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Global Learning for Operational Leaders



DIGITAL INNOVATION AND TRANSFORMATION | DIT-051

Deep Learning and Neural Networks: Practical Applications

Contact

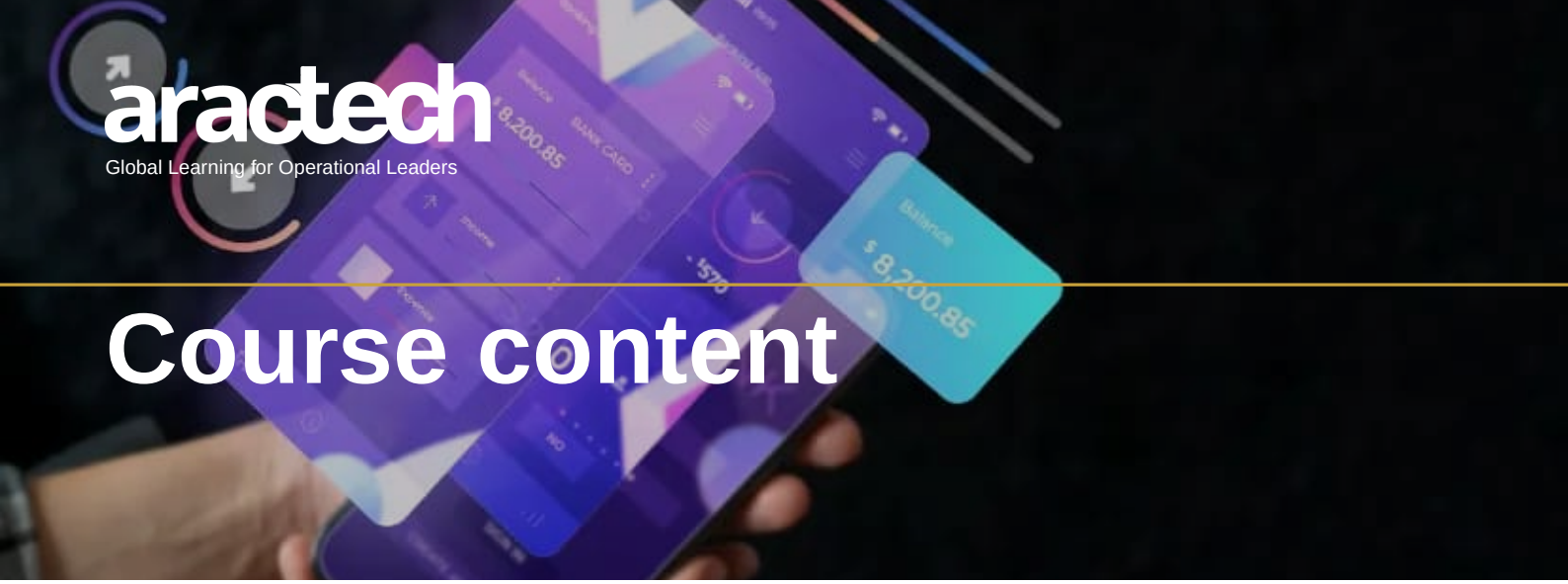
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Course content

Why Attend

Deep learning powers today's most impressive AI achievements, from image recognition and speech assistants to language models and autonomous systems. Its ability to learn directly from raw data has transformed what organisations can automate and predict.

Applying deep learning successfully requires more than downloading a model. Practitioners must understand network architectures, training dynamics, data requirements and the practical trade-offs between accuracy, cost and explainability.

Course Methodology

• This training course will utilise a variety of proven adult learning techniques to ensure maximum understanding, comprehension and retention of the information presented. This includes an interactive mixture of lecture-led learning, case studies, practical exercises and group discussions.

Course Objectives

• Understand core principles and best practices covered in Deep Learning and Neural Networks: Practical Applications.

• Apply practical techniques to day-to-day operational challenges.

• Build an implementation action plan suitable for your organization.

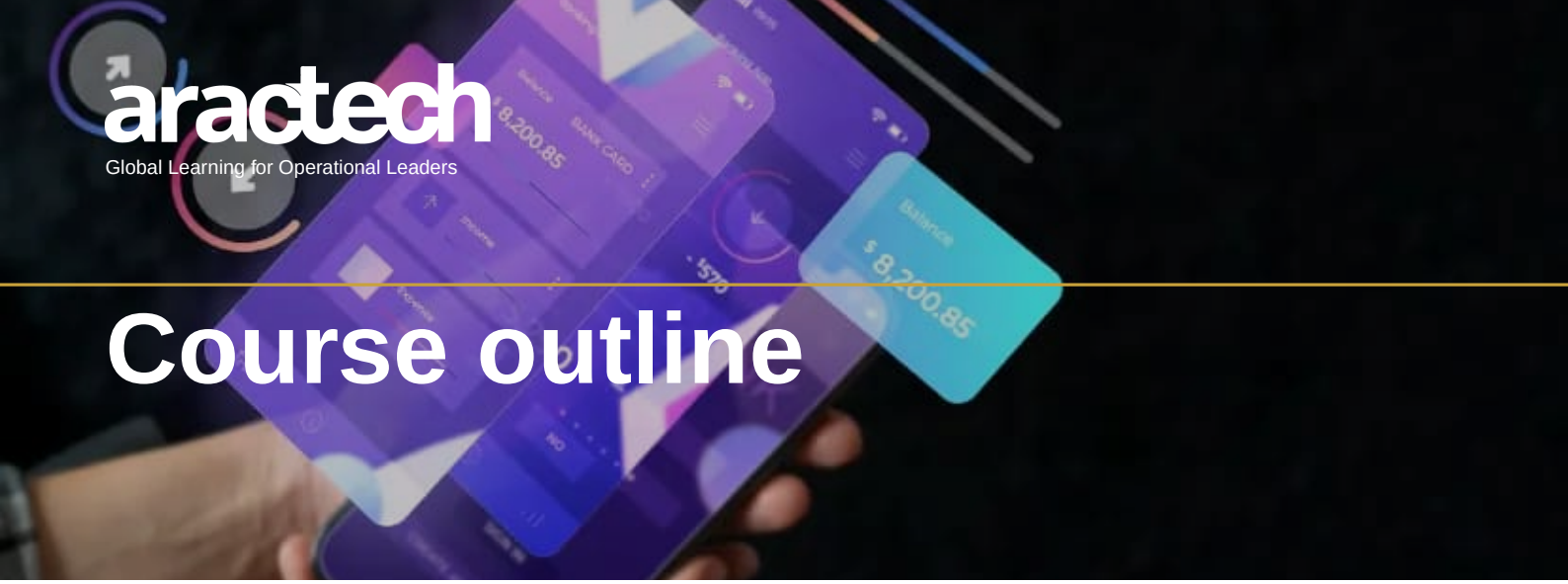
Target Audience

• Data scientists and machine learning engineers

• Software engineers moving into AI

• Engineers working on inspection, vision or sensor data

• Researchers and technical specialists



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Course outline

Detailed course outline

Day-by-day outline for Deep Learning and Neural Networks: Practical Applications.

Day 1 - Foundations of Neural Networks

• 09:00-09:34 | From Perceptron to Deep Networks: The history and intuition behind artificial neurons and layered networks

• 09:34-10:08 | Activation Functions: Sigmoid, tanh, ReLU and softmax and why non-linearity matters

• 10:08-10:42 | Loss Functions: Choosing the right loss for regression, classification and ranking problems

• 10:42-11:00 | Gradient Descent and Backpropagation: How networks adjust weights to reduce error

• 11:00-11:30 | Coffee break

• 11:30-11:46 | Gradient Descent and Backpropagation: How networks adjust weights to reduce error (continued)

• 11:46-12:20 | Optimisers: SGD, momentum, RMSprop and Adam, and how to choose learning rates

• 12:20-12:53 | Frameworks Overview: TensorFlow, Keras and PyTorch compared for research and production

• 12:53-14:00 | Lab: Build and train a fully connected network on a tabular business dataset

Day 2 - Training Deep Networks Effectively

• 09:00-09:34 | Overfitting and Underfitting: Recognising the signs in learning curves

• 09:34-10:08 | Regularisation Techniques: Dropout, weight decay, early stopping and data augmentation

• 10:08-10:42 | Batch Normalisation and Initialisation: Stabilising and speeding up training

• 10:42-11:00 | Hyperparameter Tuning: Batch size, depth, width and learning-rate schedules

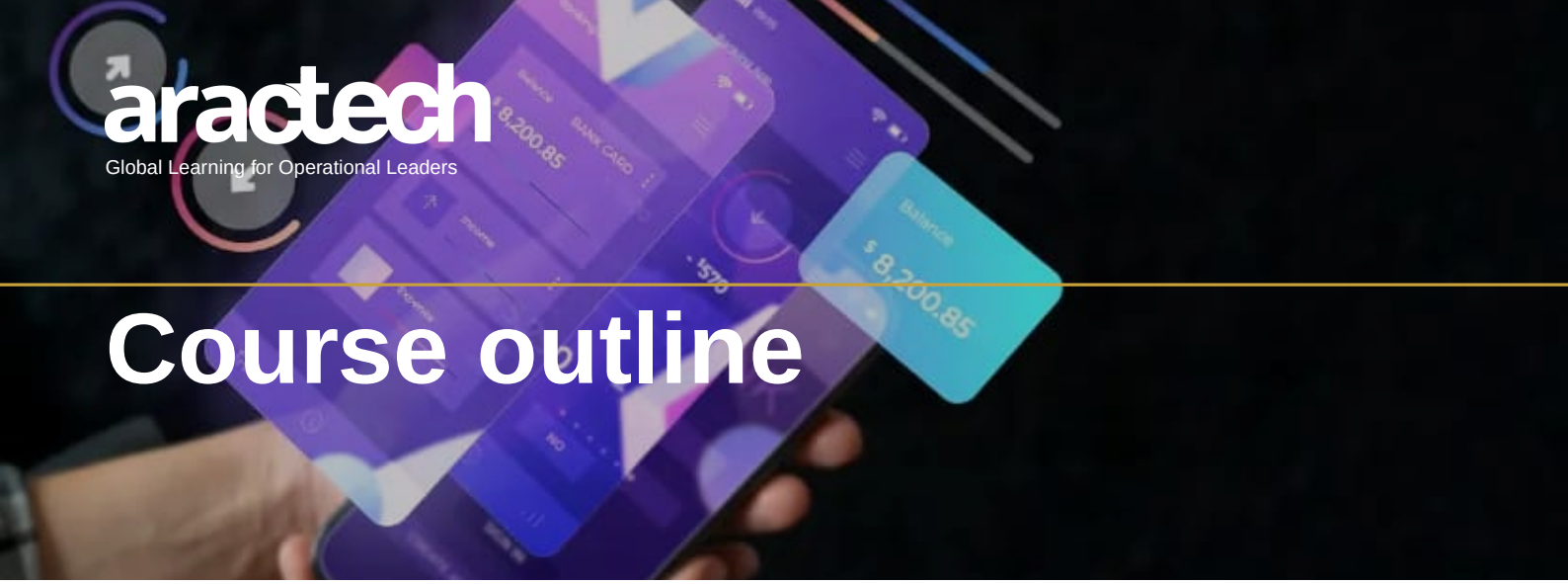
• 11:00-11:30 | Coffee break

• 11:30-11:46 | Hyperparameter Tuning: Batch size, depth, width and learning-rate schedules (continued)

• 11:46-12:20 | Hardware and Cost: Using GPUs, cloud instances and estimating training cost

• 12:20-12:53 | Experiment Tracking: Logging runs, comparing models and ensuring reproducibility

• 12:53-14:00 | Lab: Diagnose and improve a poorly performing model



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Day 3 - Convolutional Neural Networks and Computer Vision

• 09:00-09:30 | How Convolutions Work: Filters, feature maps, pooling and receptive fields

• 09:30-10:00 | Classic Architectures: LeNet, VGG, ResNet and EfficientNet and what each contributed

• 10:00-11:00 | Image Classification: Building a CNN to classify product, document or defect images

• 11:00-11:30 | Coffee break

• 11:30-12:00 | Transfer Learning: Fine-tuning pre-trained networks with small datasets

• 12:00-12:30 | Object Detection and Segmentation: An introduction to YOLO and U-Net style models

• 12:30-13:00 | Industrial Applications: Visual inspection, safety monitoring and document processing

• 13:00-14:00 | Lab: Fine-tune a pre-trained model for a visual inspection task

Day 4 - Sequence Models and Transformers

• 09:00-09:34 | Working with Sequential Data: Time series, text and event logs

• 09:34-10:08 | Recurrent Networks: RNNs, LSTMs and GRUs and their strengths and limits

• 10:08-10:42 | Word Embeddings: Representing words and entities as vectors

• 10:42-11:00 | The Attention Mechanism: Why attention transformed language and sequence modelling

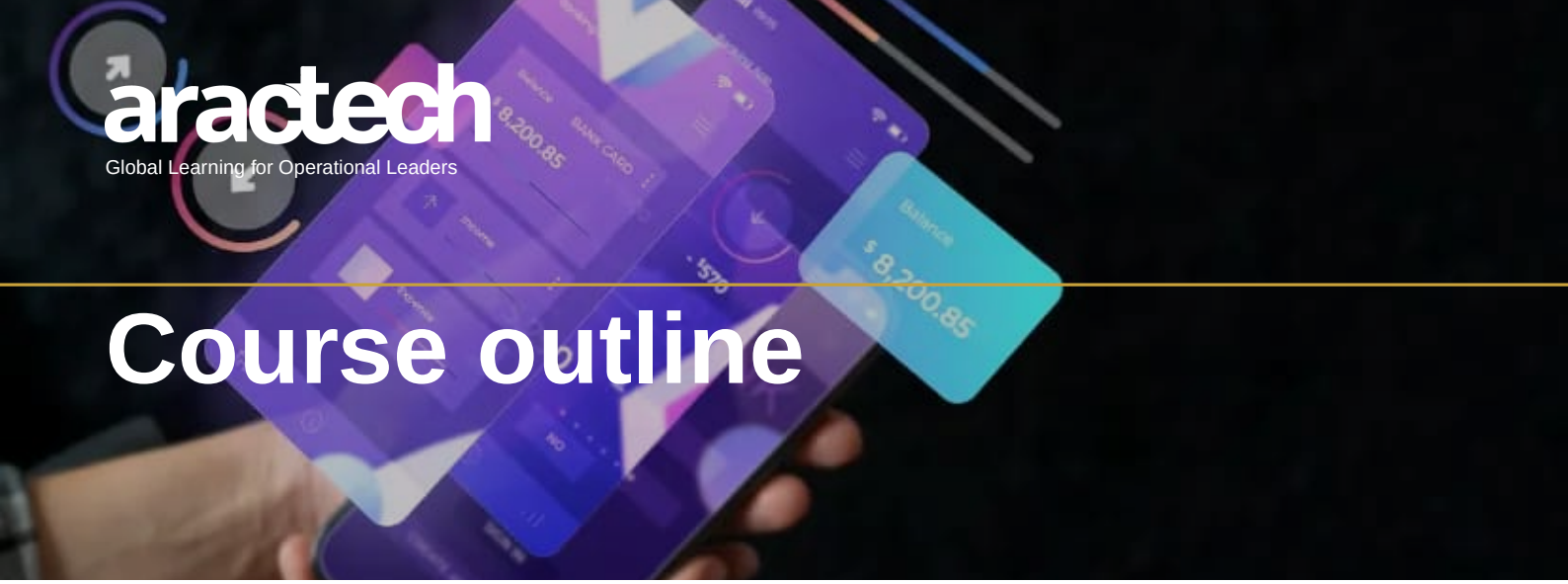
• 11:00-11:30 | Coffee break

• 11:30-11:46 | The Attention Mechanism: Why attention transformed language and sequence modelling (continued)

• 11:46-12:20 | Transformer Architecture: Encoders, decoders and the foundation of large language models

• 12:20-12:53 | Time-Series Forecasting with Deep Learning: Demand, energy load and sensor prediction

• 12:53-14:00 | Lab: Build a text classifier using a pre-trained transformer



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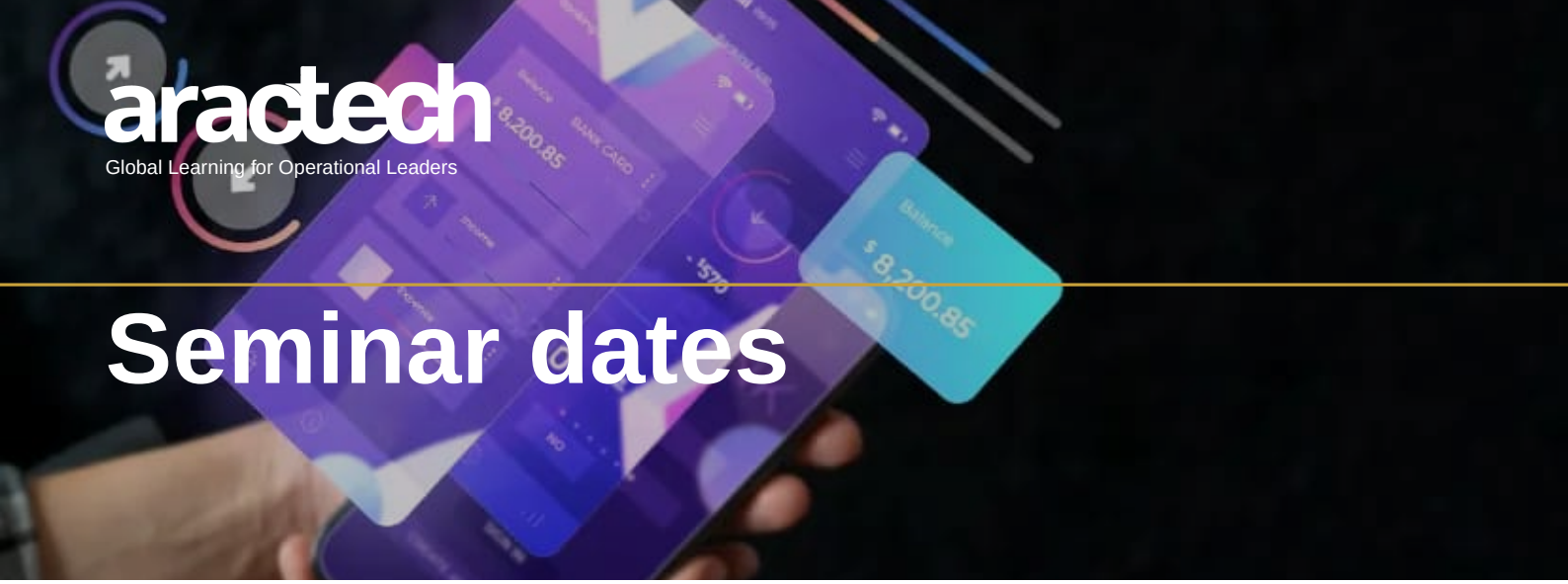
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Day 5 - From Model to Business Impact

- 09:00-09:34 | Model Evaluation Beyond Accuracy: Confusion matrices, calibration and error analysis
- 09:34-10:08 | Explainability for Deep Learning: Saliency maps, Grad-CAM and SHAP for neural networks
- 10:08-10:42 | Model Compression and Optimisation: Pruning, quantisation and edge deployment
- 10:42-11:00 | Deployment Patterns: Batch scoring, real-time APIs and on-device inference
- 11:00-11:30 | Coffee break
- 11:30-11:46 | Deployment Patterns: Batch scoring, real-time APIs and on-device inference (continued)
- 11:46-12:20 | Responsible Deep Learning: Bias, data privacy and robustness considerations
- 12:20-12:53 | Choosing Deep Learning Wisely: When simpler models are better and how to justify the investment
- 12:53-14:00 | Capstone: Participants design a deep learning solution for a real business problem and present it



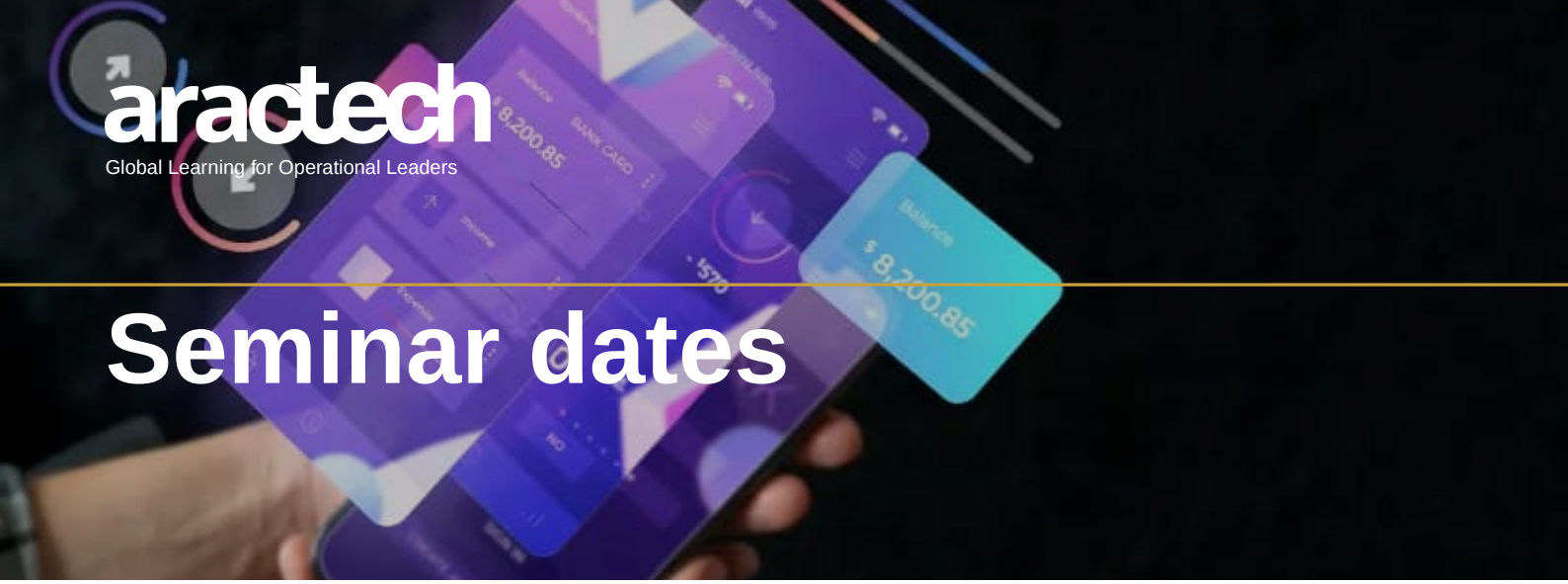
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Seminar dates

Available seminar dates

Live dates and pricing for Deep Learning and Neural Networks: Practical Applications generated from the course details page.

Date	Location	Format	Fee
4 - 8 January 2027	Dubai	Classroom	**€2,745**
11 - 15 January 2027	Cape Town	Classroom	**€1,895**
18 - 22 January 2027	Paris	Classroom	**€2,210**
25 - 29 January 2027	Dubai	Classroom	**€2,745**
1 - 5 February 2027	Amsterdam	Classroom	**€2,415**
8 - 12 February 2027	Dublin	Classroom	**€3,360**
15 - 19 February 2027	London	Classroom	**€2,815**
22 - 26 February 2027	Cape Town	Classroom	**€1,895**
1 - 5 March 2027	Manchester	Classroom	**€3,360**
8 - 12 March 2027	Liverpool	Classroom	**€3,360**



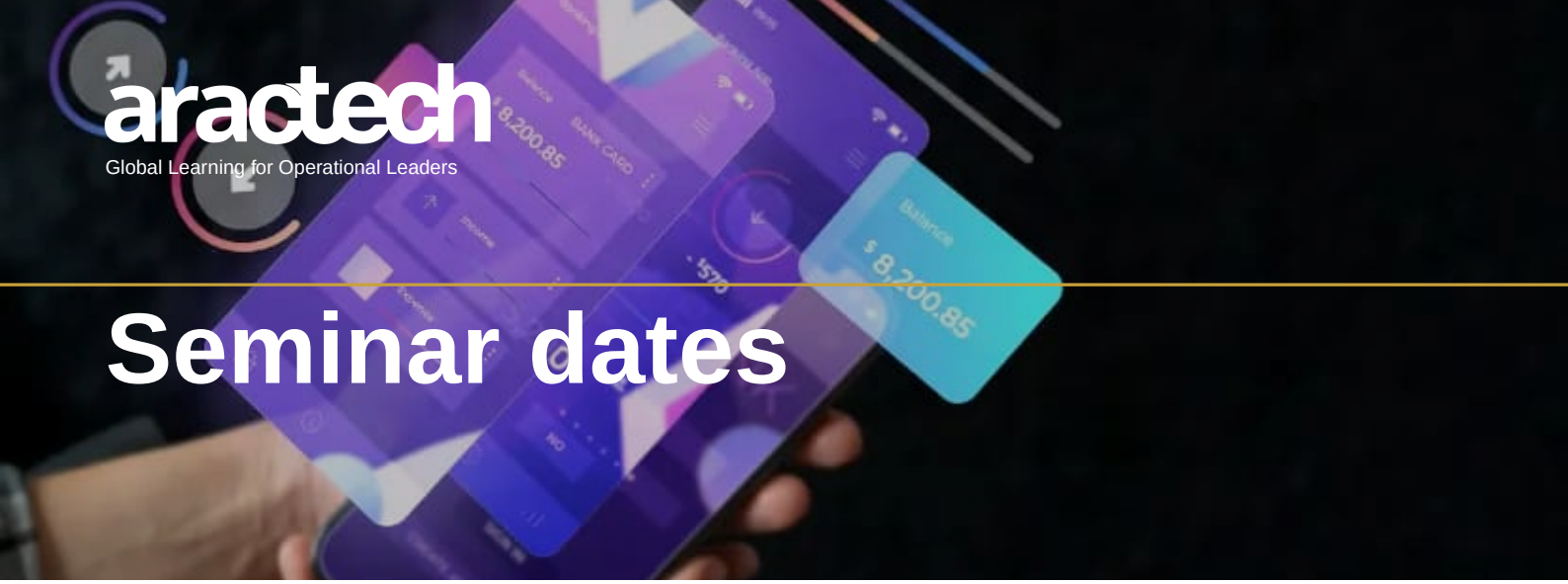
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Date	Location	Format	Fee
15 - 19 March 2027	Barcelona	Classroom	**€2,175**
22 - 26 March 2027	Cape Town	Classroom	**€1,895**
5 - 9 April 2027	Frankfurt	Classroom	**€2,215**
12 - 16 April 2027	Dubai	Classroom	**€2,745**
19 - 23 April 2027	Kuala lumpur	Classroom	**€2,425**
26 - 30 April 2027	Brussels	Classroom	**€3,400**
3 - 7 May 2027	Istanbul	Classroom	**€2,250**
10 - 14 May 2027	Dubai	Classroom	**€2,745**
17 - 21 May 2027	Cape Town	Classroom	**€1,895**
24 - 28 May 2027	Paris	Classroom	**€2,210**



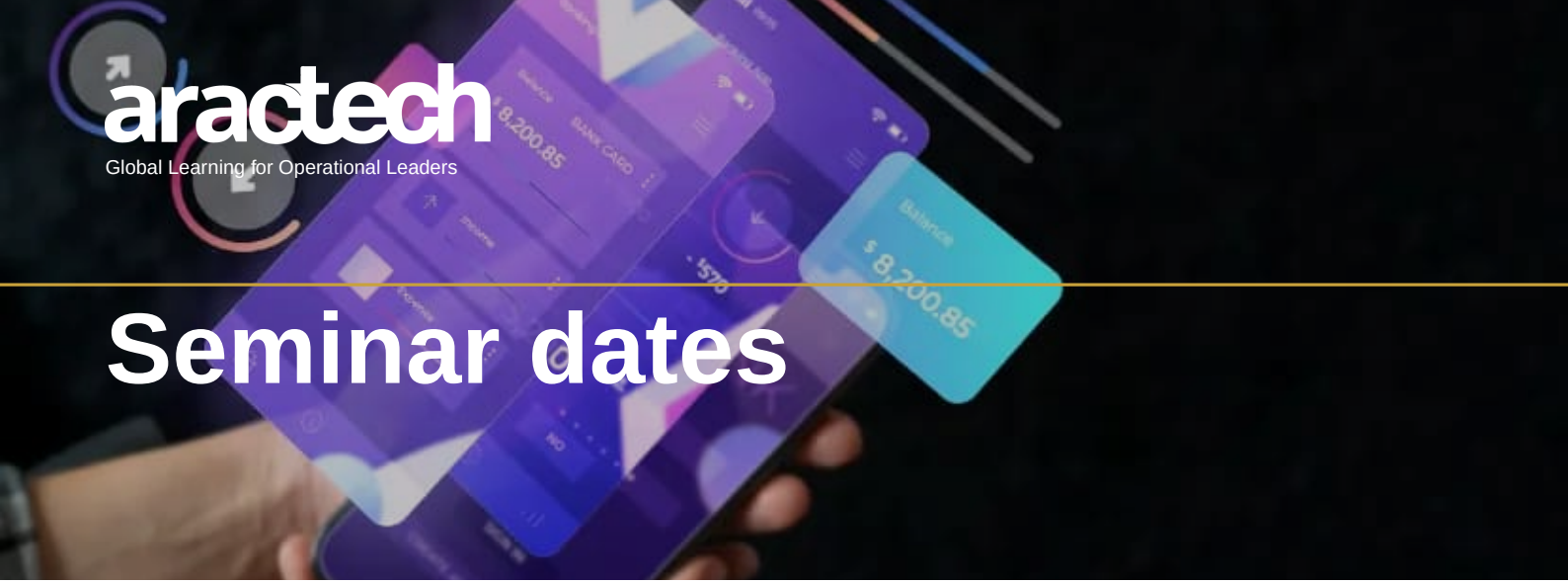
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7 - 11 June 2027	Dubai	Classroom	**€2,745**
14 - 18 June 2027	Amsterdam	Classroom	**€2,415**
21 - 25 June 2027	Dubai	Classroom	**€2,745**
5 - 9 July 2027	London	Classroom	**€2,815**
12 - 16 July 2027	Cape Town	Classroom	**€1,895**
19 - 23 July 2027	Eindhoven	Classroom	**€3,400**
26 - 30 July 2027	Dubai	Classroom	**€2,745**
2 - 6 August 2027	Barcelona	Classroom	**€2,175**
9 - 13 August 2027	Cape Town	Classroom	**€1,895**
16 - 20 August 2027	Frankfurt	Classroom	**€2,215**



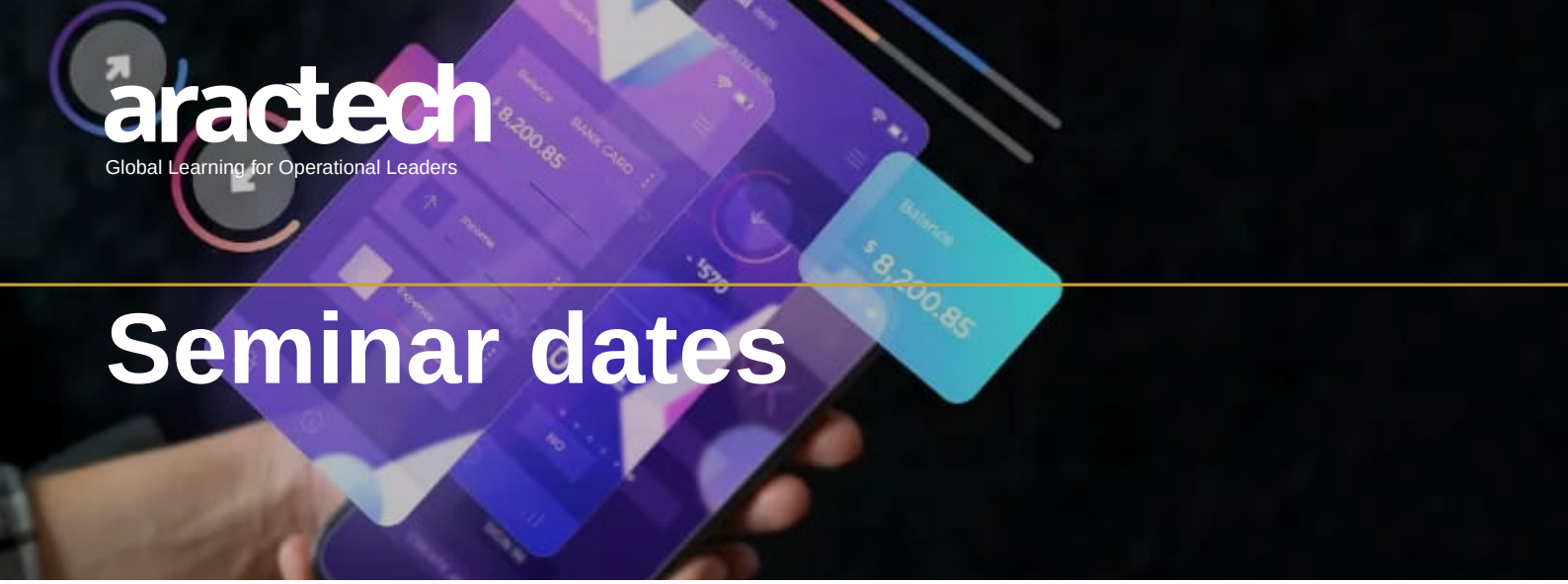
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23 - 27 August 2027	Dubai	Classroom	**€2,745**
6 - 10 September 2027	Kuala lumpur	Classroom	**€2,425**
13 - 17 September 2027	Rotterdam	Classroom	**€3,400**
20 - 24 September 2027	Istanbul	Classroom	**€2,250**
4 - 8 October 2027	Dubai	Classroom	**€2,745**
11 - 15 October 2027	Cape Town	Classroom	**€1,895**
18 - 22 October 2027	Dusseldorf	Classroom	**€3,400**
25 - 29 October 2027	Dubai	Classroom	**€2,745**
1 - 5 November 2027	Amsterdam	Classroom	**€2,415**
8 - 12 November 2027	Dubai	Classroom	**€2,745**



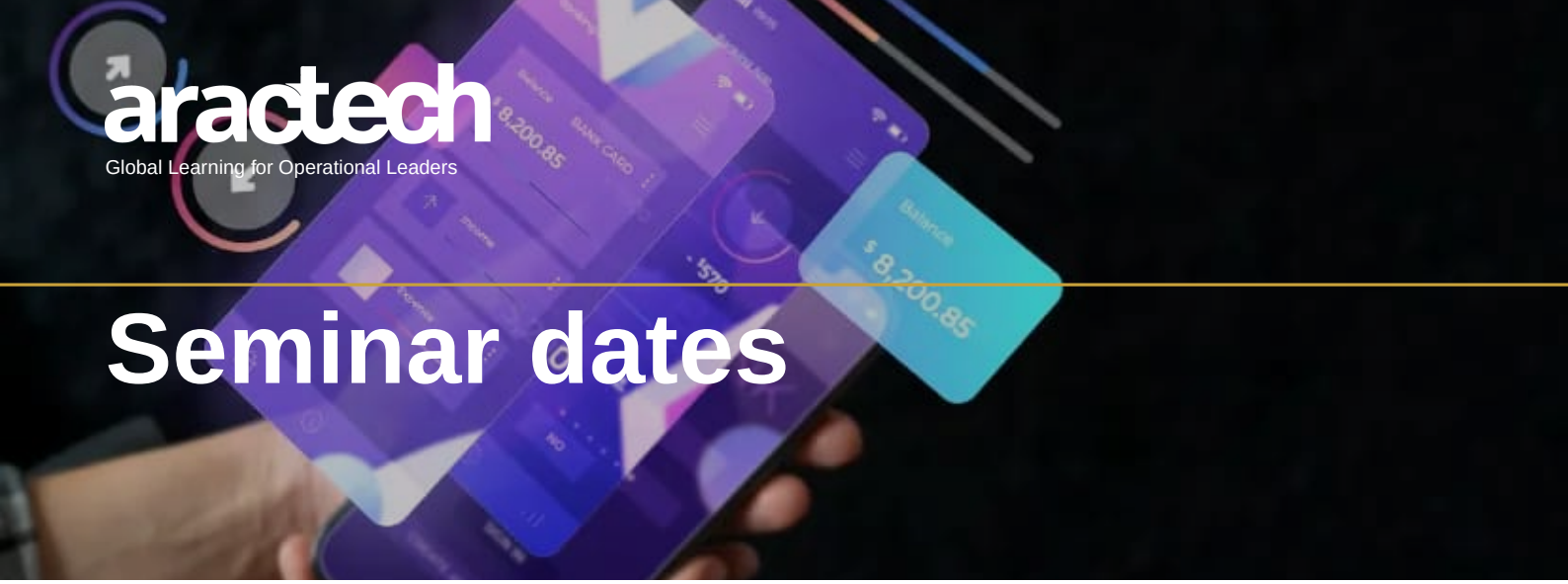
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22 - 26 November 2027	Cape Town	Classroom	**€1,895**
6 - 10 December 2027	Berlin	Classroom	**€3,400**
13 - 17 December 2027	Dubai	Classroom	**€2,745**
20 - 24 December 2027	Barcelona	Classroom	**€2,175**
27 - 31 December 2027	Cape Town	Classroom	**€1,895**
4 - 8 January 2027	Online / Live	Online / Live	**€1,515**
11 - 15 January 2027	Online / Live	Online / Live	**€1,515**
18 - 22 January 2027	Online / Live	Online / Live	**€1,515**
25 - 29 January 2027	Online / Live	Online / Live	**€1,515**



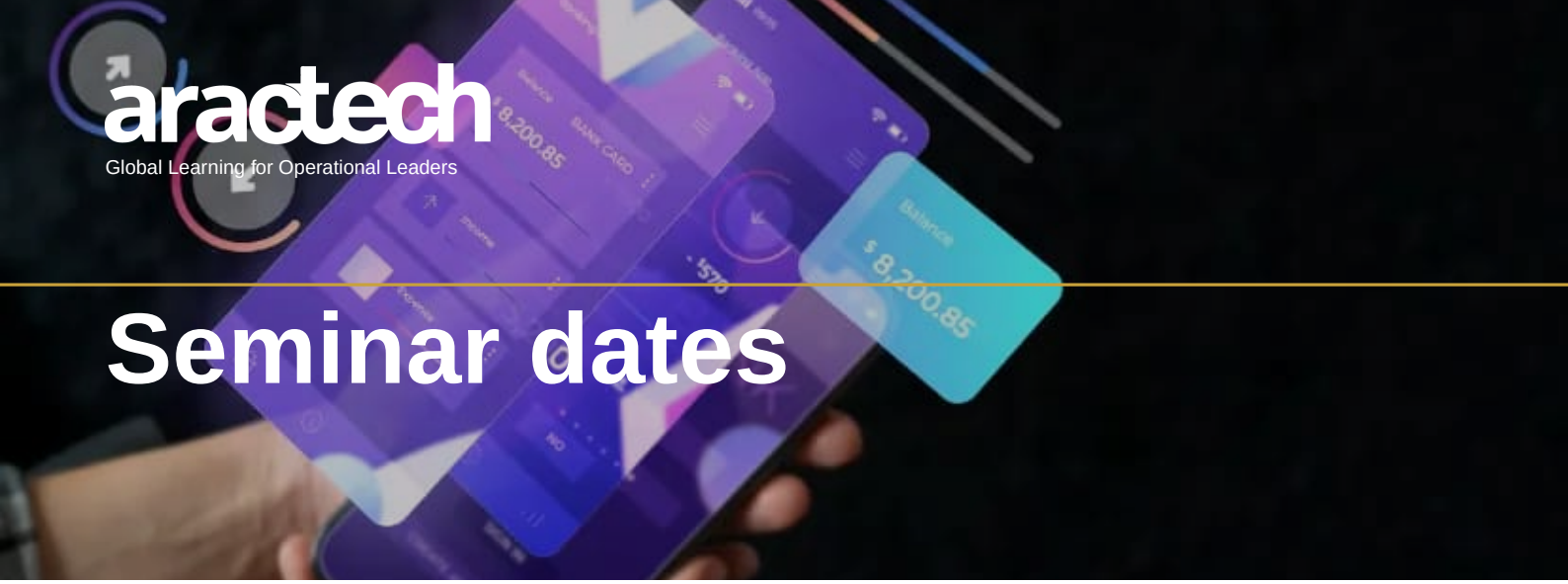
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1 - 5 February 2027	Online / Live	Online / Live	**€1,515**
8 - 12 February 2027	Online / Live	Online / Live	**€1,515**
15 - 19 February 2027	Online / Live	Online / Live	**€1,515**
22 - 26 February 2027	Online / Live	Online / Live	**€1,515**
1 - 5 March 2027	Online / Live	Online / Live	**€1,515**
8 - 12 March 2027	Online / Live	Online / Live	**€1,515**
15 - 19 March 2027	Online / Live	Online / Live	**€1,515**
22 - 26 March 2027	Online / Live	Online / Live	**€1,515**
5 - 9 April 2027	Online / Live	Online / Live	**€1,515**
12 - 16 April 2027	Online / Live	Online / Live	**€1,515**



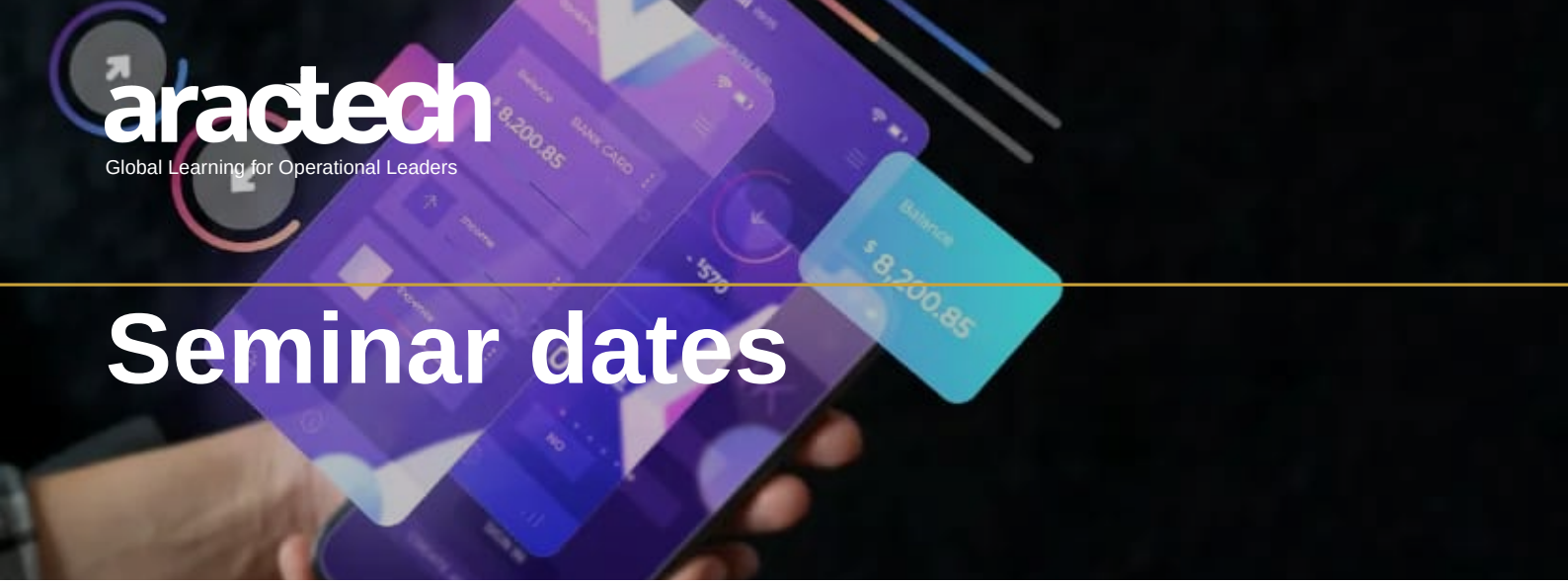
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26 - 30 April 2027	Online / Live	Online / Live	**€1,515**
3 - 7 May 2027	Online / Live	Online / Live	**€1,515**
10 - 14 May 2027	Online / Live	Online / Live	**€1,515**
17 - 21 May 2027	Online / Live	Online / Live	**€1,515**
24 - 28 May 2027	Online / Live	Online / Live	**€1,515**
7 - 11 June 2027	Online / Live	Online / Live	**€1,515**
14 - 18 June 2027	Online / Live	Online / Live	**€1,515**
21 - 25 June 2027	Online / Live	Online / Live	**€1,515**
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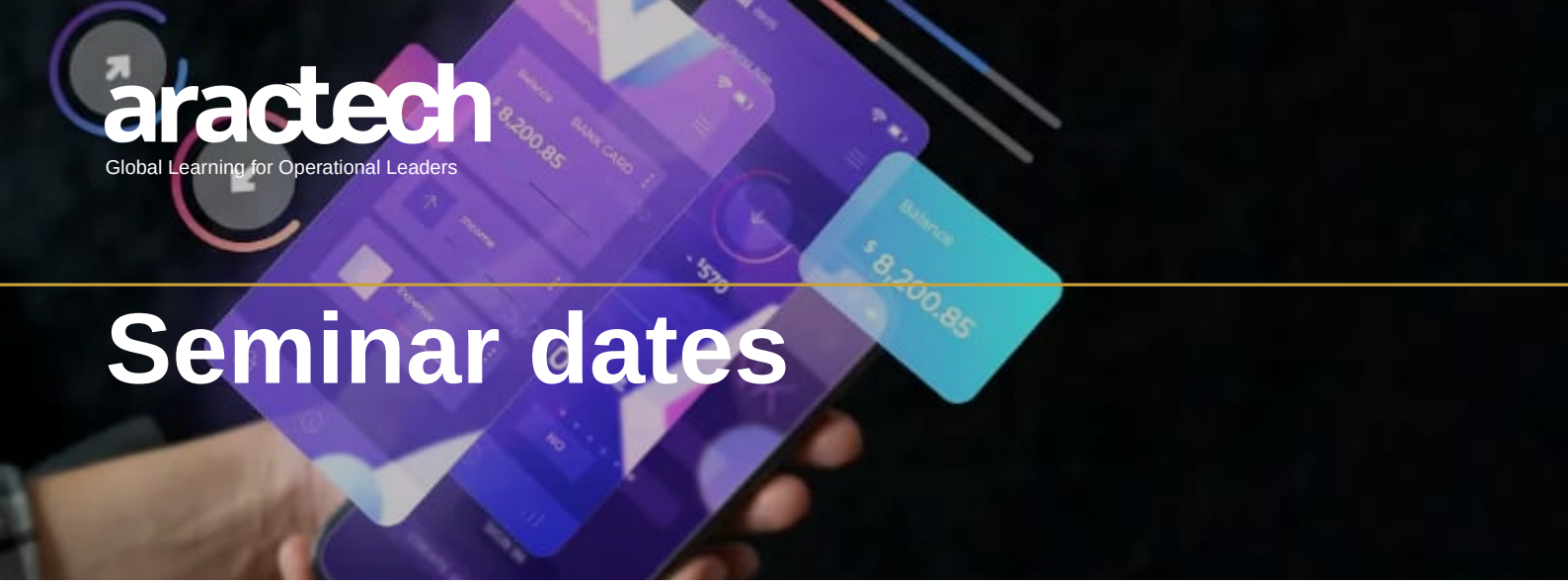
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9 - 13 August 2027	Online / Live	Online / Live	**€1,515**
16 - 20 August 2027	Online / Live	Online / Live	**€1,515**
23 - 27 August 2027	Online / Live	Online / Live	**€1,515**
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13 - 17 September 2027	Online / Live	Online / Live	**€1,515**
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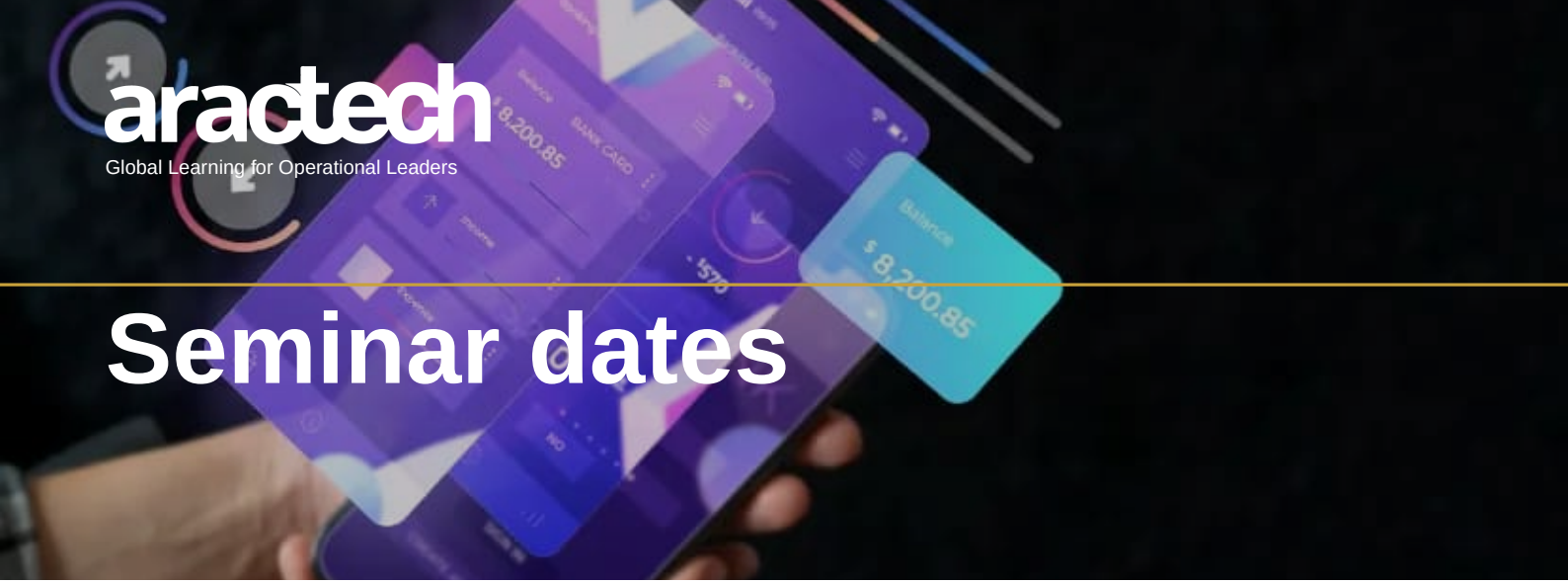
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