Smart Packaging: How AI is Changing the Game

Over the last several years, the packaging industry has undergone significant transformations driven by rapid advancements in technology. From the introduction of innovative materials and sustainable practices to automation and smart packaging solutions, technological developments are revolutionizing how products are packaged, stored and transported. As consumers look for convenience, sustainability and product safety, the packaging industry is leveraging cutting-edge technologies to meet these needs while enhancing efficiency and reducing costs.

One example of this transformation is the intersection of depalletization systems and artificial intelligence (AI) technology. These systems enhance the efficiency and safety of e-commerce fulfillment and warehousing operations and can handle packages of various sizes more efficiently. Automated depalletization has long been available for uniform pallets, but new systems allow for the depalletization of mixed-size packages. AI machine learning helps assess stacking so the equipment can prioritize which packages to move and respond accordingly to damaged ones. Robotic depalletization systems safely unload pallets and deliver up to 40% cost savings when compared to manual labor, with scalability savings as well.

Additionally, factory automation offers businesses a viable option to enhance operational efficiency and decrease labor costs. The integration of collaborative machines in the packaging industry promises enhanced production optimization, data gathering and return on investment. Due to the distinguished success Berry Global realized through the implementation of AI within its manufacturing capabilities, other industry leaders are looking towards mergers and acquisitions (M&A) to quickly ramp up their own technological capabilities. Upskilling employees to operate machine software is viewed as key to becoming an industry leader.

Amazon developed the AI-powered Package Decision Engine to improve efficiency for customer orders, aiming to optimize packaging matches, reduce waste and enhance delivery. By combining deep learning, natural language processing and computer vision, the model adjusts packaging needs for items based on fragility and protection requirements. This innovation supports Amazon's sustainability goals, significantly reducing packaging material use, and was adopted globally due to its scalability compared to prior manual methods.

AI is set to revolutionize the manufacturing industry by enhancing efficiency and precision. With AI-driven automation, repetitive tasks can be performed faster and with fewer errors, reducing costs and increasing productivity. As seen in the below chart, the manufacturing industry is expected to realize the most benefit from the new technology. While companies continue to adopt AI, they will continue to refine and optimize their production to align with the new opportunities available.

Value Added from AI by Industry
($ in billions)

Baseline ■ Additional AI Contribution

Source: Accenture
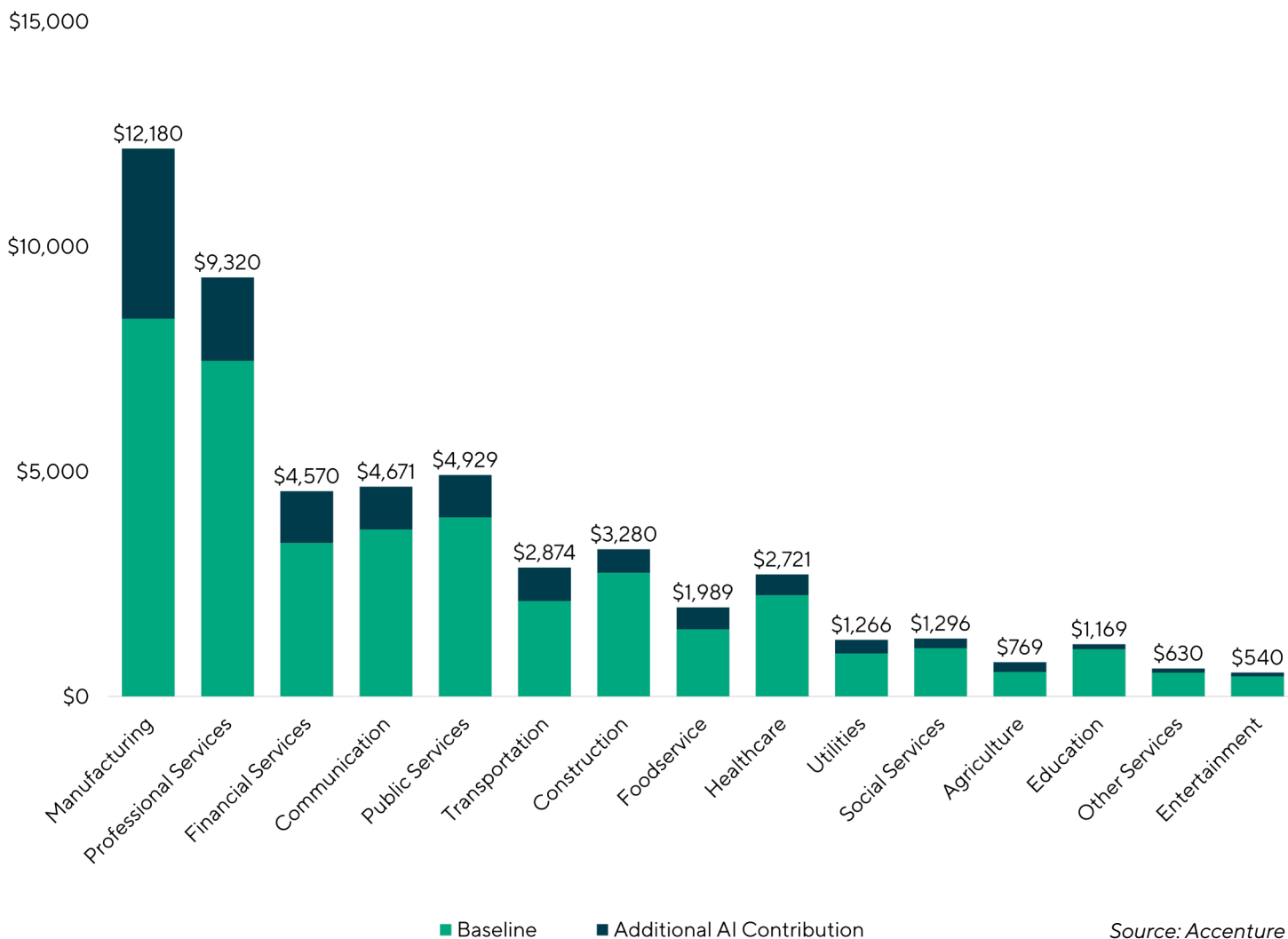
The technological advancements in the packaging industry are reshaping its landscape, offering unprecedented opportunities for innovation, sustainability and efficiency. Leading companies, like Amcor and Smurfit WestRock, are looking to M&A as an effective strategy to rapidly increase their technology capabilities. As technology continues to evolve, the packaging industry is poised to further enhance its capabilities, contributing to a more sustainable and efficient global supply chain.

Connect with a Lincoln packaging expert to learn more about this trend and how we can take your business to its next success: www.lincolninternational.com/whoweserve/packaging