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How machine learning can boost IoT efficacy

CIOs should leverage machine learning to turn the tsunami of data obtained in Internet of Things (IoT) deployments into actionable insights. This is according to a new report from Forrester.

Paul Miller, senior analyst, Forrester

Successful companies in the industrial sector that are doing this are not only predicting problems and opportunities before they occur, but are also developing new revenue streams during their digital transformation.

Large volumes of data are required to train and then exploit machine learning algorithms, and fortunately that data is now easily accessible, especially as IoT gains traction in industries. According to Forrester's Paul Miller, senior analyst serving CIO professionals and lead author of the report, *Put Data to Work in the Industrial Internet of Things*, machine learning is becoming a powerful tool in efforts to win, serve, and retain customers.

"It's easy to focus on automating or augmenting existing processes with IoT, and this can deliver real cost savings and efficiency gains. But the bigger opportunity is using IoT and machine learning to drive entirely new business models, with far-reaching implications for the way in which your products are built, sold, used, and maintained," explains Miller in the report.

Some organisations are already seeing good results by combining machine learning with IoT:

- Ocado, one of the UK's online-only grocers, has augmented its human packers with robots that swarm and cooperate. Average picking times have dropped significantly from two hours to just 15 minutes.
- HUK-Coburg, a German car insurer, has partnered with IoT and telematics company Robert Bosch to develop a usage-based insurance and rescue solution which monitors driving patterns and rewards safe driving habits. Good drivers have seen premiums drop by as much as 30%.
- Siemens' claimed that shortly after giving control of the turbines to a set of machine learning algorithms at a gas-fired power station, emissions of nitrogen oxides reduced by almost 20% beyond the best engineers could achieve.

Miller also points out that Forrester currently identifies three core scenarios driving IoT adoption: designing connected products and experiences; operating connected business processes; and consuming connected insights. He also says that Forrester is now observing three broad classes of adoption for IoT.

Asset monitoring and control

Although basic asset monitoring and control is rarely exciting, the report points out that this is often the first experience of IoT within the industrial sectors. Moreover, Miller writes that when the experience is done right, its return on investment could free up the resources to pay for future developments.

Some examples of these uses include smart meters to monitor energy usage; keeping track of movable assets in the transport sector; and managing temperatures in smart buildings.

Prediction and action

The report acknowledges that the migration from asset monitoring and basic control to prediction and action is a big step, particularly for manufacturing firms that have typically focused on the physical aspects. Forrester advises that in order to succeed, companies must gather data from their own systems and from the environment in which those systems operate. They should extract insights from that data, (perhaps using the digital twin concepts that most IoT platforms support), and then interpret those insights and take action.

According to Miller, data and the insights extracted from it are key to digital ecosystems that so many organisations now try to control. IoT devices are an important source of data, but it's vital that organisations understand and use the data in a timely and effective manner. Forrester believes that this is an important juncture where machine learning begins to play a real part in an organisation's use of IoT.

Some examples where this next step in the IoT / machine learning can benefit companies include: Smart buildings which monitor weather and adjust temperatures in anticipation; transport companies anticipating failure as a means to better manage moveable assets; and building supply chains which are able to adapt to allow for customisable production, but still retain efficiencies and optimisation of resources.

Powering new business models

While the progressive use of IoT and machine learning is helping drive efficiencies as described above, Forrester believes the truly digitally minded CIO can make use of IoT and machine learning to imagine and implement entirely new business models.

Some examples of these new businesses models include: train-as-a-service offerings where the manufacturer owns and maintains the trains and simply sells their services to the rail companies; and compressor manufacturers selling compressed air by the litre to buildings. In both these instances, the manufacturer can monitor equipment, predict failures and ensure less downtime, while the customer gets exactly the service they need at a more competitive rate, without carrying the asset on their books.

Finally, Forrester cautions that while companies make the transition from physical to digital organisation, CIOs will need to ensure that they facilitate the transition and avoid putting a chokehold on the evolution - which could, ultimately, damn the organisation to irrelevance.