In other words, edge computing provides on-device processing and analytics in real time. On the other hand, cloud computing processes data in centralized cloud and data centers that may not be as fast and efficient for time-sensitive information. Edge computing will not replace cloud computing, and they complement one another.

The "Edge Computing in Action" box highlights four real-life applications of edge computing.[31]

Edge computing is different from fog computing. In fog computing, a single centralized computing device processes data from multiple edge devices in a network; in edge computing, each device in a network processes its own data. The following are some of the advantages of edge computing:[32,33]

- Real-time data analysis at the edge (any device connected to the network) that is not in a remote data center or cloud.
- Lower operating costs due to the smaller operational and data management expenses of local devices.
- Reduced network traffic because less data is transmitted from local devices via a network to a data center or cloud.
- Improved application performance due to lower delay levels on the edge of the network.
- Increases network performance by eliminating or reducing latency, due to local processing of data.
- Conventional cloud computing is vulnerable to DDoS (discussed in Module 5) attacks and power outages due to having centralized servers. Edge computing distributes processing, storage, and applications across a wide range of devices and data centers, which makes it difficult for any single disruption to take down the network.
- Offers an enhanced scalability by allowing companies to expand their computing capacity through a combination of IoT devices and edge data centers with a moderate cost.
- Data centers can easily target desirable markets without having to invest in expensive infrastructure expansion. It also empowers IoT devices to gather exceptional amounts of actionable data because they are always on and connected.
- With IoT edge computing devices and edge data centers positioned closer to end users, there is less chance of a network problem in a distant location affecting local customers. Even in the event of a nearby data center outage, IoT edge computing devices will continue to operate effectively on their own because they have built-in capability and can handle vital processing functions.

Edge Computing in Action

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Envision, a power producer, manages a network of 20,000 wind turbines. There are 3 million sensors installed on these turbines that produce over 20 terabytes of data at a time. Envision has reduced its data-analysis time from 10 minutes to seconds using edge computing. As a result, the wind turbines' production has increased by 15 percent.

Edge computing has helped Coca-Cola to boost its overall sales on its Freestyle vending machines by constantly analyzing and reporting the popularity of each of over 100 different combinations of carbonated and noncarbonated drinks on an hourly basis. This enabled the company to increase its offering of Caffeine-Free Diet Coke from less than 1 percent of its dispensers to a top five brand during the afternoon.

Edge computing has helped General Electric digital locomotives to perform at or near their peak performance levels, which resulted in increased revenue. Behind this top performance level are more than 200 embedded sensors that collect gigabytes of operational data and process more than 1 billion instructions per second that apply algorithms in real time.

Edge computing has helped the city of Palo Alto, California, in several ways. Its parking space sensor program notifies drivers about available parking spaces and, as a result, traffic congestion and air pollution are reduced. Its smart traffic signal project enables traffic lights to work in sync with connected vehicles, resulting in reduced wait time for the traffic light to turn green.

Questions and Discussions

1. How does Edge Computing impact the world of data analytics and business information?
2. What are some additional applications of edge computing? Discuss.