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Shaping society 5.0 Building trust in AI as a force for good

Feeding the future: How AI can help to build a safer and more secure global food system

Foreword



**By Harold Pradal,
Chief Commercial Officer, BSI**

2023 will be viewed as the point that Artificial Intelligence (AI) tipped into the mainstream, with a 286% rise in media coverage of the topic¹. And whilst headlines were grabbed by ChatGPT, the real AI story is much, much deeper.

This transformational technology is accelerating progress – and has the potential to go further as a force for good and move us towards Society 5.0, a ‘human-centered society that balances economic and technological advancement to solve society’s problems’². Importantly, it also raises questions around how we build trust in AI and what guardrails are needed to ensure AI shapes our future in a positive way.

In this collection we go behind the headlines to explore the real-world impact of AI through the eyes of BSI experts, drawing on the views of 10,000 people in nine countries. For anyone in doubt, AI is here and it’s here to stay – 38% of people use AI in their jobs daily, rising to 70% in China and 64% in India. By 2030, 62% expect their industry will use AI³.

At BSI we are committed to shaping the impact of technology and innovation for the benefit of individuals, organizations and society. AI sits at the heart of this because it has the potential to be a powerful partner, changing lives and accelerating progress towards a better future and a sustainable world.

We commissioned these essays to turn the spotlight on this generational opportunity – recognizing that the better we understand it, the better we can harness its power. Whether it’s creating new workplace opportunities, improving patient outcomes, tackling modern slavery or building a safe global food system, AI has a pivotal role to play.

We examine the importance of embedding digital trust in AI, the critical role for collaboration – between nations, policymakers, organizations and individuals – to unlock AI’s true potential, and the fast-evolving regulation designed to ensure consistency and certainty.

With AI crossing over from small, contained environments into mainstream technology at work and at home, this offers a transformational opportunity to unlock a multitude of benefits – provided trust and confidence are present too.

AI is just getting started. At BSI we are excited to partner with our clients as we embark on this journey. We are delighted to present these essays to explore the enormous potential AI offers to shape Society 5.0 and deliver a sustainable future powered by innovation.

1. Signal search analysis 2022-2023.
2. Society 5.0: The Fundamental Concept Of A Human-Centered Society, Open Business Council, Aug 2023
3. BSI Trust in AI Poll 2023



Feeding the future: How AI can help to build a safer and more secure global food system

As a purpose-driven organization, BSI believes AI can be a force for good, changing lives, making a positive impact on society, and accelerating progress towards a sustainable world. In this essay, Neil Coole, Director – Food and Retail Supply Chain, looks at the areas in which farmers and manufacturers can partner with AI to shape a safe, sustainable, and transparent future food system, meeting the needs of people and planet.





By Neil Coole

Director, Food and Retail Supply Chain, BSI

Light, water, soil. Producing food can be distilled into three core elements – and yet the farm to fork process is anything but simple. With the UN predicting that 60% more food will be needed worldwide by 2050 to feed our growing population¹, and agriculture contributing to around a quarter of greenhouse gas (GHG) emissions², feeding the world in a way that is safe, nutritious and sustainable is one of the central and most complex societal challenges we face today. Can AI be part of the solution to food security and can farmers and manufacturers partner to help make the food we eat safer, healthier, and better for people and planet? And if so, how can we build trust in a food and farming system that has AI as a key ingredient?

There's certainly precedent for AI shaping the future of food in a positive way³. From the invention of the plough to the first fridges, technology has always played a part in improving the volume and quality of food we're able to produce. Increasingly, agricultural organizations and advisory bodies such as the World Economic Forum (WEF)⁴ are looking at ways AI can be a force for good and support a safe, secure global food system. And there is public enthusiasm – already more than two fifths of those surveyed in BSI's Trust in AI Poll⁵ (42%) agree we should use AI tools to minimize the impact of agriculture and food production on the environment.

- The use of AI in relation to the global food system offers the potential to bring benefits for food safety, nutrition and sustainability.
- AI can also support greater transparency as to how food is produced and under what conditions, as one in two people say they want AI to ensure accurate use by dates to reduce food waste.
- Innovators are already putting AI-based tools to use to improve soil health, conserve water and reduce food contamination risks.

60% 

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Uptake so far

Only a quarter (25%) of those in Retail, Food and Leisure say their job currently uses AI on a daily basis – compared with industries like finance, in which 55% do. And so far, just one in four people say they would have more confidence in AI than people to detect contamination issues in the food supply.

Such reticence around the adoption and integration of AI could reflect concern that AI will make food safety professionals obsolete or impact wider jobs in the sector⁶. Equally, there could be uncertainty around how AI would be viewed by regulators when it comes to the safety of food, given the current requirements for human oversight in food processing.

Public faith in use of AI in the food industry may still be in its infancy, but we are already seeing opportunity arise in innovative pockets⁷, for example, within autonomous agricultural machinery, or to detect harmful pathogens in food before it is processed⁸. And 73% working in the food sector say with the right training they would trust AI to do some or all of their job, including the most menial tasks. Long term, the potential AI offers for keeping food safe, producing it sustainably and adding value is enormous.



24%

of food and retail workers use AI on a daily basis – 53% expect their sector will by 2030.



The untapped potential of AI for improving food safety

Take, for example, one of the most common occurrences in the food industry: consumer health incidents. According to the World Health Organization (WHO), contaminated food results in an estimated 600m people falling ill every year, leading to 420,000 deaths⁹. These arise, typically, because someone, somewhere in the production process, unintentionally made an error. AI could have a positive impact on reducing recurring incidence of consumer health scares and enforcing food hygiene standards by removing the possibility of human error from food production.

Likewise, there is the potential to reduce the likelihood of foodborne illness outbreaks by using AI to assist in the rapid detection of pathogens such as salmonella, E. coli or listeria¹⁰. This is because AI has the potential to analyze data from microbial tests and identify possible issues quicker and more accurately than manual methods.

AI could also be applied to cases of food fraud, which is estimated to cost the global food sector €30 billion annually¹¹. According to the EU this can include “adulteration, substitution, dilution, tampering, simulation, counterfeiting, and misrepresentation”¹². In these situations, by replacing the moment where people’s behaviour could be compromised with an algorithm that can identify anomalies, research has identified that AI offers the opportunity to detect food fraud and prevent its recurrence¹³.

Of course, algorithms reflect the bias of those developing them, so having safeguards is critical. Likewise, while AI has the potential to improve efficiency, accuracy, and safety in food manufacturing, three quarters of people said they need trust if AI is to be used to manufacture food.

Food safety professionals must take steps to ensure AI is used responsibly and safely throughout the industry. Transparency, thorough testing and ongoing monitoring, with manufacturers working with trusted partners who understand industry risks, standards and requirements, can help mitigate concerns and build trust.

AI could have a positive impact in reducing recurring incidence of consumer health scares and enforcing food hygiene standards by removing the possibility of human error

Neil Coole



Farming technology that puts the earth first

Nearly half of people (46%) support the use of AI to make the food system more sustainable and better for people's health. With concerns about food security¹⁴ and whether food production can meet future needs, sustainability and managing the resources being used to take food from farm to fork, is a key driving factor behind many AI innovations emerging in relation to food production.

For example, AI is being used to manage soil health and water stewardship. As set out in [BSI Thirst for change report](#), agriculture uses more water than any other industry and water is a resource that needs to be protected. Intensive farming is already leading to desertification and, without good soil management, topsoil can be over-farmed to the point it can't be used for crops any longer. The net effect risks being reduced land for growing¹⁵.

Used innovatively, as PWC has identified¹⁶, AI can help farmers manage land more effectively and potentially make use of depleted land, either by recycling it or via infrastructure like vertical farms. PWC forecasts that agricultural AI applications can help reduce emissions by up to 160 mega tonnes CO2 equivalent by 2030, while producing more food and using fewer resources.

Already, there are some exciting examples of so-called Smart Farming innovation happening. US-based crop health company Enko¹⁷, for example, is applying DNA-encoded libraries and machine learning to combat pest resilience, while CropX¹⁸ is using digital twins of crops via sensors, allowing AI mapping technologies to predict yields based on changing weather.

At the consumer end, AI offers the potential to improve shelf life and manage expiry dates, minimizing food waste – something one in two (49%) people said they wanted AI to be used for. In collaboration with a US partnership involving the Pacific Coast Food Waste Commitment, Afresh and Shelf Engine, WWF used AI purchasing systems in two retail pilots aimed at reducing food waste¹⁹. The pilots prevented 26,705 tons of CO2 emissions from food to landfill, as well as generating other efficiencies.

46% 

of people globally back the use of AI to make the food system more sustainable and better for people's health.



Data and consumer choice

Already, 48% of us globally use fitness tracking apps like Strava. That's just the beginning. Because AI is able to gather vast quantities of data, it offers the potential to respond to consumer demand for greater information and transparency about nutritional content²⁰, provenance of the ingredients and how food was produced.

There are already tools using AI to track data about anything from the welfare of an animal²¹ to calorie count²². As AI uses become more advanced, there is the potential to give consumers greater choice. With that farm to fork information, people could find it easier to make healthier or more sustainable choices.

Two thirds



of under 25s use health and fitness tracking apps.

Food for thought

Whether used in autonomous agricultural machinery, to improve soil health, to improve water use, to minimize food waste or to establish food standards, AI in food production is likely to prompt discussion about governance and ethics at every level of the supply chain.

What is crucial in all the opportunities AI presents for innovation in the global food system is trust – 75% said this is the key ingredient in them being comfortable with AI being used to manufacture food. Equally, by prioritizing people alongside leveraging the benefits of AI, we have the opportunity to build a future food system that is safe, sustainable and supports food security.

Used well, with people at the centre of innovation and with transparency embedded we can build greater trust in AI, so that it can enhance food systems and lead to improved food safety, reduced risk and better health and well-being. If the initial innovation we are seeing is anything to go by, it also offers the opportunity to support sustainability goals and give consumers greater confidence about where food comes from and how it is produced. These are outcomes that can surely only further trust in AI to benefit society and accelerate progress towards a sustainable world.

Find out more

Artificial Intelligence (AI) technology brings numerous benefits to farmers, helping them to identify inefficiencies in their processes, gather data (which can be used to manage risks), and monitor the progress of crops, including assessing soil health, pests and diseases. Read all about AI and smart farming in BSI's recent report [here](#).

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BSI Group
389 Chiswick High Road, London, W4 4AL
+44 345 080 9000
bsigroup.com

