

SEATS



SEATS GB – MANUFACTURING UNIT – 5 AXIS *(AFTERMARKET AND DEVELOPMENT)*



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- Aftermarket Parts Requirement:- Make Verses Buy summary.

Proposed solution and project details

- Overview of Technical details.
- Further benefits taken to be taken from the technology.
- Proposal for Financial Year 2022.

Problem Statement

- Manufacturing Unit has started the journey to become “Rapid Prototyping” shop for both Seats GB and Seats FR on metallic items.
- It now also equates to 85% of the revenue stream for aftermarket requirements just for Seats GB.
- The manufacturing unit has and continues to provide good levels of support into both demand streams for items within its capabilities.
- The manufacturing unit is currently unable to support all demands, as its current capabilities are constrained. Over the past three months we have been unable to support or unlock:-
 - **Over 250 development parts for Seats FR** - (Impact - Seats FR had to use Chinese suppliers with increased lead times and cost)
 - **JAL rapid prototypes for Seats GB** - (Impact - Key example:- JAL meal table. Excessive spend on UK 3rd party supplier)
 - **£931k of backlog on aftermarket.** - (Impact:- Revenue loss within month and poor On Time In Full to customer)
 - **20% of metallic parts requirement** - (Impact - Outside of current capability)
 - **Customer requested delivery** - (Impact – Metallic lead times 150 days verses requirement of 45 days. Target 4 days)
- We are therefore constrained to support the internal customers, which in turn impact our external customers.
- Looking forward we have the below demands:-
 - **£5.6m of the forecasted aftermarket sales for machined parts for the remainder of 2022.**
 - **£250K of development parts for Seats GB and Seats FR**
- For this Seats GB has conducted an industrial study on what would be required to unblock this.

Problem statement:- Is this a problem within our Mid Term Plan (MTP)?

1 Development requirements:-

27 new programmes forecasted within the MTP

			Bespoke FC - A350-1000 - Japan Airlines	
			Unity - B787 - xxx	
			Optima Prime - B777-300 - Cathay Pacific	
			Unity - A350 - xxx	
			Bespoke FC - B777-9x - Cathay Pacific	
		Air New Zealand B787-9 Bespoke BC	Air New Zealand B787-10 Bespoke BC	
		Qantas A350-1000 Unity	Unity Bespoke - B787-9 - Japan Airlines	
		Optima Prime - B787-9 - Air China	Bespoke FC - B777-9x - Cathay Pacific	Unity Bespoke - A350-900 - Japan Airlines
		Optima Prime - A330-300 - Cathay Pacific	Unity - B777 - xxx	Unity Bespoke - B787-9 - Japan Airline
		Unity Bespoke - B787-8 - Japan Airlines	Unity Bespoke - B777 - xxx	Unity - B777 - xxx
FC JAL A350-1000		Qantas A350-1000 Bespoke FC	Unity Bespoke - A350-1000 - Japan Airlines	Bespoke FC - A350 - xxx
BC JAL A350-1000	Air New Zealand B787-9 L Bespoke BC	Unity - B787 - xxx	Optima Prime - A350 - xxx	Unity - B787 - xxx
FY22	FY23	FY24	FY25	FY26

2 Aftermarket Manufactured Hours:-

200% growth from baseline

	SSGB - MU Aftermarket Hours				
FY	2022	2023	2024	2025	2026
Hours	25504	51243	67368	68722	68722
% Growth (FY22 Base line)		201%	264%	269%	269%

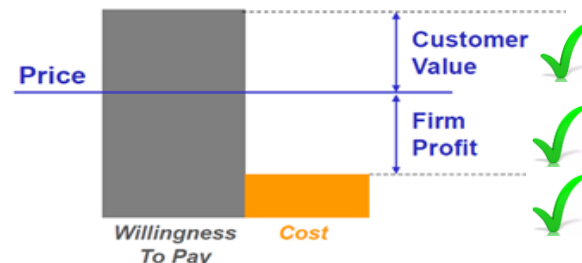
Key Messages

- 1. Development programmes
 - 27 programmes forecasted within the MTP.
 - 27 X Average cost of UK 3rd Party supply rapid prototyping = £6.3m
- 2. Aftermarket
 - 200% growth on FY22 baseline.
 - Based on demonstrated data:- £1.8m of backlog held and missed customer requested delivery.

Summary of proposals:-

Aftermarket:- Make vrs Buy

Buy		Make	
Criteria	Comments	Criteria	Comments
Cost	- Expedite fees to pull low volume production in from Chinese's suppliers. Up to 30% of mark up in extreme cases. - UK 3rd Party support:- <u>Average Hourly rate</u> :- £110 per hour. - Due to lead time forecasted £1.8m of held backlog.	Cost	- Hourly rate is fixed. There are no Expedite fees linked to low volume. I.E change overs and negative impact to OEE. It is already the strategy of MU. - <u>Hourly Rate</u>:- £69.30 - Lead time supporting CRD. Conversion of backlog into sales.
Profit	- Direct impact to margin linked to points 1+2 above.	Profit	- 77%, which is already demonstrated on current make items. - Clearly opportunities to increase based on reduction of standard times. Benefit from modern technologies to be taken.
Customer Value	- 150 day lead time vrs customer requirement of 45 days. - Impact to NPS and "concern" topic during new bids of repeat business.	Customer Value	- 4 day lead time vrs CRD of 45 day. Demonstrated both on current demands and supporting SFR demands. - Reduction of backlog and increased adherence to OTIF to our customers will create a positive impact to NPS.



In the context of both aftermarket and development metallic primary parts. The study has shown that by installing capabilities will allow:-

- Cost benefits on hourly rates and non-quality.
- Increased profit levels in aftermarket margin and positive impact to rework.
- Increased customer value in both quality and delivery performance.
- All required in line with our Mid Term Plan.

Development Parts:- Make vrs Buy

Buy		Make	
Criteria	Comments	Criteria	Comments
Cost	<u>Average Hourly rate</u>:- £120 per hour. <u>Average cost per programme</u>:- £236k <u>Cost of non quality</u>:- Design team are not co-located with UK 3rd party supplier. Up revisions create "double impact" as all requirements require new P/O	Cost	<u>Average Hourly rate</u>:- (Direct + Overhead) £69.30 per hour. <u>Average cost per programme</u>:- (Study) £134k <u>Cost of non quality</u>:- Design team hold full access to manufacturing plant. Ability to prove out primary parts "real time" for fit, form and function
Profit	<u>Direct link to RTDI overspend</u>:- Hard to prove out designs without ordering additional prototypes. - Also creating delays, approach is not "Rapid". Order parts, await to be delivered to SSGB then correction.	Profit	Prove out of fit, form and function on primary parts will able a higher % of right first time on the assembly level. Positively impacting over spend on RTDI cost.
Customer Value	<u>Quality at development milestones</u>:- Due to increased lead times and design teams "distance" from the supplier it's difficult to prove out fit, form and function on primary parts. - Hence prove out is completed on the assembly level just before presentation to the customer. - Any quality issues I.E Jai meal table creates a negative impact on quality for our customers.	Customer Value	<u>Quality at development milestones</u>:- Ability to work "locally" and prove out prototypes at the primary part level "Rapidly". Whilst providing a reduced lead time allowing full development of fit, form and function in a timely manner before presentation to the customer.

Machine Selection — Manufacturing 4.0 technologies

Mazak CV-5-500

Overview

Axis:-

5 (+2 on current capability)

Spindle Speed RPM:-

18,000 (6000 on current capability)

Bed Movement:-

X730mm x Y450mm x Z470mm

Maximum Workpiece Size:-

Ø 500 mm x H 320mm



Mazak VTC-800/20R

Overview

Axis:-

5 (+2 on current capability)

Spindle Speed:-

18,000 (6,000 on current capability)

Bed Size:-

X2000mm x Y800mm x Z720mm

Maximum Workpiece Size:-

Ø700 mm x H570mm

X1950mm x Y750mm x Z570mm



Key IOI'S:-

- Average Spindle speed increase > 140%.
- > Cutting speed = Reduced cycle times.
- Unlocking capabilities to support aftermarket short lead time products.
- Supporting DTC via enablement of rapid prototyping in house.
- > 40% energy consumption on equivalent cycle times.
- FAI can be carried out on the machine.

Investment – Benefits to be taken from the technology?

- Low Carbon



- Biggest benefit is forecasted energy reduction of 40%.
- The new technology allows the head to travel x3 times faster using the same level of energy.
- We have proved this out with the support of the University of Wales.

- Indirect head requirements within MTP



- Today we have 6 indirect within our structure who are machine programmes.
- Current ROM cost:- £240k PA and forecasted to grow in line with MTP demand
- In line with roll out the machine will programme directly from the model. Removing the indirect headcount.

- Reduction in standard timings



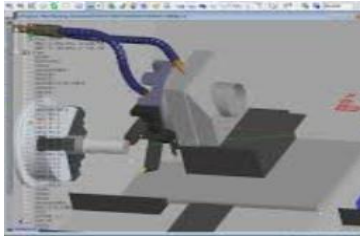
- Standard times will be reduce by 40% (proven out with support of University wales)
- Will provide benefit in cost reduction and support improved margin on aftermarket.
- Further support to “Rapid prototyping” via reduced run times.

- Link to “Shake”

- Removing the need for drawing release on metallic parts for development milestone.
- Supporting right first time via enabling prototyping of complex parts.
- Via use of prototyping allow DTC to be challenged and improved during modelling.

Investment – What is required in both capabilities and technologies ?

Current State:- (3 Axis only)



Stage 1:-

Manual intervention – Model and drawing provided to MU



Stage 2:-

Manual intervention – Man to programme the machine



Stage 3:-

Manual intervention – Man upload the machine, set up based on tool selection and run. Maxium spindle speed 8,000 rpm.

Future State:- (Full 3 Axis and 5 Axis)



Stage 1:-

- Model uploaded directly to machine and run

Project Appraisal

Calculations from collated data for five years investment total of £540k show:

NPV: £47,802,629

Payback period: 0.12

IRR: 972.68%

CIC: £23,132,481

ARR: 122.25%

PGR: 224.94%

PI: 89.52

RECOMMENDATION: Proceed with investment.

End of presentation – Any Questions?

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End of presentation – Any Questions?

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Investment Report

SEATS GB
Manufacturing Unit 5 Axis
(Aftermarket and Development)
02/09/22
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Financial Management and Planning ACPA7002
Assignment 1 Presentation and Written Report
Author Note
MADE Industry 4 Wales (I4W)

Investment Report

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Investment Report

Abstract

Manufacturing Unit proposal to introduce 5 Axis machining capability to enable additional incomes from Aftermarket requirement and revenue by insourcing work currently manufactured by 3rd Party suppliers. Thereby reducing costs and increasing profitability, reducing carbon foot print, securing current jobs and creating new job opportunities.

Problem statement categories.

Aftermarket: Current impact to customer

Programs: Current impact to customer

Link to MTP: Forecast growth of Aftermarket and Development demand.

Studies Explored.

Aftermarket Parts: Make Verses Buy

Development Parts: Make Verses Buy

Proposed solution and project details.

Overview of Technical details.

Further benefits taken to be taken from the technology

Proposal for Financial Year 2022

Financial Summary.

Detailed calculations for project

NPV

CIC

PB

PGR

IRR

PI

Investment Report

Problem Statement

Status:

The manufacturing unit has and continues to provide good levels of support into both demand streams for Development and Aftermarket items within its capabilities.

- Manufacturing Unit has started the journey to become “Rapid Prototyping” shop for both Seats GB (SGB) and Seats FR (SFR) on metallic items.
- Aftermarket items equates to 85% of the revenue stream for Seats GB.
- The manufacturing unit is currently unable to support all demands, as its current capabilities are constrained. Over the past three months we have been unable to support or unlock:
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Looking forward:

We have the below demands:

- £5.6m of the forecasted aftermarket sales for machined parts for the remainder of 2022.
- £250K of development parts for Seats GB and Seats FR

Average spends per program at development milestone = £235,686k

Key Message

Should we choose to address concerns raised within the analysis, we need to close the gap on manufacturing 4.0 means and capabilities.

Investment Report

Proposal.

Sales and Spend Forecast for remainder of FY 2022

<u>Demand Source</u>	<u>Forecasted Value</u>
Aftermarket	£5.6m (£28m ACTU2 / 20% metallic items based on demonstrated data as of end of May FY2022)
Development	ROM £250K SSGB/SFR demand

Cost and lead-time

<u>Supplier</u>	<u>Cost (x2)</u>	<u>Lead-time</u>
Mazak	£500k	X1 show stock for immediate use. 3 – 6 months Or take cancellation slot.
Bridgeport	£500k	3 – 6 months Or take cancellation slot

- Mazak is the preferred supplier; their technology is much more advanced in comparison to Bridgeport.
- Safran already strong links with the group and UK. They are in the process of supplying Landing Systems.
- Mazak have one machine in stock ready to ship, this is a result of a customer cancellation from last week.
- They have also offered to loan their display model via hire whilst a second is in production. Any hire costs will be taken off the new machine costs.

Machines

- 1 new machine is equivalent to 2 old machines: Hence x1 in, x2 out.
- 30% saving on footprint.
- Reduction of machines from 28 down to 16 within the Mid Term Plan (period 5 years).
- We have been accepted into a Welsh Government “Digital acceleration” funding program.
- Current forecast is that 33% of the cost will be supporting via the Welsh Government funding program.

Investment Report

Recommendation

After consideration of all studies and results, the recommendation is to invest in 5 Axis proposal.

End of Report

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Investment Calculations NPV – PB – IRR – CIC – PGR – PI

[illegible]

End of Calculations



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Investment Calculations Table

PRESENT VALUE TABLE																					
Present value of 1, that is $(1+r)^{-n}$ where r = interest rate; n = number of periods until payment or receipt.																					
Interest rates (r)																					
Periods (n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%	
1	0.99	0.98	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893	0.885	0.877	0.87	0.862	0.855	0.85	0.84	0.833	
2	0.98	0.961	0.943	0.925	0.907	0.89	0.873	0.857	0.842	0.826	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.72	0.706	0.694	
3	0.971	0.942	0.915	0.889	0.864	0.84	0.816	0.794	0.772	0.751	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.61	0.593	0.579	
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.52	0.499	0.482	
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.65	0.621	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.44	0.419	0.402	
6	0.942	0.888	0.837	0.79	0.746	0.705	0.666	0.63	0.596	0.564	0.535	0.507	0.48	0.456	0.432	0.41	0.39	0.37	0.352	0.335	
7	0.933	0.871	0.813	0.76	0.711	0.665	0.623	0.583	0.547	0.513	0.482	0.452	0.425	0.4	0.376	0.354	0.333	0.31	0.296	0.279	
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.54	0.502	0.467	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.27	0.249	0.233	
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.5	0.46	0.424	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.23	0.209	0.194	
10	0.905	0.82	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322	0.295	0.27	0.247	0.227	0.208	0.19	0.176	0.162	
11	0.896	0.804	0.722	0.65	0.585	0.527	0.475	0.429	0.388	0.35	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.16	0.148	0.135	
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.14	0.124	0.112	
13	0.879	0.773	0.681	0.601	0.53	0.469	0.415	0.368	0.326	0.29	0.258	0.229	0.204	0.182	0.163	0.145	0.13	0.12	0.104	0.093	
14	0.87	0.758	0.661	0.577	0.505	0.442	0.388	0.34	0.299	0.263	0.232	0.205	0.181	0.16	0.141	0.125	0.111	0.1	0.088	0.078	
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.209	0.183	0.16	0.14	0.123	0.108	0.095	0.08	0.079	0.065	
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.07	0.062	0.054	
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.27	0.231	0.198	0.17	0.146	0.125	0.108	0.093	0.08	0.069	0.06	0.052	0.045	
18	0.836	0.7	0.587	0.494	0.416	0.35	0.296	0.25	0.212	0.18	0.153	0.13	0.111	0.095	0.081	0.069	0.059	0.05	0.044	0.038	
19	0.828	0.686	0.57	0.475	0.396	0.331	0.277	0.232	0.194	0.164	0.138	0.116	0.098	0.083	0.07	0.06	0.051	0.04	0.037	0.031	
20	0.82	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.04	0.031	0.026	