

1

What's in this Handbook?

1.1 Overview

Process facilities produce as much, if not more, data than product. There are many types (classes) of data: process values, control information, key performance indicators (KPIs), and a host of other things. The data can be presented in various ways:

- As numbers, in quantitative (e.g., digits) or qualitative form (e.g., a bar chart)
- In categorical form (e.g., stopping, raising, lowering, confirmed, stopped)
- As a status or indicator (as a graph or table summary)
- Animated number/text/symbol (e.g., change the on/off status of a pump)

The data are used for a variety of purposes:

- Show status
- Reflect process performance
- Identify areas that need attention
- Predict future process performance

What is the best way to present the data? While some would think it obvious, it is not. The presentation of data in operator displays is often poor, to the point of creating distracting and misleading information. Why? Because almost no one who produces displays (including specialists such as control engineers, process engineers, operators, and distributed control system [DCS] suppliers) has been trained on how to present data for optimal usage.

The purpose of this handbook is to help display designers use data from the process to provide actionable information for the operator. This is termed *data-to-information*. What is the relationship between data and information? Data are the facts or details from which information is derived, the building blocks of information. Information is anything that reduces uncertainty. A good display assembles and presents the data in such a manner that the user has greater confidence in the display and knows more about the situation after looking at the display. This handbook owes a great deal to the seminal work of Edward Tufte's *Visual Display of Quantitative Information*, which admonishes, "**Above all else, show the data**" [1].

Individual pieces of data are rarely useful alone. For data to become information, it needs to be provided in context. For example, the data showing that the score of a game was 10-7 provides little information if we do not know which teams played or which had the higher value. Oil refineries produce millions of data bits every minute, enough to overwhelm any group of individuals if shown in their raw form. What enables an operator to utilize that data is that it is contextualized into information.

2 | 1 What's in this Handbook?

This handbook utilizes a bottom-up approach. It begins with a short discussion on the types of data generally captured in a process. Different methods of presenting that data for visualization are described, along with when to use each method. Basic process elements (e.g., valves and pumps) are discussed along with major pieces of equipment (e.g., heaters and towers). Finally, parameters are combined to show different levels of information for major process units.

Review Questions/Exercises

- 1.1 What types of data are available in a process?
- 1.2 What are three ways to present data?
- 1.3 How is the data displayed used?

Reference

- 1 Tufte, E. R., *The Visual Display of Quantitative Information*, 2nd ed. (Cheshire, CT: Graphics Press, 2001).