**About the Case Company**

This case study is based on a typical mass customization production company (named Keda) which is located in Pearl River Delta (PRD) region of southern China. The company is specialized in manufacturing customized ceramic and large-scale construction machineries. Currently, Keda employs over 2,000 workers being responsible for operations management, product design, process planning and manufacturing operations. Keda owns six manufacturing lines equipped with over 1,000 machines which are distributed in two factories. Two lines are responsible for manufacturing interchangeable parts which are fit into any mass-customization products. The other four lines are responsible for manufacturing tailored components that are one-of-a-kind. This means these components are unique and require special manufacturing processes. Due to high customization, shop-floor production in Keda faces a ‘once’ successful challenge under constraints of a critical delivery data, cost and quality.

**IoT enabled Smart Environment**

- Typical manufacturing objects such as machines and buffers are equipped with high frequency RFID readers because machines are value-adding points, whose working statuses must be real-time monitored.
- For critical components such as highly customized items or key elements which play an important role on the final products, item-level tagging scheme is adopted because they are one-of-a-kind items which should be uniquely tracked.
- For non-critical materials, tray-level tagging scheme is adopted.
- 433MHz wireless standard is adopted for communication network.
- Once bound by RFID readers, they become active smart objects (SOs) that can sense and detect the passive SOs which are physical manufacturing resources attached by RFID tags.
- SOs are able to acquire, receive and distribute information in a near or distant environment via wireless connections.

**Improvements**

- Paper-based operations are eliminated by 90%
- A performance enhancement at management-level
- Total output value is improved by 18.5%
- The profit increases by 47.5%
- WIP inventory and production cycle are reduced and shorten by 27% and 22.6%
- An 8% increasing to productivity and 29% to product quality

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