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Challenges

PCB companies worldwide have to continuously reduce costs, increase quality and efficiency and have the required amount of redundancy for critical processes to stay ahead of competition. The usual approach of trying to accomplish this through continuous improvement of processes by way of standardization, simplification and automation of processes are often yielding incremental improvements that are good but not quantum improvements that are adequate and timely. The industry needs dependable service provider for quantum results to allow continued growth in the face of stiff competition.

Solution

Engineering services from Entelechy Global are specially designed for PCB companies fully leveraging our core competency in PCB and technology skills. Our front-end engineering services include:

- **Quote Data Processing (QDP)**: A Service that enables PCB companies to respond to RFQ's faster, and more accurately at reduced processing costs.
- **Pre-CAM:** A Service that enables PCB companies to outsource the initial manual data read in process and obtain data in ODB ++ or a similar format that feeds into their automated CAM process more efficiently.
- **Front End Engineering (CAM)**: A Service that enables PCB companies to outsource the entire CAM process and gain the advantage of reduced engineering costs, redundancy for critical processes, and infinite engineering capacity.
- **Post CAM**: A Service that enables PCB companies to outsource the generation of AOI / ET net-list outputs, routing programs, and fixture drilling programs from CAM data. This allows companies to outsource that part of CAM that has more slack time, as these outputs are required more towards the end of the PCB manufacturing process. This service also helps customers manage a one-time conversion of existing data when acquiring newer machines.
- **Product Engineering (PE)**: A Service that enables PCB companies to outsource product engineering processes such as loading ERP, PDM and Engineering Systems with product related information, while gaining the advantage of reduced costs, increased bandwidth, and much needed redundancy.

Benefits

- Reduced process costs that directly impact profitability.
- Much needed redundancy for critical processes.
- Reduced cycle times and improved response times to customers.
- Infinite processing capacity that manages the ups and downs in business more efficiently.
- Easier to manage one-time conversion/transition process when new machines / processes are acquired.

Capabilities

Quote Data Processing (QDP) activity generally includes the following; however, this is tailored to each customer's requirements:

- Download and screen customer supplied electronic data (Gerber files, drawings, etc.).
- Verify that the customer-supplied information is complete and the job is well within the pre-set manufacturability limits.
- Prepare and send a clarification note, as per an agreed template, if the information is incomplete or the job is not within the manufacturability limits.
- Complete a quote request form by either remotely accessing the quote system in use, or in a pre-determined format that can be easily or automatically read.
- Strict pricing rule confidentiality.

Pre-CAM activity generally includes the following; however, this can be tailored to each customer's requirements:

- Read customer supplied electronic data (Gerber files, drawings, etc.) in any recognized format
- Align all layers
- Re-name layers as per pre-determined naming conventions
- Assign layer attributes
- Drawn to flash pad conversions
- Contour drawn or filled areas
- Assign feature attributes
- Perform any other customer specific operations
- Prepare any other customer specific reports
- Output data in ODB ++, or any other customer specific format

Front End Engineering (CAM) activity generally includes the following; however, this can be tailored to each customer's requirements:

- Modify / Generate drill layer as per customer specific tolerances
- Etch compensation as per customer specific requirements
- Perform DRC as per customer specific parameters
- Repair DRC errors as per customer specific guidelines
- Slivers, acid traps and pin hole elimination
- Repair / generate solder-mask layer
- Perform silk screen (Legend) clippings
- Generate any other job specific layers and drawings (peelable, carbon, gold plating, via plugging, mechanical drawings, drill drawing, etc.)
- Create route profile
- Add customer and job specific logo's, markings, date code, etc.
- Palletize as per job requirements (create array)
- Panelize as per customer specific panel frames, and add any other feature as required
- Output and send completed files after thorough validation

Post-CAM activity generally includes the following, however, this can be tailored to each customer's requirements:

- ET net-list and fixture drilling programs
- AOI net-list output
- Any other customer / job specific drawings

Product Engineering (PE) activity generally includes the following; however, this can be tailored to each customer's requirement:

- We will assign a dedicated and experienced product engineer to perform any or all of the following operations:
    - Review customers supplied data (Gerber files, drawings, etc.) and perform manufacturability checks for complex jobs and report findings (for ITAR jobs, this would need to be provided as an output of your internal CAM process)
    - Work in close contact with customer's process engineers and forward job specific editing requirements to CAM engineers for complex jobs
    - Prepare panelization, stack-up detail, and all other part engineering details as per customer and job specific requirements
    - Enter this information into the current ERP / shop floor control system via remote access (VPN or 'Private Could'), or provide the same information in a format that can be imported into the customer's system.