

Visual Analysis of Corporate Tolerance to Sales Decline by Industry

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ABSTRACT We develop a visualization system to analyze how the decrease in sales affects each industry over time, assuming a uniform decrease in corporate sales. For this purpose, we simulated the balance of cash and deposits for each company at each rate of sales decline, and visualized the results for each industry with stacked bar charts that changes over time. The developed system reveals the tolerance to the sales decline of each industry and the differences among industries.

INTRODUCTION

Corporate activities are influenced by external factors, and business performance can be greatly affected by them. The impact of the covid-19 epidemic that began in early 2020 on companies has been enormous, causing sales to decline simultaneously for many companies, not just certain ones. If such situation persists for a long period of time, the current deposits balance of each company will decrease, which may eventually lead to bankruptcy. Although the government is providing financial support for the coronavirus crisis, there is not enough information to make a decision on how to provide support for each industry rather than uniform support.

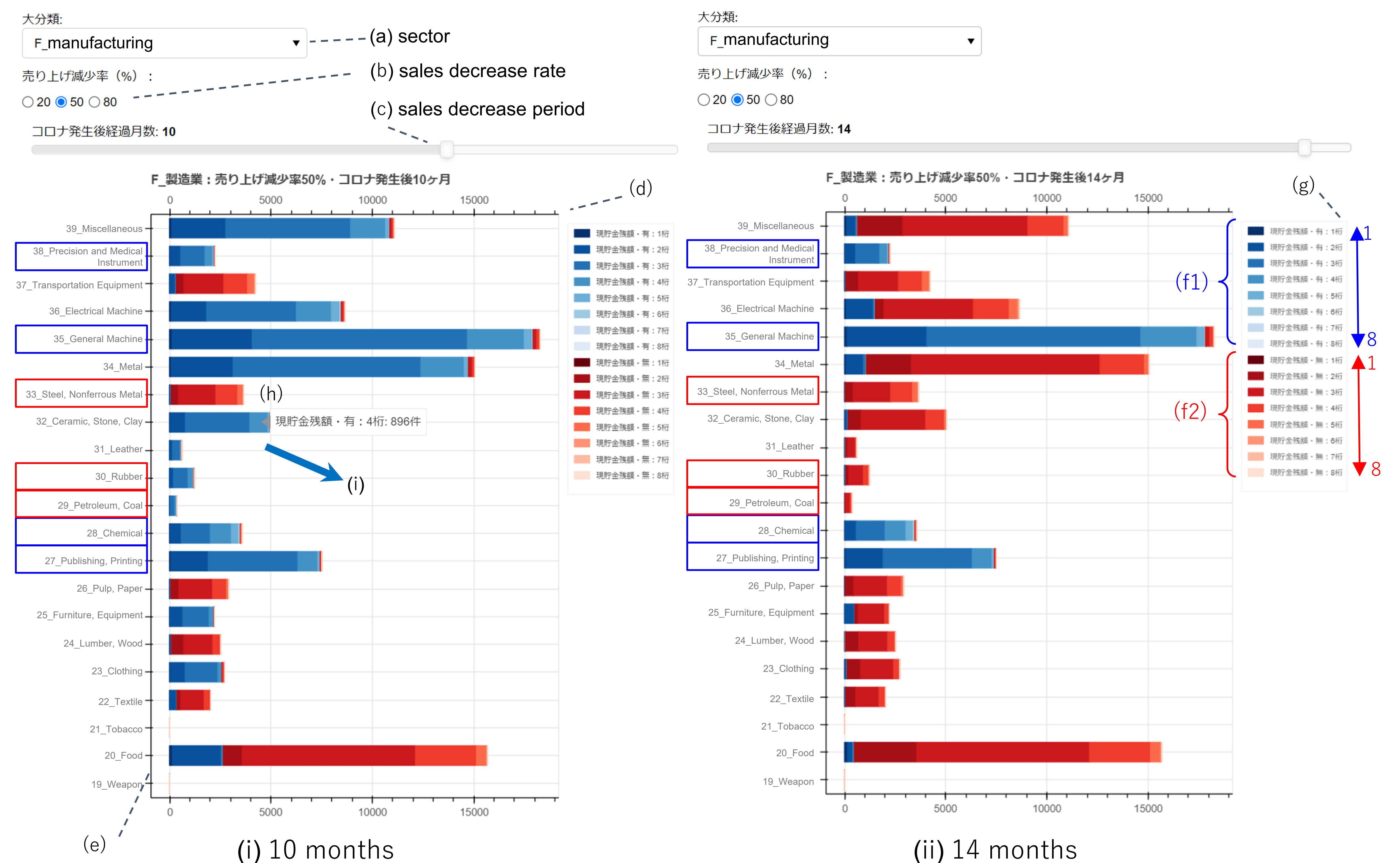
SYSTEM IMPLEMENTATION

Simulated Data: We simulate the balance of cash and deposits due to a decrease in sales for each company, using the corporate data held by Teikoku DataBank. We will use the following equation to simulate the cash and cash equivalents balance due to a decrease in sales.

$$Cash_t = Cash_{t-1} + Sales_t - Cost_t$$

The current month's cash balance $Cash_t$ is calculated by adding the current month's sales $Sales_t$ to the previous month's cash balance $Cash_{t-1}$ and subtracting the current month's cost of sales $Cost_t$ (i.e. costs incurred in purchasing and manufacturing goods). For sales and cost of sales, we use the amounts from the previous year's financial statements divided by 12 months.

Visual Analytics System: In the stacked bar chart, the horizontal axis represents the number of companies (d), the vertical axis represents subsectors (e). In each subsector, “Companies with current deposits balance” and “Companies without current deposits balance” are colored blue and red, respectively (f1, f2). The blue and red stacked bar graphs are subdivided by sales digits (unit is 1 million yen) (g) to explore the differences between company sizes.



Visualizing tolerance to sales decline by subsectors belonging to F: manufacturing sector with a 50% sales decrease rate. (i) and (ii) represent the cases where the sales decrease period has passed 10 months and 14 months, respectively.