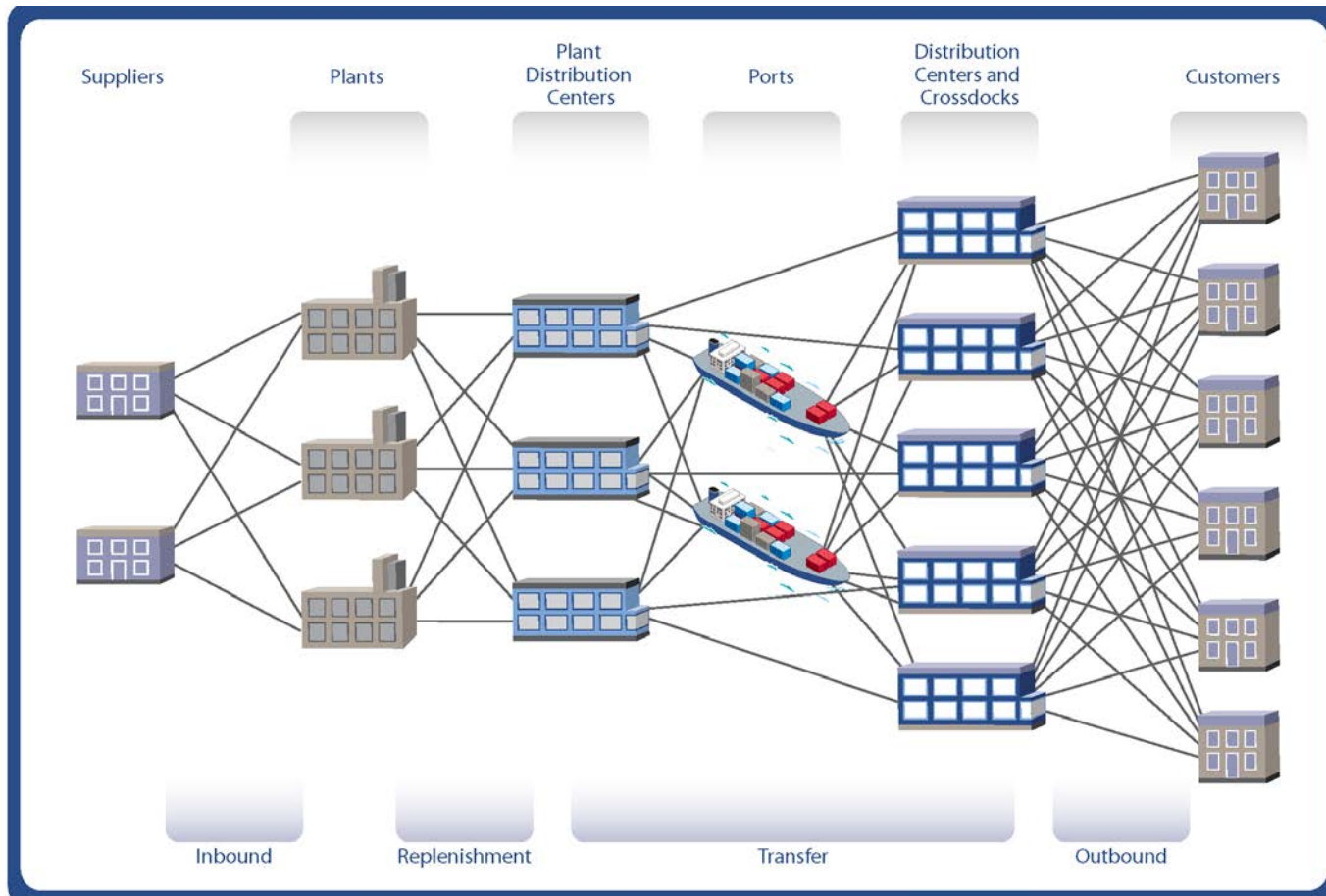


# Operational Income Statement (OIS) Model's Structure and Data

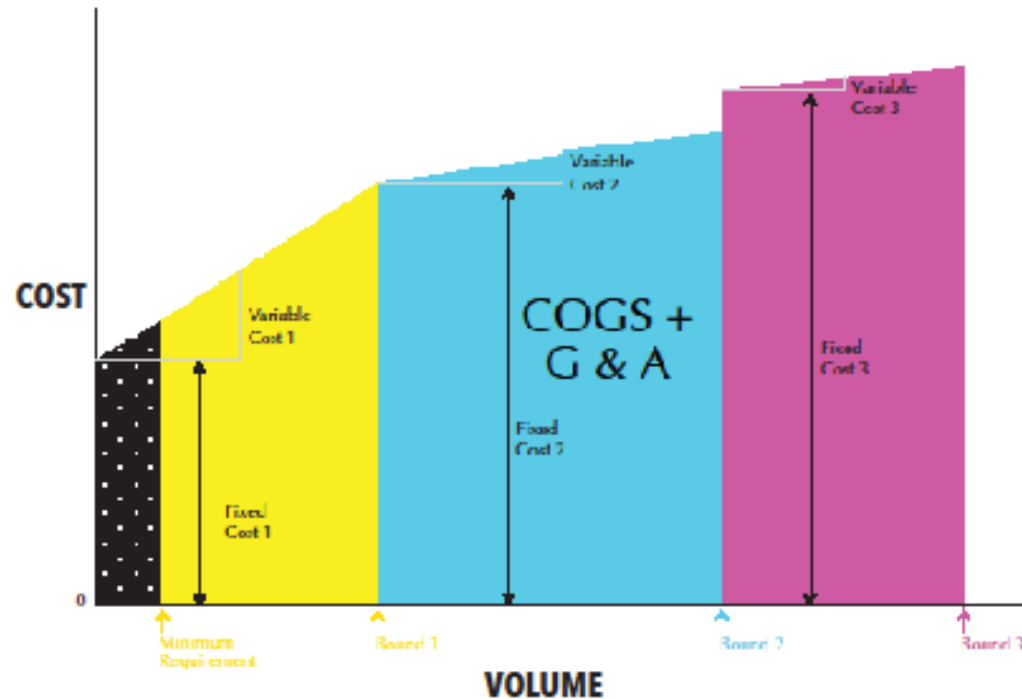
- Definition of the OIS mixed integer and linear math programming (MILP) model
  - $OIS = S$  (enterprise response functions) + COGS and G&A (supply chain network design model )  
NOTE: The S of SG&A will be referred to as the marketing communications budget (MCB), a term used in the most popular MBA, Keller and Kotler's *Marketing Management*, 16th edition, 2022.
- OIS's functional innovation
  - relaxes supply chain network design (SCND) models' assumption of a fixed forecast
  - By embedding enterprise response functions in the SCND model
  - These response functions are developed by non-linear math programming and must be linearized for integration

# OIS model structure



Supply chain network model structure is node/link

# OIS model data



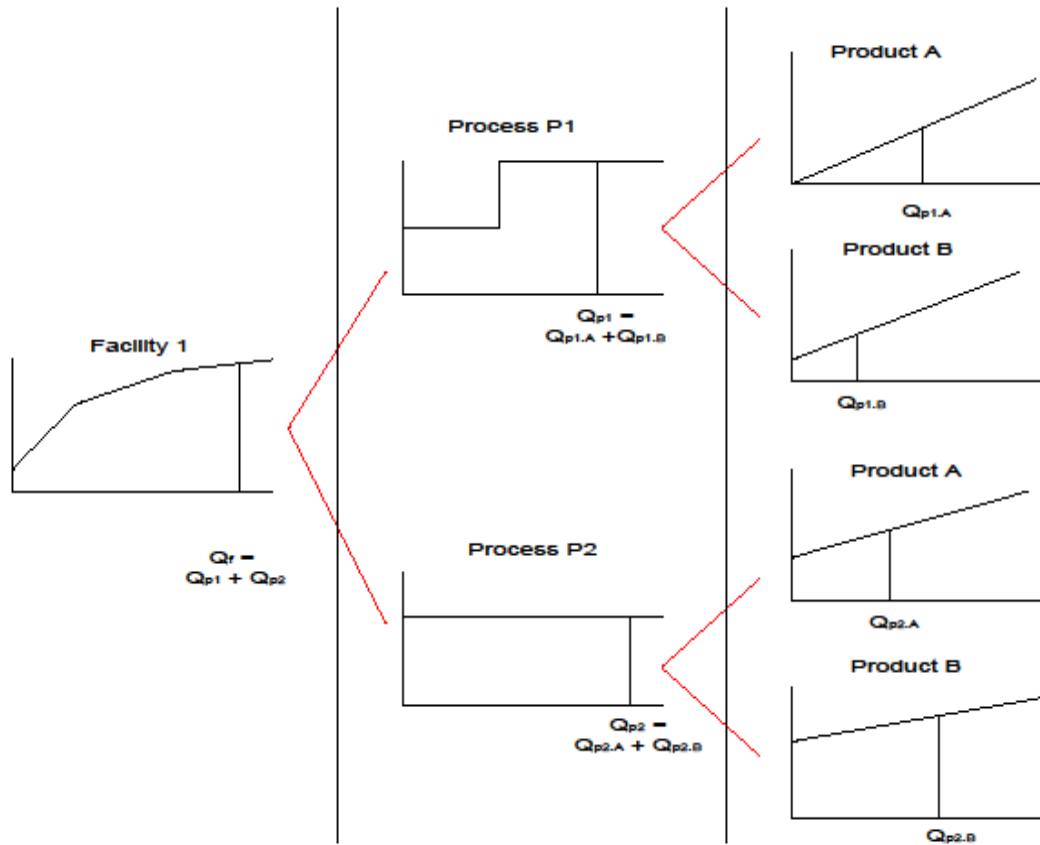
Costs functions: How supply chain network's process (a.k.a. activity or operation or flow) costs are modeled

# Importance of the next slide

- It illustrates how the product, process and facility costs are nested within the model
- This allows OIS to include ALL enterprise costs that have ANY relationship to volume in the model
- Thus, the only enterprise costs not included are those that are strictly fixed which have no impact on the solution

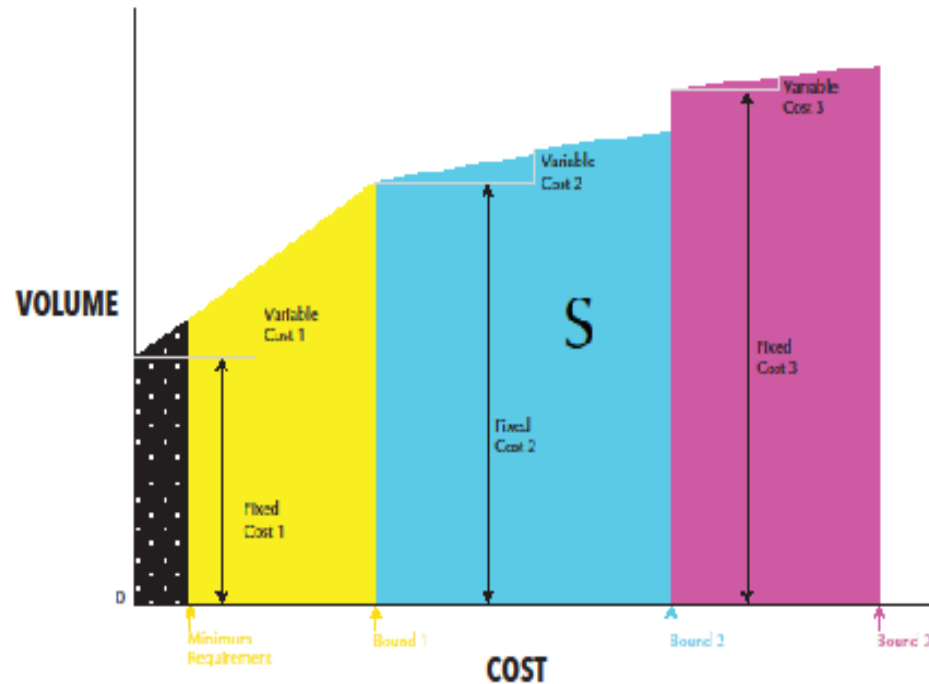
# OIS model data

## Cost Function Relationships Between Elements Within a Noded

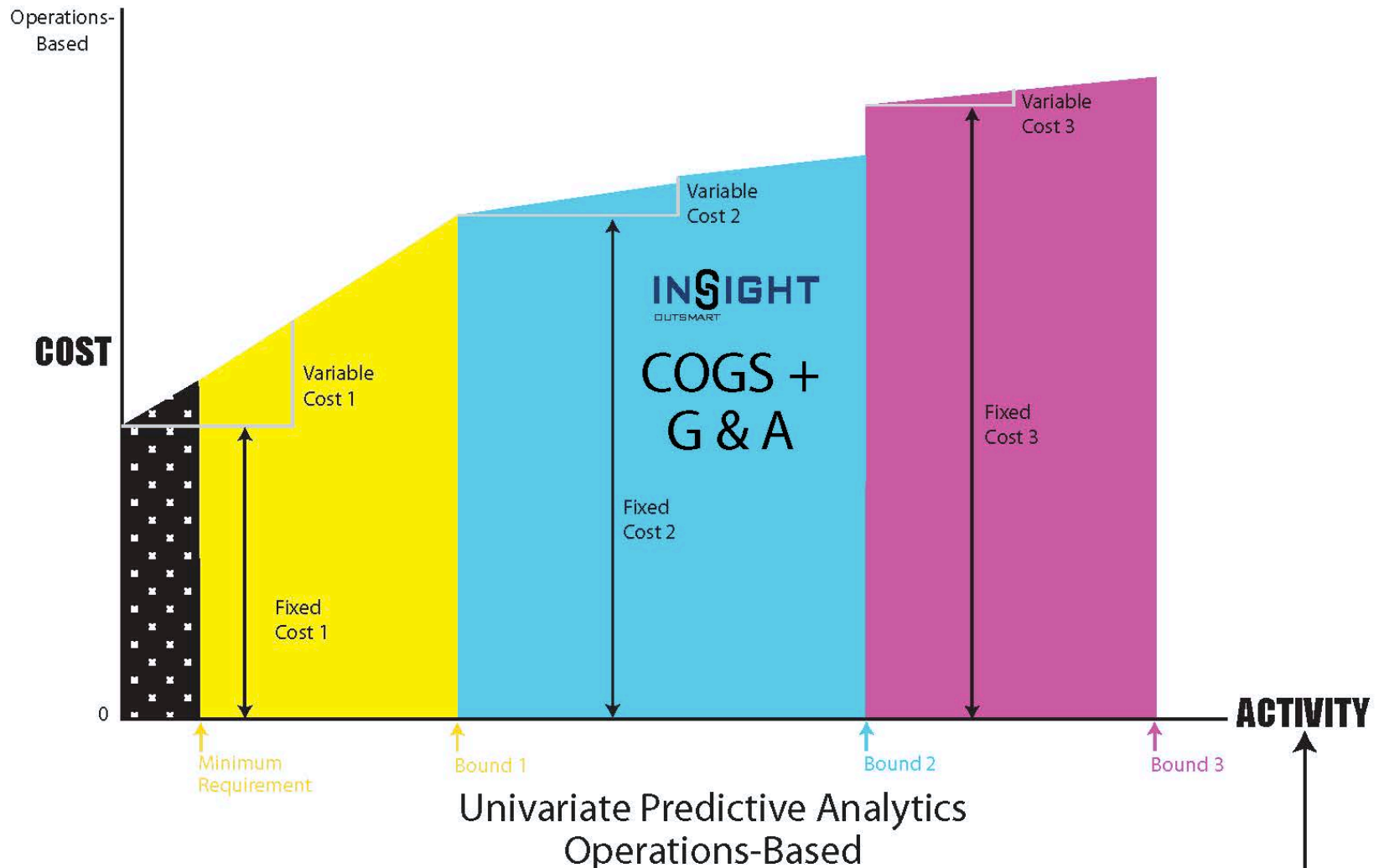


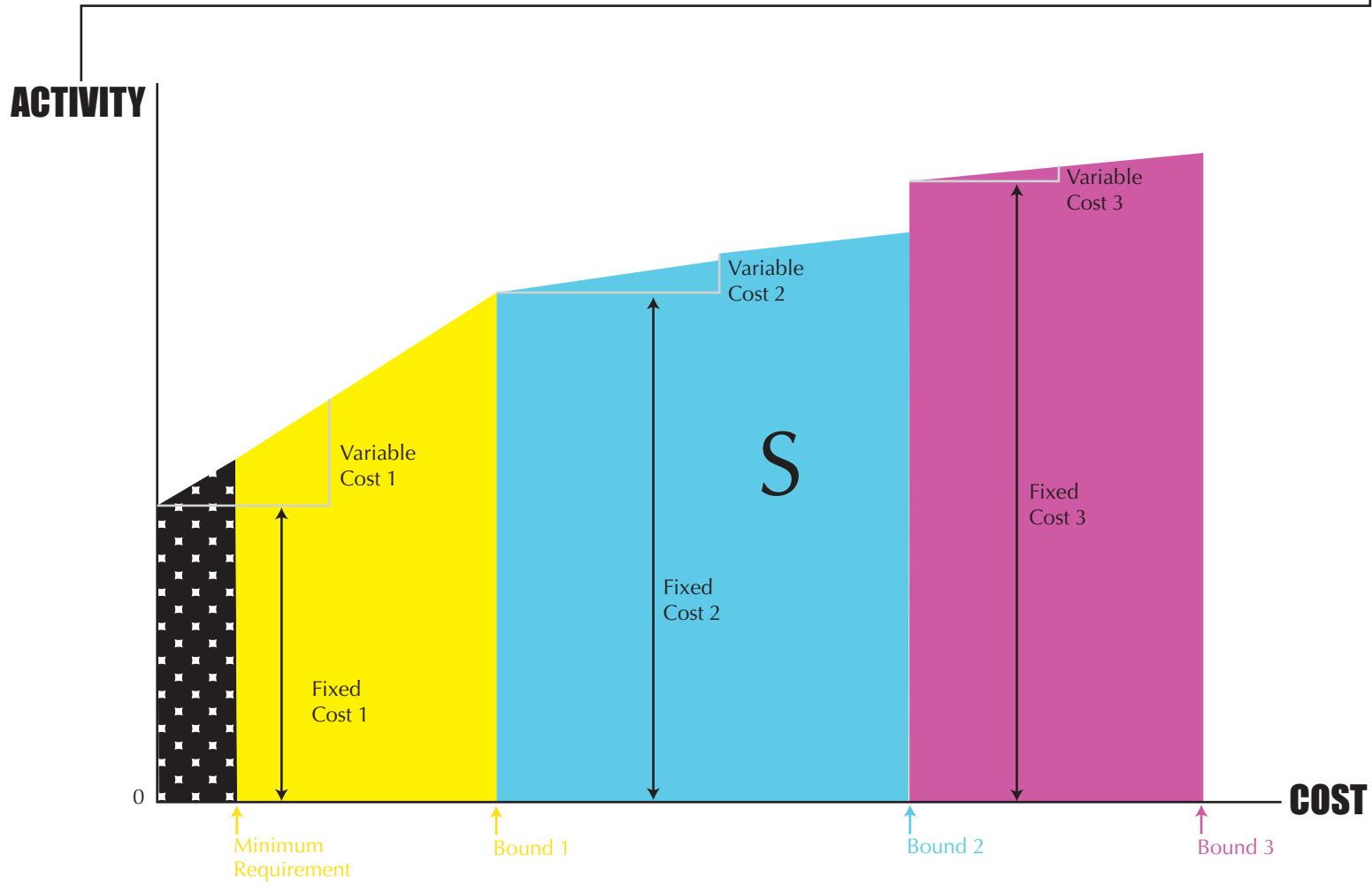
# OIS model data

- Enterprise response functions have the opposite cost/volume relationships of cost functions
- They have same product and demand aggregation as supply chain model
- Includes ALL the S of SG&A and no G&A expenditures
- Needs to be “linearized”



This foil illustrates the modeling fact that response functions are the independent variable in an OIS model and cost functions are the dependent variable. Thus sales and marketing expenditures drive the forecast just like the marketing theory says they should; a genuine first in marketing's maturation as firm value.





Multi Variate Predictive Analytics  
Demand Driven