

Analytics technology to identify performance raising measures based on employee/customer behavior

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Hitachi today announced the development of big data analytics technology to help identify effective measures to improve business performance based on behavioral data collected from employees and customers using badge style sensors and business performance data such as POS data. In a retail store pilot test, employees were re-positioned within the store based on an analysis of 10-days of POS data and employee/customer behavioral data. Results showed a 15% improvement in average sales per customer, confirming the effectiveness of the big data analytics technology in assisting business performance improvements.

Business performance is affected by various factors including corporate activity, employee and customer behavior, and the external environment. If that huge amount of data can be collected and analyzed, clues hidden in the data may help identify effective measures to improve business performance. In 2007, [Hitachi](#) developed the "Business [Microscope](#)", a behavior [measurement system](#) based on a "sensor-net badge" and has successfully applied it to the collection and visualization of employee communication and activity in companies. From 2009, a solution service for organizational reform was developed based on the "Business Microscope," and to-date, over one million days of [human behavior](#) and big data consisting of 10 tera (10¹²) data items have been collected.

The analytics technology developed uses big data related to employee

and customer behavior and business performance data to help identify measures to improve business performance. Features of the technology developed and the results of the pilot test are as described below.

(1) Analytics technology for big data

By employing the analytics technology developed, it is possible to automatically generate over 6,000 indices of business performance from the big data on behavior and business performance. The technology then automatically identifies the important factors affecting business performance from the indices, and derives equations describing the relationship between the factors and business performance. When a user inputs an item which needs to be improved, factors affecting that item, the degree of impact and the reasons therefore, are displayed, informing the user on the impact of measures on improving business performance.

(2) Pilot-test confirming effectiveness

A pilot test was conducted with the cooperation of the management consulting company, SIGMAXYZ Inc. over approximately 6 weeks in a large hardware [retail store](#) (floor space approx. 2,970m²) to verify the effectiveness of an improvement measure derived with the analytics technology. Using the Business Microscope, behavioral data such as customer service activity, and standing locations were collected over 10 days from the employees working in the store and a sample of 304 customers who visited the store during the study. As the data is tied to a time clock, information such as where and when the customer stood still, received service, what was purchased and where the sales employees were positioned at the time, was recorded.

This behavioral data and the POS data were input into the analytics engine to automatically identify over 6,000 candidate indices affecting

sales performance. Using these indices to produce an equation for average sales per customer, it was found that the location of employees within the store strongly influenced results. Further, it became apparent that there were areas in the store where sales employee presence raised purchase (H), and areas where presence had relatively little effect on purchase (L). Based on these results, a measure was initiated to concentrate employees in the H areas. Employee presence in the H areas increased by 1.7 hours and led to a 15% increase in average sales per customer, indicating the effectiveness of the analytics engine in raising business performance.

More information: www.hitachi.com/New/cnews/121019.pdf

Source: Hitachi

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