Executive Summary

Industrial companies face significant challenges in today’s complex economic environment. Collaboration is a necessary element of success in a competitive marketplace where there is a need to increase manufacturing efficiency, reduce operating costs, meet shorter time-to-market demands and provide on-target customer solutions.

With millions of data values collected every week in a typical plant, companies must have visibility into the right data, at the right time, and in the right context. Organizations can have all the data in the world, but personnel cannot utilize the information if it is not presented in an intuitive way.

Manufacturers require collaboration solutions to unleash the knowledge of multidisciplinary teams — no matter their location — and provide the means for increased situational awareness, faster analysis of critical information, and improved “big picture” decision-making.
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Introduction

In a connected world, collaboration involves not just teams that work together physically, but virtual teams that may span continents. Globalization, emerging communication technologies and the desire to reduce travel expenses all contribute to the proliferation of virtual teams.

While collaboration is widely promoted within and between companies, it can be difficult to achieve. Management assumes that after a team is established, it will function in an effective and cohesive manner. But, in fact, collaboration requires leadership commitment, resources, training and constant reinforcement.

Creating collaboration is one of the keys to extracting maximum value from the talent in an industrial firm and fully leveraging its asset base. Most of the problems that personnel face involve multiple disciplines at sites, whether it is safety, performance or environmental issue and having the opportunity to address them. A certain level of intellectual property associated with each organizational domain is required to contextualize and truly understand the ramifications associated with the information (See Fig. 1).

In other words, to obtain the utmost value from human resources distributed across various silos, managers must get the people to work together to the same end—driving improved business results.

Obstacles to Collaboration

“Big Data” is a significant obstacle to collaboration in many companies. As the name suggests, it refers to massive amounts of data, often collected from multiple business units, facilities and operations. Organizations must be able to use this information to make decisions in real-time, which requires analytical tools and techniques as well as an infrastructure suited to fast data handling.

Manufacturers have a growing need for a single, integrated system, which deals with all data sources and presents information at the right time for better decision-making. The key is to understand how data can be distilled across systems to present it before various stakeholders in order to facilitate improved overall performance (See Fig. 2).

Due to increasing competitive pressures, stringent safety requirements and other factors, employees within an industrial firm have no choice but to collaborate on some level. However, diverse disciplines across an organization make it difficult to share the right data to help address day-to-day challenges.
Company experts are usually situated at headquarters, existing plants, or regional offices, making them hard to access for remote operations. Even when key talent can be found onsite, production facilities still struggle with siloed communication that can make experts difficult to reach. Plant floor communication is often so constrained that conversation is restricted to a limited number of employees without supporting the collaboration necessary to handle both routine and abnormal situations. Even identifying someone to help resolve a specific issue can be a challenge; any one person might not have an understanding of cross-discipline data.

For example, an operator would recognize his or her Human-Machine Interface (HMI) screens instantly, but a plant manager might not know where to find (much less understand) critical data associated with a given process operation.

Studies show that difficulty in locating, accessing, and collaborating with subject matter experts typically slows problem resolution and process optimization, and requires lengthy and expensive travel from other plants or partner sites. Effective remote collaboration is therefore crucial for extending access to knowledge across a global workforce, helping to sort out production issues and maximize uptime and asset utilization.

**Take the Right Approach**

Throughout the process industry, there is a constant struggle to make sense out of data across operating facilities and the enterprise as a whole. Manufacturing companies are challenged with finding suitable and unique solutions, which can help in organizing large quantities of data collected from multiple plant systems.

Business pressures are also driving manufacturers to find new ways to collaborate and utilize their best asset — the knowledge and expertise of their employees. Extending access to these valuable resources is critical to optimizing production processes and improving responsiveness.

Technology is not the sole panacea for effective collaboration, but is the backbone to help implement the right tools and strategies, or even open hitherto unavailable possibilities. However, it requires supporting infrastructure.

The following are three essential "pillars" upon which organizations can define collaboration in an industrial setting and build a solid platform for progress:

Figure 2 - Manufacturers have a growing need for a single, integrated system, which deals with all data sources and presents information at the right time for better decision-making.
1. Bring people together
No matter the business setting, collaboration is always between people. This is especially true in the industrial world, where people are responsible for running plants and overseeing operations. The goal is to bring people together as opposed to collaboration across systems, or between people and systems.

Without people there is only the silent handshake of machines. People are engines and their insights the fuel that propels organizations forward.

When complex problems arise, it’s a person such as an operator or engineer talking to another person that provides the desired solution. The right people and the right content, brought together under the appropriate context, are essential for resolving operational issues or addressing incidents.

2. Provide an enabler
Experience has shown the act of gathering team members in a room does not necessarily ensure collaboration — even if they have a strong common goal. Teams need a stable platform, situated on top of the human element, to host their interaction and serve as an enabler for a collaborative effort.

Advanced technology can open new avenues for collaboration, which were unavailable before. For example, mobile technologies ensure workers can be productive even when they are at home or on the road. Social collaboration tools allow information to be displayed and shared in unprecedented democratic and viral ways, which spurs collaboration like never before. Technology can therefore impact policies and processes, and even impact organizational objectives by opening new vistas.

3. Ensure ease of use
Collaboration does not have to be disruptive to normal operations; indeed, it will not be accepted by the involved parties should it prove to be so. Enterprise portals that hoard content and make the user jump through hoops to get to it do not serve organizations. Digital data overload requires collaboration tools that truly assist the user. Information repositories that do not yield their insights without the right keyword are of limited or no value.

In addition, collaborative techniques are counter-productive if they do not enable greater ease of use across the enterprise. These techniques shouldn’t require personnel to master a host of new systems, or demand creation of new databases or redesign of current systems. The ideal solution is simple to employ and relies on existing data sources to spur new levels of collaboration between individuals and different departments and geographically dispersed assets. Users also must have confidence in the collaborative system and know that it utilizes actual data — not an aggregate or interpretation of data.

Put Technology to Work
As industrial firms begin to embrace organizational change, intent on improving communication and collaboration, there are apt to be specific types of technologies to increase collaborative behavior across enterprise networks, which will help employees share objectives and activities in achieving business goals.

Automation suppliers have taken up the challenge of enterprise collaboration, developing innovative technology to integrate people and processes for better performance. The new generation of plant control system merges traditionally disparate functions and systems across the manufacturing enterprise. It captures the knowledge of plant personnel and their workflows to deliver sustainable efficiencies.

By enabling a common and consistent HMI over the entire control architecture, the latest automation solutions should provide the essential foundation for improving operational effectiveness. These solutions result in better overall collaboration, allowing plant personnel to make intelligent decisions to improve business performance, safety, efficiency and agility.

Modern control systems are designed to provide plant personnel with exactly the information they’re looking for, not just an application to search for data. They expand access to valuable data sources, driving information and procedures to the appropriate individuals and making them visible in a way they won’t be overlooked or misunderstood.

The current breed of control system also facilitates multi-disciplinary thinking so workers in the control room, field and front office can make appropriate decisions to enhance their company’s business results.

At the same time, purpose-built “collaboration stations” enable faster response to various situations by displaying a common view of how distributed assets at multiple locations are functioning. The stations use multi-touch gestures to access various plants or sites in a company’s network, offering a complete view of how the plant is operating. Such tools are especially well suited for production sites with distributed assets such as offshore oil and gas operations, pipelines, and large refineries with centralized control rooms.
With advanced collaboration solutions, company personnel have access to both control system and business network information from the same screen. They can rapidly establish communications for quick resolution of issues utilizing real-time process data and alarms, intuitive graphics and trend information, robust engineering/diagnostic tools, and live audio and digital video displays. Moreover, these standardized solutions ensure fast site deployment, minimize training requirements and reduce total cost of ownership.

**Typical Industry Applications**

Today’s innovative solutions for industrial collaboration have diverse applications: in the plant control room, inside the facility but outside the control room, and in the central office. They are particularly useful in facilitating regular plant events like shift changeovers and operations meetings, and also when troubleshooting is needed. Companies may employ this technology in a combination of settings to meet their specific operational and business objectives (See Fig. 3).

In the control room, for example, collaboration tools can be used to quickly share displays from the operator HMI with remote managers and technology experts in order to address equipment failures and process upsets. This approach not only saves time in enlisting knowledgeable support, but also maintains a secure environment where problems can be clearly analyzed.

![Figure 3 - Today's innovative solutions for industrial collaboration have applications in the plant control room, inside the facility but outside the control room, and in the central office.](image)

Additionally, a read-only control room collaboration station provides operators with the flexibility to access the Internet to obtain information such as weather forecasts, download files from the company intranet, or analyze non-control-related business data.

Outside the control room, personnel can use a collaboration console to safely view the entire control environment in the event of an incident or other problem. This minimizes security concerns and does away with unnecessary intrusion into the operator workspace. Plus, the station can be used to share trend information and other data during daily or weekly team meetings.

In terms of remote engineering, advanced collaboration tools enable a company’s engineering staff to organize and view information from different plants around the world in a central office location. The result is less costly and time-consuming travel, while the best engineering talent is deployed when and where it’s needed.
Benefits to Organizations

Thanks to recent advancements in the field of collaboration, global manufacturing firms have new tools for connecting people to information in a consumable manner, and creating a relationship between personnel and the assets that need to run at top performance.

The ability to share critical information seamlessly (in the proper context) across the enterprise not only improves plant efficiency, but also maximizes the utilization of resources to achieve greater profitability.

Personnel can now share their displays with the company workforce distributed across multiple disciplines and facilities worldwide, and deliver data in a way that is intuitive and useful to all stakeholders.

With the freedom to collaborate, organizations can unleash the knowledge of teams wherever they reside and optimize their ability to make important operational and business decisions. Instead of dealing with the perplexing challenges of Big Data, plant and central office workers can access information from intuitive displays in a format that’s engaging and easy to understand.

Navigating through plant and enterprise systems is no longer a chore with innovative collaboration tools, either, since key information is available at the user’s fingertips through secure, yet user-focused applications residing on top of data sources. These tools take the guesswork out of data searches by providing links that are preprogrammed to the right documents in the right locations.

Conclusion

Companies are made up of people who work with the goals of the business on a day-to-day basis. They are constantly thinking of ways to increase efficiency, improve safety, reduce costs and solve problems, however, the vast majority of these ideas are not shared. If knowledge already exists, and the people who hold it are readily accessible, then the key is the communication of their information to the appropriate people who can do something with it.

Experience has demonstrated there are several key pillars of collaboration in an industrial organization, but none of them really exists in isolation. They all influence and reinforce each other. Companies that see collaboration as a desirable strategic outcome need to take this broader, multi-pronged approach.