

**Final Deliverable Report:**  
**Task 879.001: Intelligent Demand Aggregation and Forecast Solutions**  
**Project 879: Demand Data Mining and Planning in Semiconductor Manufacturing**  
**Networks**

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**Original Objectives:**

- Intelligent multidimensional demand aggregation/disaggregation strategies (Year 1)
- Forecasting methodologies for multidimensional aggregated demands (Year 2)
- Integrated demand aggregation/forecast prototype system (Year 3)

**Significant Changes in Directions:** None

**Most Significant Outcomes and Deliverables:**

- We have defined and developed an optimum Demand Planning Hierarchy (DPH) to support demand aggregation/disaggregation strategies for different granularities of planning activities.
- We have investigated the effects of making forecasts at different aggregated levels and provided guidelines to help practitioners determine the appropriate aggregated levels to make demand forecasts.
- We have also developed optimum methodologies to estimate the product-mix and therefore the methodologies to predict the disaggregated demands.
- We have designed and developed a DPH Planner software system that can be used to find the optimum DPH for hierarchical products. The software system also provide what-if analysis interface for practitioners to benchmark their current practice against the best practice and perform what-if analysis to tune their current practice.

**Participating students:**

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**Most Significant Publications:**

- “Aggregation and Forecasting of Interrelated Demands for Effective Operations Planning,” Argon Chen and Chia-Hua Hsu, *International Conference on Modeling and Analysis of Semiconductor Manufacturing* (MASM), Tempe, AZ, April 2002.
- “Semiconductor Product-Mix Estimation with Dynamic EWMA Scheme” Argon Chen, Kyle Yang, Ziv Hsia, *The 12<sup>th</sup> International Symposium on Semiconductor Manufacturing*, San Jose, CA, October, 2003.

**Significant References and Resources:** None

**Future Directions:**

- Investigating different DPH evaluation metrics.
- Incorporating business constraints and rules into the optimum DPH
- Implementing DPH planners in actual business settings.