Chapter 1 : History of technology - The Industrial Revolution (â€“) | www.nxgvision.com

Successful industrial innovations: a study of factors underlying innovation in selected firms Sumner Myers, Donald George Marquis, National Science Foundation (U.S.) National Science Foundation; [for sale by the Supt. of Docs., U.S. Govt. Print.

However, although Engels wrote in the s, his book was not translated into English until the late s, and his expression did not enter everyday language until then. Credit for popularising the term may be given to Arnold Toynbee , whose lectures gave a detailed account of the term. This is still a subject of debate among some historians. Important technological developments The commencement of the Industrial Revolution is closely linked to a small number of innovations, [24] beginning in the second half of the 18th century. By the s the following gains had been made in important technologies: Textiles â€" mechanised cotton spinning powered by steam or water increased the output of a worker by a factor of around The power loom increased the output of a worker by a factor of over The adaptation of stationary steam engines to rotary motion made them suitable for industrial uses. Iron making â€" the substitution of coke for charcoal greatly lowered the fuel cost of pig iron and wrought iron production. The steam engine began being used to pump water to power blast air in the mid s, enabling a large increase in iron production by overcoming the limitation of water power. It was later improved by making it double acting, which allowed higher blast furnace temperatures. The puddling process produced a structural grade iron at a lower cost than the finery forge. Hot blast greatly increased fuel efficiency in iron production in the following decades. Invention of machine tools â€" The first machine tools were invented. These included the screw cutting lathe , cylinder boring machine and the milling machine. Machine tools made the economical manufacture of precision metal parts possible, although it took several decades to develop effective techniques. Textile manufacture during the Industrial Revolution British textile industry statistics In Britain imported 2. In raw cotton consumption was 22 million pounds, most of which was cleaned, carded and spun on machines. Value added by the British woollen industry was Cotton factories in Britain numbered approximately in In approximately one-third of cotton cloth manufactured in Britain was exported, rising to two-thirds by In cotton spun amounted to 5. In less than 0. In there were 50, spindles in Britain, rising to 7 million over the next 30 years. In tropical and subtropical regions where it was grown, most was grown by small farmers alongside their food crops and was spun and woven in households, largely for domestic consumption. In the 15th century China began to require households to pay part of their taxes in cotton cloth. By the 17th century almost all Chinese wore cotton clothing. Almost everywhere cotton cloth could be used as a medium of exchange. In India a significant amount of cotton textiles were manufactured for distant markets, often produced by professional weavers. Some merchants also owned small weaving workshops. India produced a variety of cotton cloth, some of exceptionally fine quality. Sea island cotton grew in tropical areas and on barrier islands of Georgia and South Carolina, but did poorly inland. Sea island cotton began being exported from Barbados in the s. Upland green seeded cotton grew well on inland areas of the southern U. The Age of Discovery was followed by a period of colonialism beginning around the 16th century. Following the discovery of a trade route to India around southern Africa by the Portuguese, the Dutch established the Verenigde Oostindische Compagnie abbr. VOC or Dutch East India Company and the British founded the East India Company , along with smaller companies of different nationalities which established trading posts and employed agents to engage in trade throughout the Indian Ocean region and between the Indian Ocean region and North Atlantic Europe. One of the largest segments of this trade was in cotton textiles, which were purchased in India and sold in Southeast Asia, including the Indonesian archipelago, where spices were purchased for sale to Southeast Asia and Europe. Indian textiles were in demand in North Atlantic region of Europe where previously only wool and linen were available; however, the amount of cotton goods consumed in Western Europe was minor until the early 19th century. Earlier European attempts at cotton spinning and weaving were in 12th century Italy and 15th century southern Germany, but these industries eventually ended when the supply of cotton was cut off. The Moors in Spain grew, spun and wove cotton beginning around the 10th century. Occasionally the work was done in the workshop of a master weaver. Under the putting-out system, home-based workers produced under contract to merchant sellers, who often supplied the raw materials. Using the spinning wheel , it took anywhere from four to eight spinners to supply one hand loom weaver. The technology was developed with the help of John Wyatt of Birmingham. Paul and Wyatt opened a mill in Birmingham which used their new rolling machine powered by a donkey. This operated until about A similar mill was built by Daniel Bourn in Leominster , but this burnt down. Both Lewis Paul and Daniel Bourn patented carding machines in Based on two sets of rollers that travelled at different speeds, it was later used in the first cotton spinning mill. Model of the spinning jenny in a museum in Wuppertal. Invented by James Hargreaves in , the spinning jenny was one of the innovations that started the revolution. In in the village of Stanhill, Lancashire, James Hargreaves invented the spinning jenny , which he patented in It was the first practical spinning frame with multiple spindles. The jenny produced a lightly twisted yarn only suitable for weft , not warp. The design was partly based on a spinning machine built for Thomas High by clockmaker John Kay, who was hired by Arkwright. The roller spacing was slightly longer than the fibre length. Too close a spacing caused the fibres to break while too distant a spacing caused uneven thread. The top rollers were leather-covered and loading on the rollers was applied by a weight. The weights kept the twist from backing up before the rollers. The bottom rollers were wood and metal, with fluting along the length. A horse powered the first factory to use the spinning frame. Arkwright and his partners used water power at a factory in Cromford, Derbyshire in , giving the invention its name. The only surviving example of a spinning mule built by the inventor Samuel Crompton. The mule produced high-quality thread with minimal labour. Mule implies a hybrid because it was a combination of the spinning jenny and the water frame, in which the spindles were placed on a carriage, which went through an operational sequence during which the rollers stopped while the carriage moved away from the drawing roller to finish drawing out the fibres as the spindles started rotating. Mule spun thread was of suitable strength to be used as warp, and finally allowed Britain to produce highly competitive yarn in large quantities. In he patented a two-man operated loom which was more conventional. Samuel Horrocks patented a fairly successful loom in Eli Whitney responded to the challenge by inventing the inexpensive cotton gin. A man using a cotton gin could remove seed from as much upland cotton in one day as would previously, working at the rate of one pound of cotton per day, have taken a woman two months to process. He is credited with a list of inventions, but these were actually developed by such people as Thomas Highs and John Kay ; Arkwright nurtured the inventors, patented the ideas, financed the initiatives, and protected the machines. He created the cotton mill which brought the production processes together in a factory, and he developed the use of power â€” first horse power and then water power â€”which made cotton manufacture a mechanised industry. Other inventors increased the efficiency of the individual steps of spinning carding, twisting and spinning, and rolling so that the supply of yarn increased greatly. Before long steam power was applied to drive textile machinery. Manchester acquired the nickname Cottonopolis during the early 19th century owing to its sprawl of textile factories. However, the high productivity of British textile manufacturing allowed coarser grades of British cloth to undersell hand-spun and woven fabric in low-wage India, eventually destroying the industry. Productivity improvement in wool spinning during the Industrial Revolution was significant but was far less than that of cotton. Lombe learned silk thread manufacturing by taking a job in Italy and acting as an industrial spy; however, because the Italian silk industry guarded its secrets closely, the state of the industry at that time is unknown. The burning coal remained separate from the iron and so did not contaminate the iron with impurities like sulphur and silica. This opened the way to increased iron production. Cast iron retaining plates; H. Bridge wall UK iron production statistics Bar iron was the commodity form of iron used as the raw material for making hardware goods such as nails, wire, hinges, horse shoes, wagon tires, chains, etc. A small amount of bar iron was converted into steel. Cast iron was used for pots, stoves and other items where its brittleness was tolerable. Most cast iron was refined and converted to bar iron, with substantial losses. Bar iron was also made by the bloomery process, which was the predominant iron smelting process until the late 18th century. In the UK in there were 20, tons of cast iron produced with charcoal and tons with coke. In charcoal iron production was 24, and coke iron was 2, tons. In the production of charcoal cast iron was 14, tons while coke iron production was 54, tons. In charcoal cast iron production was 7, tons and coke cast iron was , tons. In the UK was making

, tons of bar iron with coke and 6, tons with charcoal; imports were 38, tons and exports were 24, tons. In the UK did not import bar iron but exported 31, tons. For a given amount of heat, coal required much less labour to mine than cutting wood and converting it to charcoal, [46] and coal was much more abundant than wood, supplies of which were becoming scarce before the enormous increase in iron production that took place in the late 18th century. Low sulfur coals were known, but they still contained harmful amounts. Conversion of coal to coke only slightly reduces the sulfur content. Another factor limiting the iron industry before the Industrial Revolution was the scarcity of water power to power blast bellows. This limitation was overcome by the steam engine. These were operated by the flames playing on the ore and charcoal or coke mixture, reducing the oxide to metal.

Chapter 2 : 5 Successful Open Innovation Examples

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The Industrial Revolution â€” The term Industrial Revolution, like similar historical concepts, is more convenient than precise. It is convenient because history requires division into periods for purposes of understanding and instruction and because there were sufficient innovations at the turn of the 18th and 19th centuries to justify the choice of this as one of the periods. The term is imprecise, however, because the Industrial Revolution has no clearly defined beginning or end. The term Industrial Revolution must thus be employed with some care. It is used below to describe an extraordinary quickening in the rate of growth and change and, more particularly, to describe the first years of this period of time, as it will be convenient to pursue the developments of the 20th century separately. The Industrial Revolution, in this sense, has been a worldwide phenomenon, at least in so far as it has occurred in all those parts of the world, of which there are very few exceptions, where the influence of Western civilization has been felt. Beyond any doubt it occurred first in Britain, and its effects spread only gradually to continental Europe and North America. Equally clearly, the Industrial Revolution that eventually transformed these parts of the Western world surpassed in magnitude the achievements of Britain, and the process was carried further to change radically the socioeconomic life of Asia, Africa, Latin America , and Australasia. The reasons for this succession of events are complex, but they were implicit in the earlier account of the buildup toward rapid industrialization. Partly through good fortune and partly through conscious effort, Britain by the early 18th century came to possess the combination of social needs and social resources that provided the necessary preconditions of commercially successful innovation and a social system capable of sustaining and institutionalizing the processes of rapid technological change once they had started. This section will therefore be concerned, in the first place, with events in Britain, although in discussing later phases of the period it will be necessary to trace the way in which British technical achievements were diffused and superseded in other parts of the Western world. Power technology An outstanding feature of the Industrial Revolution has been the advance in power technology. At the beginning of this period, the major sources of power available to industry and any other potential consumer were animate energy and the power of wind and water, the only exception of any significance being the atmospheric steam engines that had been installed for pumping purposes, mainly in coal mines. It is to be emphasized that this use of steam power was exceptional and remained so for most industrial purposes until well into the 19th century. Steam did not simply replace other sources of power: The same sort of scientific inquiry that led to the development of the steam engine was also applied to the traditional sources of inanimate energy, with the result that both waterwheels and windmills were improved in design and efficiency. Numerous engineers contributed to the refinement of waterwheel construction , and by the middle of the 19th century new designs made possible increases in the speed of revolution of the waterwheel and thus prepared the way for the emergence of the water turbine, which is still an extremely efficient device for converting energy. Windmills Meanwhile, British windmill construction was improved considerably by the refinements of sails and by the self-correcting device of the fantail, which kept the sails pointed into the wind. Spring sails replaced the traditional canvas rig of the windmill with the equivalent of a modern venetian blind, the shutters of which could be opened or closed, to let the wind pass through or to provide a surface upon which its pressure could be exerted. In mills equipped with these sails, the shutters were controlled on all the sails simultaneously by a lever inside the mill connected by rod linkages through the windshaft with the bar operating the movement of the shutters on each sweep. The control could be made more fully automatic by hanging weights on the lever in the mill to determine the maximum wind pressure beyond which the shutters would open and spill the wind. Conversely, counterweights could be attached to keep the shutters in the open position. With these and other modifications, British windmills adapted to the increasing demands on power technology. But the use of wind power declined sharply in the 19th century with the spread of steam and the increasing scale of power utilization. Windmills that had satisfactorily provided power for small-scale industrial processes were unable to compete with the production of large-scale steam-powered mills. Steam engines Although the qualification regarding older sources of power is important, steam became the characteristic and ubiquitous power source of the British Industrial Revolution. Little development took place in the Newcomen atmospheric engine until James Watt patented a separate condenser in , but from that point onward the steam engine underwent almost continuous improvements for more than a century. By keeping the cylinder permanently hot and the condenser permanently cold, a great economy on energy used could be effected. This brilliantly simple idea could not be immediately incorporated in a full-scale engine because the engineering of such machines had hitherto been crude and defective. The backing of a Birmingham industrialist, Matthew Boulton , with his resources of capital and technical competence, was needed to convert the idea into a commercial success. During the quarter of a century in which Boulton and Watt exercised their virtual monopoly over the manufacture of improved steam engines, they introduced many important refinements. Basically they converted the engine from a single-acting i. The rotary action engine was quickly adopted by British textile manufacturer Sir Richard Arkwright for use in a cotton mill, and although the ill-fated Albion Mill, at the southern end of Blackfriars Bridge in London, was burned down in , when it had been in use for only five years and was still incomplete, it demonstrated the feasibility of applying steam power to large-scale grain milling. Many other industries followed in exploring the possibilities of steam power, and it soon became widely used. This development came quickly once these patents lapsed in The Cornish engineer Richard Trevithick introduced higher steam pressures , achieving an unprecedented pressure of pounds per square inch 10 kilograms per square centimetre in with an experimental engine at Coalbrookdale, which worked safely and efficiently. Almost simultaneously, the versatile American engineer Oliver Evans built the first high-pressure steam engine in the United States, using, like Trevithick, a cylindrical boiler with an internal fire plate and flue. Trevithick quickly applied his engine to a vehicle, making the first successful steam locomotive for the Penydarren tramroad in South Wales in The success, however, was technological rather than commercial because the locomotive fractured the cast iron track of the tramway: Meanwhile, the stationary steam engine advanced steadily to meet an ever-widening market of industrial requirements. High-pressure steam led to the development of the large beam pumping engines with a complex sequence of valve actions, which became universally known as Cornish engines ; their distinctive characteristic was the cutoff of steam injection before the stroke was complete in order to allow the steam to do work by expanding. These engines were used all over the world for heavy pumping duties, often being shipped out and installed by Cornish engineers. Trevithick himself spent many years improving pumping engines in Latin America. Cornish engines, however, were probably most common in Cornwall itself, where they were used in large numbers in the tin and copper mining industries. Another consequence of high-pressure steam was the practice of compounding , of using the steam twice or more at descending pressures before it was finally condensed or exhausted. The technique was first applied by Arthur Woolf, a Cornish mining engineer, who by had produced a very satisfactory and efficient compound beam engine with a high-pressure cylinder placed alongside the low-pressure cylinder, with both piston rods attached to the same pin of the parallel motion, which was a parallelogram of rods connecting the piston to the beam, patented by Watt in In John McNaught introduced an alternative form of compound beam engine, with the high-pressure cylinder on the opposite end of the beam from the low-pressure cylinder, and working with a shorter stroke. This became a very popular design. Various other methods of compounding steam engines were adopted, and the practice became increasingly widespread; in the second half of the 19th century triple- or quadruple-expansion engines were being used in industry and marine propulsion. By this time also the conventional beam-type vertical engine adopted by Newcomen and retained by Watt began to be replaced by horizontal-cylinder designs. Beam engines remained in use for some purposes until the eclipse of the reciprocating steam engine in the 20th century, and other types of vertical engine remained popular, but for both large and small duties the engine designs with horizontal cylinders became by far the most common. A demand for power to generate electricity stimulated new thinking about the steam engine in the s. The problem was that of achieving a sufficiently high rotational speed to make the dynamos function efficiently. Such speeds were beyond the range of the normal reciprocating engine i. Designers began to investigate the possibilities of radical modifications to the reciprocating engine to achieve the speeds desired, or of devising a steam engine working on a completely different principle. In the first category, one solution was to enclose the working parts of the engine and force a lubricant around them under pressure. The Willans engine design, for instance, was of this type and was widely adopted in early British power stations. Another important modification in the reciprocating design was the uniflow engine, which increased efficiency by exhausting steam from ports in the centre of the cylinder instead of requiring it to change its direction of flow in the cylinder with every movement of the piston. Full success in achieving a high-speed steam engine, however, depended on the steam turbine , a design of such novelty that it constituted a major technological innovation. This was invented by Sir Charles Parsons in By passing steam through the blades of a series of rotors of gradually increasing size to allow for the expansion of the steam the energy of the steam was converted to very rapid circular motion, which was ideal for generating electricity. Many refinements have since been made in turbine construction and the size of turbines has been vastly increased, but the basic principles remain the same, and this method still provides the main source of electric power except in those areas in which the mountainous terrain permits the economic generation of hydroelectric power by water turbines. Even the most modern nuclear power plants use steam turbines because technology has not yet solved the problem of transforming nuclear energy directly into electricity. In marine propulsion, too, the steam turbine remains an important source of power despite competition from the internal-combustion engine. Electricity The development of electricity as a source of power preceded this conjunction with steam power late in the 19th century. The pioneering work had been done by an international collection of scientists including Benjamin Franklin of Pennsylvania, Alessandro Volta of the University of Pavia, Italy, and Michael Faraday of Britain. It was the latter who had demonstrated the nature of the elusive relationship between electricity and magnetism in , and his experiments provided the point of departure for both the mechanical generation of electric current , previously available only from chemical reactions within voltaic piles or batteries, and the utilization of such current in electric motors. Both the mechanical generator and the motor depend on the rotation of a continuous coil of conducting wire between the poles of a strong magnet: Both generators and motors underwent substantial development in the middle decades of the 19th century. In particular, French, German, Belgian, and Swiss engineers evolved the most satisfactory forms of armature the coil of wire and produced the dynamo, which made the large-scale generation of electricity commercially feasible. The next problem was that of finding a market. In Britain, with its now well-established tradition of steam power, coal, and coal gas , such a market was not immediately obvious. But in continental Europe and North America there was more scope for experiment. In the United States Thomas Edison applied his inventive genius to finding fresh uses for electricity, and his development of the carbon-filament lamp showed how this form of energy could rival gas as a domestic illuminant. The problem had been that electricity had been used successfully for large installations such as lighthouses in which arc lamps had been powered by generators on the premises , but no way of subdividing the electric light into many small units had been devised. The principle of the filament lamp was that a thin conductor could be made incandescent by an electric current provided that it was sealed in a vacuum to keep it from burning out. Edison and the English chemist Sir Joseph Swan experimented with various materials for the filament and both chose carbon. The result was a highly successful small lamp, which could be varied in size for any sort of requirement. It is relevant that the success of the carbon-filament lamp did not immediately mean the supersession of gas lighting. Coal gas had first been used for lighting by William Murdock at his home in Redruth, Cornwall, where he was the agent for the Boulton and Watt company, in When he moved to the headquarters of the firm at Soho in Birmingham in , Matthew Boulton authorized him to experiment in lighting the buildings there by gas, and gas lighting was subsequently adopted by firms and towns all over Britain in the first half of the 19th century. Lighting was normally provided by a fishtail jet of burning gas, but under the stimulus of competition from electric lighting the quality of gas lighting was greatly enhanced by the invention of the gas mantle. Thus improved, gas lighting remained popular for some forms of street lighting until the middle of the 20th century. Lighting alone could not provide an economical market for electricity because its use was confined to the hours of darkness. Successful commercial generation depended upon the development of other uses for electricity, and particularly on electric traction. The popularity of urban electric tramways and the adoption of electric traction on subway systems such as the London Underground thus coincided with the widespread construction of generating equipment in the late s and s. The subsequent spread of this form of energy is one of the most remarkable technological success stories of the 20th century, but most of the basic techniques of generation, distribution, and utilization had been mastered by the end of the 19th century. Internal-combustion engine Electricity does not constitute a prime mover, for however important it may be as a form of energy it has to be derived from a mechanical generator powered by water, steam, or internal combustion. The internal-combustion engine is a prime mover, and it emerged in the 19th century as a result both of greater scientific understanding of the principles of thermodynamics and of a search by engineers for a substitute for steam power in certain circumstances. In an internal-combustion engine the fuel is burned in the engine: The major problem was that of finding a suitable fuel, and the secondary problem was that of igniting the fuel in an enclosed space to produce an action that could be easily and quickly repeated. The first problem was solved in the midth century by the introduction of town gas supplies, but the second problem proved more intractable as it was difficult to maintain ignition evenly. It was modeled closely on a horizontal steam engine, with an explosive mixture of gas and air ignited by an electric spark on alternate sides of the piston when it was in midstroke position. Although technically satisfactory, the engine was expensive to operate, and it was not until the refinement introduced by the German inventor Nikolaus Otto in that the gas engine became a commercial success. Otto adopted the four-stroke cycle of induction-compression-firing-exhaust that has been known by his name ever since. Gas engines became extensively used for small industrial establishments, which could thus dispense with the upkeep of a boiler necessary in any steam plant, however small. Petroleum The economic potential for the internal-combustion engine lay in the need for a light locomotive engine. This could not be provided by the gas engine, depending on a piped supply of town gas, any more than by the steam engine, with its need for a cumbersome boiler; but, by using alternative fuels derived from oil, the internal-combustion engine took to wheels, with momentous consequences. Bituminous deposits had been known in Southwest Asia from antiquity and had been worked for building material, illuminants, and medicinal products.

Chapter 3 : Rothwell | Gabriel MartÃ-nez - www.nxgvision.com

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We are not going win the direction we wanted but we are not sure where we need it to go, causing the project to fail or to expand in budget and time. Highly successful innovation managers define and structure projects for success, a simple Project Definition Scorecard guides the project scope and direction. These are some principles that can guide you through the next successful innovation project: What are we trying to achieve by completing the project? Is it a new product, increase know-how or capability, or increase your brand awareness on a specific market, technology or capability. Technical Targets Once the objective is defined we can start to develop the specific, measurable targets for the project. These targets let us define success. A measurable, non-subjective goal is essential to really know when the project is completed and whether is successful or not. Key Deliverables The deliverables are how we demonstrate we have achieved the technical targets, the results of the project. They could be in the form of a technology demonstrator, a set of sample parts, a technical article, and positioning paper, etc Deliverables are critical, as they should drive business. As such deliverables should capture the attention of Sr. Management and industry leaders. Problem we are solving We need to make sure there is a problem for our solution. Are we addressing market needs or trends with the project? Does it support our current strategy or is designed to move us forward into a new space? Is it driven by customer demand, legislation, etc..? Timing and Budget It is essential to have clear expectations of the project timing and the resources budgeted to complete it. Resources are not only the money required, but also equipment and key people and its availability to support a successful project. Partners and funding Have we questioned ourselves, if we should be doing the project alone or it would benefit from collaborating partners? Is it worth considering customer or research institution for collaboration? Is there funding available to leverage internal resources? Monetization Plan Once we have delivered a successful project. How are we going to monetize the results? We should plan to demonstrate the project at technology road shows and other trade and specialist events. Socialize the project with technical papers, marketing publications and speaking engagements. Finally, does the IP provide us with unique capabilities or the ability to differentiate ourselves? Expected Returns It is critical that we have a good understanding of how and when we can expect revenue to start due to the project. Are we selling the new capabilities or can we charge a premium pricing? Can we sell the IP?

Chapter 4 : Successful industrial innovations (edition) | Open Library

The report summarizes the results of a study conducted over the years to by the National Planning Association for the National Science Foundation.

Their GE Open Innovation message highlight their understanding to address world problems through implementing crowdsourcing innovation. Their Open Innovation Manifesto focuses on the collaboration between experts and entrepreneurs from everywhere to share ideas and passionately solve problems. The ideas presented at First Build focuses on solving problems and create new home appliances products. Winning ideas are made available for purchase. The First Build is using a co-create collaborative model which is one of the open innovation models that aims to provide a platform that can help both external and internal individuals to collaborate together in terms of ideas sharing and manufacturing to reach innovative ideas for products and services. The application of open innovation created a cost-effective and time-effective solution that could not be reached using the internal team alone. Coca-Cola Coca-Cola is one of the pioneer companies in the field of innovation back to the Coca-Cola fountain dispenser designed by Raymond Loewy in Currently, the company is adopting open innovation models on levels between the team and other entrepreneurs from one side and the company and its consumers from the other. Those start-ups aim to think in innovative ways to build a the Happiness Coca-Cola brand. Coca-Cola Free Style machine and mobile app. Coca-Cola website Another open innovation model presented by Coca Coal is the Freestyle dispenser machine that allows users from around the world to mix their own flavors and suggest a new flavor for Coca-Cola products. The new product records the consumer flavor so they can get it from other Freestyle machines located around the world using the Coca-Cola mobile application. This model of open innovation puts the consumers in the heart of the production process as the company uses the suggested flavors as part the external ideas that can be evaluated and processed as a new product line. Following this period, strategic decisions and changes have driven the company to more innovative route than before. The new LEGO strategy aimed to focus on the consumer by linking both business and creativity. LEGO is the top world toy maker source: Other users start to discuss the idea and vote for it, once the idea reaches a targeted vote, LEGO can consider it as a new product with giving a small part of the revenues to the creator of the set. This co-create platform can also contribute reducing the risk of innovation as these feedback from the website can give business analysts idea about the viability of the new product. Samsung While Apple is adopting closed innovation model, Samsung adopts an open innovation in order to build their external innovation strengths through Samsung Accelerator program. The initiative aims to build a collaboration between designers, innovators, and thinkers to focus on different solutions. The program provides office spaces, statical capital, and product support to entrepreneurs to help them to build software and services. Samsung store image source: The first is a partnerships team â€” think of commercial partnerships between us and a third party. The above examples show how different large companies depended on open innovation to achieve different goals. However, the open innovation can also be adopted by small and medium companies to achieve the same goals and give them the ability to compete in competitive markets. He is an affiliated faculty teaching design at the American University in Cairo. He is also a contributor at the Design Management Review. His design artwork was exhibited in many locations including Croatia, South Africa, Brazil, and Spain. You May Also Like.

Chapter 5 : Industrial Revolution - Wikipedia

Not only is technology changing rapidly, but the process of the commercialisation of technological changeâ€"the industrial innovation processâ€"is changing also. The paper traces developments in the dominant perceived model of industrial innovation from the simple linear 'technology push' and.

Chapter 6 : 8 Things Successful Innovation Managers Do

A lot of investigations adopt the resource-based view, which highlights the heterogeneity of firms and the role played by internal attributes in firm's performance (Wernerfelt,).