The Digitization of Capital Projects and Infrastructure in the Public Sector

Building Back **Smarter**

accenture

Project Controls EXPO
Washington, DC - USA

The passing of the Infrastructure Investment and Jobs Act is a generational opportunity to reimagine infrastructure for the future, with “nearly 80% expected spending increase, ..targeting big and long-overdue investments.”

It’s an historic investment in America and a global game changer, helping shape the labor force of the future, and incentivizing key industry shifts to new technologies and standards.

It’s time to **rethink** infrastructure delivery.

Decades of underinvestment and deferred maintenance have created common infrastructure challenges to safety, efficiency and experience

According to the 2021 report card for America's infrastructure by the American Society of Civil Engineers.....

Roads
scored a **D**

As vital lifelines, **43%** of our public roadways are in poor or mediocre condition

Over **36,000** people are still dying on the nation's roads every year

Our highways and roads move **72%**, or ~**$17 trillion**, of the nation's goods

Bridges
scored a **C**

46,154 of the nation's bridges are considered structurally deficient

178M daily trips are taken across structurally deficient bridges

Need to increase rehabilitation spend by **58% / ~$9B** annually or it will take until **2071** to make necessary repairs

Rail
scored a **B**

Passenger Rail's current state of good repair backlog at **$45.2 billion**

In the Northeast Corridor, infrastructure-related issues caused **328,000** train-delay minutes

In 2019, DOT's FR reported a total of **11,667** accidents/incidents

Transit
scored a **D-**

45% of Americans have no access to transit

$176B transit backlog, and expected to grow to more than $270B through 2029

19% of transit vehicles and 6% of fixed guideway elements like tracks and tunnels were rated in "poor" condition

In 2019, the U.S. spent just 2.5% of our GDP on infrastructure, down from 4.2% in the 1930s

World Economic Forum ranks U.S. infrastructure 13th, behind countries like Singapore, Japan, South Korea, France and the U.K

Before COVID 19, WEF estimated that the world was facing a $15 trillion infrastructure gap by 2040

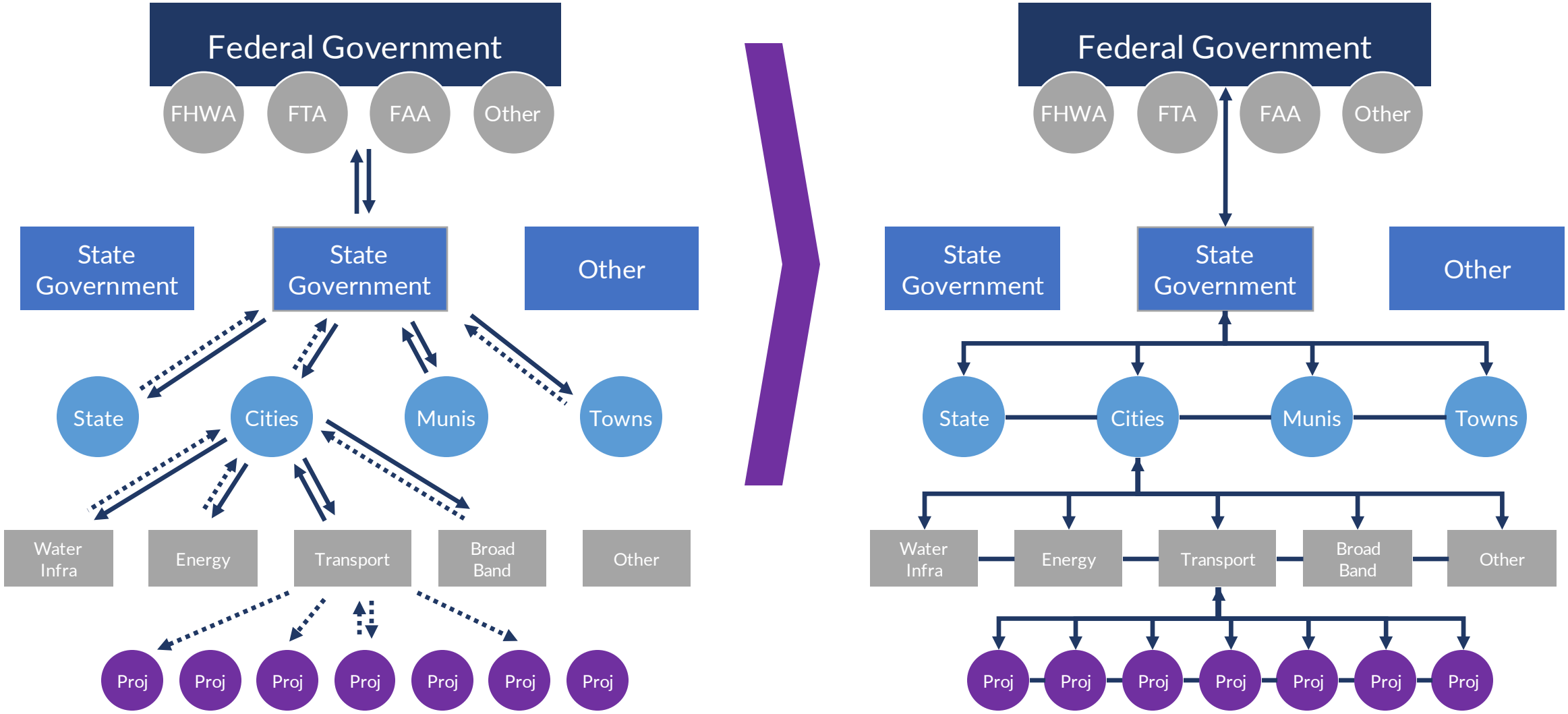
**Sourcee details available upon request*

It’s time to move the needle by turning bold visions into meaningful action

Many have not yet defined the benefits or prepared to accelerate and scale in delivering intended outcome from the infrastructure investment.

And with limited visibility, management and control over distribution, uses, and performance from federal funding, capital projects becomes incredibly challenging.

The mission is to move from fragmented to **integrated**, from hidden to **transparent**, from no controls to successful **outcomes**, creating a digital thread throughout federal, state and local governments, across funding, projects and outcomes.



Capital Projects run "over budget, over time, under benefits, over and over again"

LESS THAN

50% … of projects meet their original goals[1]

NEARLY

1/3 … projects are cancelled before completion, while 77 % are more than 40 % behind schedule.

9/10 projects have cost overruns – regularly up to 50%, and not uncommonly over 50%[1]

11% of every dollar is wasted due to poor project performance[3]

93% of respondents ranked project performance data (e.g., cost & schedule) as high or very high importance…[2]

47% … despite this, almost half of project performance data is still collected in paper forms or spreadsheets[2]

..and **challenges are exacerbated with public sector projects being fraught with risk within a complex landscape.** Millions of people are dependent on, and move through public infrastructure a day, making these projects disruptive while confronted with fragmented stakeholders, public scrutiny, and increased regulatory and compliance.

**Sourcee details available upon request*

While you need to move fast, it's critical to establish a strong foundation with a clear execution path

Get to the Starting Line

- Review and adjust operating model to meet needs
- Develop strategic alignment and execution plan
- Analyze and interpret Federal guidance and eligibility
- Conduct capability capacity, maturity and readiness assessments
- Investment candidate identification, prioritization, business case development

Accelerate and Scale

- Mobilize acceleration and oversight team
- Minimize friction points and streamline procurement and delivery processes
- Determine acceleration opportunities
- Scale operation and increase through-put
- Revisit contracting/procurement strategies and policies

Measure and Report

- Review and adjust internal policies
- Implement compliance, control and tracking systems
- Provide transparency and real-time analytics
- Track and measure against goals and objectives
- Lead with citizen value and sustainable development goals at the center

Ensure Future Readiness

- Invest in lasting future strategies, including low operating costs and new revenue models
- Importance of end-to-end capabilities
- Born digital through broad ecosystem partners
- Secure assets through robust cyber security programs

But there's a digital challenge

We find that a lot of organizations are not digitally enabled to effectively execute capital projects, let alone geared for the current surge and scale of projects, while a maturing workforce brings massive talent and capacity shortages.

We must **do more with less,** while many of us rely on outdated, disparate, and often offline systems and spreadsheets, which has implications:

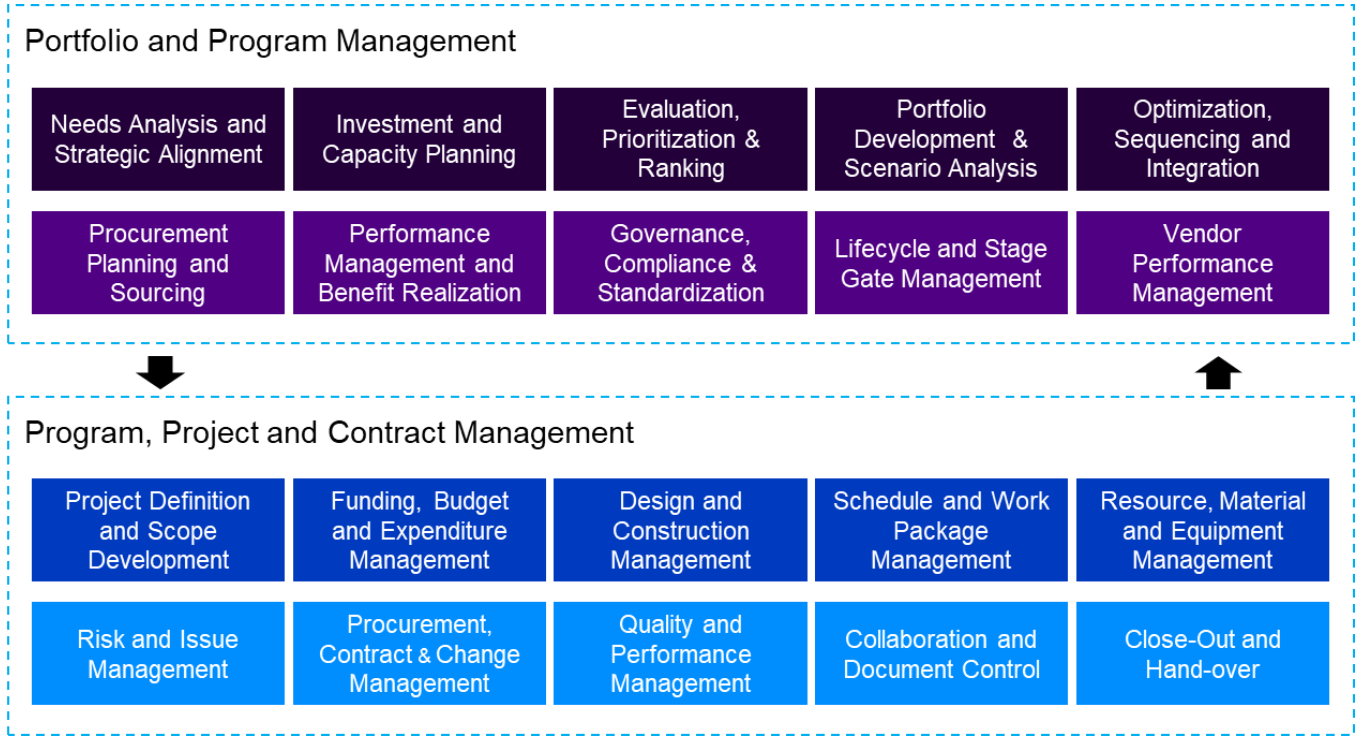
Substantial burden on the end-users to collect, prepare, and report on projects manually and in a common standard across many stakeholders

Trapped and fragmented data that breaks down contextualization, questioning integrity and placing a strain on reporting, performance tracking and decision making

Limited capabilities and control, not enabling success or enforcing governance, leading to non-compliance, poor quality and performance, and not realizing benefits

No common environment to create a single view of the truth and share information while collaborating across stakeholders, projects and agencies.

Organizations must adopt a robust PPM framework while recognizing the vital role of digital solutions to integrate functions and processes across the value chain and project lifecycle.



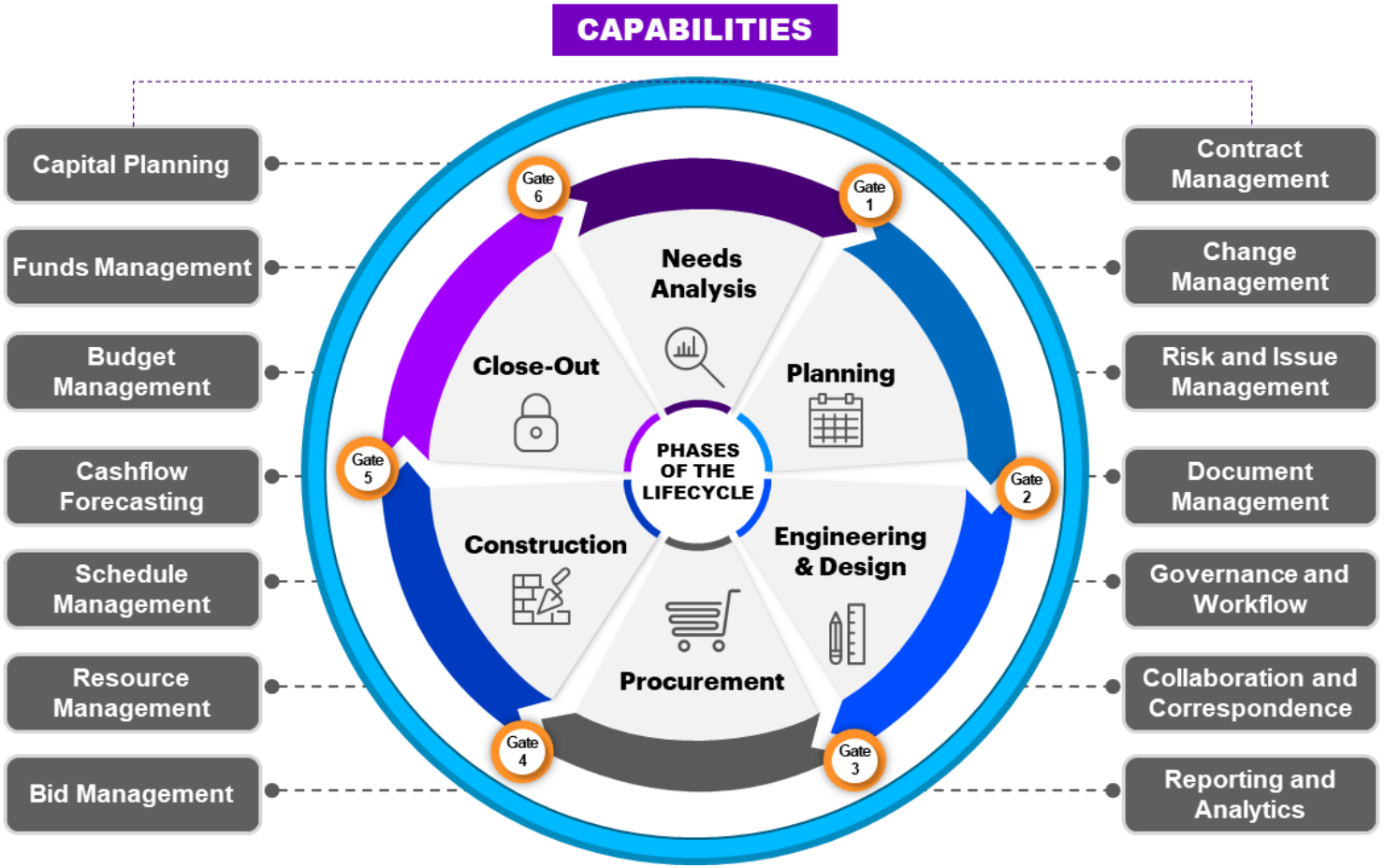
- Mature project and program management capabilities enable **quality, standardization, and scalability**
- Consistent application of PPM framework is critical to ensure **consistent results**
- Digital solutions integrate functions, processes and controls to **implement standards** across all levels of your organization

Connected PPM (cPPM) and Climate Change Pathway Planner (C2P2)

Accenture Connected PPM (cPPM) solution offers critical capabilities to coordinate funding and manage capital projects

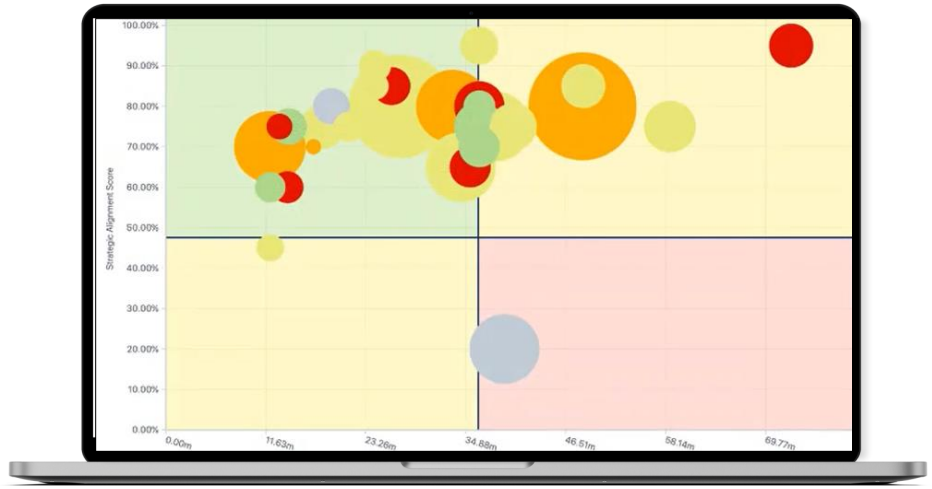
In strategic partnership with Oracle, Accenture developed a "connected" Portfolio, Program & Project Management cloud platform, that is cross-industry relevant for asset and capital-intensive organizations with a focus on public infrastructure.

- Create transparency and offering critical insights with a common data environment
- Enable more effective collaboration and use of data
- Drive more informed decision making and compliance
- Minimize risk of value being trapped at functional integration points



Accenture cPPM solution offers…

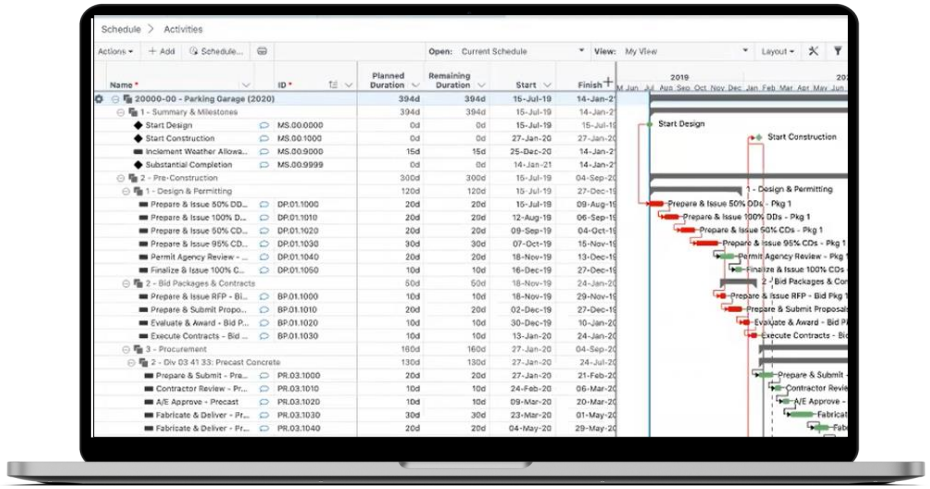
- Provide framework for multi-year capital plans, **balance critical constraints**, and **align investments** with strategic objectives
- **Track the 'color of money'** as you allocate funding
- Closely monitor capital budgets, expenditure, and **forecast across your portfolio**

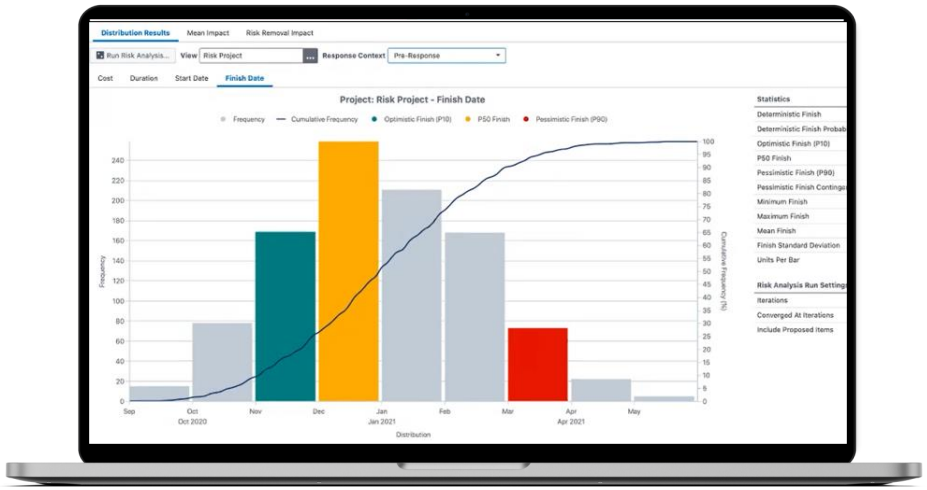


- Enable intuitive and easy-to-implement **Monte Carlo analysis** to effectively identify and mitigate risks on your projects
- Provide **powerful scheduling** for both construction and less non-construction projects, ranging from simple to complex
- Help manage integrated resource capacity and **demand planning** and management across labor, equipment, and material resources

Accenture cPPM solution offers…

- **Monitor performance** while closely managing **contractor progress** and tracking contract changes
- Provide instant visibility into **schedule progress**, and **resource capacity** while managing risks
- Enable field staff with **field task management** for short interval planning

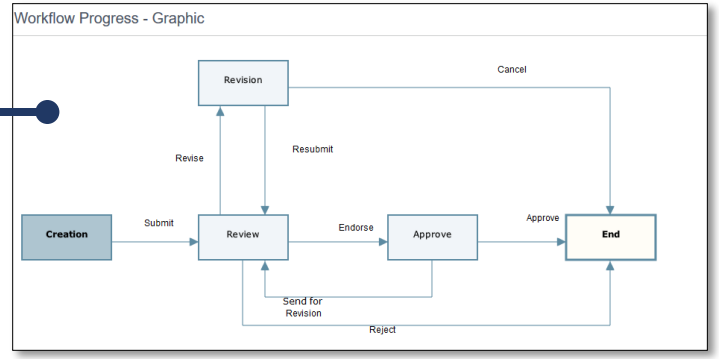




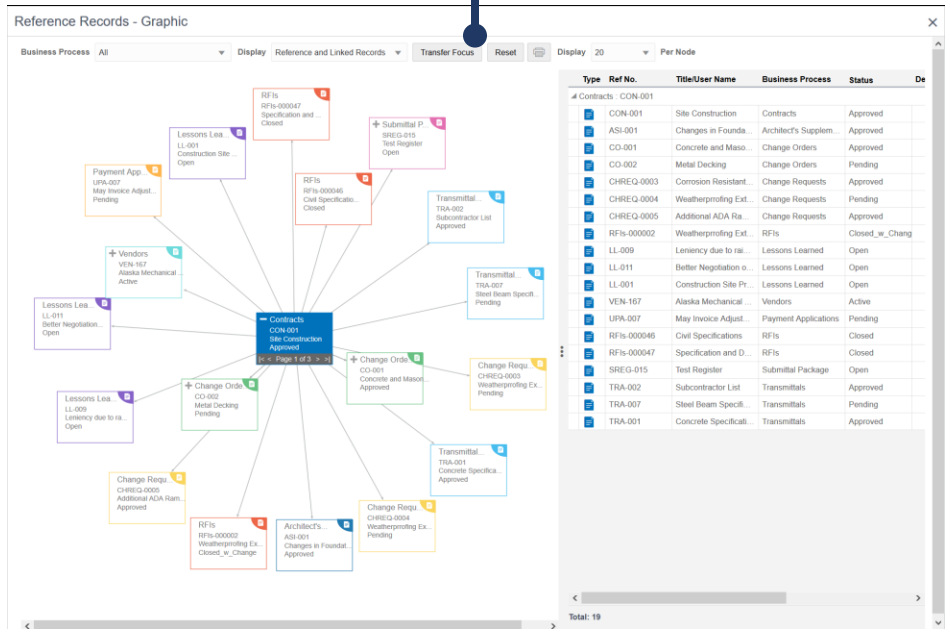
- **Automate workflows** to ensure that business processes are followed consistently every time
- Provide robust auditing capabilities to support your organization and **regulatory compliance** requirements
- Enforce **data protection** with detailed user permissions administration
- **Report** on data, documents, and workflow progress within and across projects in a variety of formats

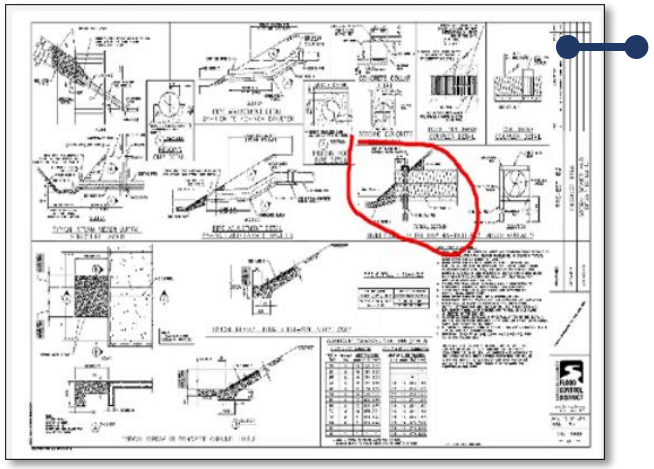
Accenture cPPM enforces governance and compliance with powerful workflows and document control functionality

Highly configurable workflows enable **strong governance** across all aspects of a project, from RFI's to correspondence, to design reviews, to approvals, etc.



Connecting and integrating related processes and documents, and demonstrating relationships intuitively allows you to quickly navigate and **trace critical data**





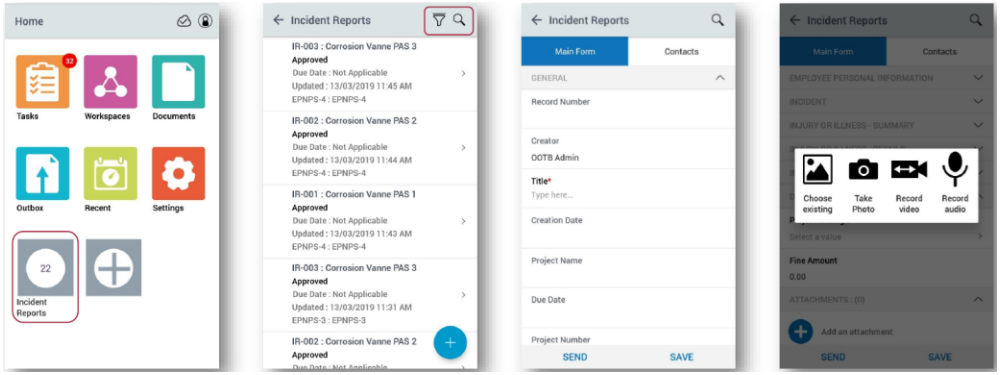
Structured document storage and native document viewer allows the ability to open hundreds different file formats, including CAD files, and to **mark-up and sign** documents directly without other systems

Extended project delivery processes combined with mobile capabilities enable strong collaboration

In addition to integrated core capabilities around cost, contract, schedule and resource management, cPPM further expands project delivery processes and communication across all stakeholders.

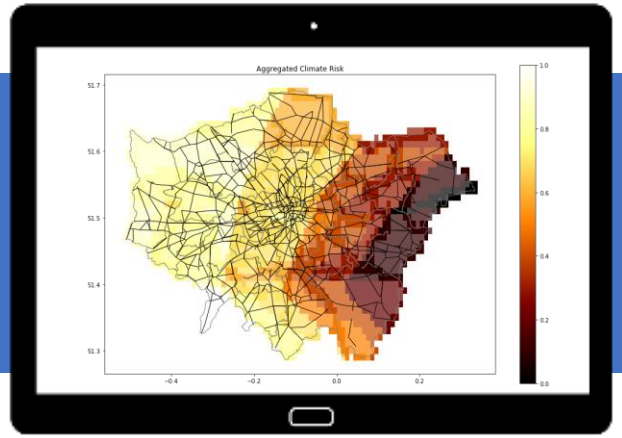
Processes and functions include but are not limited to:

- Funding Allocation, Budgets, Estimates
- Contracts, Purchase Orders, Work Orders
- Risks, Issues, Change Orders
- Submittals and Design Reviews
- Requests for Information
- Communication and Collaboration
- Reports & Analytics



cPPM solution also provides mobility options

Accenture Climate Change Pathway Planner (C2P2) makes sustainability possible now



C2P2 enables owners to evaluate and increase their resilience to climate change so that they can prioritize assets, refine project plans and maximize their impact.

How can C2P2 help?

Enable strategic decision making and allocation of funding to make the infrastructure of cities more resilient to climate change

Access insights to mitigate climate and carbon emission risks across asset portfolios

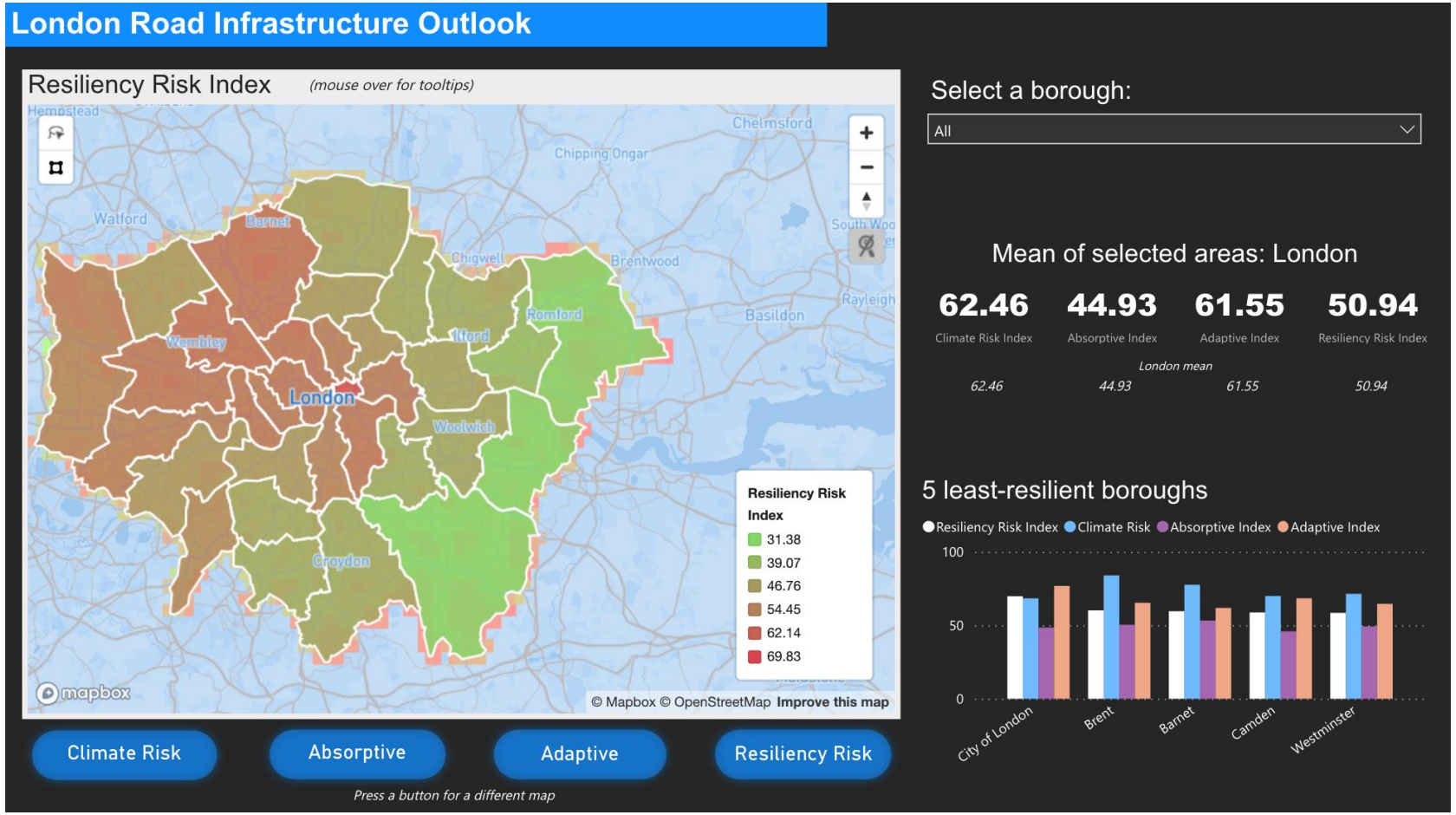
Understand the assets most at risk from physical climate change

Assess the projected carbon associated with capital infrastructure assets and projects

Over **50% of sewage pumping stations in NYC will be under threat from floods in 2100**. Planning the infrastructure to minimize this risk can greatly benefit the city at a societal and economic level.

Accenture C2P2 addresses climate risk today for a more sustainable tomorrow

London Road Infrastructure Dashboard



Climate Risk Index
Aggregate of the projected change in climate variables by 2050

Absorptive Index
Measure of the likelihood that the local environment will change (e.g., exposure to large climate changes, or whether roads are heavily-used and/or in poor condition)

Resiliency Index
Aggregate of the absorptive, adaptive and transformative capacities, in particular: **absorptive + adaptive - transformative**.

A higher value indicates an area or infrastructure asset is at greater risk of deterioration, and where **mitigation or prevention strategies** should therefore be applied

Adaptive Index
Ability to react and assimilate changes in the local environment (e.g., use of alternative transportation mechanisms)

Leaders who will have the **biggest impact** on society will be powered by data and digital, looking beyond their own industry to **broader partnerships** and taking an **integrated ecosystem approach** that brings technologies together, across multiple aspects of infrastructure.

Case Studies

We support many large public sector clients deliver their capital infrastructure programs through transformation of project delivery processes and systems

National Transport Infrastructure Department
Brasilia, Brazil

PMO Creation, Process & Technology Standardization

Value Delivered: Provided Tactical and Operational PMO management services; Monitoring of construction, maintenance and operations work; and Implemented an Innovation Center.

Queensland Dept. of Transport and Main Roads
Brisbane, Australia

Capital Project Delivery Process & Systems Transformation

Value Delivered: Implemented Portfolio, Program, Project and Contract Management (3PCM) solution and improved business processes; Providing an eight-year managed service of the solution.

Gauteng Dept. of Infrastructure Development
Johannesburg, SA

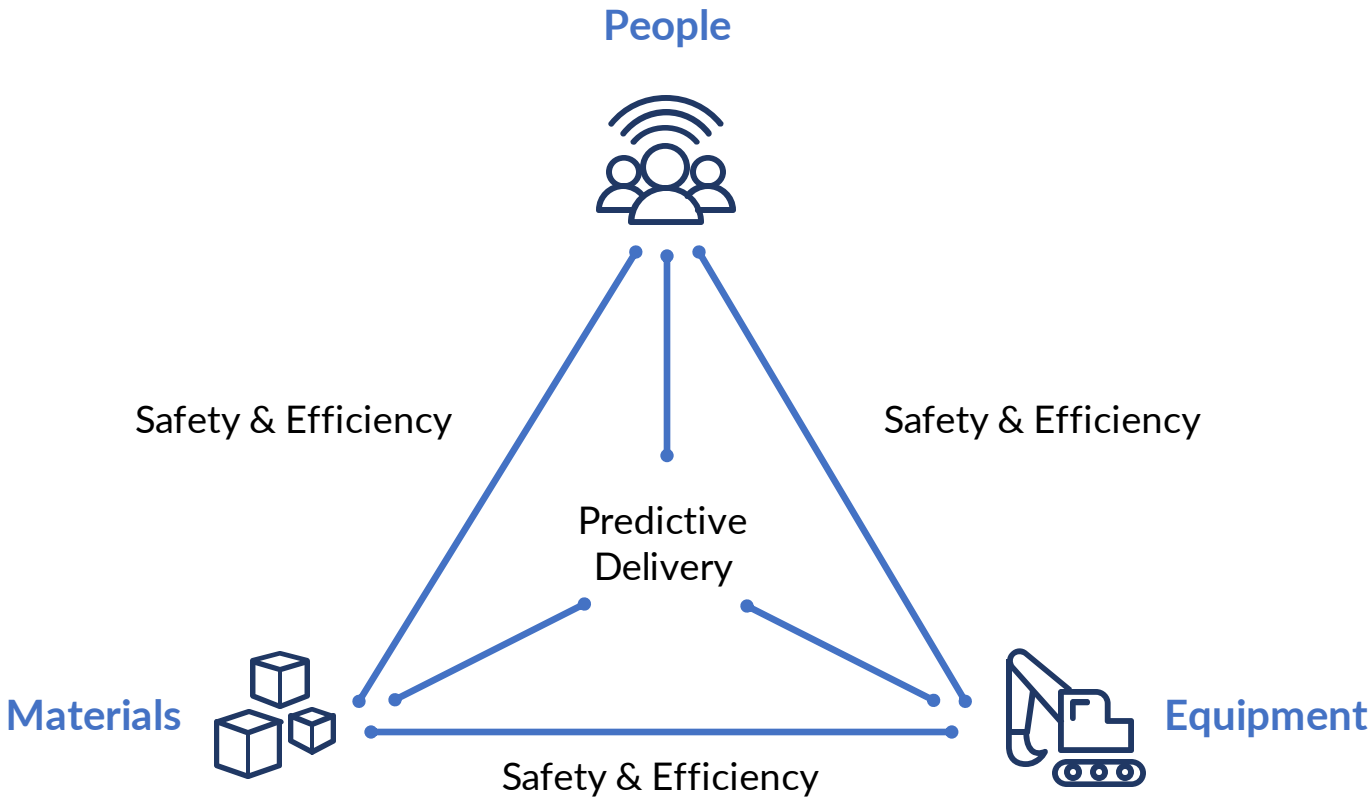
Capital Project Delivery Process & Systems Transformation

Value Delivered: Operating model redesign; Business process reengineering; Capability Development; Organizational Change Management; Integrated Capital Projects solution; and a Digital Command Center.

Connected Construction and PPM Control Tower

What is Accenture Connected Construction?

A platform that enables organizations to realize the full potential from their **people, equipment and materials** by connecting them in real-time to improve safety, efficiency and predictive delivery.



Accenture Connected Construction offers…

Control Cost and Schedule Better

Proactive actions not reactive. Identify cause of cost over-runs and schedule extensions with real time data. Create early warning systems tied to leading indicators.

Optimize to Avoid Waste

Insight into assets – real time access to capability, location and quantity of people, equipment and materials are key to successful job planning, accurate demand planning and waste avoidance or duplication.

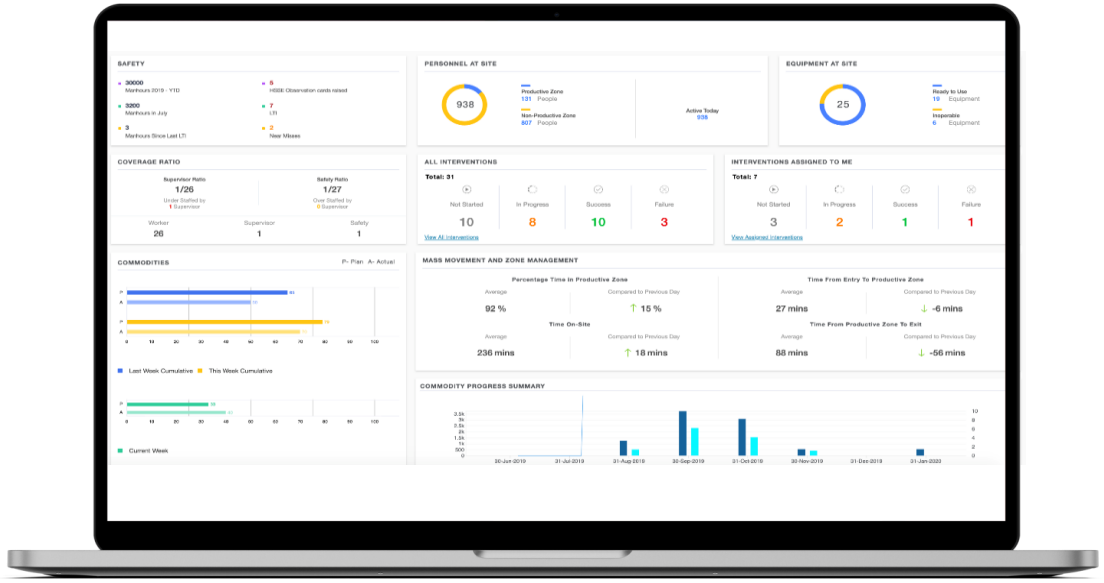
Create Smart, Productive Teams

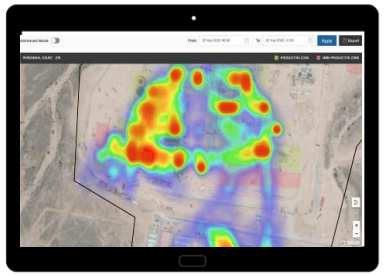
Real time, multi-directional communication between people, systems, assets and management.

Aid Decision Making with Technology

Modern policies mandate constructors to integrate decision making technology into their work practices without affecting performance or cost.

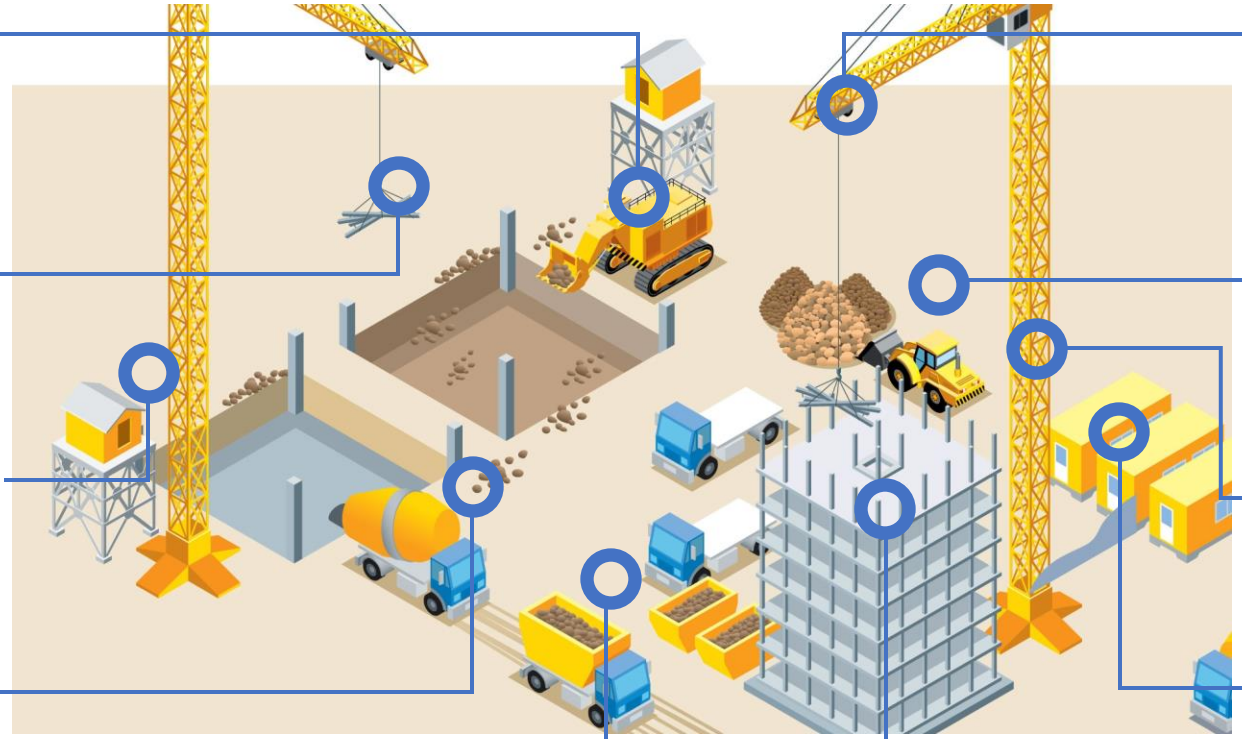
Microsoft IoT Partner of the Year 2019





What does a Connected Construction site look like?

Our solution brings together a comprehensive set of functionalities and insights within one platform, making construction sites connected, collaborative, and intelligent



"Smart" Machines
Embedded software in construction equipment reports productivity and maintenance information to Plant and Building Management systems to drive energy efficiency and productivity.

Real-Time Inventory Tracking
Near Field Communications and RFID tags receive and track materials and assemblies delivered and stored at the job site.

BIM/Asset Lifecycle Management
Tracks materials from design, through the supply chain, installed into the facility, and through the operational life of the infrastructure.

Intelligent Vehicles / Telematics
Rolling equipment reports real-time productivity, environment, and diagnostic data to the back office, while the vehicle uses design data to guide its autonomous or semi-autonomous operation.

Jobsite Crew Monitoring
Leverage Wi-Fi Geofencing to track crew movements from productive areas and nonproductive areas to improve safety and job site design

Environment and Safety
Environmental variables, location, geo-fence violations, and general well being of field employees is reported real time to safety monitors.

Video Analytics
Video analytics supports real-time alerts for job-site events and environmental changes. Man and machine productivity data is captured real time for consumption by management and inputs to project management systems.

Mobile Field Force
Mobile devices are used for field technicians to access information and checklists, while collaborating real-time with other colleagues in the field and at the home office.

Interactive Job Trailer
A connected job trailer allows field employees to interact with 3D/4D/5D models, design professionals, owners, and the home office.

Project Control and Analytics
Exchange of data between the job trailer and home office provides management with real-time actionable insight regarding project status, finances, productivity, risks, and change orders.

Where is Connected Construction implemented?

Highway Construction Company

Oil/Gas

Data Center

Decarbonization of Steel Manufacturing Facilities

Petrofac

Global Steel Manufacturer

Global Mining Company

Oil/Gas

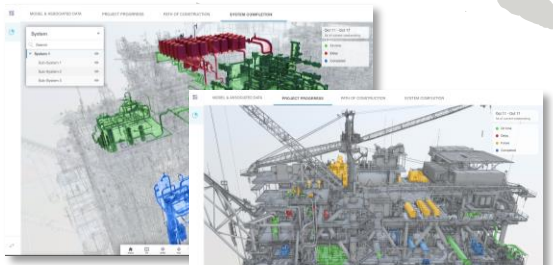
Commercial Construction

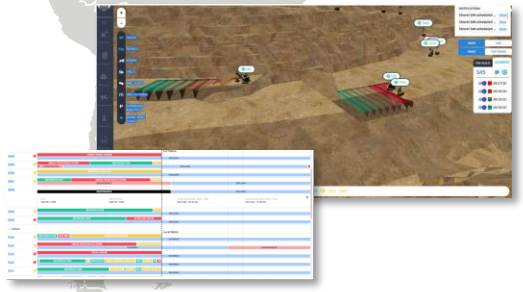
Utility

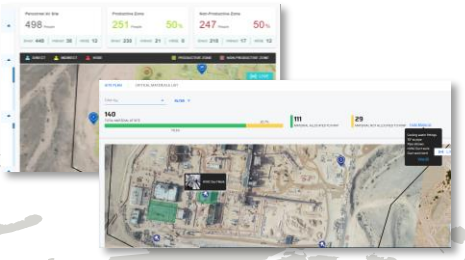
Developers and PIF of KSA

Energy Company

Global Mining Company



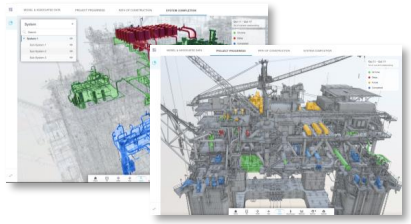




Accenture Connected Construction Case Studies

The solution has been delivered to clients in various industries including Oil & Gas, Utilities, Infrastructure and High Tech; four clients from various industries are highlighted below.

OIL & GAS



Client: How can 4D Visualization aid the **Major Capital Project Constructability Peer Review and** other post-Engineering activities at scale

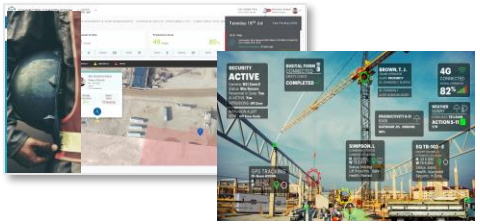
Model Visualization

Construction Progress

Path of Construction

System Completion

GLOBAL CONSTRUCTION



Client: How can we improve visibility into and control of our operations across Central & Western Europe? Also, Including **gaining Real-time visibility of our people and the location and utilization of construction equipment**.

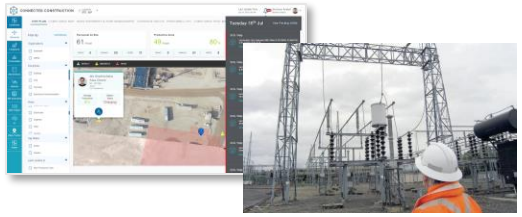
Traceability & Visibility

Sustainability Achievement

+330 IIoT

3MM

EU UTILITY OPERATOR



Client: We want to undertake a digital transformation journey to enhance our construction and operation processes for substations and HV transmission grid. The client wants to increase **productivity & safety across the development and maintenance of a high-voltage transmissio**n grid of over 44,000 km across the country.

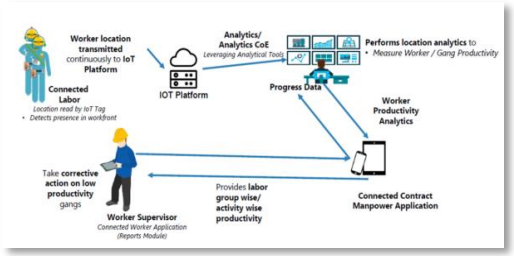
Project Control Room

Model Visualization

+280 IIoT

2MM

STEEL MANUFACTURING



Client: We are struggling to get an **end-to-end view of its project health with limited project management capability** & visibility on workers, equipment, and material on site.

Project Control Room

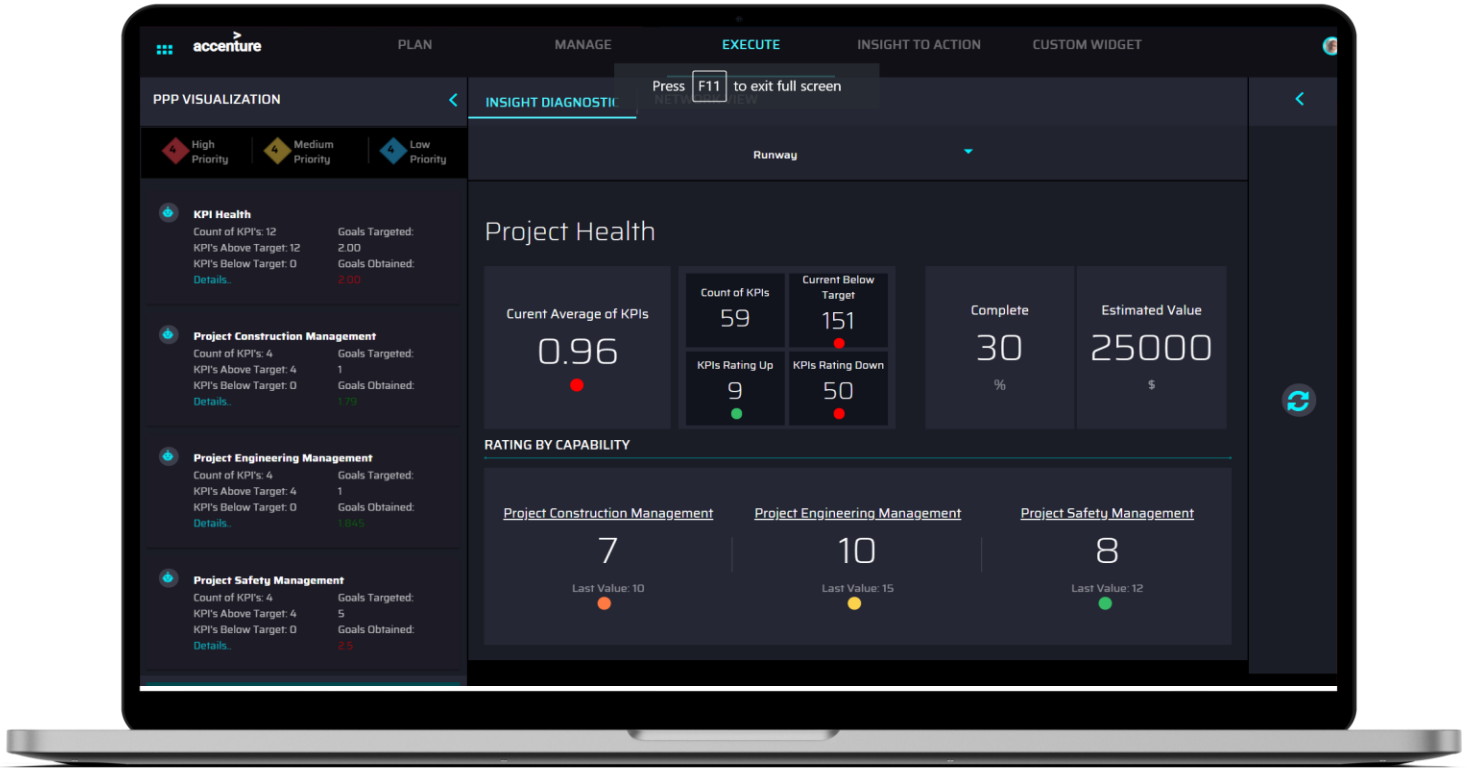
Model Visualization

+65 IIoT

1MM

What is Accenture Control Tower?

A single source of truth for engineering, procurement & construction updates to realize the full potential of people, partners, suppliers, equipment, materials and IP.



Demo

Multi-Disciplinary Single Source of Truth

Multiple structures of reporting

AI-Powered Decision Support

Capture project learning, success and failure paths, and simulate “what ifs..”, etc.

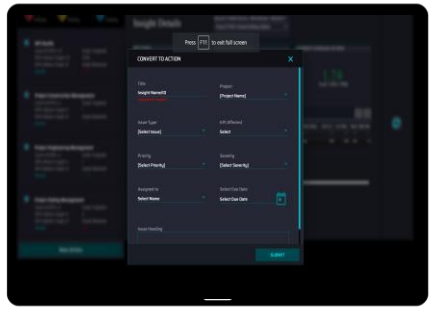
Benchmarking & Management

Define & manage constraints for data driven decision making

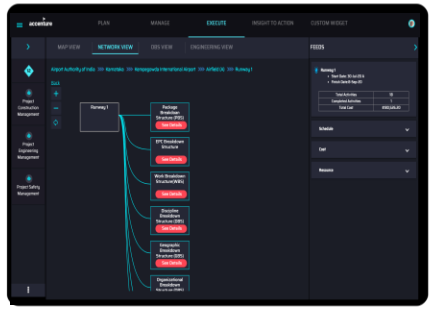
Accenture Control Tower offers…

A platform to plan, manage, execute, and optimize all aspects of capital projects, utilizing industry standard project controls and decision support insights .

Asset Breakdown Structure



Insight to Action



Multi-Dimensional Analysis

- **Project Controls** manage KPIs at portfolio, program and project levels, define leading and lagging indicators and set controls
- **Explore Project Structures** allowing drilldowns at any level (portfolio, program or project)
- **Organization Breakdown View** for milestones per organization under capital projects, **Geographic Breakdown View** to visualize site wise project health, and **Asset Breakdown Structure** to view asset wise project health indicators using multi-D visualization
- **Insights to Action** allow users to act upon the health indicators, by adding action items for teams along with SLA and action history
- **Descriptive Project Health Indicators** including overall project progress to date plus look ahead, and breakdown of detailed reports of work package elements and **Predictive Leading Indicators** for early identification of EPC trends
- **Multi-Dimensional Analysis** of cost, discipline and package breakdown structures for EPC and Safety indicators
- **Planning Simulation, Benchmarking & Optimization**
- **Connectors Tools** and **Extension Model** for deeper integrations and company specific requirements

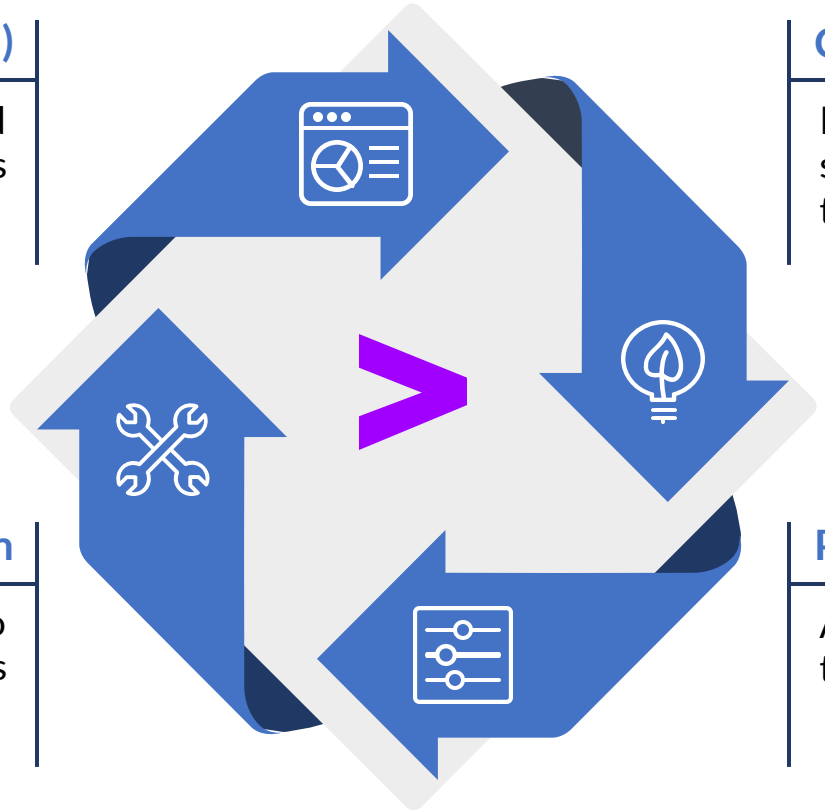
Our Featured Offerings

Connected PPM (cPPM)

Plan portfolios and manage project cost and schedule with integrated PPM tools

Climate Change Pathway Planner (C2P2)

Inform capital planning by measuring sustainability risks with a suite of indexing tools



Connected Construction

Combine physical technology and analytics to provide a real-world view of your projects

PPM Control Tower

Access data efficiently across various PPM tools in a single system

Live demos of our solutions are available by request!

THANK YOU

accenture

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