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Sling Aircraft: gearing up for the big time

McEdward Murimbika, Claire Beswick and Richard Thomson

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Despite the upheaval caused by the COVID-19 pandemic, 2020 had been productive for South African small-aircraft manufacturer Sling Aircraft. Globally, sales of its aeroplanes had increased and the company had just finished a development prototype of a high-wing four-seater. Now, in January 2021, founder Mike Blyth and his business partners, James Pitman and Andrew Pitman, felt certain that there was space in the market for a five-seater aeroplane, and they were meeting to discuss how to set up the business for success, so as not to put all the hard work of the past 15 years in jeopardy.

Background on sling aircraft

Founded by Blyth in 2005 when he started to develop a low-wing two-seater aeroplane, Sling Aircraft currently produced experimental two-seater and four-seater, low-wing aeroplanes and now the four-seater high-wing (see Exhibit 1 for Sling's product range in 2021).

Experimental aeroplanes (called "non-type certified aeroplanes" in some countries) contrasted with type-certified aeroplanes, which had to go through a complex and costly certification process with country aviation authorities. This certification indicated that the aeroplane complied with all the specifications for a particular type of aeroplane and froze not only the aeroplane configuration but also its production methods. Every deviation from the design or production methods had to be approved (Science Direct, 2024). Certified aeroplanes had to be manufactured in a certified facility and were expensive to build, among other things, because of all the controls that had to be in place and the number of qualified staff necessary to oversee the process (Beswick, 2020b). Certified aeroplanes could be used for both commercial and private purposes.

Experimental aeroplanes could be used for private purposes only. It was still necessary to obtain approval for the design of the aeroplanes from the relevant aviation authorities, but the requirements of the manufacturing process were not as rigorous. They could be sold in two formats: ready-to-fly, where they were built by factories licenced to do so, and in kit form for private individuals to build. Aviation authority inspectors inspected kit-build aeroplanes at critical phases of the build and then test-flew them before licensing them to fly. Experimental aeroplanes were far less expensive than certified aeroplanes and therefore far easier for private individuals to own (Beswick, 2020b).

Blyth had designed all of Sling's aeroplanes and the company produced them at its factory at the Tedderfield airstrip, south of Johannesburg. The market for its aeroplanes was global, however, with most of the company's sales happening in the USA (Beswick, 2020). The past year had been the company's best ever, despite the disruption caused by the lockdown (see www.youtube.com/watch?v=fVuX5DJCdTs).

Confident of the quality of Blyth's aeroplane design, the three partners were convinced that there was space in the market, especially in the USA, for a five-seater. Their aeroplane would compete directly with the Cirrus SR 22 T, a fully-certified five-seater first launched in

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2001. As such, producing a five-seater could take Sling into the more complex and costly realm of building certified aeroplanes, because this was where the biggest market was (Beswick, 2020a). Although the company had changed incrementally over the years, they knew that the move into building certified aeroplanes would be a big one for their company, which had started out as Blyth's rather crazy dream.

Origins of Sling Aircraft

Blyth was an entrepreneur by nature, having started a number of companies in his career. Describing himself as "a designer, a pilot and a businessman", he had found the university environment to be too restrictive, dropping out of his architecture studies at the University of Pretoria and obtaining his first job as a mechanical engineer at motor manufacturer Chrysler. "They put me into studying mechanical engineering at technical college. But again, I never finished that, because I wanted to get on with working and just making progress. I just felt my brain was too far ahead for that. So I went to work at a company making truck bodies and tippers and trailers," he said.

After working there for a few years, he started a business designing and making truck bodies and trailers, as well as tippers and truck tractors. "Because my focus was engineering, I thought that if I did perfect engineering, and because I was making a superb product, I could price it high and the money would take care of itself," he said. "It didn't. And I went bankrupt after three years." Through this process, he learned "a big lesson – that if you want to be a businessman, you have to look at the money first. Because if the money doesn't work, nothing works. But if you can get the money to work, then everything can work."

Shortly after the truck business folded, in about 1984, a friend introduced him to microlights and it was then that Blyth's love of flying began. He started designing microlights a year later. By the following year, he was involved in manufacturing microlights. He went on to start a microlight import business in 1993, which he sold in 2003 when he felt that he wanted to move on to something different.

The idea for Sling Aircraft, which he originally called the Airplane Factory, arose in 2005 when there was a change in the market for Rotax aeroplane engines, which he had the licence to sell in South Africa, and his sales started to fall. At about the same time, the Federal Aviation Authority (FAA) in the USA opened up an experimental category for light sport aircraft (LSA) (FAA, 2021). South Africa's Civil Aviation Authority (SACAA) had recognised non-type certified aircraft for some time, but the market for them in South Africa was very small, making it unviable for Blyth to consider building such planes for this market alone (although SACAA had subsequently noted that this segment had "grown exponentially and become a fully-fledged industry in its own right".) (Fisha, 2015).

There had long been a market for small private aeroplanes in the USA, however, and the introduction of the experimental category in that country, therefore, presented a huge opportunity. The cheaper cost of experimental aeroplanes would open up a market of private individuals who wanted to own an aeroplane but who had not previously been able to afford one. "So I decided I was going to make an aircraft that I would be able to export out of the country and sell locally, and grow into quite a large business," said Blyth. His plan was to sell his Rotax engines into this business.

He employed an engineer and a draftsman and poured all of the money he had into designing and developing the perfect two-seater LSA. However, in 2007, he ran out of money. So, he approached the Industrial Development Corporation (IDC) for a grant, which he later obtained. He also persuaded his good friend James, whom he had met because of their common love of adventure, to invest in the business as a 50% partner.

An unlikely partnership

Although he and James shared a common love of adventure, James, who was a lawyer by profession, did not have an entrepreneurial background. In 2004, he took up a position at a uranium exploration business that was listed on the Alternative Investment Market of the London Stock Exchange and later on the Toronto Stock Exchange. Share options came with his package. "I was there for two years and two days, and the company was sold for a lot of money," said James. "For the first time in my life, I had a lot of money and I was looking for something else to do." This was in 2006, at about the same time as Blyth was looking for a partner for his business.

"I wanted to make a shift from professional to business and entrepreneurial. So I joined him," said James. By that stage, Blyth had put R1.5m into the business. James put in another R1.5m and used his assets to obtain a bank loan. At that stage, Blyth had not yet started to build the aeroplane. The money that James put in, coupled with the loan, enabled them to buy the machines they needed to start building the development prototype.

To help them with the build, they brought in a friend of theirs who had worked for another aeroplane company and who "could do anything with his hands" said James. Together with two factory workers, they built the aeroplane and then test-flew it on 18 October 2008. "We flew 42 hours in that little aeroplane," said James, "and in February 2009, we retired it and started to build our production prototype. We built serial number 002 in a six-week period. It was essentially the same, but there were a few little changes."

Having completed the production prototype, Blyth and James embarked on what was to become a tradition for subsequent production prototypes – a flight around the world. "We got into the aeroplane on 18 July 2009 and we took off to fly in eight days to the world's biggest air show in Oshkosh, Wisconsin [in the USA] to show it off," said James. "We did the longest straight-line flight ever in a small aeroplane. We went through storms and all kinds of hell, but it was hugely exciting. We then flew back around the world. The whole trip took us 40 days and nights." (See www.youtube.com/watch?v=jkvP3q_sea0 for James's account of that trip.)

By the time they came back, they had two orders: one for a kit and one for a ready-to-fly aeroplane. "We thought that by the time we got our prototype going we would have an order or two. But that didn't happen," noted Blyth. "We had to fly our prototype around a little bit first." Needing more space to fulfil these and subsequent orders, they moved the company from an airfield in Springs (east of Johannesburg) to the company's current premises in Tedderfield.

Remembering the early days of his partnership with James, Blyth noted: "It was a very interesting dynamic that James and I had. I was an entrepreneur and I had a whole lot of businesses that I'd tried. Being an entrepreneur, you have to be an optimist. You would never do it otherwise. For me, because I knew my abilities by then and I had absolute, complete confidence in myself, there was never a question that we weren't going to succeed. I'd cut my teeth learning how to make a business work. I had been designing microlight aircraft, I'd won the world championship [1]. I was an extremely experienced pilot. I knew I could produce an aircraft that would be exceptional. My design abilities had been fine-tuned for the previous 20 years or so. So I knew all of that. And so it was just a matter of how long it would take."

> James on the other hand, kept using the phrase, 'If we make it,' which used to infuriate me. Because it was never a case of 'if we make it'. From my perspective, you only fail if you stop trying. Because I'd been in the industry for so long, I knew what the industry entailed already. I knew what the opposition was doing, how many aircraft were being sold. I did worry a little bit about the money. But as it turned out, it worked out fine.

James admitted that he and Blyth were not always of the same mind and that this had led to some lively debates over the direction of the company. He believed, however, that this testing of ideas had been good for the company overall.

Andrew Pitman joins the business

Andrew, James's younger brother, joined the business in 2011. He had just returned from a stint in London, where he had worked as an account manager for a design company that produced annual reports for companies listed on the Financial Times Stock Exchange. He had moved there after obtaining a marketing diploma from the Institute for Marketing Management and completing some additional studies to convert this to a bachelor of commerce degree. When he returned, because Sling Aircraft had no accounting systems in place, James asked him to come and spend a month or two helping the company to set up an accounting system and complete its first-ever tax return.

"I had no immediate plans and I did not need a job because I had saved some money," Andrew recalled. Still, the opportunity appealed to him – even if the monthly R10,000 salary was a pittance in comparison with what he was earning in London. "It was a huge change for me," he said. "I'd been going to work on the London underground wearing a pin-stripe suit. Now I was riding a motorbike to work and wearing a T-shirt and shorts." He loved it.

Andrew spent three months getting the company's books in order and while he was doing this, Blyth and James were building the prototype for Sling's first four-seater aeroplane. Because they had flown their first two-seater around the world, they decided to do the same with this aeroplane. "So literally, in my third month here, they packed up and got into this aeroplane to spend 40 days flying around the world. And they asked me to stay here and hold the fort," said Andrew:

> During those days while they were away, I discovered what it is like to run a whole company. Back then, we had two hangars and about 80 people. I knew nothing about aviation. But I really enjoyed the job. So when they got back, I told them, 'I want to be part of this thing. I'm not going to do your books, because there is nothing in the world more boring. But my history is marketing. Let me run your marketing for you.'

Not long after that, Blyth and James asked him to take on the role of chief executive officer (CEO). He agreed and obtained a 10% share in Sling Aircraft in the process. Since then, the three of them had run the company together. Andrew noted that they were each very different and that this was to the benefit of the company. "It brings balance to the situation. Some of us are extreme in certain ways, but we balance each other out quite well. So we have worked very well together over the years and are very good friends," he said.

Building new models

The philosophy behind Blyth's aeroplane design was that it should be extremely user-friendly. "Our aircraft really are usable. It's not like some of these aircraft that you have to squeeze into, where there is no place for luggage and the furthest you can fly is from here [Johannesburg] to Bloemfontein," he explained. "With ours, there is lots of space, and you get in and you can fly from here to Cape Town non-stop. And if you can't land in Cape Town, you can still turn around and you can go and land in Knysna. So it's really usable."

It was this usability and strength of design that prompted a Belgium-based aeroplane parts company, Sonaca, to approach Sling in 2013 with a proposal to use its two-seater as the basis for an aeroplane that Sonaca would certify with the European Air Safety Association. It achieved certification in July 2018. Sling provided all the engineering expertise and built the airframes at its factory in Tedderfield. The company then shipped the frames to Belgium, where Sonaca added the engine, the instrument panel and the wheels before test-flying and selling the aeroplanes.

Being part of this venture had highlighted to Sling the vast differences between building certified and experimental aeroplanes. The cost to the consumer of the certified two-seater was $235,000, almost double the $120,000 that Sling charged for the experimental counterpart. Net income on a certified aeroplane would be 35%, whereas on an experimental aeroplane it was 15%. However, to comply with certification regulations, Sling

had to build the aeroplane in a separate hangar and ensure the complete traceability of parts. Moreover, the production process was much slower: Sling's two-seater kit-packing department employed three people and packed 13 kits a month; the Sonaca department employed eight people and packed three aeroplanes per month.

Developing a four-seater

The idea for the four-seater, in which Blyth and James flew off shortly after Andrew joined the company, germinated on the round-the-world flight in the two-seater. That aeroplane had to carry a massive amount of fuel to cross the oceans as it did. Blyth and James realised on this trip that the two-seater flew very well with the equivalent weight of four people in it. Andrew observed that developing the four-seater was "a very easy, natural progression," adding, "They took the two-seater, extended the fuselage by about 40 cm and each wing by 40 cm and made a four-seater. That was the second model."

In 2018, Rotax introduced a much more powerful engine that, fortuitously for Sling, was the perfect fit for its existing four-seat airframe. This was a game-changer for the business, leading to the development of the Sling TSi, the company's best-selling aeroplane in 2020 (see Exhibit 2 for details on the sale of Sling's aeroplanes since the company's inception). Andrew explained: "We were selling this four-seater with a 100-horsepower engine in it. Rotax came to us and said that the next engine they were making was 140-horsepower – so 40% more powerful. And what's really lucky for us, is that there is absolutely zero competition in the whole world for this aeroplane right now. It's a disruptor for us. The manufacturers out there are scrambling to bring out a four-seater with this new engine. But we were lucky. We were there first. There are lots of four-seaters, but none like ours."

> It's the type of advantage that we will be able to maintain, because while other manufacturers are still scrambling to develop their own four-seater that works with this Rotax engine, we are developing our second model. And we've gone through the trials and tribulations and testing and the learning curve.

(see https://generalaviationnews.com/2019/03/04/flying-the-sling-tsi/ and www.avweb.com/features/kitplanes-flight-review-sling-tsi/ for reviews of the Sling TSi.)

The introduction of the new Rotax engine presented another opportunity for Sling and come 2021, the company launched a high-wing four-seater. All of Sling's previous designs had been low-wing aeroplanes (see Exhibit 3 for information on the Sling 4 high-wing). Sling's plan with this aeroplane was to take a piece of the market dominated by the Cessna 172 Skyhawk, a high-wing four-seater first produced in 1956. *Popular Mechanics* said of this aeroplane in 2019: "With more than 43,000 Cessna 172s sold since the aircraft's first production year in 1956, it is hands-down the most successful airplane ever to hit the market" (Hollings, 2019).

Sling believed that there was a gap for a more modern, four-seater design. "There is no great, little, modern, four-seater high-wing airplane on the market," said James. "We have the perfect engine. We have a great low-wing and it's not been very difficult to convert to a high-wing. So it's a perfect opportunity for a niche that needed to be filled. We feel like we are going to kill it with this aeroplane." Sling had already received 15 orders for the high-wing, even before it had built the development prototype. The company finished the development prototype in December 2020 and started test-flying and making minor adjustments to the aeroplane, with a view to go into production by March 2021. Blyth believed that the company could have between 30 and 40 orders for the aeroplane within the next three months, which would take up the first year's production capacity completely.

Growing global

Blyth's motivation for starting Sling Aircraft had been the potential he saw for experimental aeroplanes in the US market. In the early years, however, most of the company's

aeroplanes were sold in South Africa. This only really changed with the introduction of the Sling TSi. It was then that the international market started to grow substantially (see Exhibit 4 for details on the distribution of sales of Sling's aeroplanes). Thus, whereas overall 40% of Sling's aeroplanes had been sold in South Africa since the company started, in 2020, 52% of sales were in the USA and only 15% were in South Africa. Sales in Australia were growing, facilitated by a distributor who had emigrated there from South Africa. In the past two years, sales in England had also grown – the company had sold 28 aeroplanes there in the two years it had been in that market. Other markets included France, Germany and The Netherlands in Europe, as well as Paraguay, Uruguay, Argentina and Brazil in South America. All of these countries allowed the use of experimental aeroplanes.

All of Sling's manufacturing happened in Johannesburg and 99% of the assembly of ready-to-fly aeroplanes happened in Johannesburg. This arrangement worked well for the company. James noted that although China often presented itself as a potentially cheaper option for manufacturing, "there is no private aviation in China and with the hands-on business that we have here, we can develop little aeroplanes as cheaply as you can in China, if not more cheaply."

When delivering ready-to-fly aeroplanes, Sling would build the entire aeroplane in the Johannesburg factory, spray it and test-fly it. Then, after about 5 h of test-flying, when Sling considered the aeroplane to be fully de-snagged and flying beautifully, it was stripped down for transport. "We take the tail and the wings off, and the aeroplane goes into a container. The fuselage rolls in on its wheels. The wings get strapped to the inside walls of the container. It all gets strapped down and sent to our distributor in whatever country it's going to. The distributor then puts it back together, test flies it, licences it in the foreign country and delivers it to the end user," explained Andrew. "The same with the kits. They go into a big 40-foot container. So what generally happens is that once a month we send a container to America with one fully-built aeroplane in one half and ten kits in the other half."

The impact of regulations

Although experimental aeroplanes were not type-certified, they and the facilities and individuals that made them had to comply with a range of airworthiness and other regulations. At Sling Aircraft, the responsibility of engaging with the relevant aviation authorities fell to James. And in this role, he had to draw on his legal expertise on a number of occasions. Dealing with most of the authorities was difficult, but James had found dealing with the SACAA to be particularly frustrating. "I've been driven nuts over the years. It's been an uphill battle," he said.

Every aeroplane flown in South Africa had to have the approval of the SACAA and full-scale production of Sling's first four-seater had been delayed by the hold-ups at SACAA. Although James and Blyth flew the prototype around the world in 2011, by 2014 the company had still not received approval from SACAA to manufacture the aeroplane commercially. In that year, Sling had to retrench a number of staff members. "I used the opportunity to lay into the SACAA, saying that we had to retrench, because we weren't able to pursue the four-seater model because they wouldn't give approval," explained James. Eventually, Sling did obtain approval, but only after the matter had been heard by the aviation tribunal.

He believed the difficulty that he had in dealing with SACAA to be "the exquisite final consequence of a country with the deranged sociological, political and anthropological history that we have". It was one thing, he said, trying to deal with these consequences in the context of a factory where he and his partners had control over the work situation. It was quite another trying to deal with them in an environment over which he had no control. However, come 2021, he believed that he now had a decent working relationship with SACAA and that the difficulties of the past had largely been ironed out. It would never be easy, but perhaps it could be less difficult.

Although countries were allowed to have their own rules regarding the manufacturing and use of experimental aeroplanes, most followed the FAA's standards. "The FAA says that you can only get a factory to build you a two-seater aeroplane. If it's going to be bigger than a two-seater, you as the end-user need to build 51% yourself," explained Andrew. "So we send a quick-build kit over there. An ordinary kit is completely knocked down, containing all the pieces that you have to use to build the aeroplane yourself from scratch. But with a quick-build kit, we build the wings, fuselage and the tail, and we send you a fully built airframe. Then you mount the engine and the interior, and you put the instrument panel in. Then it's considered that you've built 51% of the aeroplane." The company's American, Australian, British and Brazilian distributors had each set up build-assist facilities so that customers could build their aeroplanes in the distributors' hangars if they did not have space of their own and make use of the distributors' expertise during the build.

The regulations in the various countries impacted the split between ready-to-fly and kit planes that Sling sold in each country. The South African regulators allowed Sling to build four-seaters in its factory and deliver them to the end user. Thus, in South Africa almost all of the aeroplanes that Sling sold were ready-to-fly. In the USA, because factories were only allowed to make two-seater experimental aeroplanes, about 70% of Sling's sales were in kit form. Over the years, the split between ready-to-fly and kit planes had been roughly 50:50, but this split changed substantially in 2020 when sales of the Sling TSi in the USA soared. In that year, nearly three-quarters of the aeroplanes that Sling sold were in kit form (see Exhibit 4 referred to above).

"A Little Bit of Chaos"

The roles in the Sling Aircraft leadership team had changed over the years, although not necessarily in a structured and organised manner. "We've had the definition of organic, chaotic growth," observed Andrew. "And it's one of the reasons we've struggled over the years – because nobody's been absolutely clear on who needs to be doing what and who's accountable for what."

Initially, Blyth was in charge of engineering and production, with James in charge of finances, regulatory issues and dealing with the SACAA, and Andrew in charge of sales and marketing. After Andrew had set up the finance system, he gradually took over responsibility for the company's finances from James, employing a competent financial manager to manage the finances on a day-to-day basis. By 2021, he and James were meeting once a month to discuss the finances.

The company drew up its first organogram in 2014 – more to meet the requirements of the SACAA than for the benefit of the company (see Exhibit 5 for the company's organogram in 2021). Even then, the organogram did not serve to prevent role confusion, which led to some chaotic board meetings. Andrew remembered one in 2018 when Blyth asked him – rather forcefully – why he was not able to deliver four aeroplanes a month. "I'm not the production manager. You are the production manager," he replied, to which Blyth responded, "I'm not the production manager. You're the production manager."

Sling had adopted a relatively reactive process for managing and scaling its production capabilities. "It has happened by supply and demand," explained Blyth. "There is a requirement, then you work out what you've got to do, then you work out how many people you need and how much space is needed, and then you work out where you should do it and who you should employ. It was definitely not like how Elon Musk set up Tesla, saying, 'OK guys, we're going to make 500 cars a day,' and then setting everything up to do that."

He gave an example of how this approach had worked out in practice during the course of 2020. "Our composites section, that makes things like nose cowling and wing tips, wasn't going well. The products were late. We had quality issues and so on. So we realised we can't keep going like this. It's been fine up to now, but now we've got more demand, we've got more complex products, we need to sort that out. We need a better manager. So we

employed a better manager. Then we needed more staff. Then we needed more space. Then we needed better ovens. Then we needed better cleaning equipment. Then we needed better storage. So then we rented a factory in Alrode [about half an hour east of the Tedderfield factory] and we spent about R1 million setting it up and getting everything ready. And then we moved everything in there with the new manager. So we went from eight months ago when we had about 12 staff [in the composites division] to about 25 staff now, just because we had to sort that department out."

He said that they would adopt the same approach with the production of the new high-wing aeroplanes. "We've rented the factory next door and now we are setting that up. As we start production of the high-wing, which has more composite stuff, we'll see how many people we need to employ and if the space we've taken is okay. So rather than laying out the money beforehand, we let the demands of production push us to do what needs to be done," he said.

The advantage of this approach, noted Blyth, was that it kept the company's costs under control by ensuring that it did not "suddenly have all these staff and all these buildings and no work to do – no planes being ordered". He acknowledged, however, that the downside was that the company operated "in a little bit of chaos". The company was often late with its deliveries as a consequence.

Seeking to streamline

Finding the solution to these production problems was not something that could happen quickly. After the 2018 board meeting, the three directors decided that Blyth should be in charge of production. "Mike gave it his best shot," observed Andrew. "He employed 30% more staff, racked up a R300K a-month overtime bill and increased the value of our stock from R5 million to R15 million to try and solve our production problems." He was attempting the impossible, however, because Sling did not have a functioning enterprise resource planning (ERP) system. "So we don't know how many parts we have in stock and we run out of parts. And we can't build aeroplanes without parts," explained Andrew.

The company then employed an "expensive process engineer" to help them solve its production problems. In the six months he was with the company, things actually got worse. Thus, in late March 2020 – at the same time as the COVID-19 hard lockdown was implemented – the directors fired him. "I feel quite bad about it, but it was actually my idea," admitted Andrew. "I said, 'Guys, the knowledge about how to run this company lives in all three of our heads. We can't expect anybody to come from the outside and know everything. Our processes and systems are not properly documented. The reason that we know how to build aeroplanes is that the people who work here have all been working here for a long time, and they know how to build aeroplanes.'"

The three of them agreed on a two-phase strategy. In the first phase, they would document the company's systems and processes. In the second phase, they would employ someone to run the systems and processes that they had documented. They agreed that Blyth would step back from production and be in charge only of the engineering office. James took over temporarily as production manager, fulfilling the roles of chairman and production manager, and also being responsible for all regulatory matters. Andrew continued as CEO, being responsible for sales and marketing, finance, human resources and purchasing.

At the beginning of lockdown, Blyth started working from home, and by the beginning of 2021, he had not returned to the office. "He's actually much more potent when he's working from home, because when he's here he has a flood of people coming into his office and asking him questions and wanting him to solve problems. So he never gets down to any engineering work," observed Andrew.

"It turns out," he added, "that the root cause of our inability to manage our stock problems is that the engineering office had never actually completed a bill of materials. I'm

embarrassed to say this, but it was literally only six months ago – after ten years of building two successful models of aeroplanes –that we actually finally got a list of all the parts that are in each aeroplane. That's how chaotic it's been." He put some of this down to his own inexperience in running a business. "It's the first time I've ever done this. I thought this was how businesses were run," he admitted.

In his role as production manager, James had simplified the processes substantially after speaking to the people involved and finding out what the problems were. Then, with a correct bill of materials in place, he set slightly higher stock levels than the company had in the past, to ensure that there would always be parts in stock and that deliveries could therefore take place on time. "So things are working unbelievably better than they were before lockdown," noted Andrew.

However, he believed that Sling still needed to implement a proper ERP system. "You can't run a business this size without an ERP system. It's crazy that we are running this business on spreadsheets," he said. Sling had actually spent six years trying to implement an ERP system but had found the system to be cumbersome and a hindrance. "There are a whole lot of ridiculous things in an ERP system," said Andrew. "So, for example, if you want to pack a wing kit: there are (say) 372 parts in a wing kit. So somebody walks down the shelves with a scanner and picks up all the parts that go into a wing kit and gets to box number 372 and sees that there are no parts there. In reality, it doesn't matter, because 371 out of the 372 parts are there. You can build most of the wing like that."

"The problem is the ERP system won't allow you to check the wing parts out of stock if you don't have a complete set. So what happens is that the guys down in the kit-packing department say, 'Let's just take it across and give it to sub-assembly. They can start building it. It doesn't matter that a part is missing. We'll just remember and take it across when we get it.' Then what happens is the wing components have never been checked out of stock. The wing is being built in the factory, but we look at our stock levels and see that we have components for five wings in stock. But actually we haven't. We only have four wings in stock. And, in fact, we are missing one part for all four of those wings. And so, the ERP system blocks you and makes the whole thing more and more unmanageable. So we decided to revert to spreadsheets until we could get the bill of materials right, the systems working, the process right. And then we will go back to introducing an ERP system."

Andrew believed that one of the reasons that Sling Aircraft experienced these production issues was that the business had been funded so organically. He thought that if the company had found a partner to buy into the business, that partner might have brought their expertise into the business and helped them to set up systems and processes. "But then again," he added, "we wouldn't be the king of our own little castle over here. We would be a much more corporate, formalised company. And I'm not sure that I would like that. I quite like being the boss of this place and being accountable only really to ourselves. If you bring in a partner, all of a sudden you have to report to them. But that might be something I have to accept going forward."

Achieving financial stability

By 2020, Sling had sold a total of 622 aeroplanes, 94 of these in 2020. There had been a couple of rough years in 2015 and 2018 when sales had dropped, but apart from that, sales had grown every year (see the graph of sales trends in Exhibit 6). As Sling's sales increased, the company started to became more financially stable (see the financial analysis in Exhibit 7). In 2011, as more orders started to come in, the company started to pay off its debt and by 2014, the company had managed to paid off its loan completely, although it still operated an overdraft facility. By 2019, the company had paid off this overdraft facility and was cash-positive. Sling had funded the development and testing of the high wing entirely from its own resources. "It hasn't made a dent in the cash flow for the past two years," said Andrew.

Andrew attributed part of this growth to Blyth's superior aeroplane design and satisfied customers who spread the word. "We genuinely do make a better aeroplane than anyone else in the world has ever made. We are considered to be one of the best-handling aeroplanes in the world. Blyth's design is so much better than anything that's been designed already," he said. This meant that Sling had many very happy customers, some of whom returned to brought the next model up when it was developed (see Exhibit 8 for customer reviews).

Blyth believed that the major reason for the recent growth in sales was a change in marketing tactics. Initially, marketing happened largely by word of mouth, through the company's website, some targeted internet advertising and a small amount of marketing on Facebook. Another important marketing tool was having a presence at the air show in Oshkosh. Organised by the Experimental Aircraft Association, which was based in the USA but had a global membership of more than 200,000 people, the week-long Oshkosh air show brought together as many as 500,000 aviation enthusiasts from about 80 countries. Its size and popularity made the show hugely influential in the experimental aviation world (EAA, 2024).

In 2019, having employed a full-time marketing officer in 2018, Sling decided to try out another marketing tactic and to sponsor a YouTube influencer by the name of Mike Mojo, a flying enthusiast whose YouTube alias was Mojo Grip, to build a Sling TSi (see www.youtube.com/watch?v=cMY2QJQlkn8 for more). Initially, Blyth was not sure that the sponsorship would have much of an impact. But he had been proved wrong. Sales increased dramatically thereafter – and not only in the USA, where Mojo lived but all over the world. "We've seen a huge change in our business since we started doing that," said Blyth.

Such was the impact that by 2021, Sling was sponsoring three YouTube vloggers. Most recently, the company had decided to sponsor JB Schultze (YouTube alias, the Candourist). Schultze, a pilot based in New Zealand, had already flown around the world in a Cessna and was now set to build a Sling high-wing, which he also wanted to fly around the world (see www.youtube.com/watch?v=0mKVgJIwEPA). "I think that will have a major impact on our sales," said Blyth.

Growth considerations

By 2021, the company was involved with some interesting projects that had the potential to open up a few niche markets for its aeroplanes. ETH Zurich, a public research university in Switzerland that focussed on science, technology, engineering and mathematics, was building an electric four-seater using a Sling kit. Aerodelft, a project associated with the Delft University of Technology in The Netherlands, was building a hydrogen fuel-cell version of the four-seater. Furthermore, Cranfield Aerospace College in England was building a diesel hybrid version of the Sling 4. The owners of Civilian Air Deployment Group, an organisation that specialised in operating in the complex environments of remote areas in Africa, Central Asia and the Middle East, were interested in using the Sling high-wing to build a surveillance aeroplane that could be flown like a drone. All of these projects could result in additional aeroplane sales if they came to fruition.

However, Blyth, James and Andrew were now keen to make a step to grow the company substantially and, before settling on the five-seater, had been considering alternatives for achieving this. "A competitive advantage of our company is that as much as we are pilots and we love flying, it's not a vanity project. It has to work financially. There had to be a niche into which one of our products will fit," said James, as he explained Sling's product development philosophy. He added that the three of them had considered "two reasonably obvious niches that are not just small add-ons and that could generate orders-of-magnitude more revenue for us". One of them was for a five-seater aeroplane, the other for an eight-seater.

They had decided against the latter for a number of reasons. Among them was that the bigger aeroplanes, being passenger aeroplane, would have to be certified from the outset.

Doing so would make the design, development and production process much more expensive, and require them to seek funding from an external investor. Said Andrew: "My personal view – and it's not that I'm not a motivated person – is that I don't want to run a multi-million dollar company. I don't need to be that rich. I absolutely love running a company of 250 people in the south of Joburg, where everyone is happy and everyone gets a good salary and I'm earning more than enough money to live the life I dreamed of and send my kids to private schools. For me that's sufficient. And I look at the risks involved in stepping up to eight seats. There are case studies of other aviation companies who have started off with one to two seaters and have tried to tackle a much bigger aeroplane, and it's bust them. We obviously need to keep developing and increasing the size of the company and offering new models, but for me a step up to a five-seater now is perfectly acceptable."

James agreed: "There is a temptation to shoot big. But I try to maintain a bit of perspective on things. Our business now is doing really well. We have come a long, long way, we've had aeroplanes crash, we've had things go wrong. This year we are going to make some proper money. We've paid off all of our debt. The business is strong and that's why it's quite tempting to shoot for something that's quite big. But I think it's dangerous."

For his part, Blyth was not convinced that there was a big enough space in the market for a new eight-seater aeroplane: "Is there a vacuum in the market?" he asked. "I have to make a business decision. What we don't want to do is venture into a space where there are already magnificent aircraft and strong competition and where we are going to be fighting against the best of the best. That doesn't make any sense at all." He felt more confident about his knowledge of the market for smaller aeroplanes, but far less so of the market for bigger ones. He was convinced that Sling could fill a vacuum for a high-wing five-seater (see his analysis in Exhibit 9).

The entry-level model of the Cirrus was priced at just under $800,000 (just over R12m), whereas additional features could be added that increased the price to in the region of $1m (just over R15m) (see https://cirrusaircraft.com/wp-content/uploads/2020/12/2021-SR22T-Domestic-Pricelist.pdf for a brochure about this aeroplane, http://twinandturbine.com/article/piston-power-series-cirrus-sr22-vs-diamond-da62/ for a comparison of the Cirrus SR series with one of its major international competitors and www.aopa.org/news-and-media/all-news/2020/april/02/fly-off-sweeps-rv-10-takes-on-cirrus-sr22 for a comparison of the Cirrus SR22 with another of its competitors).

How to set Sling up for success?

Having settled on developing a five-seater, the three partners now had to decide how to set the business up so that it could compete in this market successfully. One of the questions with which Sling was grappling was whether and when to certify the five-seater. As with its existing experimental models, an experimental five-seater could be sold only in countries that allowed experimental aeroplanes. Countries such as South Africa, Namibia and Botswana and a few others, allowed them in both ready-to-fly and kit form. In countries like the USA and others following FAA regulations, it could be sold in kit form only. If the new aeroplane was to be fully certified, Sling would be able to sell it in any country in the world and the margins would be far higher. "We'd probably sell more kits as far as numbers are concerned, but the profit margin is much smaller," said Blyth.

Andrew was not sure that there would be a big market for an experimental aeroplane of this size and cost. At a total of approximately $200,000, a kit aeroplane would cost less than the $450,000 to $800,000 that Sling would charge for a certified five-seater. Andrew nevertheless believed that the type of person who would want an aeroplane of this nature and have the money to buy it, would not want to build it themselves. James believed that Sling could possibly sell as many as 40 experimental aeroplanes, but that to make the project commercially viable, Sling would have to certify the aeroplanes.

However, certification would be difficult, costly and financially risky. “We would need double the space, double the staff and we would need new tools,” said Andrew. “You can’t mix certified and non-certified parts, so we would have to build the aeroplane in a separate hangar.” Blyth pointed out that the certification process alone would cost in the region of R100m (about $6m).

Whereas Sling had managed to develop and build the high-wing without taking on debt or an additional investor, this would not be possible when building a certified five-seater. However, the idea of involving an outside investor did not particularly appeal to Blyth. “Ideally, as entrepreneurs, we do not want to dilute too much. If we are the geniuses and the risk takers, then from my perspective, I’d like to keep as much shareholding as possible: to see if we can get a grant from the IDC or take the risk and borrow the money.” He believed that James’s approach would be to de-risk, form a separate business for the five-seater and take on partners in that business.

Complicating the process was the fact that neither of the partners was confident enough in the SACAA to use that organisation to certify the aeroplane. Moreover, the standing of the SACAA within the international community was not sufficient for its certification alone to be acceptable for other regulators. The biggest market for the aeroplane would be in the USA and Sling would therefore need to get the approval of the FAA for its new aeroplane. The SACAA was interested in gaining a better standing in the international community and had approached Sling, asking the partners to certify an aeroplane through the organisation. “But,” observed Blyth, “I’ve been in this business for 36 years. So I know that it would probably bankrupt us if we tried to do it.” It would make better sense, therefore, to certify the aeroplane directly with the FAA.

Certifying in the USA would raise the question of where to manufacture and assemble the aeroplane. It would be cheaper to manufacture the aeroplane in South Africa, but a substantial portion of the assembly would have to take place in the USA, where it was certified. James believed that the model for a certified five-seater could look similar to the arrangement Sling had with Sonaca in Belgium for the certified two-seater: manufacture the airframe in South Africa and complete the rest of the process in the USA. “This business model of locating elements of a complex process in places where it makes sense to do so is a good one,” he said. “The cost of premises to do everything in one place is too much. So we could divide it up, do as much of the cheap work as we could here, and then farm out the rest.”

The company would need a more sophisticated operation to assemble a certified aeroplane than its current distribution and build-assist office in the USA could supply. Thus, when considering assembly, marketing, sales and distribution in the primary market of the USA, the partners had to decide exactly how to set the business up there. “Do we take away distribution from our current distribution office and set up our own business there?” asked Blyth. “Or is there another model that would work better?”

One option was to adopt a hybrid model: to enter the market with an experimental aeroplane and then certify it at a later stage. Andrew estimated that it would take approximately four years to get to the stage of producing a development prototype. The process of having it approved as an experimental aeroplane would take no longer than two weeks. Full certification could take as long as two years. “The advantage of the staged approach is that you start generating revenue early in the process,” said James. For Blyth, the staged approach was a “no-brainer”, in that it would allow Sling to perfect the design before certifying the aeroplane. “Once you’ve done the certification, any changes that you want to make down the road, you’ve got to certify again. It’s very costly. So if you can perfect the design first, that makes sense. And then we are also sure of the market.”

But would using a staged approach actually dilute the market for a certified aeroplane? Having gone to all the expense of building and certifying a five-seater, would the market that required a certified aeroplane be large enough to be profitable? Was there a possibility

that the existence of an experimental aeroplane that was so similar could impact on perceptions of quality and therefore discourage buyers from considering Sling's certified five-seater?

In addition to all of these questions, Sling had to consider the issue of how to market the aeroplane. Sponsoring a kit build might be effective in the experimental market, but the market for certified aeroplanes in this category would be different. There may be some private buyers with the funds to purchase an aeroplane in this category, but the aeroplane would more than likely be used for commercial purposes. And such purchasers would require a different approach.

Decision points

Building aeroplane was in the blood of all three of Sling's partners. There was no question that they would continue to innovate and grow the business, and they were convinced that they could be very successful with a five-seater. But building one could take them into an entirely new and more complex realm, and they had to be sure to set the business up so that they could enter this realm and compete there successfully.

The agenda for the upcoming board meeting details the key discussion and decision areas required to set Sling up for success:

- strategy;
- manufacturing and operations;
- finance/investment;
- marketing;
- organisational design and development; and
- human resources/talent management.

The outcome of this board meeting was likely to be critical in determining the future of Sling.

Keywords:
Strategy,
Entrepreneurship,
Strategic management,
Entrepreneurial strategy,
Aviation,
Effectuation

Notes

1. Blyth had numerous microlight achievements, among them bettering the world altitude record by 5,000 feet in 1988 when he climbed to 25,013 feet, winning the World Microlight Championships in 1992, and flying a self-designed and manufactured trike-type microlight from Cape Town to North Cape in Norway. This was the longest unsupported flight ever undertaken in a trike-type microlight and it took him five months. [Source: Trike-Expeditions.com (n.d.), "Mike Blyth", available at: www.trike-expeditions.com/CapeToCape/Mike_Blyth/mike_blyth.html (accessed 1 March 2021).]
2. A semi-monocoque aircraft has an internal skeleton that helps it to keep a rigid and strong shape. [Source: Smithsonian National Air and Space Museum (2014), "Ask an explainer", available at: https://howthingsfly.si.edu/ask-an-explainer/what-difference-between-monocoque-and-semimonocoque-structure-aircrafts (accessed 16 February 2021).

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Exhibit 1. Sling's product range in 2021

The Sling light sport aircraft



Source: Personal email correspondence with Pitman (2020b), 23 February

Pioneering South African aviator and Sling Aircraft co-founder Blyth dedicated himself to designing the world's best handling LSA – The Sling LSA – a stick and rudder experience to delight and inspire. The Sling LSA's flying characteristics make for a perfectly coordinated, highly responsive control setup that gives her the distinct qualities of a fighter jet, while not being overly sensitive.

The Sling LSA is the perfect trainer aircraft – easy to fly, easy to maintain, economical and with its robust landing gear and superb handling, it is most importantly safe. Reviewers comment on its manoeuvrability and responsive feel, areas where it leads its competitors, and which make it ideal for teaching aspirant pilots.

The Sling LSA is a stressed-skin, semi-monocoque [2] aircraft, made to precise standards from aviation-grade aluminium, punched using computerised numerical control (CNC) machines. Rugged aluminium lines, combined with cutting-edge tech advances, ensure that the Sling looks the way an aircraft should and flies even better.

"The real magic of the Sling comes from flying it. Easily the Sling's most impressive quality is its manoeuvrability and handling. The controls are an extension of your mind, with only the slightest finger pressure necessary to execute the manoeuvre in your head." Marc C. Lee (Plane and Pilot Magazine).

The Sling 2



Source: Personal email correspondence with Pitman (2020a, 2020b), 23 February

The Sling 2 was built for heroic adventure. Her 2009 maiden voyage flew Sling Aircraft founders Blyth and James around-the-world (ATW). A 40-day, 45,000 km journey that included 22-h legs of the severest of weather conditions. Her aluminium airframe makes for ease and consistency of construction while offering proven strength and a longer lifespan than most composite rivals.

Designed to be a perfectly balanced aircraft, the Sling 2 is a sexy looker that would outperform other aircraft in its class while being highly economical and fun to fly.

Being a stressed-skin, semi-monocoque aircraft, the Sling 2 is made to precise standards from aviation-grade aluminium, punched using CNC machines. Rugged aluminium lines, combined with cutting-edge tech advances, ensure that the Sling looks the way an aircraft should and flies even better.

“A dream-aircraft to fly! From the moment I took delivery of my Sling 2, I was in love. Nimble, fast, comfortable for long journeys and unbelievably forgiving. My Sling has taken me to Zambia, Zimbabwe, Botswana, Namibia, Malawi, Madagascar and all over South Africa – I could not be more proud of this proudly South African aircraft.” Marc C. Trollip (Owner).

The Sling 4



The idea of a Sling four-seater emerged from Sling Aircraft founders' Blyth, James's 2009 ATW Sling flight. Although designed as a 600 kg LSA, it was soon clear that even with a normally aspirated 100-hp motor, it performed well up to 970 kg. Thus, the Sling 2, after passing the required standards, was certified as a 700 kg MAUW.

Work also began on the development of a four-seater version. The chief differences between the Sling 2 and the Sling 4 were wing size, engine and the centre fuselage arrangements. Where the standard Sling customarily uses a 100-hp Rotax 912 ultra-light sport (ULS) or iS engine, the Sling 4 is fitted with the 115-hp turbocharged Rotax 914 ultra-light (UL) engine, while the Sling TSi is powered by a 142-hp Rotax 915 iS Turbo Injected Sports engine.

The turbocharged engine gives full power at up to 15,000 feet, at which altitude the 100-hp would only be delivering approximately 55-hp. So, on a hot day, the difference in power between the 912 ULS and 914 UL engine is in the vicinity of 36%, not just 15%.

Practical and desirable

The Sling 4 was built to be the most practical and desirable lightweight, four-place experimental aircraft on the market, a niche not previously filled. It was slightly longer than the Sling LSA but with a more powerful engine (Rotax 914 UL) and gullwing doors instead of a sliding canopy. It flies much like the Sling LSA, perfectly coordinated with highly responsive – but not overly sensitive – controls. It is the perfect getaway aircraft for four with ample luggage space.

"A four-place cruiser that carries four adults, several hours' worth of fuel and a respectable luggage load, and consumes less than 6 gph, the Sling 4 does so in leather-wrapped comfort. It has a wider cabin than a Bonanza, looks sexy on the ramp, and its turbocharged Rotax whisks it along at a decent 125 knots – all for a fraction of the price of a comparable new Part 23 airplane." Marc C. Lee (Plane and Pilot Magazine).

The Sling TSi



Like its predecessors, the Sling TSi has been critically acclaimed for its capabilities, effortless handling and all-around functionality. As one review wrote, "Sometimes just the right combination of factors come together to create a really great airplane" (Alton K Marsh, AOPA). Those factors are a generously proportioned four-seater that handles like a fighter jet, controls that are a natural extension of the mind and a superbly balanced buy that will stoke your love of flying.

Following on from the acclaimed handling capabilities of the Sling LSA, the Sling TSi offers the same perfectly coordinated flight characteristics, with controls that are highly responsive yet not overly sensitive.

It comfortably seats four with luggage and still cruises effortlessly and efficiently, making it the ultimate in affordable cross-country flying.

This is an aircraft with an uncompromising mission: To offer unrivalled performance, safety and reliability in the hands of all pilots no matter the mission.

"A four-place cruiser that carries four adults, several hours' worth of fuel and a respectable luggage load. This sexy Sling TSi does so in leather-wrapped comfort. It has a wider cabin than a Bonanza, looks incredible on the ramp. Its turbocharged Rotax 915 iS whisks it along at a brisk 148 knots." Marc C. Lee (Plane and Pilot Magazine).

Source: Sling Aircraft (n.d.), "Sling Aircraft", available at: www.slingaircraft.com/airplane-factory/ (accessed 3 March 2021).

Exhibit 2. Sling aeroplane sales

Table E1

Sling Aircraft sales summary by year and country – 31 December 2020

	2008	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*TOTAL*
Sling LSA/2 RTF	1	1	4	12	29	28	22	18	9	21	10	11	10	*176*
Sling LSA/2 kit		1	1	10	15	22	24	7	17	25	12	14	7	*155*
Sling 4 RTF				2	1	5	18	13	16	7	1	0	0	*63*
Sling 4 kit				0	0	4	12	10	24	14	4	5	5	*78*
Sling Tsi RTF										4	7	16	14	*41*
Sling Tsi kit										1	12	38	58	*109*
Sling Tsi High Wing RTF														*0*
Sling Tsi High Wing kit														*0*
Totals	*1*	*2*	*5*	*24*	*45*	*59*	*76*	*48*	*66*	*72*	*46*	*84*	*94*	*622*

Source: Personal email correspondence with Pitman (2020a), 23 February

Exhibit 3 The Sling 4 high-wing

Sling 4 high-wing – the newest addition to the iconic range of Sling Aircraft.



Featuring all the great Sling handling characteristics combined with the inherent stability of the classic high-wing design. Added to this, all the latest modern-day design safety features, including ballistic parachute recovery system, low workload Garmin glass cockpit, efficient and powerful 141-hp Rotax 915 iS turbocharged powerplant and Airmaster Constant Speed Propeller.

The extra-large cabin features wide, easy access doors, superb four-place ergonomics and the best-in-class comfort and quality. The removable rear seats increase the already generous baggage area providing for a great utility platform.

An outstanding four-place high-performance aircraft that will happily cruise long distances at 145 kts or take you and your family to your favourite backcountry destination. Available in tricycle and taildragger variants.

Go everywhere . . . take everything!

"The Sling 4 high-wing design sets a new standard for Sling Aircraft. It is the culmination of many years' experience in the design, manufacture, and production of the successful range of Sling Aircraft. We have always used the best materials wherever possible in our aircraft and this is particularly true with the Sling 4 High-Wing. For the first time, we have a substantial portion of the aircraft, being the centre fuselage, produced in carbon fibre. This has allowed us to design an aerodynamic aircraft which is beautifully shaped, light and extremely strong.

The Sling 4 high-wing is a modern aircraft with a perfect blend of practicality, performance and beauty. It has a large comfortable cabin with a high useable load, long range, excellent handling and built-in active and passive safety features.

The Sling 4 high-wing will cruise at 145 knots carrying 4 adults and luggage in comfort while burning just 28 L/h (7.4 gph), giving a real range of 880 nautical miles (1,630 km).

For the first time, we have a highly versatile aircraft that has a large useable cargo area. Remove the unused seats and controls quickly and easily, then fill it up with any kind of cargo. The Sling 4 high-wing can also be flown with the doors removed for photographic work or for use as a parachute jump ship.

Having a strutless high-wing aircraft means you can land almost anywhere in the outback such as alongside bushes and low fences without the worry of wing strut limitations." Mike Blyth (Sling Aircraft Director).

Source: Sling Aircraft (n.d.), "Sling Aircraft", available at: www.slingaircraft.com/airplane-factory/ (accessed 3 March 2021).

Exhibit 4. Distribution of sales

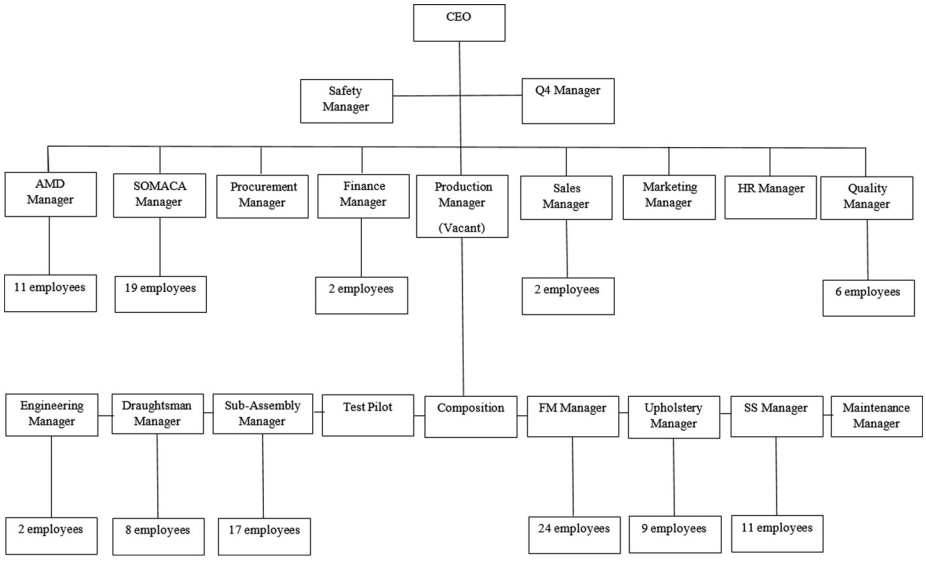
Table E2

Distribution	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	Total
South Africa	1	2	5	20	44	42	39	28	14	17	8	14	14	*248*
African countries (excl RSA)				1	1	4	7	1	6	3	2	2	2	*29*
Australasia				1	0	10	21	8	18	15	9	7	13	*102*
North America				1	0	3	8	7	19	16	21	43	49	*167*
South America								3	6	11	1	2	2	*25*
Europe				1	0	0	1	1	3	10	5	16	14	*51*
Total	*1*	*2*	*5*	*24*	*45*	*59*	*76*	*48*	*66*	*72*	*46*	*84*	*94*	*622*
cumulative	*1*	*3*	*8*	*32*	*77*	*136*	*212*	*260*	*326*	*398*	*444*	*528*	*622*	*622*

Source: Personal email correspondence with Pitman (2020b), 23 February

Exhibit 5. Sling's organogram in 2021

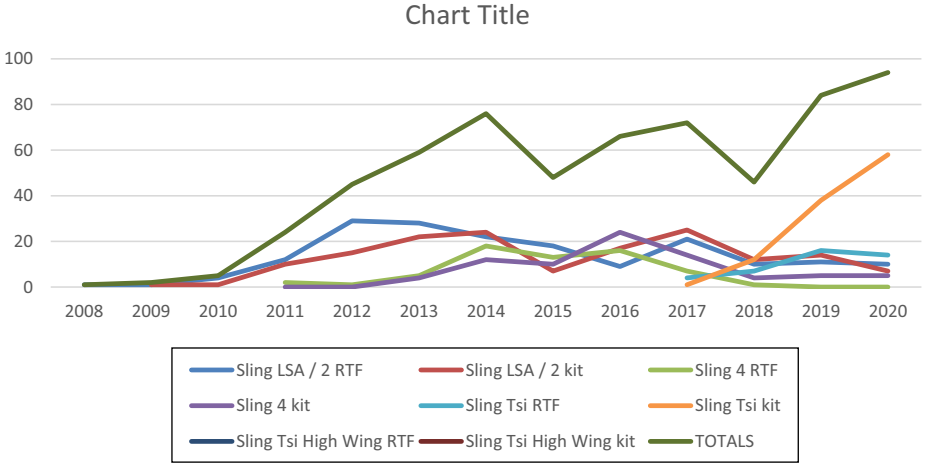
Figure E1



Source: Personal email correspondence with Pitman (2020b), 23 February

Exhibit 6. Sales Trends at Sling

Figure E2



Source: Personal email correspondence with Pitman (2020a, 2020b), 23 February

Exhibit 7. Analysis of Sling's financials

Table E3

Growth and financial ratio analysis: Sling Aircraft (Pty) Ltd for the period 1 March 2015–28 February 2021

Details	*2015%*	*2016%*	*2017%*	*2018%*	*2019%*	*2020%*	*2021%*
							#1
Growth % 2015–2021							
Revenue growth							135
Gross profit growth							128
Year-on-year growth							
Revenue		4.5	8.7	(8.7)	25	29	29
Cost of sales as % of revenue	56	55	48	44	62	51	58
Expenses as % of revenue	35	36	43	48	42	45	35
Gross profit		7	27	6.7	(16)	69	11
Profitability ratios							
Gross profit margin	44	45	52	56	38	49	42
Operating profit margin	11	22	10	8	1	6	18
Net profit margin	6.6	14.4	6.2	5.6	(4.8)	4.5	7.8
							#1
Liquidity ratios							
Current ratio	1.19	1.41	1.86	1.86	1.32	1.26	1.34
Quick ratio/ACID-test ratio	0.72	1.1	1.3	0.84	0.9	0.77	
Networking capital/sales ratio	6.1	11.8	15.4	17.6	8.4	8.0	
Operating cash flow ratio	(5.2)	33.3	32.7	10.9	36	(8.3)	
Growth in net cash from operations		634	(30)	(42)	422	(135)	
Financial leverage ratios							
Total debt to assets	5.7	6.9	1.5	7.7	0	0.5	
Equity multiplier	4.98	2.37	1.82	1.61	2.16	2.37	
Return ratios							
Operating return on assets	20	36	18	15	2	10	17.6
Return on assets	12	24	12	10	(11)	8	18.7
Return on equity	62	57	22	16	(3)	19	

Notes: #1 2021 Ratios are based on Provisional Financial Statements
Source: Drawn up by the case author from Sling Aircraft's annual financial statements

Exhibit 8. Customer reviews

"What an exceptional experience this has been as the proud owner of a Sling 4."

"It is one of a few aircraft anywhere close to this price range that can carry four adults, six hours of fuel and 70 pounds of luggage."

"My wife Maureen and I wish to thank the dedicated Sling Aircraft employees who built our Sling 2 #262 N517JT. It is truly a work of art and a mechanical genius. Since retiring for good in April 2019, and with the cooperation of Mother Nature, we have been living up the Sling 'Taking you Places'" motto.

"Good evening to the Sling Aircraft employees. Today I flew my Sling TSi for two hours and the aircraft flies very well! My landings were not even as terrible as I thought they would be. Thank you for making me a wonderful plane. In addition, my father has also flown it and was exceedingly happy. Thank you, Sling Aircraft, for making my father a happy man!"

Source: Sling Aircraft (n.d.), "Customer testimonials", available at: www.slingaircraft.com/about-us/#testimonials (accessed 16 February 2021).

Exhibit 9. The market case for a five-seat high-wing modern aircraft by Mike Blyth

Market trends show a growth in certified and experimental single-engine new aircraft sales over the past 10 years. The upward trend of single-engine aircraft sales is expected to continue into the foreseeable future, even though the total number of aircraft registered is slowly declining, as is the number of active private pilots. The reason the decline in aircraft registrations and the increase in new aircraft sales is expected to continue is that the aging fleet of aircraft around the world is being retired. The positive trends in sales are because old aircraft are being replaced and because there is a shift in the type of aircraft needed. In the USA, the average age of the general aviation fleet was 47.3 years old in 2019. Active private pilot licenced pilots' numbers are on the decline worldwide for various reasons but largely because airline travel is easier and less expensive than ever, personal light aircraft are expensive to purchase and operate and flying does not hold the appeal that it did in earlier years. It appears that the COVID pandemic which has affected many industries around the world has had no significant impact on light-certified and experimental aircraft sales.

Looking at market trends – which certified and experimental aircraft are selling and the experience that Sling Aircraft has – we feel that there is still a market for the right experimental aircraft. The challenge is finding the right gap in the market and then developing the perfect aircraft to fulfil the potential opportunity.

In the experimental aircraft market Vans Aircraft is a very well-established aircraft kit manufacturer in the USA (where the majority of experimental aircraft are sold) so it does not make sense to try to compete with Vans in a sector of the market in which they dominate. Vans only makes low-wing aircraft.

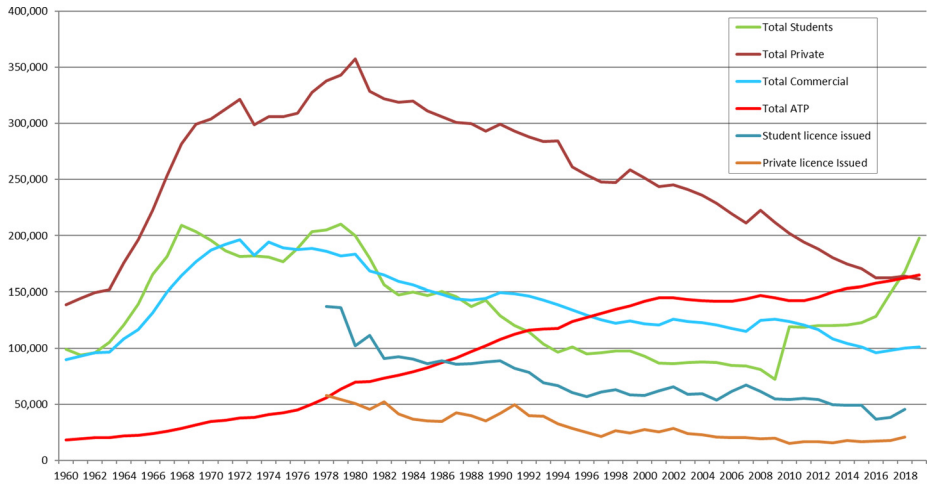
It also would not make sense to compete in the certified market with well-established manufacturers that produce inexpensive four-seat aircraft even if their original designs are old. Instead, the right approach will be to design an aircraft for both the experimental and the certified markets where there currently is a gap in both markets.

After analysing market trends and aircraft sales, it seems the best aircraft to design and manufacture would be a high-wing, modern, greatly improved version of a combination of the Cessna 182, 210 and 206. The popular, well-loved Cessna 210 is no longer in production, and although the 182 and 206 are both still being produced, they are old, unsophisticated designs. Also, there is no kit aircraft that fits into that niche, so there would be no other manufacturer to compete with.

The Sling 5T would be a modern, five-seat, strutless, high-wing, cruising aircraft, powered by a 260- hp and later a 310-hp turbo engine. It would have a fixed tricycle gear, four large doors, large loading and luggage areas, with a rescue parachute as standard. The aircraft would essentially be a high-wing version of the Cirrus SR22/22T, but with better utility, and, as an experimental kit, it would cost less than half the price.

The below graph shows the total number of active students and pilots in the USA. Although private pilot numbers are decreasing, there is good growth in airline transport pilot numbers. Active pilot licence trends suggest that there will continue to be customers for light aircraft sales for the foreseeable future.

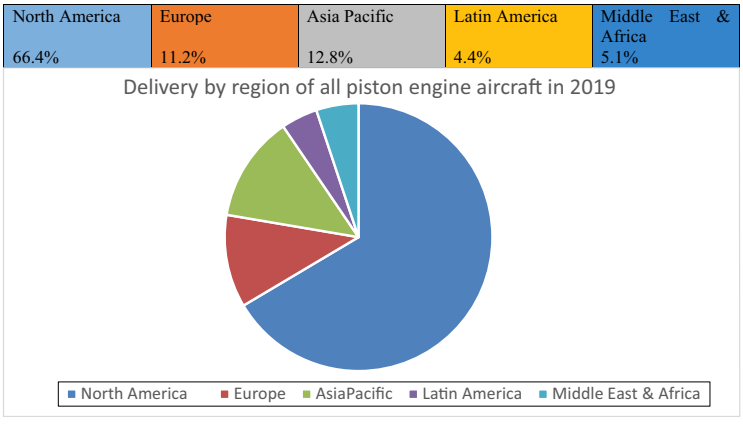
Figure E3 Number of active students and pilots in the USA



Notes: The graph below shows where piston aircraft deliveries occurred in 2019. As can be seen the USA still dominates sales worldwide by a large margin

The graph below shows where piston aircraft deliveries occurred in 2019. As can be seen, the USA still dominates sales worldwide by a large margin.

Figure E4 Technical analysis of single-engine aircraft sold worldwide



The following is a technical analysis of single-engine aircraft sold worldwide. Sling aircraft are included for reference.

Table E4 Technical analysis of single-engine aircraft sold worldwide

2013 Specifications and prices	*Base price*	*High price*	*Wing*	*Weights Parachute*	*Engine hp*	*Spe Empty*	*MAUW*	*Max usef.*	*Cruise*	*Tank*	*Max range*
http://aircareav.comandwww.cessna.com											
Cessna 172S Skyhawk SP	$289,500		High	no	180 hp	1,641 lbs	2,550 lbs	917 lbs	124 KTAS	56 gal	518 Nm
Cessna Skylane JT-A Diesel	$515,000		High	no	227 hp	2,092 lbs	3,100 lbs	1,018 lbs	156 KTAS	87 gal	1,360 Nm
Cessna 182T Skylane	$398,000		High	no							
Cessna T182T Turbo Skylane	$515,000		High	no							
Cessna 206H Stationair			High	no							
Cessna T206H Turbo Stationair	$597,500		high	no	310 hp	2,336 lbs	3,600 lbs	1,281 lbs	164 KTAS	92 gal	559 Nm
Cessna 350 Corvalis	$540,000		low	no							
Cessna 400 Corvalis TTX	$733,950		low	no	310 hp	2,600 lbs	3,600 lbs	1,000 lbs	200 KTAS	106 gal	1,200 Nm
http://cirrusaircraft.com/											
Cirrus SR20	$349,900	$484,900	Low	yes	200 hp	2,126 lbs	3,050 lbs	924 lbs	155 KTAS	81 gal	625 Nm
Cirrus SR22	$489,900	$664,900	Low	yes	310 hp	2,260 lbs	3,600 lbs	1,340 lbs	183 KTAS	92 gal	825 Nm
Cirrus SR22T	$589,900	$764,900	Low	yes	315 hp	2,342 lbs	3,600 lbs	1,258 lbs	213 KTAS	92 gal	850 Nm
http://www.diamondaircraft.com/											
Diamond DA40	$420,000	$500,000	Low		180 hp	1,755 lbs	2,645 lbs	890 lbs	150 KTAS	50 gal	720 Nm
Pipistral Panthera	$557,000	$650,000	Low	yes	260 hp	1,700 lbs	2,900 lbs	1,200 lbs	181 KTAS	55 gal	1,000 Nm
Tecnam P2010	$324,000	$369,500	High	option	180 hp	1,565 lbs	2,557 lbs	992 lbs	133 KTAS	64 gal	715 Nm
Flight Design C4	$300,000	$400,000	High	yes	180 hp	1,320 lbs	2,640 lbs	1,320 lbs	160 KTAS	70 gal	1,200 Nm
http://www.piper.com/											
PA-28–161 Warrior III			Low	no							
PA-28–181 Archer TX/LX	$338,200	$350,700	Low	no	180 hp	1,688 lbs	2,550 lbs	870 lbs	128 KTAS	48 gal	522 Nm
Piper Archer DX	$399,495		Low	no	155 hp	1,764 lbs	2,550 lbs	794 lbs	123 KTAS	43 gal	848 Nm
PA-28R-201 Arrow	$448,750		Low	no	200 hp	1,798 lbs	2,750 lbs	952 lbs	137 KTAS	72 gal	880 Nm
			Low	no							
Beechcraft Bonanza A/G36	$759,000		Low	no	300 hp	2,630 lbs	3,650 lbs	1,020 lbs	176 KTAS	74 gal	840 Nm
Zlin Z 242 L Guru			Low	no	200 hp	1,642 lbs	2,400 lbs	758 lbs	120 KTAS	58 gal	520 Nm
Zlin Z 143 LSi Genius			Low	no	235 hp	1,885 lbs	2,976 lbs	1,091 lbs	131 KTAS	58 gal	600 Nm
Robin DR401/135 CDI	$236,700			no	135 hp	1,410 lbs	2,160 lbs	750 lbs	120 KTAS	42 gal	1,030 Nm
Robin DR401/155 CDI	$257,500			no	155 hp	1,410 lbs	2,425 lbs	1,015 lbs	120 KTAS	42 gal	910 Nm
Robin DR401/200 Ai	$272,600		Low	no	200 hp	1,347 lbs	2,425 lbs	1,078 lbs	140 KTAS		840 Nm
http://www.robin-aircraft.com/en/home-1.html											
http://www.mooney.com											
Mooney Acclaim S	$630,000		Low	no	280 hp		3,374 lbs	1,000 lbs	200 KTAS	100 gal	1,445 Nm
Mooney Ovation 3	$550,000		Low	no	310 hp		3,374 lbs	1,107 lbs	180 KTAS	100 gal	1,860 Nm
Mooney M10T	$400,000		Low	no	135 hp				140 KTAS	42 gal	500 Nm
Mooney M10J	$480,000		Low	no	155 hp				160 KTAS	42 gal	900 Nm

(*continued*)

Table E4

2013 Specifications and prices	*Base price*	*High price*	*Wing*	*Weights Parachute*	*Engine hp*	*Spe Empty*	*MAUW*	*Max usef.*	*Cruise*	*Tank*	*Max range*
Glassair Sportsman KIT	$200,000	$300,000	High	no	210 hp	1,350 lbs	2,500 lbs	1,150 lbs	150 KTAS	50 gal	733 Nm
Vans RV10 KIT	$220,000	$350,000	Low	no	260 hp	1,600 lbs	2,700 lbs	1,100 lbs	172 KTAS	60 gal	800 Nm
Ravin 500 KIT	$250,000	$350,000	Low	no	260 hp	2,200 lbs	3,565 lbs	1,365 lbs	170 KTAS	120 gal	1,800 Nm
Sling Tsi KIT	$200,000	$250,000	Low	yes	141 hp	1,100 lbs	2,090 lbs	990 lbs	148 KTAS	51 gal	800 Nm
Sling High Wing KIT	$200,000	$250,000	High	yes	141 hp	1,320 lbs	2,310 lbs	990 lbs	146 KTAS	51 gal	800 Nm
Sling 5 T KIT	$230,000	$500,000	High	yes	280 hp	2,100 lbs	3,500 lbs	1,400 lbs	190 KTAS	90 gal	1,069 Nm

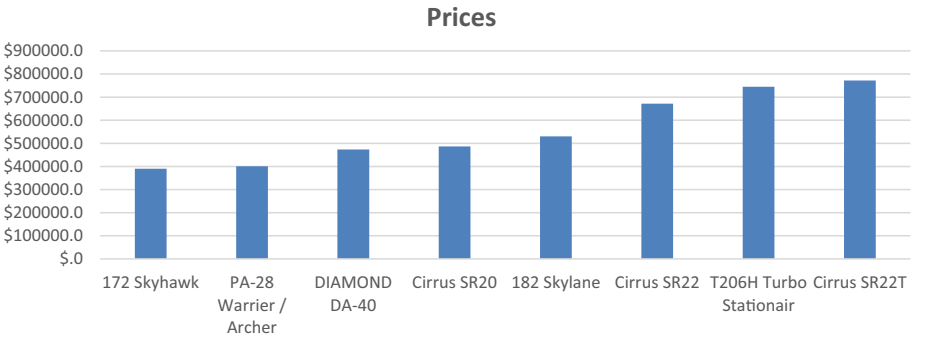
Below is an analysis of the specifications and sales of the most popular single-piston engine aircraft sold worldwide. Seven are made in the USA, one in Canada (Diamond) and one in Italy (Tecnam).

Figure E5 Comparison of the most popular single engine aircraft

2019 mainstream certified single piston engine aircraft worldwide sales

	Price	HP	seats	Wing	Range	Cruise	Jsef load	MAUW	Fuel	2014	2015	2016	2017	2018	2019	
Tecnam P 2010	$380,000	215	4	High	597	146	860	2557	55	0	20	22	18	20	34	High wing trainer
172 Skyhawk	$390,000	180	4	High	640	124	878	2550	53	155	143	100	129	129	126	Inexpensive high wing trainer
PA-28 Warrier / Archer	$401,000	180	4	Low	522	128	870	2550	48	48	45	47	72	107	182	Inexpensive low wing trainer
DIAMOND DA-40	$473,690	180	4	Low	830	142	900	2646	50	136	75	48	60	45	126	Low wing trainer
Cirrus SR20	$486,900	215	4	Low	709	155	1028	3150	61	31	31	35	46	65	53	
182 Skylane	$530,000	230	4	High	915	145	1110	3100	87	0	33	50	46	31	33	
Cirrus SR22	$671,900	310	4	Low	1169	183	1328	3600	92	117	128	133	135	135	131	
T206H Turbo Stationair	$745,000	310	6	High	703	161	1441	3789	87	43	51	36	40	32	37	
Cirrus SR22T	$771,900	315	5	Low	1021	213	1246	3600	92	160	142	149	174	180	200	High end personal aircraft
									TOTALS	690	648	598	702	724	888	





Source: Personal email correspondence with Mike Blyth (2021), 10 February

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Teaching notes

McEdward Murimbika, Claire Beswick and Richard Thomson

Synopsis

In 2021, Mike Blyth and his business partners, James Pitman and Andrew Pitman were facing new challenges the business had never faced before. Despite the global upheaval and economic devastation caused by the COVID-19 pandemic, 2020 had been a productive year for the South African small-aircraft manufacturer. Globally, sales of Sling Aircraft's aeroplanes had been good and the company had just finished a development prototype of a high-wing four-seater. Blyth, Andrew and James felt certain that there was space in the market for a five-seater aeroplane and they were meeting to discuss how to set up the business for further success. The strategic choices required to take the company in the new direction seemed clear and obvious, but it became apparent that they faced a dilemma regarding how to set up or restructure the company for success by exploiting the new opportunity without putting all of the hard work of the past 15 years in jeopardy.

Case teaching purpose

This teaching note is as much about applied strategic entrepreneurship as about strategy because its ultimate objective is to help the course facilitator to effectively engage and guide students through the key learning objectives. This is a decision-based case study. Students will be asked to play the role of the founding entrepreneur and executive Blyth and his business and executive partners, James and Andrew who are faced with the decision to introduce a new product line for producing a certified five-seater aeroplane. This would take the company into an entirely new and more complex realm, and the partners have to be sure to set up a new strategy for the business so that they can enter this realm and compete successfully.

This would require a significant investment of financial capital to establish a new local and international manufacturing and operational plant; undertake expensive aviation licencing requirements and launch global marketing for the new product line. Auxiliary to these strategic decisions, the company would require significant changes in human capital and talent management, research and development and organisational restructuring. A salient decision which may not be on the company's board meeting agenda relates to the effects of the decision on the entrepreneurial founder and his partners' relationship and their quality of life since the new emergent strategy is likely to place the company under significant pressure.

Research methods

The data for this case study was collected between 2020 and 2021. It consists of primary data collected through in-depth interviews with Blyth, James and Andrew. Secondary data was collected from operational, management and financial reports obtained from the company, aviation industry reports, public websites, social media platforms and customer testimonies.

Learning outcomes

This case study is useful for business administration students and strategic and corporate entrepreneurship students at the master's degree level with moderate to extensive knowledge of strategy and strategic entrepreneurship which involves the integration of entrepreneurial and strategic management perspectives to achieve sustainable growth and competitive advantages for a firm. Given the real-life business scenarios in this case study, it cannot confine itself within the disciplinary boundaries of strategy or entrepreneurship. Thus, this case study is also recommended for use as a global case study. It could be used in strategy, strategy innovation, strategic entrepreneurship and global entrepreneurship courses. However, given the moderate to high level of difficulty of the case study, it would be appropriate for MBA, Master of Management and graduate programmes positioned beyond the introductory models of the programme.

This case study is not an attempt to solve once and for all the above-mentioned problems in the respective sub-disciplines. Rather, it suggests a way of coping with the difficulties and complexities of strategic and entrepreneurial decision-making in pursuit of competitive advantages in small and medium companies by exploring the predictable dangers that come with this process.

At the end of the case study discussion, students should be able to:

- critically analyse the strategic options for a global small and medium-sized enterprise (SME) seeking competitive advantage in a highly specialised industry;
- determine the strategic management and operational approaches to introducing a new product line using the case study options as an example;
- determine the best investment approach for a global operational strategy considering financial analysis of associated costs and the best form of financial capital/investment in terms of risks and control references; and
- carry out a financial analysis and make evidence-based decisions with respect to addressing how strategic recommendations will affect the future of a firm's competitive advantage.

Secondary learning outcomes include the following:

- learning about the global nature of the aviation industry;
- distinguishing strategic issues from entrepreneurial considerations in an SME;
- collaborate, debate, convince and communicate using strategic entrepreneurship vocabulary in the field of entrepreneurship and management;
- follow a well-considered decision-making process; and
- detect at a personal level the challenges that entrepreneurs and founding partners experience at various stages of business evolution.

Core readings

Belhadi, A., Kamble, S., Jabbour, C. J. C., Gunasekaran, A., Ndubisi, N. O., & Venkatesh, M. (2021). Manufacturing and service supply chain resilience to the COVID-19 outbreak: Lessons learned from the automobile and airline industries. *Technological forecasting and social change*, *163*, 120447.

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Kazanjian, R. K., Drazin, R., & Glynn, M. A. (2017). Implementing strategies for corporate entrepreneurship: A knowledge-based perspective. In *Strategic entrepreneurship: Creating a new mindset,* 173–199.

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Robinson, T. (2022). Inspiration Nation. Retrieved from https://reachvolunteering.org.uk/sites/default/files/Inspired%20Aviation%20-%20May%20AEROSPACE%202022.pdf

Steenburgh, T.J. & Avery, J. (2010). Marketing analysis toolkit: A situation analysis. Harvard Business School Background Note (510–079), abstract. Retrieved from https://www.hbs.edu/faculty/Pages/item.aspx?num=38364

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Welter, F. & Smallbone, D. (2017). Entrepreneurship and enterprise strategies in transition economies: An institutional perspective. Retrieved from www.researchgate.net/profile/Friederike-Welter/publication/235966802_Entrepreneurship_and_Enterprise_Strategies_in_Transition_Economies_An_Institutional_Perspective/links/54f462610cf2f9e34f09e2e4/Entrepreneurship-and-Enterprise-Strategies-in-Transition-Economies-An-Institutional-Perspective.pdf

Teaching plan and approach

The suggested strategy for a 90-min discussion is adapted to MBA and master's in management classes. This case study is most suitable to be delivered after a general introduction to organisational strategy and corporate entrepreneurship. The instructor may adjust the time for covering the case study dependent on teaching in-person classes or online sessions. It is recommended that the case study be distributed to the students ahead

of class. The case preparation will require the students to engage with the case study at least a week ahead and during which time they should also critically engage with core reading materials and work on the case study questions. The Sling Aircraft case study involves a team of entrepreneurial partners and executives taking their recommended implementation strategy to the board for final implementation approvals. As such, each student needs to have the opportunity of reading the case study and then be organised to work in syndicate groups/teams before convening the class exercise.

The recommended overview of proposed classroom activities, the associated objectives and recommended time allocations are tabulated below (see Table 1). The steps are further explained.

Because this case study has detailed supporting information including pricing models, competition, market sizes and production statistics, it is recommended that the case analysis includes an implementation step in the case closure phase. The suggested mnemonic device for these important steps is PROSITOPIC, namely:

Step 1 PRO – defining the problem.

Step 2 SIT – situation (setting the stage).

Step 3–4 OP – options – polarising the case and making decisions.

Step 5 I – implementation.

Step 6 C – closing the case.

The authority or ownership of this case discussion beginning with who initiates and leads the discussion must be transferred from the instructor to the students or delegates as efficiently as possible and later transferred back to the instructor during the options polarisation (Step 3–4) and eventually the closing step (Step 6).

Step 1: defining the problem. The instructor may begin the discussion by asking students about the key issues in the Sling Aircraft case study and recording answers on a digital or manual board/chart. The 10 min allocated here is in cognisance of the fact that the students would have pre-worked on this case study as individuals and in their syndicate groups/

Table 1 The 90-min teaching plan

Step	*Classroom activities*	*Learning outcomes*	*Time*
1. Defining the problem	Plenary discussion – structuring student suggestions on the strategic dilemma and strategic entrepreneurship issues in the case. Students may be asked to demonstrate an understanding of the essence of strategy, strategic thinking and approaches to decision-making. Students should differentiate key issues from secondary issues and symptoms	1, 2	10 min
2. Setting the stage	Plenary discussion. The instructor should invite students to describe the situation. The 5Cs model is helpful to conduct the situation analysis to extract the relevant information on Sling Aircraft. This should be done by returning to the problem to identify important decisions to be made to guide the business in solving the problem	2	15 min
3. Polarising the case	Create tension by asking students to take a stand, to identify decisions or options that should be polarised decisions whether to introduce the new 5-seater plane and all the auxiliary processes or not	All including secondary outcomes	5 min
4. Making decisions	Plenary discussion – structuring student suggestions and data. The instructor can directly address the teaching objectives of the case	1, 2 and secondary outcomes	30 min
5. Implementing decisions	Plenary discussion – structuring student suggestions building upon the decision(s) made during the previous step. Ideally, the students are on their own but the instructor can help by making remarks or asking questions about the topics being discussed	All including secondary outcomes	20 min
6. Closing the case	Summary of learnings from this case. It may be useful to expressly link the case to theories and concepts at this time	All including secondary outcomes	10 min
	Allocated time:		*90 min*

teams. Students should differentiate key issues from secondary topics and "symptoms" (which reveal the problem but should not necessarily be addressed). Typical questions to guide the discussion at this stage include the following:

1. What is the real problem that requires Sling Aircraft's board decision?
2. Why does Sling Aircraft need to introduce a new aircraft into the market? Is it critical?
3. How should the introduction of the new product line be introduced into the operations of the company?
4. Why should something be done about this problem?
5. Who should be doing something about it? Who "owns" the problem – the founding partnership and executives or more role players?

The instructor may choose to do an in-depth analysis of the problem anchored on the consideration of introducing a new aircraft product line and the associated strategic decisions or quickly move on to the next step if students have difficulty identifying the main problem and taking ownership of the discussion. The instructor should ensure students are differentiating the main strategic problem – the dilemma – of how to set up Sling Aircraft for sustainable success through the proposed introduction of the new aircraft product line which is separate from the other auxiliary historic problems relating to organisational design, operational inefficiencies and a lack of corporate and marketing strategy.

Step 2: setting the stage. The students should participate in the discussion by "setting the stage" for the Sling Aircraft case study. The instructor can help students by asking them to describe the situation. The "5Cs" model of situation analysis can be helpful here by ensuring that relevant information about the Company, the Context, the Clients, the Competitors and the major Collaborators (suppliers, distributors, etc.) is included (Steenburgh & Avery, 2010). The following questions may be used to guide the discussion:

Company: What does Sling Aircraft do? What does it stand for (mission, values)? Who runs it? Who makes what decisions? Who "owns" the problem? What are the revenue sources? What motivates managers? Does Sling Aircraft need the new product line?

Context: Why is Sling Aircraft facing this situation where it had to come up with a new strategic decision to guide new growth? In which industry and sub-industry is it active? What do we know about the current situation of the company/industry (life cycle stage, key success factors, value chain, economic context, threats, opportunities, weaknesses, strengths, etc.)?

Competition: Who are the competitors – historical and in the future market targeted? What is Sling Aircraft's competitive advantage? How strong is the competition? What are the key success factors in this industry, specifically the sub-sector Sling Aircraft is targeting?

Clients: How is the customer base for the new aircraft line segmented? Which are the most important segments (e.g. individuals, SMEs, multinational corporations [MNCs])? Who are the prime and secondary targets for the proposed fixed-wing, five-seater Sling Aircraft model?

Collaborators (stakeholders in general including employees and external business partners): Who are the major stakeholders? What are their motivations to be in business with the company? Current and potential partners (e.g. local or international manufacturers, distributors, funding entities, etc.), What value do they add and for whom in the context of Sling Aircraft's proposal to invest in the new aircraft product line? Why does the company need them? What are the pros and cons of doing business with them? What is the ideal profile of these business partners that Sling Aircraft may consider for the proposed expansion strategy?

The instructor should ensure that at this stage they guide the class to iterate by going back to the previous section on the definition of the problem identified in Step 1 – refining it and identifying important decisions to be made to "solve" the problem that Sling Aircraft was facing. At this stage, the possible solutions or options on how to set Sling Aircraft up for success should become clear. The instructor should encourage students to assume leadership of the discussion as if they were in the company's board meeting where this strategic matter is being discussed.

At this point, three strategic options should be clear:

1. build an "increasing the pace" strategy around the production of the five-seater Sling Aircraft model;
2. build a scaffolding realignment strategy starting with the experimental five-seater model and subsequent five-seater Sling Aircraft models; and
3. build a business start-up venture-like strategy to invest and certify the five-seater Sling Aircraft model from inception.

Step 3: polarising the case. This step is carried out by the instructor. All three strategic options have relative urgency in the context of what the Sling Aircraft leadership needs to do to set up the business for sustainable success in the future. The significance and suitability of the identified decisions/options should be discussed, and students should decide which decision to prioritise with respect to advantages and disadvantages.

At this stage, the instructor should allow the class to be polarised around decisions through syndicate group or individual vote, for example questions such as the following should elicit "black and white" answers (e.g. yes/no):

1. Would you recommend Option 1, 2 or 3? Would you recommend that Sling Aircraft:
2. Expand by adopting the strategy to build the experimental five-seater model only?
3. Expand by adopting a strategy that starts with the experimental five-seater model and subsequently moves to certifying the fixed-wing five-seater model?
4. Expand by adopting a strategy to invest in certifying the five-seater model from inception and then expand.
5. Would you recommend that Sling Aircraft expand by locating the five-seater model production plant in the (1) USA or (2) split the production plant between the USA and South Africa?
6. Imagine that I am Blyth and you are James or Andrew, and I am telling you that I have decided to go with Option 2. Are you happy? Why or why not?
7. Is Option 3 a bad idea?

Whichever decision we go with, we must be sure that resources are devoted to the most important customers today and in the future to secure their loyalty and encourage them to buy more Sling Aircraft and products.

- Do we need to borrow or use our cash reserves to finance the expansion into the five-seater production line?
- What financial options should we consider – debt or equity?
- A combination of debt and/or grant? Which of the three options do you think would be best in this situation?
- How much control as entrepreneurs do we want to retain to guarantee that we do not dilute our control?

Based on divergent positions, the instructor should lead the students towards further analysis required to make the best decision. This is where the distinction between a large organisation and an SME strategy development process can be identified. In the case study, Blyth refers to the entrepreneurial posture of both the partners and the company itself as an SME by aviation industry standards. Thus, Sling Aircraft is an entrepreneurial venture seeking a strategic future competitive advantage, albeit with higher risk, which requires proactiveness and innovation – all hallmarks of a highly entrepreneurial-oriented organisation.

Step 4: making decisions. At the decision-making phase, for the core of the case discussion, the instructor can directly address the learning outcomes.

LO1: *Analysing the strategic options for a global SME seeking competitive advantage in a highly specialised industry* – The instructor may initiate and guide the discussion by asking the following questions:

- *Q1:* What advice would you give Sling Aircraft on to how to grow the company's competitive advantage through the new five-seater aircraft?
- *Q2*: How should Sling Aircraft build a competitive advantage based on cost structure, differentiation, and scope in any of the alternate expansion strategies?

The instructor may also initiate and guide the discussion by asking questions about the possible options or alternatives:

- How would you justify Option 2 – building a scaffolding realignment strategy starting with the experimental five-seater model and subsequently certifying the five-seater model?
- What makes Option 3 – Build a business start-up venture-like strategy to certify the five-Seater model from inception a strong or weak option?
- Why is it impossible to choose Option 1 to expand by adopting the strategy to build the experimental five-seater model in this context?

LO2: *Determine the best management and operational approaches to introducing a new product line using the case options as an example.*

- Q1: What are the core dimensions of an implementation plan that address (i) operations processes, (ii) marketing and (iii) talent management and human resources?

LO3: *Determine the best investment approach to global operational strategy taking financial analysis of associated costs and the best form of financial capital/investment in terms of risks and control references.*

- What finance breakdown costs are associated with the strategic goals?
- What is the of best form and source of financial capital/investment in terms of risks and control requirements for Sling Aircraft?
- Why is it important to develop operationalisation timelines for this initiative?
- How would you conduct a comparative analysis of regulatory requirements for different operational and marketing considerations?

LO4: *Carry out a financial analysis to address how the recommendations will affect Sling Aircraft.*

- Which financial model is most suitable for Option 2?

Step 5: implementing decisions. This step builds upon the decision(s) made during the previous step. Ideally, the students should be "doing the heavy lifting" on their own/in syndicates, with help from the instructor by making remarks or asking questions regarding the following topics:

- short- and long-term impact of the decision(s) on those involved, on other stakeholders inside or outside the company, on the company's functional activities, on performance indicators, etc.;
- the operational implementation of the decisions (challenges to be met: legal/compliance, human, technical and financial resources required; timing/scheduling and budgeting for commercially producing the fixed wing experimental and/or certified five-seater plane.);
- the relevance of a possible contingency plan (i.e. what to do in case something does or does not happen in the wake of the decision); and
- ways to monitor and control the outcomes of the decisions made.

Step 6: closing the case. The last step of the discussion should centre on the learnings of the case study. Because the audience of this case study will be masters/postgraduate level students, it may be useful to expressly link the case study to organisational strategy theories and concepts relating to entrepreneurial organisational strategic plans, the choices and

decisions used to guide a company to future sustainability and competitive advantages. At this time, the instructor, must now assume full ownership of the discussion (taking no more questions or comments) and provide a clear explanation of what the case study best illustrates.

Case questions and analysis

As suggested and recommended in the opening section of this teaching note and given the development and availability of electronic boards and or Apps that allow the instructor and students to share the same workboard, it is useful in this exercise to again follow the PROSITOPIC approach.

1. PRO – defining the problem.

2. SIT – situation (setting the stage).

3–4. OP – Options – polarising the case and making decisions.

5. I – implementation.

6. C – closing the case study.

1. PRO – defining the problem. In this case study, the main problem that the Sling Aircraft board seeks to solve is how to set up the business for future success through organic growth driven by introducing a new aircraft product line:

> The three partners now had to decide how to set the business up so that it could compete in this market successfully. One of the questions with which Sling was grappling was whether and when to certify the five-seater. As with its existing experimental models, an experimental five-seater could be sold only in countries that allowed experimental aeroplanes.

This requires the company to decide on a new strategy that would help Sling Aircraft move forward into the new five-seater global market without jeopardising the successes the company had achieved to date.

Other secondary issues include building the right operational and production capacity for the new product line as well as mobilising financial resources for this expansion strategy. The preferred strategy would have to consider the best approach, namely, building the experimental five-seater plane in the South African plant and continue selling it through exporting aircraft kits. Alternatively, the company could adopt a hybrid approach to begin the new product line through building the experimental five-seater plane parallel to an internationalisation of the investment and production plant in the USA to certify the five-seater aircraft with the American Civil Aviation Authorities as an alternative to certifying the plane with the South African civil aviation authorities. Alternatively, the company may adopt a full special purpose start-up approach by creating a new venture in the USA to pursue full licencing of the five-seater model to be manufactured in the USA. This could be done through investment partnerships with USA-based partners. In this situation, the decision-makers – Blyth, Andrew and James should pursue the following objectives: set up the most efficient production process that would lead to the introduction of a new aircraft line and launch a competitive, aggressive marketing plan to help capture a new market through first mover advantages; create organisational design and operations systems to efficiently pursue certification of the five-seater aircraft to gain a broader international market and increase the profit level of the new five-seater model when it goes on the market. In the meantime, the company should continue to increase sales, revenues, profits and market share of the existing aircrafts already in production at Sling Aircraft.

Table 2 below sets out how to distinguish between the key and secondary issues in the case study.

2. SIT – situation (setting the stage). The instructor might want to consider the following points when analysing the situation described in the case.

- What is the real problem that requires Sling Aircraft's board decision?

The question that the Sling Aircraft partners and executives must answer is how does Sling Aircraft sets itself up for success in the five-seater aircraft market? The main issue is that Sling Aircraft should come up with strategic clarity on how to introduce a competitive five-seater aircraft into the experimental and/or certified market. The company must overcome its

Table 2 Distinguishing between key and secondary issues in the Sling Aircraft case study

Case issues	*Issue category*
Issue #1 New strategy for developing the capabilities essential for starting a new business unit to enter the five-seater aircraft global market	Key issue – establishing new structures and systems without a clear framework or boundaries; building a collaborative, high-performing team; managing with limited resources
Issue #2 Realignment to enable Sling Aircraft to refocus and adapt to global competition in the experimental aircraft market where it is already established	Key issue – Leading change to continue with the organisational restructuring that has begun before the decision to enter into the new five-seater plane market. This involves reorganisation of the business to accommodate the changes required for the new strategy to produce the new five-seater product line
Issue #3 Manufacturing and Operations – consider dual production centres in the USA and South Africa or separate the traditional product lines from the newly proposed five-seater aircraft including its certification	Secondary Issue to be considered alongside the decision on strategy. By their own admission, "Building aeroplanes was in the blood of all three of Sling's partners". The organisation has experience and resources that can be refocused and used to extend into the new five-seater product line. The leadership is confident in retaining and maintaining talent for success
Issue #4 Financing the new product line without risking the already successful product lines of Sling Aircraft	Consequence of the problem – the concerns for the funding model are only triggered from the strategic decision of how to launch the five-seater aircraft. Each of the three options available to launch the new aircraft has different financial requirements and implications that need to be considered subsequent to adopting the preferred option.
Issue #5 Marketing	Consequence of the problem – The decision to enter the five-seater experimental and/or certified aircraft market will take the company on a new trajectory which would require significant investment in a new marketing framework for the company. However, this is secondary subsequent to the strategic option to be adopted specifically considering the fact that the experimental market is significantly different from the certified plane aircraft market
Issue #6 Organisational design and development	Secondary problem – sling aircraft already embarked on the organisational redesign to improve its current production capacity. The efficiencies being harvested from this organisational redesign would leave the organisation ready for the new expansion strategy
Issue #7 Human resources/talent Management	Consequence of the problem – which of the alternative decisions to introduce the five-seater aircraft would dictate how the organisation will structure its human resources and talent management systems? Scaffolding from experimental to certified five-seater would demand different HR and talent structures, and so will the decision to establish the plant in South Africa or in the USA or both

historically inefficient business model that may have delivered handsome returns in the past but has significant limitations that make the new five-seater product line less competitive. The new strategy should adequately deliver a five-seater aircraft market entry strategy.

- Why does Sling Aircraft need to introduce a new aircraft into the market? Is it critical?

While the organisation has done well in the earlier experimental aircraft model markets from the two-seater to the four-seater low- and high-wing designs, these product lines will not generate the organic growth the company needs to remain competitive. Although the entrepreneurs are comfortable with their achievements to date, the introduction of the new five-seater aircraft model is necessary to generate new organic growth for their going into the future. Industry trends indicate:

- a gap in certified five-seater market;
- limited modern and sophisticated high-wing designs;
- growth in high-net-worth individuals; and
- aviation industry lagging behind in digital marketing.
- How should the introduction of the new product line be introduced both into the management system and operations of the company?

Sling Aircraft needs a "Project Take off" business start-up strategy characterised by the need to acquire or develop the capabilities needed to launch a new and significantly differentiated five-seater aircraft product line. This includes people, funding, customers, technology and knowledge all geared towards attaining a low-cost, hybrid strategy of introducing an experimental five-seater aircraft while acquiring certification for the aircraft's entry into a potentially bigger market.

- Why should something be done about this problem?

Sling Aircraft needs to set itself up for future success and competitive advantage. Failure to enter the emerging growth market threatens the company's market position. The company seeks to achieve an impact in revenue growth of half a billion rands (using the historic growth trajectory), more than a 20% internal rate of return, achieve an R100m net present value and a four-year payback period.

Sling Aircraft has the existing resources and capabilities for the board to take an entrepreneurial orientation in risk propensity, innovativeness and proactiveness rather than reacting to the market leaders by which time it could be too late for the company to reap the benefits of its deep design and engineering expertise, strong partnerships with distributors, low-cost manufacturing advantages and its positive cashflow position.

- Who should be doing something about it?

The strategic decision to introduce the new five-seater aircraft product line lies with the board of directors led by the founding executive board chairperson and chief designer, Blyth, and his business partners, James and Andrew. There is a demand for both experimental and certified five-seater aircrafts. Sling Aircraft is well-positioned to become a market leader if it can find and adopt the right strategy.

The 5C framework in Table 3 below may help with this analysis.

Step 3: Polarising the case – identify and evaluate options and Step 4: making decisions.

This case study has three possible solutions, scenarios or options for addressing the main problem in the case: build and sell the experimental five-seater aircraft only, scaffold starting with the experimental five-seater and moving to the certified five-seater aircraft or pursue certification for the five-seater aircraft from inception.

- Option #1 experimental five-seater aircraft only.
- Option #2 scaffold starting with experimental five-seater moving to certified five-seater aircraft.
- Option #3 certification for five-seater aircraft from inception.

Table 4 below evaluates these options.

Based on the preceding analysis, the most important factors on which to base decisions aimed at solving the strategic decision challenge presented in the case study are as follows:

- *Introduction of the five-seater* has significant potential to create a new global brand positioning for Sling Aircraft.
- *Perfect timing* – Gap in the market for the five-seater high-wing certified aircraft. Sling Aircraft is positioned to introduce a new product line in form of the high wing five-seater aeroplane.
- With the introduction of the five-seater aircraft comes the potential to increase sales. That will create a platform for the company when applying for the certification of the five-seater Sling Aircraft.
- *Structure joint venture with an American aircraft company* – This approach will separate the existing Sling Aircraft product lines from the new aircraft product line. The certified aircraft has the potential of increasing the margin by roughly 10% to 15% because it will also capture the new commercial market through the certified aircrafts.
- *Location strategy* – by having at least 51% of the planes being manufactured through assembling in the USA, Sling Aircraft's largest present market suggests that it will remain the market with growth potential.

Table 3 5C framework

Guiding questions		*Information summary*
Company	What does the business/company do? What is its mission? Who runs it? Who makes the decisions? Who "owns" the problem? What are the revenue sources? What motivates managers?	Decision-makers Mission, vision and values of company Historical overview Location Size and revenues Strengths and weaknesses Internal value chain ■ Given our 5Cs analysis, how well positioned are we in the face of challenges and opportunities? ■ How have we tracked goals and objectives in the past?
Context	Why is the company facing this situation? In which industry is it active? What do we know about the current situation of the company/industry? (e.g. life cycle stage, key success factors, value chain, economic context, threats, opportunities, weaknesses and strengths)	Industry Stage in the industry life cycle External value chain Recent trends Opportunities and threats ■ PESTLE analysis ■ Political ■ Economic ■ Social ■ Technology ■ Legal ■ Environmental
Competitors and competition	Who are the competitors? What is the company's competitive advantage? How strong is the competition? What are the key success factors in this industry?	Direct and indirect competitors Degree of competitive rivalry Key success factors in the industry: ■ Who are the market share leaders and why? ■ Who has gained/lost share and why? ■ Any new business models introduced that are small now but growing fast ■ Competitive advantage of company
Clients and Demand	How is the customer base segmented? Which are the most important segments? (e.g. SMEs and MNCs) Who are the prime and secondary targets?	Current and potential clients Segments, targets and positioning Market size, qualification and quantification of demand Power of customers: ■ The essential question: can you articulate what your relationship with your customers is like? ■ How are your customers changing and how will you adapt to better solve their problems and serve their needs versus the competition?
Collaborators	Who are the important stakeholders? What are their motivations for doing business with the company? Current and potential partners (e.g. local manufacturers, distributors, funding entities): What value do they add and for whom? Why does the company need them? What are the pros and cons of doing business with them? What is the ideal profile of these business partners?	Employees Suppliers (and bargaining power of suppliers) Distributors Financial institutions Research institutions Governmental agencies: ■ Upstream and downstream partners ■ Technology partners ■ Suppliers

Table 4 Alternative options for the case study response

	Option #1 experimental five-seater aircraft only	*Option #2 scaffold starting with experimental five-seater moving to certified five-seater aircraft*	*Option #3 certification for five-seater aircraft from inception*
Pros	■ Existing resources and infrastructure ■ Quick approval process ■ Quick access to market	■ Opportunity to perfect/improve the design prior to incurring the costs for certification ■ Access to a larger market, of both experimental and certified aircraft customers ■ Earlier revenue generation and certification processes can be run concurrently	■ First mover advantage as there are no other certified high-wing five-seaters ■ Quality perception will be maintained ■ Willingness to pay for exclusivity
Cons	■ Limited market growth opportunity ■ Large established competitors in the USA	■ Risk of market dilution	■ Large financial outlay ■ Any improvements will require additional certification ■ Lack of current capacity as certified and non-certified parts cannot be mixed ■ Long timeframes for a development prototype

- *Equity finance strategy* – It is recommended that Sling Aircraft find a partner through equity to finance the expansion project and the setting-up of Sling Aircraft to be able to manufacture certified aircrafts.
- *Expansion strategy* into Asia Pacific regions – the data shows that this region is third in sales which is 16% of Sling Aircraft's total sales and this is an indication of the potential of this region.

5. Implementing decisions. The overall evaluation indicates just how significantly the options differ in terms of suitability (see Table 5 below). In this case study, there seems to be a clear "winner" (Option 2 Hybrid). Option 1 is more suitable than Option 3, but by a smaller margin. This evaluation does not include the time factor and long-term competitive advantage and sustainability. The differences only show which option is most suitable at the point of decision-making. There are several factors that should be considered. For cost and ease of implementation, Option 3 seems to be the least suitable, however, it is the most suitable for future profitability and growth potential. These two criteria could be weighted as more significant if the overall objective is to be drawn using tools such as a decision matrix. The answers are not black and white, just interpretations. Based on this evaluation, the best option is to combine Options 1 and 3 to give Option 2 – which is the hybrid.

6. Closing case analysis. This decision-based case study takes place in Johannesburg, South Africa in the small plane aviation sector. The partners are poised to make a decision on the strategy regarding how the company could be set up for success without putting all the hard work of the company for the past 15 years in jeopardy. The executives are exploring options for introducing a five-seater aircraft product line targeting the type-certified market, with the potential to generate orders of great magnitude and more revenue for Sling Aircraft.

Students are invited to play the role of Sling Aircraft's partners and directors in the case study who must make decisions about the feasibility of entering and successfully competing in the type-certified light aircraft market with a new high-wing, five-seater model. The decision requires analysing the situation described and formulating recommendations regarding the strategy to adopt. In the case study situation, the hybrid scaffolding solutions/options of combining market entry through the experimental aircraft model and subsequently licencing the five-seater may be adopted or considered, and the case study may be polarised around the divergent opinions related to steps to be followed.

Table 5 Assessing options – decision matrix evaluation of options on a five-point Likert scale

Criteria	OPTION 1 Experimental	OPTION 2 Hybrid	OPTION 3 Certification
1. Cost effectiveness	5	3	1
2. Profitability	1	4	5
3. Ease of implementation	3	5	1
4. Organisational culture	5	4	2
5. Potential for growth	3	5	5
Total	**17**	**21**	**14**
Legend of evaluation 1 is least suitable option and 5 is the most suitable option.			

Conclusion

The important "learnings" of the case are that there is no simple or direct path for an entrepreneurial organisation such as Sling Aircraft to decide on a new expansion strategy for the global market in a highly competitive and specialised innovative industry. Similarly, choosing the right strategic approach is not easy. This case study illustrates how a single decision may require more than one strategic approach. Introducing a new five-seater aircraft product line which is radically different from the present product line suggests that the company must adopt a business start-up strategy located in developing the capabilities essential to starting a new business project such as designing, certifying and marketing a new five-seater aircraft. Such a strategy would have to help the organisation to establish new structures and systems without a clear framework or boundaries. Given the complexities involved, this also requires building a collaborative, high-performing team and managing with limited resources.

The benefits of this entrepreneurial strategy include the observation that there is little rigidity in the Sling Aircraft team members' thinking and consequently the business can be made to work from the beginning specifically if a scaffolding approach is adopted. This would involve an effectuation process starting with what the company already knows and has – Sara Sarasvathy's (2001) "bird in hand" perspective. Also, the entrepreneurial spirit of the Sling Aircraft team is observable in how the partners are energised by the possibilities and enthusiasm of expanding the company's aircraft product line.

However, the strategic options presented in the case suggest a realignment approach is also required, and or at least was underway in Sling Aircraft to ensure that the successes the firm had attained with existing product lines can be adapted or refocused to address the serious management, operational and capital challenges that threaten the possibilities of introducing a new product line. Introducing a more demanding product line such as a certified five-seater aircraft requires significant strategic changes to reorganise the business, the management, the partnership and setting new priorities. The realignment's strategic benefits and opportunities are presented in the business's experience and resources that can be refocused and used especially the option of introducing the new five-seater planes as experimental and developing it further to a certified aircraft. This strategic hybrid scaffolding approach has significant benefits.

Finally, the main theories and concepts that can be applied to this case study are listed below in Table 6.

Links to other case studies and preliminary use in the classroom

This case study is not directly linked to other cases. This case study has been tested in the classroom. The MBA and Master of Management students shared preliminary challenges in differentiating between the core problem and secondary issues. When the case was polarised, students voted freely and did not always agree with their syndicate group members. Overall, this case study worked for both MBA and master's cohorts when adopting a strategic management and/or strategic entrepreneurship perspective. The 90-min suggested teaching plan worked on average but if the students have not prepared the case study in advance adequately, the 90-min slot could be too short.

Table 6 Learning outcomes and theories in the case study

Topics/learning outcomes	*Questions for students*	*Concepts and theories/references*
A. Analysing the strategic options for a global SME seeking competitive advantage in a highly specialised industry	How do firms usually build growth strategy?	■ Strategic entrepreneurship ■ Hitt, M. A., Ireland, R. D., Camp, S. M. & Sexton, D. L. (Eds.) (2017), "Strategic entrepreneurship: Integrating entrepreneurial and strategic management perspectives", In *Strategic entrepreneurship: Creating a new mindset*, Blackwell Publishing, pp.1–16
B. Determine the best management and operational approaches for introducing a new product line using the case options as an example	What organisational management and operational structure should the company adopt to support an organic competitive advantage? How?	■ Kazanjian, R. K., Drazin, R., & Glynn, M. A. (2017), "Implementing strategies for corporate entrepreneurship: A knowledge-based perspective", In *Strategic entrepreneurship: Creating a new mindset*, pp.173–199
Entrepreneurial capital C. Determine the best investment approach for global operational strategy taking into account the financial analysis of associated costs and best form of financial capital/investment in terms of risks and control references	How would you decide on investment structure and options to justify expanding into a new product line and related market?	■ 5Cs framework ■ Steenburgh, T.J. & Avery, J. (2010), "Marketing analysis toolkit: A situation analysis", Harvard Business School Background Note (510–079), abstract available at: https://www.hbs.edu/faculty/Pages/item.aspx?num=38364

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Abstract

Title – *Sling Aircraft: gearing up for the big time.*

Learning outcomes – *At the end of this case study discussion, students should be able to critically analyse the strategic options for a global small and medium-sized enterprise seeking competitive advantage in a highly specialised industry, determine the strategic management and operational approaches to introducing a new product line using the case study options as an example, determine the best investment approach for a global operational strategy considering the financial analysis of associated costs and the best form of financial capital/investment in terms of risks and control references and carry out a financial analysis and make evidence-based decisions with respect to addressing how strategic recommendations will affect the future of a firm's competitive advantage.*

Case overview/synopsis – *In 2021, Mike Blyth and his business partners, James Pitman and Andrew Pitman, were facing new challenges the business had never faced before. Despite the global upheaval and economic devastation caused by the COVID-19 pandemic, 2020 had been a productive year for the South African small-aircraft manufacturer. Globally, sales of Sling Aircraft's aeroplanes had been good and the company had just finished a development prototype of a high-wing four-seater. Blyth, Andrew and James felt certain that there was space in the market for a five-seater aeroplane and they were meeting to discuss how to set up the business for further success. The strategic choices required to take the company in the new direction seemed clear and obvious, but it became apparent that they faced a dilemma regarding how to set up or restructure the company for success by exploiting the new opportunity without putting all of the hard work of the past 15 years in jeopardy.*

Complexity academic level – *This teaching activity is aimed at Master of Business Administration (MBA) and Master of Management.*

Supplementary materials – *Teaching notes are available for educators only.*

Subject code – *CSS 11: Strategy.*