Case Study: Rethink Robotics

Industry: Industrial Automation
US Manufacturing Locations: Boston, MA

COMPANY OVERVIEW

Rethink Robotics was originally called Heartland Robotics at its inception in 2008. Heartland Robotics embodied the company's vision to provide economical and effective robots for small and medium sized businesses (SMBs) in America. More importantly, various investing groups shared Rethink Robotics' vision. Groups such as Bezos Expeditions, Charles River Ventures, Highland Capital Partners and Sigma partners have collectively funded Rethink with $113.5 million since 2009 [3,4]. With this infusion of capital, Rodney Brooks and his team developed a humanoid robot named Baxter in 2012. Baxter has a variety of functionality and futuristic capabilities and puts Rethink in a strategic position for differentiation among its competitors.

Baxter is differentiated from its competitors by being a "co-bot". "Co-bots are designed to work alongside humans with quick programming for simple, repetitive manufacturing tasks. Baxter is designed to perform "human class and human scale tasks in a human environment"[2]. This positioning allows Rethink to avoid direct competition with industrial robots on the market. Instead of replacing those bots, Baxter can complement and work side-by-side with them. This concept is allowing manufacturing engineers to rethink their operations in terms of enhancing efficiency.

Rethink Robotics is disrupting manufacturing technology with an easy-to-use, inexpensive robot that optimizes operations.

"Rethink Robotics…will do for manufacturing workers what the PC did for office workers — increase their productivity by giving them direct access to technological tools."[1]

Rodney Brooks, Chief Technology Officer and Founder

RESHORING MEANS RETHINKING

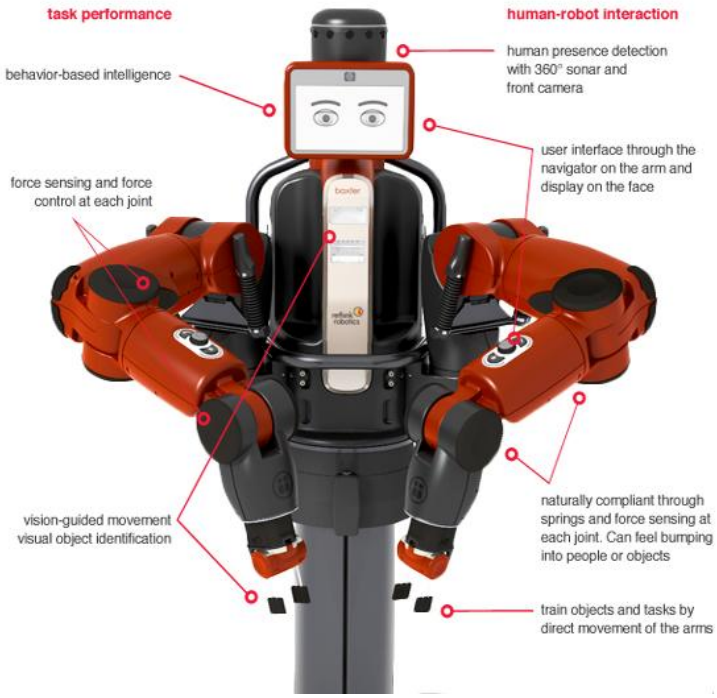
"Just as businesses had to completely rethink ways to use computers when the PC was first introduced, they will want to take advantage of opportunities created by this new class of robot," said Rod Brooks, chairman, founder, and CTO of Rethink Robotics. "With our robots, businesses will have the opportunity to rethink manufacturing, automation, and outsourcing."[5] Small to midsize manufacturers have much to gain by developing a process that works around mobile, adaptable robots. There is a misconception that robots and large capital expenditure. Baxter costs about $22,000 whereas its human counterparts cost anywhere from the $30,000 to $60,000. This affordability combined with functionality and efficiency make Baxter a sought after addition to the manufacturing process.

ROBOTIC CAPABILITIES

Rethink's humanoid robot weighs in around 300 lbs. and can stand from 5'10" - 6'3" depending on the attachments. The most impressive feature when one sees Baxter is its facial expressions triggered by its 360 degree sonar and front camera. These facial expressions include neutral, sleeping, concentrating, focused, surprised, confused, and sad. Eye movement and eyebrow shape convey these emotions to perceive each facial expression. With these facial expressions, Baxter can communicate when he is 'ready for training', "on standby", "learning a task", "working on a task without a problem", "detecting human", "having trouble completing a task", or "giving up trying to complete a task when there is a problem". The most notable emotion is the surprised feature. The face changes from a white screen to a red screen to let you know that Baxter senses you. These non-verbal communications are indicative of his behavioral based intelligence for common sense programming and vision guided object detection.

Not only is Baxter smart, but he is also versatile. Baxter has two arms that have 7-degrees of freedom that allow maximum flexibility. He is easily adaptable with interchangeable end-effectors and compliant joints that sense force control when being trained to perform a task. The Figure below describes its features in more detail.

Picture courtesy http://www.ubergizmo.com/2012/09/baxter-robot-needs-no-programming/



AUTOMATION AFFECTS ON MIDDLE CLASS

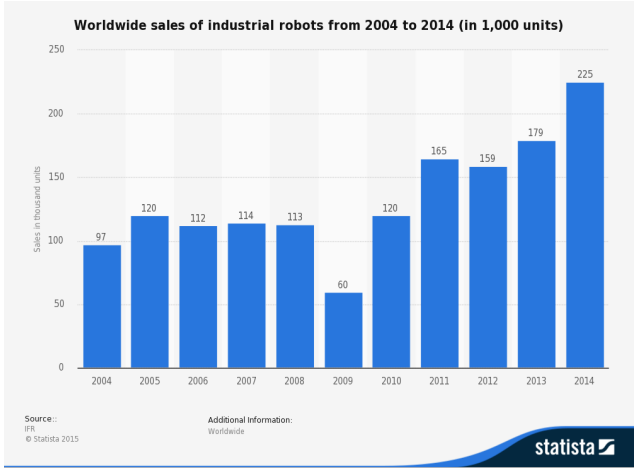
Does Reshoring manufacturing also mean Reshoring jobs? Not all of the jobs are coming back to America. Robots will replace some humans, however this advanced manufacturing technology will result in higher skilled and better paid labor. Today's manufacturing is more likely to be clean, automated and computerized. We are in the Talent Age of Manufacturing, where employees are valued for utilizing data and adapting product and functionality to changing global market demands. Robots are a key factor in future automation of manufacturing processes, increasing efficiency and quality and ultimately stimulating economic growth.

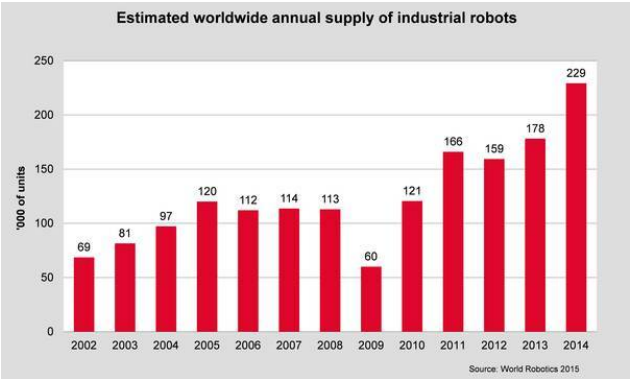
Are robots taking American jobs? Empirical evidence says otherwise. The decline in American and European manufacturing is attributed to globalization and outsourcing. "If robots are a substitute for human workers, then one would expect the countries with much higher investments in automation technology to have experienced greater employment loss in their manufacturing sectors"[6]. According to researchers George Graetz and Guy Michaels, "though the U.S. lost two million manufacturing jobs when robot use increased, it is important to note that correlation does not mean causation". "Despite the installation of far more robots between 1993 and 2007, Germany lost just 19 percent of its manufacturing jobs between 1996 and 2012 compared to a 33 percent drop in the United States. Countries like the United Kingdom and Australia invested less in robots but saw faster declines in their manufacturing sectors. Data has also shown that automation leads to more jobs!" "Metra Martech study concluded a job-creation ratio of 3.6 jobs for every robot deployed and that with more robots, fewer jobs are lost"[2].

RETHINK THE FUTURE

No matter how you slice it - robotics are here to stay. Robot sales have increased steadily since 2004 with a decrease only during the global economic crisis in 2009. Sales are expected to steadily increase.

Baxter has been used in many different industries including research, plastics injection, and molding. Some of the early adopters of Rethink robots are MIT, the Rodon Group, and Nypro[2] and their reviews of Baxter include increased efficiency and overall capability that allows for specialization. Rethink, Baxter and other robotics companies are helping manufacturers automate their processes, improve their quality, and bring manufacturing back to the U.S.





ABOUT THE AUTHOR

Nick Privitelli is pursuing a Bachelor of Finance and a minor in Supply Chain Management at the University of San Diego. Nick has an expected graduation date of May 2016. Being an Orange County native and going to school in San Diego, Nick had an itch to expand his horizons and see more of the world. This urge to travel eventually led Nick to Madrid, Spain, where he studied Finance and Marketing, and tutored Spanish children in English. During his junior summer, Nick worked for RBC Bearings and learned to appreciate and respect manufacturing operations and business development.

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Citations

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