

Case Study III:

1. Which of the agile concepts are applied here and how do they apply them?
 - o Timeboxing: The teams at NASA effectively used long-term timeboxing in an effort to ensure continual progress. JFK set the intimidating goal of a man on the moon “in this decade”. Setting a difficult but attainable deadline can be an effective motivating factor for the individuals working on the project. Without such a deadline, there is the illusion that the project will go on indefinitely, and progress suffers. NASA further timeboxed this decade into three large iterations: Mercury, Gemini, and Apollo. This further enforced that the teams were working towards a tangible release rather than some unspecified goal.
 - o Sustainable development, able to maintain a constant pace: From the beginning, the leaders at NASA devised a multi-generational plan. They knew there was an incredible amount of work involved, so they created a plan that solved the problem a little at a time over the course of a decade. This measured approach encourages slow, thoughtful actions rather than quick decisions based on partial information. The ability of NASA engineers to predict a huge number of corner cases and exceptional scenarios is one of the cornerstones that allowed the missions to succeed, and it might not have been possible without sustainable development practices.
 - o Working software is the principal measure of progress: The engineers at NASA didn't attempt to build a fully functional lander from day one. They devised a plan to research and build a series of new technologies that together would allow them to build a lander. These new technologies were tested along the way in the Mercury and Gemini missions, before the project goal was finally realized in the Apollo mission. These prior missions proved the technology was feasible, exposed a number of faults, and showed tangible progress to the engineers and the general public. Without these prior missions, the public would be unaware that any progress had been made for almost a full decade.
2. Name 4 of the agile techniques/concepts that might not be applicable or work well in this case study. Provide supporting rationale.
 - o Customer satisfaction by rapid delivery of useful software: “Rapid” is a bit of a relative term, however it would be difficult to describe the years these projects took to complete as rapid development. Building giant machines that fly into space is something that must be done slowly and carefully. Every corner case and exceptional scenario must be discussed and integrated into the design, so overly rapid development practices may not be a good fit.
 - o Welcome changing requirements, even late in development: Large-scale embedded systems, like spacecraft, are usually not amenable to later requirement additions. The physical hardware can sometimes take years to acquire, meaning large delays if hardware needs change. Additionally, late requirements make testing more difficult, as prior tests must be rerun in order to prove the new requirements didn't introduce any defects.
 - o Planning poker: the coarse-grain estimates that planning poker provides are sufficient for many software projects, but projects as large as the lander require a greater degree of accuracy. A panel of experts would probably be required, rather than a general guess from a member of the engineering team.
 - o Continuous Integration: The lander projects would require a more in-depth approval process than CI could handle. Usually, teams using CI might only require a quick peer review before pushing the code into the mainline. On the lander however, a large number of people would need to review the change in order to assess how it would behave in the countless mission scenarios.

Case Study IV:

3. How should Stoneham handle Mackenzie's concerns?

Stoneham should start by addressing some of Mackenzie's misconceptions about agile processes. Mackenzie claims that under agile he will “join a homogenized mass and be just like everyone else”. Stoneham could say that many of the agile principles are based around the concept of the individual. Each individual should be allowed to use their unique skills in any way that works best for them, rather than require each team follow a prescribed process. Many agile methods also focus on cross-functional teams, requiring a team with a diverse mix of skills. This is the opposite of the “homogenized mass” Mackenzie fears.

Mackenzie is also concerned that: “everyone is going to be interrupting everyone else on a regular basis because they won't be able to keep their ideas to themselves”. Stoneham could ask Mackenzie why he thinks everyone will disagree with his ideas. Mackenzie seems to be worried that even though he is experienced, if everyone knows what he's working on they will tell him his ideas are wrong. Stoneham could assure Mackenzie that he is a talented employee with good ideas, and the transparency will only catch the few moments where Mackenzie is wrong, not interfere when he is right. It simply allows someone else to check the work for mistakes, not argue about each little decision.

Next, Mackenzie states that the team won't follow the rule that: “any new requests are supposed to go through the proper channels”, which he claims will lead to chaos. Mackenzie seems to equate agile methods with being undisciplined, while the opposite is often true. Stoneham could state that agile methods can often foster discipline by removing some of the more rigid processes. Team members are now personally responsible for following proper practices, rather than relying on a manager or QA team to catch their mistakes. This practice encourages shared responsibility on both a team and individual level.

Finally Mackenzie closes with “Working conditions here have never been ideal”. This could mean that Mackenzie is actually ill-suited to working within an agile organization. This is not a bad thing, some people thrive within agile organizations, while others perform much better in plan-driven organizations. Stoneham believes agile processes are helping the company so he could close by offering Mackenzie two options. Mackenzie can either make an effort to work within the new agile methods, or Mackenzie can find another organization that better suits his needs. If the latter, Stoneham can say that there are no hard feelings and write Mackenzie a letter of recommendation if he wants. Stoneham certainly wants his employees to be happy, and sometimes that means the employee would be happier if they left the company.