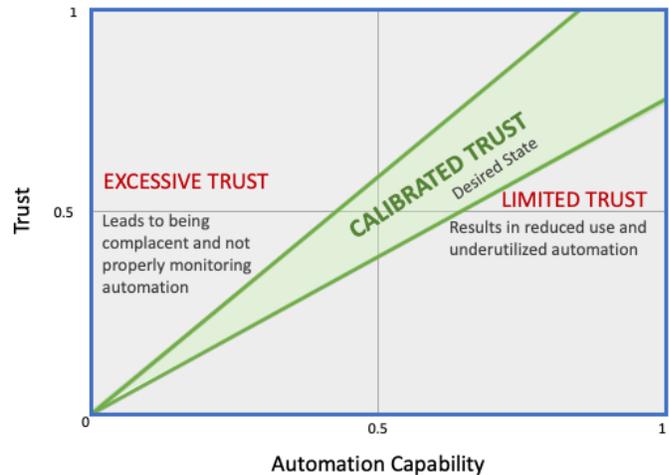


Trust in Automation Calibration Insights

What is Trust Calibration?

The impact of automation and trust must be balanced appropriately in diverse operational scenarios of an automation system. Calibration is that balancing mechanism whereby humans leverage machines more effectively throughout different phases of the automation life-cycle.

Humans must have an *appropriate level of trust* (calibrated trust) in automation systems. The goal of calibration is to avoid the negative impacts of no reliance, under-reliance, and over-reliance on automation by staying in line with what is considered appropriate trust.



Factors that Influence Calibration of Trust

The ability of an organization to calibrate trust depends on an appropriate assessment of their trust level (such as no trust, limited trust, calibrated trust, or excessive trust) of the automation system, which by itself is a difficult task, due primarily to the lack of direct measures. However, the factors that influence trust, can in most cases be ascertained, at least qualitatively. The IACD Johns Hopkins University - Applied Physics Lab team has proposed a 'Trust in Automation Framework' that identifies twenty influencers, in three different categories. Some examples of these influencers are technology attributes (transparency, reliability, timeliness, and sustainability), human characteristics (perceived accountability, self-confidence, perception of technology utility), and environmental aspects (workload, task complexity, and workplace culture). These factors, along with the desired/available level of automation contribution determine the need for and degree of calibration.

What Can be Done to Promote Trust Calibration?

Organizations can start by analyzing these influencers mentioned above, in terms of applicability in their environment, how observable (and measurable) they are, how they change over time, as well as changing operational contexts, in order to assess their priority and impact in the automation environment. The next step is to gather relevant data about trust perception/attitude (through a survey of relevant stakeholders), as well as observable functional and behavioral automation performance data, in order to assess the level, resolution, and specificity of trust. Once an assessment of trust is available, then organizational culture, including trust tolerance can be factored in to determine whether the system is operating within the range of calibrated trust.

Functional Examples

- An overwhelming workload on analysts may lead to over-relying on automation and thus analysts become complacent, not monitoring the automation performance. An organization in this situation may choose to respond by offering training, which enhances understanding of automation, perception of utility, and individual accountability to get to the calibrated trust level.
- Conversely, influencers such as fear of task complexity or lack of perception of utility may lead users to under-rely on automation. In that case, an effort to make better use of automation features, log/audit (to enhance transparency) and collecting data measuring the timeliness, sustainability, and reliability would potentially get them back to a level of calibrated trust.

Contact the [IACD team](https://www.iacdautomate.org) or [visit our website](https://www.iacdautomate.org) to learn more about our Trust Framework, reports and upcoming tools on this topic.

[http:// https://www.iacdautomate.org](https://www.iacdautomate.org)

[@IACD_automate](https://twitter.com/IACD_automate)

[in https://www.linkedin.com/groups/860811](https://www.linkedin.com/groups/860811)

icd@iacdautomate.org