Decisions to Make at the Beginning of a New Product Development

Developing a new product or deploying a new system is tough to do well. There are hundreds of things to consider at the outset of the development, and just one poor decision can doom the entire effort.

I recently read a scholarly article[1] that claims that successful product development initiatives must start with a series of good decisions. The researchers attempted to identify what decisions have to be made and in what order to obtain the best outcome. They provide an extensive set of decision topics based on their research - literature surveys, analysis of case studies, and interviews with product development veterans.

The article serves as an interesting memory jogger of decisions that leaders should tackle at the beginning of a new development effort. I've summarized the list below. The full article is referenced at the end.

1. **Operational product or system –** *What are the features, functionality, and architecture of the product that we plan to design and produce?*
   a. Needs analysis – definition and validation of the problem to be solved by the product
   b. System analysis and concept design
      i. Concept definition
      ii. Concept evaluation
      iii. Concept validation
   c. System, subsystem & component requirements and design
      i. Requirements definition
      ii. Design definition
      iii. Test definition
      iv. Validation definition
   d. System, subsystem, and component test planning
      i. Strategy for verifying that system meets requirements
      ii. Strategy for prototyping
      iii. Strategy for testing the design

2. **System, subsystem, and component test –** *How will we test the design of the product and its components to ensure it is ready for operation?*
   a. Integration
   b. Verification
   c. System validation

3. **Life-cycle planning –** *How will manufacture, operate, support and maintain the product from first shipment to end-of-life?*
   a. Manufacturing
   b. Operation, support, maintenance, upgrades

4. **Development approach –** *How will we organize so we can design the product and get it ready for manufacture or deployment?*
    a. Management structure
        i. Project or program definition (project scope)
        ii. Stakeholder management approach
        iii. Program manager role and skills definition
    b. Program management approach
        i. Communication and information management
        ii. Resource acquisition
        iii. Program control approach
    c. Development approach
        i. Organizational structure
        ii. Definition of key development roles
        iii. Team composition, including required skills and experience
        iv. Tools, equipment, infrastructure, technology, and data resources
        v. Location of teams
        vi. Training

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[1] Robert Powell and Dennis Buede, *Decision-Making for Successful Product Development*, IEEE Engineering Management Review, Vol. 36, No. 4, Fourth Quarter 2008, p. 28-47