Scenario analysis, planning and discovery

Introduction

- long-range strategic business planning technique
- mixes quantitative and qualitative approaches
- narrative based - Beginning in the 1950's Herman Kahn (hudson institute) - Shell scenarios team

Steps

1. Define the Scope.
2. Identify the Major Stakeholders.
3. Identify Basic Trends.
4. Construct Initial Scenario Themes
5. Identify Key Uncertainties.
6. Check for Consistency and Plausibility.
7. Develop Learning Scenarios.
8. Identify Research Needs.
9. Develop Quantitative Models.
10. Evolve toward Decision Scenarios.

Some ways to do it

Intuitively Once all pieces are laid out, you have to find some major themes and story lines around which to organize all the elements.Heuristically. *Heuristically* Select the two most important uncertainties (e.g., by asking members to vote for them individually) and place them in a matrix (see Sloan review article Table 4) to get some starting points for the scenarios, and then layer in the other elements. *Statistically* Systematically combine the outcomes of all the key uncertainties into internally consistent strings to provide feasible boundaries

The Seven Questions (Chermack)

1. Clairvoyant
2. Good Scenario
3. Bad Scenario
4. Inheritances from the Past
5. Important Decisions Ahead and Priorities
6. Constraints in the System and Changes that need to be made
7. Epitaph

Scenario discovery

- new area quantitative approach
- Developed at Rand
- PRIM: Patient rule induction method

PRIM and EMA Workbench

- PRIM is implemented in the Exploratory modelling Workbench (EMA) a Python module
- developed at the TU Delft
- find subregions in the input space with relatively high (low) values for the target variable.
- as such it is a type of sensitivity analysis
- also known as bump hunting
- This is a data mining technique

Bump hunting

The objective of bump hunting is to find regions in the input (attribute/feature) space with relatively high (low) values for the target variable. The regions are described by simple rules of the type if: condition-1 and ... and condition-n then: estimated target value.

- similarity to what if analysis is apparent - MS-Excel scenario tool does something similar - PRIM is a little more sophisticated implemented in both R and Python.

Assignment

Read the instructions on Piazza, you have three weeks no need to use scenario discovery that goes a little too far.
Please try and present your work using MS-Sway. I think it is quite suited to this type of analysis. We will publish your work on the internet at the end.