Poorly managed engineering information could be compromising safety and effectiveness in an operational facility, or contributing to cost overruns on capital projects. For this reason, operators in the process industries must consider a move to the cloud to remain competitive.

**Unstructured information: second class safety and increased costs**

Access to trustworthy, integrated engineering data and documentation is essential for both effective project delivery and safe, efficient plant operations. However, a surprising number of engineering, procurement and construction (EPC) companies and plant owners still rely on paper documents, drawings and datasheets that are scattered around in various official and unofficial storage locations – also known as ‘unstructured’ information.

The absence of a centralised information asset as a single source of truth poses serious safety hazards for both EPCs and asset owners. In a recent study conducted by Intergraph, in cooperation with TechValidate, nearly half of the survey respondents from the process industries reported that 40% or more of facility information is unstructured. A worrisome figure when combined with the statistic that only 39% were confident they could find the necessary information to adequately respond to an emergency.

Kevin Holmes, Intergraph® Process, Power & Marine, UK, discusses how the implementation of cloud technology in process plants can help to improve safety and project productivity.
Aside from the safety risks, unstructured or poorly managed engineering information can lead to other serious consequences for both plant owners and EPCs:

- Inefficiency of operations and maintenance: preparing for maintenance tasks or daily operations wastes precious work hours when information is unavailable, outdated, or scattered in different locations.
- Increased cost of modifications and turnarounds: plant shutdown time can be significantly lowered when unforeseen issues arise in the turnaround by having access to relevant, correct engineering information.
- Compliance challenges: failure to locate accurate and up to date information of the asset during an external audit can lead to fines and other penalties by regulatory authorities.

The situation is even more critical on today’s geographically complex mega projects. Large projects are very sensitive to practices and processes, including information management techniques, because they are more complex and involve multiple participants and contractors.

The project delivery process is already a complex one with multiple moving parts, from project definition at the front end right through to handover and operations – the complexity increases exponentially with each new participant.

Cloud technology

A simple solution to the engineering information challenge is available: cloud technology – where drawings, reports, schedules, tag lists, criticality lists, etc., exist in a single location with all project and/or operational staff accessing, not recreating, the same piece of information. The most innovative owners and contractors recognise that a move to a cloud environment will improve engineering information, help to better manage projects costs and improve efficiency.

Using a cloud-based solution enables the project deliverables to support the next phase front end engineering design (FEED), detail design, fabrication and construction, and to support ongoing plant operations. This consistency offers opportunities to better meet schedules, reduce organisation migration costs, and ease the handover process from project to operations by providing a centralised, integrated access point to all engineering data and services.

In addition, controlling access in a cloud environment is straightforward, hence, each user has access only to the data that is relevant to them. A cloud-based solution reduces this risk of a negative security incident by protecting data with strong user compliance and governance. For example, an instrumentation engineer has full access to the instrumentation data, but view-only access to a limited part of the electrical engineering data. This central access management is particularly convenient when there are changes in personnel, contractors, during turnaround planning, or when a project moves between phases. Furthermore, the backup and disaster recovery strategy also protects data confidentiality, integrity and availability in case of an event.

Working in the cloud offers multiple significant financial benefits. Global joint ventures can have their entire project environment up and running very quickly, using a collaborative project structure where information is made accessible and reusable for all.

**Benefits of cloud technology**

- Reduced capital expenditure: lowers the cost at multiple local sites by central cloud delivery.
- Faster project startup: a project environment can be up and running in days, rather than the months that would be required to agree, build and deliver tools needed by the end users.
- Improved collaboration: all project participants have easy access to relevant data, reducing rework between the project phase and handover.
- Procurement, construction, and operations advantages: cloud provides better opportunities for greater material consolidation and construction sequence planning, and more effective and timely operations training.
- Smoother project handover: every engineering company has its own system and standards, which are not necessarily compatible with that of the project owner’s. This can cause considerable issues at the
handover stage, however, working in a consistent, 
standardised cloud environment would all but 
eliminate such issues.

What is the industry doing? 
Despite the advantages, the industry has been slow to 
embrace cloud. There are two main reasons for this:

- Risk aversion: the process industries are highly 
  regulated and competitive, with a natural aversion to 
  risk. The tendency is to ‘wait and see’ how a new 
  technology plays out in another industry before 
  adopting it.

- The gap between technology and knowledge: for a 
  long period, there was a shortage of cloud providers 
  with comprehensive knowledge of the process industry 
  requirements. After continuous development and pilot 
  projects with the key players in the industry, cloud 
  solution providers have breached the gap and know 
  not just their technology, but recognise its specific 
  applications in the process industries.

Success in the cloud 
Intergraph’s SmartPlant® Cloud is an example of a cloud 
solution for a business issue. It is more than just another 
cloud offering, it is a business enabler that brings globally 
dispersed resources together. The solution has been 
adopted by owner operators and EPC contractors, as well 
as by service providers, such as project management 
consultants. Major players such as Eni Process S.p.A., Fluor 
Corporation and Shell have successfully executed projects 
in the cloud, proving that not only can it be carried out, 
but that there are significant advantages in terms of 
efficiency and access to information. These companies are 
now using SmartPlant Cloud to get the best from their 
data and use it efficiently, without significant investments 
in information technology (IT). Under the current market 
conditions, this is what is required to reduce costs and 
compress schedules while improving safety.

Burns and McDonnell, an American engineering design 
firm, has also implemented SmartPlant Cloud. The company 
noted two key benefits to this technology. The first is the 
application expertise, both in terms of the backend database 
administration and in the Intergraph application itself, which 
aided greatly in setup and maintenance. The second is the 
speed of onboarding. Intergraph worked closely with Burns 
and McDonnell’s internal experts to address any issues, 
which meant a complex product could move into 
production more efficiently.

Conclusion 
As global energy demands increase and the oil price 
continues to fluctuate, it is becoming increasingly clear that 
a major focus must be placed on the minimisation of 
overheads, while an even sharper focus on productivity and 
costs is needed to achieve this. Implementing cloud 
technology today will be best placed to embrace these 
challenges.

References 
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