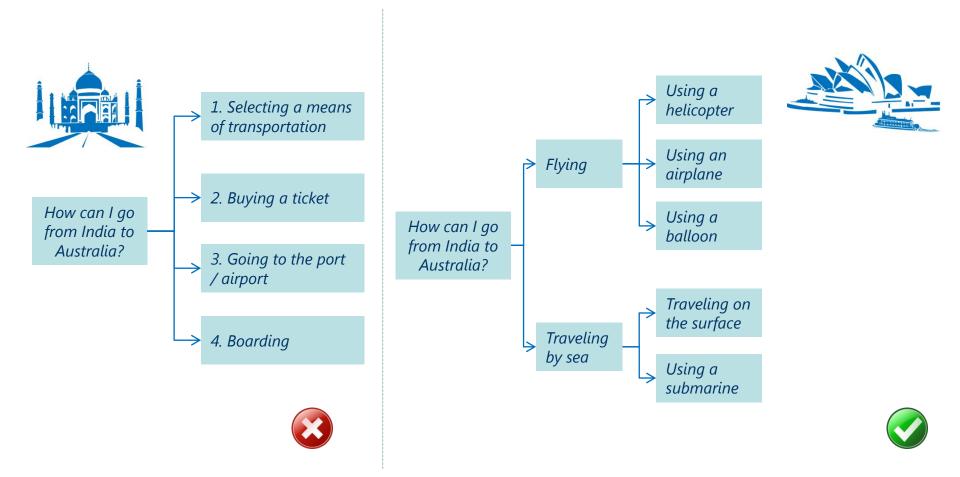
An issue tree goes from left to right breaking down the primary question into smaller sub-issues; *each move to the right must logically break down the question further*

Key Question	Level 1	Level 2	Level 3	Level 4

How can we increase our profitability?

- Increase revenues
  - Increase prices
    - Increase prices of the products
    - Increase prices of the services
  - Increase volume
    - Acquiring new customers
    - Selling more to existing customers
- Decrease costs
  - Decrease raw material costs
    - Decrease the quantity of the raw materials
    - Decrease the prices of the raw materials
      - Negotiating better
      - Switching supplier
  - Decrease employee costs
  - Decrease other costs

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Tip # 2

An issue tree should not describe a sequential process; instead it should show alternative solutions that are individually capable of solving the part of a primary problem

How can I go from India to Australia?

1. Selecting a means of transportation
2. Buying a ticket
3. Going to the port / airport
4. Boarding

❌

How can I go from India to Australia?

Flying
- Using a helicopter
- Using an airplane
- Using a balloon

Traveling by sea
- Traveling on the surface
- Using a submarine

✅

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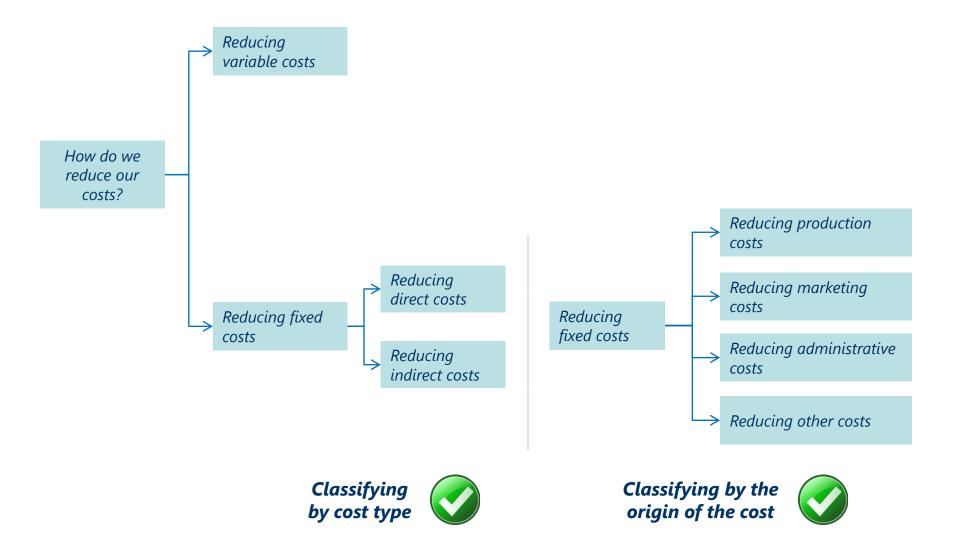
Tip # 3

Sub-issue(s) in the tree should be in form of a question, an idea, or an action-item.
They should not just be titles

How can we increase our profitability?
- How do we increase revenues?
- How do we decrease costs? ✓

How can we increase our profitability?
- Increasing revenues
- Reducing costs ✓

How can we increase our profitability?
- Increase profit from new acquisitions
- Increase profit from existing customers ✓

How can we increase our profitability?
- Revenues
- Costs ✗

The above tree is not right because you have to infer on what to do with the revenues and costs

Tip # 4

You can solve each problem with more than just one tree

How do we reduce our costs?

- Reducing variable costs
- Reducing fixed costs
  - Reducing direct costs
  - Reducing indirect costs

Reducing fixed costs
- Reducing production costs
- Reducing marketing costs
- Reducing administrative costs
- Reducing other costs

Classifying by cost type ✓

Classifying by the origin of the cost ✓

Today's agenda

Problem definition

Problem solving (Issue tree approach)

Classroom case study

Practice case study - Assignment

Case study: Debit card market share

ABC bank is experiencing a decline in market share (by number of cards) of its debit card portfolio. The bank is interested in developing a framework that would improve the share in the next 2 years.

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Problem Statement Worksheet
Debit card market share

How can ABC bank increase its debit cards market share, by number of cards, from X% to Y% in the next 2 years?

1. Background

- The market share of the bank's debit card portfolio in Australia has been decreasing for the last couple of years due to increased competition
- Focus is on increasing the portfolio size and strategy need not focus only on profitable/high potential acquisitions

2. Desired outcome

- Increase in market share, from X% to Y%, in the next 2 years
- Insights and "Go to market" strategy

3. Scope

In scope:
- Analysis of overall debit card portfolio, customers target list, campaign recommendations
- Australian market

Out of Scope:
- Cannibalization effect on credit cards portfolio

4. Constraints

- Inorganic growth is ruled out due to time and cost considerations
- Since market share is also dependent on the competitor's strategy ; the Bank has to plan aggressively to outperform the growth of others
- Usual involuntary cancellation of cards due to unavoidable reasons (e.g. long dormancy) will continue
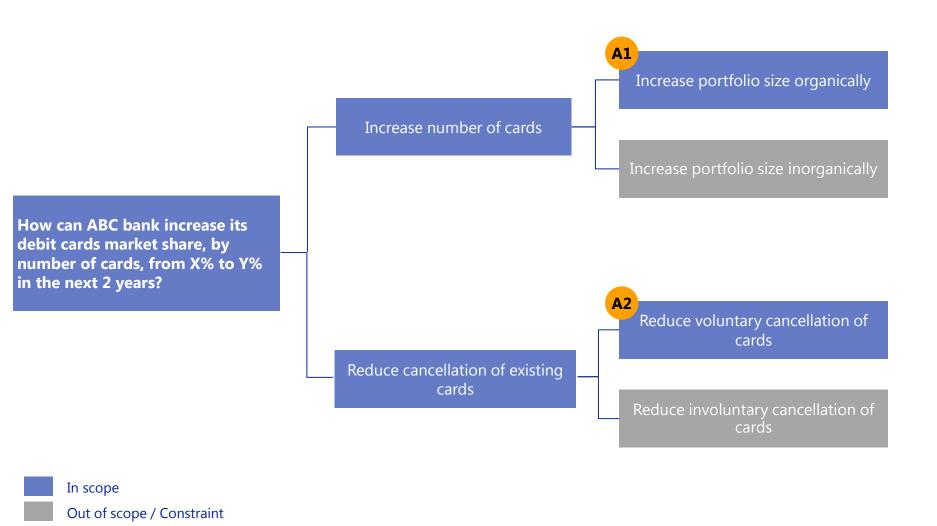
5. Stakeholders

- Debit card team
- Marketing Team

6. Resources
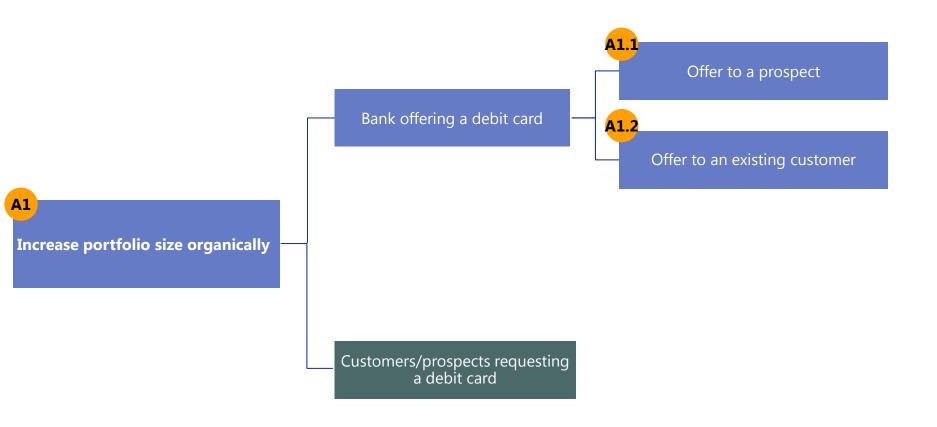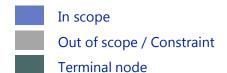
- Data provided by the Bank (Demographics, product holding details, transactions, results of past X-sell campaigns)
- Interviews held with the stakeholders
- Information gathered through secondary research

Issue Tree
Debit card market share

How can ABC bank increase its debit cards market share, by number of cards, from X% to Y% in the next 2 years?

- Increase number of cards
  - **A1** Increase portfolio size organically
  - Increase portfolio size inorganically
- Reduce cancellation of existing cards
  - **A2** Reduce voluntary cancellation of cards
  - Reduce involuntary cancellation of cards

In scope

Out of scope / Constraint

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Issue Tree
Debit card market share

A1
Increase portfolio size organically

Bank offering a debit card

A1.1 Offer to a prospect

A1.2 Offer to an existing customer

Customers/prospects requesting a debit card

- In scope
- Out of scope / Constraint
- Terminal node

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Issue Tree
Debit card market share

Bank offering a debit card

A1.1 Offer to a prospect
- Prospects who have a debit card
- Prospects who do not have a debit card

A1.2 Offer to an existing customer
- Customers who have a debit card
- Customers who do not have a debit card
  - Savings/current account customers
  - Credit card customers (affinity to plastic money)
  - Other customers

Legend:
- In scope
- Out of scope / Constraint
- Terminal node

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Issue Tree
Debit card market share

A2

Reduce voluntary cancellation of cards

Customers who have requested a cancellation

Customers who are expected to request a cancellation

In scope
Out of scope / Constraint
Terminal node

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ABC bank is experiencing a stagnation in profitability of it's credit card portfolio. The bank is interested in developing a framework that would improve the profitability.

Problem Statement Worksheet

How can ABC bank increase overall profitability of their credit card portfolio from X% to Y% in 3 years time?

1. Background

- The bank's credit card portfolio is experiencing stagnation in profitability
- The bank is looking at support and guidance on improving portfolio growth and increase profitability

2. Desired outcome

- Actionable Insights
- Clear quantification of the opportunities
- Recommendations of industry best practices

3. Scope

- In scope: Increase revenue from various components (interchange, interest income)
- Out of Scope : Cost reduction

4. Constraints
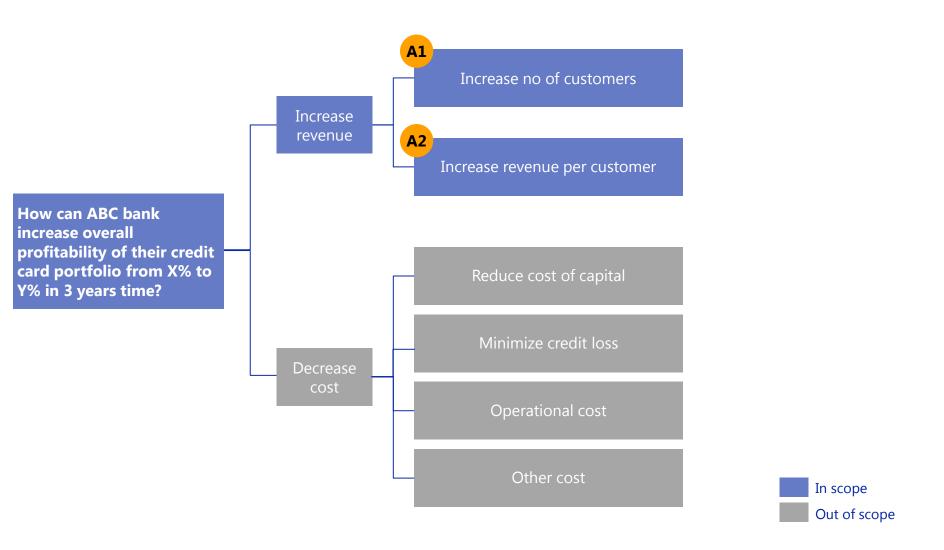
- Campaign data is not available
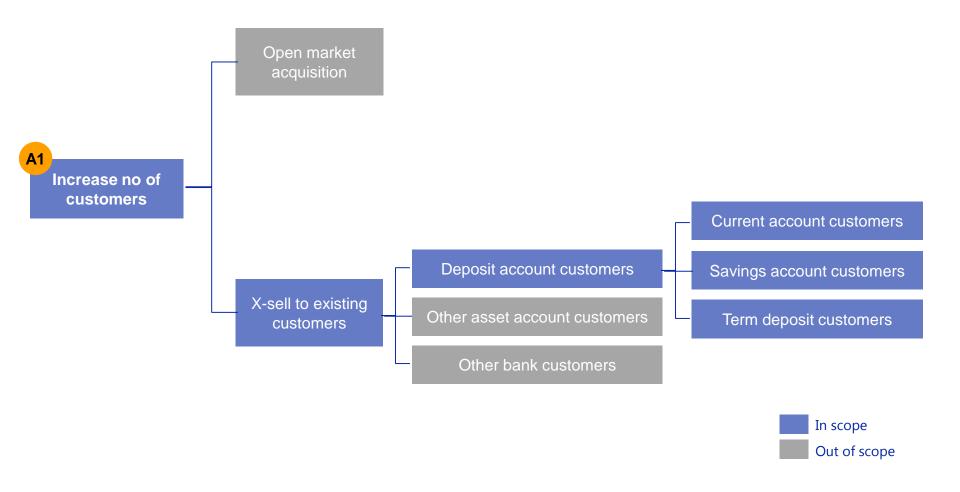
5. Stakeholders
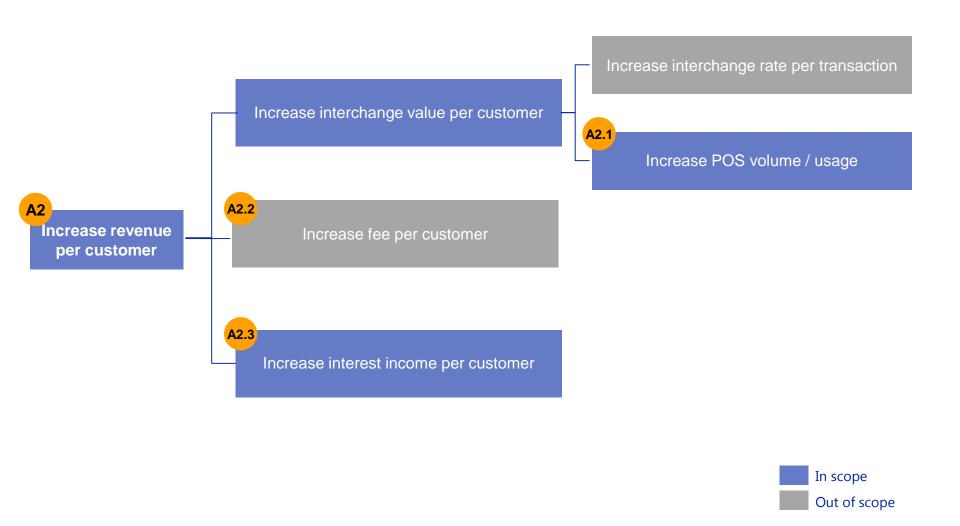
- Portfolio Manager of credit card portfolio

6. Resources

- Data provided by the bank (Customer demographics, transaction data, billing data and payment data)
- Interviews held with the stakeholders
- Insights based on secondary research

Issue Tree

How can ABC bank increase overall profitability of their credit card portfolio from X% to Y% in 3 years time?

Increase revenue
- **A1** Increase no of customers
- **A2** Increase revenue per customer

Decrease cost
- Reduce cost of capital
- Minimize credit loss
- Operational cost
- Other cost

■ In scope
■ Out of scope

Issue Tree

```
                          ┌─────────────────────┐
                          │   Open market       │
                          │   acquisition       │
                          └─────────────────────┘

   ┌──────────────┐
A1 │ Increase no of│
   │  customers    │
   └──────────────┘
                          ┌─────────────────────┐      ┌───────────────────────────┐
                          │ Deposit account     │      │ Current account customers │
                          │ customers           │      └───────────────────────────┘
                          └─────────────────────┘      ┌───────────────────────────┐
   ┌──────────────┐                                    │ Savings account customers │
   │ X-sell to     │       ┌─────────────────────┐     └───────────────────────────┘
   │ existing      │       │ Other asset account │     ┌───────────────────────────┐
   │ customers     │       │ customers           │     │ Term deposit customers     │
   └──────────────┘       └─────────────────────┘     └───────────────────────────┘
                          ┌─────────────────────┐
                          │ Other bank customers│
                          └─────────────────────┘
```

In scope

Out of scope

Issue Tree

A2

Increase revenue per customer

Increase interchange value per customer

A2.1

Increase interchange rate per transaction

Increase POS volume / usage

A2.2

Increase fee per customer

A2.3

Increase interest income per customer

■ In scope
■ Out of scope

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Issue Tree

A2.1 **Increase POS volume / usage**

Increase POS usage for customers inactive in last 12 months
- New customers; vintage <= 12 months → Activate
- Old customers; vintage > 12 months → Activate / Reactivate

Increase POS usage for customers active in last 12 months

Legend:
- In scope
- Out of scope
- Answered before/later

Issue Tree

A2.1

Increase POS volume / usage

- Increase POS usage for customers inactive in last 12 months
- Increase POS usage for customers active in last 12 months
  - Increase no of POS transactions
    - Low level activity
      - Push customers to higher level of activity
    - Medium level activity
    - High level activity
      - Prevent downward migration of customers
  - Increase value per POS transaction

Legend:
- In scope
- Out of scope
- Answered before/later

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Issue Tree

A2.1

Increase POS volume / usage

- Increase POS usage for customers inactive in last 12 months
- Increase POS usage for customers active in last 12 months
  - Increase no of POS transactions
  - Increase value per POS transaction
    - Top MCC - 1
      - Low level ATV
        - Push customers to higher level of activity
          - Create opportunity index
          - Predict customer likelihood to move to high level of activity
      - Medium level ATV
      - High level ATV
        - Prevent downward migration of customers
          - Predict likelihood of customer to move to lower level of activity
    - Top MCC – 2 Top MCC – N — Same as above
    - Other MCC's

Legend:
- In scope
- Out of scope
- Answered before/later

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Issue Tree

```
                            ┌──────────────────────────────┐
                            │         Annual fee           │
                            └──────────────────────────────┘
                            ┌──────────────────────────────┐
                            │       Cash advance fee       │
                            └──────────────────────────────┘
                            ┌──────────────────────────────┐
                            │  International transaction fee │
                            └──────────────────────────────┘
  ┌──────┐                  ┌──────────────────────────────┐
A2.2                        │   Over-limit transaction fee  │
  │ Increase fee per │──────┤                              │
  │    customer      │      └──────────────────────────────┘
  └──────────────────┘      ┌──────────────────────────────┐
                            │      Balance transfer fee     │
                            └──────────────────────────────┘
                            ┌──────────────────────────────┐
                            │           Late fee           │
                            └──────────────────────────────┘
                            ┌──────────────────────────────┐
                            │   Redemption handling fee    │
                            └──────────────────────────────┘
                            ┌──────────────────────────────┐
                            │          Other fee           │
                            └──────────────────────────────┘
```

A2.2 — Increase fee per customer

- Annual fee
- Cash advance fee
- International transaction fee
- Over-limit transaction fee
- Balance transfer fee
- Late fee
- Redemption handling fee
- Other fee

■ In scope
■ Out of scope

Issue Tree

A2.3

Increase interest income per customer

Increase revolve balance
- Convert transactors to revolvers
- Increase revolve balance of existing revolvers

Increase pricing
- Upward pricing correction through market benchmarking
- Increase for unprofitable segments
- Increase for price inelastic segment

In scope

Out of scope

Today's agenda

Problem definition

Problem solving (Issue tree approach)

Classroom case study

Practice case study - Assignment

Case – 1 | PPC

Your client ABC is a leading bank in India and offers various products – assets (home loan, auto loan, mortgage, credit card etc), liabilities, wealth management. It is looking to increase product penetration amongst it's customer base. The current PPC, on an average, is 1 and the bank wants to increase this to 5 over the next 2 years. You need to arrive at a strategy that will help the bank achieve this objective.

Case – 2 | Restaurant

Client & background

Your client is a leading restaurant chain in the Indian market and feels there is scope to improve it's profits. Being a leading organization in the sector, investment is not a big issue. It has been advised to the organization to open up new restaurants but the firm feels it has exhausted all the areas where it could grow. Acquiring new land is out of options.

You have been asked to give efficient recommendations and strategy the organization should follow to increase their profits. It wants to see the effect within a year of implementation of recommended strategies

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Case – 3 | Attrition management

Client & background

Your client is a leading IT firm and is doing well in the sector. It is recently facing a steep increase in its employee attrition, has gone up from 14% to 25% in the last 1 year. You are asked to prepare a strategy to immediately tackle this issue such that the firm's business is not hampered and also to propose an efficient employee satisfaction program for long run. Currently, no such program is in place. Further salary hikes not an option.

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Case – 4 | CPG

Your client XYZ is one of the largest and amongst the fastest growing consumer goods companies in the world; it's second largest market worldwide is China where it contests for market share with companies like Unilever, Energizer, Colgate etc. XYZ would like to improve it's market share in China and identify top categories (amongst hair care, skin care, pet nutrition, child care, small appliances etc), where there is maximum opportunity to grow.

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Your client ABC is a leading American chain of discount superstores similar to Wal-Mart. Headquartered in Illinois, United States, the client company operates a total of 1,221 stores in 49 states. Each store receives one delivery per day from a distribution center. The CEO of ABC has hired you to investigate if the costs related to distribution can be reduced. What recommendations would you give to the CEO of ABC?

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Assessment Scheme

Task nature	Description	Score				
		Excellent	**Very Good**	**Good**	**Average**	**Poor**
Industry Research	Key industry trends/drivers	5	4	3	2	1
Creation of PSW	PSW with all components	5	4	3	2	1
Creation of issue tree	MECE issue tree	5	4	3	2	1
	Final solution/Action on end node	5	4	3	2	1
Final presentation	Explanation of PSW & issue tree	5	4	3	2	1
	Response to questions	5	4	3	2	1

Score required for certification: 18 (average of both case studies)

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Guidelines for practice case study

- **Distribution**
  - One case each per group
  - Repetition of cases are fine

- **Assessment**
  - Group presentations on the case assigned
  - Group level feedback

- **Issue Tree**
  - Take assumptions wherever required
  - Keep the "tips" in mind

Fractal® Analytics

Fortune 500 companies recognize <u>analytics is a competitive differentiator</u> to **understand customers** and make **better decisions**.

We deliver <u>insight, impact and innovation</u> to them through **predictive analytics** and **visual story-telling**.

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