Werner Von Siemens: Transpirational Leader on Leading the Revolution

Palin Phoocharoon

Abstract**—**To create a competitive edge, firm needs a strategy that is both creative and practical. The rapid technology change, increased global competition, and greater customer sophistication have made leader more difficult to execute than ever before. In 1847, young engineer created his path for others to follow and played a major role in determining the course of the industrial revolution in 19th century. Rather than follow others, he employ his knowledge to the best practical advantage, led to innovate that revolutionize the technology of the age, some of them still influence our lives today. Werner Von Siemens and his vision established him as a true and resourceful advocate of contemporary technology. His characteristics is reflected in his genius management has earned him a place among the great pioneer of the industrial revolution.

Keywords**---**Transpirational leader, innovation, pioneering spirit, and entrepreneurship

I. Introduction

TWO centuries ago when Scottish engineer Jame Watt (1736-1819) innovated "steam-engine or fire-engine". The world has been changed significantly to the age of the industrial revolution. This transition had shifted the way of production from hand to machines, new chemical manufacturing, steel production processes and also change from wood to bio-fuel to coal. Industrial revolution redefined new aspect of diary life and influence average income, standard of living and economic growth. It already initiated the era of capitalism. This new invention of mankind was debatable in the real impact of the revolution, particularly under the early capitalism period. Industrial revolution began in Great Britain and spread to Western Europe and the United Stated within a few decade. While Western Europe experience the new world of pioneering and discovering the new economy and creating the wealth of their nations. Germany, in 1806, was economically and politically powerless and divided and largely focused on agriculture. Up until the mid of 19th century very few German names appeared among the great pioneers on contribution of the revolution. This was the world, characterized by intellectual and material upheaval, into which Werner Siemens was born, a man whose life-work contributed greatly to the industrial revolution in Germany and moreover inspired others to lead the industrial revolution.

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II. Transpirational Leader

The concept of leadership has drawn heightened attention in the process of the industrial revolution. In particular, the emphasis has been on transformational leader [1], which has been termed as visionary [2], [3], charismatic [4], or new leadership [5]. Over two decade that researcher focused their attention to address how transformational leaders develop, communicate, and implement a vision. As a result, researchers interested in either intrapersonal [6] or interpersonal [1], aspects of transformational process than organizational development and innovation aspects [7]. To address this limitation of existing research, this case presented the extended nature of contextual influences and implications for transformational leader by introducing transpirational leadership concept to highlight the collective influences of all prominent factors.

Transpirational leader is the next step of transformational leader, which is currently the most influence accepted leadership paradigm for the past two decades. The transformational form of leadership is characterized by leaders' are closely engaging with followers, motivating them to perform beyond traditional practices. Podsakoff, MacKenzie, Moorman, & Fetter [8] defined the characteristics and conceptualize transformational leadership behavior as following; 1) articulating a vision of the future, 2) fostering group-oriented work, 3) setting high expectations to become champion, 4) challenging followers' creative thinking, 5) supporting followers' individual needs, and 6) acting as a role model. Recently the world has changed significantly. Thus, it would be reasonable to assume that while the antecedents of business environment are likely difference, transformational leadership behavior may require additional unique characteristics to fit with current situation. Therefore, transpirational leadership is purposed and applied to Werner Siemens leadership behavior.

Transpirational leadership behavior has special characteristics additional to transformation leadership behavior by characterized when leader 1) focusing more on energizing followers' internal drive, 2) inspiring on radical change, 3) motivating through self-realization incentive, 4) motivating through spiritual-stimulation to shift standard of living in new platform, and 5) inspiring of transforming business purpose to socio-economic benefits to promote sustainable growth. This study provides empirical support for the contribution of new initiate concept of business means and end of transpirational leader.

III. The Beginning And The Internal Drive

German inventor and industrialist of the 19th century, Werner von Siemens was born at Lenthe, Hanover, Germany, on 13 December 1816. He was the oldest son of family and of his four brothers and five sisters. His family has lived in the same region since the 14th century; in Lower Saxony, in the northern Harz mountains and foreland, specifically in the old Free Imperial City of Goslar. In his early life, Siemens and his younger brothers and sisters were first taught by grandmother Deichmann [9]. Siemens was influenced most of all during his home studies in 1829 by a tutor named Sponholz, whose inspired stories about Germany's past made a particular impression on him.

Especially, one which captured the thirteen-year-old's imagination and made a lasting impression on him was the success of the House of Fugger, a family of bankers who, by the time medieval Europe was entering the modern era, had achieved a position of power and established a large commercial empire which for more than 100years had been the fulcrum of early capitalist activities in Southern Germany [10]. Werner Siemens enthused about founding of a world-wide company in the spirit of the Fugger family. This success story had helped mold the young man's character and constantly inspired him to be energetic and enterprising in his later life

Werner Siemens did not complete the tradition elementary schooling but chose to join the army to undertake training in engineering instead. For three years he was a pupil in the Military Academy at Berlin. In 1838 at age of 22, he earned his living as lieutenant in the artillery, and six years later he accepted the post of supervisor of the artillery workshops. In 1846 he had the task of defending the port of Kiel against the Danish fleet, and as commandant of Friedrichsort built the fortifications for the defense of Eckernforde harbor. The same year he was entrusted with the laying of the first telegraph line in Germany, which between Berlin and Frankfort-on-Main, and with that work his military career came to an end. Fortunately, he found some important interest in his life from military orientation [10], [11].

IV. Physics Orientation If Young Inventor

In 1842 Werner Siemens invented a galvanic method of gold and silver plating, based on a discovery made by Professor Jacobi in St. Petersburg. This invention played an important role in Werner's career more than one ever expect. His first hand at electro-technical experiment provided him his first patent. His life in the army gave him a comprehensive education to become the leader of revolution. Second-lieutenant Werner Siemens continued his scientific pursuits. He seldom took part in the leisure-time activities with his fellow officers because he was much happier in his world of scientific investigation and study [12].

Berlin at that time had a good many facilities for those wishing to engage in technical and scientific pursuits or who were interested in further education in this field. Beuth's technical college and the Polytechnical Association was welcome everyone to attend the classes and normally gave the lectures in a language which the layman could understand. Particularly, Professor Gustav Magnus (1820-1870) were among the one that inspire him. Werner Siemens attended his class and realized his interest of physic. In 1845, Professor Magnus and young Werner Siemens with his associate decided to form themselves into the "Physics Society" name "Magnus Institute". Magnus Institute became a focal point of scientific research in Germany and became a source of new vitality of many other institutes of learning and research [10] [12].

Werner Siemens was the one that most energetic among young scholars. This opportunity brought him an opportunity to electrical telegraphy: a telecommunication system that created a big shift in that period. He discovered and achieved the experiment of automatic electrical controlled synchronism between sender and receiver to improve the effectiveness of telegraph. Werner Siemens pursued his invention by develop an entire system incorporating all the prerequisites for an efficient and serviceable telecommunication network. In 1846, his military assignment was to lay the first telegraph line in Germany, which between Berlin and Frankfort-on-Main, and with that work his military career came to an end.

V. Young Entrepreneur

In 1846, Werner Siemens gave a lecture on the subject at the Institute of Physics, one member of his audience, Johann George Halske was impressed. His inspiration on Physics fostered him to think about creating a company. Therefore, Warner Siemens and Johann Georg Halske found the "Siemens & Halske Telegraph Construction Co." on October 1, 1847 in Berlin. He still served at the army as the officer at that time. It seems rather odd that someone could be an officer on active duty and a company director at the same time. Thus, He intended to start business fully and fully participate until he had left the army [10], [14].

The company intensively focused to produce carriage-mounted inductors for use to improve in electric power supply. With the industrial development, Berlin had changed during the past quarter-century into aspiring center of machine construction. By contrast, Siemens & Halske focused in precision mechanics optics and watch making. It was concerned not only with production but also with invention and development. By 1847, Siemens built his own version of telegraph that was significantly superior to any previous constructed. Instead of requiring the use of Morse code, Siemens device was capable of transmitting message letter by letter and set the stage of pointer telegraph. The same year Siemens pioneered the use of the latex-derivative gutta-percha to insulate electrical cables. Siemens built the army's first underground telegraph line [9], [10], [11]. After experiencing the establishment of several more telegraph lines for the army, Siemens resigned from the military to concentrate on his own entrepreneurial venture. Berlin-Frankfurt, the company's first telegraph line, was built [14].

VI. From Local To Global

After the first project operated successfully, Siemens & Halske expanded its business in Russia. In 1851, Siemens & Halske had already supplied 75 recording telegraphs for Russia's electric telegraph between Moscow and St. Petersburg. Next decade later, Siemens & Halske laid key

telegraph lines in Germany, and built Russian telegraph network that connect Baltic Sea to Black Sea and constructed an Indo-European telegraph line between London and Calcutta [10], [11].The Construction of Indo-European telegraph line was widely acclaimed as a great engineering competence and a monument to enterprise.

These created the engineering competency of Siemens for new global opportunities. The big growth of Siemens & Halske was aggressive and commit into many big projects. Big orders, mostly from Britain and Russia in 1857, forced company to start serial production and to introduce piece-work, which went against the grain of Halske's philosophy. He had the sensitivity of an artist and craftsman's respect for individuality. The impersonality of mass-production was beyond his concern of quality and precision. Halske decided to leave the company at the end of 1867. Werner adopted a shorter name to "Siemens AG".

VII. New Innovation "Dynamo"

Werner Siemens celebrated his 50th birthday in the autumn of 1866. In the same year, he invented the most important discovery in his scientific career the electro-dynamic principle. The originality ideas of new innovation occurred since the day of telegraph-line construction in Russia [9], [10], [11]. Siemens had been particularly interested in the problem of generating continuous current and high voltage by mechanical means rather than power from DC batteries.

The success of new innovation happen when he further developed double-T armature which he had designed ten year ago which provided the basic continuous AC machine. The machine had been used in the magnetic dial telegraphs supplied to the Bavarian State Railways, and was also employed in railway bell mechanism and later in telephones and detonators [10]. Thus, he built an inductor in which the double-T armature was routed between the poleshoes of a soft-iron electromagnet with a very narrow air-gap. He used the current generated in the rotating armature as an energizing current for the field magnets by forming a single circuit out of and armature winding, energizing winding and external circuit.

Although others had worked independently on the same innovation either before Werner Siemens or almost simultaneously, all accepted that Werner Siemens was the first to fully appreciate the significance of the electro-dynamic principle. The confirmation expressed clearly on his paper and was read by Professor Gustav Magnus on January 17, 1867: "Technical science now has the means of generating electric current of unlimited strength, cheaply, and conveniently, and at any place where driving power is available. This fact will prove to be of considerable importance in several directions"

The discovery of dynamo did not provide wealth to Werner Siemens overnight. To develop the perfect dynamo, it took many years to complete. Siemens had to get back to company traditional business of overland telegraphy, submarine cables and after 1870, signaling equipment for the railways. These gave opportunities for company to explore new challenge growth.

VIII. Transatlantic Cables And Cable-Ship "Faraday"

In 1873, Siemens had signed two contracts, one for a cable along the coast of Brazil, for which a ship was chartered, and another for a direct cable link between Ireland and New York which, unlike previous cables, was to be landed on US territory without crossing Newfoundland in Canada. This commitment was disturbed Siemens on worrying that he might unable to fulfill the obligations. Finally, in February 1874, the cable-ship, of weight: 4917 gross ton by displacement, length: 361 ft.., width: 52 ft., draught: 26 ft. fully laden, seed: 10.5 knots, "Faraday", began its mission [10], [12]. The laying of the main cable was started in September 1874 on the west coast of Ireland near Ballinnskellig's Bay. Werner moved into the local coastguard station to be able to monitor the system test of the cable. During the operation, they faced many problems one was the cable broke down and sank into the great depth than the height of Mt. Blanc, which could have hidden its 15,780 feet in the ocean. But, they solved the problem professionally and finally DUS (Direct United States) cable ready for acceptance in 1875. The operation confirmed the correctness of Werner's theories on cable laying, which he had developed way back in 1857, as well as paving the way for even better methods of manufacturing and laying deep-sea cables. These convinced others state enterprises and eliminate the competitor in deep-sea cable business. Ten years later, Siemens operated another five transatlantic cables [10].

IX. Living For Others

Space has already been given to the public-spirited manner in which Werner Siemens chose to devote himself to society and politics on campaigning for patent legislation to his pursuits as a scientist, engineer and industrialist. It has been convinced that Werner Siemens strongly flavored independent management with sole responsibility for the company's well-being particularly workforce. Thus, he turned his attention to the need for industrial welfare and made practical contributions toward solving the problems of which he, as an industrialist, had first-hand experience. The constructive measures which he introduced included the initiating of relief fund (1868), the reduction of working-hours from 9-hr. per day in 1873-to 8.5 hr. per day in 1888 [11], [12]. His good mind and big heart stemmed not from religious, patriarchal or philosophical considerations but solely from a hard-headed appreciation of what was best for the new industrial society that was emerging. On the occasion of Siemen's 25th anniversary in 1872, a pension fund was inaugurated with the aim of benefitting both workers and management by reducing the turn-over rate [10].

X. Built Till Last

In 1870, one of Siemens internal drive was electric traction. Siemens invented an electric locomotive that could travel at the speed of 10 miles per hour. Siemens appreciated in his new invention deeply and presented his electrical train in the Industrial Exposition in Berlin in 1879, and two years later his company built the first commercially operating electric railway system [10], [12], [14]. The system became the revolution of

locomotive through the magnetic train of Siemens with the speed of over 500 mile/hr. today.

At an age when he was closer to retirement, Werner Siemens intended to build an institute that solely devote to pure physical research. Although the idea of founding state-supported institute of precision engineering had been discussed since 1872, ten years of discussion had not produced any advances. In petition which he addresses to the Prussian Government in 1883 he wrote the following timeless statement: "Research is the firm foundation of technological progress; a country' s industry has no hope of attaining an international, leading position and sustaining itself unless it is in the forefront of scientific research. Helping it to get there is the most effective way to raise industry to such heights [10]".

Eventually, National Physical-Technical Institute (PTR) was founded. Helmholtz, Germany's leading physicist at that time, became the first president of the Institute in 1887. At the turn of the century the Institute became a model for similar projects in America and Britain, and the founding in 1910 of Kaiser Wilhelm Society-later renamed the Max Planck Society-provided a logical complement of the PTR. National and nowadays, supra-national basic research establishment owe a great deal of the pioneering efforts of Werner Siemens.

XI. The Momorable Ofleader On Leading The Revolution

Having examined all evidences, we are called upon to learn from Werner Siemens, as a proactive learner, pioneer thinker and innovator of the modern era. His work inspired most scientists to a very large extent by the status accorded to science and technology. His attempts and efforts was significantly responsible for the emergence of Germany in the mid of 19th century as a modern industrial nation which positioning ever greater heights in the world of trade and earned international respect for its core competence "craftsmanship". In 1888, Emperor Friedrich II elevated him to the rank of nobility "von" in his appellation late in his life.

Werner Von Siemens died in Charlottenburg, Berlin, on December 6, 1892. His descendent have carried on his work and his inspiration in the same spirit, constantly adapting oneself to shift and transform Siemens to become one of the biggest global enterprises listed in FORTUNE 500. Siemens business is now on the 167th years of contributing and inspiring Siemens's fruits of thought and electrical engineering experience to the world of business and well-being of mankind.

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