Leadership Development
Meeting-12 SM III
2019-2020

QUANTITATIVE AND QUALITATIVE DECISION MAKING TECHNIQUES

Students can understand and know quantitative and qualitative decision making techniques

Meeting-12 Semester-3/Odd
Year: 2019-2020

DECISION

➢ Decision making is universally defined *as the choice between various alternatives.* This understanding includes both making choices and solving problems.

➢ Decision making type: is *management's action in choosing alternatives* to achieve goals

Each leader will face many problems that must be solved and must make a decision.

Among of the decision-making types are:

1. Personal decision
2. Organizational decision/group

Based on who participated

3. Principal decision
4. Routine decision

Based on the level

5. Programmed decision
6. Un-programmed decision

Based on the type of problem

7. Emotional Decision
8. Rational Decisions

Based on the process

DECISION

❖ In the company, decision making can occur starting from *the employee level, lower level, middle level managers, and up to managers/ top level leaders*.

❖ Decisions made by them *generally have risks* that can adversely affect the company.

❖ Moreover, decisions made by *top-level managers, obviously have a big impact* on the company, because it has a big risk.

❖ The accuracy in decision making will sustain the company's success

DECISION

❖ If the decision is right, it will *bring progress to the company*

❖ Conversely if the decision is *not right or wrong*, it will *bring setbacks and even bring bankruptcy*

❖ So that decisions to be made right and right, decision makers need to use *the right methods*

DECISION

❖ Decision is a reaction to several alternative solutions *made consciously* by analyzing the possibility of these alternatives with their consequences

❖ Every decision will make a final choice, which can be *action or opinion.* It all starts when we need to do something but don't know what to do.

❖ For this reason decisions can be felt *rational or irrational* and can be based on *strong or weak assumptions*

Basic Differences between Quantitative and Qualitative
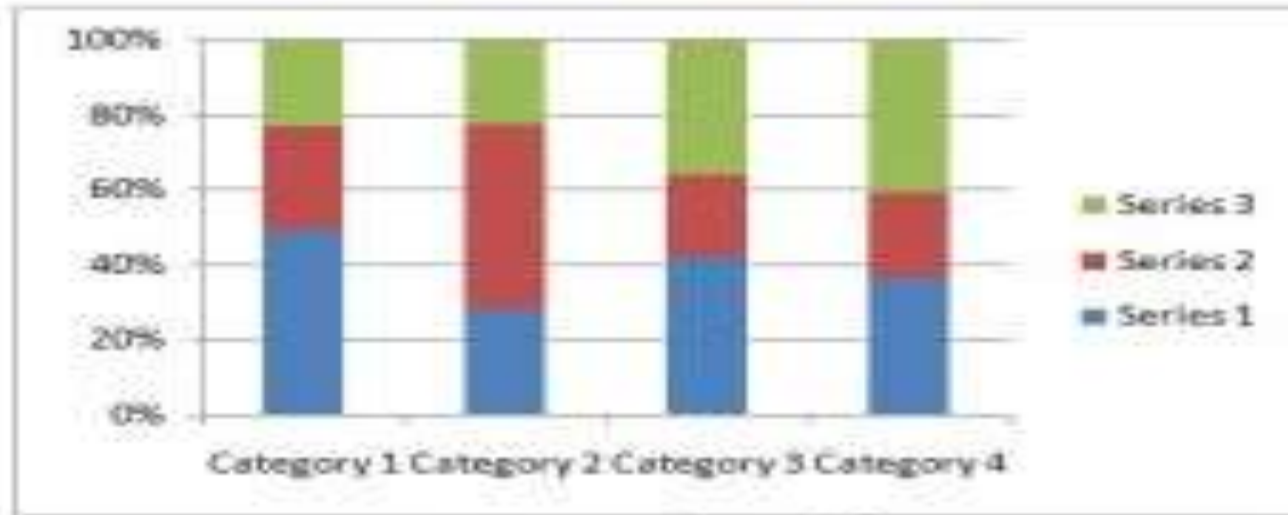
Kuantitatif

kualitatif

DECISION

In the theory there are two approaches to decision making, namely:

1) **Qualitative approach** and

2) **Quantitative approach**.

➢ In large companies, now there is a tendency for more companies to use *quantitative methods* in decision making. This method is *often called operations research*

➢ Broadly speaking, *a qualitative approach relies on subjective assessments of a problem*, where *a quantitative approaches base decisions on objective judgments based on mathematical models.*

➢

DECISION

Simply, the *Qualitative focuses on quality*, while the *Quantitative focuses on quantity/ number*.

➢ Qualitative is a value that is contained by something/ an object, where the assessment will be based on *the quality contained therein*

➢ Quantitative is an assessment based on *the amount of something*, in this case quality is not the main factor on which to judge

➢ A qualitative approach relies on *subjective assessment* of a problem

➢ A quantitative approach bases decisions on *objective judgments* based on mathematical models that are made

Eamples:

- ✓ If we predict the weather based on experience, the approach used is *qualitative*.

- ✓ However, *if the forecast is based on a mathematical model* (with data: air humidity and temperature, wind direction and speed, etc.), then the approach used is *quantitative.*

- ✓ Employee decision based on *entrance test* is an example of a quantitative approach, while if based on *the results of interviews to find out personality and motivation*, then the approach taken is qualitative

QUANTITATIVE DECISION MAKING TECHNIQUES

➢ Generally the quantitative approach in decision making *uses mathematical models*.

➢ Mathematics was discovered by humans thousands of years ago and has been widely used in many applications.

➢ For more complex cases, of course, more *complex mathematical models* are needed

Steps in Quantitative decision making:

1. **Define the problem.**

Simply, the problem is *the difference (gap)* between the desired situation with the existing reality.

Example:

If a student wants to get an A score, but it turns out the results obtained are less than that, then the student is facing problems.

Basically, all decision making steps are taken to eliminate or reduce the differences that exist between what is expected and what happens.

2. Develop a model

✓ The model is a representation of a real situation. Models can be developed in various forms: *physical models, logical, or mathematical models.*

✓ Miniature cars or model houses are examples of physical models

✓ Electric current with a certain circuit or water flowing with a certain channel pattern is *a logic model*

✓ The economic model which states that income is a function of consumption and saving is an example of *a mathematical model.* Ex: { i = f (c,s) }.

Quantitative Decision Making Techniques (cont')

- ✓ In the step of developing the model, the term is is known as *variable*, which the values will influence the decision to be made.

- ✓ In real cases, these variables can be partially controlled and some are not.

- ✓ The length period of red lights on traffic lights can be controlled easily, but the speed of vehicles and the number of vehicles that pass the road is not easily controlled.

3. Collecting data

- ✓ Accurate data is very important to ensure the quantitative analysis carried out produces the desired output.

- ✓ Data sources for testing the model can be in the form of company reports such as *financial reports and other company documents, results of interviews, direct measurements in the field and the results of statistical sampling*

4. Make a solution

- ✓ The solution taken in a quantitative approach is done by manipulating the model and by inputting the data generated in the previous step.

- ✓ Many methods can be done in making solutions, such as solving through equations (mathematical models) that have been developed previously

- ✓ Use a trial and error approach with different input data to produce the "best" solution, or use an algorithm or specific detailed completion steps that have been developed

Quantitative Decision Making Techniques (cont')

❖ Regardless of the method used, the resulting solution must be practical and implementable.

❖ The "best" solution produced must be uncomplicated and can be used to solve existing problems.

❖ Do not let the method used to solve a problem be more complicated than the problem you want to solve

5. Testing the solution

- ✓ Testing is done, both on the model or on the input data

- ✓ Testing is done to see the accuracy and completeness of the model and data used.

- ✓ To see the accuracy and completeness of the data, data obtained from various sources can be entered into the model and the results compared.

- ✓ Models and data that are accurate and complete should guarantee consistency of results (valid and reliable)

- ✓ This test is important before the results analysis is performed.

6 . Analyzing the results

- ✓ Analysis of the results is done to understand the steps that must be done if a decision has been chosen.

- ✓ Furthermore, the implications of the steps taken must also be analyzed. In this step the sensitivity analysis becomes very important.

- ✓ Sensitivity analysis is done by varying the input values of the model and seeing what differences occur in the results

- ✓ Sensitivity analysis will help to better understand the problem and the possible answers to the problem.

7. Implement the results

- ✓ This implementation step is carried out by applying the results of the analysis to the processes contained in the company.

- ✓ No less important in this step is monitoring the results of implementing the solution. However, it must be realized that the implementation of the analysis results (solutions) is not without obstacles.

- ✓ One obstacle that may be faced is how to convince management that the solution offered is the best and will solve the existing problem.

- ✓ In this case, the sensitivity analysis of the resulting model can once again be used to sell the resulting solution to management

Quantitative Decision Making Techniques (cont')

Some Options for Quantitative Analysis Techniques:

1. Cost, profit & volume (BEP) analysis
2. Decision tree analysis
3. Probability analysis
4. Forecasting
5. Correlation & regression
6. Path analysis
7. Factor, discriminant & cluster analysis
8. Inventory control models
9. Linear programming (optimization)
10. Network model

Strengths and weaknesses of quantitative methods:

1. Strengths of quantitative methods:

   a) Can be used to guess or predict

   b) The results of the analysis can be obtained with certainty and accuracy if used according to the rules set

   c) Can be used to measure the interaction of relations between two / more variables

   d) Can simplify the reality of complex problems in a model

2. Weaknesses of quantitative methods:

a) Based on assumptions

b) If the assumptions are not in accordance with the reality that occurs or distorted far away, then the ability cannot be guaranteed or even misleading

c) Data must be normally distributed with a measurement scale of data that must be used are intervals and ratios

d) Cannot be used to analyze with a small number of samples (<30)

Quantitative Decision Making Techniques (cont')

❖ From the above review it can be concluded that the quantitative method can be carried out and can be very helpful in decision making as long as it is in accordance with the problem/ material to be studied or solved.

❖ Quantitative data uses quantitative methods while quality data uses qualitative methods

QUALITATIVE DECISION MAKING TECHNIQUES

Qualitative Decision Making Techniques

Usually Qualitative Decision Making Techniques are done in groups/ organizations

Some Decision Making Techniques:

1. **Brainstorming (Looking for ideas)**
   - ✓ Under the leader of the group
   - ✓ The leader states a clear problem
   - ✓ Each member presents ideas, opinions and ideas
   - ✓ Other members are prohibited to criticize
   - ✓ All ideas are recorded, discussed, and analyzed

2) Nominal group technique

- ✓ The group meets in a meeting
- ✓ Each member writes ideas and ideas on the card
- ✓ The group discusses members' ideas
- ✓ Each member ranks independently
- ✓ The decision is the one who gets the highest ranking

Strengths:

- ✓ Team members meet, but members are free to express their ideas
- ✓ Members who choose the best ideas and ideas

Qualitative Decision Making Techniques (cont')

2) Nominal group technique:

- ✓ Kelompok *bertemu dalam pertemuan*

- ✓ Masing-masing anggota *menulis ide dan gagasan dalam kartu*

- ✓ Kelompok *mendiskusikan ide dan gagasan anggota*

- ✓ Setiap anggota *meranking secara independen*

- ✓ Keputusan adalah yang mendapat *ranking tertinggi*

Kentungan:

- ✓ Anggota Tim bertemu, tetapi anggota *bebas mengemukakan idenya*

- ✓ Anggota yang memilih *ide dan gagasan terbaik*
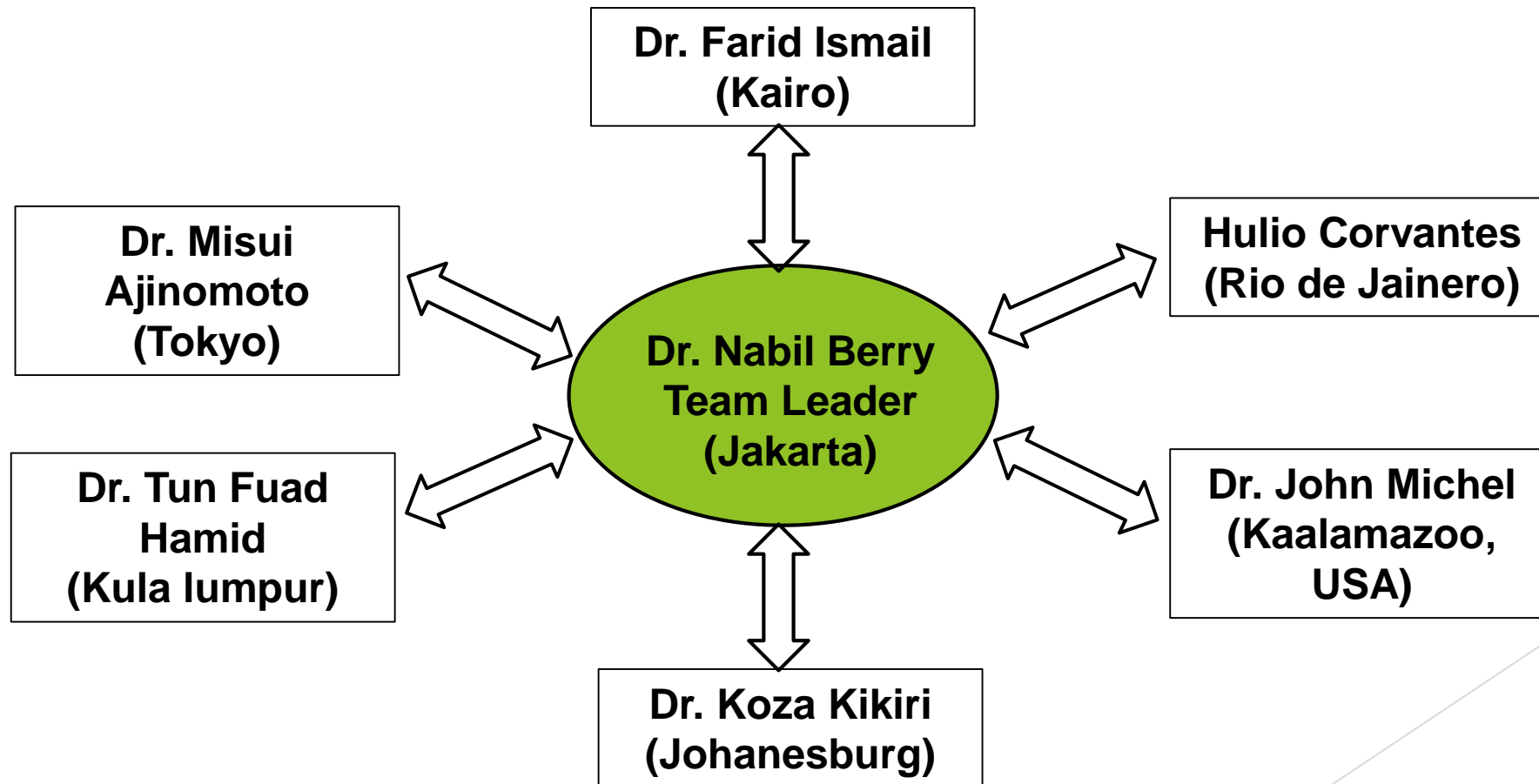
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- ✓ The group *discusses members' ideas*

- ✓ Each member *ranks independently*

- ✓ The decision is the one who *gets the highest ranking*

The advantage:

- ✓ Team *members meet*, but members *are free to express their ideas*

- ✓ Members *who choose the best ideas.*

3) Delphi technique

Delphi Technique

✓ Does not require members to attend

✓ Members can be in their cities

The steps:

✓ The leader sends a questionnaire-1 to each member

✓ Each member without naming (anonymity) suggested a solution, and sent it to the leader

✓ Leader process Questionnaire-1, the result is questionnaire-2 sent again to all members

✓ This second information causes a member to change their opinion. If previously for example there were 6 ideas, in the second one could change to only 3 ideas

✓ The process is repeated until a consensus occurs

Qualitative Decision Making Techniques (cont')

❖ **The Advantages of the Delphi Technique**

  ✓ The team works individually

  ✓ Free to express ideas

  ✓ Not dominated by other members

  ✓ In general they work in groups, so the consensus can be reached

❖ **The disadvantages:**

  ✓ Takes a long time

  ✓ Requires intelligent team leaders

Last 1

Qualitative Decision Making Techniques (cont')

4) Democratic technique

✓ Through voting

✓ Most votes become decisions

Finish