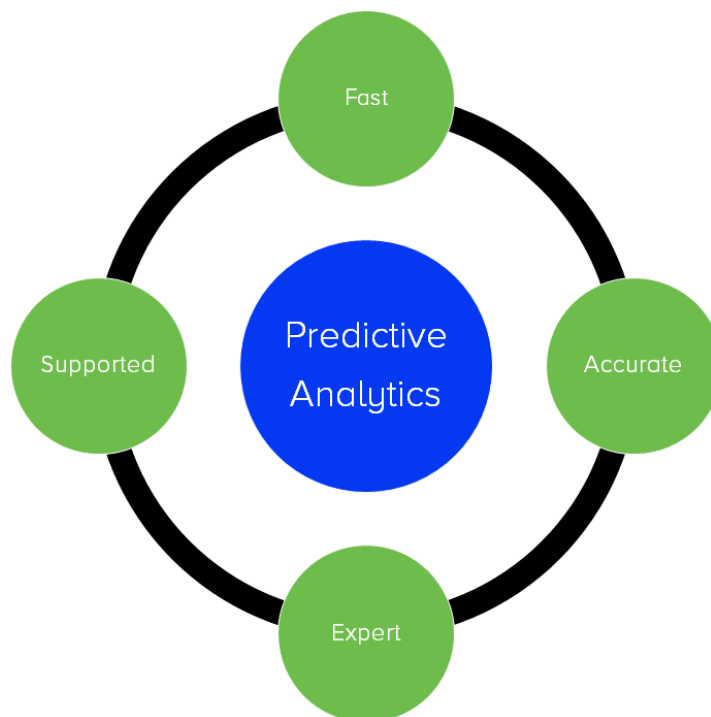


# Jube Predictive and Prescriptive Analytics Platform Training.



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## Introduction

This document details the course plan for the Jube Predictive and Prescriptive Analytics Platform training. The training is intended to provide the attendee with the ability to administer and maintain the platform.

The public course lasts four days. The 'At Your Place' Course lasts five days and includes modules on the installation and configuration of the Jube platform on a customer's own servers.

The course will present a variety of use cases that showcase all functionality available in the platform, such that the attendee will acquire knowledge that is transferable to their intended use case. The use cases to be explored in the course are:

- Fraud Prevention in eCommerce, Debit Card and Risk Based Authentication.
- Stock Market \ Numeric Prediction.
- Credit Lending Risk.
- Instruction Detection via Packet Sniffing and Syslog Monitoring.

To satisfy these use cases, all functionality of the Entity and the Symbol model systems will be explained, including:

- Model Creation and Message Structure.
- Ready Made Inline Scripting (IP Intelligence, Abuse IP, Virus Totals Process Monitoring and Demographic IP).
- Abstraction Rules and TTL Counters.
- Adaptations.
- Activation Rules.
- Evaluation.

In addition, to comprehensively implement the aforementioned use cases, all supporting and adjacent functionality of the Jube Predictive and Prescriptive Analytics will be explained, including:

- Real-Time Activation Watcher, Simple Activation and Suppressions.
- Case Management.
- Databases, Compression and Territorial Encryption.
- Exhaustive Machine Learning.
- Backup and Recovery.
- Production and Volume Monitoring.

By the end of the course the attendees will have an ability to configure and administer Jube to support a wide variety of use cases.

While this course might appear technical, it is presented in an extremely practical manner and assumes no technical knowledge, building technical knowledge only as required. All that is required is an intermediate ability in using Windows, as the attendees will be using Windows Server 2016, which bears absolute resemblance.

## Prerequisites

Each participant is required to bring a laptop which is able to connect to a Windows Server via Remote Desktop Connection. Availability of Remote Desktop Connection Clients can be found in the following link:

<https://docs.microsoft.com/en-us/windows-server/remote/remote-desktop-services/clients/remote-desktop-clients>

The server credentials will be forwarded two days before the course starts to validate that connections can be made from the participants device. A windows PC is most ideal, as the Remote Desktop Connection Client will already be installed. A video explaining the Remote Desktop Client on a Mac is available as follows:

<https://www.youtube.com/watch?v=x7TCvLuWIF0>

## Course Plan

The detailed course plan encompassing the four days is detailed as follows:

<p><b>Day 1</b> Get to grips with the Jube Platform concepts:</p> <ul style="list-style-type: none"> <li>• <b>Module 1:</b> Methodology and Platform Introduction.</li> <li>• <b>Case Study 1:</b> Platform Acclimatization.</li> <li>• <b>Module 2:</b> Messaging and Processing Introduction.</li> <li>• <b>Case Study 2:</b> Messaging the Jube Platform.</li> <li>• <b>Module 3:</b> Introduction to the Entity Model System.</li> <li>• <b>Case Study 3:</b> Financial Transaction Model, Payload Definition and Inline Scripting.</li> <li>• <b>Module 4:</b> Entity Abstractions, Abstraction Calculations, Abstraction Deviations and Search Key Cache.</li> <li>• <b>Case Study 4:</b> Creating Fraud Prevention Abstractions.</li> <li>• <b>Module 5:</b> Sampling Activation, Response Elevations, TTL Counters and Evaluations.</li> <li>• <b>Case Study 5:</b> TTL Counter Activation.</li> <li>• <b>Module 6:</b> Case Management.</li> <li>• <b>Case Study 6:</b> Fraud Prevention Alerts.</li> </ul>		
09:00 – 10:00	<b>Module 1:</b> Methodology and Platform Introduction.	This module firstly presents, an introduction to the Predictive and Prescriptive Analytics Methodology that was used in the creation of the Jube platform.
10:00 – 10:20	<b>Case Study 1:</b> Platform Acclimatization.	The class will navigate around the platform and become familiar with the Jube Screens.
10:20 – 10:40	<b>Break.</b>	<b>Break.</b>
10:40 – 11:30	<b>Module 2:</b> Messaging and Processing Introduction.	The module will present the various integration methods available to Jube such as: <ul style="list-style-type: none"> <li>• XML over HTTP.</li> <li>• JSON over HTTP.</li> </ul>

		<ul style="list-style-type: none"> <li>• Querystring over HTTP.</li> <li>• PropSniff (our own packet sniffing relay format) over UDP.</li> </ul> <p>While this might appear technical, it is presented in an extremely practical manner and assumes no technical understanding.</p> <p>Having examined the different message types, message switching will be introduced to provide an understanding as to how different messages are routed to different parts of the system depending on certain switchable parameters passed in the message query string.</p> <p>The module will introduce the passing of messages to the "Demo Echo" models installed by default using basic requestor tools.</p>
11:30 - 11:50	<b>Case Study 2:</b> Messaging the Jube Platform.	The class will perform a list of integrations using a variety of message formats. The goal of the case study is to test that Jube is available and listening to all message formats.
11:50 – 12:10	<b>Break.</b>	<b>Break.</b>
12:20 – 12:50	<b>Module 3:</b> Introduction to the Entity Model System.	<p>The Entity model system is where classification models are created (such as Fraud Prevention, Advertising Technology or Intrusion Detection).</p> <p>This module will introduce all aspects of the Entity Model system, before detailing the creation of models and defining messaging payload. A basic model will be created to</p>

		<p>consume an example XML document over HTTP.</p> <p>Composite Hashing and "Encrypt at Rest" fields will be explained, as a means to encrypt and obfuscate data to comply with local data protection laws (such as GDPR).</p> <p>A fraud prevention use case will be introduced and the class will explore an example API document and implement that format for this model.</p> <p>The IP2Location, IP Demographic, VirusTotal and AbuseIP Inline Script will be introduced and attached to this entity model.</p>
12:50 – 13:10	<b>Case Study 3:</b> Financial Transaction Model, Payload Definition and Inline Scripting.	<p>Using a list of fields specified in an API document, the class will set about creating a model with these fields, achieving real-time request \ response messaging in XML over HTTP.</p> <p>The message will provide the basis for the Fraud Prevention use case to be developed in the afternoon session.</p>
13:10 – 14:10	<b>Lunch.</b>	<b>Lunch.</b>
14:10 – 14:40	<b>Module 4:</b> Entity Abstractions, Abstraction Calculations, Abstraction Deviations and Search Key Cache.	<p>Abstraction is the process of creating features for Entity or Symbol models by reaching into the online cache of records available to the platform. In this example, it might be calculating the number of transactions having taken place recently for a given account number \ customer.</p>

		<p>This module will cover the concept of abstraction in depth.</p> <p>Once an abstraction has been created it can be further manipulated in basic calculations comparing it to other abstractions, or the typical history of that abstraction. For example, Abstraction Deviation can compare the current number of transactions performed by a customer, with what is normal for that customer.</p> <p>Search Key Cache will be introduced as a means to provide aggregation where enormous amounts of data may be present for a Search Key value, hence cannot be aggregated in real-time. Search Key Cache can be computed in the background, with the computation referenceable real-time.</p> <p>A brainstorm will be led to introduce the factors that are commonly used in eCommerce Fraud Prevention.</p>
14:40 – 15:00	<b>Case Study 4:</b> Creating Fraud Prevention Abstractions.	<p>The group will set about creating a number of Abstractions relating to eCommerce Fraud, or more broadly Financial Transaction Fraud.</p> <p>For each Abstraction created, it will be tested via messaging created beforehand.</p>
15:00 – 15:20	<b>Break.</b>	<b>Break.</b>
15:20 – 15:50	<b>Module 5:</b> Sampling Activation, Response Elevations, TTL Counters and Evaluations.	The creation of Abstractions is separate from any tangible (positive or negative) action taken, such as declining an



		<p>eCommerce transaction. This module will introduce activation rules such to be able to send response codes out of the platform in the form of a Response Elevation.</p> <p>TTL Counters will be introduced as a means to maintain a history for an account for much longer periods of time, without cache storage requirements being quite so burdensome.</p> <p>The evaluation page will be introduced as a simple means to identify records that have been activated within the platform. The Evaluation page will be used to introduce the concept of Archive sampling, as it need not be the case that all data be stored for the creation of Predictive or Prescriptive Analytics.</p> <p>Entity Suppressions, Entity Lists and the Simple Activation Interface will be introduced as a means to more simply manage rules in the day to day operation. The Activation Watcher will be introducing as a means to communicate real-time activation events, in a dashboard which is intended to be visually available (i.e. wall mounted TV) for a team.</p>
15:50 – 16:10	<b>Case Study 5:</b> TTL Counter Activation.	<p>The group will set about creating a number of TTL Counters, incrementing those counters via activation rules and escalating the response elevation based on those TTL counters.</p> <p>Activations will be streamed out to the Activation Watcher.</p>

16:10 – 16:50	<b>Module 6:</b> Case Management.	<p>The case management platform provides a means to present work as a consequence of Activation Rules matching in either the Symbol or Entity model subsystem.</p> <p>In this module the functionality of the Case Management System will be explored, explaining how to configure Case Workflows to be a repository of alerts.</p> <p>The class will learn how to use the Case Management platform as an end user and how to navigate through cases on a manual or rotating basis.</p>
16:50 - 17:20	<b>Case Study 6:</b> Fraud Prevention Alerts.	The class will use the case management system and the fraud prevention model created on the first day to produce a capability to create alerts for analysts to work.
17:20 – 17:00	<b>Summing Up.</b>	<b>Summing Up.</b>
<p><b>Day 2</b></p> <p>More Jube Platform concepts and an introduction to R machine learning:</p> <ul style="list-style-type: none"> <li>• <b>Module 7:</b> The Symbol Registry, Symbol Models and Symbol Covariance.</li> <li>• <b>Case Study 7:</b> Consuming Stock Prices.</li> <li>• <b>Module 8:</b> Symbol Abstraction, Abstraction Deviation, Activation and Evaluation.</li> <li>• <b>Case Study 8:</b> Emulating Technical Analysis of a Chart.</li> <li>• <b>Module 9:</b> Introduction to Adaptations and Data Extraction Jobs.</li> <li>• <b>Module 10:</b> Getting Started with R.</li> <li>• <b>Module 11:</b> Data Structures in R.</li> <li>• <b>Module 12:</b> Summary Statistics and Basic Plots in R.</li> <li>• <b>Module 13:</b> Linear Regression in R.</li> <li>• <b>Case Study 13:</b> Stock Price Forecasting with Linear Regression.</li> </ul>		
09:00 – 09:20	<b>Review.</b>	<b>Review.</b>
09:20 – 10:10	<b>Module 7:</b> The Symbol Registry, Symbol Models and Symbol Covariance.	Numeric prediction is performed on a single numeric value known as a Symbol. The Symbol can represent anything

		<p>from a stock price through to the number of calls being dealt with by a call centre in a given time interval. This module will set about creating a Symbol such that XML messages can be switched to this Symbol.</p> <p>Many Symbol models can roll up to the Symbol with these models being invoked depending upon the time interval specified at invocation. A Symbol model specifies how much data from the Symbols past will be used to predict the future (akin to how a stock chart might be read). The module will explore each of the model parameters and the methodology for numeric prediction in Jube.</p>
10:10 – 10:30	<b>Case Study 7:</b> Consuming Stock Prices.	The class will create a Symbol that will consume a remote dataset containing all the stock prices for big cap stocks (e.g. AAPL). The goal of the case study is to be able to configure both Symbol Registry and Symbol Models confidently and then invoke them.
10:30 – 10:50	<b>Break.</b>	<b>Break.</b>
10:50 – 11:30	<b>Module 8:</b> Symbol Abstraction, Abstraction Deviation, Activation and Evaluation.	<p>Unlike Entity Models, where Abstraction is performed on a history of records which have a variety of fields, a Symbol model performs Abstraction on just a single numeric value over a period of time. This module will discuss some of the functions available for this abstraction (as there are more aggregation functions than available in the Entity model system).</p> <p>Abstraction Deviation is a means to check the current</p>

		<p>abstraction value observed against a recent history of abstractions, to calculate the extent to which it deviates for what is typical. The module will explore the various Abstraction Deviation types available for Symbol models.</p> <p>The construction of an activation rule is extremely similar to that in the Entity Models system, although unlike the Entity Models system, activation in the Symbol model's system tends to rely on Adaptation and Machine learning to create useful models. The module will introduce the Activation functionality of the Symbol model's system.</p>
11:30 – 12:00	<b>Case Study 8:</b> Emulating Technical Analysis of a Chart.	<p>This case study will seek to create a model to target a particular stock and process a variety of Abstraction rules. The historic data will be processed through the model to create a detailed analysis for each record, returned in the HTTP post.</p> <p>The concept of stock market technical analysis might appear daunting, but it is really only the application of averages and ratios across recent price values. It will be introduced from the ground up and require no previous understanding of stock price technical analysis.</p>
12:00 – 12:20	<b>Break.</b>	<b>Break.</b>
12:20 – 13:00	<b>Module 9:</b> Introduction to Adaptations and Data Extraction Jobs.	At this stage there will be two type of models created, numeric prediction and classification, Symbol and Entity models respectively.

		<p>This short module introduces Adaptations which facilitates the extraction of data from the models for the purposes of machine learning using the Exhaustive algorithms (subsequent modules).</p> <p>This module will explore how to create Adaptations in both the Symbol and Entity model systems and execution of the data extraction utility, taking the Adaptation GUID as its key for extraction.</p>
13:00 – 14:00	<b>Lunch.</b>	<b>Lunch.</b>
14:00 – 14:20	<b>Module 10:</b> Getting Started with R.	<p>An R Primer, introducing some of the key concepts in R such that it can be made use of as a centralised Predictive Analytics application:</p> <ul style="list-style-type: none"> <li>• Predictive Analytics Tools.</li> <li>• What is R?</li> <li>• R Console and Command Line.</li> <li>• RStudio.</li> <li>• Packages.</li> <li>• Data Types.</li> <li>• Review.</li> </ul>
14:20 – 14:50	<b>Module 11:</b> Data Structures in R.	<p>R has a variety of data structures which underpin the entire Predictive Analytics endeavour. This module will provide a comprehensive overview of these data structures:</p> <ul style="list-style-type: none"> <li>• Vectors.</li> <li>• Selecting \ Subscripting.</li> <li>• Matrices.</li> <li>• Arrays.</li> <li>• Factors.</li> <li>• Lists.</li> <li>• Data Frames.</li> </ul>

		<ul style="list-style-type: none"> <li>• Save and Load.</li> <li>• Review.</li> </ul>
14:50 – 15:10	<b>Break</b>	<b>Break</b>
15:10 – 15:40	<b>Module 12:</b> Summary Statistics and Basic Plots in R.	<p>Predictive Analytics is rooted almost entirely in statistics and an understanding of basic statistics is vital to fully understand the linear and nonlinear predictive analytics techniques to be taught in the course. This module will present techniques to use R to create summary statistics and plots:</p> <ul style="list-style-type: none"> <li>• Time Series \ OLHC.</li> <li>• Frequency.</li> <li>• Histogram:</li> <li>• Range.</li> <li>• Tendency.</li> <li>• Spread.</li> <li>• Shape.</li> <li>• Range.</li> <li>• Tendency.</li> <li>• Spread.</li> <li>• Shape.</li> <li>• Z Score to Probability.</li> </ul>
15:40 – 16:00	<b>Break</b>	<b>Break</b>
16:00 – 16:40	<b>Module 13:</b> Linear Regression in R.	<p>Linear Regression is an approach to modelling a relationship between variables and a continuous value. Linear Regression can form a simple yet extremely powerful form of predictive analytics:</p> <ul style="list-style-type: none"> <li>• Relationship Estimation.</li> <li>• Correlation Analysis.</li> <li>• “Stepwise” Correlation.</li> <li>• Line Fitting and Extrapolation.</li> <li>• Linear Regression Output.</li> <li>• Deployment.</li> </ul>

		<ul style="list-style-type: none"> <li>• Confidence Intervals.</li> <li>• “Stepwise” Linear Regression.</li> <li>• Multicollinearity.</li> <li>• Visual Representation.</li> <li>• Review.</li> </ul>
16:40 – 17:20	<b>Case Study 13:</b> Stock Price Forecasting with Linear Regression.	Use Linear Regression to create a predictive model forecasting the percentage of price change for the dataset created by Jube Quant Platform, selecting the most appropriate instrument.
17:20 – 17:30	<b>Summing Up</b>	Summing Up
<p><b>Day 3</b></p> <p>More R machine learning and an introduction to Image and Pattern Classification:</p> <ul style="list-style-type: none"> <li>• <b>Module 14:</b> Logistic Regression in R.</li> <li>• <b>Case Study 14:</b> Fraud Prevention with Logistic Regression.</li> <li>• <b>Module 15:</b> Decision Trees in R.</li> <li>• <b>Case Study 15:</b> Decision Trees for Credit Risk Analysis.</li> <li>• <b>Module 16:</b> R Naive Bayesian Classifiers and Laplace Estimator.</li> <li>• <b>Case Study 16:</b> Bayesian Classifiers.</li> <li>• <b>Module 17:</b> Neural Networks in R.</li> <li>• <b>Case Study 17:</b> Improving Logistic Regression with a variety of Neural Networks in R.</li> </ul>		
09:00 – 09:20	<b>Review.</b>	<b>Review.</b>
09:40 – 10:30	<b>Module 14:</b> Logistic Regression in R.	<p>Regression is revisited, as is the concept of curve fitting, before reviewing how these are ported to R:</p> <ul style="list-style-type: none"> <li>• Behavioural Analytics.</li> <li>• “Binary Regression” \ Classification.</li> <li>• Logistic Curve.</li> <li>• Symmetric Sampling.</li> <li>• Skew in Behavioural Analytics.</li> <li>• Categorical Data Pivoting.</li> <li>• Profile Abstraction Deviation.</li> <li>• Logistic Regression Output.</li> <li>• “Stepwise” Logistic Regression.</li> </ul>

		<ul style="list-style-type: none"> <li>• Logistic Regression Deployment.</li> <li>• Logistic Regression Output.</li> <li>• Probability Threshold Function.</li> <li>• ROC Curves.</li> <li>• Review.</li> </ul>
10:30 – 11:20	<b>Case Study 14:</b> Fraud Prevention with Logistic Regression.	Using a dataset of credit card accounts and the customer behaviours, Logistic Regression will be used to identify customers whose accounts may be subject to fraud.
11:20 – 11:40	<b>Break</b>	<b>Break</b>
11:40 – 12:20	<b>Module 15:</b> Decision Trees in R.	<p>Moving to probability-based techniques, this module will produce Decision Trees (without the limitations of the graphical version of the software). Homogenising the concept of Decision Trees with that of Regression, Regression trees will be presented as an underused tool for numerical prediction, albeit predicting within a range:</p> <ul style="list-style-type: none"> <li>• Decision Trees.</li> <li>• Activation Utility.</li> <li>• Reducing Standard Deviation.</li> <li>• Regression Trees.</li> <li>• Maximum Entropy.</li> <li>• C5 Decision Trees.</li> <li>• Boosting \ Ensemble Activation.</li> <li>• Boosting Activation.</li> <li>• GBM.</li> <li>• Review.</li> </ul>
12:20 – 13:00	<b>Case Study 15:</b> Decision Trees for Credit Risk Analysis.	Using the Credit Risk Dataset, the class will create a decision tree using c5 and compare its results to a Regression Tree.
13:00 - 14:00	<b>Lunch</b>	<b>Lunch</b>



14:00 – 14:40	<b>Module 16:</b> R Naive Bayesian Classifiers and Laplace Estimator.	<p>The Bayesian Network packages in R are a particularly powerful means to create automated models. Bayesian Networks, created via automated structure, are a stalwart to machine learning of classification problems and in this regard, R has some extremely sophisticated packages available. This module aims to introduce the machine learning aspects of Bayesian Networks as explained in the foundation course, ported to R:</p> <ul style="list-style-type: none"> <li>• Naive Bayesian Network.</li> <li>• Calibration.</li> <li>• Laplace Estimator.</li> <li>• Review.</li> </ul>
14:40 – 15:30	<b>Case Study 16:</b> Bayesian Classifiers.	<p>Create a Bayesian Network which has a better classification accuracy than that observed using Logistic Regression. Seek improvement in the model by transitioning through a Naïve Bayesian Network through to a Hierarchical Bayesian Network, before lastly looking at how variables that may not directly relate to the likelihood of default, relate to one another which when taken together may improve the overall accuracy.</p>
15:30 – 15:50	<b>Break</b>	Break
15:50 – 16:30	<b>Module 17:</b> Neural Networks in R.	<p>Neural Networks is a catch all technique for a variety of non-linear machine learning methods. This module explores the most advanced packages and compares their utility:</p> <ul style="list-style-type: none"> <li>• Artificial Neural Networks.</li> <li>• Visualisation of Regression.</li> </ul>

		<ul style="list-style-type: none"> <li>• Visualisation of ANN.</li> <li>• Learning.</li> <li>• Training Numeric Prediction.</li> <li>• Symmetric Sampling.</li> <li>• Training Classification.</li> <li>• Review.</li> </ul>
16:30 – 17:20	<b>Case Study 17:</b> Improving Logistic Regression with a variety of Neural Networks in R.	Using a variety of Neural Network based predictive analytics tools for which there are R packages, create a predictive model improving upon all preceding models created in the workshop.
17:20 – 17:30	<b>Summing Up</b>	<b>Summing Up</b>
<p>Day 4</p> <p>Putting it all into practice:</p> <ul style="list-style-type: none"> <li>• <b>Module 18:</b> Exhaustive Search for Regression and Neural Network Topology Exploration.</li> <li>• <b>Module 19:</b> "Convolution" and Grid Image Abstraction Techniques.</li> <li>• <b>Case Study 19:</b> Exploring Classifiers on image Data.</li> <li>• <b>Module 20:</b> Syslog, VirusTotals Process Monitoring, VirusTotals Auto Runs and PropSniff integration for network and host intrusion detection.</li> <li>• <b>Case Study 20:</b> Block IP on Failed Login, Abuse IP, Excessive Ping or SQL injection.</li> <li>• <b>Module 21:</b> Security, Backup and Recovery and Consolidation.</li> <li>• <b>Module 22:</b> Getting Help from Jube, Backup and Recovery of Tenants.</li> </ul>		
09:00 – 09:20	<b>Review.</b>	<b>Review.</b>
09:30 – 10:10	<b>Module 18:</b> Exhaustive Search for Regression and Neural Network Topology Exploration.	<p>Exhaustive is a component that can be used on a standalone basis but is natively embedded into the Jube Predictive and Prescriptive Analytics platform.</p> <p>For the purposes of training, models will be created and recalled on a stand-alone basis in batch (i.e. files) and via Jube (i.e. via XML over HTTP) before showcasing the integration of Exhaustive models with both the Symbol and Entity model subsystems.</p> <p>Using an Advertising technology dataset, the concept of Response Elevation</p>

		prescription, indeed prescriptive analytics as a whole, will be introduced.
10:10 – 10:40	<b>Module 19:</b> "Convolution" and Grid Image Abstraction Techniques.	<p>This module will explore some techniques for transposing images into a data such that it can reliably underpin machine learning:</p> <ul style="list-style-type: none"> <li>• What comprises an image?</li> <li>• The theory behind convolution.</li> <li>• Revisiting Slate Fray.</li> <li>• Using Slate Fray in the Convolution.</li> <li>• Alternative Uses.</li> </ul>
10:40 – 11:20	<b>Case Study 19:</b> Exploring Classifiers on image Data.	This case study will explore the use of image data and explore the differing performance of each classifier explored thus far, including Bayesian, Decision Trees and Neural Networks.
11:20 – 11:40	<b>Break.</b>	<b>Break.</b>
11:40 – 12:40	<b>Module 20:</b> Syslog, VirusTotals Process Monitoring, VirusTotals Auto Runs and PropSniff integration for network and host intrusion detection.	<p>By now the attendees will have a strong capability in building models in both the Symbol and Entity model systems. To use a different means to integrate data into the Entity model's system, Syslog and PropSniff over UDP will be explored.</p> <p>The module will double down on the creation of entity models. In this module the UDP messaging formats will be introduced alongside some example intrusion detection implementations. The class will start a packet sniffer on the Windows server, which will be responsible for sending PropSniff messages to Jube.</p> <p>The class will also use a third-party Windows Event log forwarder to send Syslog</p>

		<p>messages to Jube (but it could just as easily be a Firewall or Load Balancer sending such Syslog messages).</p> <p>The class will explore the VirusTotal database and discuss how hash values of executing processes are send to Jube for analysis.</p> <p>While this session is not intended to explain the in-depth requirements of an intrusion detection system, it is intended to provide an alternative use case in the Entity subsystem to demonstrate flexibility and create a fluency in this important model system.</p> <p>The module will introduce message queues as a means of sending messages to other systems upon Activation, which in this case may be an instruction to block the IP at a firewall.</p>
12:40 – 13:40	<b>Lunch</b>	<b>Lunch</b>
13:40 – 16:00	<b>Case Study 20:</b> Block IP on Failed Login, Abuse IP, Excessive Ping or SQL injection.	<p>The main goal of this case study is to create a simple abstraction rule on failed login attempts and send a message asynchronously to block the IP at the firewall.</p> <p>With the initial objective being met, the module will explore packet sniffing in more depth, such to identify Excessive Ping or SQL Injection across a network connection.</p> <p>The primary objective is to cement fluency in the Entity Models subsystem.</p>
16:00 – 16:20	<b>Break</b>	<b>Break</b>

16:20 – 16:40	<b>Module 21:</b> Security, Backup and Recovery and Consolidation.	<p>Jube is a multi-tenanted platform which allows many organisations or business units to have their own completely isolated environment, where any updates and changes they make to that environment will be completely isolated from the changes made by another organisation or business unit.</p> <p>Roles, which have granular security permissions, roll up to Tenants, with users rolling up to Roles.</p> <p>All actions taken by the user are comprehensively audited and available in the database for review and monitoring. The module will set about an exploration of these audit records.</p>
16:40 – 17:00	<b>Module 22:</b> Getting Help from Jube, Backup and Recovery of Tenants.	<p>Jube has a backup and recovery feature that allows for the saving of a tenant, which would include all models and configurations for that tenant. While – at this stage at least – it is not intended to be used for production use, Backup and Recovery is a means to be able to communicate environments with Jube such to get support.</p> <p>This module will give a very brief introduction to the Backup and Recovery feature and discuss how to get support from Jube.</p>
17:00 – 17:30	<b>Summing Up.</b>	<b>Summing Up.</b>

## Day 5

Installing the Jube Platform on your own servers and performing advanced configuration and reporting:

- Module 23: Platform Technical Architecture.
- Case Study 23: Installing the Prerequisites and the Jube Platform.
- Module 24: Databases, Compression and Encryption Zones.
- Module 25: Telerik Reporting Designer.
- Case Study 25: Creating Reports in Jube and Telerik Reporting Designer.
- Module 26: Entity Model Inheritance, Volume Monitoring and Background Limits.
- Case Study 26: Create a Real Time Auction for Advertising Technology.
- Module 27 .net platform augmentation.

09:00 – 09:20	<b>Review.</b>	<b>Review.</b>
09:20 – 10:00	<b>Module 23:</b> Platform Technical Architecture.	<p>The technical architecture used in the creation of the Jube platform will then be presented. Assuming no technical understanding, the module will present concepts such as Web Servers and Message Queues (although this will be built upon extensively throughout the course).</p> <p>The module will explain the Jube installation bundle and the uninstalled software components available.</p> <p>The module will step through the documentation to fully install the Jube Predictive and Prescriptive Analytics platform, discussing each of the software prerequisites in turn.</p>
10:00 – 11:00	<b>Case Study 23:</b> Installing the Prerequisites and the Jube Platform.	<p>Using a Windows server operating system on a remote server, the class will set about installing the Jube platform.</p> <p>SQL Server and Mongo DB software prerequisites will already be installed with their default settings.</p>

		<p>MSMQ and IIS prerequisite software will not be installed and will require installation.</p> <p>The Jube software will not be installed. The Jube software will be a bundled zip file on the desktop and require installation.</p>
11:00 – 11:20	<b>Break</b>	<b>Break</b>
11:20 – 12:00	<b>Module 24:</b> Databases, Compression and Encryption Zones.	<p>The Jube platform uses two databases. Mongo Database is used to store and process fast moving cache data (possibly with an in-memory storage engine). SQL Server is used to store long-term archive data.</p> <p>Jube uses a meta data model and performs both compression and encryption of the data in the SQL Server. The native data storage in SQL Server is XML, such to support the meta data model exposed by Jube, albeit it is compressed and encrypted.</p> <p>Given data privacy laws, Jube can be configured such that certain data does not leave the host territory, and if it is doing so, that the data is encrypted with keys only available to the host territory.</p> <p>This module will explore the storage structure of Jube data at a high level and discuss how bulk copy can improve the storage performance for very large amounts of data.</p> <p>As the meta data model uses XML for storage by default, it can make reporting quite slow and impractical. The class will discuss how to promote data from the model to a static data table structure. While</p>

		<p>promoting data makes for uncompressed and unencrypted duplication of the data, it can facilitate indexing. Without indexing, reporting would be difficult, if not impossible to process in a reasonable amount of time.</p>
12:00 – 12:40	<b>Module 25:</b> Telerik Reporting Designer.	<p>Jube has integrated Telerik Reports and in combination with the ability to promote data to static, reporting, tables, exotic and feature rich reports can be created via Telerik Reporting Designer.</p> <p>This module gives a very basic introduction to Telerik Reporting designer. Much of the functionality of Telerik Reporting Designer exists outside the scope of this course, with the main focus being how a saved Telerik report definition can be integrated to various parts of the platform.</p>
12:40 – 13:40	<b>Lunch</b>	<b>Lunch</b>
13:40 – 14:20	<b>Case Study 25:</b> Creating Reports in Jube and Telerik Reporting Designer.	<p>The class will use a prepared model SQL Script to create a real-time bidding platform for advertising technology bidding. The class will experiment with hidden parameters and limits to test edge cases and avoid bidding accidents.</p>
14:20 – 15:00	<b>Module 26:</b> Entity Model Inheritance, Volume Monitoring and Background Limits	<p>Jube is a multi-tenant platform with each tenant having their own models in isolation. It is however possible to share models between tenants, whereby a model can broadcast the results of its model processing to have other tenants offer a response elevation in an auction (where</p>



		<p>the highest response elevation becomes the response elevation delivered by the parent model on completion of all processing).</p> <p>This module will explore the concept of Entity Model Inheritance and discuss some of the options available for processing. A self-service advertising use case will be used to bring together several advertisers, allowing them to bid on a single advertising impression message. The Jube platform will be used as a real-time example of this functionality in use, such to evidence the platform under extreme load.</p> <p>There are several limits that can be imposed on entity models to prevent accidents, such as the maximum response elevation or maximum number of responses in a period of time. These limits will be reported out to database tables.</p> <p>Advertising Technology is an ultra-high-volume processing use case and the class will explore means to monitor such high-volume activity for administrative purposes.</p> <p>The control of model limits are hidden parameters and this module will take the opportunity introduce several other hidden parameters that can provide advanced control over the platform.</p>
15:00 – 15:20	<b>Break</b>	<b>Break</b>
15:20 – 16:00	<b>Case Study 26:</b> Create a Real Time Auction for Advertising Technology.	The class will use a prepared model SQL Script to create a real-time bidding platform for

		advertising technology bidding. The class will experiment with hidden parameters and limits to test edge cases and avoid bidding accidents.
16:00 – 17:00	<b>Module 27:</b> .net platform augmentation.	<p>There exist several opportunities within the platform to extend the functionality by using .net, providing near limitless opportunities to deliver a particular use case. It is, for example, possible to create every rule in the platform in code rather than using the rule builder.</p> <p>This optional module will discuss the various areas that .net can be natively compiled into the application.</p> <p>The most powerful means of .net code augmentation is Inline Scripting. The class will explore the code construction of the inline script used throughout the course.</p> <p>Some programming knowledge would be beneficial for this module; however, it should be useful to all participants to gain an understanding of the functionality so that they can confidently provide specifications to their own programmers.</p>
17:00 – 17:30	<b>Summing Up</b>	<b>Summing Up</b>

## Post Course Implementation

The Training represents a large investment in both your time and money. We are thrilled to be given the opportunity to bring about this change in your business.

It is important to recognise that the training course is extremely intensive. We have found in delivering this training course to many companies and individual participants, that post course

planning and implementation is of paramount importance. The skills you will acquire on this training course will fade very if they are not put into practice immediately. Conversely, if the skills acquired are put into immediate practice, then they will crystallise and stay with you forever.

It is therefore strongly encouraged to engage with stakeholders in your business, to agree a project and deliverable pre-course, for immediate commencement post-course. Your trainer will be on hand after the training course to help answer any questions or immediate skill fade. In this manner, you should be in no doubt that this course will deliver you immeasurable, real, value upon your return.