Systematic Assembly Analysis and Planning Process

Understand context (addressed in more detail later)
management's objectives for the product or product line
production volume
cost
quality
model mix or evolution
schedule for going into production
status of the design: new, reused
character of the product, nature of the market and customers
customer expectations
nature of customer interaction with the product
reuse, upgrade

Assembly in the Small

Understand each assembly step in detail
the basic requirements
size, shape, weight, dimensions of each part
characterization of each mate between parts
special character of particular parts
assembly difficulty
handling constraints
gripping
feeding

Conventional Design for Assembly
part consolidation opportunities
part feeding difficulty
part handling difficulty

Identify high risk areas
part damage
wrong part
misassembly
safety or regulatory issues
tasks so hard only one person can do them

Identify necessary experiments
Recommend local design improvements

Assembly in the Large (aka Design of Assembly)

Understand the business context
product character and type of market
sales volume anticipated
model variety anticipated
plans for new versions
delayed commitment
supplier logistics and make vs buy
cost limits
labor costs and any regulations
cost calculation and ROI methods
ROI targets

Understand the factory context
labor conditions, training, shift policies
space and facility constraints

Identify system requirements
tentative cycle time
production flow and floor layout
feasible methods and equipment
required sensing and communication
required displays and controls
parts presentation
alternate assembly sequences
fixtures and parts carriers

Design a concept assembly system
  system architecture
  equipment selection and task assignment
  cost and economic performance
  simulation
    average flow and production rate
    uptime
    queues, blockage, starvation
    model changeovers

Make final recommendations
  additional design improvements
  line design or sequence options
  remaining risk areas