**Managing engineer:** The managing engineer is responsible for coordinating the overall system design and development effort. Although they are responsible for the success (or failure) of the design team, they must also be able to listen to other members of the design team.

They must be capable engineers and architects and able to confidently lead the design team without regularly resorting to draconian authoritarian means for leading the team. Such tactics do not work when leading talented engineers—the best engineers will simply leave under these conditions. They may also be the manager for the entire project as well; this is often a complementary role for this individual. However, in some large projects and organizations, there is a manager that is responsible for the design effort and other managers responsible for programmatic management activities. The managing engineer’s scope of responsibility will have to be tailored and defined to meet the needs of the project and the organization.

The managing engineer will plan, coordinate, track, and direct the overall activities of the design team. He or she is responsible for creating and maintaining the programmatic plans and schedules in both the period of uncertainty and the period of certainty.

**Support engineer:** The support engineer is responsible for setting up and maintaining the design team’s support tools and environments, such as development environments and tools, configuration management tools, test environments and testing tools, development infra-structure, Web presence, and so forth. He or she may also be responsible for the system or product infrastructure or environment. As such, support engineers will play a key role in the design of the system from a physical perspective.

**Chief architect:** The chief architect is responsible for overall system design. He or she will work with all of the other members of the design team to coordinate the system design, beginning with gathering the architectural drivers, designing the architecture, reviewing it, refining it, and documenting it until production and deployment—preferably throughout the system or product life cycle. The architecture and the chief architect can provide enormous value throughout the system or product life cycle in managing change and evolution.

The chief architect is responsible for coordinating the creation and maintenance of the architecture design documentation.

**Requirements engineer:** The requirements engineer leads the effort to gather and document the architectural drivers. He or she will also help to manage the change and evolution of the architectural drivers—preferably throughout the system or product life cycle. The requirements engineer will also serve as the primary customer liaison. It is essential that the designing and developing organization presents a single, united face to the customer. Nothing can be more frustrating to customers than constantly receiving incongruent messages from the organization designing and building their product. The requirements engineer will also assist the quality engineer in coordinating architecture design review and in defining “black box” system or product tests. This testing will be explained in detail later, but in short, black-box element and systemic tests are derived directly from the architectural drivers without any insight into the underlying implementation.

**Chief scientist:** The chief scientist is the project technologist and is primarily responsible for coordinating the planning, tracking, and documentation of experiments that are used to refine the architecture design. While the chief architect focuses on the overall system or product’s architectural design, the chief scientist focuses inwardly on technological issues that could impact the architecture. Generally, the chief scientist assists the architect with detailed technical issues concerning architectural design. In addition to a technical focus, the chief scientist assists the quality engineer in the architectural design reviews and in the development of “clear box” tests. This type of testing will be explained in detail later, but in short, clear-box tests are devised with an understanding of the underlying design and implementation details.

**Quality process engineer:** The quality process engineer ensures that ACDM and other defined processes are followed as prescribed to ascertain project quality goals are met. The quality process engineer is responsible for coordinating architecture design reviews as well as product test development, planning, and execution. The quality process engineer will work with the requirements engineer and the chief scientist to coordinate the architecture design reviews and in planning product or system tests. During architectural reviews, the quality process engineer is responsible for capturing, documenting, and tracking architectural issues uncovered during architectural evaluation, and that they are addressed and closed. The quality process engineer will also work with the team to establish the processes for configuration management, defect tracking, and so forth that the design team uses. These processes may also be used by the detailed designers or implementers throughout the production stage and for the life cycle of the system or product as well.

**Production engineers:** These are team members whose focus is on detailed design, implementation of the architectural elements, and integration of the elements to compose the system. The term production engineer has been selected deliberately to avoid bias toward software engineers, electrical engineers, IT engineers, or some other specific engineering community. Indeed, the production engineers of an organization may be software engineers, but the design teams often have software, electrical, mechanical, chemical, and many other kinds of engineers that play a role in the implementation of the system elements. In large organizations and projects, the production engineers may be a separate group or organization and may play a small role in systemic design. In smaller organizations and projects, all of the members of the design team may play a role as production engineers. Some production engineers may also participate in the design of the architecture, especially during stage 6 experimentation, when various proofs of concepts are developed to mitigate issues with the design. Production engineers also assist the quality process engineer in architectural design reviews and in system test as necessary