# Cultivating Analytics-driven Excellence in Service Provisioning

Utilize the FibrePro Analytics Maturity (FAM) Model for improved decision-making, enhanced customer satisfaction, and cost efficiency

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Prodapt

Organizations have prioritized being data-driven for decades, but their outcomes have been inconsistent
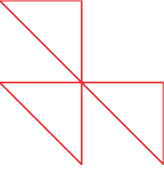
Investments in data & analytics is ever-increasing, but **are you truly data-driven?**

23.9% Companies characterize themselves as data-driven

20.6% Companies claim to have fostered a data culture internally

HBR Fortune 1000 survey

" Data analytics maturity is a critical factor in enabling the shift from intuition to insights. "

Key challenges in achieving data analytics maturity

Lack of data & analytics strategy that aligns well with data, analytics and business

Cultivating data culture that binds data talent, tools and decisions

Creating a robust data architecture that enables controlled, secured data access and utilization

Building a skilled team with both domain and data analytics expertise
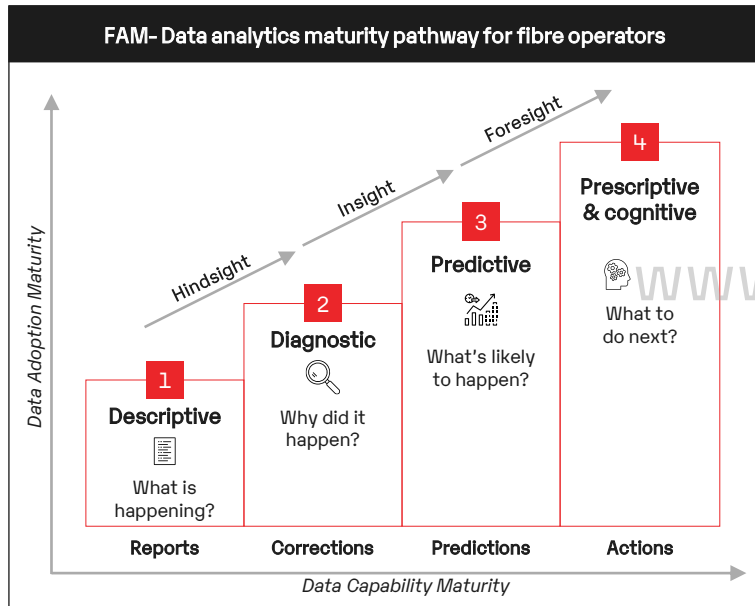
IMPACT
- ✓ **Poor decisions** due to lack of data insights
- ✓ **Lost opportunities** for growth and innovation
- ✓ **Inefficient operations** with suboptimal processes

McKinsey says, by 2025, data-driven organizations are projected to be 23 times more successful in attracting customers. Telecom operators can use digital and analytics to generate incremental revenues of 5 to 15 percent and reduce costs by 15 to 35 percent.

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Utilize **FibrePro Analytics Maturity (FAM) Model** to build a fully integrated data-driven organization
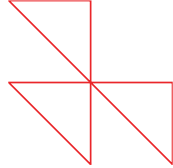
Improve business decision-making, drive innovation, and tap new opportunities

FAM synchronizes data capability and adoption maturity to enhance data analytics maturity across the fibre journey.

FAM– Data analytics maturity pathway for fibre operators

Data Adoption Maturity →

Foresight

Insight

Hindsight

4
Prescriptive & cognitive
What to do next?

3
Predictive
What's likely to happen?

2
Diagnostic
Why did it happen?

1
Descriptive
What is happening?

Reports — Corrections — Predictions — Actions

Data Capability Maturity →

Different stages of a fibre operator's journey

	Plan & Build	Service Provisioning	Service Assurance
Descriptive Summarize and visualize data to uncover patterns, trends, and insights	*Network performance dashboard, Master build tracker*	*Installation journey jeopardy tracker, **Field service performance tracker***	*Service management dashboard, Repair truck rolls & ERS tracker*
Diagnostic Identify the root cause behind observed patterns and trends to drive decision-making	*Analysis of splitters with high cycle time and high defects, Design rework*	*Demand conversion analysis, **jeopardy root cause analysis***	*Fault cause and location analysis, SLA breach analyzer*
Predictive Forecast future outcomes or event using historic data and advanced algorithms	*Capacity forecasting, network build defect prediction*	***Demand and supply forecasting,** installation jeopardy predictor*	*Incidence reoccurrence prediction, customer churn prediction*
Prescriptive & Cognitive Generate best possible actions or decisions to achieve business objectives	*Multi Build partner model strategy, Quality gates strategy*	*Auto-allocation of resources, **Jeopardy management plan***	*Automated fault resolution plan, Preventive maintenance plan*

*The Insight details out data analytics maturity journey for **service provisioning,** which is critical due to its direct impact on revenue generation, competitiveness, and customer satisfaction. As per a Forrester study, telcos lose up to $30 billion per year due to service provisioning errors.*
Use case discussed: Non-productive/out-of-slot dispatches in fibre installation

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Summarize historical service provisioning data visually to unveil trends and insights

Challenges in Data Management and Analysis
- No central repository
- Manual data extraction
- Inconsistent data formats, metrics & assessment
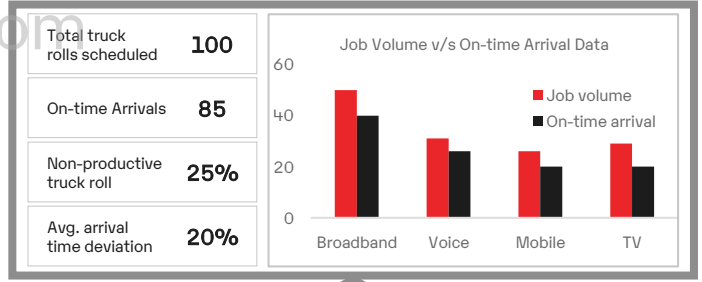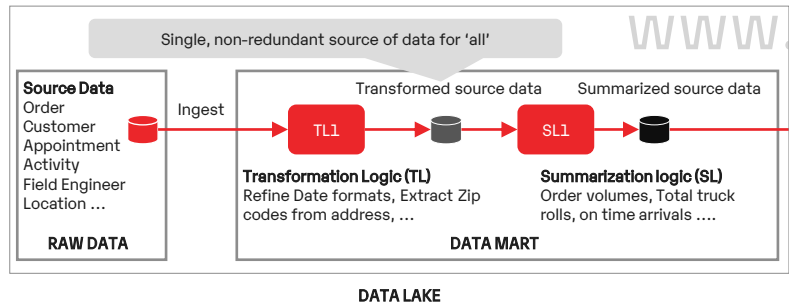- Multiple handoffs
- Lacks smart dashboards

Discover, Design, Develop: Approach to harmonize, streamline, and centralize data for seamless flow, processing & analysis

1. **Discover the As-Is** fibre service provisioning journey, KPIs, metrics, definitions, data maturity, and usage (network, sales, inventory data)
2. **Design the To-Be** data lake solution (**Snowflake, AWS, Azure**) and streaming, and standardize capture format. Establish a single source of truth with a **metric dictionary and taxonomy.** Design dashboard wireframes
3. **Develop informative, intuitive, and interactive dashboards:** Set up data lake and data streamers. Engineer **data marts** for dynamic BI dashboards to analyze trends. Leverage tools like Tableau, Qlik, and PowerBI to visualize metrics

Scenario: A dashboard to visualize the field engineer performance impact on the fibre installation journey

Field Service Performance Tracker

Single, non-redundant source of data for 'all'

Source Data
Order
Customer
Appointment
Activity
Field Engineer
Location …

RAW DATA

Ingest

Transformed source data

TL1

Transformation Logic (TL)
Refine Date formats, Extract Zip codes from address, …

Summarized source data

SL1

Summarization logic (SL)
Order volumes, Total truck rolls, on time arrivals ….

DATA MART

DATA LAKE

Reporting and visualization tailored for different roles & departments

Total truck rolls scheduled	100
On-time Arrivals	85
Non-productive truck roll	25%
Avg. arrival time deviation	20%

Job Volume v/s On-time Arrival Data
- Job volume
- On-time arrival

Broadband · Voice · Mobile · TV

Recommendations
- Use TM Forum's SID framework as a foundational reference for creating a metrics dictionary and taxonomy. It facilitates standardized and consistent measurement of KPIs
- Set business priorities (like productivity, cost reduction, compliance, revenue growth, customer experience, innovation, etc.) for As-Is assessment to align efforts with organizational goals

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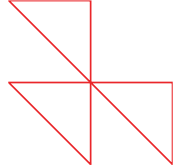
Identify the causes behind observed trends for informed service provisioning decisions

Moving to diagnostic: Key adoption drivers

- Fostering a culture of data-driven decisions
- Adopting right skills, tools, and infrastructure
- Planning change management

Examine metrics, perform hypothesis testing and root cause analysis to explain the outcomes and prevent future problems

1. **Identify drifting metrics:** Decipher the performance through **descriptive dashboards and find improvement areas**
2. **Create & validate hypothesis:** Define the hypothesis with clear outcome, criteria, and metrics and validate it to identify the **problem**
3. **Analyze:** Use domain experts to define **data factors** for analysis. Data analysts to perform **statistical analysis** using data lake to uncover trends
4. **Insights & recommendations:** Create insights & recommendations based on the analysis and outline value

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☞ **Scenario: Explore causes for non-productive/out-of-slot truck-rolls in fibre installation journey** | **Jeopardy Root Cause Analysis**

Metrics impacted
Conversion %, Right first Time, Cycle time, Missed Appointments %, Install revisits, Cost of Service

Principle Hypothesis (H$_1$):
Conversion is poorer when truck roll providers arrive out of slot

Validate the hypothesis: In-slot vs. Out-of-slot

Critical Value
Null Hypothesis
Alternative Hypothesis
Appt out of slot
Correct Decision No effect
Correct Decision Effect Exists
Type II   Type I

There's a significant difference in order conversion based on the punctuality of truck roll providers.

Analyze data factors like dispatch tickets, repair calls, etc. to identify the key reasons for arriving out-of-slot, as below

Demand Allocation	15
Uncertain Demand	5
Unforeseen Delays	2
Wrong Skills	5

Insight – Appointment slots distribution imbalance resulting in uneven resource allocation affecting delivery commitments

Recommendation:
Optimize demand distribution across appointment slots with a buffer to scale to fix out-of-slot performance and boost the conversion rate.

Recommendations

- Ensure there is a comprehensive data workbench allowing time travel for effective validation of hypotheses
- Analyze the Essential '5 Ws' (Who, What, Where, When, Why, and How) for holistic understanding and comprehensive insights
- Employ multiple analysis techniques to enhance the robustness and reliability of insights- Statistical, Pattern finding, Exploratory, Content, Sentiment, Regression, Time series

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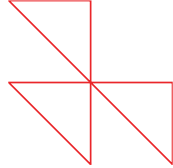
Forecast future provisioning setbacks using historic data and advanced algorithms

Shifting to predictive: Key adoption drivers
- Invest in ML-pipeline platforms
- Develop, maintain & govern ML-models
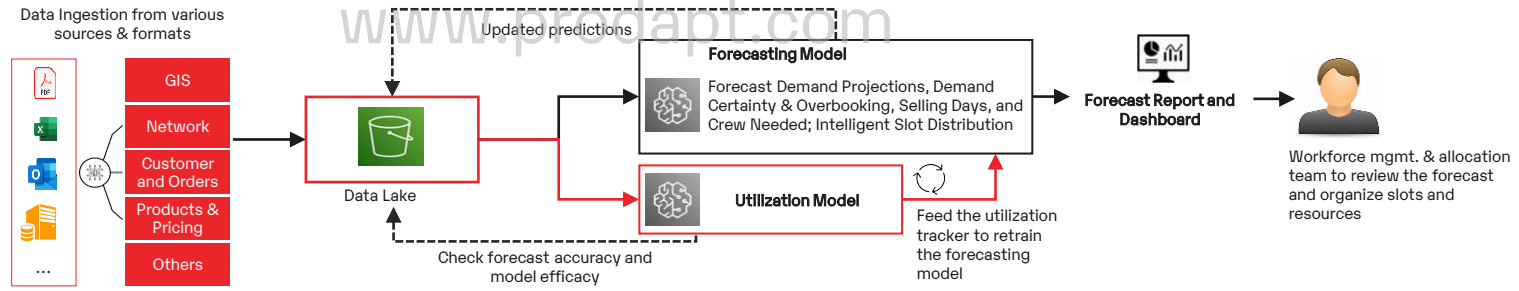- Recruit advanced analytical roles

Analyze data and manipulate variables to extract forecasting capabilities from the existing data

1. **Check prediction feasibility:** Use methods (Feature Engg.) for high-predictive variables. Assess performance parameter availability & frequency
2. **Define & design prediction methodology:** Choose a prediction method (supervised, unsupervised, reinforced learning) based on the problem, data, and task
3. **Develop prediction model:** Build a model workflow in **Azure ML/Python**, train with dataset, measure accuracy, iteratively fine-tune
4. **Implement & maintain prediction:** Deploy the model to make **predictions using test data,** track accuracy, and update periodically with new data

**Scenario: Improve Demand allocation by predicting installation demand and forecast the supply capacity to handle the demand**

Demand & Supply Forecasting Model

AI/ML model uses historical data to forecast non-productive truck rolls by analyzing scheduling, delays, technician performance, and customer feedback patterns.

Data Ingestion from various sources & formats

Updated predictions

PDF

GIS

Network

Customer and Orders

Products & Pricing

Others

Data Lake

Forecasting Model
Forecast Demand Projections, Demand Certainty & Overbooking, Selling Days, and Crew Needed; Intelligent Slot Distribution

Utilization Model

Feed the utilization tracker to retrain the forecasting model

Check forecast accuracy and model efficacy

Forecast Report and Dashboard

Workforce mgmt. & allocation team to review the forecast and organize slots and resources

Recommendations
- Initiate your AI/ML adoption journey by evaluating your existing decision-making processes and ensuring the availability of the necessary data to meet your objectives
- Thoroughly assess the existing data lake capabilities and infrastructure to ensure they support upcoming AI/ML experiments, facilitating accurate modeling and insightful predictions
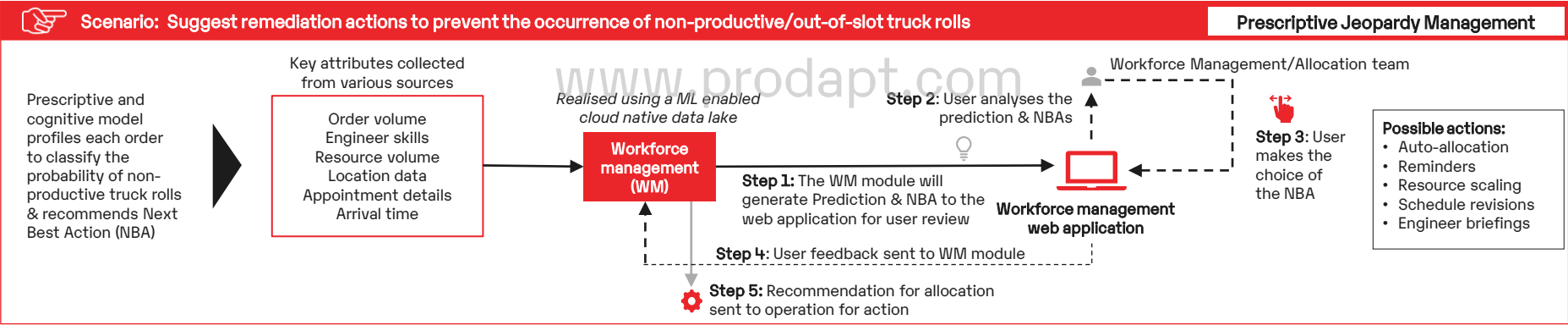
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Generate the best possible actions or decisions to attain service provisioning goals
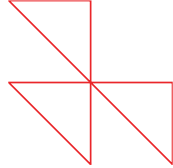
Achieve prescriptive & cognitive: Key adoption drivers
- Collaboration between analytics teams, decision-makers, and experts to align solutions with business goals
- Organizational support to continuously adopt data-driven problem-solving

From insight to action: Produce data-driven recommendations for optimal actions

1. **List the prescriptions:** Advise actions & impact, note constraints, situations, and KPIs affecting decisions, evaluate feasibility & risks
2. **Design a decision-to-outcome pathway:** Conduct **scenario modeling** for objective-aligned prescriptions, create an **auto-corrective cognitive model** for implementation
3. **Develop action-driven decision model:** Build a **scenario-based simulation model**, use optimization (NLP, deep learning) for cognitive solutions
4. **Implement & monitor:** Execute actions, monitor outcomes, iteratively improve model using performance data and feedback

☞ **Scenario:** Suggest remediation actions to prevent the occurrence of non-productive/out-of-slot truck rolls

Prescriptive Jeopardy Management

Prescriptive and cognitive model profiles each order to classify the probability of non-productive truck rolls & recommends Next Best Action (NBA)

Key attributes collected from various sources

Order volume
Engineer skills
Resource volume
Location data
Appointment details
Arrival time

Realised using a ML enabled cloud native data lake

Workforce management (WM)

Step 1: The WM module will generate Prediction & NBA to the web application for user review

Step 2: User analyses the prediction & NBAs

Workforce Management/Allocation team

Workforce management web application

Step 3: User makes the choice of the NBA

Possible actions:
- Auto-allocation
- Reminders
- Resource scaling
- Schedule revisions
- Engineer briefings

Step 4: User feedback sent to WM module

Step 5: Recommendation for allocation sent to operation for action

Recommendations
- Choose appropriate model types (linear programming, decision trees, simulation, or optimization algorithms) based on the problem characteristics and available data. Combine multiple models to improve robustness and accuracy. Use cross-validation to avoid overfitting
- Leverage AI/ML to mimic human-like reasoning and decision-making to generate more advanced and adaptable solutions

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UK's leading Fibre Operator achieves Data-Driven Service Excellence with FAM Model

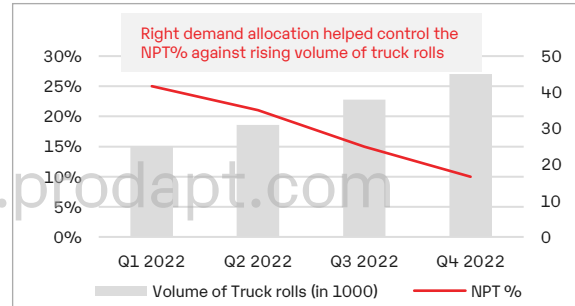## Transformed service provisioning, saving costs, and improving customer satisfaction
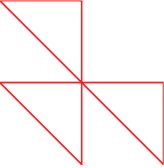
End-to-end data-driven implementation — Our data analytics platform has been active for over a year, analyzing ~2GB of data from 8 different sources, achieving **90%+ forecasting accuracy**, and **saving over ~22%** in operations.

### Analytics in Service Provisioning- Key Deliverables

	Service Provisioning	Key deliverables
Descriptive	Installation journey jeopardy tracker, Field service performance tracker	**~5 executive and performance dashboards created**
Diagnostic	Demand conversion analysis, jeopardy root cause analysis	**20+ metrics measured and value-tracked** **30+ data insights recommended**
Predictive	Demand prediction and supply forecasting, installation jeopardy predictor	**~5 prediction levers introduced. New ML/NLP frameworks established**
Prescriptive & Cognitive	Auto-allocation of resources, Jeopardy management plan	**~20 change initiatives implemented. Saved cost in operations & penalties, and improved customer experience**

Benefits Realized in Service Provisioning

Right demand allocation helped control the NPT% against rising volume of truck rolls

Volume of Truck rolls (in 1000) — NPT %

Operational Savings from PJM

~22%

Improved operational efficiency using prescriptive analytics

Expected — Actual

NPT – Non-Productive Truck rolls

Better Demand & Supply forecasting helped

- Reduce non-productive truck rolls from **25% to 10%**
- Increase field engineers' productivity from **4 to 8** jobs per day enabling the fulfillment of more demands and increasing sales
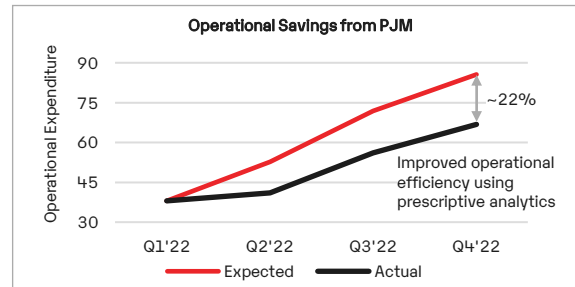
Prescriptive Jeopardy Management (PJM) enabled Opex savings of up to 22%

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Thank you

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