

Ch 12: Made

Personal Connection. You have a great idea for a business. An AMAZING idea. One that you think could change the world.... How would you turn your idea into reality? What are the steps to creating a successful business?

Introduction: A Mechanized World

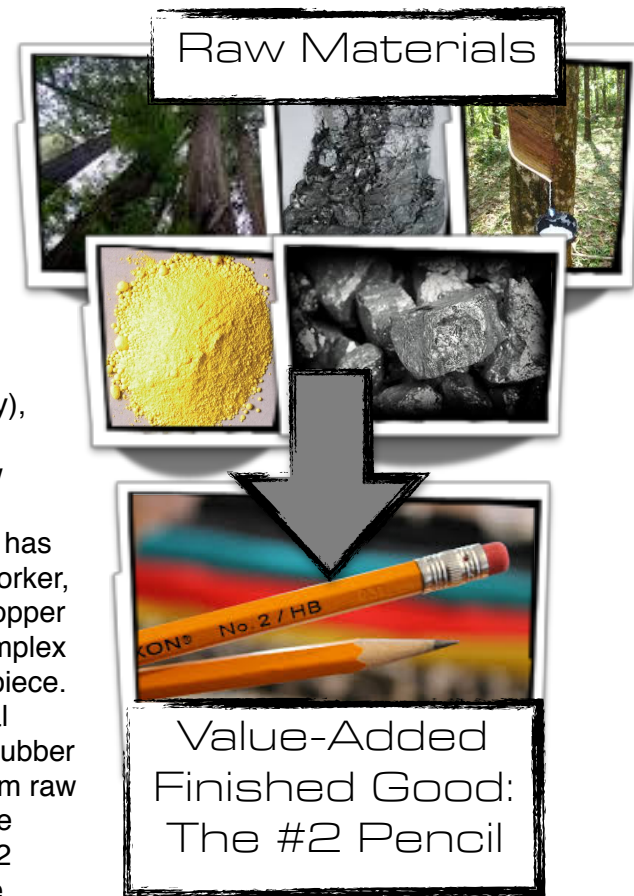
Look around. What items in the surroundings were made by machines? Maybe a simpler list: what in the surroundings was NOT made or transported by machines? The 21st century world is a mechanized world. Machines and corporations control or strongly influence every area of human life on the planet.

With advanced machinery, humanity is no longer just a servant subjected to the whims of an unpredictable planet that determines its fate. Instead, the power of industry has allowed humans the possibility of authoring its own story, reshaping the world - for better or worse - with the tools we have made.

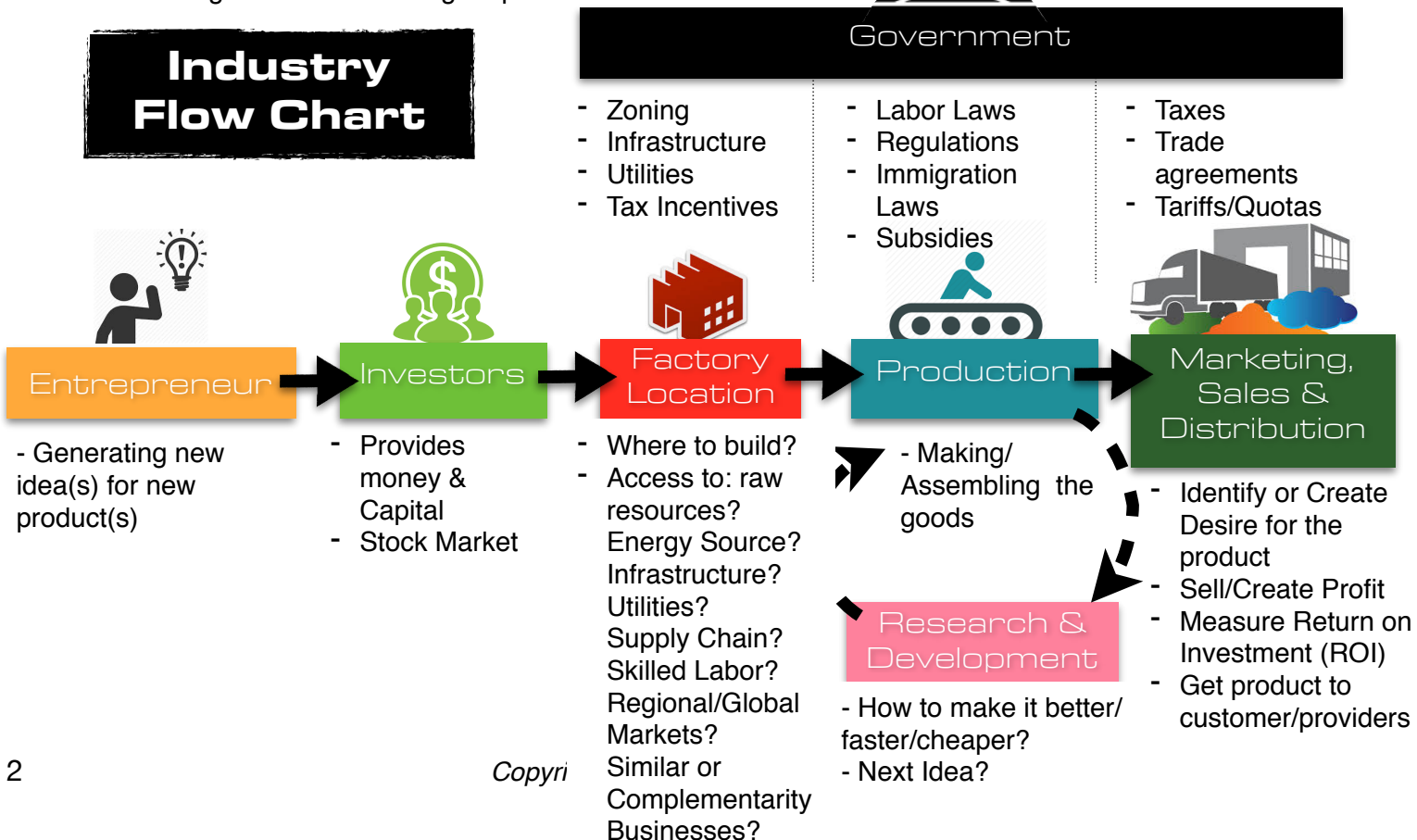


A. Understanding Industry

Basics. To understand the power, impact and potential of industrialization, there must first be an examination of the basic components that contribute to a product transforming from natural resources into finished products. An industry is a series of economic and mechanical activities that turns raw materials into finished goods. The primary sector activities extract resources from the earth, like coal, metals, iron ores, wood, corn, cotton, oil, natural gas, etc. The secondary sector activities are processes that add human value - taking the raw materials from the earth and applying labor with tools (either by hand or with automatic machinery), to make products that meet human needs. Raw materials are processed, purified, mixed, melted, molded or assembled into a new products that more valuable to the consumer than the original raw materials. To a person who is cold, the finished good of a sweatshirt has more value than the original cotton on the plant. To a construction worker, the finished good of a crane has more value than the iron ore and copper mined directly from the mountain. This transformation requires a complex series of steps. Rarely is one product created as one whole, single piece. Instead, many smaller parts are created and assembled into the final product. Something as simple as a pencil consists of: wood, metal, rubber composite, paint, and graphite. Each of those components came from raw materials from different regions of the world that were pulled from the earth, processed, and finally merged together to create the number 2 pencil. A car consists of 30,000 unique parts and pieces. An airplane has 6,000,000 parts.

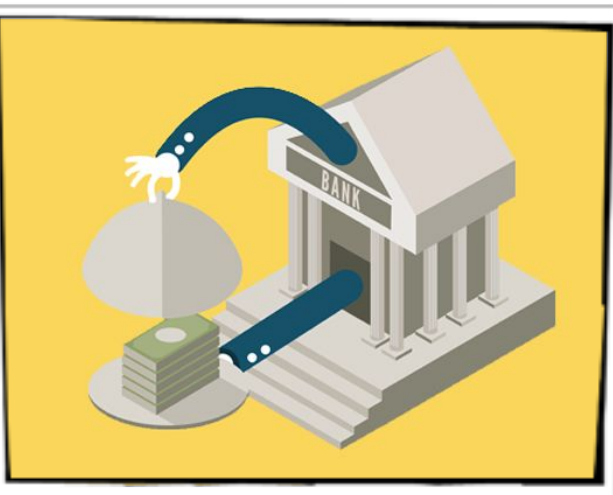


Anatomy of a Company. Making goods is complicated. Here is a flow chart to help understand the inside functioning of a manufacturing corporation:



- **Step 1 - Entrepreneurs:** The entrepreneurs are the idea generators. In an economy, these people are looking at the current problems of society and trying to develop solutions, or looking at current products and trying to develop an improvement.

Entrepreneurs are the dreamers that look at what humanity currently has and imagines what could be, then taking the risk to turning the dream into reality. During the development/prototype phase, they use more basic technologies to develop models and test prototypes of new technologies - in hopes that their idea will make it to market. However... over 90% of new ideas die in this phase. Innovations' life blood are new ideas and the willingness to confidently and repeatedly fail forward (no product has ever been perfect on its first attempt). Once the idea is proved useful and potentially profitable, the entrepreneur will take their prototype to the next step of production.



- **Step 2 - Investors:** Production is expensive. There are many costs: Land, buildings, raw materials, energy, utilities, certifications, permits, taxes, labor, etc. Unless the entrepreneur is independently wealthy, investors are needed to provide the seed money to get production started. Depending on the size of the project, an entrepreneur can get a loan from a bank. However, banks typically allow people to borrow up to 3-4x their income or net value. For example, if a person makes \$1 million per year, then then bank will loan \$3-4 million. However, if a person makes \$40,000 per year, the bank will only make a loan for \$120-160,000. This limits entrepreneurship to those with wealth (they do say it takes money to make money). Once the bank makes the loan, they expect monthly payments with interest, which puts massive pressure on businesses to find early success. It can take a new business 2-3 years before they become truly profitable. Many businesses cave in under the pressure of loans and debt before they "make it."



A second option are finding investors and Venture Capitalists. Investors are people who are willing to provide businesses money in exchange for a percentage of the future profits. Venture capitalists are wealthy investors who intentionally seek out start up businesses who need funds. Investors can be foreign (outside the state) or domestic (within the same state). Foreign Direct Investment (FDI) is when a foreign company decides to invest money into a company outside of the same state. FDI may occur if they feel the company will give them good return on investment (ROI). For example, an investor provides \$300k into a cotton thread factory in Haiti in exchange for 30% it its annual (yearly) profits. By the end of year

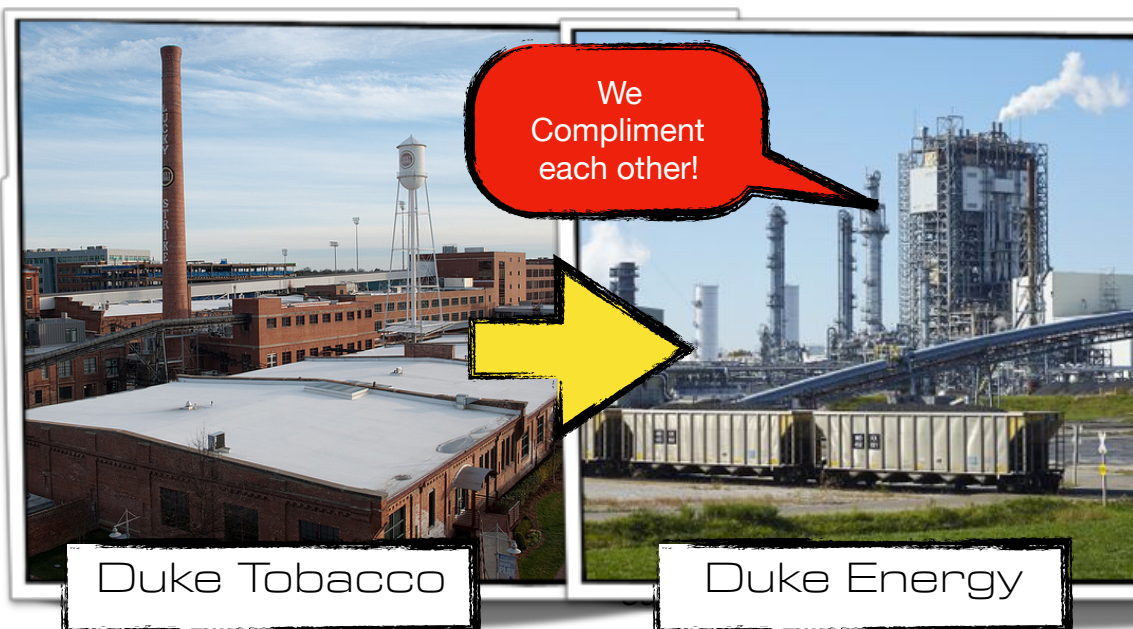
four, the factory has an annual corporate earning of \$2 million. Per their contract, the investor receives 30% of \$2 million, which is \$600k. Thus, the \$300k investment had a ROI of \$600k. Year 5, 6,7 had similar profits, growing the investors ROI into \$2.4 million.

A company will provide FDI to create economic complementarity. Complementarity is when one companies services work with or meet the needs of another - one complimenting the other. For example, a major hospital with an Emergency Room. A hospital relies on other business that compliment what the hospital is trying to do: cardiac machines, pace makers, latex-free gloves, scalpels... The Hospital provides the care while the other companies compliment the hospital by producing other resources. When a business has a need and no one to readily fill it, the business will invest into other companies who can fill that need. For example: The USA grows abundant corn that gets processed into Ethanol - a supplement used in gasoline. Ethanol is mixed with gasoline as a means of cheapening the the fuel price. In the Caribbean, neither oil nor ethanol are produced domestically. Transportation companies in the Caribbean that need lower cost fuel invest in the improvement of an ethanol plant because it compliments their business need for cheaper fuel. Their businesses are not competing with each other, but instead complimenting one another. Similarly, in the early 1900s, James Duke in Durham, NC needed more electrical energy to run his rapidly growing tobacco factories and warehouses. He invested money to found Duke Energy, that today provides energy to North Carolina, South Carolina, Indiana, and parts of Florida and Ohio. Duke needed cotton bags for his tobacco, so he invested in the growth of the regional textile companies. The tobacco company invested in the power and textile companies because their businesses provided a complementarity. China is currently investing heavily into states in Africa, providing funds for dams, power plants and highways, in exchange for Chinese companies being allowed to open up business. The African states provide low cost land and labor for processing factories that Chinese companies need to compliment their more

As businesses begin to thrive, they still need money for expensive improvements, which they can receive through the stock exchange. A “stock” is a share or a piece of ownership in the company. In return for selling shares in the company, the business gets money to invest in new buildings, equipment and technology. The business gets money now, in exchange for future profit later. As the company increases in profit and value, the size or worth of the stock share will increase. If the company begins to lose money, the share of the stock with decrease. The investors can buy and sell shares as a way of making their money (potentially) grow, hoping that putting their money into high performing companies will give them a good ROI. The more people that want to have a “Share” of the company, the higher the demand becomes. As demand increases, the higher the stock’s value will rise (as we learned in the last unit). Inversely, the less people that want to be involved in a company, the demand falls, lowering the value of the shares of stock.



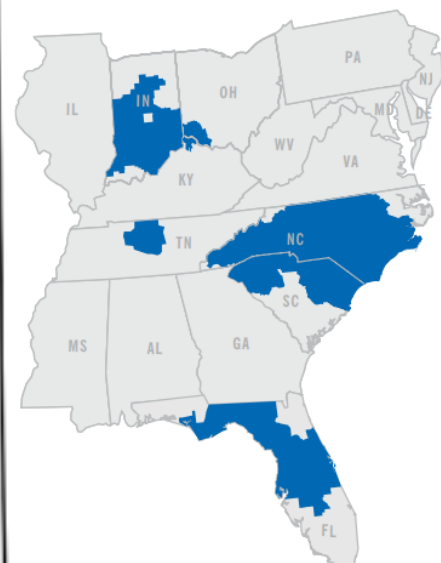
Stock Market Trading Floor



Duke Tobacco

Duke Energy

Electric and Gas Utilities Service Area



Duke Energy Map

- **Step 3 - Factory Location:**

The location of a factory is extremely important to the success of the business. There a plethora of considerations to take into account when determining the location (and will be further explored in a later section of the chapter):

- Where are the resources needed to produce the product? Is it raw materials that the factory needs to process or is it purchasing parts that need to be assembled?
- Where are the markets that plan to purchase the products?
- What utilities and infrastructure are available in the area? How will the factory get the power needed to make its machinery function? How will clean water and sanitation reach the facility? Are there roads and utilities already in place or is the company responsible for building and maintaining their own?
- What is the cost of the land? Industrial complexes near urban centers tend to be located on the edge of cities, where they have access to transportation corridors and utility infrastructures, but have lower land costs (in relation to the Bid-Rent Theory).
- Is there appropriately skilled labor in the region? If yes, how much do they consider to be acceptable pay for the work? If not, what are the living conditions like in the area and how to attract appropriate talent to migrate to the area.
- What is the position of the location within the global market? Are the appropriate supplies able to affordably reach the location? Are there other services and products near by that our business needs? Are the goods able to grow to foreign markets from the location?

Role of Government: The government of a region/state plays a key role in attracting businesses. The governments are responsible for the legal codes, providing private property laws. Private property laws protect a business' land or materials; promising it not be confiscated by the government. Governments zone land, assigning the purpose to the land. The government can zone land near important transportation corridors to only be used for industrial complexes, ensuring the land will only be used for that purpose. The government can also zone land near key resources, determining how close the factories are allowed to be located. The government can provide property tax incentives (reduced rate or tax free) for businesses to build factories on the land. Many industrial parks are setup, where the governments take on the financial costs for corporations by using tax dollars to build and maintain infrastructure, power grids, clean water, sewer and other utilities to support industry. They also provide tax breaks to businesses that locate themselves in the specially zoned areas.

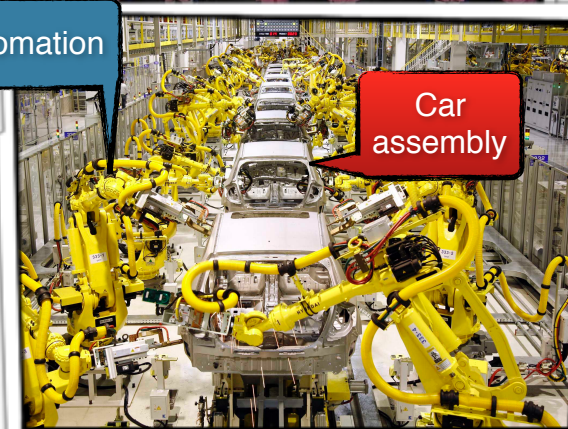


Application #1. Why would these factories choose this locations to setup their facilities?

- **Step 4 - Production:** Once a factory has been built, it is time to produce the product. Production requires the acquisition and maintenance of the appropriate physical capital - buildings, machinery, computers, etc. Key decisions have to be made about the production process:
 - Is there a benefit to mass production and achieve economies of scale or make smaller batches, that are more expensive but are customized to individual needs?
 - Are the tasks best completed by humans or by automation (performed by machines): pay humans by the hour, but have uncertainty about their variable daily performance and whether they will stick around (as not all humans provide the same quality work). With a machine, there is quality and uniform consistency, with the ability work 24 hours a day, 7 days a week for one price (plus maintenance)... but they are limited in their ability to think creatively and to problem solve abstract problems (at least for the moment...)
 - How many tasks does each laborer have to perform? Are the laborers multi-skilled with many responsibilities or is it an assembly line where the worker has only one task to perform. There are many questions about the labor that is needed to addressed:
 - How many people are needed? How many hours will they work and what will the work conditions be like?
 - What skills and diplomas are required for the work?
 - What is appropriate pay for the work?
 - What status of citizenship is required (or what level of enforcement of the rules will be used)?
 - Will benefits be provided by the company: health care, maternity leave, retirement?
 - Where will the appropriate labor be found? Where will they live and how will they get to work?



Automation



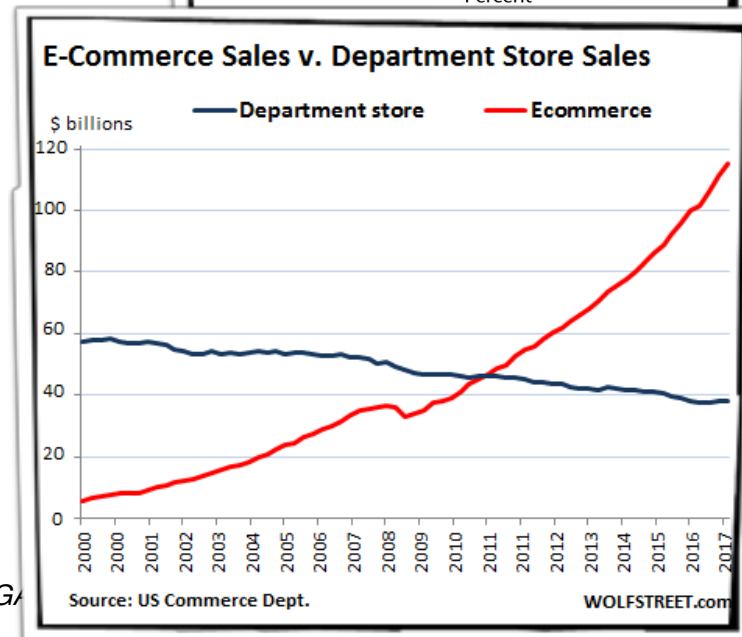
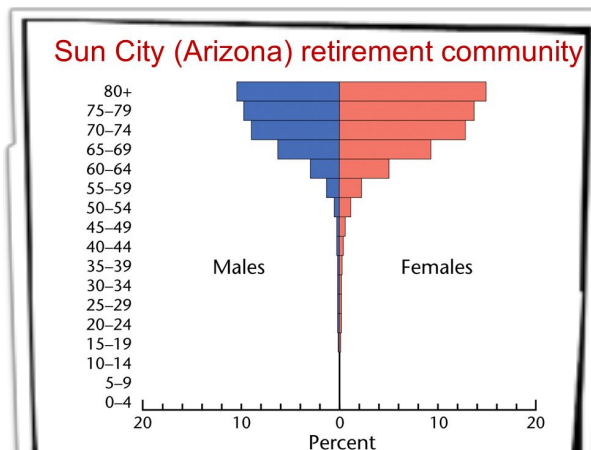
Role of Government: The role of the government during production is two sided. The government must decide the balance between being pro-labor or pro-business. Pro-labor policies protect and support labor from greedy schemes of the corporate executives who just want to make more money with no regard for the poor workers. Pro-labor policies include: minimum wage, safety regulations, product regulations and testing, child labor laws, anti-illegal migrant worker policies, maximum work hour laws, overtime pay, proving maternity and disability pay. These services tend to come with high price tags and pull a large percentage from business profits and salaries. Pro-business policies seek to promote business profitability and competitiveness on the global trade market. Pro-business governments focus on lowering or removing taxes on businesses and their executives, allowing illegal immigrants to work for low wages, limiting or remove regulations and safety checks on working conditions, protecting businesses against environmental protection and conservation policies, while also providing subsidies and tax credits that allow businesses to sell their products at less then the cost of producing the item.

Research and Development: Winston Church once said, "To improve is to change, to perfect is to change often." In the business world, a company is either moving ahead or falling behind. The research and development team (R&D) has two jobs: improve the current method and develop the next "big idea." Time is money and pennies add up. Creating better processes, streamlining tasks, automating/mechanizing systems can save a corporation thousands, if not millions, of dollars. Developing the next big idea is the life blood of the corporation. In a rapidly evolving world, a business must always be evolving: an better method, an improvement to a product, or a new product. Something to keep an edge on the competition and something new to be offering to customers to keep them paying money. When a customer does not have a reason to give a company money, the company goes bankrupt.

- Step 5: Marketing, Sales and Distribution:** As the product gets ready to go into production, the process begins for generating the demand to sell the product. Most of the goods that are made and sold in America are not “the final product” that every day consumers use. Instead, they are the “parts and pieces” that get assembled into something else: thread, copper wires, bolts, screws, washers, springs, microchips, steel beams, etc. These parts and pieces are sold and shipped to other corporations who use the parts to assemble their advanced product. It is the marketing teams job to identify upcoming trends and patterns amongst businesses and consumers, find their potential clientele, and then advertise to attract new clients. Most people who have a produce or service they like do not want to switch and must be convinced by creating a comparative advantage for the product/service. Other products are “market disruptors” that radically alter how people live/work/play in an unexpected way. For example, the world had been bound to physical forms of media like 8 tracks, cassette tapes, and CD players. MP3 player “disrupted” the industry in a way no one was projecting. In 2015, Amazon released the Echo - an online device that allows a person to use voice commands to control aspects of their house (a concept that is a growing part of the “internet of things.”) Before 2015, products like this did not exist. There was not a “market demand” for the item. Through marketing and advertising, the Amazon Echo became the number 1 best selling electronic on amazon.com. Amazon got people to want a product they had lived without their entire life - creating a market.

One tools that marketers use are population pyramids. By analyzing population pyramids from the past five to twenty five years, a business can analyze the date for demographic trends, and know which products to promote and what style of marketing to use to best reach that area. If the demographics do not match the population trends of the region, the business will know not to waste their time trying. An example would be Fisher Price. Fisher Price sells baby and toddler toys and products. Sun City in Arizona is a prime retirement community. Based on their population pyramid, Fisher Price would not invest a tremendous amount in advertising or trying to “create a market.” However, AARP would look at the same population pyramid, and dramatically increase their spending on advertisements.

Distribution’s role is to deliver the product in an affordable and efficient manner. Distributors must organize the supply chain to get the resources from the bulk loss processing factories, to the bulk-gain assembly factories, finally to the warehouses that are strategically placed near the markets. These factories are located along either highways or railways, to expedite transport. Most distribution warehouses are placed along the intersection of major highways, giving the warehouse access to multiple large cities. This allows the company to supply the needs of tens of millions of people within a couple hours. Warehouses keep certain amounts of stock on hand based upon the sales (i.e. demand) over previous months. When a store runs out of a product, they place an order to the warehouse. The requested product is shipped to the store, who then sells it to the customer. Amazon helped revolutionize distributing by disrupting the market, selling directly from the warehouse to the customer. This act of skipping the store and selling to the customer has had a devastating impact to retail stores and malls that have gone out of business. Companies are always looking for ways to keep up with supplies with the ever changing markets and to reduce the costs of transportation to stores and customers.



(2) Bulk Gain Assembly

(1) Bulk Loss Processing

(3) Warehouse

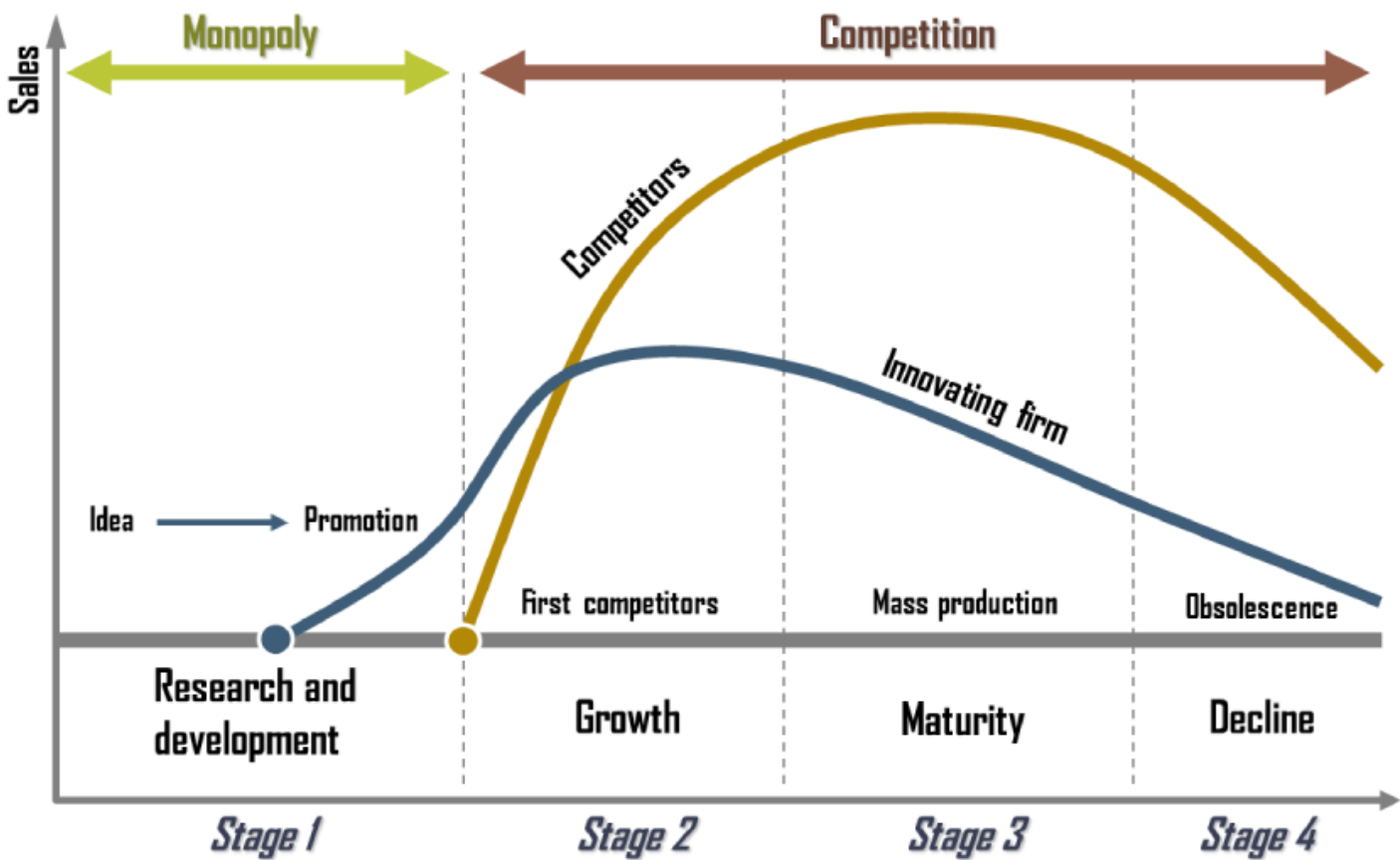
Distribution: Supply Chain Management

(4) Stores



Application #2. Why would these warehouses choose this locations to setup their facilities?

Role of Government: The government has three key roles it can play at this stage. The first is the role of protector: protecting fledgling industries from cheap markets from global trade. When a societies companies do not have a strong comparative advantage, the businesses are at risk of going bankrupt, hurting the overall economy. A government can use tariffs and quotas to limit the access of foreign goods to domestic markets. The government can play the role of promoter. Through free trade agreements and trading blocs, a government can create new markets for their businesses to export goods and services to, growing the societies GDP. Finally, a government is able to control taxes. High taxes can be used to discourage consumption while lower taxes can be used to encourage consumption. For example, there are high taxes on tobacco products, to discourage people from consuming them. Meanwhile, there are no taxes on fresh foods, to encourage consumption. Some states have a "tax holiday" to encourage people to go to the stores and spend.



Product Life Cycle. Any product that goes onto the market goes through a four stage process. Whether it is a durable goods meant to last for a long time (cars, equipment, tools) or consumable goods meant to be used up and wasted (pens, papers, ink toner, razor blades, shampoo...), the same general process is followed to bring new products to market.

- **Stage 1: Research and Development.** This is the life blood of a company. A company is only as good as their next great idea. An employee is only as valuable as their contribution to the next great idea. The next “wave” of innovations and improvements has already been prepped and waiting for its turn to come to market. The inventions and “toys” two years from now are being developed and tested right now. As discussed above, this phase has a 90%+ failure rate, of ideas that die and never see the final product. When a company has an idea for an innovation, they have a monopoly, or exclusive possession and control, on that idea. If the state has copyright and patent laws, a company can submit their idea for copyright, granting the company exclusive rights to profit off the idea for 20 years. If anyone directly copies the idea, they will be sued for infringing. In 2012, Samsung was sued for copying the iPhone design, being fined \$1 billion dollars. In States that do not have copyright and patent laws, corporations can still ideas from each other will little punishment.

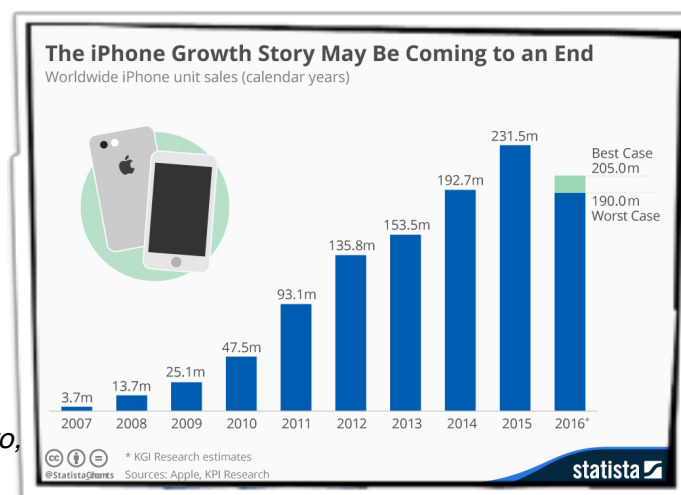


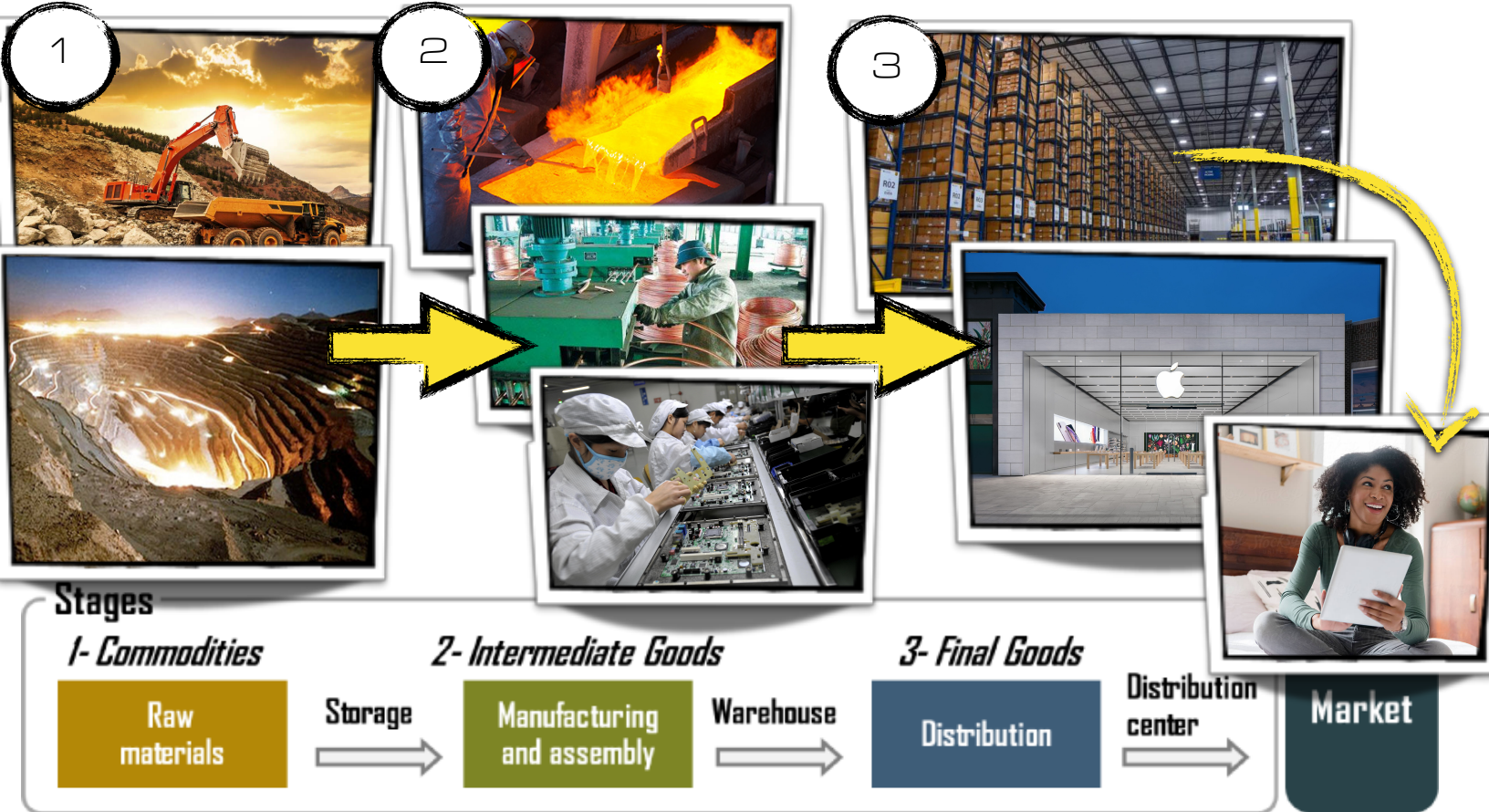
An idea goes through a conceptual phase, followed by beta testing, to see how well the product works and receive feed back. Extensive research into demographic and census information is done to see where to market and distribute the product to make the greatest profit. After hundreds of revisions and edits, the idea goes to receive final approval. If the company is well established, promotion and marketing for the product begins, putting the first batch into production. Space on the store shelves is rented/reserved, signs are printed, commercials are produced. If the company is a brand new start up, they will use their beta testing to try to secure investors to help raise funds to produce the product.



- **Stage 2: Growth.** After extensive testing, the product is on the market and hopefully starting to grow. Competitors see the product for the first time and begin to create competitive products that meet the same need. A race begins between the competitors and the initial corporation as to who can produce the best product, and who can create the next improvement to the original idea. Through this cycle, the competitor's innovations tend to surpass the original idea. For example, in 1999 the Japanese company NTT DoCoMo released the first smartphone. The innovations by DoCoMo was then surpassed by Blackberry, who was then surpassed by Apple and the iPhone.
- **Stage 3: Maturity.** During the maturity phase, the product achieves its peak performance on the market. The factories are humming, mass producing as many as the market desires. At this point, a company who is wise is investing this profit into research and development, looking for the next idea that will keep the company profitable.
- **Stage 4: Decline.** In a world of innovation, no products stays on popular forever. Eventually, the next great idea is released. The newest innovation comes to market, making the other ideas obsolete - out of date, no longer used. At this point, companies want to get rid of as many as possible; clearing storage space and money for the latest idea. Products find their way onto sales shelves, clearance bins, free giveaway boxes, or in the trash. Really successful ideas find their way into museums, so people can relive the "good ol' days."

In conclusion, no product stays popular forever. As industrialization has progressed, the speed of product cycles has increased. Before the 1700s, there could be decades to centuries between major updates to a product. In the 1950s, a product would stay in maturity for a couple years, between major releases. In the 2010s, a product's lifecycle is six-to-twelve months. The original telephone got replaced by the rotary phone, that got replaced by the push button phone, that got replaced by the wireless phone, that got replaced by the cell phone, that got replaced by the smartphone. The only thing constant is change, and a business is only as good as its next great idea. In early industrialization, corporations tried to make goods that would last a long time. The companies soon realized that if the product never wore out, customers did not have to buy a replacement. If customers did not buy a replacement, the company went out of business. Companies began to design products with planned obsolescence - purposefully designing a product to wear down or break after a certain number of uses. If products breakdown, customers must buy a replacement; bringing more profit to companies.





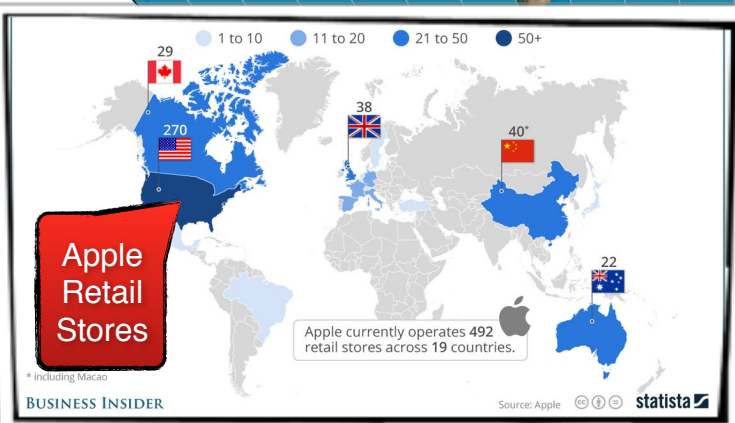
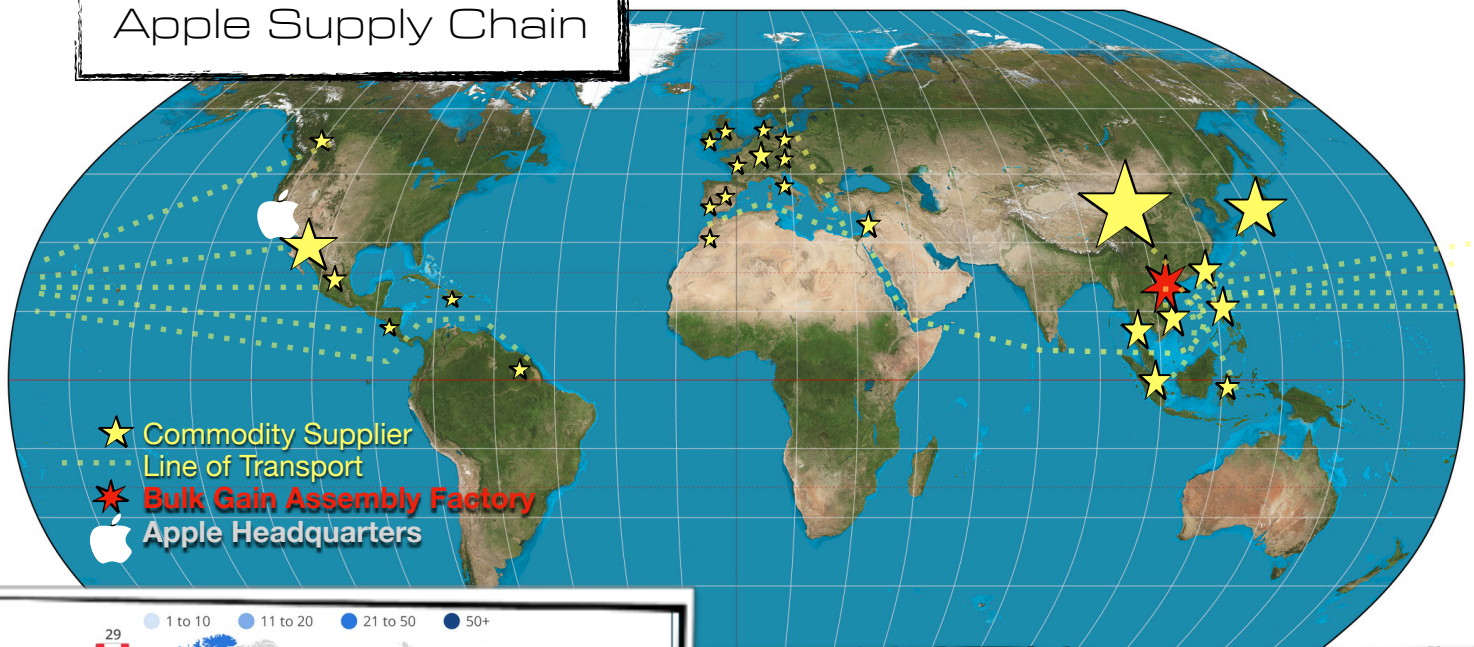
B. Supply Chains & Integration

Supply Chains. In a modern economy, production takes place in stages. Stage 1 is the primary sector, where the commodities are extracted from the ground. For example, copper is mined from the mountains of Indonesia. Stage 2 is the secondary sector, where the resources are refined at bulk loss factories into materials humans can use. For example, the raw copper is transported to a copper smelting factory, that removes the impurities while transforming the copper into wires. The raw copper was not useful when it was mined from the mountains. However, the smelted copper wire IS useful; value has been added to the copper. Then, the resource is transported to a bulk gain factory, where multiple resources are joined together to make a product. For example, copper arrives at the factory to be joined with processed aluminum, glass, titanium, lithium, wood, petroleum, etc. These products are specifically engineered and assembled to create an iPad. Stage 3 is the tertiary sector, where the finished goods are distributed and sold customers. The products are shipped from the factory to strategically placed warehouses, built along transportation corridors within a short distance of major population centers. From the warehouses, products are either shipped directly to the customer or shipped to the store, where customers can purchase. In our example, a person could into the Apple store to purchase the product. This would trigger the store to request more iPads to be shipped from the warehouse. The customer could also have gone onto Apple, Walmart, Target, or Amazon's webpages to purchase the iPad. With e-commerce, the product is shipped directly from the warehouse to the client.

With modern transportation, the links in a supply chain can be located anywhere in the world. Due to the efficiency and effectiveness of mass industrialized vehicles, transportation has achieved economies of scale. Goods can be transported thousands of miles on massive ships, trains and trucks for pennies-per-item. As a result, goods are transported tens of thousands of miles from the primary sector extraction through the tertiary sector final delivery.



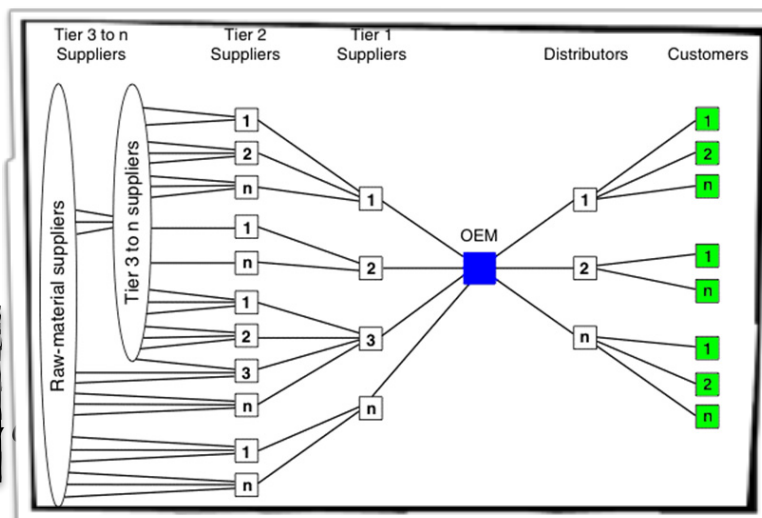
Apple Supply Chain



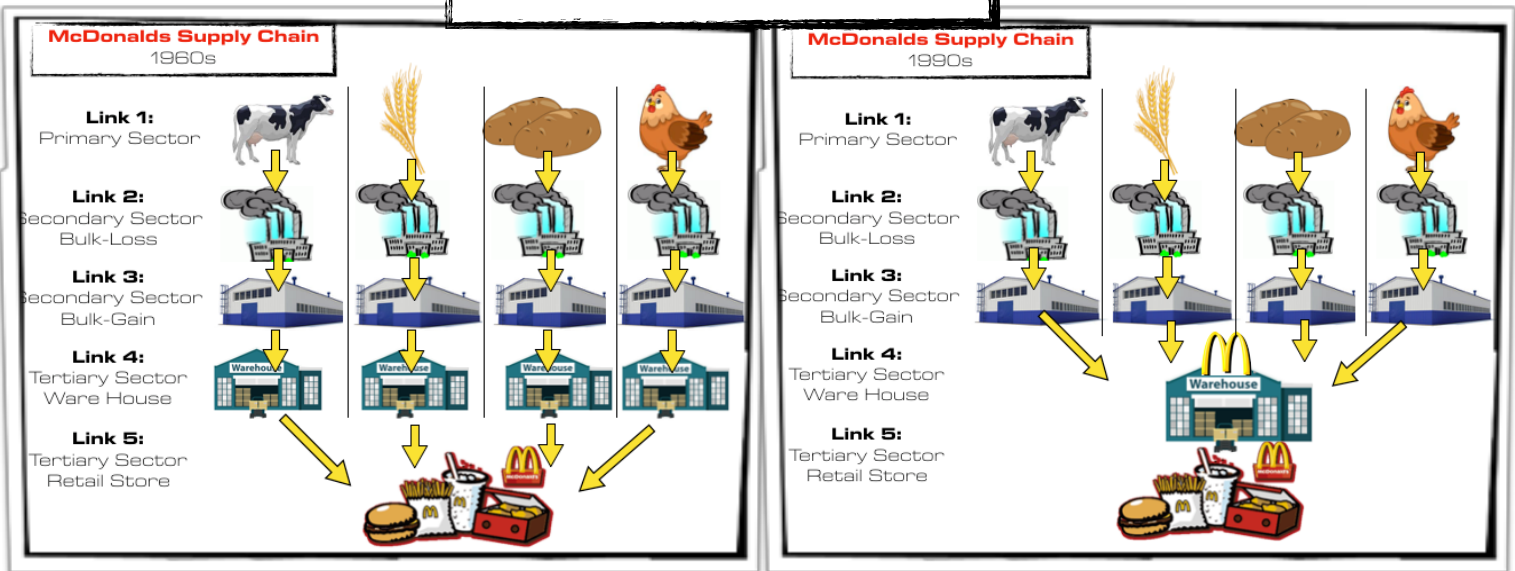
Application #3. Apple is an American company. If size of star represents quantity of supplies, which continent / region does the most supplies come from (Rank from most to least)? Why does Apple Make this choice? Where are these suppliers & manufactures located in comparison to Apple's headquarters? Why do you think Apple has its head quarters in one state but their factories in another?

The result of industrialization is the international division of labor. The location of primary sector companies are always environmentally determined. Certain resources are only available in specific parts of the world. Copper can only be mined from mountains with copper. Rubber can only be extracted from trees that produce rubber. As a result of the unique location and resource mining and refining needs, each step of the supply chain is controlled by its own company. Each company owns its own machines and focuses on achieving economies of scale in their production while maximizing the profits for their investors and stock holders (spend as little money as possible, make as much money as possible). When Apple's engineers decide which resources they will utilize in their next product, purchase agreements are made to export and transport the resource to their bulk gain manufacturing factory. Currently, Apple has their factories located in Shenzhen, China in the Guangdong Special Export Zone (SEZ), near Hong Kong. Once assembled and packaged, the products are distributed around the world to warehouses, ready to be sold. Apple has close to 500 Apple retail stores. However, they do work with other mass distributors like Amazon, Walmart, Target, and eBay who make Apple products available to customers. The result is a system that is spatially disaggregated -spread around the world. In total, every Apple product travels over 500,000 miles, from the time the commodity leaves the earth to the moment it arrives in their customer's hands. To put this distance in perspective: it is 238,900 miles from the earth to the moon. 500,000 miles is from the earth to the moon and back PLUS one more trip around the earth.

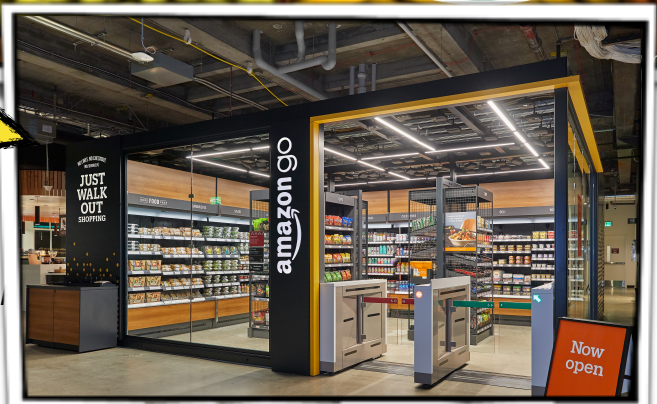
This is another way of graphing supply chains: raw resources on the right, factories in the in the middle, Warehouses & customers on the right.



Vertical Integration

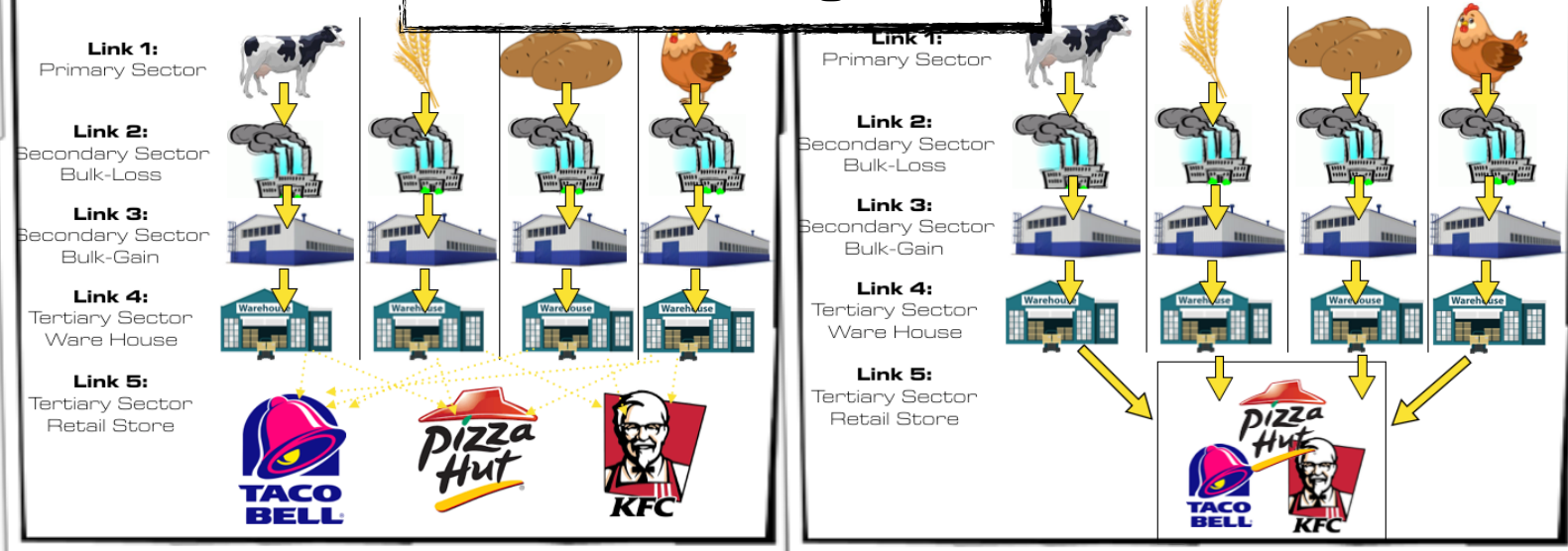


Horizontal & Vertical Integration. Every company has a difficult choice: how many steps of the chain do they want to own and control? When a small company begins, they are trying to profit off of ONE link of the chain: A miner wants to just sell their minerals. The new restaurant owner wants to JUST serve customers food. However, as a company becomes more successful they must decide if they want to own just one link in the chain, or if it would be more profitable to own MORE than one link in the chain. For example: when McDonalds opened in the 1960s, they JUST owned the restaurant that sold burgers and fries. They bought all their meats, breads, potatoes and chickens from other suppliers. However, as McDonald's grew in size, they decided it would be more profitable for them to vertically integrate: purchasing, owning and operating more than one link on the supply chain. Instead of relying on other warehouse companies to store and distribute McDonald's necessary ingredients, McDonalds purchased/built its own network of warehouses. McDonalds has corporately decided it only wants to own and control two links of the supply chain. McDonalds still buys all of its food materials from other suppliers, that get sent to McDonald's Warehouses and then to McDonalds restaurants. Similarly, Amazon started off as just a warehouse distributor. Since 2010, Amazon has been vertically integrating, purchasing its own trucks, and most recently, opening its own retail stores. Amazon purchased Whole Foods, giving Amazon its first retail stores they were responsible for owning and operating with face-to-face shopper interactions. Amazon has also opened its first Amazon Grocery store in Seattle, Washington. They are deciding if they want to expand their "footprint" in the retail market.



right 2020 by GA

Horizontal Integration



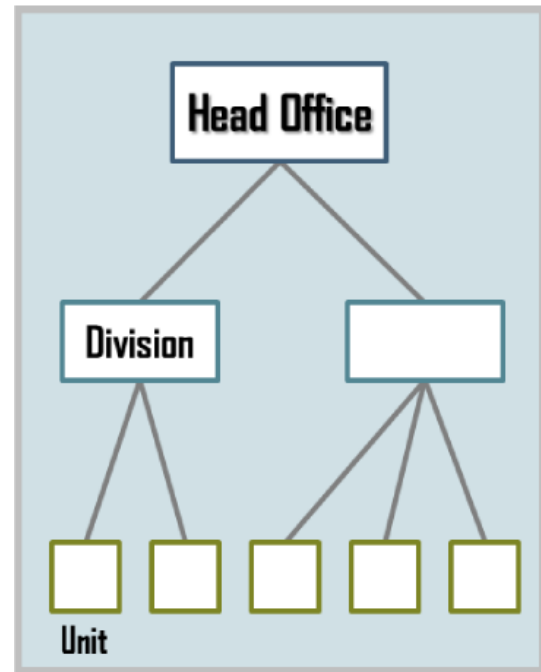
Horizontal integration is when companies merge or purchase their competitors who perform the SAME LINK in the supply chain. Companies decide that instead of competing with each other they should merge into one company. The companies feel they can be stronger working together, then competing against each other for the same share of the market. Some mergers are mutual agreements to work together as equal partners. Other mergers are more acquisitions, where one company is struggling financially and is purchased by another. For example, In 1977, Pepsi purchased Pizza Hut. Then in 1986, Pepsi purchased KFC, followed by Hot'n Now and Taco Bell in 1990. Pepsi (technically it's restaurant off-shoot called Yum!), horizontally integrated three competitors into one brand. Now, combinations of the three stores either appear next to each other in the same shopping complex or even "sharing" the same building. Horizontal integrations happen all the time, as companies try to strengthen their position in the competitive market place. For example: in 2006 Disney Studios horizontally integrated, purchasing its animation competitor Pixar. In 2019, Disney purchased Marvel Studios and Lucas Films' Star Wars Franchise. As a result, in 2019 Disney produced 8 of the top 10 most profitable movies at the box office: Avengers Endgame, Lion King, Frozen II, Captain Marvel, Spider-Man: Far from Home*, Star Wars: The Rise of Sky Walker, Toy Story 4, and Aladdin (technically, Spider-Man was shared with Sony). Similarly, the gasoline companies Exxon and Mobile merged in 1996, allowing the company to increase its production capacity, its gas pipelines, transportation vehicles, and gas stations.

C. Company Organization.

How a business relates to its supply chain is strongly influenced by its method of organization. As discussed above, companies must decide how many links in the chain to insource, or to keep in control of the company, and how many links to outsource - paying other companies to produce and supply needed parts. In sourcing and outsourcing each have their benefits and drawbacks. Insourcing gives a company a great deal of control. They can control the quality of materials, the skill and training of the labor, and the speed of production. In sourcing allows a company to make desired changes quickly. On the downside, insourcing is expensive. The more aspect of the supply chain a company insources, the more machinery and equipment they must own. If the company is not careful, all the added expense will either make their product more expensive or put financial pressure on the company to justify multiple millions of dollars in machinery, staff, training, etc. While insourcing may allow companies to make changes, those changes can be expensive to make as they have to adjust all their machines and retrain their workers. Outsourcing can be a positive solution as companies can purchase just the supplies they need in just the quantities they want. The other company uses THEIR machines and THEIR labor to achieve economies of scale, allowing your company to purchase the cheap final product. For example, it is a lower cost to purchase a computer monitor another company made than it is to get all the equipment to make a monitor yourself. This also allows a company to quickly upgrade their technology, as they are PURCHASING the latest tech instead of having to go through the whole process themselves. On the down side, with outsourcing a company loses control. If a part needs to be specially made or needs to be specialized, it is difficult to work with people from other companies who are trying to make a profit (especially if they are in another country and their workers speak another language).

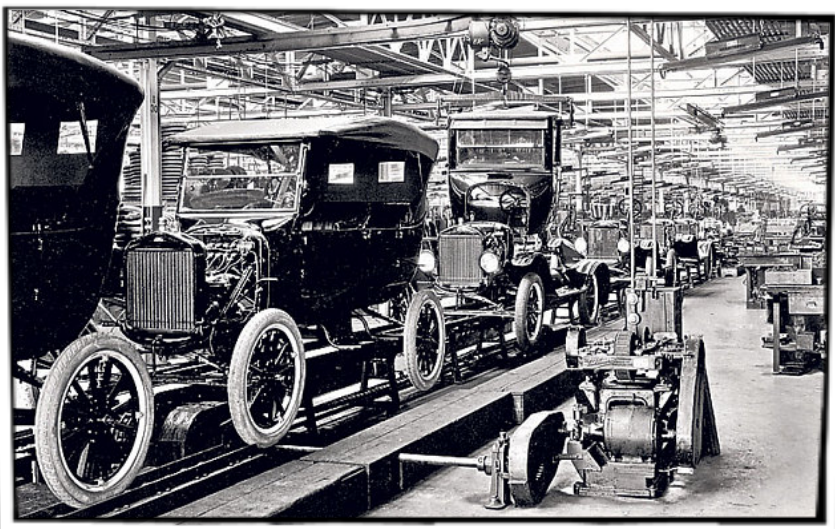
Company organization can be classified into two categories:
Fordist and Post Fordist

Fordist. During the 1920s Henry Ford invented the assembly line. The assembly line assigned 1-2 roles to each worker, allowing them to master that skill and becoming highly efficient. If one worker left, it was simple to teach a new person that one skill set. This allowed production to improve in speed (and justified paying the workers less, because they were less skilled and easier to replace). Through the assembly line, economies of scale could be achieved through mass production of a single product. The greater the quantity of production, the lower the costs. Fordist styled factories vertically integrated, attempting to insource as many steps of the product chain as financially possible; bringing them under one factory roof (many times literally). This created megafactories in the city centers, the birth of the Industrial City. The factories needed so many workers, that housing and retail were built surrounding the factory. Some companies even owned the housing AND the food stores/restaurants the workers ate at. The company invested heavily into their machinery and physical assets, allow them to achieve their mass production. The Fordist model works on creating massive supplies of goods. They want to achieve economies of scale, selling their few products, in mass quantities, at a price lower than their competition.



These megafacilities were organized to be top-down power structures. There was a clear social hierarchy of Executives -> Management -> Lower Management -> Workers. The executives created the plan for the company to follow and worked on securing (and pleasing) the investors. The Division Managers were given specific responsibilities: Marketing, Sales, Engineering, Assembly, Warehouse & Supply Chain Management, etc. The low level managers were responsible for the workers: making sure the workers were on time, trained and a meeting production requirements. The workers, especially on the assembly line, were given simple jobs. They were prized for their ability to show up daily on time, do their assigned job, at a fast speed, with few errors. The workers were not supposed to be creative thinkers, just obedient labor. All thinking was done by the executives, everyone else was awarded for their obedience.

As a result, change was slow, if change happened at all. Change was expensive, because EVERYTHING had to be changed: the machines, the parts, the labor training, the packaging, the needed resources, the supply chain contracts... Not only was there the cost of the change, but it made the older products obsolete and undesirable. For a company that tries to make a large supply, change would result in wasted products just sitting unsold on the shelves; losing profit for the company. This made change slow, expensive, and discouraged.



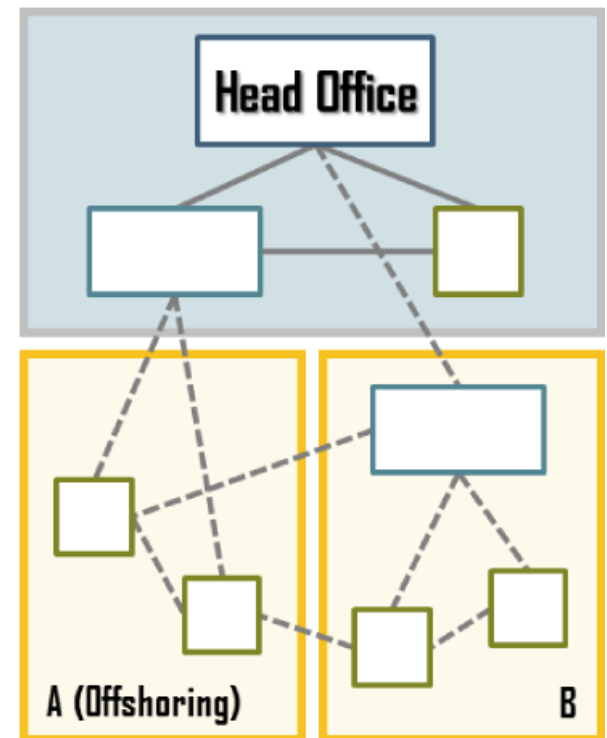
Post-Fordist. In the 1980s, the improved space time compression of mass transportation and communication led to the age of mass customization. In the 1980s, the Japanese car company Toyota had a problem: the headquarters were in Japan, but the largest market of car consumers were in the USA - particularly on the East Coast/Rust Belt. The distance from Tokyo to NYC is 6,700 miles while the distance from Ford's Headquarters in Detroit to NYC is 615 miles. It would be too expensive to make the cars in Japan and ship them the 6,700 miles and they would not compete with the Big 3 in Detroit. So too, it would be equally expensive to try to build megafactories in the USA to compete with the Ford model.

To overcome, Toyota came up with a model - using outsourcing to improve production. Unlike Ford in the 1920s, the USA in the 1980s had robust highways, freight trains and ships, telephone lines, computers, and a network of parts producers. Toyota's plan was to purchase outsourced parts and pieces. Instead of trying to control all aspects of the industrial process. Instead of needing mega-facilities to design and build everything, Toyota just needed an assembly plant. All the parts and pieces from all of the suppliers could be quickly shipped to the factory, and then assembled. Using Just-in-Time delivery, Toyota only needed to order just the parts they needed, in just the quantities they needed it. When the factory needed more parts, they could order more parts, filled quickly thanks to rapid transportation.

This model was revolutionary for a number of reasons. First, it allowed Toyota the ability to quickly upgrade and customize their cars. Since Toyota was purchasing the speakers instead of building the speakers, they could offer customers a choice: low end cheap speakers, medium grade speakers or top end speakers. Just about anything could be customized including the steering wheels, headlights, seat fabric, wheels, rims, air conditioning, rear view mirrors, moonroof, exhaust pipes... Each year, when speaker companies introduced a new speaker, it was easy for Toyota to adapt and upgrade. When new technologies came out, like remote unlock or blue tooth, Toyota could just add it into production. Car dealerships now offered different quality levels (low, medium, high) along with the ability to order a car completely customized. Instead of focusing on making large supplies like Ford, Toyota promoted customization as a standard part of the Toyota culture.

This had a number of impacts on how Toyota functioned as an organization: Instead of trying to create a massive supply, businesses focused on creating and meeting demand through customization and rapid delivery. The corporate focus shifted to providing as many options as possible to meet as many desires as possible. Product lifecycles reduced from years to months, as constant change produced constant demand. Because of just-in-time delivery and purchasing just what was needed, factories produced enough to meet expected demand.

This shift had an interesting impact on product price. On the one hand, the price of the Toyota car went down. This is because Toyota was not making things like speakers and steering wheels, they were purchasing them from outside suppliers. Thus, the steering wheel company only made steerwheels and achieved economies of scale with steering wheels. In theory, Toyota spent less on each car because they spent less purchasing these outsourced products. On the flip side, the focus on customization made it difficult for Toyota to achieve economies of scale. Since EACH product was meant to be customizable, it kept the company from being able to mass produce millions at a low cost. Thus, this focus on customization with a higher price, put a greater emphasis on products having high quality. Because companies only a few of a certain product are created, customers began to expect the products to have zero-defects.



With the Toyota model, companies experienced a work-culture shift in the qualities they desired for their employees. In the Toyota model, a company is only as good as its next innovative product. Employees are valuable for both their work production AND their next great ideas. Companies value collaboration, knowledge and innovation. Employees are encouraged to give ideas of potential improvements and updates to the work-flow process that could save the companies money, time, or improved productivity. Because of the global networking is now a required part of the business model, the ability to work with other people and cooperate is of great importance.

However, the worker now faces new challenges. The worker in the Toyota model faces the competition of a global job market. If a worker in India speaks English and has internet access, they become competition for jobs all across the English speaking world (which, with English being a global lingua franca...) Businesses can even be owned and operated by people from outside the country, the essence of multinational, globalized businesses. Finally, workers must be educated. The ability the read, write, and critically think are essential components. Workers need to be have at least a high school level education, with most industries requiring a specified bachelors degree to become involved in the occupational field. Even then, once a worker is in the field, they are always learning, always growing, always adapting... with a keen eye on what will be the NEXT great idea.

In conclusion, businesses have a difficult choice to make, and the decision is based upon the type of products that they make. If the business mass produces a few goods that do not change frequently, the fordist model is still effective. There are products that have effectively utilize the high-supply model like nails, screws, toilet paper, computer paper, 2x4 wood planks, surgical masks, and #2 pencils. All of these products are standardized, rarely change and are prime for achieving economies of scale. Interestingly, almost all this pro-fordist professions have been outsourced to periphery societies or become dominated by mechanization and automation. On the flip side, if the business is driven by innovation and customization, then the Toyota (post-fordist) model is ideal. The ability to innovate, change, evolve and customize is critical and needs a structure that allows business to quickly adapt. This is seen in the technology industry, where technology becomes obsolete in 6-12 months. With the evolution of the 3D printing and other on-demand, customized technologies, objects can go from idea-to-product in the matter of hours; being shipped within the day with the exact specifications the customer desires. We are living in a rapidly changing, innovative, interconnected, globalized world.

	Fordist	Post-Fordist
Production	Mass Production	Mass Customization
Organization	Pyramid/Top-Down	Networked/Flexible
Focus	Supply	Demand
Market Reach	Region/Nation	Global
Information Update	Month/Weeks	Daily/Real Time
Key Resource	Physical Assets	Innovation, Knowledge, Global Network
Inventory	Months	Hours Just in Time Delivery
Production Cycle Time	Weeks/Months	Days
Product Life	Years	Months
Quality	Expected Defects	Zero-Defect