GLOBAL MANUFACTURING COLLABORATION: A CASE STUDY OF TAIWAN’s HON HAI PRECISION INDUSTRY COMPANY AND JAPAN’S SHARP CORPORATION

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Abstract
In April 2016, Taiwan’s Hon Hai Precision Industry Co. invests Japan’s leading electronics makers Sharp Corp. The strategic alliance does not focus on the financial advantages. On the contrary it focuses on increasing sales, strengthening supply chains and increasing manufacturing capabilities and productivity. The final objective of the alliance is to strengthen Sharp’s global competitiveness. After three quarters since the alliance is effective, Sharp is expecting a yearly gain compared to the loss for the last two years. This research summarizes the characteristics of both companies from their individual stories. Then, the research states the success of the alliance, and tries to explain the reasons of Sharp’s failure. This research then shows the key factors of the successful operation in the alliance. This research reviews the history and financial statements of Sharp. Finally we reach to a conclusion. That is, if the company could figure out the major problem actually was the organizational management, not the low demand and price of LCDs or the poor financial structure, the sorrow could be avoided. Finally, this research pinpoints the challenges of new Sharp in sales management of brand-name products and in debt management.

Keywords:
Global manufacturing, merge and acquisition, third-party allotment, strategic alliance.

1 BACKGROUND
In this section, the author summarizes the historical background of both companies. Section 1.1 summarizes the important history of Sharp Corporation from the beginning to 2012. The materials are from the history book published by Sharp [1]. Section 1.2 summarizes the history of Hon Hai from a book titled “Coupling: East Asian Industrial Transformation in the New Global Economy” published by Yeung [2]. Then, Section 1.3 summarizes the history of alliance on both companies happening since 2016.

1.1 History of Sharp Corporation
In 1915, Sharp founder Tokuji Hayakawa invented the innovative twist-type Hayakawa Mechanical Pencil—later named the Sharp Pencil. Having lost everything in the Great Kanto Earthquake, Hayakawa relocated to Osaka and made a fresh start in 1923. He soon encountered an exciting new product—the radio. He produced Japan’s first crystal radio receiver.

In 1932, two-man teams from the production and sales departments began a series of study tours visiting retailers and surveying the market. While they strengthened their relationships with the retailers, the teams were also able to hear directly from them and from the consumers about the market penetration of Sharp products. They learned valuable information about which product components were prone to failure and about the specific needs of different regions. The study tour was an example of the company’s commitment to trying out new creative ideas—not only in product development and assembly-line operations, but also in the areas of sales and distribution.

Sharp produced the first TV in Japan and quickly moved to mass-produce sets before the start of television broadcasting in 1953. The company’s foresight in launching research on TVs in 1931 was finally bearing fruit. The Sharp TV was born as the company overcame a crisis of surviving resulting from post-war recession.

In 1952, as the company was moving to develop a network of sales outlets, it spun off its sales division as a separate subsidiary and established Sharp Electric Co. Hayakawa Electric and Sharp Electric thus became inseparable. With one devoted to manufacturing and the other to sales, they worked together to promote business.

In 1958 Akira Saeki was appointed the Senior Executive Director. He went on to enact numerous management reforms. The company expanded its appliance line, began research into cutting-edge technologies, and started whole new product categories, including microwave ovens and calculators. It also focused on exports, was it set up sales companies in the US and other countries.

From the late 1950s to the 1960s, the company came out with many appliances with proprietary functions that were clever and original. Hayakawa Electric began development of electroluminescence in 1960. Research continued as the company achieved laser oscillation in liquid nitrogen.

In September 1960, about 20 engineers in their mid-twenties were gathered as the founding staff of a research department dedicated to areas such as semiconductors and circuits. But despite the hopes and passion of these employees, the fact was that the company was sorely lacking in these technologies. Needing to learn the basics of computers, the calculator group from the circuit research lab spent their days at the offices of Hiroshi Ozaki and Zen’ichi Kitamura at Osaka University. This led to the company’s development in 1962 of the HAYAC-1, a small-scale electronic test computer. Two months later the company commercialized the CTS-1, a voucher printer utilizing a relay calculator.

The company acquired a 2.5 cm-diameter silicon wafer to trial solar cells in 1959. This was the beginning of the company’s semiconductor business. The 225W solar module made in the Nara Plant was the time the world’s largest.

On January 1, 1970, the company changes its name from Hayakawa Electric Co. Ltd. to Sharp Corporation. In 1973, Sharp carefully reviewed the basic spirit and ideas and put it into Business Philosophy, Creed, and Basic Business Principles. The Basic Business Principles includes five key ideas: to develop unique technologies; to create the best products; to remain committed to customer-oriented sales; to build cooperative relationships for mutual prosperity; and to equate the growth of the company with the happiness of everybody.

To resolve the problem of depending on other companies for the supply of semiconductors for the electronic calculators, Sharp boldly made an investment for the
Advanced Development and Planning Center. The investment was as large as 10.5 billion yen in 1970s. In early 1972, Sharp successfully made a prototype of LCDs and decided to make LCDs as the next strategic product. In June 1973, the company introduced the world’s first COS pocket electronic calculator with an LCD.

Sharp’s first copier was released in 1972. The copier was developed from scratch by a small group of engineers who had little experience in the field. The development of the copier needed to integrate technologies of electronics, optics, mechanics, and chemistry.

As Japan’s consumer electronics market become saturated, the company reorganized its Export Group into the Overseas Business Group in 1970. Its increasing exports of color TVs caused trade friction. To deal with trade friction, Sharp set up a number of manufacturing facilities for re-export in Asia.

Over the 10 years from 1976 to 1985, Sharp made capital investments at home and abroad 500 billion yen and 280 billion yen in research and development. In 1989, Sharp reached to the record high on sales 1.572 trillion yen and on profit 72.4 billion yen; being a trillion yen business.

In 1991, to build a new Sharp towards the 21st century, the company launched the STAR 21 program:

- (S)trategic and Creative Mind
- (T)otal Customer Satisfaction
- (A)dvanced Technology
- (R)apid Action

In the same year, it begins to produce color TFT-LCD. Sharp continued to improve its product and production lines by combining LCD technology and imaging technology. The Kameyama Plant integrating manufacturing of TVs from panel production to final assembly. Kameyama became synonymous with Japanese manufacturing. In 2005 made-in-Kameyama AQUOS models reached a cumulative production of 1 million sets.

In 2007, Machida was appointed Chairman and Katayama was appointed President. The beginning of a two-person executive system was in light of the fact that Sharp’s sales in excess of 3 trillion yen annually. It is difficult for the president to work alone.

In 2009, the plant for the 10th-generation LCD by Sharp Display Products Corporation (SDP) based on Sakai, Osaka became operational with an investment of 380 billion yen.

In 2012, Sharp signed an agreement with Hon Hai to allow Hon Hai to invest 66.9 billion yen of new Sharp shares through a third-party allotment, specifically for SDP. Under the agreement, Hon Hai would procure ultimately up to 50% of the LCD panels and LCD modules by SDP.

By the end of March 31, 2016 (before the partnership with Hon Hai), Sharp’s important statistics of the financial reports for the last five years are summarized in Appendix 1. The currency numbers are million yen. From the statistics, it is found that the Cost of Sales and Administrative Expenses are both stationary and disregarding to the decrement of Net sales. Although the company has cut the labors especially in years 2015 and 2016, the cost of saving was not significant. It turned out that the Net Asset became negative in 2016, because of the huge income loss almost every year. Huge loss of 129,173 million yen in the segment of LCD was the major reason. The company stated that it was because Sales of large-size LCDs for TVs and of small- and medium size LCDs for Chinese smartphones declined [1,3].

### 1.2 History of Hon Hai Precision Industry Co.

Hon Hai was founded by Terry Gou in 1974 as a company making plastic parts, such as channel-changing knobs for black-and-white television sets. It did not experience exponential growth until the late 1990s. In 1996, Hon Hai’s revenue was only half a billion U.S. dollars. Its competitive advantages are on its ability to combine discretion with a solid record of quality control and competitive pricing. Established in 1974, its “Foxconn City” is well known for guarding the identities of Hon Hai’s key customers and strategic partners. And its optimal production operation and in-house manufacturing of many parts for its EMS products have significantly reduced its per unit cost.

By 1995, Dell and other PC companies purchased parts from their suppliers and assembled them in their own factories. Hon Hai created a full production line integrating most of these parts and processes, from the raw steel for PC casings and electrical connectors to the final assembly. Since then, Hon Hai has become Dell’s largest EMS provider. Working closely with PC lead firms, Hon Hai became the world’s largest EMS provider of desktop PCs and PC servers for worldwide global lead-firm customers by 2004. Its strategic partnership with Motorola and Nokia let it became the world’s largest mobile-handset EMS provider with handset-related revenue of $6.3 billion. In addition, it is the major manufacturer of Sony’s PlayStation and Nintendo’s videogame consoles.

Through its China-based company Foxconn International, established in 2000, Hon Hai has been serving almost exclusively as Apple’s EMS provider in the production of iPhones (since 2007) and iPads (since 2010). Hon Hai’s competitive strength in EMS is critical to Apple’s success since the launch of its iPhones. When Steve Jobs announced the first iPhone in 2007, the time-to-market was about six months. Five years later, the time-to-market of new iPhones was reduced to less than two weeks. The achievement is due to Hon Hai’s high performance in manufacturing and supply chain management.

In 2003, Hon Hai entered into the TFT-LCD business through joint ventures with Taiwan’s panel producer Chi Mei Optoelectronics. To further increase its production capacity and technologies in LCD TVs, Hon Hai merged its display-panel firm Innolux with Chi Mei Optoelectronics to become a vertically integrated LCD TV producer in 2010. This vertical integration makes Hon Hai be the strategic partner of brand-name TV firms. In February 2012, Hon Hai was financially strong enough to acquire a 10% stake in Japan’s Sharp and around 40% stake in Sharp Display Products Corporation, a joint company of Sharp and Sony. Later, the Sharp Display Products Corporation was renamed Sakai Display Products Corporation. Hon Hai jointly operate the corporation [2].

### 1.3 Partnership of Hon Hai Company and Sharp Corporation

In April 2016, the Hon Hai acquired Sharp by paying 388.8 billion yen for a two-thirds stake in Sharp [4]. “This is a case of one global company investing in another global company because we know we can complement each other with our unique resources,” Gou said during a news conference held at Sakai Display Products Corporation. The chosen venue was an apparent effort to showcase the two firms’ closeness.[5]. “Through this new strategic alliance and new synergies, we will be able to increase sales, tap into new supply chains and use manufacturing capabilities that will strengthen our global competitiveness,” Sharp President Kozo Takahashi said [5]. Kozo Takahashi later stepped down.
In August 2016, “There is relief over the investment, but there is going to be constant concern whether Sharp can revive itself under Hon Hai amid tough structural challenges in the industry,” said Mitsushige Akino, chief fund manager at Ichiyoshi Investment Management [4]. In addition, at that time Sharp is bracing for more radical restructuring under Gou. A need to further reduce Sharp’s workforce instead of protecting jobs was inevitable in August 2016.

Sharp’s new profit was 4.2 billion yen for the fourth quarter of 2016 with an operating income of 18.8 billion yen. It was the first quarterly profit in two years [6]. Sharp's shares have more than four times in value since August 2016, when Hon Hai bought control of Sharp. The stock price is now in the three-year highest.

3 REVIEW OF SHARP’S FAILURE

Based on the history of Sharp, its careful connections with the demands of the market/customers and bold investment for the development of cutting-edge technologies made it successful every time. However, the success on Kameyama could partially be attributed to extra-large digital TV demands when the government ceased the analog broadcast to digital broadcast. This resulted in an unusual optimal investment in SDP. When the demand returned back to normal, the unused capacity of SDP created a huge financial burden to the company, especially at that time Sharp’s large panels were not common or with the quality that was over the need or the affordability in the overseas market [7].

However, the dual executive in 2009 also indicated the extra-large organization could become a burden for the company management, especially when its return on investment on SDP became a problem.

Lincoln and Gerlach summarize three institutional constraints for Japan’s business organization [8]:

(1) Institutional Inertia: Beyond the simple persistence of obsolete organizational forms, inertial forces cause evolutionary trajectories to be path dependent, bound to courses of development that early choices or events set in motion and so are unresponsive to current conditions.

(2) Institutional Coevolution: A country’s socioeconomic organizational systems coevolve and complement one another in mutually reinforcing ways. Institutional fields such as government, law, education systems, and market organization are of necessity tightly coupled.

(3) Institutional Isomorphism: As economies mature, some organizational forms are identified as best or standard practice. They may represent the careful distillation of accumulated know-how and experience, or they may owe their legitimacy to unconscious and untested cultural assumptions about how the world works. When organizational fields gain wide acceptance as normal and legitimate, they display isomorphism – that is, take on similar observable features whatever the variations in the historical paths or local conditions.

Unfortunately, the three constraints are all seen in Sharp. Sharp Corporation got used to its historical success. When it used the organization management with the above constraints to face the new world with various uncertain in demand and competition, it failed. The carelessness on the R&D investment of large LCD was a reflection of the above institutional constraints.

4 KEY FACTORS OF THE SUCCESSFUL OPERATIONS OF THE ALLIANCE

In this section, we summarizes the key factors for the successful operations of new Sharp as follows.

• Cost Reduction and Efficiency in Organizational Management

The company attributed the positive profit to cost cutting, which offset weaker revenue from slowing sales of display panels and camera parts. “Decision making has sped up under new management, which is the biggest contributor to the turnaround,” Executive Vice President Katsuaki Nomura told Reuters at an earnings briefing. “This has also sped up the pace of balance sheet improvement.” [6]

• Revolution on Human Resource Management

Under the new Sharp President Tai’s leadership, the company introduced a merit-based bonus paid separately at a different time from the traditional summer and winter bonuses. Some workers received several hundred thousand yen as a special bonus. Sharp also plans to reward talented recruits generously. The company will introduce a system that raises the monthly salary of high-performing new employees after the initial six months [9].

In addition, new Sharp President Tai established a presidential office with 200 people to centrally control the management of the corporation. Only one of the original twenty-two executive officers was maintained in the position to reduce large salary expenses of the executive level [10].

• Gain of Customer Orders

Hon Hai is a global EMS company. Besides its efficiency in manufacturing, its business relationship with the customers and customer order management are both superb. When Hon Hai was jointly operating SDP, it immediately gains the orders from Vizio in the USA and from SONY.

New Sharp also takes advantages of Hon Hai’s relationships with the first tier companies to gain orders from those companies.

• Increasing Price of LCD from SDP

Before the alliance, Sharp supplied Samsung LCD with low price. After the alliance, Sharp has stable customer orders from Vizio, SONY, and others. Sharp decided to halt LCD TV supply to Samsung [11], because of the unacceptable low price with Samsung and because of the fully occupied capacity in SDP.

• Terminating the Unfair Material Supply Contracts

Before the alliance, Sharp’s long-term contracts with the material suppliers in various kinds (e.g., multicrystalline silicon for the solar cells) are usually with high price because Sharp did not have bargaining power with the supplier. As Hon Hai is the world No. 1 EMS, its demands in various business sectors let the new Sharp has the power to terminate the unfair contracts and re-negotiate with the suppliers for the better price.

• Careful Control the Expenses of the Organization

New Sharp carefully controls the expenses of the organization. Sharp terminated the subsidiaries if they are with maturity in technology and stable cash flow income, or if their performance is unexpectedly low. The subsidiaries were merged in new Sharp to reduce the unnecessary managerial costs. Dissolution of SD Future Technology Co. is an example [12].

5 CAN THE SHARP’S FAILURE BE AVOIDED?

This research intended to answer the questions from two perspectives: Sharp’s growth history and financial statements in Appendix 1.
In 1973, Sharp’s Basic Business Principles includes five key ideas: to develop unique technologies; to create the best products; to remain committed to customer-oriented sales; to build cooperative relationships for mutual prosperity; and to equate the growth of the company with the happiness of everybody. In 1991, to build a new Sharp towards the 21st century, the company launched the STAR 21 program: Strategic and Creative Mind, Total Customer Satisfaction, Advanced Technology, and Rapid Action. In both 1973 and 1991, Sharp reviewed the company’s history and stated the values of the company for the future. In both times, when Sharp mentioned advanced technology, it mentioned customer-oriented sales. The wisdom to keep the balance between the investment of new technology and market demand was one of the success factor. Unfortunately, the company obviously ignored the credo. Sharp optimistically viewed the temporary demand of extra-large digital TV owing to the cease of the analog broadcast as the real market demand. That results in a bold investment on the LCD business segment.

In Appendix 1, the financial statement shows that the operating incomes were negative except 2014. The positive operating income in 2014 is owing to the increase of gross profit and savings of administrative expenses. Sharp was working hard to change its financial structure by issuing new shares through Third-Party Allotment from 2012 to 2014 [13]. Unfortunately, the striving for success only occurred in 2014. In the Annual Report of 2016, it indicated that the annual R&D expenditure still maintained fixed at about 135,000 million yen from 2012 to 2016. The company never reduce capital investment. The capital investment still maintained at 45,240 million yen in 2016, when the Net Asset was actually negative. The above evidence and the stationary level of Administrative Expenses in the five years shows that there was no feedback loop to adjust the company’s investment and expenses.

The uncontrollable investment and expenses results in the loss of Net Asset. If the company could figure out the major problem actually was the organizational management, not the low demand and price of LCDs or the poor financial structure, the sorrow could be avoided.

6 DISCUSSION
This paper presents the histories of both Sharp and Hon Hai. From the study, it is found Sharp as a century company has gone through many challenges. Every time, its new invention in products and technologies that sharply meet the needs of the customers can always create great return in profit and move the company up.

In 1972, the decision to develop LCD was correct, because there is always a demand on the display device. However, since 2007 its organization showed inefficiency and required dual executive officers. The highly competitive LCD market push Sharp to decide to take a further lead in the technology and to invest 380 billion yen in the 10th generation LCD plant in Sakai, Osaka. The investment decision was partially influenced by the government’s promotion to switch to digital TVs. Hence, the investment decision was not sound because it was based on that Sharp chased the market needs not based on the tradition that customers chased Sharp’s new products.

Sharp’s reluctance to accept the acquisition from Hon Hai was reasonable. After all, it represented the pride of Invent- and Make-in-Japan for a century. However, considering its negative net asset in March 2016, Hon Hai is probably the only company that can save Sharp financially and in reality. First, Hon Hai is efficient in management and manufacturing. Second, Hon Hai’s superb management in supply chain and huge power in negotiation resulting from networks of suppliers and buyers, and super large scale of purchasing orders. Third, Hon Hai can find new buyers that Sharp cannot. Certainly the success of the alliance was partially due to the large market demand of LCD in the late 2016 and early 2017.

7 CONCLUSION
Sharp’s lesson cost too much and deserved managers/researchers to study on it. First, risk management on finance is critical. The numerous successes in the history has made Sharp’s investment in LCD with less care. The balance between the investment and market demand obviously was not carefully evaluated. Second, organization’s isomorphism could blind the company and put unrealistic imagination for the future in the market demand. Until 2016, Sharp’s R&D investment and administration expenses had never reduced much. Third, organization inertia could delay the cure of the serious problem. The only response by introducing Third-Party Allotment was obviously not strong enough to save the company.

As for the new Sharp, there are many challenges in front of it. After all, Hon Hai’s core competence is in manufacturing and supply chain management. To manage a company with brand-name products and sales channels with different segments is new to Hon Hai. Until now, Hon Hai has successfully gained the trust of most of the employees, and reduced the costs and expenses. How to upgrade the value of products for the customers in different segments and how to successfully compete in the markets are both new to Hon Hai. In the meantime, the new Sharp is still facing the debt of 1.5 trillion yen. How to financially not only operationally revive is another challenge. However, the so-far success already lay a foundation to lead the new Sharp to the bright future. Its success will demonstrate an example that a global company may need a help from another global company not from the government, because the business crisis may be so large that no government is eligible to help.

8 ACKNOWLEDGMENTS
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9 REFERENCES
Appendix 1: Sharp’s share value in five years from Financial Times
Appendix 2: Sharp’s important statistics of the financial reports for years 2012 to 2016

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sales</td>
<td>2,455,850</td>
<td>2,478,586</td>
<td>2,927,186</td>
<td>2,786,256</td>
<td>2,461,589</td>
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<tr>
<td>Cost of Sales</td>
<td>2,043,842</td>
<td>2,218,003</td>
<td>2,396,344</td>
<td>2,397,749</td>
<td>2,228,277</td>
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<tr>
<td>Gross Profit</td>
<td>412,008</td>
<td>260,583</td>
<td>530,842</td>
<td>388,507</td>
<td>233,312</td>
</tr>
<tr>
<td>Gross Profit/Net Sales</td>
<td>16.78%</td>
<td>10.51%</td>
<td>18.13%</td>
<td>13.94%</td>
<td>9.48%</td>
</tr>
<tr>
<td>Selling, General and Administrative Expenses</td>
<td>449,560</td>
<td>406,849</td>
<td>422,282</td>
<td>436,572</td>
<td>395,279</td>
</tr>
<tr>
<td>Selling, General and Administrative Expenses/Net Sales</td>
<td>18.31%</td>
<td>16.41%</td>
<td>14.43%</td>
<td>15.67%</td>
<td>16.06%</td>
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<tr>
<td>Cost of Sales + Expenses</td>
<td>2,493,402</td>
<td>2,624,852</td>
<td>2,818,626</td>
<td>2,834,321</td>
<td>2,623,556</td>
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<tr>
<td>Operating Income</td>
<td>-37,552</td>
<td>-146,266</td>
<td>108,560</td>
<td>-48,065</td>
<td>-161,967</td>
</tr>
<tr>
<td>Operating Income/Net Sales</td>
<td>-1.53%</td>
<td>-5.90%</td>
<td>3.71%</td>
<td>-1.73%</td>
<td>-6.58%</td>
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<tr>
<td>Total Assets</td>
<td>2,614,135</td>
<td>2,087,763</td>
<td>2,181,680</td>
<td>1,961,909</td>
<td>1,570,672</td>
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<tr>
<td>Liabilities</td>
<td>1,969,015</td>
<td>1,952,926</td>
<td>1,974,507</td>
<td>1,917,394</td>
<td>1,601,883</td>
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<tr>
<td>Liabilities/Total Assets</td>
<td>75.32%</td>
<td>93.54%</td>
<td>90.50%</td>
<td>97.73%</td>
<td>101.99%</td>
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<tr>
<td>Net Assets</td>
<td>645,120</td>
<td>134,837</td>
<td>207,173</td>
<td>44,515</td>
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<td>Thousands of Shares (Common Stock)</td>
<td>1,100,324</td>
<td>1,166,224</td>
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<td>1,690,733</td>
<td>1,690,678</td>
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<tr>
<td>Number of Employees</td>
<td>56,756</td>
<td>50,647</td>
<td>50,253</td>
<td>49,096</td>
<td>43,511</td>
</tr>
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Note: currency numbers are million yen.