Figure 1

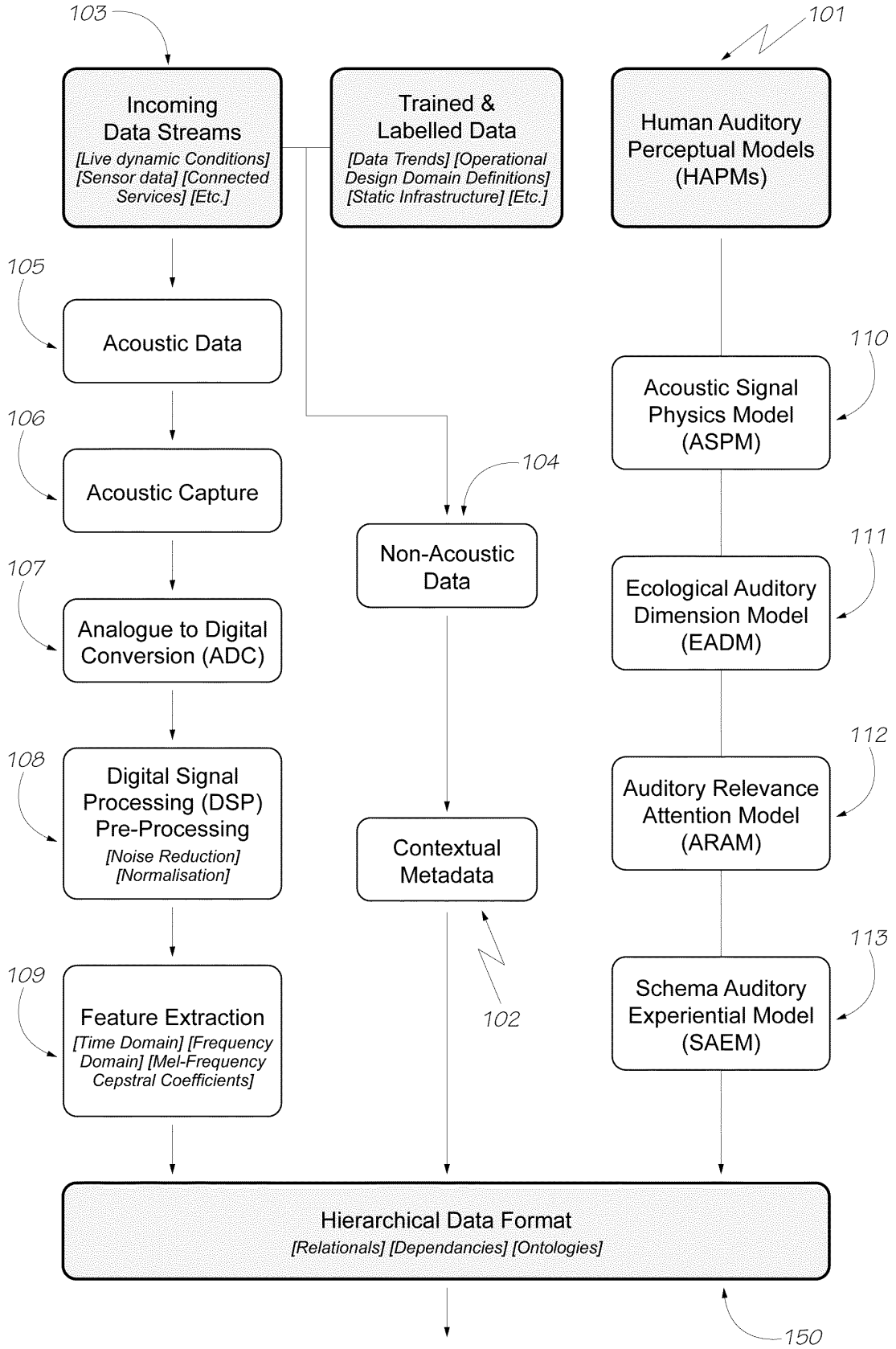

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Incoming Data Streams
[Live dynamic Conditions] [Sensor data] [Connected Services] [Etc.]
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Acoustic Capture
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Ecological Auditory Dimension Model (EADM)
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Analogue to Digital Conversion (ADC)
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Auditory Relevance Attention Model (ARAM)
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Digital Signal Processing (DSP) Pre-Processing
[Noise Reduction] [Normalisation]
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[Time Domain] [Frequency Domain] [Mel-Frequency Cepstral Coefficients]
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Hierarchical Data Format
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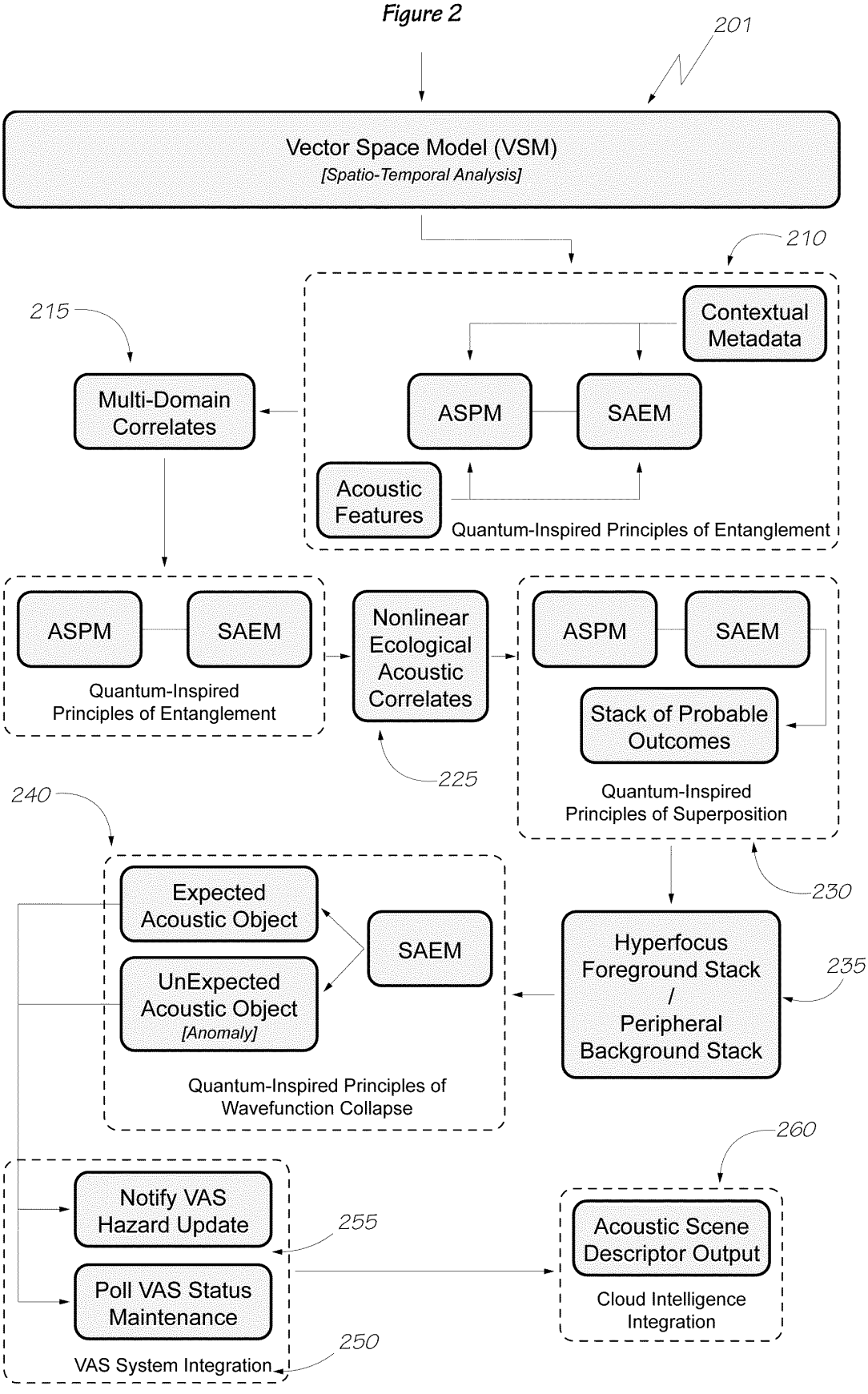

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Vector Space Model (VSM)
[Spatio-Temporal Analysis]
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Contextual Metadata
Multi-Domain Correlates
ASPM
SAEM
Acoustic Features
Quantum-Inspired Principles of Entanglement
ASPM
SAEM
Quantum-Inspired Principles of Entanglement
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Hyperfocus Foreground Stack / Peripheral Background Stack
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Notify VAS Hazard Update
Poll VAS Status Maintenance
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VAS System Integration
Acoustic Scene Descriptor Output
Cloud Intelligence Integration

Figure 3

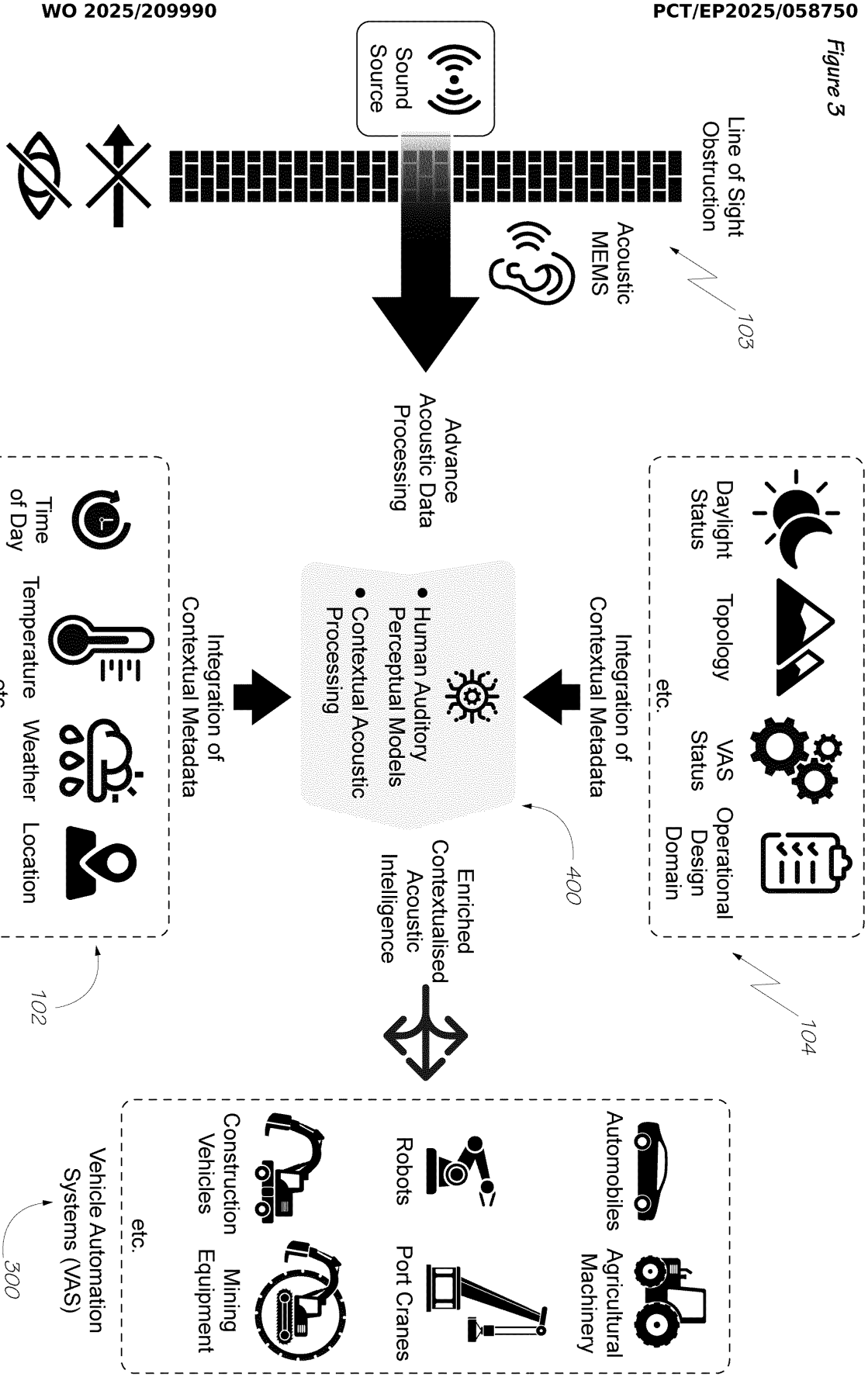

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Advance Acoustic Data Processing
Daylight Status
Topology
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• Contextual Acoustic Processing
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Weather
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Agricultural Machinery
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Port Cranes
Construction Vehicles
Mining Equipment
etc.
Vehicle Automation Systems (VAS)
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Figure 4

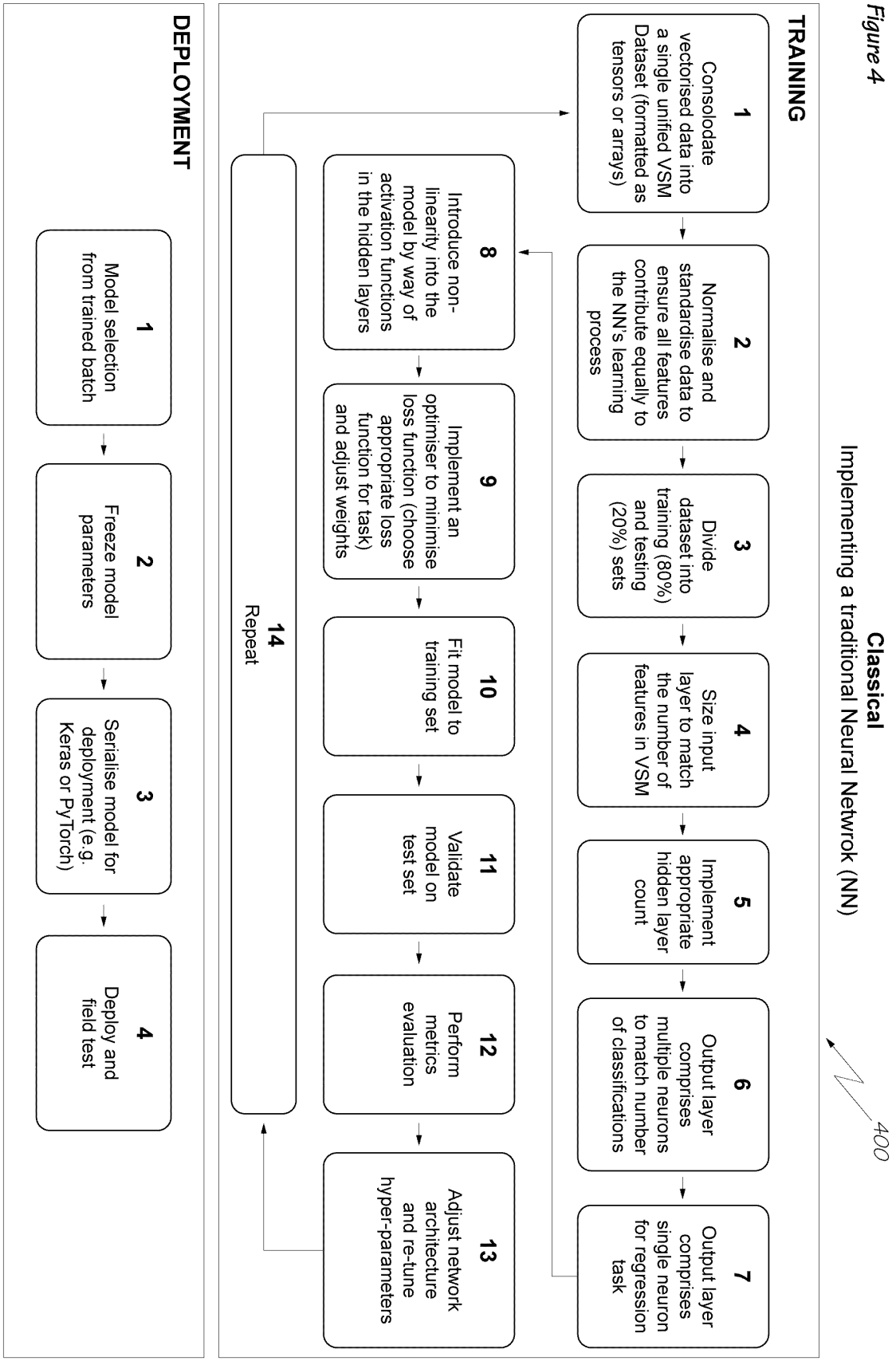
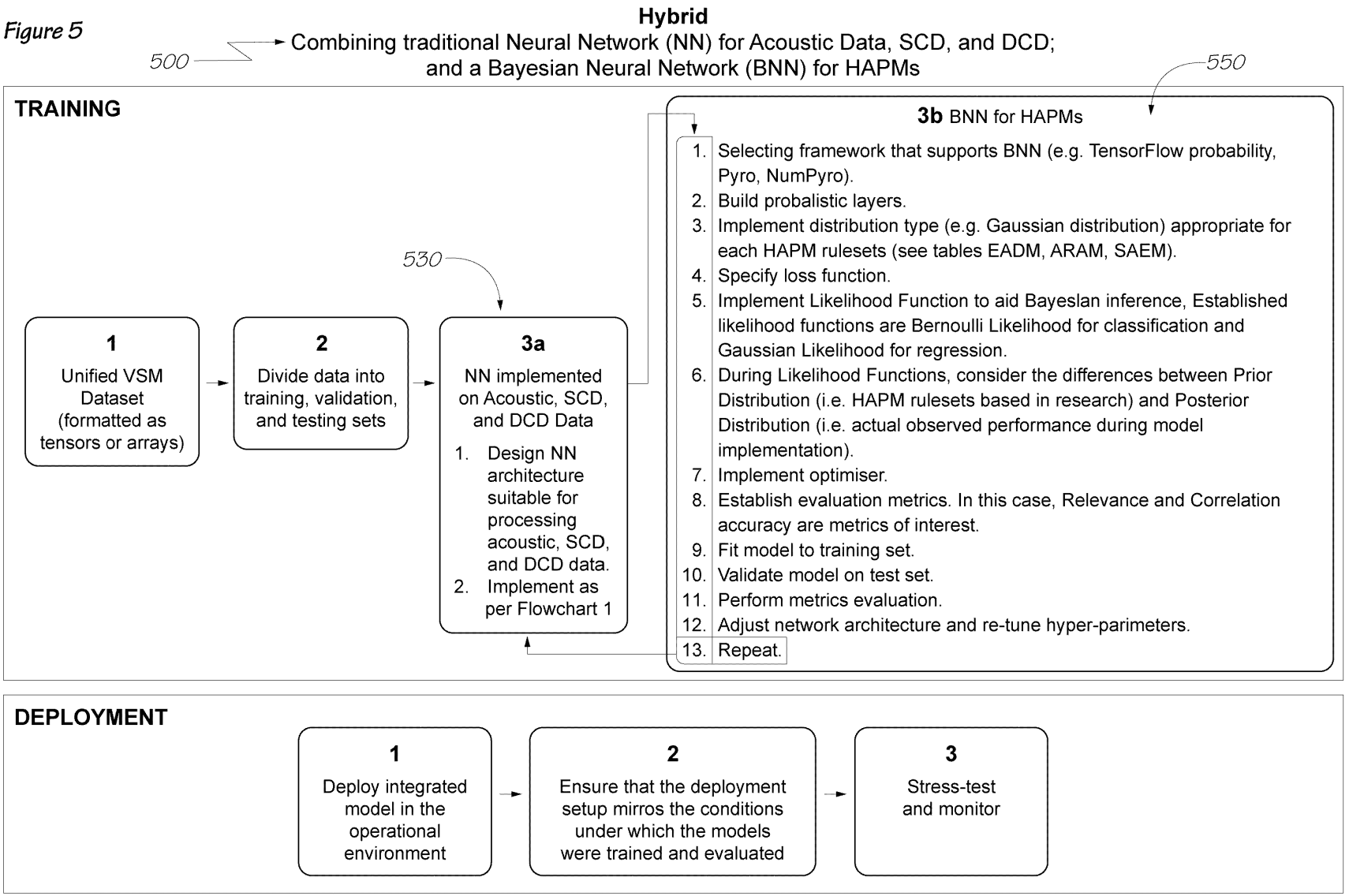

Classical
Implementing a traditional Neural Netwrok (NN)
400
TRAINING
1
Consolodate vectorised data into a single unified VSM Dataset (formatted as tensors or arrays)
2
Normalise and standardise data to ensure all features contribute equally to the NN's learning process
3
Divide dataset into training (80%) and testing (20%) sets
4
Size input layer to match the number of features in VSM
5
Implement appropriate hidden layer count
6
Output layer comprises multiple neurons to match number of classifications
7
Output layer comprises single neuron for regression task
8
Introduce non-linearity into the model by way of activation functions in the hidden layers
9
Implement an optimiser to minimise loss function (choose appropriate loss function for task) and adjust weights
10
Fit model to training set
11
Validate model on test set
12
Perform metrics evaluation
13
Adjust network architecture and re-tune hyper-parameters
14
Repeat
DEPLOYMENT
1
Model selection from trained batch
2
Freeze model parameters
3
Serialise model for deployment (e.g. Keras or PyTorch)
4
Deploy and field test

Figure 5



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