

THE DIGITAL REFINERY

**CRACKING THE CODE:
DIGITAL DISTILLED**

**ASEAN HIGHLIGHTS OF
THE 2017 DIGITAL REFINING SURVEY**

YOUR SOURCES TODAY...



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WHAT DEFINES A DIGITAL REFINERY

The industry is under pressure to cut costs due to price volatility digital refinery redefines its ability to address challenges at speed, responding with effective solutions, and improvements and process changes.

Digital aligns and integrates processes, plant, and people - helping refinery companies gain a competitive advantage in the marketplace.

- 1. Adopt an agile, collaborative and connected operating model (processes)**
- 2. Deploy robust technology based on an agile Digital architecture (plant)**
- 3. Create a flexible organisation with a future-ready workforce (people)**

DIGITAL REFINING - KEY TRENDS

TREND 1:

NEW DIGITAL TECHNOLOGIES ARE DISRUPTING INVESTMENT PRIORITIES – helping enable a shift from reactive solutions to proactive monitoring using big data and analytics.

TREND 2:

ANALYTICS IS NUMBER ONE FOR PERFORMANCE FOLLOWED BY CYBERSECURITY – for driving the greatest impact in terms of operational performance for companies currently using digital technologies.

TREND 3:

TWO THIRDS REFINERS SURVEYED PLAN TO INCREASE DIGITAL INVESTMENTS OVER NEXT 3-5 YEARS – almost a quarter are making significantly higher levels of investment in this area than a year ago.

TREND 4:

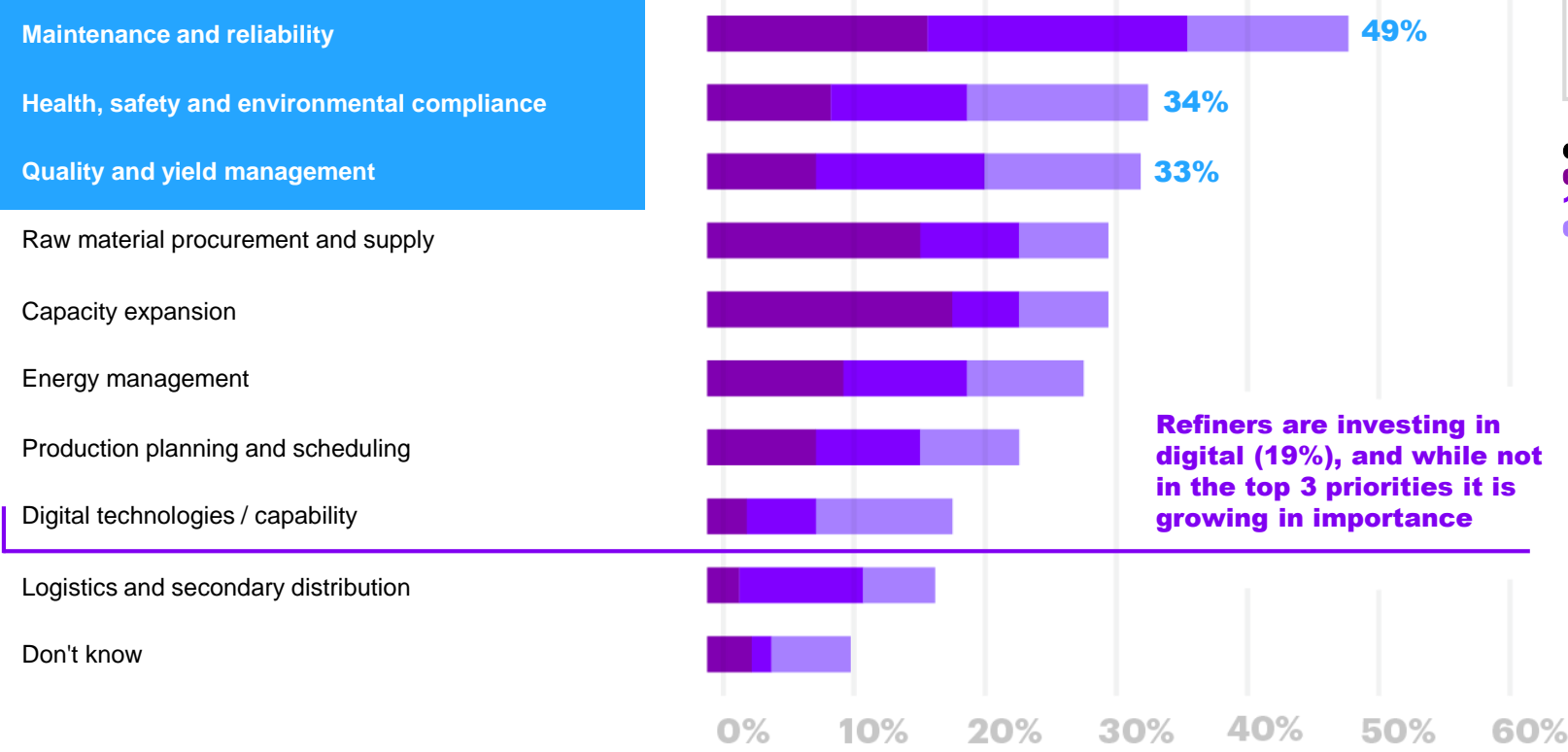
IT'S NOT “CAN REFINERS AFFORD TO”—IT'S “CAN THEY AFFORD NOT TO”? – refiners continue to struggle to understand how digital can drive enough incremental benefit to offset the initial cost outlay.

TREND 5:

DIGITAL BENEFITS ARE CLEAR - ABILITY TO REALIZE THEM IS NOT – the unproven business value combined with lack of clear strategy is slowing down the speed of uptake in refining.

TREND 1: NEW DIGITAL TECHNOLOGIES ARE DISRUPTING INVESTMENT PRIORITIES

AREAS OF INVESTMENT IN THE NEXT 3 YEARS
TO IMPROVE REFINERY EFFICIENCY/PRODUCTIVITY



PRIORITY

- 1ST
- 2ND
- 3RD

OTHER:
0.5% TOP PRIORITY,
1.5% 2ND PRIORITY,
0.5% 3RD PRIORITY

Refiners are investing in digital (19%), and while not in the top 3 priorities it is growing in importance

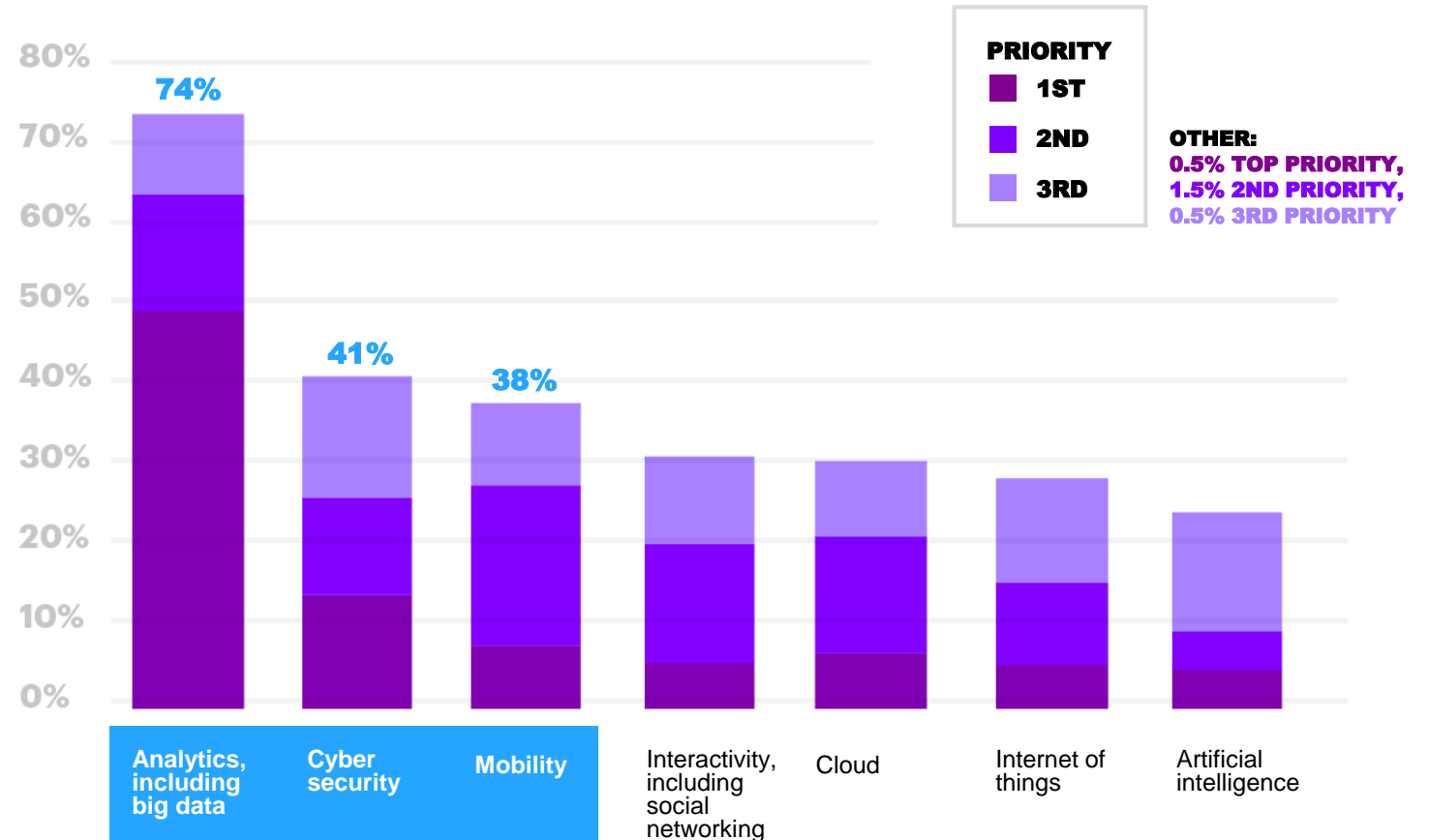


In which of the following areas is your company planning to invest in the next 3 years to improve the efficiency and productivity of your refinery/refining portfolio? Please rank your top 3 with "1" as top priority.

TREND 2: ANALYTICS IS NUMBER ONE FOR PERFORMANCE FOLLOWED BY CYBERSECURITY

Analytics, including big data, by a large margin is viewed to be the number one digital technology that will impact performance.

DIGITAL IMPACT ON OPERATIONS



If currently using digital technologies, which of the following are driving the greatest impact in terms of the operational performance for your refining business? Please select your top 3, with "1" signifying the most important.

TREND 3:

2/3 OF REFINERS SURVEYED PLAN TO INCREASE DIGITAL INVESTMENTS OVER NEXT 3-5 YEARS



THE REALITY

NOCs are currently leading the way in digital investment.



ANALYSIS

Most refiners generally consider themselves to have low levels of digital maturity. However, national oil companies were significantly higher — almost a quarter indicated they have been making significantly higher levels of investment in digital.

THE OPPORTUNITY:

We see that developing new digital skills combined with an innovative workforce culture is key to help address the maturity gap for ALL refiners. **According to the survey, NOCs (24%) stated they are currently spending 20% or more than they were a year ago in digital technologies.**



JOURNEY TO THE CONNECTED REFINERY

- Digital requires senior executive leadership and vision, underpinned by proof of concepts that quickly lead to scaled programs focused on **maximizing return on investment.**
- Companies need to drive **a culture of innovation** and technology adoption – a parallel focus on OT & IT.
- Investment in human capital and development programs are needed to promote new, **digital thinking** and **new ways of working.**
- A methodical approach for developing and/or industrializing **the digital foundation** is needed, including managing the broader ecosystem of digital partners.
- A comprehensive digital enablement plan should be built into business strategy to lead to **digital transformation.**

ASEAN-BASED DIGITAL REFINER

In refining, the company has the capacity to handle 120,000 barrels/day.

Its retail business has more than 1,072 fuel stations and a growing renewable energy portfolio.

Accenture designed a comprehensive plan to transform it into a digital enterprise, focusing on 3 key areas

- 1. IT/Digital Transformation Roadmap**
— for the enterprise, refinery, retail & renewable energy businesses.
- 2. Cloud Architecture**
— Involving its SAP ERP system and legacy systems—including some 80 applications, data centers, databases, networks & security.
- 3. IT Operating Model**
— bringing 360 degree view of all IT projects, and developing an IT operating model encompassing people, process and technology.

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Q+A Session