

A Predictive World

Summary: Predictive analytics will provide low-cost, easy-to-use tools to businesses, organizations, and individuals. This will empower users with a greater ability to detect and forecast developments to make better-informed decisions, but these systems could also provide false or skewed information that may distort choices.

Forecasts

- As predictive systems expand their reach and scope, it will become gradually clearer which topics are amenable to forecasting and which are too chaotic or data-poor and thus resistant to prediction. Fields and industries will be exploring what their particular boundaries of “forecastability” are.
- There will be a growing popular expectation for predictability in all things. One result could be disappointment in these systems, i.e., “weatherman syndrome,” when systems can give reasonably accurate probabilistic outcomes but are blamed for the “wrong” answers.
- Even with more data flowing into predictive analytics systems from sensors, consumer behavior monitoring, and mobile data, there is still a danger of false precision in systems. Users may focus on single results and miss the multiple potential outcomes which may be in play in a system.
- Overreliance on predictive technologies could lead to a loss of user confidence in their own decision-making, due to dependency. Similarly, there is a risk of overconfidence in system outputs: the “follow GPS into the lake” problem.



Key uncertainties affecting the future of predictive analytics:

- Consumer privacy worries
- Backlash against filter bubbles
- Expansion of consumer encryption protections
- Questions about the legitimacy of profiling and “algorithmic discrimination”
- Overall societal status of trust
- Who controls—or has access to—needed data



Supporting trends

Predictive analytics and social media. Predictive analytics are being applied to social media streams to understand and predict small-group behavior.

Affective computing. Affective computing integrates emotion detection and simulated psychological sensitivity into computers.

Anticipatory ambient intelligence. Ambient intelligence may lead to AI systems anticipating consumers' needs in every aspect of life.

Algorithmic discrimination. Widespread use of data analytics creates the potential for algorithmic discrimination.

Controlling product use with geofencing. Companies are using geofencing technologies to monitor and control how and where their products are used by consumers and employees.

Smart surveillance. Smart surveillance systems are able to use sensor-fusion technologies to track shoppers picking specific products off shelves in real time.

Machine learning model extraction. Machine learning algorithms can be used to reveal hidden information, such as pixelated images.

Off-grid conversations. The desire for privacy in online communications is being addressed by an emerging genre of "dark social apps" like FireChat and LiveText.

Quantum computing. Quantum computing will emerge from the lab during the next few years, radically accelerating some forms of computation, including brute force decryption of traditional public key cryptography.

Data points

Don't type angry. Studies have shown that predictive analytics can pull relevant data from unobvious sources. One program was able to identify the moods of typers with remarkable accuracy: tired (84%), confident and nervous (83% for each) and sad (88%).

Investment in prediction. According to business research firm Forrester Research, annual investment in predictive analytics will grow to \$6.2 billion in 2020, up from \$3.5 billion in 2016.

Topics for additional research

- Evolving understanding of predictability in real-world situations
- Ethical issues in predictive analytics
- The expansion of affective computing into predictive analytics



Strategic insights

For the security industry

- Predictive systems are in some sense always stereotyping based on data, and this stereotyping may be especially problematic in the security arena. Industry users will need to take steps to make sure their systems are not algorithmically discriminating.
- Predictive analytics may reveal that a much wider range of factors are security-relevant than are used at present. Companies will need to respond to this new information by shifting the boundaries and inclusiveness of security when appropriate.
- With AI advancing rapidly, an arms race in predictive systems is likely. Sudden advances may make particular systems much better than others, if only briefly.

For ASIS

- The security industry would benefit from clear regulations about predictive data use acceptable to the public and politicians, so that norms are not set by the actors with the lowest standards. ASIS could play a crucial role in coordinating and conveying industry needs and ideas for regulations.
- ASIS could develop expertise in how to translate deep human experience and gut instinct in the industry into machine learning for predictive systems.
- It may be beneficial for ASIS to invest in education and training on issues and skills relating to human-machine cooperation, as many jobs going forward will include some measure of this.
- Predictive analytics could be a helpful tool for ASIS when it comes to serving members. Analysis that provides a better understanding of members' needs and what they want from the association could help with member retention efforts. ASIS should look into acquiring some of these tools. It may be that the AGOBA study should be updated.

Timing

- **Stage:** Expansive growth stage, but potentially facing headwinds from current events
- **Speed:** Growing at the speed of software and AI development

Potential alternative futures

- **Information starvation:** As a result of data scandals, new regulations on data collection and sharing are introduced, building on the EU's lead. Starved of data, predictive analytics is stunted.
- **It's too hard:** The complexity of many systems is greater than analytics proponents realized and many areas are found to be resistant to effective data-driven forecasting.
- **Algorithmic world:** Due to the spread of predictive analytics, almost every decision or choice is either made by a system or selected from pre-screened options vetted by analytics systems.