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Abstract: This project is developed as a result of observing strategic planning processes in high technology companies. Both literature research and a mail survey was done. The literature study covered the background of the existing strategic planning process. The survey instrument was sent to selected respondents to provide data on current trends. It is presented in tabulations and graphs in the appendix. Discussion of the results, suggestions, recommended future projects and conclusions are also presented.

A STUDY OF STRATEGIC PLANNING

IN HIGH-TECH COMPANIES

EMGT 506

submitted to:

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EXECUTIVE SUMMARY

Many topics can be derived from the subject of management. One topic that interests the author is 'Strategic Planning in High-Tech Companies'. Rapid changes make the strategic planning process becomes a dynamic process. Some steps need to be followed in order to have better strategic plan. Derivation of it will bring to a form of tactical plans.

A mail survey had been developed and sent out to the selected respondents across USA. Thirteen questions focusing on the development, distribution, evaluation and implementation of strategic planning are inside that survey instrument.

From 304 selected respondents, 50 of them had sent the answered survey instrument back. It means the response rate is 16.45%, which is an average percentage compared to response rate from similar researches.

The data results had been analyzed and compared to the present literature. Most literature come from the planning area for general firms. The results showed the current trends in high-tech company. Finally, more discussion, suggestion, recommended future project and conclusion had also been presented.

ABSTRACT

This project is developed as a result of observing strategic planning process. A special topic was picked and named it as Strategic Planning in High-Tech Companies. Both literature research and mail survey had been done. The literature study covered the background of the existing strategic planning process. The survey instrument was sent to the selected respondents to provide the data result of current trend. It is presented in form of tabulations and graphs which are in the appendix. More discussion about the result has also been done. Finally, suggestions, recommended future projects and conclusions can also be found.

INTRODUCTION

The subject of Management is growing rapidly but is not likely to become mature in the near future. Many topics come from this subject. Planning, Organizing, Motivating, Leadership, etc. are some interesting examples to be learned.

In this project, the author has already selected a special topic in planning and named it as "Strategic Planning in High-Tech Companies". Strategic Planning itself was identified in late 1960s, but it is still a good topic to be discussed since it is a dynamic process.

By using a literature research and mail survey, the author tries to show the current trends in that topic and compares the result with the existing research papers done by other researchers before, in which most of them are strategic planning in general or other special companies. The literature comes from selected books and articles, mainly in the area of planning. The mail survey had been sent to the selected 304 respondents from high-tech companies across the USA. The response rate is 16.45% which is in the average number of survey response rate.

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THEORETICAL BACKGROUND

STRATEGIC PLANNING

Strategic planning is a process or action to define company's objective, to provide a framework to establish some tactical plans and to relocate resources through capital budgeting. In order to establish the objective, company accepts possible changes in trends and is not based on the assumption that adequate growth can always be assured. This definition is made by compiling some ideas from the literature.

From the definition above, the planning is implicitly divided into two parts: strategic planning and tactical planning. Strategic planning is closer to the future operations while tactical planning is more related to day-to-day operations in the company.

Then, there will be a question appeared which is closely related to the topics, "Why Plan?" or even more concrete, "Why Strategic Plan?". From the previous experiences in the company, many top-level managers said that the plan is important as a leading factor to the company success. Further, strategic plan is a process that permits one to stimulate the future on paper [18]. Mostly, it is the top-level management's responsibility to develop the strategic plan.

Strategic plan takes a form of a book in which all tactical

plans must be derived from it. It can appear in the company or division level.

HIGH-TECH COMPANY

Every company that uses a sophisticated and new technology for its production and manufacturing can be considered as a high-tech company. Including in this sector are manufacturing, electronics, machinery, instrumentation, etc. Usually, this type of company has R&D, engineering, marketing and other general departments.

LITERATURE RESEARCH

Top-level management must have a high degree of belief that planning has to be developed in a high-tech company. The reason for this is mainly because the technology itself keeps developing. Dividing process between of strategic planning and tactical planning then replaces the general planning process if the company is positively growing and mature.

The main modes of strategic planning, according to Taylor [21] are:

1. Central Control System
2. Framework for Innovation
3. Strategic Management
4. Political Planning
5. Future Research

But, there is one thing that the company must do if it has the strategic plan which is to review the strategic plan itself regularly. The frequency of the review can be different from one company to another, but according to Eskridge [4], it can be determined by these factors:

1. Speed
2. Change
3. Geography
4. Tracking
5. Money

For developing a strategic plan, it is advisable to look at the technology itself and this can be done by technology forecasting. Some technology forecasting techniques that can be used are [20]: Surveillance, Projective, Normative, Expert Opinion and Integrative.

Chinta, in his paper, proposed a list to should be done in the planning process [2]:

1. Design and administer strategic planning process
2. Develop corporate plans
3. Develop SBU strategic plans
4. Provide training and education of management
5. Provide internal consulting on strategic planning
6. Support acquisitions and divestitures
7. Identify business development opportunities and implement
8. Review and evaluate strategic

9. Monitor implementation actions
10. Conduct environmental scans and forecasting
11. Conduct financial analysis and construct financial plans
12. Participate in functional planning

For having a clearer picture of strategic planning, Ramanujam has identified 12 roles of planning system in his article [15], which are:

1. Role in identifying key problem areas
2. As a mechanism for identifying new business opportunities
3. Ability to communicate top managements' expectations down the line
4. Flexibility to adapt to unanticipated changes
5. Generation of new idea
6. Ability to anticipate surprises and crises
7. As a tool for managerial motivation
8. As a mechanism for integrating diverse function and/or operations
9. As a means for fostering organizational learning
10. As a tool for management control
11. Ability to communicate line managements' concern to the top level
12. As a basis for enhancing innovation

Success in developing and implementing the strategic plan will give better results in attaining the company's objective. There must be some determinant steps to be followed. The

framework has been identified by Sherman as follows [19]:

1. Perform Analysis
2. Forecast the Future
3. Set Objectives and Goals
4. Consider Technology issues
5. Set Strategy
6. Prepare the Plan
7. Set Milestones
8. Monitor Progress

Previous researches which have been done also identify that there are some problems in developing strategic plan that can not be neglected.

Lastly, from Wernham in [22], the author can excerpt that the success of the implementation can be viewed from three major standpoints which are management, finance and marketing.

THE SURVEY

METHODOLOGY

This project stresses on the ability to find out the current trends in today reality. Based on the data result obtained from the survey instrument, the author made an analysis and compared it with the existing literature. Discussion, suggestion and recommended future projects will follow.

Since this two-quarter project develops a survey instrument and depends on it to get the data needed, the development of the survey instrument had to be taken very carefully. A copy of the survey instrument, which consists of 13 questions addressing the development, distribution, evaluation and implementation of strategic planning, is attached in Appendix A.

SURVEY RESULT

Out of 304 selected respondents residing in the U.S.A., 50 of them have returned the survey instrument. The participating respondents came from:

State	Number
California	2
Connecticut	4
Florida	1
Georgia	3
Illinois	6
Lousiana	1
Maryland	2

Michigan	3
Minnesota	2
Missouri	2
New Jersey	3
New York	5
North Carolina	2
Ohio	5
Oregon	1
South Carolina	1
Texas	3
Washington	1
Wisconsin	3

Illinois, New York and Ohio are the most participating states.

All responses are tabulated in appendix B. Following those tabulations, graphs are also presented.

From analyzing the data, the author finds:

The impact level of strategic plan on the growth of the high-tech company, based on the data is:

- High (39.62%)
- Medium (30.19%)
- Very High (22.64%)
- Low (5.66%)
- Very Low (1.89%)

The result is interesting since only 7.55% of the respondents state that strategic planning is not important in the relation to the growth of the company. Furthermore, this result definitely supports the literature since the literature says that most of the general companies use the strategic plan as a framework of their activities. By looking at appendix E, we can see that most of respondents correspond with the remark of question #13.

The technology forecasting techniques that the high-tech

companies use, from the most to the least useful, are:

- Observation Techniques (29.71%)
- Expert Opinion (26.09%)
- Normative Techniques (21.01%)
- Projected Techniques (12.32%)
- Integrative Techniques (10.87%)

The initiator of strategic planning in the high-tech companies, ranked from the most to the least prevalent, is:

- President (46.48%)
- Corporate Planners (22.54%)
- Vice Presidents (8.45%)
- Board of Directors (4.23%)
- Line Managers (4.23%)
- Staff Managers (4.23%)
- Consultants (4.23%)
- Team (1.41%)
- Chairman (1.41%)
- Executive Vice Pres. (1.41%)
- Senior Management (1.41%)

The result is quite surprising since the president gets a very high percentage. This is different from what the literature says. In the literature, the corporate planner is usually the one who initiates the strategic plan. The others remain the same with the literature.

For every task in each company, the result is compiled based on the highest point reached by each person:

- To set the company's objective
President (48.81%)
- To design strategic planning process
Corporate Planners (48.48%)
- To develop strategic plan
Line Managers (26.09%)
- To monitor the distribution of strategic plan
Corporate Planners (41.18%)
- To monitor the implementation of strategic plan
Corporate Planners (25.49%)
- To provide consultation for impl. of strategic plan

- | | | |
|---|--|----------|
| | Corporate Planners | (33.33%) |
| - | To evaluate the implementation of strategic plan | |
| | President | (27.10%) |
| - | To conduct technology forecasting | |
| | Staff Managers | (30.86%) |
| - | To participate in tactical planning | |
| | Line Managers | (33.04%) |
| - | To identify the new business opportunity | |
| | Vice Presidents | (22.79%) |

The result shows that the strategic planning process is done mostly by the middle to top management level, starting from staff managers to the president.

Listing of how the strategic planning is viewed in high-tech company, from the most to least prevalent, is:

- | | | |
|---|--|----------|
| - | Identification of priorities | (12.86%) |
| - | Tool for exploring and creating the future | (12.01%) |
| - | Basis formulating more effective decision | (11.87%) |
| - | System for allocating resources | (10.49%) |
| - | Framework for management activities | (10.03%) |
| - | Support to management activities | (8.44%) |
| - | Framework for innovations | (7.92%) |
| - | Tool for resolving conflicts in the company | (7.52%) |
| - | Means of collecting external historical data | (6.20%) |
| - | Means of collecting internal historical data | (6.07%) |
| - | Solution to management problems | (6.00%) |
| - | Communication to the organizations | (0.33%) |
| - | Long-term financial plan | (0.26%) |

Communication to the organizations and long-term financial plan have low scores because they belong to 'other.' The first five functions can describe the present and real functions of the strategic plan in the high-tech companies.

Note:

'Other' means the respondent did not choose the provided answer and would like to give their own opinion of the question.

The primary data sources, from the most significant to the least, for developing the strategic plan in high-tech companies are from:

- Marketing Department (11.72%)
- Outsiders (10.09%)
- Vice Presidents (9.97%)
- Managers (9.31%)
- President (8.46%)
- Engineering Department (8.16%)
- Financial Department (7.79%)
- Production Department (5.98%)
- R&D Department (5.86%)
- Personnel Department (5.44%)
- Accounting Department (4.89%)
- Board of Directors (4.11%)

This is an interesting fact to be evaluated because marketing department mostly deals with the customers and it will know the customers' needs better. Evaluating the customers' need probably will direct the strategic plan to a successful one. The result also presents that most of the data came from the customers and middle to top level management.

The steps used in developing strategic plan are written as follows:

- Set company's objectives (5.99%)
- Define company's mission (5.85%)
- Make assumptions about overall ext. env. (5.85%)
- Analyze the environment of the company (5.56%)
- Project the future of the company (5.42%)
- Obtain the data (5.42%)
- Consider possible risks (5.42%)
- Consider acquisitions (5.42%)
- Analyze the company (5.28%)
- Develop linkages (4.99%)
- Set a priority for the company's activities (4.99%)
- Make assumptions about emerging technology (4.85%)
- Allocate resources (4.85%)
- Identify the changes in technology (4.56%)
- Review the previous strategic plan (4.56%)
- Identify company's total range of activities (4.28%)

- Predict the technology needs (3.99%)
- Consider time constraints (3.85%)
- Do contingency planning (3.71%)
- Plan technology alternatives and transfer (2.85%)
- Identify market needs (1.28%)
- Analyze environment of customers (0.57%)
- Analyze customer strategies (0.43%)

This is also interesting fact since most of the steps found in the literature are still used in today activities. Only one of the steps mentioned above which is plan technology alternatives and transfer is needed to be evaluated since it only has 2.85%. It is relatively small compared with the others. The other percentages smaller than that came from 'identify market needs, analyze environment of customers and analyze customer strategies' which all of them belong to 'other'.

The influencing factors in strategic planning, from most to least significant, are:

- Company's Objective (10.36%)
- Markets (9.64%)
- Economy Factors (9.40%)
- Financial Situation (8.92%)
- Competitions (8.67%)
- Company Structure & System (8.43%)
- Technology (8.19%)
- Past Experiences (7.47%)
- Legal Factors (5.78%)
- Management Pressure (5.54%)
- Supply Factors (4.82%)
- Social Factors (4.58%)
- Demographic Factors (4.58%)
- Cultural Factors (3.61%)

The result is akin to the literature. One influencing factor that has an increasing number is 'past experience'. Usually, this item has low position in the existing literature, but now it is moving to middle position.

The problems associated with strategic planning, from the most to least disturbing, are:

- Tendency to resist change (13.64%)
- Difficulty in communicating the str plan (11.69%)
- Implementation of strategic plan (11.69%)
- Insuff. understanding of the needs (11.04%)
- Failure to use str plan as a basis (9.74%)
- Tendency to avoid the existence of str plan (8.44%)
- Assumption that str plan // management (7.79%)
- Insufficient data (7.79%)
- Insufficient time (7.14%)
- Limited knowledge of the planners (3.25%)
- Fear to have tighter control (3.25%)
- Attitude of the planners (1.30%)
- Failure to develop str plan based on obj (1.30%)
- Short objective (1.30%)
- Financial Resources (0.65%)

Apparently, the first 4 problems are distinguished from the others since they have high percentages. The further result that the author gets after analyzing more about those problems is human factors has an important role in driving the problems. Some incorrect perceptions can be implicitly detected.

The decision maker about how the strategic plan is to be implemented in high-tech companies is:

- President (34.41%)
- Vice Presidents (27.96%)
- Line Managers (22.58%)
- Board of Directors (5.38%)
- Staff Managers (4.30%)
- Corporate Planners (4.30%)
- Executive Vice Pres. (1.08%)
- Consultants (0.00%)

Similar to the result of #3, president still has an important role in strategic planning.

The level of difficulty in implementing strategic plan in the:

- Short-Term Project is LOW
- Medium-Term Project is MEDIUM
- Long-Term Project is MEDIUM

For short-term and medium term project, the result is very meaningful, since we can expect the planning for short term project is easier than that for medium-term project. For long-term project, the result is quite good because the percentage is spread out among the choices.

The main objectives of high-tech companies, as the author identifies, are:

- Market positioning (12)
- Financial Growth (11)
- Increase shareholders' value (6)
- Leadership and Growth (5)
- Customer satisfaction (4)
- Improve productivity and quality (3)
- Innovation (1)

The number in brackets represents number of high-tech companies which is participate in responding the survey instrument. Most of the objectives can be grouped as the response. The most expected result is market positioning which is good from marketing standpoint, but not for financial standpoint. From the literature, the author found that for financial standpoint, the actual expected result is to increase shareholders' value.

The implementation of the high-tech companies' strategic plan, compared with the expected result from:

- Management standpoint is Medium
- Financial standpoint is Medium
- Marketing standpoint is Medium

Compared to the financial standpoint (39.02%) and marketing

standpoint (46.51%), management standpoint has the biggest percentage (57.14%).

Some respondents have additional comments either negative or positive for the survey instrument. Those additional comments (some have been revised) are:

- Excellent, 110% great work
- Strategic planning process is static - we need to analyze and take action sooner
- There is little understanding and support for true strategic planning (in the high-tech company)
- (Difficulty in applying strategic plan, because the company is moving too fast)
- (Difficulty in applying strategic plan, because) the company was initiated just over 1 year ago
- Balance between the 'winners' and the 'lossers' is the key
- Q 13 can be answered differently by other subsidiary
- The questionnaire does not represent planning process

From those pros and cons comments, the author concludes that he is quite successful in developing the survey instrument since the results contribute both to the other researchers and to the companies themselves. The cons comments appear because of some reasons:

- The company is not familiar with the strategic plan
- The company has difficulties in implementing strategic plan

DISCUSSION

A perception that strategic planning can help high-tech company to grow has been in most of the respondents' mind. By looking at the data result, most of them said that strategic plan has medium to very high impact to the growth of the company.

Level of the management position also affects the effectiveness of strategic planning. This conclusion is derived since most of the works in strategic planning are done by the president and vice presidents. It is fully support the literature since the literature is expecting the corporate planners should be the one who mostly do the works.

Relationship between the technology and strategic planning is significant because all high-tech companies also made some technology forecasts before developing strategic plan. After observing what will be the technology change, then the strategic plan is started to be developed. This close relationship can be explicitly seen from the data result of the survey instrument.

In today high-tech companies, there is a reality that tasks are divided equally among the top level of management and also corporate planners. For some parts, middle management also helps them.

Findings show that strategic planning has a major function as an identification of priorities. It is a good explanation of

why respondents agree that strategic plan has a big impact to the growth of the company.

Following the steps that are presented in the questionnaire will lead the high-tech company to have the same condition as the existing high-tech companies since the percentage is very closed and most of the steps are accepted by the respondents. Some suggestions need to be concerned especially because it has a closed connection with the customer.

'Problems raised in strategic planning' is an good topic to be evaluated. Most of the problems come from the 'mis-psychology effect' of the human himself. Misunderstanding of strategic plan functions also leads the worker to the fear and resistant to the change. Some external factors also affect the strategic planning but as mentioned before, internal factors are dominant to generate the problems. An explanation of strategic planning must be presented to the workers.

Findings indicate the implementation of the strategic plan is spread out between low, medium and high. This means that some high-tech companies still do not pay attention too much to the process. It can also give an opportunity to take care of strategic planning more seriously in the future. Some respondents only have short and medium projects, but it does not really affect the findings.

The high-tech companies tend to have a medium level of

success for implementing the strategic plan. Some possible reasons are the strategic planning process is not taken seriously and there is an assumption that strategic plan is not as important as tactical plan.

In term of implementation, the successful in management stand point which higher than financial and marketing has an indication that strategic plan can help more to the internal operation of high-tech company.

SUGGESTIONS

1. Strategic planning must be taken more seriously in today operation than before.
2. Strategic planning must be done for high-tech company, either big or small one, although the impact can be felt more in bigger company.
3. In high-tech company, it will be better to hire the management people who has a strong ability to make a plan, both the strategic and tactical plan.
4. Some explanations to the workers about the effect of strategic planning will help a lot in implementing it.
5. Since high-tech company deals much with innovation, some forecasts must be included in strategic planning.
6. Strategic planning in high-tech companies needs to be concerned with the customers' expectation.
7. Functions of corporate planner must be increased since so far corporate planner only has a small to medium role in strategic planning.
8. Workers and middle management must fully support the top management in implementing the strategic plan.
9. Strategic plan must be neatly filed.

10. The high-tech company must take more advantages of external environment to reach better the company's objective.
11. Using an integrated computer system to help top-level management to facilitate the development of the strategic plan in the future.

RECOMMENDED FUTURE PROJECTS

1. Studying the relationship between technology and strategic planning.
2. Overcoming the gap between engineering and management position to develop strategic plan.
3. Utilizing more the strategic plan for marketing and financial benefits.
4. Utilizing the computer system to compile the data and develop the strategic plan.

CONCLUSION

The author remembers one thing, "through studies and technologies, people can learn more and improve their own world, not only having routine life but also having some changes that bring to the brighter future." Now, by completing this project, the author adds one literature to the present collection of the literature.

Strategic planning process is an interesting topic to be learned since it is also able to generate sub-topics. This project is ended here, but the author believes there will be a continuation of this project in the future.

Since the respondents had already answered the question 'how it is', this project can bring the readers to understand more about the functions of strategic plan in the high-tech companies. It gives advantages to be owned by each individual company, but it also generates some problems in the process of development. Strategic planning must absolutely be done in every high-tech company.

The successful strategic plan can not be separated by the management of the company especially the people themselves. Same pattern that is detected appears in most of the high-tech companies. Pros and cons can also be detected.

Overall, since the author has carefully examined the project, this project agrees with the slogan, "benefits by designs, rather by accidents."