

USING BIG DATA TO MANAGE WASTE AND RECYCLING FOR FOOD SUSTAINABILITY



OCTOBER 2018 TECH BRIEF FOR FOOD INDUSTRY TALENT NETWORK

Increasing Efficiencies to Improve Bottom Line

Experts declared 2015 a [watershed year](#) for data collection and management. More data was collected in 2015, than throughout human history combined. By taking advantage of this newly available Big Data and advanced analytics at every link in the value chain from field to fork, food companies can harvest data's enormous potential for [sustainable value creation](#) across the entire supply chain.

[Reasons](#) to engage in the advancement of food sustainability for businesses in this industry vertical are many and compelling. Growth in revenue in the waste management sector – from \$57.6M in 2016 to an anticipated \$223.6M in 2025 – is certainly reason enough. Other impacts – from regulatory compliance, to environmental protection, to improved [efficiencies](#) in the distribution of product, to the reduction in food waste (a multi-billion dollar annual expense globally) – provide an urgent need for “smart waste” management.

Labor Force Takeaway

Associates who will fill food industry positions in the near and long term will need to be both data and reporting literate. As businesses begin to take advantage of the data mining opportunities that are available, the Talent Advisory Network recommends employees receive training in these areas.

[CompTIA A+ and Fundamentals certifications](#), aimed at the IT beginner, are an excellent starting point for associates to gain knowledge in the area.

Intermediate associates can delve deeper into the discipline with certifications in [Cisco Network Administration](#) (CCNA), CompTIA Server+, IBM Certified Specialists credentials, and others like OCA, OCP, VCP, and MCSA. Advanced certifications like MCSE and CCNP will prove valuable for associates running a data shop full time.

Expert level certifications like ASE/CSE and OCM render associates fully capable of gathering, concatenating and interpreting data, as well as managing large network installations. In-state major universities like NJIT and Rutgers also offer advanced degrees in Big Data Science for intensive practitioners.

Opportunities to Optimize Yields, Manage Waste

There are a variety of **opportunities** in which the application of Big Data mining and reporting techniques can be used to improve efficiencies in food production, distribution/availability and waste management. Innovation can be accelerated in soil science, weather/environmental impacts, and trials/insights.

Precision agriculture is a rapidly growing field, particularly for foods that only grow in small quantities in highly specialized areas – like coffee, chocolate and vanilla. Fragmented supply and unstable yields lead to regional product shortages and wide price swings. Big Data can provide invaluable insights.

Supply chain transparency, including integrated planning and segmented critical path adjustments, can be key to improving forecasting accuracy. This is especially critical in developing/emerging economies, where newer production tools are less available. Waste management is a larger issue in more developed economies, where production and distribution typically exceed demand capacity.

According to a recent study by **McKinsey**, in developing/emerging economies, 32% of crop loss occurs during production in developed/mature economies, 38% of loss occurs during consumption.

Big Data can improve downstream **operational capabilities**. Plant optimization uses data from previous years' yields, forecasted weather, soil insights and pest management strategies. Simulation has been shown to come very close to actual yields, once measured in arrears, and can play a critical role in ensuring the timing and availability of distribution channels to specific outlets.

Infrastructure challenges can employ Big Data to identify distribution bottlenecks, outlet saturation of certain foodstuffs and outlet deficiencies in real time, allowing for product reroute. This information helps select intermediate warehouses or drop-off locations, hence driving down business expense.

Accurate anticipation of waste volumes by region and location followed by planning for environmentally-friendly disposal is where Big Data can perhaps play the most crucial role. The identification of waste streams, associated volumes and outlets for disposal are key to meeting regulatory requirements.

Several available software tools and applications are currently on the market and available for use in closing the loop on food procurement. Examples include:

- BioHitech Cirrus 2.2, used with companion digesters provides actionable real-time information on waste creation, towards an idealized zero-waste outcome.
- Disposal systems, such as the EnviroPure commercial one-step solution, converts food waste to gray water, without the current intermediate steps to sort, transport and store, which adds significant cost to waste management needs.
- Grind2Energy, the result of an AT&T/Emerson partnership, uses Internet of Things (IoT) and Big Data in converting food waste to slurry, which is then held in a predetermined holding cell for transport to local anaerobic digestion facilities. Big Data provides real time data for the creation volume and movement of this product waste. Global food waste, currently estimated at a **\$940B** annual cost, with carbon footprint and blue water impacts, will improve as a result.