Revolutionizing Capital Portfolio Management with AI-Powered Predictive Analytics

iCapital Intelligence Hub

Community Services – Capital Portfolio Performance Analysis Group

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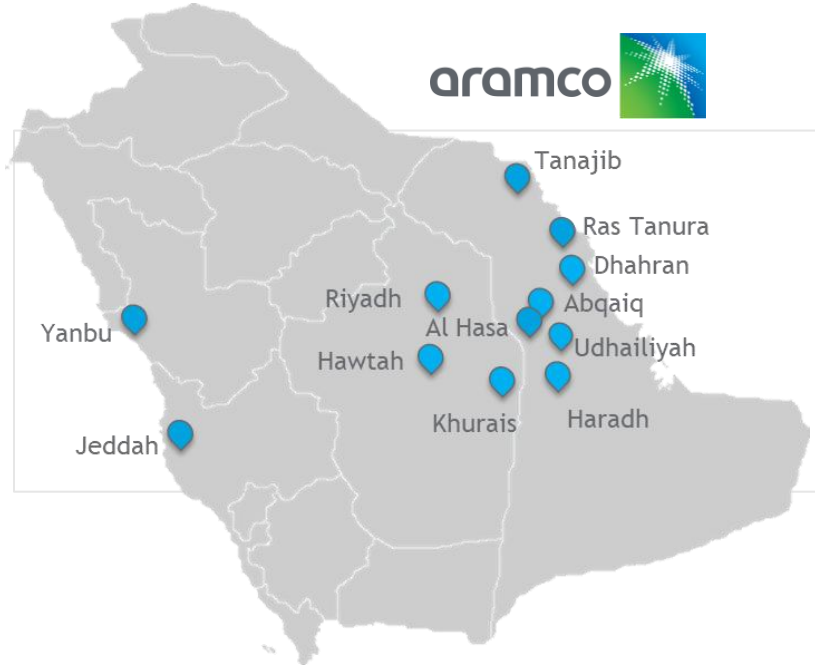
Enhancing Quality of Life

Aramco Community Services

Community Service, operates and maintain Aramco residential communities, office buildings and provides comprehensive maintenance/life support to the non-industrial facilities and infrastructures of the Company.



Serve **12** Areas around Saudi Arabia

13 Residential Camps

+25,000 Office Users

+32,000 Population

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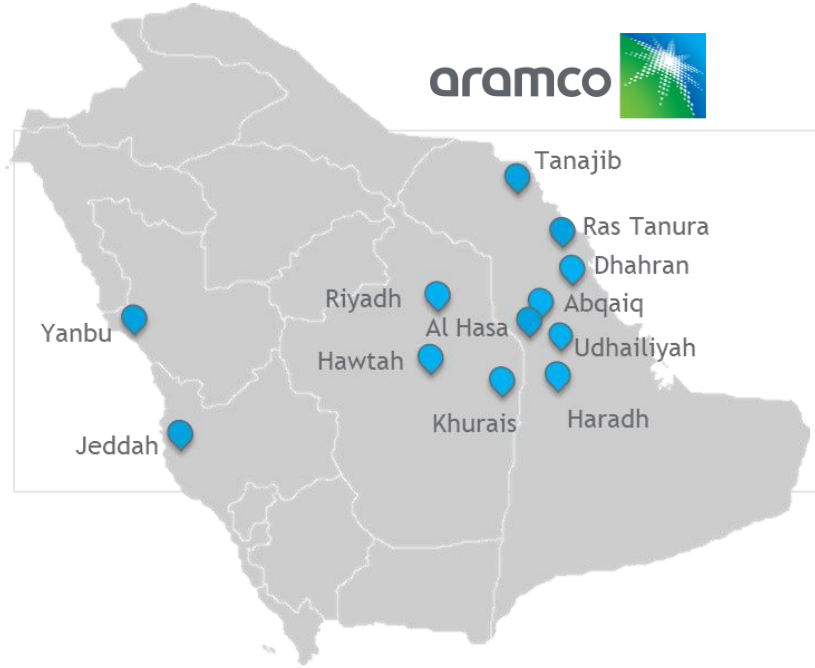

+25,000
Housing Units

+320
Recreation Facilities

+266
Concession Facilities

+2 MM
Trees

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Enhancing Quality of Life

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Business Projects

- Aramco Stadium
- Voltage Conversion Program
- Remote Camp Expansion

Public Projects

- “OLFA” Animal Shelter
- Saudi Aramco Building Government School
- Home Ownership

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Capital Planning
Charter & Scope

Capital planning division lead and streamline CS Capital and Public Support projects.

Prioritize, develop, and approve capital projects, ensuring alignment with corporate strategies and objectives

Performance Analysis Group:

Monitoring & Controlling

The performance of all active CS capital portfolio
And maintain the KPI's.

Capital Data Reports & Capital Performance

- Issuance of Capital Data Reports & Alerting Notification
- Conducting Quarterly Capital Performance Steering Committee

Dashboard

Managing Intelligence Hub Dashboard

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Capital Portfolio Data

Massive Data

40k+

Rows

Over

2500+ files

Solid WBS history of 14+ Years

3

Various sources

- SAP Finance
- Excel Sheet
- Microsoft SharePoint

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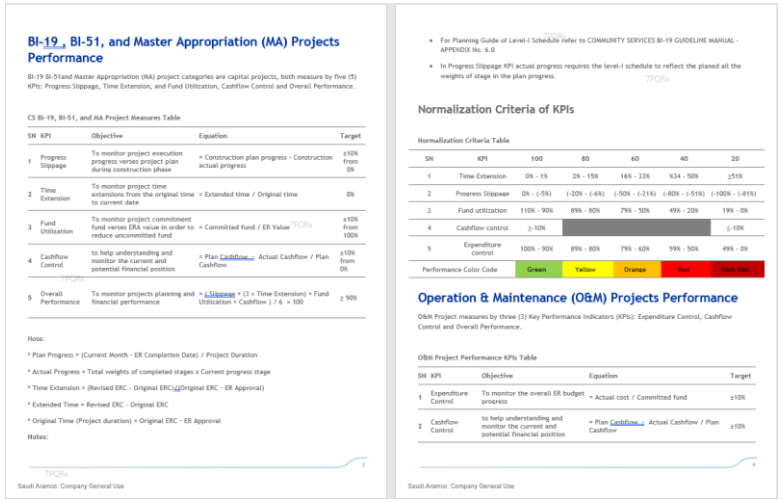
Capital Performance Model (CPM)

Capital Performance Model (CPM) was established with redefined **Key Performance Indicators (KPIs).**

To address challenges such as low project performance, increased project volume, poor fund utilization, and non-adherence to cash flow plans.



BI-19 , BI-51, and Master Appropriation (MA) Projects Performance

BI-19 BI-51and Master Appropriation (MA) project categories are capital projects, both measure by five (5) KPIs: Progress Slippage, Time Extension, and Fund Utilization, Cashflow Control and Overall Performance.

CS BI-19, BI-51, and MA Project Measures Table

SN	KPI	Objective	Equation	Target
1	Progress Slippage	To monitor project execution progress verses project plan during construction phase	= Construction plan progress - Construction actual progress	≤10% from 0%
2	Time Extension	To monitor project time extensions from the original time to current date	= Extended time / Original time	0%
3	Fund Utilization	To monitor project commitment fund verses ERA value in order to reduce uncommitted fund	= Committed fund / ER Value	≤10% from 100%
4	Cashflow Control	to help understanding and monitor the current and potential financial position	= Plan Cashflow - Actual Cashflow / Plan Cashflow	±10% from 0%
5	Overall Performance	To monitor projects planning and financial performance	= (Slippage + (3 x Time Extension) + Fund Utilization + Cashflow) / 6 x 100	≥ 90%

Notes:

* Plan Progress = (Current Month - ER Completion Date) / Project Duration
* Actual Progress = Total weights of completed stages x Current progress stage
* Time Extension = (Revised ERC - Original ERC)/(Original ERC - ER Approval)
* Extended Time = Revised ERC - Original ERC
* Original Time (Project duration) = Original ERC - ER Approval

Notes:

- For Planning Guide of Level-I Schedule refer to COMMUNITY SERVICES BI-19 GUIDELINE MANUAL - APPENDIX No. 6.0
- In Progress Slippage KPI actual progress requires the level-I schedule to reflect the planed all the weights of stage in the plan progress.

Normalization Criteria of KPIs

Normalization Criteria Table

SN	KPI	100	80	60	40	20
1	Time Extension	0% - 1%	2% - 15%	16% - 33%	%34 - 50%	≥51%
2	Progress Slippage	0% - (-5%)	(-20% - (-6%)	(-50% - (-21%)	(-80% - (-51%)	(-100% - (-81%)
3	Fund utilization	110% - 90%	89% - 80%	79% - 50%	49% - 20%	19% - 0%
4	Cashflow control	≥-10%				≤-10%
5	Expenditure control	100% - 90%	89% - 80%	79% - 60%	59% - 50%	49% - 0%
Performance Color Code		Green	Yellow	Orange	Red	Dark Red

Operation & Maintenance (O&M) Projects Performance

O&M Project measures by three (3) Key Performance Indicators (KPIs): Expenditure Control, Cashflow Control and Overall Performance.

O&M Project Performance KPIs Table

SN	KPI	Objective	Equation	Target
1	Expenditure Control	To monitor the overall ER budget progress	= Actual cost / Committed fund	±10%
2	Cashflow Control	to help understanding and monitor the current and potential financial position	= Plan Cashflow - Actual Cashflow / Plan Cashflow	±10%

Saudi Aramco: Company General Use

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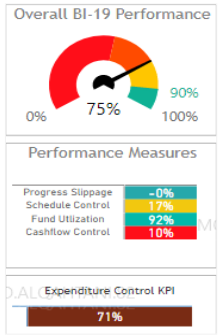
Normalization criteria

Time Extension	Score
0%	100%
1% to 12%	80%
13% to 36%	60%
37% to 48	40%
Above 48%	20%



Time Extension Control

Monitor project time extensions from the original time

Expenditure Control

Monitor actual spending against committed fund

Five Core Fundamental KPIs

Slippage Control

Monitor project execution progress verses plan progress

Fund Utilization Control

Monitor the overall ER budget utilization progress

Cashflow Control

Monitor cashflow actual versus forecasts on monthly basis

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Yearly Proponent Performance

- Reward early closure to boost productivity
- Deduct point from extensions and high slippage

KPIs Are Unique

Overall Performance KPI

$$\text{Type 1} = \frac{\text{Slippage Control} + (3 \times \text{Time Extension Control}) + \text{Fund Utilization Control} + \text{Cashflow Control}}{6} \times 100$$

$$\text{Type 2} = \frac{(\text{Expenditure Control} + 2\text{x Cashflow Control} + \text{Time Extension})}{4} \times 100$$

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Transformation to achieve effective portfolio control

Adopted the Extract, Transform, Load (ETL) Process

ETL (Extract, Transform, Load) is a cross-industry standard for data integration and data mining, as it provides a solid, structured approach to building valid data.

ETL Process

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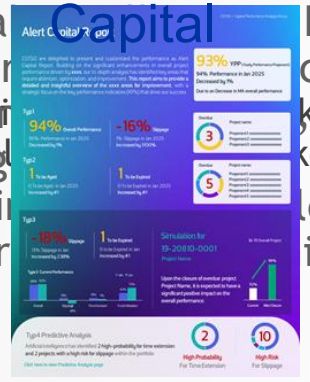
Sample Data for demonstration purpose only

mCapital

Alert



QCapital

iCapital Capital Hub has a user-frien e and offers r ct updates, enhanced ation, affordabl k After and Meet acceleratedmana ision-making al keholders Needs aspects and autom nance reportin lders on monthly ba active measur itigate operational iss

ustained xcellence in rojects

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Tools and Technologies Used

Power BI

- Live and accessible platform for all stakeholders
- Set of KPIs for Capital Performance
- Better data visualization
- Uplift of CS active Capital Portfolio interface and report

SharePoint

- Integrated multiple databases into a single centralized database
- Streamlined data integration processes
- Improved operational efficiency

RPA

- Zero pending updates
- Auto refreshes
- No human-required action

Chatbot Assistant

- Continuous learning and improvement
- More engaging with customer
- Always-on support

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Leading Performance to Excellence

Successful implementation of iCapital Intelligence Hub

Redaction Capital Alert Items	Redaction Pre-Challenged	Redaction Overdue	Cashflow Variance	Community Service Capital Overall Performance
72% ▼	100% ▼	75% ▼	2% ▼	23% ▲

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Transition from Descriptive to AI Predictive Analysis

The Cross-Industry Standard Process for Data Mining (CRISP-DM) is widely used because it provides a structured and systematic approach to data mining projects.

Objectives

- Utilizing big data and AI technologies
- Support Our Proponents
- Enhancing Project Success Rates

Business Un

1. Transition descriptiv predictive project pe monitorin
2. Establish objectives requireme

eployment

- oard
- lopment
- Training

- Ensured pro deliverables directly enh making and
- Set a clear upcoming pl

- abled real-time cision-making with edictive insights.
- hanced the proactive anagement of project nelines and budgets.

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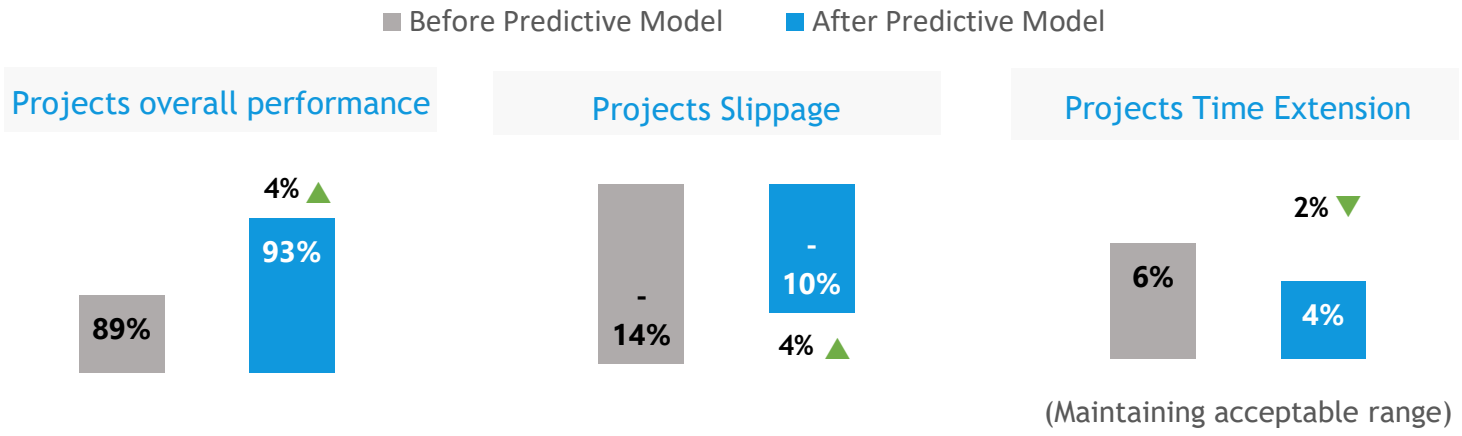
Predictive Insights

Successful Implementation of Predictive Model



AI Predictive Model Upscaling to cover Projects

Development of AI **Projects** predictive analysis model

- Improved predictions
- Reduce Time Extensions
- Positive progress

Predictive Model Upscaling

Achieved 96% Accuracy 5%▲

Anticipates Expired & Overdue Projects

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Global Award

- **Limitless Business intelligence Dashboard** - IBIS
- **Project Controls Transformation of the Year 2025** – Controls Expo USA

Recognized

Corporate Spotlight

Smart Data & AI Summit

Saudi Arabia

Obtained:

ISO 42001:2023
Artificial intelligence Management system

Obtained:

Copyright registration for the **AI Predictive Analysis Model**

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