Many at NASA believe the myth that good engineers make good project managers. My twenty-eight years of experience in engineering and management have taught me that engineers are often poorly equipped to manage projects, but it isn’t always their fault.

Good engineers know a lot. They know how and when to multitask; they can focus on details as well as the big picture; they interpret requirements and make good judgments about which are necessary and which are merely desirable; they make educated decisions about risk; they are team players and listen to others’ opinions; they brainstorm, whittle down to viable options, and make decisions; they empower, mentor, and teach others; and they take and give constructive criticism. Many of these qualities are also essential for being a good project manager. So why don’t all good engineers become good managers?

A Difficult Transition
When I made the move from engineer to manager, upper management expected me to handle all project issues and concerns and report back plans to correct them. Trying to do that on my own, with no formal training, I ran the risk of becoming a micromanager and a stranger to my family. I eventually realized I needed help from my whole team. Sharing the load meant the project could be successful, and I could leave work at a reasonable time and have a family life. I also believe that letting my team know that I couldn’t do it all myself encouraged them to come to me when they, too, needed help on a particular task. No one ever told or showed me that this was something I should do as a manager—and must do to become a successful manager—and learning the lesson was painful.

I made mistakes and couldn’t avoid all the pitfalls that come with moving from a specialist role to a managerial one. During unfavorable (not constructive) feedback, I learned I was doing a poor job of managing my budget and schedule and that my team was filing complaints about me. That was tough to hear, but it told me what type of manager I had become. In some areas I was a “micromanager” and in others I was a “hands-off manager.”

One of my early projects as a manager involved a guidance system for a launch vehicle, which I let the contractor handle completely because, at the time, I had little guidance system expertise. At the critical design review, it became clear that the contractor had accidentally designed for a suborbital launch trajectory, which meant the vehicle would come back to bury itself in the earth, rather than an orbital trajectory. Had I taken time to familiarize myself with the system along the way, I could have caught the problem early on. I was paying too much attention to the areas with which I was most comfortable and familiar and avoiding the unfamiliar because it was uncomfortable, and I had a greater chance of messing it up. A tight schedule and low budget compounded the problem. At this point, I had two choices: proceed on my current path and more than likely continue to be unsuccessful, or acknowledge my error and get some help.

Instead of falling deeper into fear and ignoring the tough feedback, I asked the company vice president, who had been a
This article mentions different managerial archetypes. Below are qualities I have observed or experienced from each type.

**THE MICROMANAGER**
The micromanager seems never to delegate; always has to do things himself; doesn’t plan (and wonders why there is always a problem); looks to blame instead of encouraging results; performs crisis management; believes whatever is done isn’t done well enough; thinks there is never enough time to get anything done; seems to always claim the fame; rarely rewards subordinates; and is motivated by fear.

**THE HANDS-OFF MANAGER**
The hands-off manager seems to always delegate; never does things herself; asks others to do the planning; reviews very little work from her subordinates; approves everything either without reviewing it or asking questions about it; doesn’t understand why or what decisions are made, as she doesn’t make the decisions; seems to work in the shadows of others; may or may not reward subordinates; may or may not claim the fame; and is motivated by fear.

**THE EMPOWERING MANAGER**
The empowering manager delegates with an observant eye; shares in the work; works with others in planning; always looks ahead; empowers those that work for him; reviews work and suggests improvements; pushes those who work for him to step forward; encourages creativity; looks to solve the issues and not place blame; looks to do the right thing; manages time; and is motivated by confidence and trust.

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