The refining landscape

Competitive pressure on refiners is growing in 2019 — margins have generally been weaker, largely due to prolonged periods of maintenance and turnarounds (after years of high utilization), rising feedstock prices, heavy oil supply disruptions and preparation for International Maritime Organization 2020.

Survey summary

Accenture Digital Refining Survey 2019* shows that while digital continues to contribute to margin improvements, satisfaction around the impact of digital is static. Refiners continue to deploy digital primarily for improving production yields (digital investment is also largely focused in this area), yet they are finding it hard to scale digital for further improvements. There is evidence that refiners are now realizing that the next step is a stronger focus on culture and change management to enhance digital adoption and scaling in their businesses.

*145 oil refining and gas industry professionals

TREND 1
Digital transformation in refining: In progress

Nearly 60% of respondents are investing “more or significantly more” in digital technologies.

Are you currently investing more or less in digital technology than 12 months ago?

- Significantly more (20% or greater)
- More (1–19% more)
- The same
- Less (1–19% less)
- Significantly less (20% or greater)
- Don't know

2019

- 19%
- 34%
- 37%
- 4%
- 5%

TREND 2
Digital benefits will be enabled by future investments

Production planning and execution processes have benefited most from digital. Process and asset optimization and automation are earmarked for future investment.

Where are refiners planning to invest? [Over the next 3 years]

<table>
<thead>
<tr>
<th>REFINERY INVESTMENT</th>
<th>% OF RESPONDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process optimization</td>
<td>61%</td>
</tr>
<tr>
<td>Predictive asset maintenance</td>
<td>43%</td>
</tr>
<tr>
<td>Greater plant automation</td>
<td>41%</td>
</tr>
</tbody>
</table>

Responses choose all that apply – do not add up to 100%. Top 3 collective responses shown.

TREND 3
Resistance to digital adoption is rising, forcing a greater focus on people priorities

Cost is no longer the top barrier to digital adoption. The next frontier is cultural change.

What do refiners see as the main barriers to successful digital adoption?* [Across the organization]

- Lack of clear strategy
- Resistance to adopt digital solutions

% of respondents in 2019

- 49%
- 50%

% of respondents in 2018

- 48%
- 33%

Responses choose all that apply *Top 3 responses only shown.

TREND 4
Maturity reality check: Digital is hard to scale

Fewer refiners are calling themselves “digitally mature.” IT/OT convergence and organizational challenges are limiting speed to maturity.

How mature would you rate the use of digital technologies? [Within the refining operation]

<table>
<thead>
<tr>
<th>HOW</th>
<th>% OF RESPONDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirational</td>
<td>34%</td>
</tr>
<tr>
<td>Localized</td>
<td>27%</td>
</tr>
<tr>
<td>Mature</td>
<td>13%</td>
</tr>
<tr>
<td>Semi-mature</td>
<td>12%</td>
</tr>
<tr>
<td>Novel</td>
<td>3%</td>
</tr>
<tr>
<td>Just getting started</td>
<td>7%</td>
</tr>
<tr>
<td>Don't know</td>
<td>5%</td>
</tr>
</tbody>
</table>

CONCLUSION

Look to the last mile of the digital transformation journey

- Refiners realize some value from digital for key processes
- Digital is here to stay, and investment will continue
- Digital transformations remain complex and hard to scale
- Refiners struggle with the last mile of digital transformation: organizational barriers around people and culture, and IT/OT convergence are causing complexity
- People changes are fundamental to transformation efforts to drive adoption of new technologies
- Success in digital requires a new, broad ecosystem of partnerships for both pace and scale

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