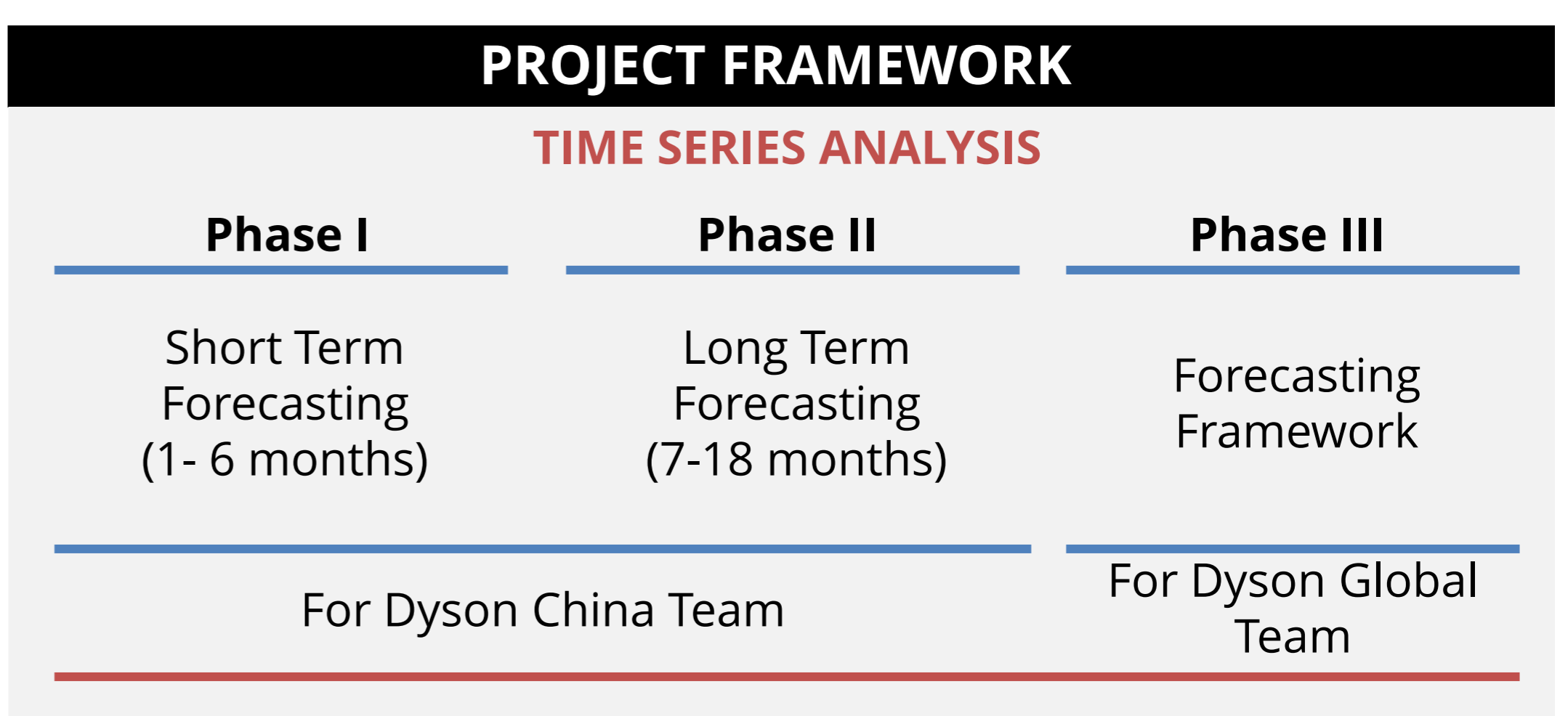
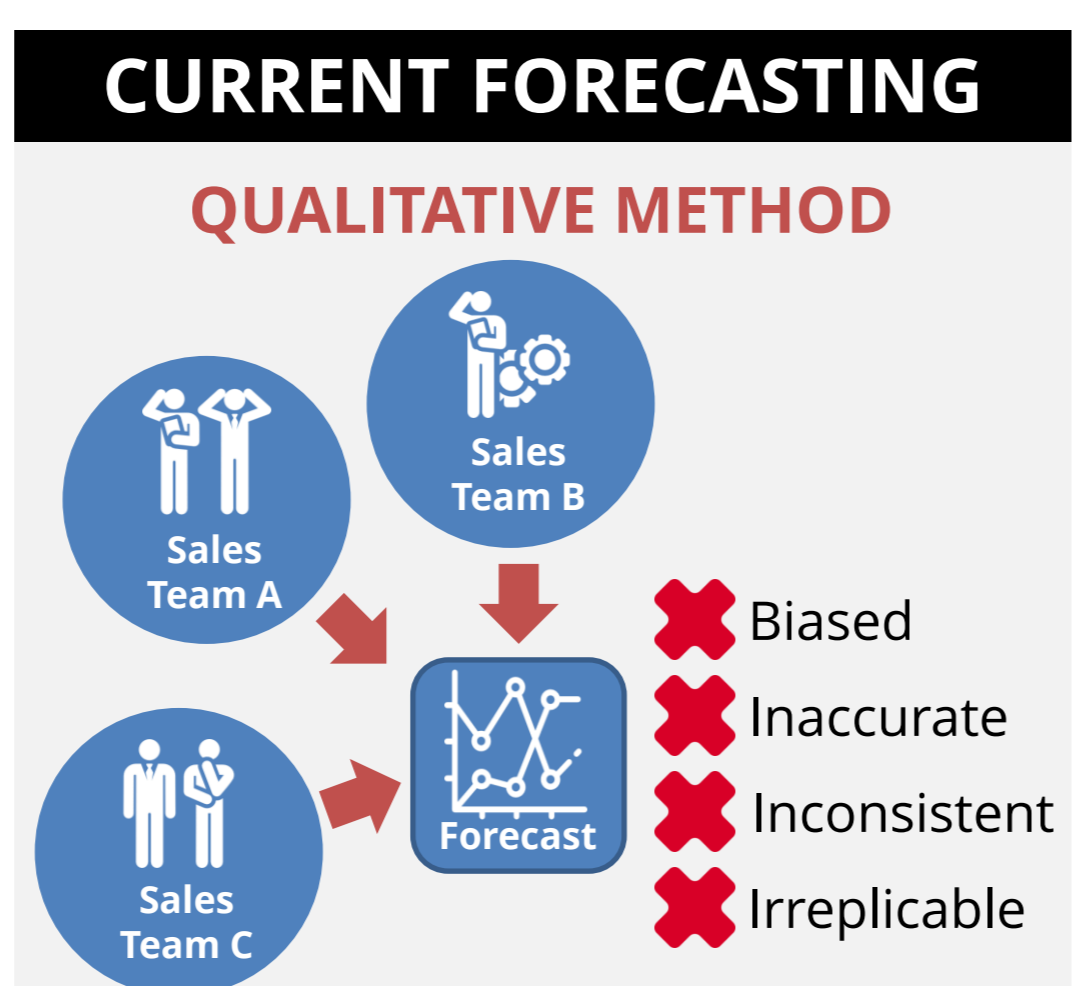
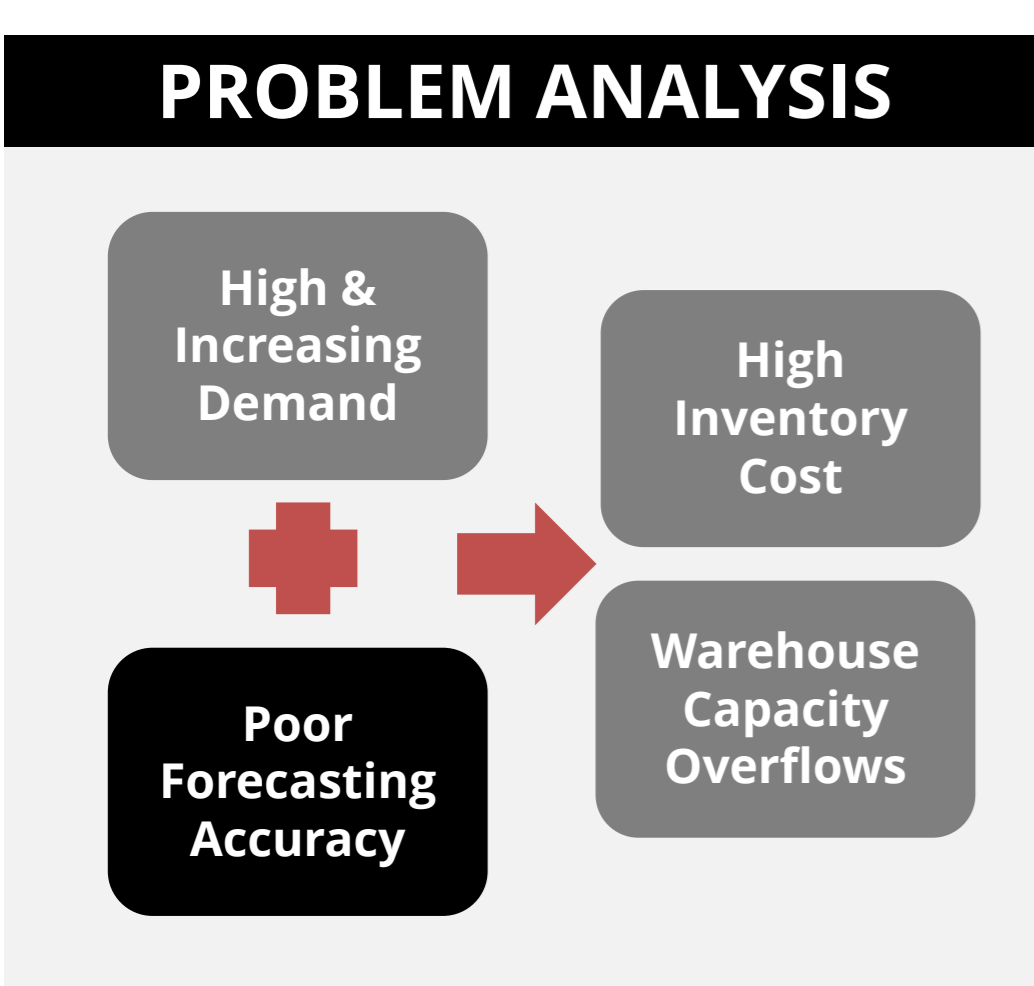
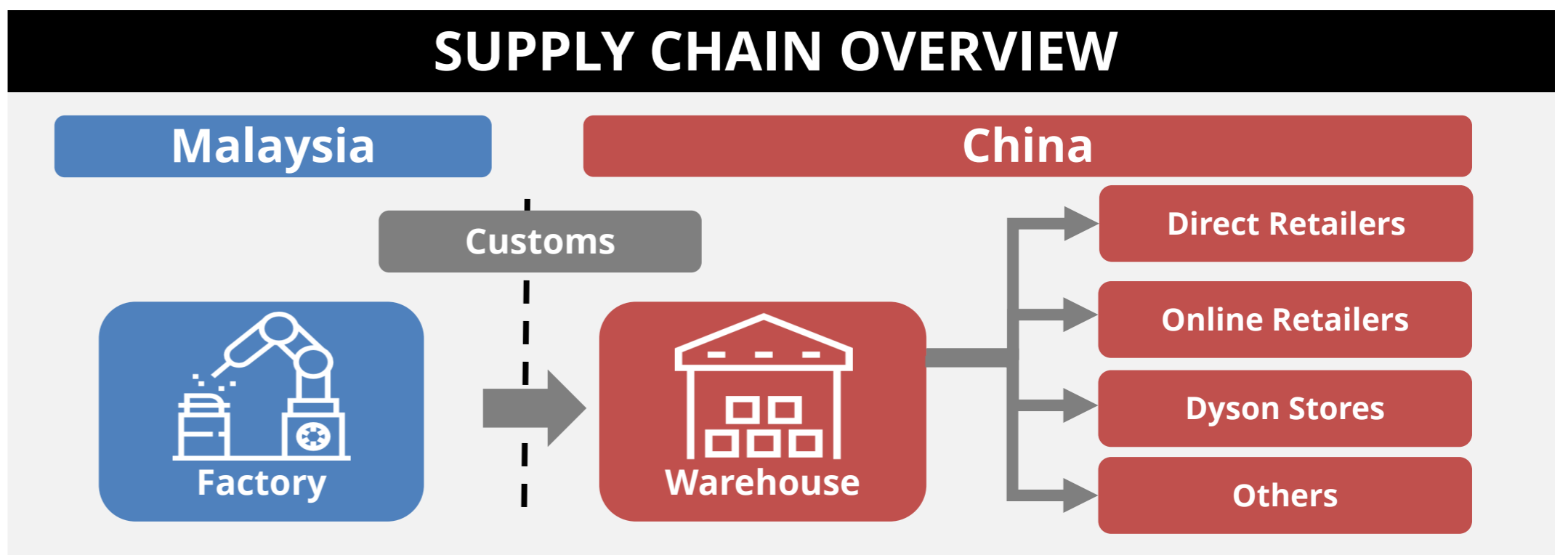


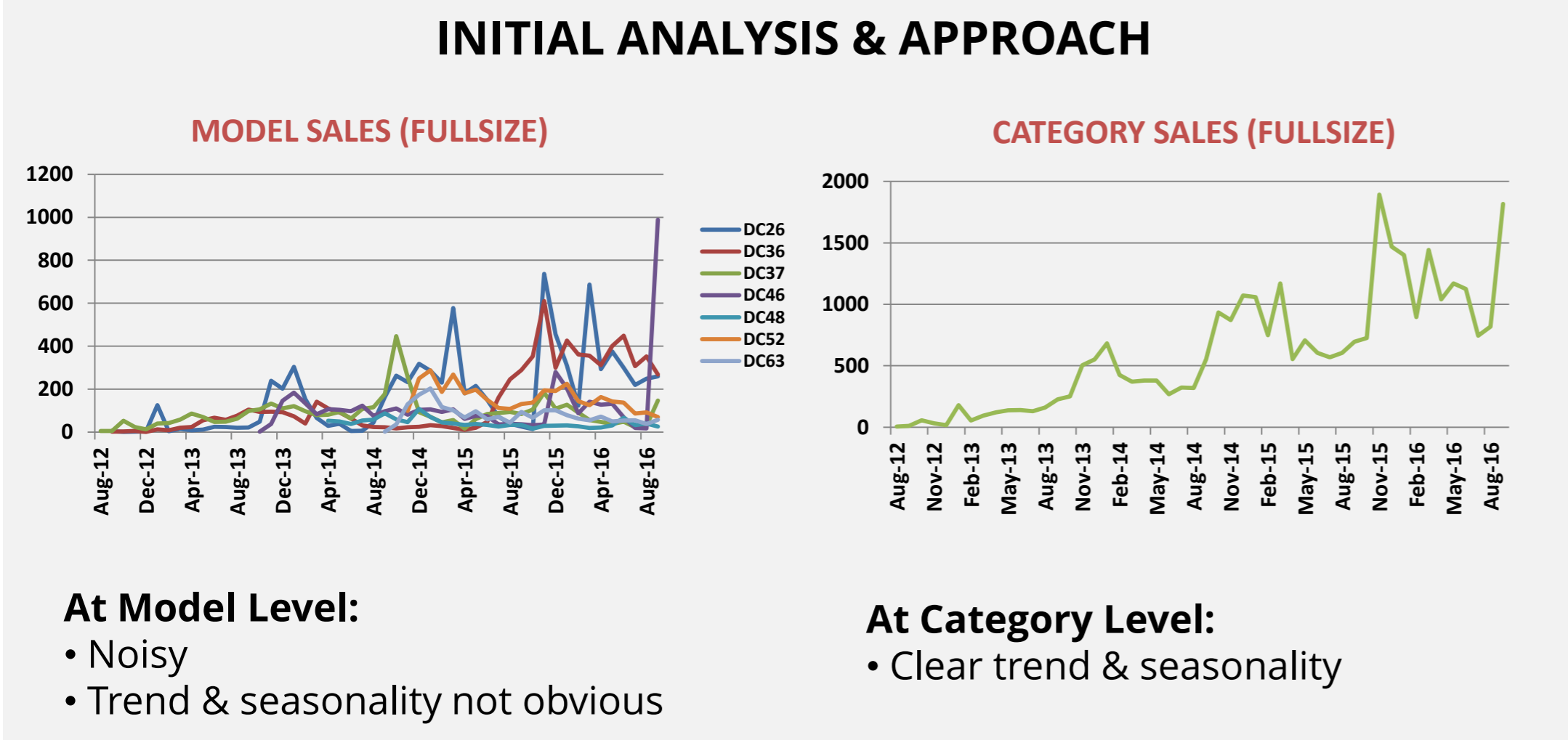
COMPANY BACKGROUND

Dyson is a global technology company that designs and manufactures household appliances, with its products sold in over 70 countries.

Dyson entered China's market in 2014 and experienced rapid growth until today.



PHASE I - SHORT TERM FORECASTING



METHODOLOGY

Hierarchical Time Series Decomposition
Model Sales Forecast = Category Sales Forecast x Model Proportion Forecast

CATEGORY SALES

For Data Points >= 24 Months
Manual Curve Fitting + Seasonally Naïve

For Data Points < 24 Months
Direct + ARIMA

MODEL PROPORTION

Forecasted Proportion
For Data Points >= 24 Months
Deseasonalised + Naïve

For Data Points >= 3 Months
Direct + 3-Month Moving Average

For Data Points < 3 Months
Direct + ETS

PHASE II - LONG TERM FORECASTING

METHODOLOGY

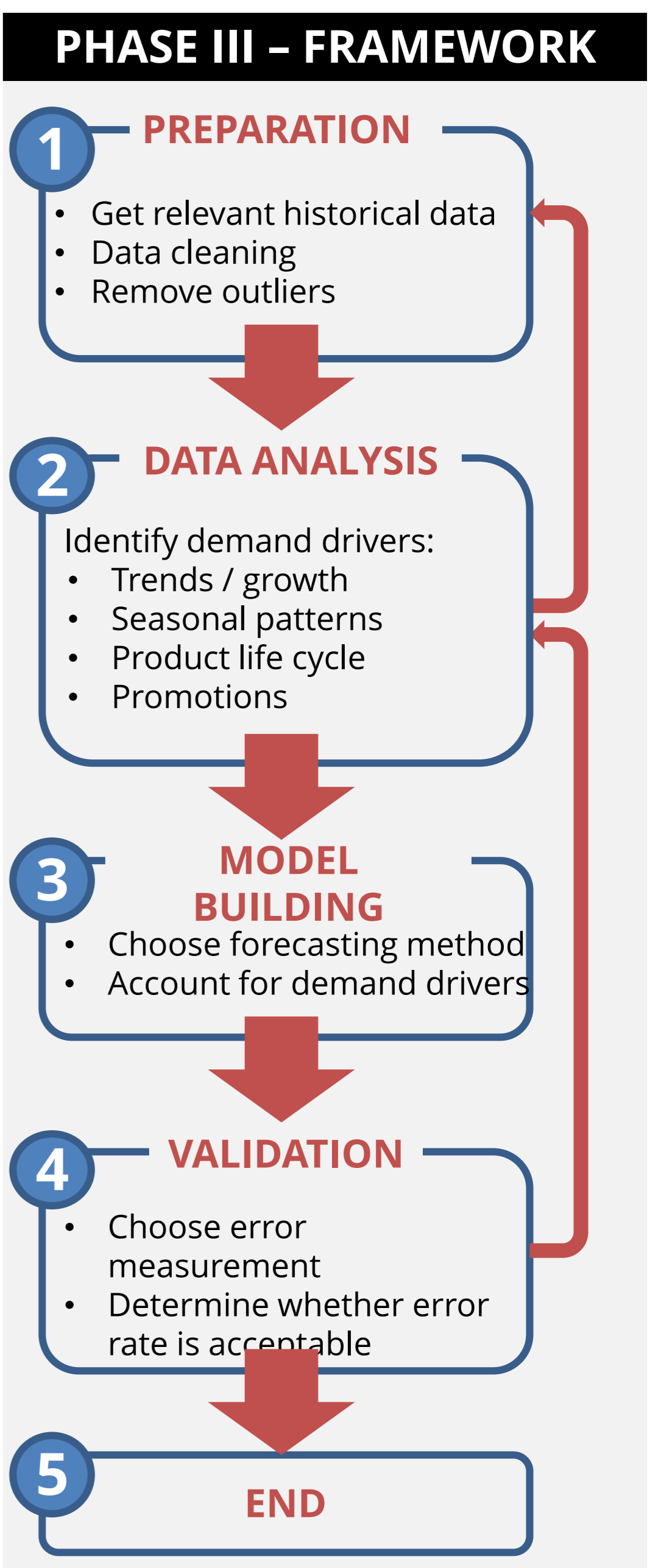
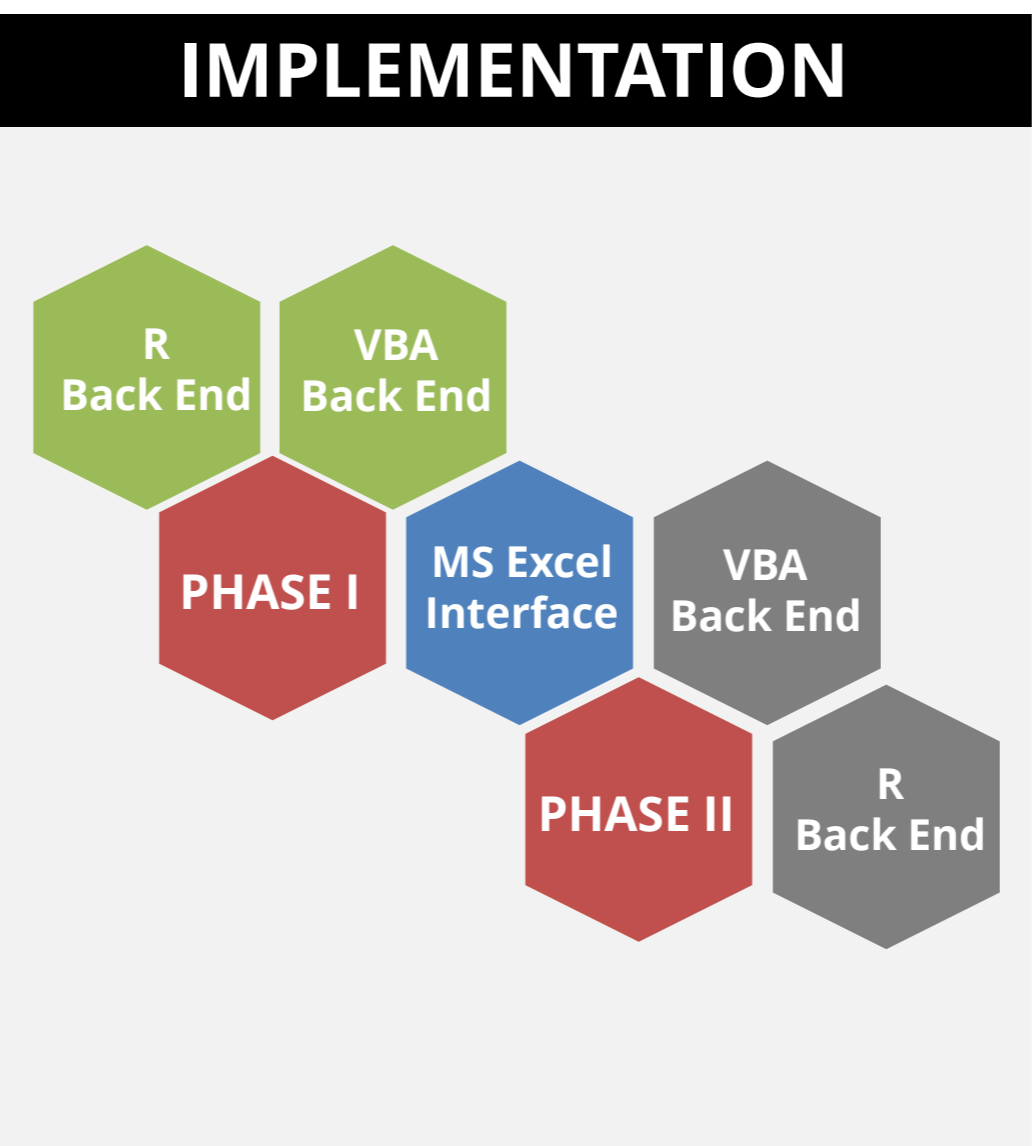
Long Term Trend Forecast (T)

Damped extrapolation of short term trend forecast (T₀)

Causal factors for long term adjustment

T = T₀ * (Adjustment Parameters)

Adjustment Factors	Adjustment Parameters
Economic condition	Quarterly GDP growth rate for China
Total market size of Dyson products	Dyson China market size growth rate



RESULTS & VALIDATION

CATEGORY SALES FORECAST

MAPE	Naive	Seasonal Naive	Average	3M Average	6M Average	ARIMA	ETS
Direct	0.571627	0.480599	0.789623	0.849302	1.147219	0.637535	0.584823
Deseasonalised	0.467641	0.451828	0.635317	0.404273	0.42096	0.35085	0.360828
Manual Curve Fitting	0.411036	0.342711	3.161434	0.312972	0.349431	0.41534	3.153406
Auto Curve Fitting	0.399496	1.010714	0.890664	0.404226	0.630358	0.659642	0.775211

MODEL PROPORTION FORECAST

MAPE	Naive	Seasonal Naive	Average	3M Average	6M Average	ARIMA	ETS	Forecasted Proportion
Direct	0.734549	0.560955	0.80903	0.817438	0.988515	0.741534	0.695491	
Deseasonalised	0.530023	0.522021	0.758369	0.694666	0.677508	0.362417	0.632253	
Manual Curve Fitting	0.424028	0.694153	0.718298	0.574798	0.587906	0.573402	0.574863	
Auto Curve Fitting	28.99361	17.777	14.46589	11.4268	11.94431	9.169831	5.148105	
Deseasonalise Model With Category Data	0.53955	0.578786	0.601365	0.488936	0.488853	0.448874	0.477397	
Hierarchical Proportion	0.977779	0.977779	1.098197	1.005399	0.999506	0.999431	0.988177	0.9835