Skunk Works

JOHN BESSANT
Managing Innovation

Skunk works case

In June 1943 the war in the air over Europe was intensifying. And one particular threat emerged which sent shock waves around the Allied forces – the appearance in the skies of the Messerschmidt Me262 *'Sturmvogel'* (Stormbird), the world's first mass-produced jet fighter/bomber. Back in August 1939 the jet-engined Heinkel He178 had successfully flown along the Baltic Sea and this provided the prototype for extensive development leading to the twin-engined Me262 capable of speeds of over 600mph, way beyond the capability of any existing Allied aircraft.

In the USA the response was an urgent request by the Air Tactical Service Command of the Army Air Force to the Lockheed Aircraft Corporation to develop their own plane. The task was given to a small team of engineers including Clarence 'Kelly' Johnson and they began working on building an airframe able to carry the British designed Goblin jet engine. The XP-80 project was given the go-ahead a month later; they didn't actually receive the full contract until October but by then they had almost completed the design! The contract gave them six months to deliver. In 143 days from initial request the team built and flew the plane, christened *'Lulu Belle',* a full month ahead of the (apparently impossible) schedule. The P80 Shooting Star had managed to fly at over 500mph, at the time the fastest achieved by an American plane.

They achieved this impressive creative feat by working in a very different mode to the mainstream organization. Many of Johnson's team had experience of similar projects in the past within the giant corporation and had learned the value of autonomy, clear and stretching goals and shared focused creativity. For example back in 1938 they had built a high speed high altitude fighter plane which became the P-38 Lightning – a strange twin-boomed design which performed extremely well. Kelly Johnson had run this project under conditions of secrecy, walling off a section of the factory and only allowing people directly involved to enter. The design involved challenging many principles in aerodynamics and airframe design; the result was the world's fastest fighter capable of 400mph speed.

The team working on the XP80 project followed the same principles and were located in a temporary facility using an old circus tent pitched on the far side of the giant airfield at Burbank, California. The tent still smelt of the animals it had once housed and one team member gave their workplace the nickname 'Skonk works' named after a comic strip called 'Lil Abner' which featured a mysterious hut in the forest called the Skonk Works' where illicit liquor was brewed from skunks, old shoes and other strange ingredients. The association of the smell in the tent and this allusion to the comic strip led to their adopting the name 'Skunk Works' –

which has stayed with Lockheed as a convenient label to describe their challenging creative projects team.

Johnson's approach to leading the team stressed the need to preserve autonomy particularly in relation to senior management control and interference. In part this was the result of necessity; Lockheed were working flat out producing planes for the war effort and so Johnson was forced to make do with whatever resources he could squeeze out of the system. There was no space available at the Burbank facility so the team had to work in a temporary arrangement involving an old circus tent attached to an outbuilding. In effect Johnson was forced to build what we would recognise today as a 'lean' project team, with a small staff and a lot of cross-boundary working, bringing design and production people together early and co-locating them.

He developed a set of 'rules' which governed this approach – elements included keeping teams much smaller than the normal engineering teams in the company and preserving their separation from the rest of the organization. An important element was the contractual right to perform the testing and prototyping – in other words being able to experiment and fail, learning by doing. Kelly's motto was '*Be quick, be quiet, be on time*' and to help achieve the latter against a very challenging deadline for the XP80 the team had a big calendar on the wall which counted down the days left in the project – effectively maintaining the focus on the a stretching target. Much of his leadership consisted of creating conditions of what we would recognise as psychological safety enabling his team to challenge and often break rules in pursuit of what were often apparently impossible goals.

For example in 1955 the company began the first of a series of projects for the CIA – essentially top secret challenges around very fast spy planes which could fly very high and avoid enemy radar detection. Creating invisible aeroplanes is a pretty stretching target, not least because it called of challenging some of the basic laws of physics in the process! The famous U-2 spy plane was one of their early successes and the long range SR71 Blackbird emerged from that experience, operating for over thirty years as the worlds fastest reconnaissance plane capable of flying at the edge of the atmosphere and at speeds of over 2000 mph. Further work led to the team achieving the impossible – pioneering and using 'stealth' technology they managed to create an aeroplane practically invisible to radar!

The idea of a 'skunk works' team working apart from the mainstream became popular with other organizations (although Lockheed carefully protect the trade mark and name) and amongst others IBM used the approach in 1980 to break free from the mainstream large company culture of a mainframe computer company to build the highly successful PC. Apple did something similar in 1983, setting up a team to work on a very different design to their current Lisa model. Steve Jobs is quoted as saying at the management away-day which led to this that 'it's better to be a pirate than join the Navy' and this metaphor stuck, with the team who went

on to produce the MacBook even flying a pirate flag above their offices as a symbol of the challenging approach they wanted to take, different from what was becoming a mainstream culture at the company.

Similarly Motorola’s iconic and highly successful Razr design was developed in a new laboratory that the company set up in downtown Chicago, 50 miles from its main R&D facility in suburban Illinois.