

Technology Propagation

Case Study: Enabling New Technologies through Deep Partner Engagement



Introduction

Enabling an organization to access a new technology is at its most basic level, is closing the gaps between what is current and what is required. Identifying the gaps established the starting point in the plan. Gap analysis includes identifying all equipment, metrology, procedures, unit processes, and current operations that are not available to the organization. Once the gaps are established, planning includes scheduling the installation or creation of activities that close the gaps, and verifying that they deliver the requisite results. In situations where the gap closure includes unknowns, it is necessary to set up experiments and tests to solve the unknowns.

Challenge

We were asked to transfer an advanced wafer bonding technology to various partners. Previous efforts produced mixed results as the process consisted of sending some documents to the partner, answering questions as they came up, and waiting for them to develop the capability. This method resulted in delayed transfers or abandoned attempts resulting in the partner never succeeding. Part of the issue was an assumption that it was easy enough to copy the process, so a transfer required minimal interaction.

A true “copy-exact” situation is exceedingly rare and only occurs between organizations who have worked together for years and prioritized synchronization; therefore, each engagement is unique. Therefore, the engagement needs to be deeper and more thorough. A successful propagation of the technology comes from performing a comprehensive gap analysis of the partner, and having the breadth and depth of experience to plan closure for each gap. The technology itself required very tight specifications and extreme attention to detail. This meant establishing protocols, methods, and ways of operating that most organizations had not used in the past.

Action

We first developed a new strategy that focuses clear and detailed documentation, a coherent set of incoming and product specifications, and a comprehensive resource list. We developed a procedure for identifying gaps involving engaging with the partner as soon as it became apparent that they would want to acquire the technology. This involved querying everyone involved and scheduling site visit as soon as possible to start identifying gaps. As a picture of the competencies and gaps starts to form, setting expectations as to required resources, schedule duration, and scope of the engagement was key.

Establishing trust early on and convincing the partner of new ways of operating was paramount. In addition, the corporate culture in each organization requires tuning the interaction to effectively communicate the plan, manage interactions, and handle the inevitable unexpected deviations. This requires working with teams that have different cultural norms, team dynamics, and external factors. Once the primary gaps have been identified, it is then possible to come up with a list of technical milestones to provide a development path. The final preparatory step is a site visit review the technology, present a plan for milestone and resourcing, and converge on a plan with the partner.

Once the plan has been developed it is crucial to follow the plan and communicate frequently with the partner. Additionally, as occasions for new metrology arise, cross-calibration is important to ensure the partner is able to get the same measurements. Given our technical depth and knowledge of the technology and potential issues that may arise, we were able to guide the partner towards required experiments to demonstrate a solution or at least find the path to a solution.

Results

The program has successfully transferred the primary technology to both domestic and international partners. Plan execution has been steady, with all deviations solved in a timely manner, so that the programs have never been derailed. By the end of two of the engagements, the partner has come forward to express interest in further collaboration outside the scope of the original program, thus presenting additional commercial opportunities.