



Te Matataua

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The OODA Loop Revisited

"History records that the military officer with the most refined situational awareness was the Duke of Wellington whose victory against Napoleon Bonaparte at Waterloo in 1815 was entirely attributable to his great courage and ability to read the face of battle."

Ian MacFarling, *Air Power Terminology* book

Colonel John Boyd was a USAF fighter pilot who flew in the Korean War and was an instructor at the Fighter Weapons School. He was an exceptional flyer who believed in his abilities, smoked cigars and talked in a loud animated manner. At the warfare school he had a standing bet with pilots that in forty seconds or less, he could beat any pilot in simulated air-to-air combat. If he lost, he would pay the winning pilot \$40. He never lost.

Boyd later undertook an undergraduate degree and while studying thermodynamics, he had the insight to develop his famous Energy Manoeuvrability (E-M) theory that enabled pilots to evaluate their energy potential and that of their opponent. Winning required managing the energy of your aircraft to your best advantage during turns because it slows down and loses altitude. Boyd used E-M theory when he was part of the team designing the new generation lightweight manoeuvrable fighter that became the F-16.

The underlying basis of E-M theory helped to form his equally famous OODA loop as a way of explaining how to get inside your opponent's decision cycle. Once you are there and moving faster than your enemy, you have the initiative and are unlikely to lose it. The OODA loop is divided into four stages: Observe and interpret the situation, Orient yourself to the condition and intensity of the situation (which includes knowing cultural traditions and previous experience), Decide what response to take, and put that response into Action. The result of each stage leads to the next and the Action element of the loop feeds back to influence the next observation.

The commonly viewed OODA loop is a simplification of Boyd's ideas in that each part of the loop can feedback to other parts and each part has an expansive set of considerations.

For fighter pilots of the day, the most important effects were surprise and speed. The aim is to disorient the enemy by some surprising act on your part, so they have difficulty making subsequent decisions and then taking action against them. This would then mean that your OODA loop is moving faster than theirs, and you would win the encounter.

The OODA loop can be applied to many military situations, including longer timescales. For example, in airborne Anti-Submarine Warfare (ASW), detection of a submarine can take days; as can coaching a trainee to improve their performance.

Through considering what cues are being observed or ignored; what expectations you are orientated to, what goals you aim to achieve and what courses of action you could take; you are developing your awareness of a situation. These attributes, while similar in concept to the OODA loop, have subtle differences that lead to an updated model.

Situational awareness (SA) can be divided into three main stages: perception of the environment, comprehension of the implications of the environment, and projection, which is the ability to make predictions about the immediate future based on what is perceived and understood about the situation. Those predictions are turned into decisions and actions that address the operational environment.

The situational awareness model described in this bulletin is shown below¹ and is slightly adapted for this bulletin.

Situational awareness is fundamental to air power. It is a critical outcome and process when undertaking operations and complex activities. It can be improved through active reflection on experience, successes and failures. For example, personnel who have deployed in disaster relief operations are likely to have greater situational awareness from the outset and, therefore, make better decisions than a person who is attending their first crisis. By reflecting on experiences, personnel enrich their mental models about a situation, which improves their ability to comprehend and predict the outcome of an unfolding situation and, therefore, make better quality and timely decisions.

The following questions will help you and your team learn and be able to coach others about the lessons of your experience:

- What cues were observed or ignored?
- What expectations were you orientated to?
- What goals were you aiming to achieve, and what courses of action could you have developed?

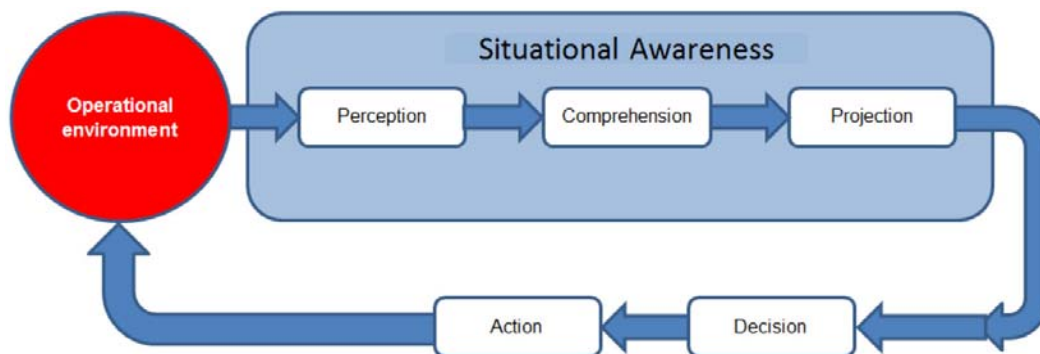
Raising and submitting well thought-out post activity reports (PARs) into a lessons-learned database and analysis program also helps to pass on experience. It is essential therefore that the lessons-learned database is researched prior to deploying, and subsequent training and planning activities are updated and enacted in respect of those lessons.

Key Points

- John Boyd's OODA loop is still a useful tool for developing SA and teaching others to improve their SA.
- Building and maintaining SA is essential to quality and timely decisions.
- Future SA can be improved through exposure to a range of experiences, followed by active self and team reflection; feedback and updated training are essential.
- Identifying and sharing lessons learned through PARs will improve SA.
- Review PARs from similar missions to build your SA.

Reference

1. **Head Strong** How Psychology is Revolutionizing War. Michael D. Matthews, Oxford University Press 2013.



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