John Deere: Business Breakdowns Research

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Primary Research Sources

- Latest 10K, Latest 10Q
- August 2021: Strategy, Financial Performance, Use of Cash
- 2021 Q3 Earnings Call
- July 2021 Retail Sales

Interesting Facts & Figures

- Deere traces its history back to 1837 (184 years ago!) and is now recognised as the largest agriculture machinery company in the world.
- Deere expects to end FY2021 with $40.1b in revenue and $8.75b in EBITDA. They have a market cap of $105b and hold 20% market share in their largest segment, agriculture and turf.
- John Deere has only had 10 different CEOs throughout their 180+ year history. 5 of those 10 CEOs have been part of the Deere family.
- John Deere enthusiasts started Green Magazine in 1984 and out of popular demand, it became monthly in 1990. It still exists today and circulation currently hovers around 30,000.

Company History & Key People

- 1837: John Deere founds the company. John Deere was a blacksmith who developed the first commercially successful, self-scouring steel plow.
  - At this time, many farmers were moving out west. The soil in the west was stickier than the sandier soils back east so it tended to clump up on the blade of a plow, requiring a farmer to stop every few minutes to clear it. With John Deere's steel plow however, the soil didn't clump, allowing farmers to work more efficiently. Source
- 1848: John Deere moved his growing operation 70 miles SW to Moline, IL (closer to the Mississippi River). The river provided water power for running a factory and riverboats for bringing in raw materials and moving plows to market.
  - Note that John Deere was not the only successful plow-maker at the time. However, he was the one to industrialize his operations and manufacture many at once (whereas others stuck to making plows one at a time).
  - After this move, Deere's company was making close to 1,000 plows per year.

- 1858: To prevent bankruptcy, John Deere reorganized the company and sold his interests to his son-in-law, Christopher Webber, and his son, Charles Deere. Charles took on most of his father's managerial roles.
- 1868: Deere's business reorganized again and became Deere & Co, as it is today.
- Early 1900s: Facing increased competition in the farming and agriculture manufacturing space (specifically from International Harvester Company, now Navistar), Deere expanded its offerings to gasoline tractors—Dail All-Wheel Drive was its first model.
  - 1918: Deere bought Waterloo Gasoline Engine Company (for $2.1m) which manufactured the Waterloo Boy tractor in Iowa (many tractors are still manufactured in Waterloo, Iowa). Deere sold tractors under Waterloo name until 1923 when John Deere Model D was introduced.
- 1927-1929: Deere introduces first combine harvester (John Deere No. 2) followed by the smaller No.1. During the Great Depression, the company never repossessed any equipment from American farmers. Source
- 1939-1945 (WWII): Charles Deere Wiman (John Deere's great grandson) was president but accepted a commission as colonel in the US Army. Deere Co manufactured military tractors and transmissions for the M3 tank, in addition to farm machinery.
- Latter half of the 20th century marked a significant leap forward for Deere & Co and cemented their dominance in the industry. They launched a number of new products (select few listed below), each outdoing their last model:
  - 1960: Introduced "New Generation models 1010, 2010, 3010, 4010: 4 and 6-cylinder tractors
    - These "10" series tractors propelled Deere from a **23% market share in 1959 to 34% in 1964**.
  - 1973: Introduced 'Sound Idea' tractors, models 4030, 4230, 4430, 4630. These features redesigned sheet metal and were available with an integrated operator's cab that Deere called 'Sound Gard body.' These cabs had a roll-over protective structure and came with heat, AC, and speakers for an optional radio.
  - 1989: Deere replaces the "New Generation" models of the 1960s
- 2017: Deere announced acquisition of Blue River Technology, a leader in applying ML to agriculture. Blue River has designed and integrated computer vision and ML tech that will enable growers to reduce the use of herbicides by spraying only where weeds are present
- 2019: Samuel R Allen announced he will step down as CEO and President of Deere Co. John May, President of the Worldwide Agriculture and Turf and Integrated Solutions division, will replace him.
- August 2021: Deere announces it will acquire Bear Flag Robotics, an agri tech co that enables a machine to work in a field autonomously. Source
  - In latest Q3 Earnings Report, Deere will acquire Deere-Hitachi JV. Deere will enter long-term supply agreement with Hitachi to source and manufacture the current products at existing locations. Source
- Other:
  - John Deere currently consists of 6 brands: Source
    - Deere & Co, Wirtgen (roadbuilding), Hagie (crop spraying solutions), PLA (grain elevators), Mazzotti (agricultural equipment), Monosem (vaccuum planters), A&I (wholesale distributor of aftermarket replacement parts), Blue River (tech solutions), Harvest Profit (software for farmers to help track costs, profits, and inventory)

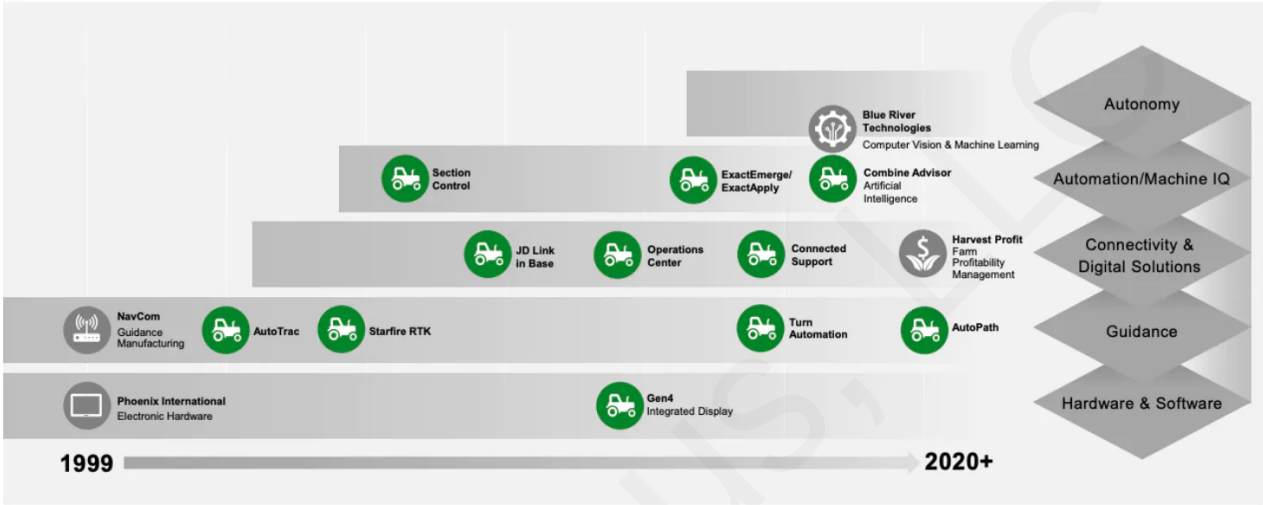
Business Model & Secret Sauce

Value Proposition

- Deere traces its history back to 1837 (184 years ago!) and is now recognised as the largest agriculture machinery company in the world. John Deere has approximately 69,600 employees with 27,500 in US/Canada.
- For over a century, Deere has been the pre-eminent manufacturer of critical agricultural equipment. Deere's strong brand has been built by its products which are known for being high-quality, durable, and efficient. One of the company's stated aims is to reduce the total cost of ownership by making their machines:

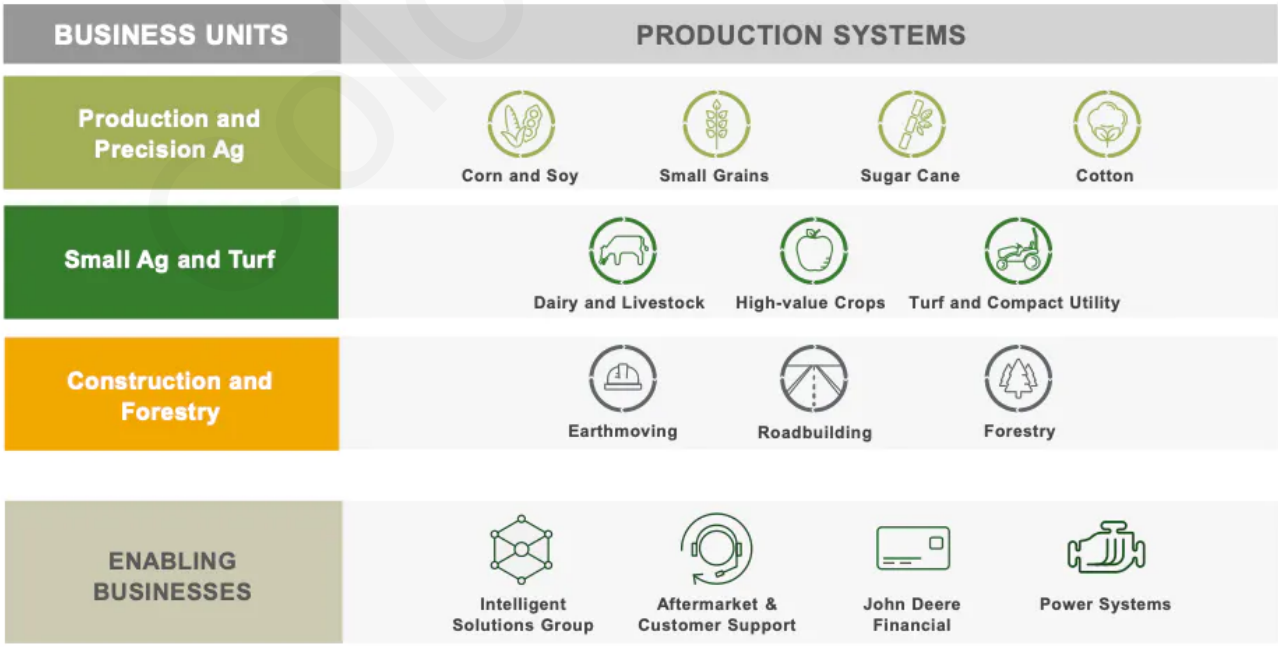
- More durable - can be used often and require replacing infrequently.
- Higher spec - can be used outside of daylight hours, for example.
- More efficient - use less fuel, chemicals, and labour (as well as increase yields).

- Deere is known as a technological leader in the industry, embedding intelligent systems within each product to increase farmers' efficiency. Over the past couple of decades, Deere has grown its capabilities to offer farmers guidance systems, connectivity, and automation of certain functions - like spacing and placing seeds in a feed to reduce wastage and increase yield.
  - Deere is pursuing a strategy to increase autonomy in its products so farmers get more for less input. This drive to full autonomy, backed by their strong brand, should increase switching costs if they can execute well.
  - Here is an overview of their technological leadership and push to autonomy:



Source

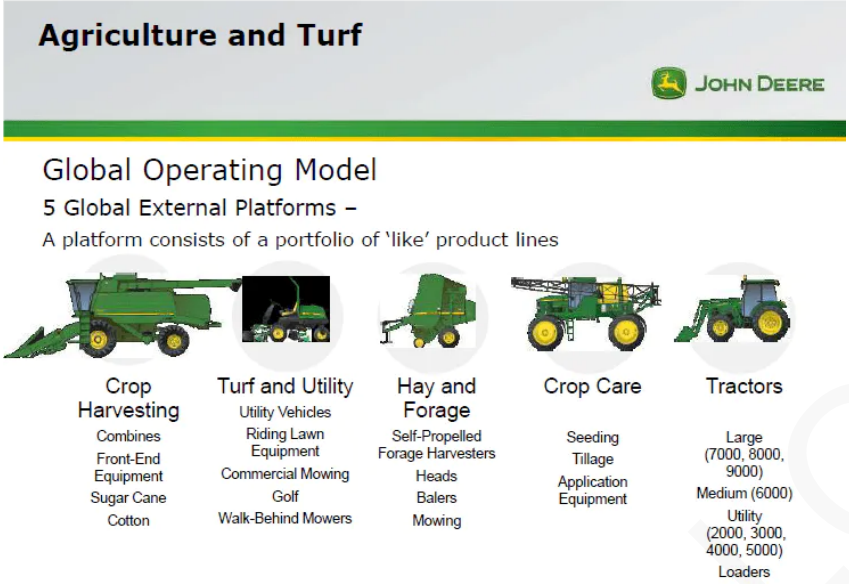
- The company's strategy focuses on delivering a comprehensive solution for farmers. Their products target each phase of the farming process, including preparation, planting/seeding, applying chemicals, and harvesting:



Source

Products:

- Their operations are organised into three principle business segments:
  - **Agriculture and Turf:**



Source

  - **Construction and Forestry:** manufactures and distributes a range of machines and service parts used in construction, earthmoving, material handling and timber harvesting — including backhoe loaders, four-wheel-drive loaders and excavators.
  - **Financial Services:** finances sales and leases by John Deere dealers of new and used agriculture and turf equipment and construction and forestry equipment, and provides wholesale financing to dealers of the John Deere-branded equipment.

Distribution:

- John Deere's products and services are marketed primarily through a network of independent retail dealerships and major retail outlets, which deal directly with the Company's own in-house sales teams. Often, these are ongoing relationships with multi-year sales agreements.
- The breadth of Deere's dealer network is unmatched, with over 1900 locations in North America and approx. 3700 globally (with significant presence on every continent).
  - It is difficult to compete with this scope, particularly as dealers offer farmers convenient access to after market parts and services.
    - Deere provides ongoing support services to customers, in the form of financing solutions, maintenance and protection plans, servicing and parts, and safety and training assistance.
- They also sell a selection of products to customers on a self-service basis through their online store.
- Their major market is the US. Based on 2020 Revenue, geographical split is as follows:
  - US: 53%
  - Canada: 7%
  - Western Europe: 15%
  - Central Europe/CIS: 6%
  - Latin America: 9%
  - Asia, Africa, AUS, NZ, Middle East: 10%
  - Geographic goals are to increase market share specifically in India and Brazil.

Economics

- **Revenue**:
  - Worldwide net sales | net income:
    - 2020: $35.5 bn | $2.8 bn
    - 2019: $39.3 bn | $3.3 bn
  - Agriculture and turf is the company's most important business line. Net sales split as follows for each business segment, with associated operating margins:

Agriculture and Turf:

	2020	2019	% Change
Net sales	$ 22,325	$ 23,666	-6
Operating profit	2,969	2,506	+18
Operating margin	13.3%	10.6%	

Construction and Forestry:

	2020	2019	% Change
Net sales	$ 8,947	$ 11,220	-20
Operating profit	590	1,215	-51
Operating margin	6.6%	10.8%	

Financial Services:

	2020	2019	% Change
Revenue (including intercompany revenue)	$ 3,867	$ 3,969	-3
Interest expense	942	1,234	-24
Operating profit	746	694	+7

Source

  - Sales by product line:
    - Large Agri: 32% | Small Agri: 23% | Construction: 10% | Financial Products: 10% | Roadbuilding: 8% | Turf: 7% | Compact Construction: 4% | Forestry: 3% | Other: 3%

Costs:

  - Unsurprisingly, manufacturing agricultural machines is capital intensive. Deere's cost of sales hovers around 75%. In FY'20, they spent 4.6% of revenue on R&D, 9.8% on SG&A, and 3.5% on interest expenses.
  - Margin Expansion, Cash Flow, Debt service
    - FY21: Analysts expect gross margins to reach 30%, EBITDA margin to reach 21%, and Net Income margin to reach 14.8%
    - FY20 saw actuals of 24% gross margin and net income margin of 8%.
    - FCF FY20 was $6.6b and analysts expect that to decrease to $5.1b in FY21.
  - Deere's debt to ebitda ratio was 7.2x (on the higher end). Analysts expect that to decrease to 4.07x in 2021.

Competitive Advantage

- **Brand.** Deere has one of the world's most valuable brands. They deliver world class products and value-added services through their global dealer network. This brand loyalty gives them pricing power and raises the barrier to compete for other brands.
  - Deere leads **market share** in agricultural equipment at close to 20%. Source
    - With the growth of both the traditional agriculture market (valued in the trillions) and the smart agriculture market (use of tech and IoT to make farmer more productive and efficient - global market

valued at $13b in 2020 and expected to grow at a CAGR of 10.1% until 2026), Deere has a solid foothold in the industry to grow with it. Market data, Market data

- **Relationships** with third party dealerships and retailers across the globe that will be hard to replicate by new entrants.
- **Data and speed to market**. Deere has employed the use of machine learning algorithms to forecast demand for their seasonal business and help farmers increase yields. The more data it has to use, the more effective and accurate the results are, the more useful it can be to their customers - farmers. They have over a century of data from operations to use.
  - Their extensive manufacturing capabilities around the globe help them manage and maintain demand and supply from different retailers

Competitive Position

Industry (they have a number of competitors in each vertical they operate in):

- Competition: the main criteria to differentiate in this industry are product performance, innovation and quality, distribution, customer service and price.
  - In North America and many other parts of the world, John Deere's brand recognition is a competitive factor.
- Deere faces competition in each vertical.
  - Agriculture and turf segment: AGCO Corporation, CLAAS KGaA mbH, CNH Industrial N.V., Kubota Tractor Corporation, Mahindra, and The Toro Company and regional and local competitors.
    - As technology becomes increasingly important to enable productivity in agriculture, the industry is attracting non-traditional competitors including more technology-focused companies and start-up ventures. The agricultural equipment industry continues to undergo significant changes and is becoming even more competitive through the emergence and expanding global capability of many competitors, particularly in high potential markets such as Brazil and India where Deere seeks to increase market share. The segment's turf equipment is sold primarily in North American and Western European markets.
  - Construction and forestry segment include Caterpillar Inc., CNH Industrial N.V., Doosan Infracore Co., Ltd. and its subsidiary Doosan Bobcat Inc., Fayat Group, Komatsu Ltd., Kubota Tractor Corporation, Ponsse Plc, SANY Group Co., Ltd., Terex, Tigercat Industries Inc., Volvo Construction Equipment (part of Volvo Group AB) and XCMG.
- There are extremely high barriers to entry in this industry. It's capital intensive and is dominated by legacy players. Additionally, Deere has manufacturing plants all over the globe, a capital intensive endeavor for any startup or upcoming competitor.

- Position within industry:
  - Brand: Deere's brand is its best competitive advantage.
  - Deep entrenched network of suppliers and distributors: John Deere uses a variety of agreements with suppliers intended to drive innovation, ensure availability and delivery of industry-leading quality raw materials and components, manage costs on a globally competitive basis, protect John Deere's intellectual property, and minimize other supply-related risks.
  - IP: Deere's vast IP (patent, manufacturing, designs) also contribute to its strong moat
    - John Deere owns a significant number of patents, trade secrets, licenses, and trademarks related to John Deere products and services, and expects the number to grow as John Deere continues to pursue technological innovations.
    - John Deere's policy is to further its competitive position by filing patent applications in the U.S. and internationally to protect technology and improvements considered important to the business.

Risks

There are a number of risks to Deere (execution risk and not innovating quickly enough, government risk, macroeconomic risk). Below are a select few:

- Deere operates in a cyclical industry. Demand for its products (agriculture and construction) changes in line with macroeconomic conditions.
  - Sales of agricultural equipment are affected by total farm cash receipts, which reflect levels of farm commodity prices, acreage planted, crop yields and government policies, including global trade policies and the amount and timing of government payments.
  - Sales are also influenced by general economic conditions, farm land prices, farmers' debt levels and access to financing, interest and exchange rates, agricultural trends, including the production of and demand for renewable fuels, labor availability and costs, energy costs, tax policies and other input costs associated with farming.
  - The prevailing levels of residential, commercial and public construction, investment in infrastructure, and the condition of the forestry products industry influence retail sales of John Deere construction, earthmoving, roadbuilding, material handling, and forestry equipment. General economic conditions, the level of interest rates, the availability of credit and certain commodity prices, such as oil and gas and those applicable to pulp, paper and saw logs also influence sales
- Deere is also subject to emissions regulation, which has become more of a focus in recent years.
  - The European Union's Stage V Regulation, parts of which became effective in 2019 and 2020, applies to non-road diesel engines across various power categories for machines used in construction, agriculture, materials handling, industrial use and generator applications. Governmental agencies throughout the world are enacting similar laws to reduce off-road engine emissions, including India's Bharat Stage IV Regulation that will become effective in 2021.
    - Deere has achieved and plans to continue to achieve compliance with these regulations through significant investments in the development of new engine technologies and after-treatment systems. Compliance with emissions regulations has added and will continue to add to the cost of John Deere's products.
  - Governments are also implementing laws regulating products across their life cycle, including raw material sourcing and the storage, distribution, sale, use, and disposal of products at their end-of-life. These laws and regulations include green chemistry, right-to-know, restriction of hazardous substances, and product take-back laws.

Useful Resources

Title	Type	What You Will Learn	URL
John Deere 2020 Annual Report Highlights and Analysis	Article	A 2020 Financial Overview and an analyst's estimates on what John Deere needs to do in the future to continue winning this market.	https://upstreamaginsights.substack.com/p/john-deere-2020-annual-report-highlights
Farm to Data Table: John Deere and Data in Precision Agriculture	Article	The exact technology benefits and challenges of precision agriculture tech.	https://digital.hbs.edu/platform-digit/submission/farm-to-data-table-john-deere-and-data-in-precision-agriculture/
The role tractor maker John Deere has to play in the future of farming	Article	An overview on the future of John Deere farming and R&D spend.	https://www.nsagriculture.com/analysis/john-deere-future-farming/
On Life and Land by John Deere	Podcast	A series on farmer's stories on agriculture, farming, and land.	https://podcasts.apple.com/us/podcast/on-life-and-land/id1439108033
Agriculture Technology Podcast: Ep. 144 John Deere Model Year '22 Sprayer Update	Podcast	An update from a farmer on John Deere's latest models. The broader series goes deep on precision agriculture tech.	https://www.rdoequipment.com/resources/podcasts/agriculture-technology-podcast-ep.-144-john-