Research and development: samsung electronics

1. Overview of Samsung Electronics

Samsung Electronics (in the following SE), the largest electronic company in the world, is an affiliated company of the Samsung Group and consists of 5 different subdivisions, Digital Media (with TVs, notebooks, printers, cameras, camcorders and DVD games, etc), Telecommunication Network(with cell & smart phones, pocket PCs, satellite receiver, etc.), Digital Appliance(with refrigerators, washing machines, vacuum cleaner, microwaves, air condition and air filter systems), SemiconductorundLCD(with LCD & TFT panels for displays, notebooks and TVs). The broad product portfolio confirms that SE follows a diversification strategy and even plans to operate in new business fields such as health, medicine and biotechnology. SE has continuously been investing in research and development (R&D) in order to maintain this product portfolio and to develop from a technology follower to a first to market player with pioneering products.

2. The structure of SE's R&D department

The global R&D network of Samsung electronics consists of six centers in Korea and 18 centers in 9 different countries (for example in US, UK, Israel, China, India, Russia, Japan) SE established, besides the SAIT as the corporate R&D center at the Headquarter, also an effective R&D system for the product division base. As already mentioned above the SAIT works on long-term projects which benefit multiple divisions. The other laboratories are responsible for medium to short-term projects. Transfers of engineers from medium/short-term projects to the SAIT and vice versa, is a very common strategy in order to profit from the various knowledge, different point of views and ideas. At the SAIT the employees belong either to a technology

group or a project group. Despite this separation both groups as well as the other business units cooperate and communicate very close with each other through the established matrix organization. By this SE is able to respond to rapid technology changes and new discoveries. Furthermore it can share business strategies, different knowledge and viewpoints in order to minimize the time to the market and increase the success rate of the new launched technologies.

3. SAIT – the corporate R&D center

SE realized that a stable R&D performance and a superior innovative technology is the key success factor to sustain competitive in the fierce and fast moving market and to become a market leader in the electronic industry. In 1987 SE founded a corporate R&D center, the SAIT (Samsungs Advanced Institute of Technology) besides that, further R&D centers for short-term R&D projects, exist.

SAIT should follow the example of global leaders' corporate R&D centers, which focus on research and core basic long-term technologies in areas such as digital-, nanotechnology optoelectronics and energy. SAIT for example does research in the area of materials such as photonics, electronic materials, display materials and electrochemistry. (The Global Inc.) While involved with technology development and research SAIT always bears its high end goal in mind to provide the best value to the customer. In addition it upgrades and improves its R&D management systems, which helps to build good relationships with the other R&D

centers as well as with other business units. All these made SAIT at the end to a key growth engine of SE’s business and provided value in successfully implementing increased R&D performances in all business units, e. g. from the planning process to commercialization.

4. The applied methods and techniques

SAIT uses the following methods for its R&D activities, which mainly come from a totally different business department and are adopted for R&D usage. The Design for Six Sigma (DFSS) or DMADV, which is an abbreviation for its 5 phases, seeks to improve the quality of process outputs by identifying and removing the causes of defects. It starts with the definitionof the goals, which has to correspond with the company’s overall strategy and create value for the consumer. Then it measuresand analyzes the critical points or defects in order to design a better alternative or solve the issue. At the end, here the technology has to be verifiedand tested. The stage-gate approach is similar to the DFSS’s last phase. That means after every development stage, from the idea of a technology to the commercialization, each phase has to be approved (the gate) for further development. In that way SE ensures that it only invest in high potential technologies. A technique to create ideas for new technologies is the scenario analysis, it consists of 3 steps. First paint a future scenario, second study it for problems and costumers’ needs and third evaluate those problems and try to solve them. The technology tree technique represents the development from only few existing technologies at the beginning to more options for improved or new technologies. These options are created by engaging in some research for the available technologies. The last approach is a technological roadmapping planwhich

shows a way to leverage R&D investments. It provides an overview of SE's available technology and identity of critical technologies and technology gaps. Of course it also helps to solve these issues. With the aim to make all these techniques more efficient and to facilitate knowledge management, the R&D management applies additionally design reviews. During those SAIT and business experts discuss critical issues and potential problems which were revealed by one of the approaches above.

5. People and investment

SE is absolutely aware that the people and the investments are the core asset for superior technology and successful R&D. Approximately 40% of the global employees are involved in R&D and in total over a quarter of all SE's employees. In total it is number of more than 42, 000 people and it is supposed to increase to 50000 people at the end of this year. Thanks to academic training sessions and scholarships at top universities in Korea and overseas, SE is able to recruit and promote talented and high qualified staff. As a result more than 10% of the employees, involved in R&D, hold doctorates from the world's best universities.

But SE also assists to develop its employees' full potential and talent by investing in extensive employee training programs. In those trainings employees learn also the usage of tools from different business units in order to understand the other involved party better.

Nowadays SE invests in general yearly at least 9% (in former times 6-8%) of its sales revenue in R&D activities. This places SE within the top 20 fastest growing spenders on R&D, after Microsoft and Siemens and before IBM and

Intel. In 2008, SE invested 6. 9 trillion Won which is around 10% of the Samsung group’s sales and in 2009 its expenditure was around 7. 27 trillion Won. The high commitment to R&D explains Kun Hee Lee, the major shareholder of SE, with the long-term impacts R&D facilities have on the company although it may hurt short term profits.

The number of patents and the turnover prove both the staff and the investments turn out to be worthy. In 2008 SE was ranked 2nd in the annual patent ranking with only 3, 515 earned patents in the US. The turnover for the first quarter of 2010 amounts to 34. 64 billion Won which is an increase of 21%.

6. Evaluations and recommendations

6. 1. Evaluations

SE´s R&D network is diversified and it contains many countries in many continents. The product categories are as well diversified and SE has large variety of electronics products. With the help of the product evaluation system, SE can differentiate the high potential products from the weak ones.

As SE has large variety of product platforms, it can benefit from the scale effects by reducing risk on volatile market situations. The variety of product platforms also gives SE the access for broad amount of technological knowledge.

Due to the massive diversification, SE might have some managerial problems while managing all of its operations around the globe. This diversification has lead to a large variety of business areas, e. g. health,

medicine and biotechnology. To be a specialist in a certain business field can consist as a problem for SE.

6. 2. Recommendations

As SE already has a large variety of existing product categories, it could concentrate on strengthening the already existing ones. Taking the example of product categories which have proved to be the most successful ones, SE could develop its weaker product categories as prospering ones.
Furthermore SE should invest its money and increase its R&D activities in the area of software tribune and environmental friendly product development because both fields are the most promising for the emerging future.

Continuous investment in R&D is an issue SE should try to hold on. By doing this SE is able to produce new technologies. It is also the way to create the advantage against its competitors and stay competitive in the future.

7. References

1. http://www. koreatimes. co. kr/www/news/biz/2010/04/294_63772. html
2. http://www. allbusiness. com/company-activities-management/research-development/10543701-1. html
3. http://www. thejabs. org/articles/JABS_Interview(V1-Issue2). pdf
4. http://www. managingip. com/Article. aspx? ArticleID= 1321566
5. http://www. ferret. com. au/c/Samsung-Electronics-Australia/Secrets-of-Samsung-s-innovation-success-n687251
6. http://www. samsung. com
7. Samsungs annual report 2008

8. Samsungs sustainability report 2008
9. http://www. handelsblatt. com/newsticker/technologie/samsung-electronics-mit-rekordgewinn; 2571695
10. Research &Development, in Samsung Electronics: The Global Inc. by Dongyoup, Lee, YSM, Inc., 2006, pp. 81-102
11. http://www. samsung. com/us/aboutsamsung/ourbusinesses/researchdevelopment. html
12. http://www. thejabs. org/articles/JABS_Interview%28V1-Issue2%29. pdf
13. http://www. ferret. com. au/c/Samsung-Electronics-Australia/Secrets-of-Samsung-s-innovation-success-n687251
14. http://www. sandia. gov/PHMCOE/pdf/Sandia’sFundamentalsofTech. pdf