

Inventory-Thumbnails: An Effective Data Visualization System for Monitoring Inventories

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Abstract

Most inventory control systems show inventory levels on tabular reports as monthly figures. However, it is difficult to recognize the exact nature of inventory problems with data presented in this format. Moreover, monthly data obscures daily fluctuations, which can conceal potential problems. We developed a visualization system using “Inventory-Thumbnails” to report inventory data through small charts of daily inventory time series in a grid to enable efficient and precise problem identification. The user can assess data based on the shape of each chart and spot inventory problems at a glance. For instance, “square block” shaped charts are likely stagnant inventories, or “saw blade” shaped charts are likely fast-moving inventories. Each chart also improves clarity by showing auxiliary indicators including inventory days and safety inventory with lines or actual figures. We tested the system by asking users to find inventory problem with both the Inventory-Thumbnails and tabular reports. The Inventory-Thumbnails increased the accuracy of inventory problem detection by 40% compared with the conventional method. Additionally, one customer reduced their inventory level by 35% as a result of using our system.

Keywords

Demand and Supply Management, Inventory Control, Excess Inventory, Data Visualization, Visual Identification, Evaluation of Subjects

Biography

Shintaro Urabe is an SCM researcher in the Research and Development Department at Hitachi Solutions East Japan. He received his Master of Engineering degree in Software and Information Science from Iwate Prefectural University in 2007. His research focuses on inventory control systems and visualization. He is also interested in simulation, optimization, and user experience.

Masaru Tezuka is the Manager of Research and Development Department at Hitachi Solutions East Japan, Ltd. He received BE and ME in bio-physical engineering from Osaka University, Japan and PhD in systems and information engineering from Hokkaido University, Japan. He is a certified Systems Analyst and a certified Application Systems Design Engineer of Information Technology Promotion Agency, Japan. He served in Malaysia as an operations research expert of Japan International Cooperation Agency in 1998. His research interests include nonlinear optimization, evolutionary computation, computational intelligence, computational statistics, risk analysis, and their industrial application. He is a member of the Information Processing Society of Japan.