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As digital programs mature, oil, gas and energy companies are getting close to designing and constructing intelligent business assets that are automated, adaptable, efficient and semiautonomous. This research offers insight on how CIOs are orchestrating efforts to accelerate success.

Quick Answer

What are intelligent assets and why are they important?

- Intelligent assets are strategic focal points that shape future digital investments.
- Investments in early-stage intelligent assets have already begun.
- As digital leaders, CIOs play a critical role in shaping focus and building momentum.

More Detail

Gartner defines intelligent assets as those that have fully accessible and compatible datasets that support lean, automated and end-to-end processes that simultaneously optimize operations, engineering, maintenance, planning and economic performance for current market conditions.

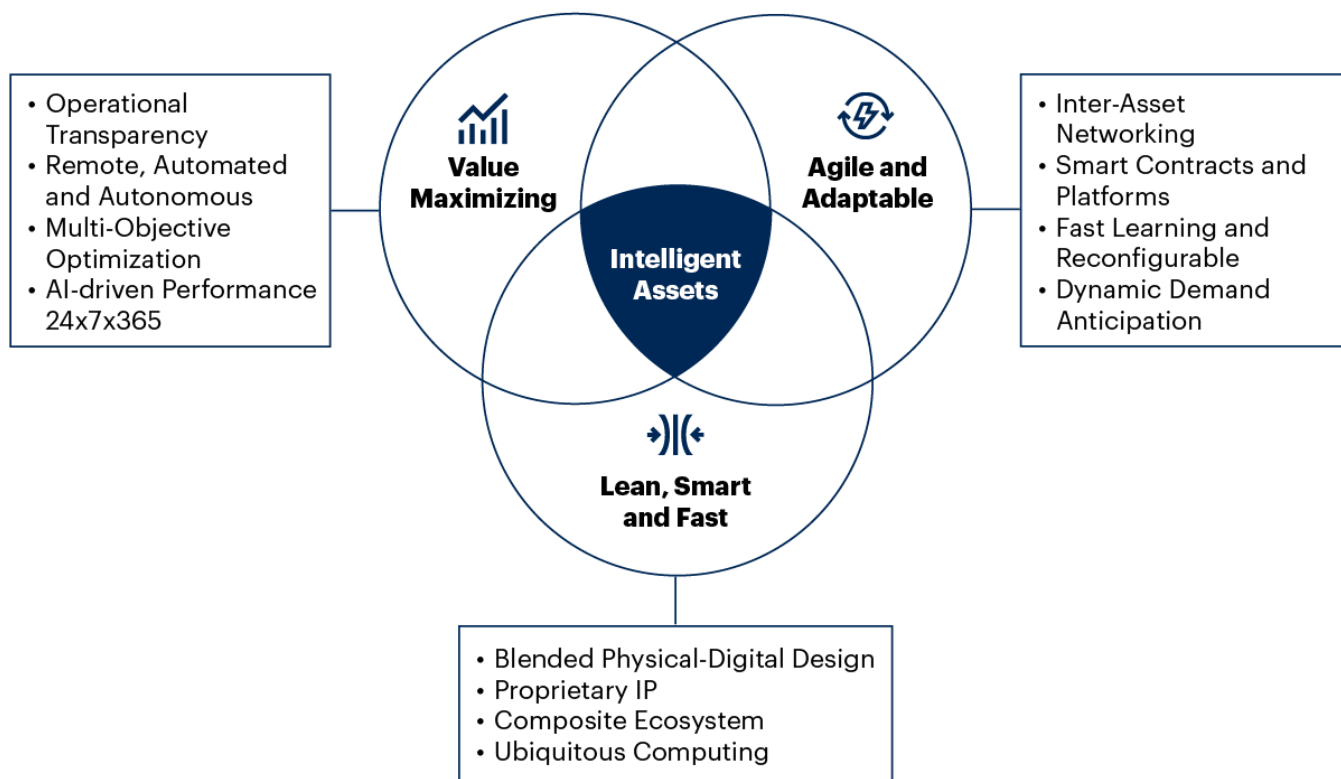
Intelligent Assets Are Strategic Focal Points That Shape Future Digital Investments

As the digital capabilities of oil, gas and energy companies mature, technical resources are becoming more adaptable and work is becoming leaner, lighter and faster. Without question, this shift in approach is increasing both the business value delivered by digital and the cost-efficiency of delivering it.

Energy-producing companies create value through long-lived oil and gas assets, such as offshore platforms, refineries, liquefied natural gas (LNG) trains and pipelines, as well as utility assets such as generation, water treatment, transport and delivery systems.

Figure 1: Business Objectives for Intelligent Assets

Business Objectives for Intelligent Assets



Source: Gartner
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As shown in Figure 1, intelligent assets integrate many current objectives for digital investments into a single program. Designing future assets has become difficult due to the persistence of disruptive forces, such as decarbonization, demand volatility, climate change and energy transition. To strengthen their resilience to these disruptions, a trend has emerged among oil, gas and energy companies to adopt intelligent assets as a strategic objective.

Investments in Early-Stage Intelligent Assets Have Already Begun

Early forms of intelligent assets are beginning to appear. The list below highlights a few examples of early-stage intelligent assets. These examples demonstrate technology has matured to the point that practical, business-oriented investments in intelligent assets can be made in 2022:

- 3 to 4 times higher performance metrics (McKinsey) ¹
- Shell Pulau Bukom refinery ²
- JSR autonomous operations ³
- Dow, Siemens Automation Test Bed ⁴
- Equinor Krafla field ⁵
- ADNOC Panorama and Thamama ⁶

Reasons industry leaders have begun to make investments in intelligent assets:

- Organizational confidence in digital innovation is strong. Positive experience with digital investments have made it easier for enterprise leaders to conceptualize and value more advanced innovations.
- Energy markets are changing faster than energy assets. New energy assets must sustain value delivery despite volatility, value pivots, regulatory action and uncertainty.
- Strong commodity markets support investment in design. Current market conditions make it feasible to invest in new capabilities that structurally position the firm for value sustainability in the future.

As Digital Leaders, CIOs Play a Critical Role in Shaping Focus and Building Momentum

In today's environment, business and IT leaders have developed a much better understanding of the benefits and limitations of digital technologies. Improvements made to connectivity, enterprise data management and edge computing have strengthened the digital foundations upon which new energy assets will operate. Efficiency gains through digital twins, automation and virtual work environments have created an operational environment capable of dynamically interacting and optimizing the performance of business assets.

These advances in digitalization have built organizational confidence in the potential of advanced technology, and at the same time, narrowed the gap to achieve the design and construction of intelligent assets. As digital leaders, CIOs can advance progress toward intelligent energy assets:

- **Start now to make progress in favorable market conditions.** Conceptualize, sponsor and fund a minimum viable product program for developing intelligent asset designs and roadmaps.
- **Host competitions to build engagement and creativity.** Empower self-actualized teams to develop innovative and practical advances toward intelligent assets and motivate engagement with social recognition.
- **Simplify the topic of money.** Create a business perspective by estimating how much your company has invested on business assets and digital investments over the prior decade. Add to that the amount that will likely be spent over the coming decade. The incremental investment to make the asset intelligent can then be put into proper context.
- **Assess the implications for your existing digital foundations.** This journey is based on far greater data and workflow integration, expanded use of machine learning (ML) and artificial intelligence (AI), and selective development of automation. Are your foundations ready?

Recommended by the Authors

6 Top Practices for Winning the Race Toward Intelligent Assets

The Ongoing March Toward Intelligent Assets

Four Essential Capabilities to Sustain Strategic Priorities in Oil and Gas

Evidence

¹ Toward Smart Production: Machine Intelligence in Business Operations, McKinsey & Co.

² Shell Pioneers New Virtual Manufacturing Technology, Asian Downstream Insights.

³ Artificial Intelligence Autonomously Controls Plant for 35 Days, Journal of Petroleum Technology.

⁴ Siemens, Dow and MxD partner to Enhance Digitalization in the Process Industries With Process Automation Test Bed, Siemens.

⁵ "A New Way of Working": Inside Equinor and ABB's Unmanned Oil and Gas Rig, Offshore Technology.

⁶ ADNOC Generates \$1B in Value From Panorama Digital Command Center, Hydrocarbons Technology.

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