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HOW DIGITAL TRANSFORMATION HELPS UTILITIES DRIVE BETTER PERFORMANCE

Process and Performance Management Webinar

February 11, 2020 | 10:00 a.m. CST
A FEW THINGS TO NOTE

→ Audio is available through your computer speakers or through dial-in. All lines are muted.

→ You can submit questions/comments at any time. We will address all questions during the Q&A session at the end of today’s presentation.

→ Links to the slides/recording will be sent to all attendees via email.
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RESEARCH OBJECTIVES

A global energy transition, in which significantly greater access to electric energy is required, is occurring. This poses challenges for utilities, requiring them to re-imagine how they innovate, operate and engage with their environment, customers, employees and partners. They can achieve this through the application of new technologies and digitalization.

APQC and the IBV surveyed 240 electric utilities ecosystem participants; 112 in generation and 128 in transmission, control and distribution on:

1. Movement toward sustainable energy models for the future
2. Digital transformation maturity
3. Adoption and application of new technologies, data and insights and workforce implications
DEMOGRAPHICS OF OUR GLOBAL RESPONDENTS

Surveyed organization:
- Regional distribution:
  - Asia Pacific: 29%
  - Europe: 35%
  - Middle East and Africa: 3%
  - US and Canada: 29%

Surveyed organization:
- Industry distribution:
  - Generation: 53%
  - Transmission and distribution: 47%

Parent company:
- Revenue distribution:
  - Less than $100 million: 10%
  - Between $100 million and $500 million: 9%
  - Between $500 million and $1 billion: 23%
  - Between $1 billion and $5 billion: 26%
  - Between $5 billion and $10 billion: 20%
  - Between $10 billion and $15 billion: 4%
  - Between $15 billion and $20 billion: 1%
  - $20 billion or greater: 5%
KEY THEMES

Cloud cover
Cloud is the supporting structure on which transformation happens

Data Core
Cloud is the structure on which digital transformation happens; automate for scale advantage

Strategy: the Missing Link

Holding Patterns: People and Security
EXTERNAL FORCES IMPACTING THE ENERGY INDUSTRY

Today

- Budgets: 17%
- Environmental factors: 25%
- Geopolitical factors: 20%
- Globalization: 19%
- Macro-economic factors: 26%
- Market factors: 30%
- People skills: 34%
- Regulatory concerns: 37%
- Technological factors: 24%
- Socio-economic factors: 25%

In the next 3 years

- Budgets: 24%
- Environmental factors: 28%
- Geopolitical factors: 22%
- Globalization: 21%
- Macro-economic factors: 25%
- Market factors: 30%
- People skills: 38%
- Regulatory concerns: 36%
- Technological factors: 27%
- Socio-economic factors: 29%

Source: IBM Institute for Business Value benchmark study, 2020; n = 240
SENSE OF URGENCY AND DEGREE OF READINESS TO DIGITALLY REINVENT OVER THE NEXT 5 YEARS TO REMAIN COMPETITIVE IN THE FACE OF GLOBAL ENERGY TRANSITION

Source: IBM Institute for Business Value benchmark study, 2020; n = 240.
Cloud in production or fully implemented today

- Generation: 67%
- Transmission and Distribution: 59%

Percentage of applications deployed on the cloud today

- 33% Generation
- 20% Transmission and distribution

Source: IBM Institute for Business Value benchmark study, 2020; n = 240.
Cloud in production or fully implemented in the next 3 years

Percentage of applications deployed on the cloud in the next 3 years

66% Generation
70% Transmission & Distribution

58% Generation (25 pp increase)
50% Transmission & distribution (30 pp increase)

Source: IBM Institute for Business Value benchmark study, 2020; n = 240.
HOW IOT TECHNOLOGY IS APPLIED IN UTILITY OPERATIONS

**Today**

- Location intelligence/management: 26% Generation, 24% Transmission and distribution
- Machine/industrial automation: 26% Generation, 27% Transmission and distribution
- Meter reading: 17% Generation, 24% Transmission and distribution
- Predictive maintenance: 22% Generation, 24% Transmission and distribution
- Real-time equipment monitoring: 21% Generation, 27% Transmission and distribution
- Remote alarms: 25% Generation, 30% Transmission and distribution
- Smart grid applications: 14% Generation, 30% Transmission and distribution
- We are not applying/have no plans to apply IoT: 18% Generation, 12% Transmission and distribution

**In the next 3 years**

- Location intelligence/management: 36% Generation, 34% Transmission and distribution
- Machine/industrial automation: 38% Generation, 38% Transmission and distribution
- Meter reading: 33% Generation, 31% Transmission and distribution
- Predictive maintenance: 25% Generation, 39% Transmission and distribution
- Real-time equipment monitoring: 24% Generation, 34% Transmission and distribution
- Remote alarms: 26% Generation, 41% Transmission and distribution
- Smart grid applications: 22% Generation, 36% Transmission and distribution
- We are not applying/have no plans to apply IoT: 8% Generation, 9% Transmission and distribution

Source: IBM Institute for Business Value benchmark study, 2020; n = 240

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HOW AI IS BEING APPLIED BY UTILITY ORGANIZATIONS

Today

- Active asset monitoring with predictive quality management: 32%
- Augmented reality: 27%
- Automated detection and response with sensor-based monitoring: 17%
- Cognitive and prescriptive analytics: 17%
- Cognitive assistants in connected products: 20%
- Customer analytics and recommendations: 29%
- Digital twins with complete views of complex systems and interrelationships: 29%
- Logistics and workflow optimization: 18%
- Not applicable - we are not applying/have no plans to apply AI: 21%
- Visual and acoustic analytics: 13%
- What-if analysis and scenario planning: 43%

In the next 3 years

- Active asset monitoring with predictive quality management: 33%
- Augmented reality: 22%
- Automated detection and response with sensor-based monitoring: 17%
- Cognitive and prescriptive analytics: 29%
- Cognitive assistants in connected products: 36%
- Customer analytics and recommendations: 36%
- Digital twins with complete views of complex systems and interrelationships: 33%
- Logistics and workflow optimization: 18%
- Not applicable - we are not applying/have no plans to apply AI: 9%
- Visual and acoustic analytics: 26%
- What-if analysis and scenario planning: 32%

Source: IBM Institute for Business Value benchmark study, 2020; n = 240
GRID MODERNIZATION INITIATIVES IN WHICH THE ORGANIZATION IS INVESTING

Source: IBM Institute for Business Value benchmark study, 2020; n = 240

### Today
- Advanced distribution management system: 40%
- Electric vehicle charging equipment: 44%
- Energy storage: 35%
- Fuel cells stationary/distributed generation: 33%
- Resilience and cybersecurity: 41%
- Smart grid: 51%
- Solar systems integration: 41%
- Transformer resilience and advanced components: 40%
- Transmission reliability: 40%
- Wind grid integration: 26%

### In the next 3 years
- Advanced distribution management system: 46%
- Electric vehicle charging equipment: 48%
- Energy storage: 49%
- Fuel cells stationary/distributed generation: 45%
- Resilience and cybersecurity: 52%
- Smart grid: 58%
- Solar systems integration: 57%
- Transformer resilience and advanced components: 52%
- Transmission reliability: 49%
- Wind grid integration: 40%

Source: IBM Institute for Business Value benchmark study, 2020; n = 240
DATA SOURCES FROM WHICH THE ORGANIZATION HAS DEVELOPED ACTIONABLE INSIGHTS

Source: IBM Institute for Business Value benchmark study, 2020; n = 240

- Real-time events and data (e.g. asset health indicators, other SCADA system data): 30% Generation, 42% Transmission and distribution
- Mobile application data: 35% Generation, 38% Transmission and distribution
- Internal systems (e.g. head-end systems, billing systems, customer information systems (CIS), geographic information systems (GIS), distribution management systems (GIS)): 36% Generation, 38% Transmission and distribution
- Sensors and actuators (e.g., mechanical, tracking, telematics): 35% Generation, 38% Transmission and distribution
- Customer-generated text (e.g., website comments, emails, call center transcripts): 36% Generation, 36% Transmission and distribution
- Advanced metering infrastructure (AMI): 33% Generation, 39% Transmission and distribution
- We have not developed actionable insights from any of the above data sources: 5% Generation, 3% Transmission and distribution
CLOUD BREAK

What’s Holding Utilities Back?
TOP THREE ISSUES PREVENTING THE ORGANIZATION FROM USING CLOUD MORE WIDELY

- Cybersecurity concerns
- Strategy still in development
- Financial considerations
- Regulations for data hosting or sharing
- Organizational maturity
- Capex vs Opex considerations
- Cloud management concerns
- Lack of defined business case

Source: IBM Institute for Business Value benchmark study, 2020; n = 240
THREE GREATEST CHALLENGES TO THE USE OF AI/COGNITIVE COMPUTING

Source: IBM Institute for Business Value benchmark study, 2020; n = 240

- Immature technology: 37%
- Difficulties optimizing processes for automation: 30%
- Inadequate investment funds available: 29%
- Insufficient top-level buy-in: 25%
- Employee resistance: 28%
- Securing IoT platform and devices: 27%
- Remaining compliant with regulatory constraints/union rules: 28%
- Managing new categories of risk associated with AI: 21%

Source: IBM Institute for Business Value benchmark study, 2020; n = 240
THREE GREATEST CHALLENGES IN EXECUTING AN IOT STRATEGY

Source: IBM Institute for Business Value benchmark study, 2020; n = 240

- Utilization of data (collected and analyzed using new technologies)
  - Generation: 21%
  - Transmission and distribution: 23%

- Lack of skills and resources to execute effectively
  - Generation: 27%
  - Transmission and distribution: 29%

- Secure our IoT platform and devices
  - Generation: 27%
  - Transmission and distribution: 29%

- Translate IoT data into actionable insights and learning processes
  - Generation: 31%
  - Transmission and distribution: 24%

- Implement device and communication standards
  - Generation: 32%
  - Transmission and distribution: 23%

- Address data ownership and privacy issues
  - Generation: 25%
  - Transmission and distribution: 29%

- Lack of IT infrastructure to support IoT
  - Generation: 20%
  - Transmission and distribution: 22%

- Scale our IoT platform
  - Generation: 32%
  - Transmission and distribution: 26%

Source: IBM Institute for Business Value benchmark study, 2020; n = 240
In 2020, the IBM IBV studied the security concerns utilities have. The risks are real: a condensed history of breaches and attacks.

Attacks on ICS networks: A snapshot

Source: IBM Security research. https://ibm.co/utilitiesIiot

Models of Investment
STRUCTURED IMPLEMENTATION STARTS WITH STRATEGY

BYPL: Transformation Themes
- System Upgradation
- AT&C Loss Reduction
- Customer Care
- Metering & Billing processes
- IT Systems & Processes
- Organizational Restructuring

BYPL: Waves of Transformation
- 2002: Set Strategy
- 2002-2007: Establish IT Infrastructure
- 2007-2014: Set Stage for Growth
- 2014-2016: Execute Next Level of Transformation
GOVERNANCE IS VITAL FOR TRANSFORMATION

1. CMI: Integrated in Transformation
   - Digital Governance
   - Executive Committee
   - Digital Executive Team
   - Transformation Director: BU
   - Technology and Transformation Director
   - Telecom Director: BU

2. TechnipFMC: Center of Excellence
   - Digital Lead
   - CoE
   - IT

3. E.ON: Innovation Team
   - Digital Governance
   - Investment Team
   - Digital Team
   - Operational Excellence
   - IT
QUESTIONS
NEXT STEPS

→ Get notifications about the latest IBV research, including this study when it comes out soon
  → IBM Institute for Business Value
  → Lisa Fisher
  → Cristene Gonzalez-Wertz

→ Check out additional research on the topic:
  → Mind the Utilities Cybersecurity Gap
  → Digital Transformation: Strategy to Tactics
The world’s foremost authority in benchmarking, best practices, process and performance improvement, and knowledge management.
APPENDIX

About IBM Performance Data and Benchmarking
IBM is an international leader in business process performance measurement and optimization. The IBM Institute for Business Value provides business process benchmarking services that help clients measure their current state and compare performance against peers. These benchmarking services can be provided as part of a process transformation initiative or strategic engagement. This is a mature offering supported by robust content and specialized tools. Our patented custom survey method and toolset enable us to provide meaningful and accurate comparisons of performance tailored to the priorities of each client. Through our benchmarking program, organizations can measure their current state using the open standard Process Classification Framework; assess their performance against external peer groups such as industry, region, revenue or other criteria; and learn from leading practices, based on fact-based, data-driven comparisons and recommendations.

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