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A COMPREHENSIVE FRAMEWORK FOR DEVELOPING INDUSTRY SCENARIOS

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ABSTRACT

The purpose of this paper is to help a business to develop scenarios for the future of its industry. It is intended to find the factors that would affect and change the outlook mostly in the current status and anticipated future, based on the results obtained from environmental analysis.

By using the trends to be revealed by the environmental analysis, it is possible to anticipate how the field of business in which we operate or plan to enter will evolve in the future. The status is reviewed according to the assumptions and the results to be obtained are evaluated. Thus, assumptions are grouped under various scenarios, their potential impacts on the industry are identified, and the potential status in the industry is defined.

JEL CLASSIFICATION & KEYWORDS

■ M10 ■ SCENARIOS ■ STRATEGY ■ INDUSTRY SCENARIOS ■ GENERATING SCENARIOS ■ SCENARIO ANALYSIS

INTRODUCTION

It is intended to find the factors that would affect and change the outlook mostly in the current status and anticipated future, based on the results obtained from environmental analysis. The external variables that are most sensitive and that would affect the results most if changed are identified and value impact matrix is created.

In short, using the trends to be revealed by the environmental analysis, it is possible to anticipate how the field of business in which we operate or plan to enter will evolve in the future. For instance, information may be obtained about the way how customer needs and expectations will evolve and develop in the future Kotler (2002).

Assumptions are made on these variables, for instance through brainstorming approach. The status is reviewed according to the assumptions and the results to be obtained are evaluated. It is important that this is continuously repeated taking into consideration evolving conditions and innovations.

Thus, assumptions are grouped under various scenarios, their potential impacts on the industry are identified, and the potential status in the industry is defined. Scenarios:

- Internally consistent views of the future.
- Focus on discontinuity and change.
- Explore the impact of the change on key players and how they respond to the environment.

Through out this paper, for the sake of understanding well, in addition to several examples, an example case will also be introduced to support the suggested approach:

"Abler by Robomedika will create an innovative brand and establish a company which designs and produces innovative medical machinery. The company will touch patient's life and make life easier for handicapped people. The brand is Abler that will be the innovative and new generation wheel chair and will be designed by Robomedika engineers."

Assumptions on Future

Assumptions imply the external factors that are not under the direct control of the business preparing the scenarios but that can affect the progress and success of its strategic plan Butuner (2015). After reviewing socio-cultural factors, technological factors, political environmental, legal conditions, macro-economic factors and variables originating from international system in the environmental analysis Wheelen and Hunger (2001), the tendencies of related parties such as competitors, customers and suppliers Porter (1998) must reflect onto the development of scenarios as assumptions.

First, key external variables are identified. Assumptions are made for the values of quantitative and qualitative variables (through brainstorming or statistical models.) Brain storming and/or statistical models are popular estimation techniques:

- Brain storming is a non-numerical estimation technique Fligor (1990). While conducting scenario analysis, instruments like participatory meetings bringing together various groups concerning the business are used. For the efforts to be made in this scope, it is possible to outsource specialized services, such as the use of facilitators (moderators) who will neutrally facilitate participatory meetings.
- Statistical models are numerical techniques including relations and other econometric models Triola (2014). However, it is based on historical data, and error margin increases as the structure of relations changes in time.

Make your assumptions as specific as possible - set parameters (e.g. is project X will be running smoothly for users by December Y). The most significant estimation errors arise from; wrong assumptions, adaptations of reflecting today's trends to future.

"Suppose by analyzing the environmental factors of the example case - Abler, the following assumptions are generated:

1. Turkish government increases the budget for social security and health care system.
2. Economic growth of Turkey increases higher than expected.
3. Turkish government provides higher incentives for high-tech startups.
4. Caucasian and Middle Eastern markets for health support equipment will grow.
5. Euro/TL parity increases so high that Turkish companies have price advantages.

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6. There will be strict restrictions for low quality health care equipment which may reduce Chinese competitive power.
7. Transportation costs from China to Turkey may decrease due to the higher return loads from Turkey to China.
8. Russia gives importance to health care equipment market.
9. New developments in medical science allow handicapped patients get well."

Forecasting the Quantitative Impacts of Macro-Economic Variables

The value of utilizing such a multidimensional analysis of the future environment lies in the fact that:

- It makes explicit all the environmental assumptions on which planning should be based.
- It integrates the social factors and the business factors into the planning framework.
- It identifies the spectrum of probable future constraints and opportunities for business performance.
- It provides an opportunity for determining needed business responses to changing conditions.

Essentially the forecasting is done in four steps Aaker, Kumar and Day (2000):

1. Select critical indicators:
   - Identify the industry's key indicators (trends).
   - Undertake literature search to identify potential future events impacting the key trends.
2. Establish past behavior for each indicator:
   - Establish the historical performance for each indicator.
   - Use data for the trend impact analysis.
   - Analyze reasons for past behavior of each trend:
     - Demographic and social
     - Economic
     - Political and legislative
     - Technological
3. Verify potential future events:
   - Interrogate Delphi panel (Render and Stair (2014)):
     - Evaluate past trends
     - Assess the potential impact of future events
     - Assess the probability of future events
     - Forecast future values
   - Specify and document assumptions.
   - Specify and document rationale for projected values.
4. Forecast each indicator:
   - Operate the Trend Impact and Cross Impact Analysis to establish the range of future values.
   - Analyze forecast results.

An example of using regression model Triola (2014) for forecasting the quantitative impacts of macro-economic variables:

"As far as the dynamics of construction industry and construction materials sub-sector are concerned, the primary factors affecting supply and demand growth in the industry are:

- GNP growth rate
- Growth in number of households
- Population growth rate
- Growth in number of licensed buildings and
- Increase in unit m^2 price of buildings

Therefore, the following example involves the projection of these five rates, taking as a basis the past 20 years (Table 1). Forecasts were obtained to be taken as the denominator of each rate. These reveal the forecasts of trends for future rates as well as the number of licensed apartments that forms the numerator in each rate. Often an arithmetic mean of these rates may be used.

$$Y = - 411.7 + 0.1117x_1 + 1.526\ x_2 + 0.1236x_3 + 1.8409\ x_4 + 0.3820x_5$$

x_1: Growth of GNP per capita

x_2: Growth in number of households

x_3: Population growth

x_4: Growth in number of licensed buildings

x_5: Increase in unit m^2 building prices

Grouping of Assumptions as Scenarios

As a result of studies and researches to be conducted for assumptions, the business will group the scenarios for its own industry, and summarize them in a table.

Against the developments that may occur in the environment beyond the control of the business, the business will prepare alternative scenarios for the future. Based on the assumption that any unexpected development may occur in the future, the business must always be prepared for such cases and constantly follow up the developments. As a natural consequence of this approach, scenarios need to be based on a flexible structure and revised continuously according to trends and developments.

The purpose of scenario analysis is to make decisions for the future based on limited number of scenarios produced Wheelen and Hunger (2001). Various views and expectations will arise while developing scenarios. The scenarios produced must encompass these views to the extent possible. Points to consider while developing scenarios are given in Table 1.

- What will be the boundaries of the industry 5 years later? What are the current boundaries and the value-added chains linked to the industry which you consider joining?
- Which actors may significantly affect the development of scenarios?
- Who, and to what extent, will be affected from the developments in the industry?
- What are the factors giving direction to the future of the industry? What are the critical unknown factors, rather than the factors possible to forecast?
- What is the most important change that will occur in the sector's structure and balance of powers?
- While scenarios are written in detail, they must be freed from internal inconsistencies.
- Detailed scenarios should not describe the situation 5 years later, but rather tell about the developments that would take us there during 5 years.

Table 1: Projection of Five Primary Factors in Construction Industry

Years	Licensed No. Of Flats Growth	GNP per Capita Increase (000)	Growth Households (X2)	Pop. Growth Rate (X3)	Licensed Build Growth (X4)	Building m² Price Increase
1977	216	11	295	853	25	6
1978	237	-11	307	872	26	44
1979	252	-31	323	890	31	33
1980	204	-57	330	908	32	-49
1981	144	26	229	1102	27	-19
1982	160	6	235	1148	49	-7
1983	169	20	242	1176	37	-3
1984	189	53	247	1206	38	-6
1985	259	22	255	1236	77	13
1986	393	56	276	1127	143	17
1987	498	99	283	1128	160	-1
1988	474	-10	292	1154	168	7
1989	413	-8	300	1178	132	19
1990	381	96	308	1205	71	30
1991	393	-24	317	1228	77	21
1992	473	66	326	1258	123	7
1993	548	95	335	1285	136	5
1994	524	-128	345	1314	132	-46
1995	508	92	355	1343	99	15
1996	446	91	364	1372	94	-1

Source: Author

Grouping of Assumptions

Position the key assumptions which underpin an issue. Write the assumption in shorthand on a yellow post-it and position relative to others on the grid. Test out relative and absolute positioning.

"Figure 1 can be used as a certainty and importance grid for positioning the assumptions (listed in the above section for Abler case) which are derived from environmental analysis."

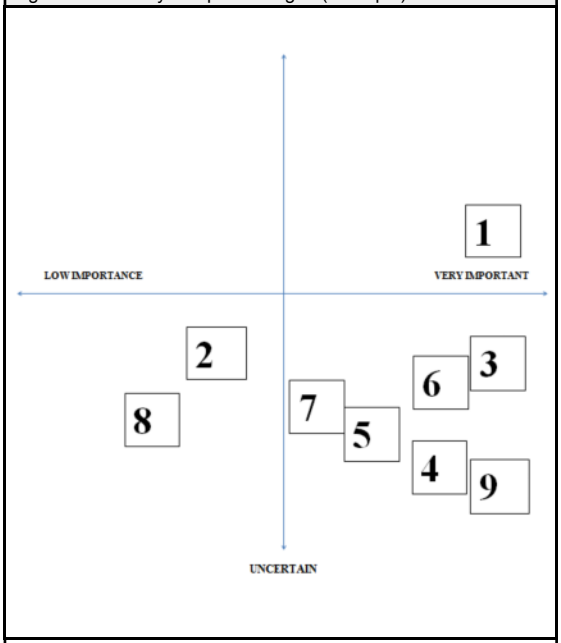
Generating Scenarios

1. Generate scenarios by testing out judgments and identifying interdependencies as is shown in Figure 2:
2. Prepare a list of basic assumptions.
3. Rank the assumptions according to probability of actualization and importance using Figure 1.
4. Convert the classification of each assumption into quantitative values (A = 4, E = 3 …) Muther (2011); multiply the values, and select the two or three assumptions with highest value.
5. Use the selected assumptions individually or as a group to diversify the basic scenario.

"Accordingly, in Abler case, the list of events that have rates above 3 (shown in Figure 2) are used for developing alternative scenario definitions."Positive Scenarios –Abler:

- "Based on event 1, governments worldwide increase their budget for healthcare and social security systems which increase the size of medical market. In addition to this progress, economic growth also improves the sales and profitability.
- Based on event 3, Turkish government gives high incentives to local startups in medical field.
- Based on event 6, the restrictions on low quality Chinese products, Turkish brands may have best price/performance ratios which may help them both in local and global competition."

Figure 1: Certainty – importance grid (Example)



Source: Author

Negative Scenarios – Abler:

- "Based on event 7, if Turkey starts exporting to China, transportation companies will be able to find return loads easier for their containers. This less likely case will decrease the transportation costs which may be a threat for Turkish medical companies.
- Based on event 8, new player means more competition. Russia currently is not active in medical field, but if they give importance to this field it may have a negative effect on especially Turkish companies."

Figure 2: Generating scenarios (Example)

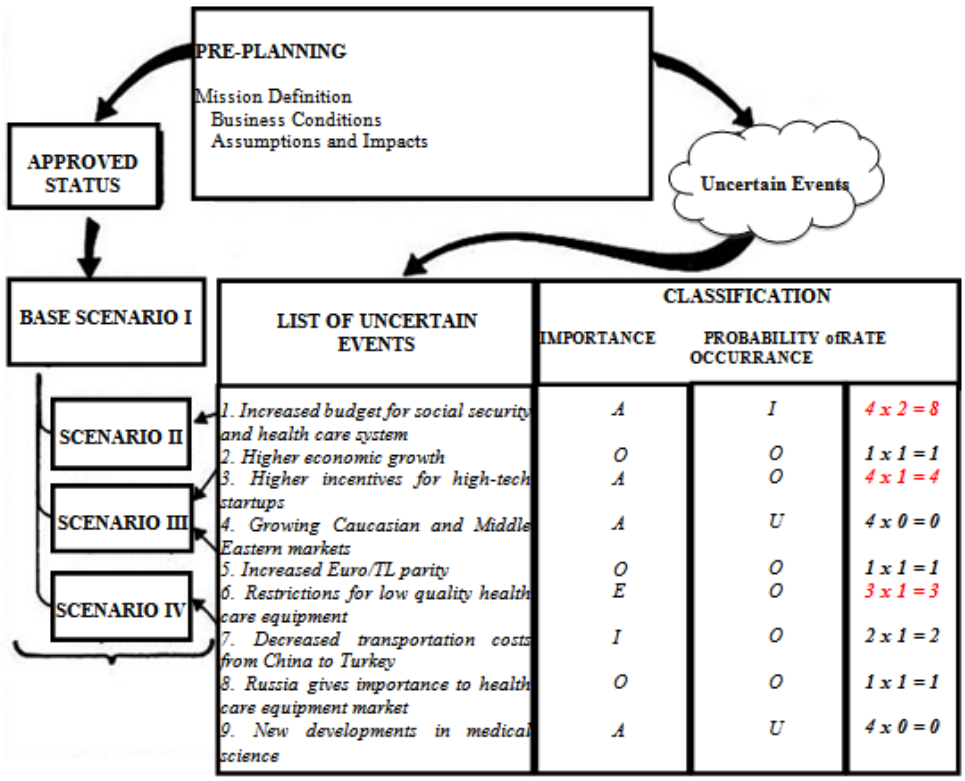


Figure 2. Generating scenarios – *Example*

Source: Author

Conclusion

It is intended to find the factors that would affect and change the outlook mostly in the current status and anticipated future, based on the results obtained from environmental analysis. Using the trends to be revealed by the environmental analysis, it is possible to anticipate how the field of business in which we operate or plan to enter will evolve in the future. The status is reviewed according to the assumptions and the results to be obtained are evaluated. It is important that this step is continuously repeated taking into consideration evolving conditions and innovations.

Accordingly, assumptions are grouped under various scenarios, their potential impacts on the industry are identified, and the potential status in the industry is defined. In conclusion, this paper is introduced to help a business to develop scenarios for the future of its existing industry.

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