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HPI INTEGRATION STRATEGIES

Fieldbus justification goes beyond total cost of ownership

Fieldbus, as a digital replacement for 4-20 mA analog communications, is a simple concept, but it is significantly changing the way that users look at their processes and is providing a flood of information from the field about both the devices and their associated processes. Users should approach the process of choosing, implementing and using fieldbus in a way that will achieve successful and superior performance, reduced costs and operational excellence in the context of the enterprise's business goals.

Process fieldbuses in the forms of Foundation fieldbus H1

TABLE 1. Five pillars of fieldbus justification

- Superior return on assets
- Reduced maintenance cost
- Reduced unplanned downtime
- Abnormal situation avoidance
- Knowledge workforce creation

and HSE, and PROFIBUS PA and DP, have all moved into the mainstream of process automation and are being installed in large plants for critical applications worldwide. For many users, fieldbus is now a part of their standard purchase specification for control systems and instrumentation. The Fieldbus Foundation, for example, reports over 6,000 host system installations worldwide. This number continues to increase.

In ARC's view, justifying any fieldbus project should be approached as methodically as the process for system selection, with its own additional unique concerns. Justification based on adopting the latest technology, or even based on reduced cost of ownership, is not sufficient. Table 1 lists the five key metrics that should be taken into account when justifying a fieldbus project. Most important is creating a knowledge workforce. Knowledge workers are empowered with the data they need when they need it to make intelligent decisions that directly affect the quality of the product being manufactured and plant performance.

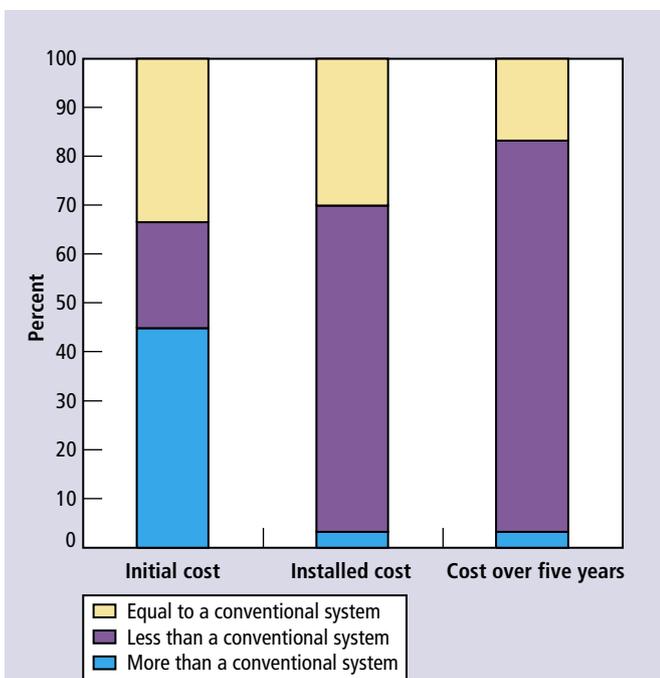


FIG. 1 According to ARC's Fieldbus User Survey, most fieldbus systems have higher initial cost than conventional systems, but much lower installed and total life cycle costs.

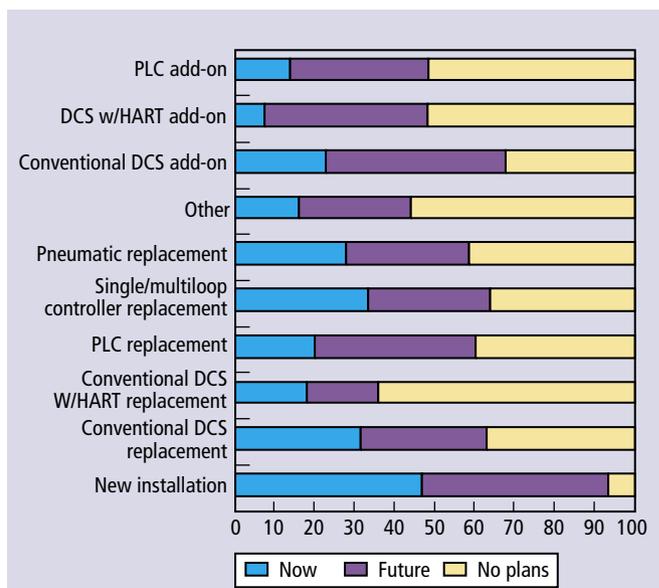


FIG. 2 Fieldbus is primarily limited to new installations, but its impact on existing installations will increase.

Installed vs. life cycle cost. The real benefits of fieldbus are obtained after startup, not during the installation or initial cost phases. Benefits such as reduced wiring and installation costs, and field control are not the primary perceived advantages. According to ARC's research, the primary advantages of fieldbus occur in the areas of maintenance and operations. In other words, fieldbus itself is not the cost-saver, but merely an enabler to a new level of asset management effectiveness that can significantly reduce operating costs and produce operational excellence. Many of the benefits of fieldbus and device networks are still being discovered as users gain more experience with these technologies in a real plant setting.

Many users are still in the discovery phase when it comes to total cost of ownership (TCO) advantages. This is not surprising, since most process automation end users do not have a comprehensive view of the system's total life cycle cost and the methodologies in place for measuring life cycle costs across the spectrum of automation products. For many users, installed cost of fieldbus control systems is higher than conventional installations, which is also consistent with ARC's findings (Fig. 1). Initial cost of fieldbus-compatible devices is slightly higher, and intrinsic-safety barriers and repeaters can add more to the cost.

Value of fieldbus transcends new installations.

Like any new technology in process automation, fieldbus was originally limited to the realm of pilot plants and noncritical, ancillary applications within plants. According to results from an ARC survey on fieldbus adoption with over 60 end-user respondents, fieldbus is still primarily deployed in new installations or as a replacement for outdated control schemes such as pneumatic systems or collections of single- and multiloop controllers (Fig. 2). This trend agrees with initial arguments that the primary value proposition of fieldbus lies in reduced wiring and commissioning costs. In fact, ARC has found in many cases that the initial cost of a fieldbus installation in a new facility can be comparable to, or even exceed, that of a conventional system

installation—especially for first timers who must deal with the new approach to P&IDs and engineering practices that are necessary for successful project implementation.

We believe that fieldbus will be increasingly used as a replacement for, and an addition to, existing control systems as users realize that the value proposition of fieldbus really lies in the operational phase of the system—and not in the initial, or even installed, cost. Several of the world's leading refiners, for example, are specifying fieldbus on greenfield and revamp projects.

Management and employee buy-in critical. Lack of upfront planning can mean the difference between disaster and success in a fieldbus installation. Upfront planning goes beyond traditional engineering issues such as P&IDs to include the people issues as well. No fieldbus project can be successful without the buy-in of plant operations personnel and management. The enabling technology fieldbus offers no benefits if employees are not willing to use the tools.

Users interested in getting fieldbus installed in their plants should get the buy-in of both management and field-level personnel. The increased flow of data from the field that comes from digital communications will be used by a much wider audience than the traditional control system operator. The role of maintenance personnel, in particular, is changed dramatically by the implementation; maintenance personnel should be included in any fieldbus projects from the beginning of the planning phase. **HP**

The author is part of the automation consulting team at ARC covering the process industries. He is responsible for tracking the market for process automation systems (PASs) and has authored the PAS market studies for ARC since 1998. Mr. O'Brien has also authored many other market research, strategy and custom research reports on topics including process fieldbus, collaborative partnerships, total automation market trends and others. He has been with ARC since January 1993, and started his career with market research in the field instrumentation markets.
