A Comparative Analysis on Sony's Approach to Problem Solving and Decision-Making

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ABSTRACT: Decision making and problem solving are especially important skills for business and life. As an innovation leading corporate, Sony has gradually lost their superiority in innovation and core competences under more and more intensive competition environment.

This report is made to investigate Sony current procedure on its solving problems and making decision, analyze approaches and tools used by Sony, and identify best solutions and opportunity of improvement by review the impact of success.

As part of my research study, the key areas of a Strengths, Weaknesses, Opportunities, and Threats (SWOT) - analysis has been performed for Sony's chosen model (Plan–Do–Check–Act Cycle- PDCA Cycle), analyze and review the findings of PDCA Cycle is adapted by Sony. A comparative analysis has then been made in order to distinguish differences and similarities between the PDCA Cycle; Define, Measure, Analyze, Improve and Control (DMAIC) model and 8D models. The report is also support me to suggest my recommendation model (8D model) by findings and comparative results.

Finally, I will introduce a strategy that to ensure my recommendation model can be acted and implemented against Sony's problems in future.

Keywords: *Plan–Do–Check–Act Cycle, Creative problem solving, Root cause analysis, Collaborative problem solving*

INTRODUCTION

Over the last decade, Sony seems to have lost its magic formula. Company has been gradual sliding down from its high market seat. After disappointing sales, Sony has recognized the solution to its problem: its plans to turn the newly reorganized "One Sony" around to prioritize core business.

But in the past several months Sony still has been faced high restructuring costs and massive tax charge everything have pushed its expected loss for $640 million in financial year 2011 (Jeff Blagdon, 2012) and losses $312 million in Q1 FY2012 (Daniel Cooper, 2012). Moreover Sony still has faced from its troubled business that are losing money and don't have chance at growth.

Sony reports record its shares have tumbled to a 31 year low and reported a net loss of 456.7bn yen ($5.7bn; £3.5bn) in the end of March, 2012 (NEWS Business, 2012). Sony has a lot to prove in order to convince investors. On February 8, 2013, its stock fell 10% to ¥1,365 (¥ - Japanese Yen) after the company reported a net loss of ¥10.8 billion for the three months through December. Sony's movie, music and financial

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operations were profitable in the quarter, but losses from the television, personal computer and mobile phone businesses continued to weigh on its bottom line.

In the quarter ended December 2012, Sony shipped 9.8 million smartphones and its global market share rose to 4.5% from 3.9% a year earlier, according to research firm IDC. That made it the world's fourth largest smartphone vendor, after Samsung, Apple and China's Huawei Technologies Co. "Whether Sony can make a comeback depends on its smartphone business," said SMBC Friend Research Center analyst Hiroshi Sakai.

Overview of Sony Company Profile

Sony Corporation (Sony) established in 1946, is a Japanese multinational corporation and headquartered in Tokyo, Japan. Sony is one of the leading manufacturers of consumer electronics and professional markets. It ranked No. 87on the list of Fortune Global 500 in 2012 (CNNMoney, 2012)

Sony is engaged in the international development, design, manufacture, and sale of various kinds of consumer electronics (The New York Times, 2012). Sony also uses third-party contract manufacturers for information technology products. Sony's products are marketed throughout the global by sales its subsidiaries, retailers, distributors and office websites. Sony is engaged in the home entertainment, including Pictures, Music and ATV Music Publishing. Further, Sony is also engaged in financial services business, such as banking leasing and credit financing. Additionally, Sony is engaged in a network service and ads agency business.

Problems of the Sony in Recent Times

Sony is facing many difficulties and there are two main reasons have caused to Sony's decline:

Lack of Innovation

Innovation development, in large part, defined the brand character for Sony. Sony grew to international prominence because of its ability to constantly innovative products over its competitive brand. Further, Sony had the ability to understand the hidden consumer demand & needs and create the product categories through its innovative development. The success of

Walkman made Sony the undisputed market leader in portable music player. However, Sony did not follow up with this innovative product line or upgrade any outstanding to sustain its initial success (Surowiecki's, 2011). During Apple iPad was introduced into the market, the brand reputation of Sony had dented and has suffered the huge challenges in product innovation (Business@GW, 2012). Nowadays, Sony has lost the knack of consumer oriented innovation (Hirai, 2012).

Lack of Core Competence

There is another major problem for Sony's fall from the top is that Sony has ignored the continuous development of core business, nowadays, Sony's failure in capturing the digital music market, such as Sony to lose the market to Apple iPod due to lack continuous improvement so that lack core advantages.

Additional, unsuccessful excessive and unrelated diversification, these failing diversification not only spends the brand resources in large part (Rubio, 2012), but also transfers the brand focus from the core of the brand (Lawler, 2012). Sony has stuck up in its multiple businesses: consumer electronics, music label, semiconductor, music online store, movies, games and financial services etc. Hence, Sony has already failed in product positioning and branding due to lack of brand focus and core competence (Byford, 2012).For the above two issues a more detailed problem description is analyzed and summarized in Appendix A.

Objectives

Lack innovation and core competencies as the vital business problems are identified by Sony. Sony is an innovation leading corporate. Once Sony has lack innovation, it should lose the core competency. Problem solving and decision-making are important skills can be effective in finding the root cause of the problems, making the best decisions and solutions and averting tragedy for Sony's survival and prosperity. Its theory also can enable Sony to achieve a sustainable competitive advantage over rivals.

Therefore, through the problems of study for Sony, the present paper discusses how to think critically about business problems, and devise and implement the remedies for overall

challenging management situations. This problem-solving process generally involves theories, problems assumptions, situations analysis, and prioritized solutions in a real-life management procedure, and help us understand decision-making skills and strategies, finally, it can teach how to solve problems in future real-life situations.

Overview of the Problem Solving and Decision Making

In a business organization, problem solving and decision making are especially important skills for business strategic management that enables the company survive in competitive market (Shibata, 1997). Problem solving is a set of activities designed to systematic analyze a situation and develop, implement, and evaluate solutions (Kendra, 1997). Decision making is making choices at each step of the problem solving process (Adair, 2010). The quality of decision making often supports problem solving for business strategic management (Greg, 2009).

Problem Solving Process in Sony

During consumer electronic market development, today's Sony needs to do something about and reinforce its competitive advantages (Mariko, 2012), so the issues and problems that should be solved by management of Sony are to make the company be more appealing to the current consumers (Shunichi, 2012). In a business context, problem solving process begins with a problem and ends with the profit (Ozasa, 2000). Sony establishes and maps problem solving to its decision making process as following, see table 1.

The table 1, Sony uses a five-step mapping from problem solving to the decision making process, this is an integrated problem solving and decision making process (Saeromi, 2012), Sony deals with problem solving as synonymous with decision making that helps its tame complex business problems and information in ways that enable quick and effective solutions (Yau, 2011), let's take a closer look at each of the five steps and how Sony can apply them to the problems.

Table 1: Problem solving process in Sony

Step	Problem Solving	Stage	Decision Making
1	Identify the problem	1	Frame the decision
2	Explore alternatives	2	Innovate to address needs and identify alternatives
3	Select an alternative	3	Decide and commit to act
4	Implement the solution	4	Manage consequences
5	Evaluate the situaton	4 & 1	Manage consequences & Frame the related decision

Source (http://www.sony.net/SonyInfo/News/Press/index.html, 2012)

Step 1: Begin with a Problem and Turns it to a Challenge

All businesses have problems. The problem solving process begins with a problem or possibly Sony has not already achieved the business goal should be considered a problem. In this step, Sony is trying to collect the all related information for its products, services and market, which sales goal is not be achieved. Once the problems have been identified, Sony will convert the problems into the challenges. The challenges are terse questions such as "In what ways might innovate products?" and "How might improve core brand competences?"

Step 2: Explore Alternatives

The second step is to explore alternative solutions to the problems identified in Step1. This step involves two parts: generate alternatives and evaluate alternatives. Brainstorming, discussion groups and market surveys are three main approaches are used to generating alternatives by Sony. After Sony has collected alternative solutions, Sony should establish a list of criteria for evaluating alternatives (See Appendix B).

Step 3: Select an Alternative

The step3 is to select one of the alternatives explored in order to implementation. After Sony has evaluated each alternative, one solution should stand out as coming closest to solving the current problems with the most advantages and fewest disadvantages. Sony should careful complete a "simulation check" to identify and evaluate the possible results of implementing the solution by potential factors before selecting the best alternative. Step3 also is a critical review in the problem-solving process.

Step 4: Implement the Solution

Finally, Sony is now ready to turn the evaluated and selected solutions into implementations that generate value for the Sony. Sony is wise to implementation of the solutions with five parts: develop a basic action plan, determine objectives, identify needed resources, build a plan and implement this plan.

Step 5: Evaluate the Situation

Firstly, the step involves monitoring the success and results of the decisions is an ongoing process that is critical to the course of actions by Sony, and then the goal basis for evaluating the results so that help Sony evaluate its decisions.

Approaches Used by Sony

CPS approach is used to tackling change within Sony. This approach usually involves a team established by personnel within the workplace are empowered to participate in the change process when looking for the creative ideas and solutions. Sony recognizes that its own personnel should hold the keys to innovation within themselves and only need the right outlet to share their experiences based ideas. This creative process brings together various people including all employees and employers, or even customers. Sony carries out the CPS approach to encourage people to participate in a dynamic setting which encourage the new ideas, rather than just rely on the traditional ideas and past practices to resolve the problems.

One of the most important characteristic of the CPS approach is the fact it convert the problems into the challenges or opportunities to improve the development of Sony. CPS approach not only can offer creative ideas and fresh solutions to Sony and help the company remain competitive advantages. It also provides a way to introduce changes into Sony that minimizes the normal fears that usually accompanies changes. CPS approach becomes a change agent that help Sony turn resistances into actions. Hence, CPS is an effective method for approaching the problems or challenges in an imaginative and innovative way. Its helps Sony re-define the problems they face, come up with breakthrough ideas and then take appropriate actions on these new ideas.

Sony as an innovation master, CPS approach will lead innovation for problem resolution. The problem may be any of a number of situations or needs, especially is the problem may be stated in terms of the need for a product innovation in order to improve the Sony competitive standing within its industry.

RESEARCH METHOD

The Sony Corporation was founded by Masaru Ibuka in the aftermath of Japans defeat during WWII. In September 1945, Ibuka left the countryside, where he had sought refuge from the bombings, and returned to the war-torn capital of Tokyo to begin a new business. Shortly thereafter, Ibuka established the Tokyo Tsushin Kenkyujo (or Tokyo Telecommunications Research Institute). At the time, the fledgling company was nothing more than a "narrow switchboard area on the third floor of Shirokiya Department Store (now Tokyu Department Store) in Nihonbashi. It became the workshop for Ibuka and his newly founded group. Having barely survived the fires during the war, the building had cracks all over its concrete exterior. Without windows, the new office was small and bleak (Genryu, 1988).

The Sony Corporation was founded in 1946 by Masaru Ibuka and Akio Morita, The two complement each other with an exclusive mix of product modernization and marketing ability, and formed a company that would in time grow into a more than $60 billion global organization.

During the post war in 1950 Ibuka and Morita Sony created first hardware device a tape player recorder which was called the G-TYPE recorder, the first tape player was made from paper and hand painted magnetic material because the materials were high in demands. (news.sel.sony.com) Ibuka was a realistic creator who could predict what products and technologies could be applied to everyday life. He motivated in his engineers he had a spirit of innovation and pushed that helped them to reach beyond their own expectations. Ibuka also encourage a thrilling working environment and an open mind company culture. In the founding booklet, he stated one of his wish was to build a company whose employees are satisfied and pleased by their work and his aspiration to create a fun, energetic workplace. (news.sel.sony.com)

Akio Morita was a marketing pioneer who influential in making Sony a household name all over the world, He was determined to launch the Sony brand. (news.sel.sony.com) Their headquarters are located in Tokyo Japan Sony is a global company of audio, video, communications and information technology products for the professional market and consumers. Their mission is; "Sony is committed to developing a wide range of innovative products and multimedia services that challenge the way consumer's access and enjoy digital entertainment. By ensuring synergy between businesses within the organization, Sony is constantly striving to create exciting new worlds of entertainment that can be experienced on a variety of different products". (Sony-europe.com)

Organizations are constantly faced with different decisions where they have to select an alternative from those available (Kao and Kao, 2007). Decision making is done at all levels of a company. Every organizational process, every action, demands a decision. These decisions determines the efficiency of the organization, hence, it is important that these decisions are rational. (Bruzelius and Skarvad, 2008). The traditional approach towards decision-making within economical theories is rational decision-making (Hatch, 2002). The rational decision-making process describes how the decision makers should behave in order to maximize the outcome (Harrison, 1995; Robbins, 2003).

Edlund et al. (1999) point out, if a decision-making process is poorly structured, a firm runs the risk of never actually taking a decision. Hence, although the decision-maker is not always as rational as assumed in the rational decision-making model, the model can still provide the decision-maker with structure and guidance in aspiring to be more rational. (Edlund et al., 1999) Dawes (1988) means that we cannot think of our decision options, and their possible consequences, simultaneously; we must do so sequentially. The resulting order in which we consider options and consequences may have profound effects on decision-making (Dawes, 1988). Harrison argues that to make a decision rational it is important that an objective exists and that the decision-maker perceives and selects an alternative that promised to meet the objective. Within firms these objectives are often derived from the firm's strategy. (Harrison, 1995).

Strategic decisions are oriented towards the future and are therefore fought with the uncertainty of outcomes yet to be realized. These kinds of decisions require a good deal of study and analysis (Harrisons, 1995). Grant (2005) believes that strategy is a pattern or theme that gives coherence to the decisions of an

organization. Strategic principles can help the decision-making by constraining the range of decision alternatives considered. Strategy not only simplifies decision-making, it an also facilitate the decision process with analytical tools like external analysis, internal resource analysis and financial analysis. (Grant, 2005)

In my study when I look into the problem solving and decision making I was not in a position to find much article that really focus on the Sony decision making process or model that precisely give an clear approach to the issues that are faced by Sony in today's competitive market with its competitors worldwide. The deductive approach has been criticized for the risk of the researcher having expectations prior to initiating the research and this could limit the access to information and can result in important information been overlooked (Jacobsen, 2002). While doing this research I have taken in to consideration that the models suggested or used by Sony is not been criticized.

When conducting the research and gathering the information for the study both qualitative method and quantitative methods were used. Since mostly empirical findings were gathered when conducting interviews. In order to get the clear outcome both qualitative and quantitative data was used, the quantitative data collected was gathered by financial reports taken from Sony annual reports. In this thesis I have taken the Plan-Do-Check-Act (PDCA) Cycle using the SWOT Analysis of Sony and compare with other different models like DMAIC and the 8D model of Whitfield and Kwok. Detail study of this is available in chapter 4 and chapter 5.

Tool Used by Sony

Plan-Do-Check-Act (PDCA) Cycle (Walter Shewhart, 1986) involve four steps for carrying out a change, it's just as a circle has no end and it should be repeated again and again for continuous improvement. The PDCA Cycle as a tool can help Sony to control and continuous improvement of products and market (Golum, 2010). The PDCA cycle will support Sony to answer three questions in problem-solving and decision-making process (table 2).

1. What is Sony trying to improve?
2. What change can Sony make that will result in a business improvement?
3. How will Sony know that a change is a business improvement?

Table 2: The PDCA cycle has specific objectives for each stage of cycle by Sony

Plan	
Identify the problems-what?	Statement the problems and identify the future business opportunities for Sony. Set Specific-Measurable-Agreed-Realistic-Timeframe (SMART) goals.
Analyze the problems-why?	Brainstorm causes of the problems by the personnel of Sony. Gather and analyze data to verify root cause of the problems.
Develop solutions	Develop some potential solutions for the problems of Sony and devise an implementation plan to solving these problems.
Do	
Implement solutions	Sony will put the plan to actions as quickly and cost effectively as possible, and then collect data and information for charting or analysis in the following "check" and "Act" steps.
Check	
Evaluate and study results	Sony will record and check the new situation works and measure against the results. If undesirability, return to plan.
Act	
Implement the full scale solutions	Sony will standardize the solutions by identify systemic changes required, develop training needs, plan and implement ongoing monitoring, and look for further future improvement opportunities.

Source (Tadashi Nakamichi, Nikkei Electronics, 2012)

Solution Taken by the Sony and Alternative Solutions

Innovation Oriented Solutions

In order to reinforce Sony innovation technology development capabilities and ensure that Sony tied closely to product and service innovation strategy, Shoji Nemoto (head of innovation technology) and Tomoyuki Suzuki (image senior vice president) (Ellen, 2012), both highly experienced and technical knowledgeable individuals with management backgrounds and will lead R&D endeavors to innovation development. Sony also will work with Kunimasa Suzuki (head of products and services innovation strategy) to ensure the efficient innovation development of technology for existing product and service lines (Rosen, 2012), take a lead to push efforts to develop new concepts and acquire next-generation innovation technologies. R&D, design and marketing will more consumer-centric to innovation development and further beef up its designs and features so that revamp brand image (Konan, 2012).

Sony is pursuing ever-faster innovation based on its mid-to-long-term strategies and by developing differentiated technologies capable of generating true value in its products. One of Sony´s key new business fields is the medical business, which currently comprises medical-use printers, monitors, cameras, recorders and other peripherals. Although Sony´s medical-related businesses were previously scattered across several business units, these have now been combined to form the medical business group, under the leadership of Executive Deputy President Hiroshi Yoshioka. (Sony Annual Report, 2012)

The alternative solution is that creating new businesses units and pursuing new market fields to accelerating innovation (Kaz, 2012).

Brand Focus and Core Competence Oriented Solutions

Sony is positioning its digital imaging, game and mobile businesses as the three main focus areas of its consumer electronics business and will plans technology development and focus investments in these three areas going forward. Sony anticipates that about 70% of its total R&D financial budget will be main dedicated to these three areas (Sony Group, 2012). Hence, Sony investing in its core areas in order to nurturing and strengthening its core competence and brand focus towards regaining brand leadership.

Sony is accelerating its efforts to turn around the television business, for which it is targeting a return to profitability in fiscal year 2013. Sony has already initiated cost reductions in LCD panel manufacturing in addition to pursuing further production efficiencies by reducing model count by 40% in fiscal year 2012 compared with fiscal year 2011. Comparing fiscal year 2013 to fiscal year 2011, Sony is also targeting a 60% reduction in fixed business costs and a 30% reduction in operating costs as it executes a thorough overhaul of the television business. (Sony Annual Report, 2012)

The alternative solution is realigning business portfolio (Minato-ku, 2012), Sony will restructure its organization structure, operating subsidiaries and trimmed down its unrelated diversification business units as it aims at further enhance managerial and operational efficiency.

Impact of Success

After using these solutions Sony increases about 70% of overall sales and 85% of operating income from the entire consumer electronics business by Fiscal Year 2014 (Sony Annual Report, 2012). Among, Sony will target digital imaging business total sales of 1.5 trillion yen and a double-digit. In addition, Sony will target total sales of one trillion yen and profitability of 8% from game business and 1.8 trillion yen from the mobile business, and significant operating income margin improvement.

Swot Analysis of the Pdca Cycle Used by Sony

Table 3: SWOT analysis of the PDCA cycle used by Sony

Strengths
- PDCA Cycle can offer Sony a clear identification of the problems and metrics, a prototyping of the solutions, evaluation of the business changes and subsequently, a full-scale implementation of the business success.   - PDCA Cycle is an effective problem management method to help Sony use its potential and resources to its optimum best in business work.   - Possibility of the errors are reduced to a minimum degree, when Sony complete the whole steps of the PDCA Cycle   - It will helps to Sony take corrective action before its mistake is noticed by anybody in decision making process.   - In problem solving process, PDCA Cycle enables Sony to optimally utilize its time and will help Sony save lot of time.
Weakness
- PDCA Cycle is a simplified abstraction method due to it doesn't reflect some activities such as leadership, coordination, training and communication, especially cultural background.   - PDCA Cycle is used for only small -scale incremental improvements, whereas it not applicable to the large-scale complex problem changes.   - Furthermore, since change is implement into the organization, people don't complain about any changes, and don't resist it.
Opportunities
- The "plan" step of PDCA Cycle can help Sony shape and plan for the future, and then the "check" step will help Sony determine whether or not standards and benchmarks can be achieved.   - PDCA Cycle as a process that is continuously being evaluated and errors can be found and corrected early on.   - Sony's productivity will improve naturally by PDCA Cycle, it also will optimum utilization of its resources, so making decision much simpler and faster for Sony.   - PDCA cycle is a continuous loop and this cycle ensures that processes are frequently checked again. This is very beneficial to Sony because if something organization changes or working to dissatisfaction it can be changed again. It also reduces the chance of mistakes.
Threats
- PDCA Cycle ignores the people element of change.   - A major threat of PDCA Cycle method is its inherently reactive nature, it unsuited to the highly competitive market that demands proactive thinking and taken actions.   - Due to PDCA Cycle is continuous improvement process and need continuous changes so that Sony may remain in a continuous state of instability.   - PDCA Cycle may bring an uncertain working environment to people and leading to they become confusing and disenchantment so that encounter fatigue for the changes.

Comparison of Sony Problem-Solving Model with Others Model

The structure of the DMAIC and the 8D model (Whitfield and Kwok, 1996) are similar to the structure of the PDCA Cycle on several points. In this part a comparison of the different step will be showed and the similarities and differences are also presented in the following table 4.

RESULTS

Visually, PDCA Cycle has 4 steps, while DMAIC has 5. DMAIC is more like an expanded PCDA Cycle, so PCDA and DMAIC all have in common and they are many important features, including all use facts, data or experiments to making a decision. Usually, they are implemented by a group to generate ideas because a team of people can create more ideas than any one individual. Basically the same methodology also as PDCA or DMAIC but put more emphasis on the data collect and analysis, but again an iterative cycle to continually improve the problem solving process. PDCA Cycle and DMAIC are all simple process but powerful models to drive continuous improvement in a business environment and a must for business solving problems. Implemented efficiently as the key part for a business they not just can help business survive but to achieve its aims, and flourish in a competitive market to stay ahead of its competitors

PDCA Cycle and DMAIC are very similar, but some big and some subtle differences. PDCA emphasizes more the need to continuous repeat the steps, while DMAIC adds the "Control" step lacking in PDCA.

PDCA Cycle as broader in scope, it is only an iterative learning model and continual improvement. It might not be the most accurate and works superficially. It's not prescriptive; and it doesn't identify how or what approaches to use to plan a test, or how to implement the plan, what analysis methods you use to check the results after the test, final how to then act on those solutions.

In contrast, DMAIC is a phased life cycle. It has a starting by a map for completion to come out a defined outcome. Hence, DMAIC can offer much more in depth on specific targeted processes or problems because a most important step for DMAIC that needs to be micro managed

in "Control" step. But DMAIC will need much more cost and efforts spending define the problems, establish measurements, and do more detailed analyses. PDCA is more basic, simpler, quicker to implement, but they both describe a process improvement cycle.

However, The PDCA Cycle and DMAIC are only suitable for a continuous improving process that are in control but not optimized. The problems handled in the 8D model will well control that are needed to solve the problems for business intended objectives. How some of the steps in the 8D model are performed that will very dependent on a team. In the 8D process, it is really important that the group is cross-functional and that key knowledge and expertise from various areas of the problems is involved. The group as whole is more effective and smarter than the total quality of the individuals. The working of 8D model has freedom and not has any restrictions to inhibit the creativity of the persons.

During the phase of define the problems by collect information in order to map and understand it. The 8D model is more of the problems formulation based on criterions. The expected outcomes of the problems are in both models also estimated. In the DMAIC model it is important to estimate expected costs.

The biggest differences between 8D model and PDCA Cycle and DMAIC are in step 3 and 4 of the 8D process. There is not a comparable explicit step for implement & verify interim containment in the PDCA Cycle and DMAIC process. The preliminary measures should be implemented in 8D model, aims at to prevent the problems from more serious and expanding and keep the company profits while the group is finding for the long-term solution. A wrong interim containment can bring misunderstand for the problems that can move onto the next step. Interim containment is a quick path that helps business to study the symptoms of its problems.

Others a more important fact that 8D has one more step than PDCA Cycle that does not have. The 8D of differently activity is defining and verifying the root cause by a RCA. The PDCA Cycle does not have perform a RCA will possibly lead to a wrong conclusion was taken and the fail "problem" was handled. Hence, PDCA Cycle is shorter than the 8D model because it is more basic than the other one. Also

8D is more detailed, by its 8 steps, it is easier to identify, plan and find the necessary information, but also can incur large costs, while the 8D process is implemented in the organization.

Both the DMIAC and the 8D model are performing a root-cause analysis. In the DMAIC it is not specified exactly how to perform the RCA, but in the 8D model there are many paths to perform one. The 8D model often is performed by much expertise and necessarily from a team. In the 8D model the team often has more analytical knowledge and is involving more in the measurements and analysis, so in the 8D process the data collected are often of a better quality than in DMAIC. Moreover, in the 8D model the verification of the root-causes of the problems is often done in parallel to the root-cause definition and the objective is to save time. In the DMAIC this is not desirable.

The PDCA Cycle and DMAIC are often targeting rather stable phase the improvement solution generated, so it often optimize to lower the mistake. In 8D model the solution is often generated in parallel with verification process so that save cost and time. In the 8D model alternative solution is seldom generated, but if alternative solution exist company often compared on various criteria depend on cost, complexity, time, difficulty to implement etc.

The 8D model "Prevent recurrence" phase is very similar to the "Act" phase of PDCA Cycle and "Control" phase of DMAIC. The 8D model can monitor the problems afterwards to evaluate any possible occurrence again for the problems or cause the new problems.

So, which model is better? Both are strong model for solving continuous improvement business problems based on an original consistent methodology and same objective.

Table 4: Comparison of Sony problem-solving model with others model

Lean: PDCA		Six Sigma: DMAIC		8D (8 Disciplines)	
Plan	Identify the opportunity by analyze the problems and then develop optimal solutions	Define	Define opportunity, objectives	Discipline 1	Form the team
				Discipline 2	Describe the Problem actions
				Discipline 3	Implement and verify the short-term corrective actions
Do	Implement the planned solutions	Measure	Measure current level of performance	Discipline 4	Define and verify root causes
		Analyze	Analyze causes of current problems and challenges		
Check	Check and study the results	Improve	Determine how can improve performance to eliminate the problems	Discipline 5	Verify corrective actions
				Discipline 6	Implement permanent corrective
Act	Standardize the solutions and plan for future	Control	Develop mechanisms to control performance	Discipline 7	Prevent recurrence
				Discipline 8	Congratulate your team

RECOMMENDATIONS

My recommendation is to try the 8D model. I recommend it depending on the type of problems and the situation of Sony involved. When working with a company on long-term continuous improvement projects my preference is PDCA Cycle and DMAIC. If I'm helping Sony with problem solving external of a formal continuous improvement project then the 8D model is my choice. The major reason that is the 8D model is applicable to all kinds of business problems-solving and is therefore often adapted to fit into any business processes to a great extent. It also is universal in model whether the problems are products or services related. I especially swear the step 3 (implement the interim action) and step 4 (defining and verifying the root cause) that are not involved in the other models. The step of implement the interim action is intended to stop the losing of problems getting to the Sony and identify the root cause is vital to Sony on real problem solving. It's really good model, because it is the most comprehensive of all the methods to problem solving and decision making, so I am recommending to Sony.

The 8D model was originally introduced and developed at Ford Motor Company in 1987, and named "Team Oriented Problem Solving (TOPS)" (Eight Disciplines Problem Solving, Wikipedia). The 8D model has been Ford's approach to problem-solving and decision making ever since (Laurie, 2006). It to be known as Ford Global 8D (G8D) (Doane, 2005). The Ford G8D model is most effective in dealing with long-term problems occur frequently (Rambaud, 2006). The 8D model emphasize on deal with problems, discover the weaknesses in the business management and prevent the problems recurrence in the first place. It can provide a standard methodology for data collection & analysis and is a vital lean tool. The 8D model is established on a good team and company will save time, cost and other resources. Nowadays, the 8D problem solving and decision making is used by big companies such as Ford, Shell and Toyota (www.tedco-inc.com, 2011). The real benefit would come by how solve problems and make decisions, both processes can generate a huge improvement for an organization.

Definition of Strategy

Strategy is a well-defined roadmap of an organization (Riley, 2012). It is a plan for how an organization will compete against its competitors by compare with its strengths and weaknesses (BusinessDictionary.com, 2004). In other words, the objective of organization strategy is to maximize its strengths and to minimize the strengths of its competitors. It defines the overall mission, vision and future direction of an organization. In short, strategy is long-term action plan for achieving an objective or goal.

Strategy of Implementation on Recommendations

Sony has a problem solving process called the PDCA Cycle, which is based on the methodology of problem-solving. The PDCA Cycle is very important to continuous improving innovation and core competence for Sony. However, through my study, I found that the major disadvantages of the PDCA Cycle include oversimplification, idealize implementation too much, and ignorance of people' feelings in implement process as well as it will not help to solve the Sony's complex problems under ideal conditions. Whereas the 8D model is much more flexible and detailed analysis which will give more accurate and fast decisions on getting Sony problem solutions in easy way.

The Office of Sony is committed to communicating and providing any concerns with the highest possible quality of support and service, the system is called "Contact Sony Support". Anybody are encouraged to submit suggestions on interactions with their staff, advisements, compliments and criticisms for management, concerns about ongoing problems or other recommendations about overall operations, and then Sony will return the feedback. This form allows me to illustrate my suggestions is appropriate for help Sony improve their business problems.

Implementation of Recommendation Model against Sony's Problem

Sony provides a way of "Contact Sony Support" to contract Sony. It'll support me to suggest my recommendation model for implementation in Sony. Follow the step-by-step implement process I recommend, I will approach

them and discuss the advantages and benefits of my recommendation model if they will choose, additional, I will identify and analysis the risks and disadvantages of their current model. Finally, I also will support my proposed options with evidence from theories and other organizations' successes, such as Ford, Toyota, etc.

The Eight Disciplines Process within Sony
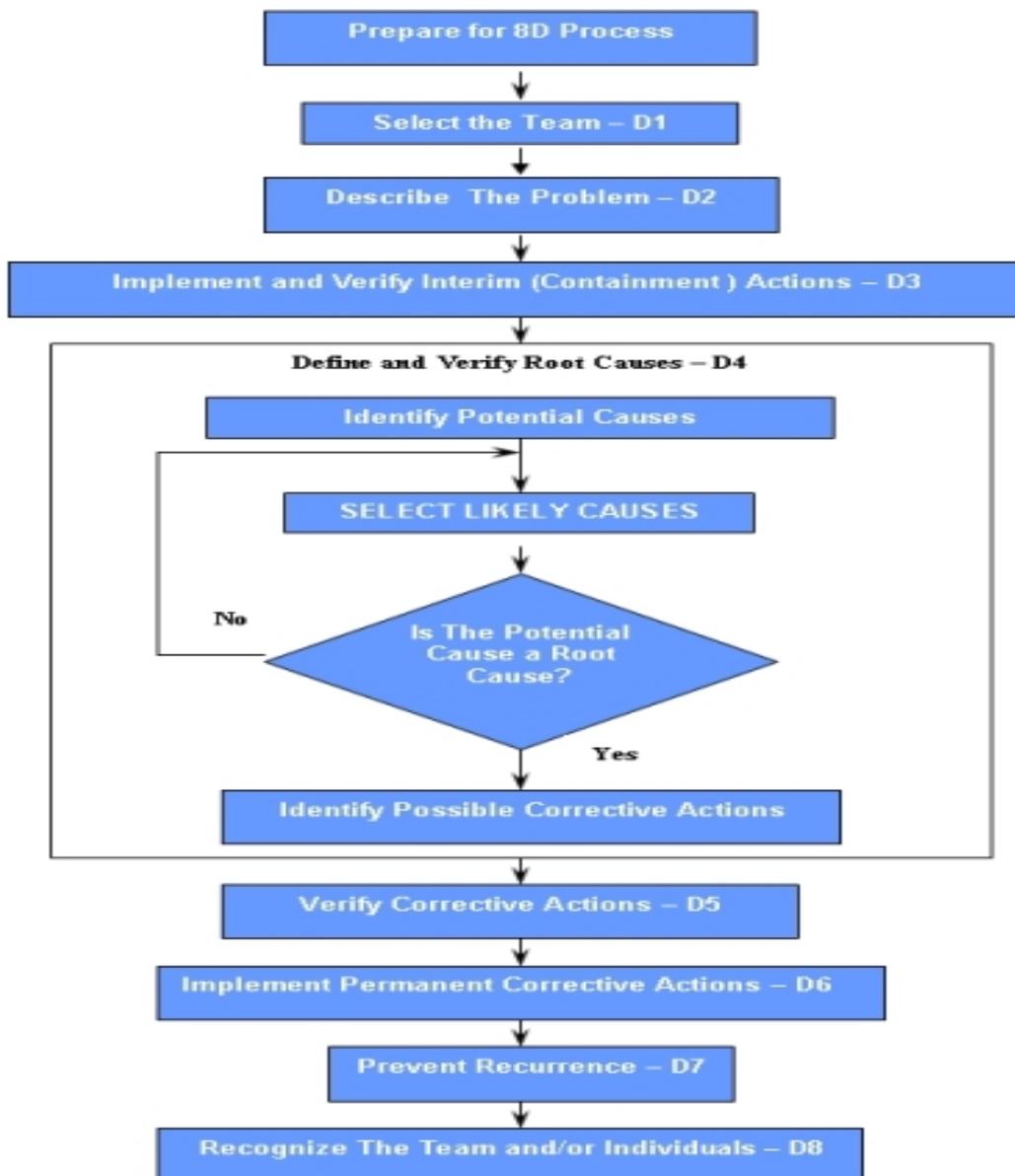
The Eight Disciplines Process within Sony

1D – Form a Team

Establish a Sony group with cross-functional. The group of people selected should have key competence connected to the current Sony's problems and be from different areas of knowledge and expertise.

2D – Describe the Problem

In is in this step important to redefinition and re-map the Sony's problems. Describe these two problems in a measurable quantitative terms by the tools such as the 5W1H (Who, What, When, Where, Why, How). The Sony group should review the data to find overall reasons behind its failure and to why the problems occur, aims at resolve them.

3D –Implement and Verify Short-term Corrective Actions

In order to prevent these two problems becoming bigger or spreading, define and implement an intermediate actions until the permanent corrective action have been taken.

4D – Define and Verify the Root Cause

In this step all potential root-causes to the problems should be identified, explained and structured why the problems occurred by the support of applicable methods or tools such as a brainstorming session, Ishikawa, Fishbone, etc. Finally, identify alternative solutions to prevent root causes for further investigation in next phase.

5D – Verify Corrective Actions

Confirm and evaluate that the chosen solutions will resolve the Sony's problems and without causing new problems in this phase. It can help the Sony group through compare to verify some of solutions might not work or are causing the risks about new problems.

6D – Implement Permanent Corrective Actions

In this step the major task is to implement the actions that were chosen in the previous step against Sony's problems. The Sony group should establish a detailed implementation plan, so that it is clear everyone commits to the work.

7D – Prevent Recurrence

Monitor the problems afterwards to explore any possible recurrence of the problems and without causing new problems in order to make ensure that the permanent corrective actions implemented to solving the root causes of the problems.

8D – Congratulate the Team

Once these two problems are successfully resolved it is important to recognize what the team has accomplished, share their knowledge and expertise and give them praise for their collective efforts.

CONCLUSION

Problem solving and decision-making are important to the survival and development of an organization. The process involves its effective and proper implementation. Problem solving and decision making are not easy for most organization, but there are many theories, approaches, models, technologies and tools to support this process to implement as result in better more effective solutions. Effective Problem Solving and Decision Making is designed to requires careful identify, analysis, diagnosis, evaluation and step-by-step action planning. Therefore, solving problems and making decisions in an effective way can be the key to a more productivity in any organization.

Appendix A

A look at the facts shows that Sony's failure in capturing the digital market due to lack innovation so that its lost business core competence. From the five-year summary of

Sony selected financial data (figure 1 and figure 2), it's clearly shows that consolidated sales and operating revenue (figure 3), and net sales (figure 2), decreased year-on-year, consolidated operating income loss also decreased year-on-year major due to the lower sales and revenging (figure 4), as the result in a large net loss for the Sony Corporation´s stockholders.

From the history of Sony returned we know that Sony had been the digital industry pioneer in transformational innovation through delivery of many outstanding products, especially in portable music areas, all these hard-earned core competitive advantages of the Sony, however, failed to deliver when the digital war was declared between the Sony and Apple as they both strive to be No.1 distributor of digital music, movies, games and other consumer electronic.

There are many reasons which caused Sony to lose the innovation and core competence to Apple and other competitors. The major is that Sony over-reliance on the technical expertise of the Sony group at the expense of tuning into the consumers' needs, value, such as use-friendliness. Preoccupation with prices, volume, and to excess lower costs (figure 2). Moreover, Sony focuses on continuous failing expand some unrelated business lines so that a significant deterioration in net income loss for Sony's affiliated segments (figures 5,6,7,8), rather than trying to continuous develop exciting new products from core business that were head and shoulders better than its competitors.

Five-Year Summary of Selected Financial Data
Sony Corporation and Consolidated Subsidiaries

Years ended March 31

	Yen in millions (Yen per share amounts)				
	2008	2009	2010	2011	2012
FOR THE YEAR					
Sales and operating revenue	8,871,414	7,729,993	7,213,998	7,181,273	6,493,212
Equity in net income (loss) of					
affiliated companies	100,817	(25,109)	(30,235)	14,062	(121,697)
Operating income (loss)	475,299	(227,783)	31,772	199,821	(67,275)
Income (loss) before income taxes	567,134	(174,955)	26,912	205,013	(83,186)
Income taxes	203,478	(72,741)	13,958	425,339	315,239
Net income (loss) attributable to					
Sony Corporation's stockholders	369,435	(98,938)	(40,802)	(259,585)	(456,660)
Data per share of common stock:					
Net income (loss) attributable to					
Sony Corporation's stockholders					
—Basic	368.33	(98.59)	(40.66)	(258.66)	(455.03)
—Diluted	351.10	(98.59)	(40.66)	(258.66)	(455.03)
Cash dividends	25.00	42.50	25.00	25.00	25.00
Depreciation and amortization*	428,010	405,443	371,004	325,366	319,594
Capital expenditures					
(additions to fixed assets)	335,726	332,068	192,724	204,862	295,139
Research and development costs	520,568	497,297	432,001	426,814	433,477
AT YEAR-END					
Net working capital (deficit)**	986,296	(190,265)	64,627	(291,253)	(775,019)
Long-term debt	729,059	660,147	924,207	812,235	762,226
Sony Corporation's stockholders' equity	3,465,089	2,964,653	2,965,905	2,547,987	2,028,891
Common stock	630,576	630,765	630,822	630,921	630,923
Total assets**	12,515,176	11,983,480	12,862,624	12,911,122	13,295,667
Number of shares issued at fiscal year-end					
(thousands of shares of common stock)	1,004,443	1,004,535	1,004,571	1,004,637	1,004,638
Sony Corporation's stockholders' equity					
per share of common stock	3,453.25	2,954.25	2,955.47	2,538.89	2,021.66

* Depreciation and amortization includes amortization expenses for intangible assets and deferred insurance acquisition costs.
** The amounts for the previous fiscal years have been revised.

Figure 1: Sony five-year summary of selected financial data: Source (Sony Annual Report 2012)

Consolidated Statements of Income

Sony Corporation and Consolidated Subsidiaries

Years ended March 31

	Yen in millions		
	2010	2011	2012
Sales and operating revenue:			
Net sales..	6,293,005	6,304,401	5,526,611
Financial services revenue	838,300	798,495	868,971
Other operating revenue	82,693	78,377	97,630
	7,213,998	7,181,273	6,493,212
Costs and expenses:			
Cost of sales..	4,892,563	4,831,363	4,386,447
Selling, general and administrative..............................	1,544,890	1,501,813	1,375,887
Financial services expenses...................................	671,550	675,788	736,050
Other operating (income) expense, net	42,988	(13,450)	(59,594)
	7,151,991	6,995,514	6,438,790
Equity in net income (loss) of affiliated companies	(30,235)	14,062	(121,697)
Operating income (loss)	31,772	199,821	(67,275)
Other income:			
Interest and dividends	13,191	11,783	15,101
Gain on sale of securities investments, net	9,953	14,325	671
Foreign exchange gain, net	—	9,297	—
Other	20,690	9,561	7,706
	43,834	44,966	23,478
Other expenses:			
Interest..	22,505	23,909	23,432
Loss on devaluation of securities investments......................	2,946	7,669	3,604
Foreign exchange loss, net....................................	10,876	—	5,089
Other	12,367	8,196	7,264
	48,694	39,774	39,389
Income (loss) before income taxes	26,912	205,013	(83,186)
Income taxes:			
Current**...	79,120	117,918	108,545
Deferred**	(65,162)	307,421	206,694
	13,958	425,339	315,239
Net income (loss)...................................	12,954	(220,326)	(398,425)
Less—Net income attributable to noncontrolling interests	53,756	39,259	58,235
Net loss attributable to Sony Corporation's stockholders	(40,802)	(259,585)	(456,660)
	Yen		
Per share data:			
Common stock			
Net loss attributable to Sony Corporation's stockholders			
—Basic..	(40.66)	(258.66)	(455.03)
—Diluted	(40.66)	(258.66)	(455.03)
Cash dividends..	25.00	25.00	25.00

** The amounts in the fiscal year ended March 31, 2010 has been revised.

Figure 2: Sony consolidated statements of income: Source (Sony Annual Report 2012)

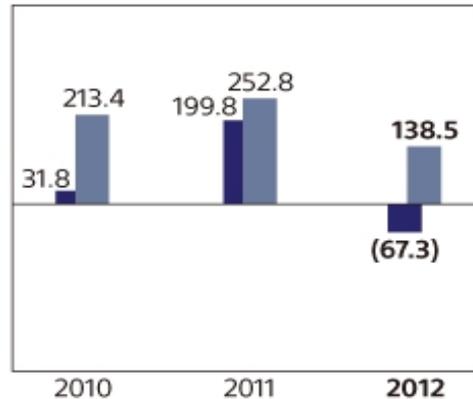## Sales and operating revenue
(Yen in trillions)
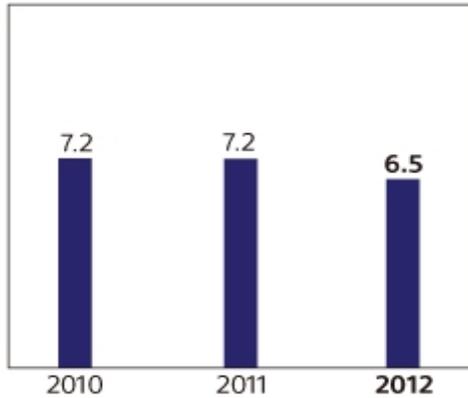
Note: Years ended March 31

Figure 3: Sony sales and operating revenue: Source (Sony Annual Report 2012)

Operating income (loss)
(Yen in billions)

■ Operating income (loss)
■ Operating income (loss), as adjusted,
which excludes equity in net income (loss)
of affiliated companies and restructuring
charges and impairments of long-lived assets

Note: This is not a presentation in
accordance with Generally
Accepted Accounting Principles
in the U.S.
Note: Years ended March 31

Figure 4: Sony operating income (loss): Source (Sony Annual Report 2012)

Sales and Operating Income by Segment
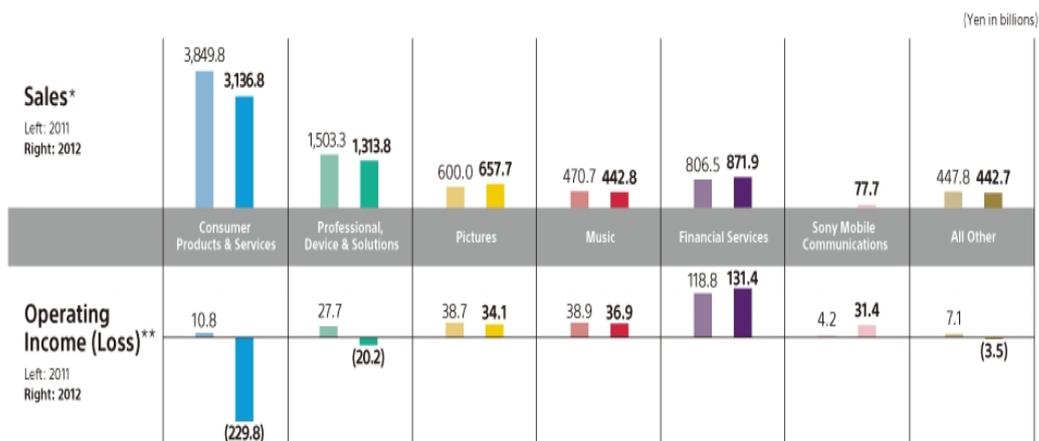
Figure 5: Sony sales and operating income by segment: Source (Sony Annual Report 2012)

Figures 6, 7 and 8	**Remarks / Comments**
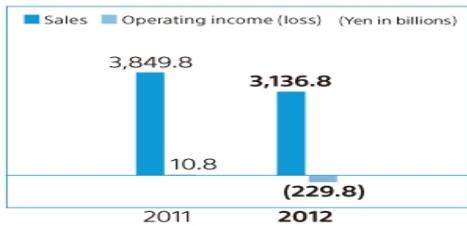
Figure 6: Sony consumer product and services segment:
Source (Sony Annual Report 2012)

By compare with the previous fiscal year, sales and operating revenue of the consumer product and services segment decreased 18.5%, to ¥3,136.8 billion and operating loss of ¥ 229.8 billion from ¥ 10.8billion.

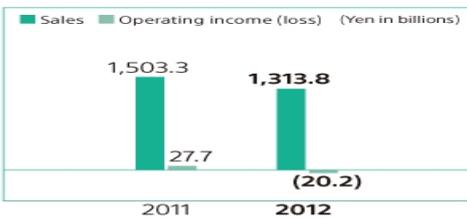**Figure 7: Sony professional, device and solutions segment:**
Source (Sony Annual Report 2012)

By compare with the previous fiscal year, sales and operating revenue of the professional, device and solutions segment decreased 12.6%, to ¥1,313.8 billion and operating loss of ¥20.2 billion from ¥27.7 billion.
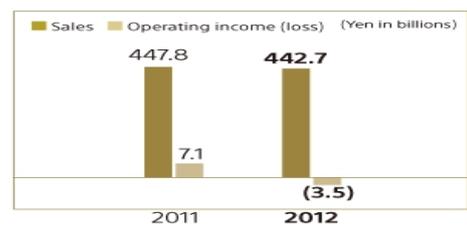

Figure 8: Sony all other segment:
Source (Sony Annual Report 2012)

By compare with the previous fiscal year, sales and operating revenue of the disc manufacturing business activities and So-net Entertainment Corporation, etc. all others segment decreased 1.2 %, to ¥442.7 billion and operating loss of ¥3.5 billion from ¥7.1 billion.

Appendix B
Criteria for Evaluating Alternative Solutions

Step	Questions to Ask
1. Identify Restrictions Do any of the following factors serve as a constraint this solution?	✓ Political ✓ Economic ✓ Social ✓ Technical ✓ Environmental ✓ Legal ✓ Human resources ✓ Time
2. Determine Appropriateness	Does this solution fit the situations?
3. Verify Adequacy	Will this option make enough of a difference to be worth doing?
4. Evaluate Effectiveness	Will this option meet the objective?
5. Evaluate Efficiency	What is the cost/benefit ratio of this solution?
6. Determine Side Effects	What are the ramifications of this solution?

Source (Sony Annual Report 2012)

REFERENCE

Blagdon, J. (2012). Sony Reorganizes into 'One Sony', Prioritizes Digital Imaging, Gaming, and Mobile. Available at: http://www.theverge.com/2012/3/27/2905412/sony-management-structure-change-announcement (February 5, 2013).

Business@GW (2012). Sony Announces Initiatives to Improve Profitability and Enhance Operational Efficiencies in its Electronics Businesses. Available at:http://www.sony.net/SonyInfo/News/Press/200812/08-150E/index.html (December 10, 2012).

Business Dictionary.com (2004). Strategy. Available at:http://www.businessdictionary.com/definition/strategy.html (December 15, 2012).

Byford, S. (2012). How Matsushita Electric and Sony Manage Global R&D. Available at: http://astro.temple.edu/~rmudambi/Teaching/BA804/F-F_09/How-Matsushita-and-Sony-manage-R&D.htm (February 21, 2013).

CNNMoney (2012). Global 500. Available at: http://money.cnn.com/magazines/fortune/global500/2012/snapshots/6640.html (December 29, 2012).

Daniel Cooper (2012). Sony Releases Q1 2012 Financial Results, Eats $312 Million Loss. Available at: http:// www. engadget. com/2012/08/02/sony-q1 2012/ (December 30, 2012).

Dawes, R. M. (1998). *Rational Choice in an Uncertain World*, USA: Harcourt Brace and Company.

Doane, D. B. (2005). How the Tech Parade Passed Sony. Available at: http://www.nytimes.com/2012/04/15/technology/how-sony-fell-behind-in-the-tech-parade.html?pagewanted=1&_r=3& (December 29, 2012).

Edlund, P. O., Hogberg, O. and Leonardz, B. (1999). *Beslutsmodeller – Redskap for Ekonomisk Argumentation*, 4th ed. Lund: Sweden, Studentlitteratur.

Ellen (2012). Systematic Problem Solving. Available at: http://www.pwc.com/us/en/technology-forecast/2011/issue2/interviews/interview-todhunter.jhtml (January 15, 2013).

Golum (2010). 8D (Eight Disciplines) Problem Solving Problem. Available at: http://oo20.com/article/show.asp?id=2474 (January 23, 2013).

Greg, Z. (2009). Yves Béhar's 7 Principles of Holistic Product Design. Available at: http://www.triplepundit.com/2011/11/yves-behars-7-principles-holistic-product-design/ (January 23, 2013).

Harrison, F. E. (1995). *The Managerial Decision Making Process,* 4th ed. USA: Houghton Mifflin Company.

Hatch, M. J. (2002). *Organisationsteori: Moderna, Symboliska Och Postmoderna Perspektiv*, Lund, Sweden: Studentlitteratur.

Hirai (2012) Sony Accelerates Transformation to Drive Innovation and Growth. Available at: http://www.sony.net/SonyInfo/News/Press/200911/09-133E/index.html (January 24, 2013).

Jacobsen, D. I. (2002), *Vad, Hur Och Varfor? Om Metodval I Foretageskonomi Och Andra Samhallsvetenskapliga Amnen*, Lund, Sweden: Studentlitteratur.

Kao, P-H. and Kao, H. (2007). Taiwanese Executive's Leadership Styles and Their Preferred Decision-Making Models used in Mainland China. *Journal of American Academy of Business,* 10 (2), pp. 71-79.

Kaz (2012). Rescue and Recovery, Available at: http://www.projectsmart.co.uk/rescue-and-recovery. html (February 14, 2013).

Kendra (1997). One More Great Lesson From Steve Jobs: Innovation Begins as A Social Movement. Available at:
http://www.fastcodesign.com/1665211/steve-jobs-embodied-the-entrepreneurial-capitalism-we-all-love (February 13, 2013).

Konan (2012). Integrated Problem Solving Decision Making is Really the Way We Work. Available at: http://www.decision-making-solutions.com/ problem_solving_decision_making. html (February 13, 2013).

Laurie, (2006). Sony Eco-Innovation. Available at: http://www.sonyinsider.com/2010/07/13/sony-eco-innovation/ (February 14, 2013).

http://www.qpatraining.com/free-resources/problem-solving.html (February 21, 2013).

Lawler, R. (2012). Barriers to Innovation. Sony vs. IPod Case Analysis. Available at: http://parttimembadegree.com/business-school-cases/barriers-to-innovation-sony-vs-ipod-case-analysi/ (February 21, 2013).

12MANAGE (2012). 8D Problem Solving. Available at:http://www.12manage.com/methods_ford_eight_ disciplines_8D_zh.html (February 15, 2013).

Mariko (2012). An Overview of the General Theory of Innovation. Available at: http://www.triz-journal.com/archives/2008/04/06/ (February 15, 2013).

Minato-Ku (2012). Classic Brand Failures: Sony Betamax. Available at:
http://brandfailures.blogspot.sg/2006/10/calssic -brand-failures-sony-betamax.html (February 15, 2013).

Nakamichi, T. (2012). Creativity Training.com Available at:http://www.creativitytraining.com/our-process/creative-problem-solving (March 3, 2013).

NEWS Business (2012). Sony Shares Tumble to 31-Year Low Amid Record Losses. Available at: http://www.bbc.co.uk/news/business-18030939

(February 20, 2013).

Ozasa (2000). Mapping the Problem Solving Process. Available at: http://www.studygs.net/problem/problemsolvingo. htm (February 20, 2013).

Problem Solving Process in Sony (2012).Available at: http://www.sony.net/SonyInfo/News/Press/index.ht ml (February 20, 2013).

Rambaud (2006). 8D-DMAIC-5Why Problem Solving. Available at: http://www.qpatraining.com/free-resources/problem-solving.html (February 21, 2013).

Riley, J. (2012). DMAIC vs. PDCA, Available at: http:// www.qualitygurus.net/DMAIC+vs+PDCA (February 5, 2013).

Rosen (2012). Creative Problem Solving Leads to Organizational Innovation. Available at: http://www.projectsmart.co.uk/creative-problem-solving-leads-to-organisational-innovation.html (February 21, 2013).

Rubio, J. (2012). *How Can Sony Unleash Innovation and Large-Scale Change?* Available at: http://www.forbes.com/sites/johnkotter/2012/09/10/ how-can-sony-unleash-innovation-and-large-scale-change/ (February 15, 2013).

Saeromi (2012). Pursuing New Product Innovation. Available at:
http://www.kepner-tregoe.com/knowledge-center/ success-stories/controlling-costs-while-pursuing-new-product-innovation/ (February 21, 2013).

Shewhart, W. (1986). Innovation Process. Available at:http://www.jpb.com/creative/innovationprocess.p hp (March 4, 2013).

Shibata, H. (1997) Sony Says Professional Products to Help Consumer Unit. Available at: http://www.bloomberg.com/news/2012-04-05/sony-says- professional- products-to-help-consumer-unit.html (January 24, 2013).

Shunichi (2012). Overview of the Problem Definition Process. Available at:
http://www.processinnovation.ca/problem/problems olve.html (February 21, 2013).

Sony Annual Report (2012). Available at: http://www.sony.net/SonyInfo/IR/financial/ar/2012/ index.html (February 22, 2013).

Sony Group (2012). Decision-Making-Solution. Available at:
http://www.decision-making-solutions.com/ decision_making_model.html (February 22, 2013).

Surowiecki's, J. (2011). Sony R & D Mission. Available at:
http://www.sony.net/SonyInfo/technology/rd/index. html (February 7, 2013).

The 8D Problem Solving and Decision Making (2011). Available at: www.tedco-inc.com (March 3, 2013).

The New York Times (2012). Sayonara Sony: How Industrial, MBA-Style Leadership Killed a Once Great Company. Available at: http://www.forbes.com/sites/adamhartung/2012/04/20/sayonara-sony-how-industrial-mba-style-leadership-killed-once-great-company/ (March 3, 2013).

Whitfield and Kwok (1996). The 8D Model. Available at: http://wiki.mbalib.com/wiki/8D%E5%B7%A5%E4%BD%9C%E6%96%B9%E6%B3%95 (March 3, 2013).

Yau (2011). Problem Solving Tools. Available at: http://www.creationsuite.com/problem-solving-tools (March 13, 2013).