Leveraging Predictive Analytics to Turn Big Data into Operations Improvement

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Key presentation takeaways

- ✓ Predictive analytics in operations
- ✓ Using predictive analytics to improve scheduling
- ✓ Best practices in implementing predictive analytics

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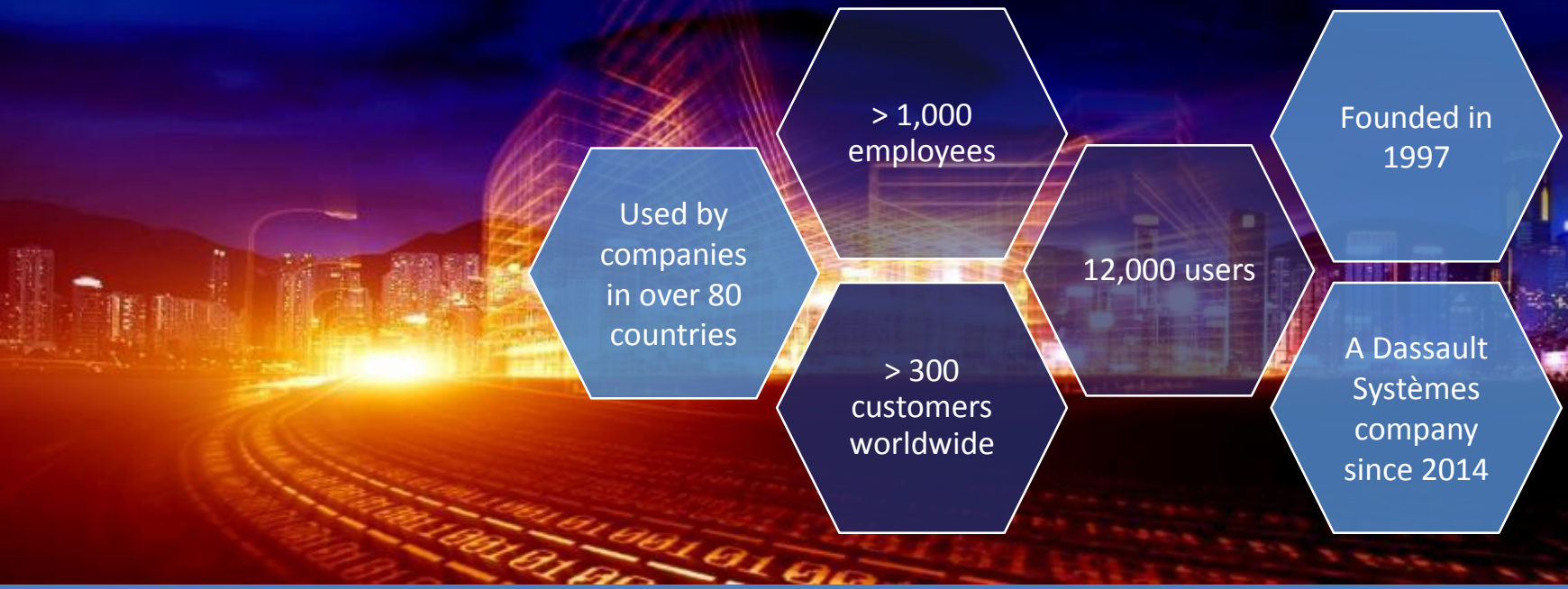
About Quintiq

Develop a single application capable of solving any type of planning puzzle



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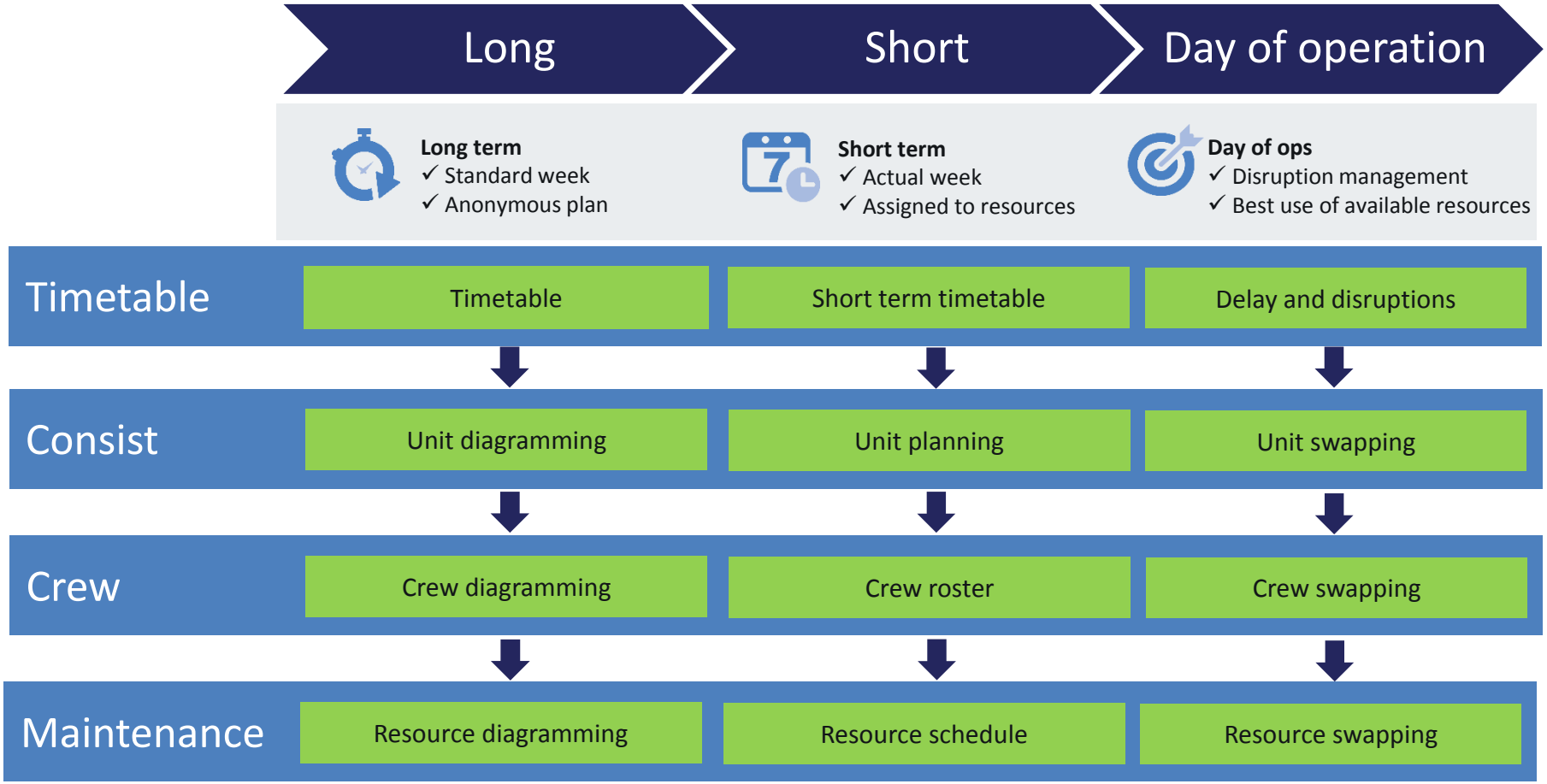
Quintiq in Rail



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The explosion in public transport data

Trend	Effect on Operations
Internet of Things (IoT)	• Track conditions • Rolling stock conditions
Operational and asset systems	• Time and attendance • Maintenance and task durations • Service performance
Fare and revenue systems	• Ridership data • Revenue trends

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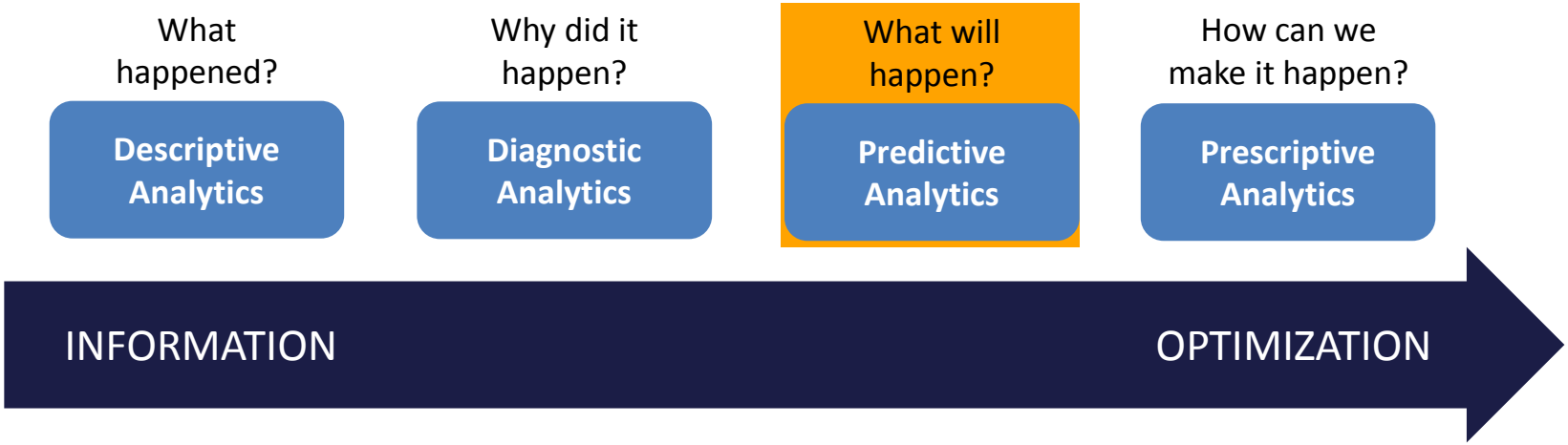
The stages of advanced analytics



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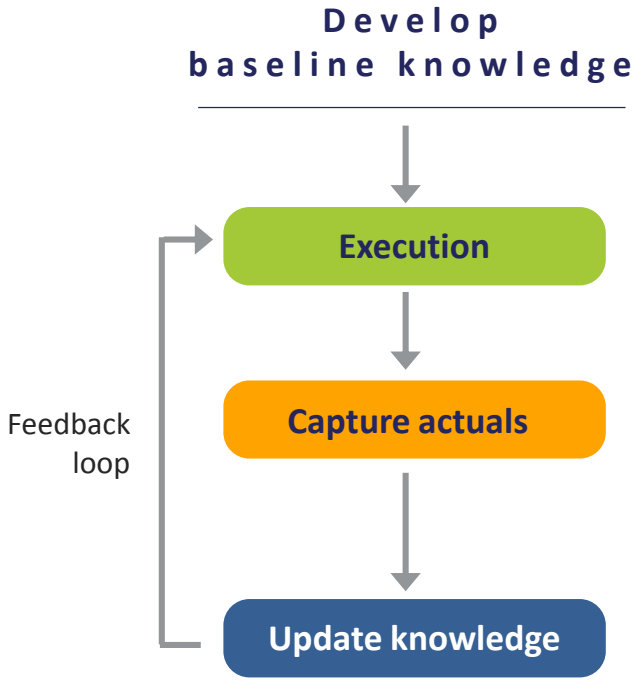
Gaining value from past performance



Execute the current plan

Capture the actuals

Specify the variable to predict

Feed recent realization data into the machine learning engine

Generate an up-to-date predictive model

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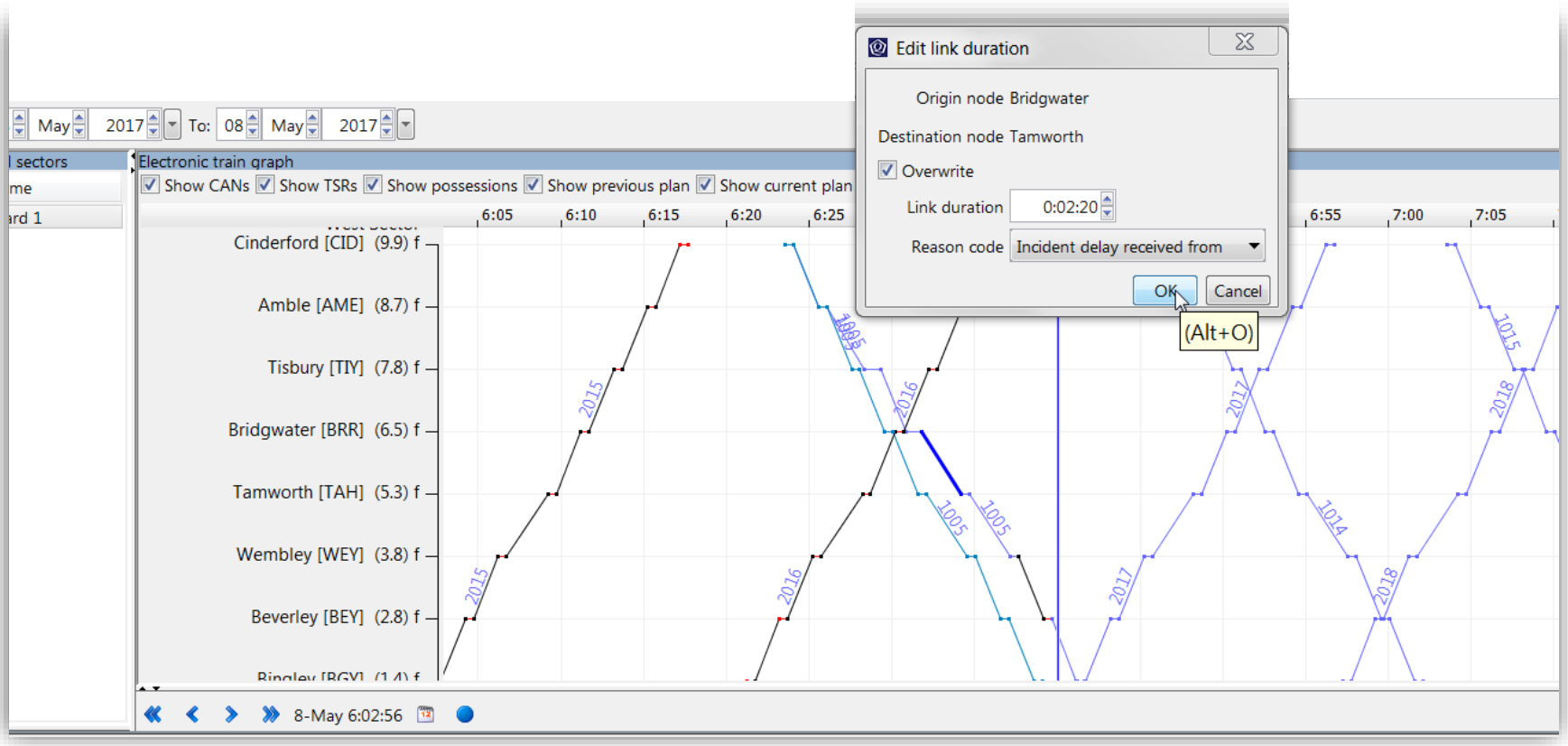
Capturing actual dwell times



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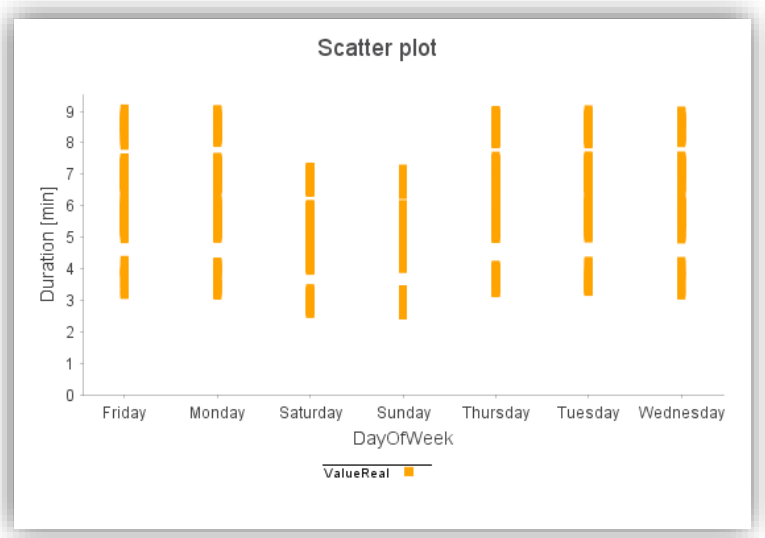
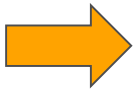
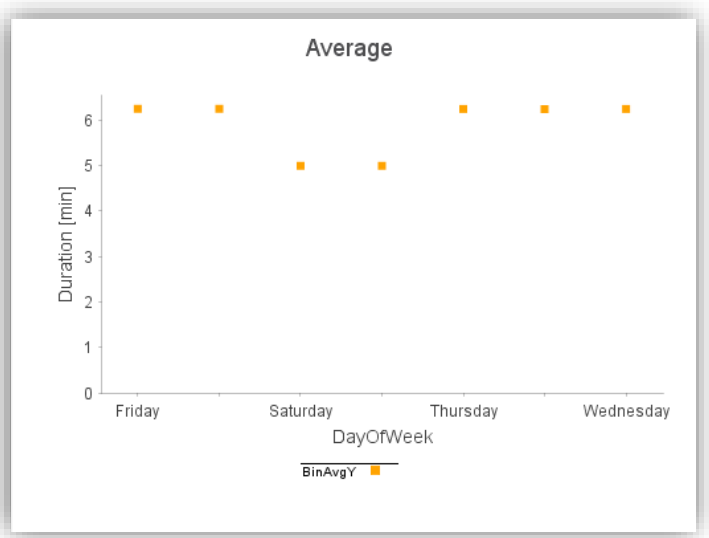
Predictive analysis of dwell times







Decision tree

NodeRule	Segment range	Mean
root		5,90
To=Beverley,Cinderford,Wembley		4,69
From=Beverley,Wembley		3,49
DayOfWeek=Saturday,Sunday		2,96
DayOfWeek=Friday,Monday,Thursday,Tuesday,Wednesday		3,70
From=Amble,Tamworth		5,88
To=Amble,Bridgwater,Tamworth,Tisbury		6,49

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Predictive analytics in maintenance planning

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Where is the value in rail operations?

	Timetables	Consist and Crew Planning	Maintenance
Inputs	Trip durations between stations Dwell times	Ridership data Time and attendance	Maintenance durations
Value	More efficient service scheduling	Improved allocation of resources Visibility into hours of service violations	More accurate maintenance window planning

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Keys to implementing predictive analytics

Determine where the value lies

Don’t overlook the human touch of planners

Relating cause and effect – don’t learn bad practices

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Closing the loop

Powered by real-world data

Self-learning planning and scheduling system

Thank you!

Join us tonight at the Quintiq Reception

Latrobe Room, 6-8PM

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