

Purchase of a Laser Machine for the New Product Offering - Supporting Hiut Denim's Bespoke Jean

Capital Project Appraisal

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Module: Financial Management and Planning

Lecturer: Howard Davies

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Executive Summary

This is an evaluation for capital budgeting, encompassing the appraising project investment of a machine and supports the decision on whether to invest or not in this particular project for Hiut Denim. Determining the viability and profitability of this project will guide the invest in, and the benefits that will come from the investment. Various options have been compared and the choice of which will be based on the production benefits and profit for the company. Knowing the effect of the project will support the decision on how much investment the company should make and how much there will be in return.

This project will offer the company an achievable goal by applying certain resources to develop this USP and is a progressive attempt to produce a tangible result. At this stage the goal will be fluid due to it being a new product line. This appraisal will demonstrate to the company how to deliver the project on time and all cost implications. Alongside financial, other viewpoints that will be considered are commercial, legal, technological, social, managerial, organisational, ecological and economical.

<i>Abbreviation</i>	<i>Explanation</i>
UPS	Unique Selling Point
NPD	New Product Development
IRR	Internal Rate of Return
NPV	Net Present Value
WACC	Weighted Average Cost of Capital
PI	Profitability Index
BCR	Benefit Cost Ratio
ROI	Return On Investment
NI	National Insurance
YTD	Year To Date

This appraisal project is for the purchase of a CO2 Laser Machine that will etch customised artwork for a leather back-patch and to then be stitched onto a pair of bespoke Hiut Denim jeans. The bespoke jean is a project currently undergoing allowing the customer to choose the fabric, rivet, thread colour and design the back-patch. The impact of this project would bring innovation to the company, add value to the product and create a strong USP as no other jean company are offering this type of service. The decision and thought process of this project is due to the increasing footfall Hiut has experienced by opening the factory to the public 18 months ago. This service is only offered at the factory in Wales.

This project appraisal will focus only on the costings for the patch rather than the jeans as a whole product, this will give realistic financial calculations that will be projected against the cost of the machine. Bringing this external laser process in-house would improve efficiency for lead-time, open a new job opportunity or an up-skill at the factory, shorten the supply chain, add value for the customer and from an environmental viewpoint there would be a reduction of carbon by minimising the transportation of the patches. Although the laser etch process isn't a significant cost saving, this NPV is offering something extra to the existing product at a higher price point.

Hiut make roughly 10,000 pairs of jeans per year, 20% of those jeans are given away at a discounted price, if 20% of the 10,000 were part of the bespoke product line the company would have to make 2,000 patches for the bespoke line in 12 months. The customer demand of 200 pairs of jeans per working week has a Takt time of 10.4 minutes, this doesn't account for seasonal fluctuations and is useful to know when configuring and running production.

Once funding has been agreed the project can start instantaneously. The footfall of customers visiting the factory is averaging 20 people per day, 80% of these make a purchase. The location of the machine will be next to the rivet process. If the installation is straight forward and can be completed within a couple of hours it can be done on a Friday when production is closed. Alternatively, there is the two week factory shutdown in either August or December that would further reduce disruption.

Overhead costs for this project have not been calculated for the entire factory, only for the machine. Three companies were contacted to find the most suitable and cost effective machine. The reason to go ahead with Universal Lasers is due to the competitive price and price match promise, free unlimited technical support that is renowned for offering the most comprehensive support for any supplier and was recommended by Hiut's current supplier whom etch the short-run patches. Even though this is a European company Hiut would be dealing with Hobarts Laser Supplies, the UK partners for Universal Lasers. For a new machine the initial investment would be £18,995 (+vat). Alternatively, a 12 year old second hand machine (VLS3.60DT - 50 Watt) has a bigger desktop in the Universal range and is refurbished to the highest standard would cost £9495 (+vat) (Hobarts, 2022). Using the straight line method (Atrill and McLaney, 2019 pp91-96) the second-hand refurbished machine has a depreciated value of £791.25 per year over 12 years. The lifespan of these machines are infinite and will work as long as the parts can be supplied, nothing on the machine cannot be replaced, although obsolete parts and future software technology must be considered. As this is a new project for Hiut,

the decision to go ahead with a second-hand machine would be a better and more affordable initial investment. If the decision later was to etch all 10,000 patches (per year) for all the jeans then investing in a new machine should be considered. Only three electricity sockets are needed for the machine, fume extraction and a suitable socket for the computer or equivalent. Electricity has been worked on per kilowatt hour only for this machine and not for the entire factory (Mucha, 2022). The machine doesn't require additional lighting or water. A full time role (36 hours) with a minimum wage of £20,000 (per annum), which includes Employer NI has been calculated into the figures. Only one member of staff would need to be at the machine when in action, to reduce downtime on the machine at least two members of staff should be trained on how to use the machine to cover annual leave and sick days. Marketing costs could also be considered.

The calculations for this project has been based on a 5 year projection and the machine would be paid back within 3 years. The payback period is important to know so the company understands how long it takes to reach breakeven on the project. The shorter the payback the more attractive the investment, and also means that another project can begin. Although this is not measuring the profitability it is measuring the risk. This machine would not reduce the manufacturing labour or material for the whole of Hiut's production as this is a new product offering. There won't be any residual value at the end of the project as the machine is already second-hand and won't be within warranty. The company expects a high ROI due to the low cost of the second-hand machine and high achievable revenue from the bespoke product. The benefits of this project will last indefinitely as the etching process can be used across all of Hiut's jean patches, or until the need for a new machine is desired.

The importance of this project is to avoid stagnancy, improve against any competition and improve on technology advancements by evolving and adapting. Consideration of resource constraints of people, business priorities, time available, legal and environment requirements and the well-being of the team could stop the project. To avoid this the company could offset areas, for example external consultancy, look into alternative funding options or working extra time to meet the timeline.

The rational of the project is favourable for a return on investment immediately. The IRR shows a high expected breakeven point at 83%. The higher the project IRR the greater the amount it will exceed the cost of capital, and the more net cash the project generates for the company. The IRR shows the expected annual rate of growth for this investment, and is ideal for comparing capital budgeting projects (Atrill and McLaney, 2019 pp387-393). This will help Hiut understand the potential rates of annual return over time. There is a positive NPV of £42,547 from a WACC of 10%, with the projected earnings generated by the project exceeding the anticipated costs. The figures show the investment with a positive NPV will be profitable. Although the NPV is a more complicated tool it explores the cashflow coming in and out of the company with an adjustment for the future value of money, and demonstrates if the project will add value to the business. NPV doesn't allow for a clear comparison of different project sizes, consideration for this is important because what works for this project might not for future projects and investments (Fernando, 2022). A PI greater than 1.0 is regarded as being a good

investment, and for this project with a figure of 5.48 it is in favour of going ahead. The PI represents the relationship between the costs and benefits of a proposed project, the higher the PI the more attract the project is (Fields, 2011 pp200). Lastly, the BCR ratio of 4.48 is used to analysis the summary of the overall relationship between the relative costs and benefits of the proposed project (Hayes, 2022). As this ratio is greater than 1.0 it is expected that the project will deliver a positive NPV for the investment, anything lower should not be considered. The favourable tool to use in this instance is a combination of IRR and NPV as these contrasting tools both determine whether a project should go ahead with the present value of cash outflows, and the profitability the company can expect from the investment (Atrill and McLaney, 2019 pp379-389).

The financial modelling for the project has demonstrated that the only investment cost is the machine, and the cash flow going back in the business is positive. Consideration of the future saleable value of the patch may change depending on market conditions. The excel based analytical model supporting this appraisal helps to assess the risk of investing in the infrastructure based on the financial structure. The financial evaluation for this project will depend on the projections and expected future cash flows of the completed project. The finance model for this project is created with the aim to of being easy to use, flexible without being complicated, and will support Hiut in making better decisions (CFI Team, 2020).

The favourable option to fund the project would be applying for a government grant, although a bank loan should been considered to prepare incase funding for a grant isn't available. Hiut currently have a loan with British Business Bank, with an interest rate of 6%, this would be a good funding option for this project as the company could extend their existing account offering. The advantages of using a business loan is the flexibility and convenience, multiple loan options, reasonable interest rates and working capital support (Fields, 2011 pp135-136). The disadvantages for Hiut could be that the loan is secured against collateral, but the payback period shows that this would only be a short term issue. Green financing should be considered as an option for either a loan or investment, as this supports the building of an environmentally friendly activity. The advantages that come with this green option can improve credit conditions for clean energy projects, the formation of innovative products, and the expansion of knowledge about the green energy benefits (Local Government Association, 2022).

In conclusion the figures have shown the project is in a strong position to go ahead, it is creditable and it will value to the company financially. Hiut cannot compare the product price point against competition as their customers buy into the brand values, not because of the price point of a pair of jeans. The market for this product can start within the companies existing customer base as 60.38% (YTD) are returning customers, so this strong USP would be a very desirable product. The depreciated value has already been calculated and short term and long term sources of financing have been considered. The cash flow looks healthy so the company stands a good chance to be issued with a loan. All factors have been assessed to ensure the delivery of the project is on time and understood.

Appendix:

Present Value Table:

	Investment	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Present Value	-£9495	£3,003.36	£7,903.36	£13,783.36	£20,839.36	£29,306.56
Payback	3 years					
WACC	10%					
Denominator	1.00	0.909	0.826	0.751	0.683	0.621
Future Value	-£9495	£2,730.05	£6,528.18	£10,351.30	£14,233.28	£18,199.37
NPV	£42,547					
NPV (Excel)	£42,553.30					

Future saleable value of the patch:

Market	Probability	Per Unit	- %
Weak	20%	£12.50	£2.50
Medium	50%	£15.00	£7.50
Strong	30%	£17.50	£5.25
			£15.25

Finance Model - Excel spreadsheet:

<https://docs.google.com/spreadsheets/d/186za1xasBBq3XUN171BRg5YrhnbVobVBdTtpqGDncZs/edit?usp=sharing>

Project Model:

Year	0	1	2	3	4	5
Inflation	0%					
Selling Price	£15.25	£15.25	£15.25	£15.25	£15.25	£15.25
Units	0	2000	2400	2880	3456	4147.2
Revenue	£0.00	£30,500.00	£36,600.00	£43,920.00	£52,704.00	£63,244.80
Inflation	0%					
Variable Cost (per unit)	3	3	3	3	3	3
Variable Costs	0	6000	7200	8640	10368	12441.60
Inflation	0%					
Overheads	0	£21,497	£21,497	£21,497	£21,497	£21,497
Cashflow	-£9495	£3,003.36	£7,903.36	£13,783.36	£20,839.36	£29,306.56
WACC	10%					
Denominator	1.00	0.909	0.826	0.751	0.683	0.621
Discounted Cashflow	-£9495	£2,730.05	£6,528.18	£10,351.30	£14,233.28	£18,199.37
Total NPV	£42,547					
NPV Excel	£42,533.30					
IRR	83%					
PI	5.48					
BCR	4.48					

References:

Atrill, P and McLaney, E. (2019). *Accounting and Finance for Non-specialists*. Harlow: Pearson.

CFI Team. (2020). Is Financial Modeling Important. [Online]. Corporate Finance Institute. Last Updated: 30 October 2020. Available at: <https://corporatefinanceinstitute.com/resources/questions/model-questions/is-financial-modeling-impo> [Accessed 29 August 2022].

Fernando, J. (2022). *Net Present Value (NPV): What It Means and Steps to Calculate It*. [Online]. Investopedia. Last Updated: 5 August 2022. Available at: <https://www.investopedia.com/terms/n/npv.asp> [Accessed 25 August 2022].

Fields, E. (2011). *The Essentials of Finance and Accounting for Non-financial Managers*. New York: AMA.

Hayes, A. (2022). *Benefit-Cost Ratio*. [Online]. Investopedia. Last Updated: 28 March 2022. Available at: <https://www.investopedia.com/terms/b/bcr.asp> [Accessed 22 August 2022].

Hobarts. (2022). *VLS3.60DT - 50 WATTS - Blue - Previously Owned*. [Online]. Hobarts. Last Updated: n.a. Available at: <https://hobarts.com/products/vls3-60dt-50-watts-blue> [Accessed 15 August 2022].

Local Government Association. (2022). *Financing Green Ambitions*. [Online]. Local Government Association. Last Updated: 4 May 2022. Available at: <https://www.local.gov.uk/publications/financing-green-ambitions> [Accessed 25 August 2022].

Mucha, M. (2022). *Electricity Cost Calculator*. [Online]. Omni Calculator. Last Updated: 8 August 2022. Available at: <https://www.omnicalculator.com/everyday-life/electricity-cost> [Accessed 22 August 2022].

References - Presentation:

Business Wales. (2022). *SMARTCymru*. [Online]. Business Wales. Last Updated: n.a. Available at: <https://businesswales.gov.wales/expertisewales/support-and-funding-businesses/smartcymru> [Accessed 31 August 2022].

Funding Circle. (2022). *Business Loan Calculator*. [Online]. Funding Circle. Last Updated: n.a. Available at: <https://www.fundingcircle.com/uk/small-business-loans-calculator/> [Accessed 22 August 2022].

UWTSD. (2022). *SMART Digital Accelerator*. [Online]. UWTSD. Last Updated: n.a. Available at: <https://uwtسد.ac.uk/smartdigitalaccelerator/> [Accessed 31 August 2022].

Capital Project Appraisal: Laser Machine for Hiut Denim's Bespoke Jean Offering.

Financial Management + Planning

September 2022

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New Product Offering.

- Bespoke Jean.
- Bringing an existing process in-house.
- Hiut customer can created a unique pair of jeans:
fabric > rivet > thread colour > design back-patch
- Adding value to the product with a USP.
- Creating an innovation offering.
- Opportunity with an increased footfall at the factory.
- No other jean company does this (in the world?)
- Project will only focus only on the costings for the patch rather than the jeans as a whole product.

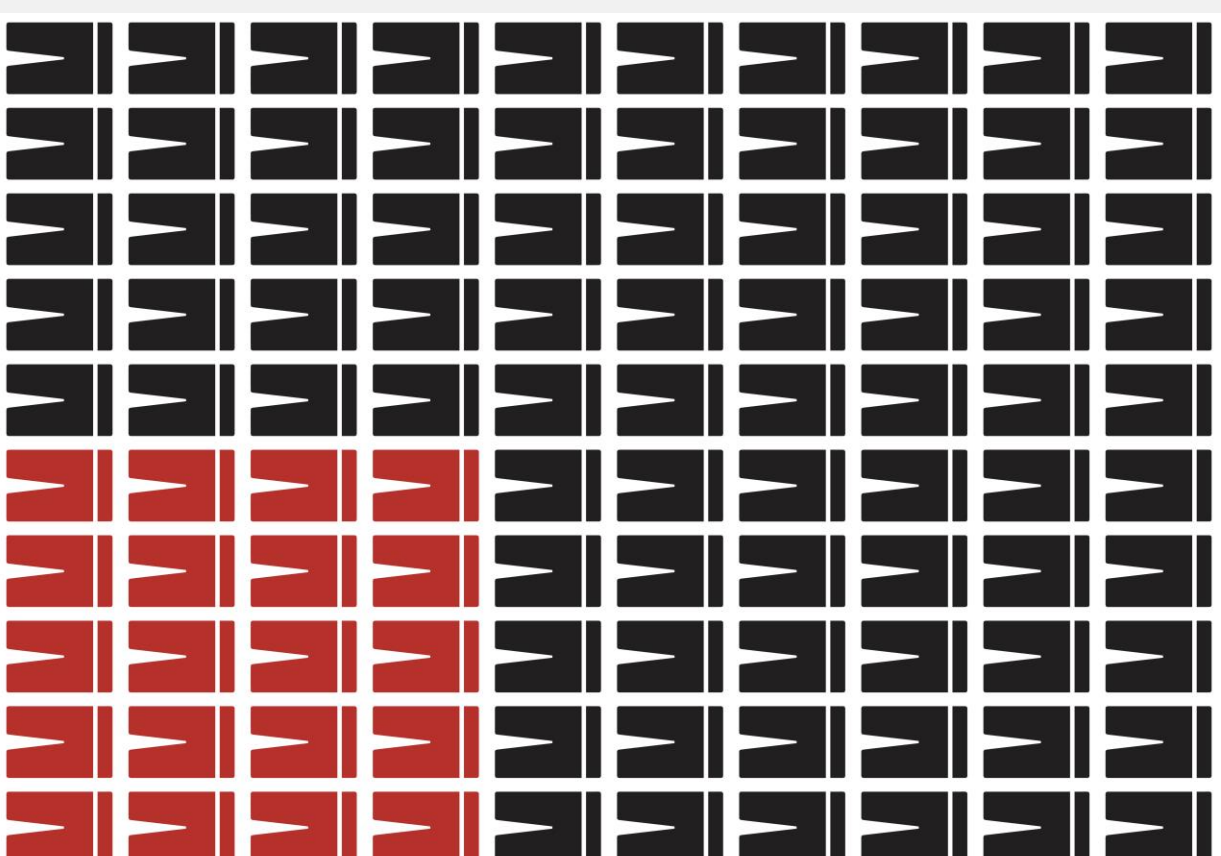
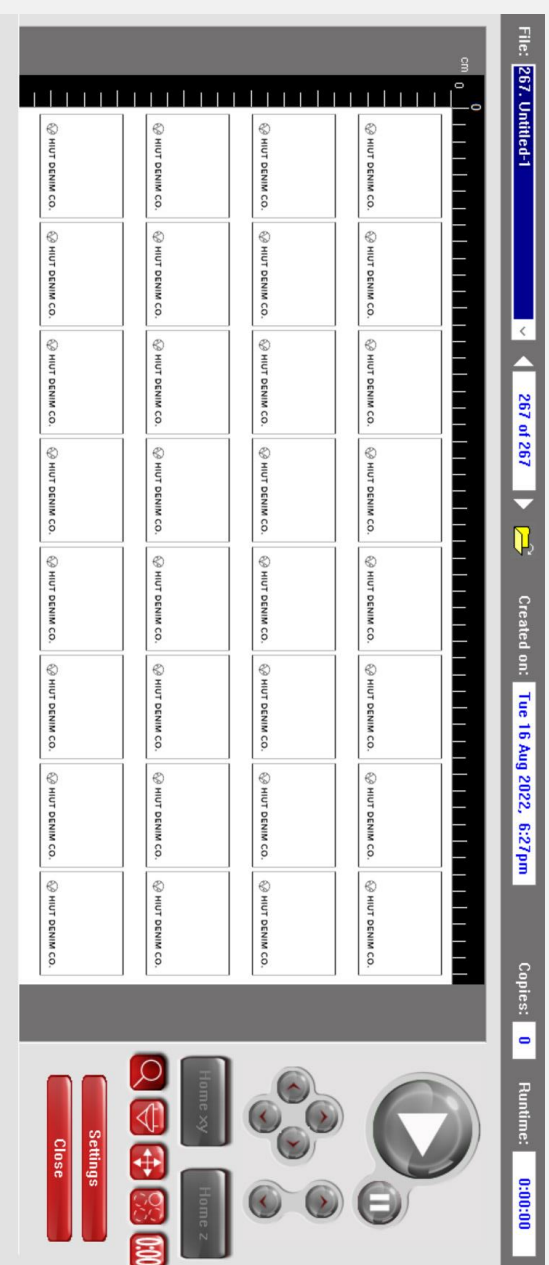




Project Solution.

Divisible project, can have a staggered approach:

- **Phase 1** - Create bespoke back-patches.
- **Phase 2** - Create bespoke + short run back-patches.
- **Phase 3** - Create bespoke + short run + core range back-patches.





Project Timeline.

Installation complete either on a **Friday** or during the **August / December** two week factory shutdown.

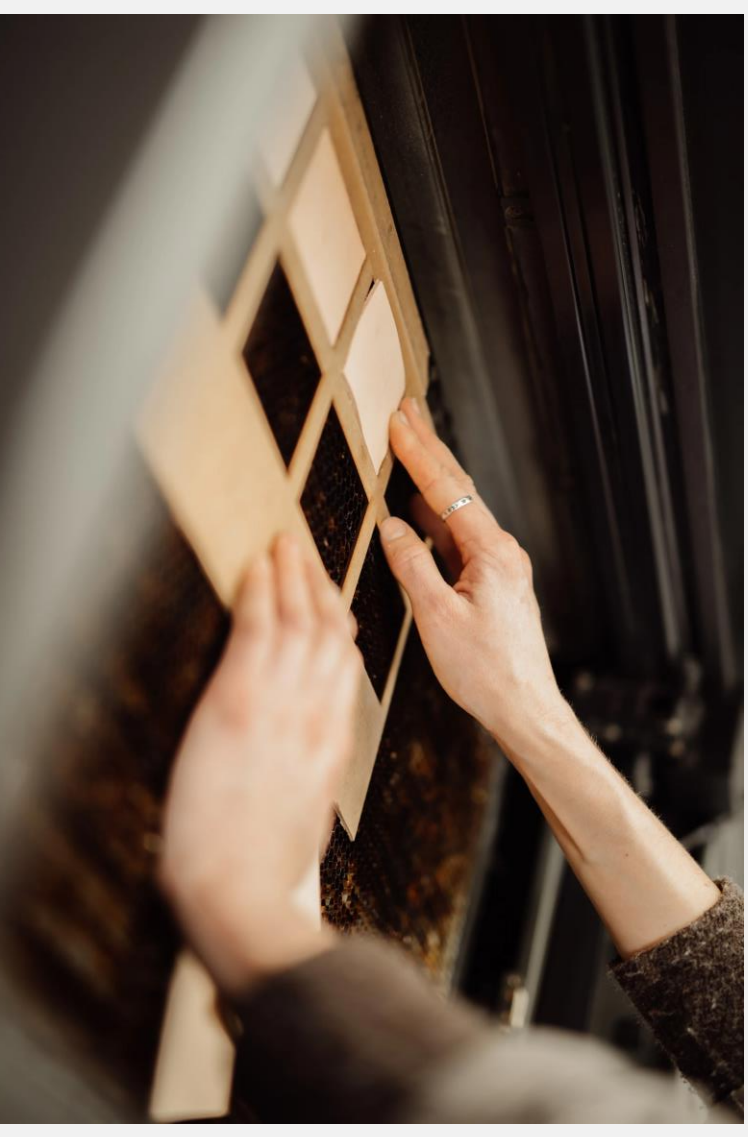




Project Cost.

Overhead Costs:

- Salary (36 hrs) **£20,000.00** (includes NI)
- Electricity 0.05 kw / £2.17 p/kWh = **£416.64** annum
 - 4-day work-week @ 48 weeks per year = 43.41 p/kwh
- Silver annual service plan **£600.00**
 - Respond time of 72 hours
 - 1 routine maintenance visit
 - 10% discount on parts
 - Unlimited telephone support
- Extraction filters (lifespan 12-18 months) **£230.00**
- CO2 Cartridges (lifespan 5-7 years) **£1,900.00 (+ vat)**
 - Budget **£250.00** (per annum) to support the cost



Variable Costs for second-hand machine:

- VLS3.60DT - BOFA Base 3 Extraction (50 Watt) **£9,495.00 (+vat)**
 - Includes: Shipping, Delivery, Installation, Training and Unlimited Support and 12-month warranty. Calibration completed on installation.



Project Lifespan.

Investment / Annual Cash Inflows

= Payback Period within **3 years**.

The project will continue for as long as the machine can.

	Investment	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Present Value	-£9495	£3,003.36	£7,903.36	£13,783.36	£20,839.36	£29,306.56
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NPV	£42,547					
NPV (Excel)	£42,553.30					



The company expects a high ROI due to the low cost of the second-hand machine and high achievable revenue from the bespoke product.



Project Issues.

Issue:

1. Disruption in the factory workflow.
2. Downtime whilst operator is getting use to the machine and material.
3. Downtime of equipment supply.
4. Loosing relationship with current external laser company.
5. Lack of education for the customers to know about the product.
6. Loosing brand identity.
7. Lack of understanding for legal and environmental requirements.
8. Financial constraints for external support
9. Time limit on project completion.



Solution:

1. Set up machine on a Friday or during factory shutdown.
2. Staggered hand-over from external laser company. Training and unlimited support will be supplied for the machine.
3. Stock of recharged lasers for quick shipment.
4. Process improvement saving.
5. Budget for marketing costs for the project.
6. Template will be given with Hiut logo visible.
7. Hire external support.
8. Look into grant funding options.
9. Work extra time (evening and weekends).





Sales and Production numbers are as below:

Year 1 : £30,500

Year 2 : £36,600

Year 3 : £43,920

Year 4 : £52,704

Year 5 : £63,244.80

Project Rational.

Second-hand CO2 Laser Machine (VLS3.60DT - 50 Watt)

The project will have a return on investment indefinitely.

Purchase of the second-hand refurbished machine is **£9495**

(+vat), includes shipping, delivery, installation, training, calibration, unlimited support and 12 months warranty.

The depreciated value of the machine is **£791.25** annum.

Favourable tool: **IRR** and **NPV**

- Both determine whether a project should go ahead with the present value of cash outflows.

- Profitability the company can expect from the investment.

Variable cost of each unit is **£15.25**

Overhead costs are **£21,497**

Positive NPV from a WACC of **10%**

Payback period is within **3 years**

IRR is **83%**

PI of **5.48**

BCR **4.48**

For this first review inflation and tax implications are to be ignored.



Project Model.

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Consideration of the future saleable value of the patch product may change depending on market conditions and has been assessed here.





Project Funding.

Funding options for expanding the Hiut business with this bespoke jean project;

Option 1:

- Internal

Option 3:

- Bank Loan

Option 2:

- Grant Funding

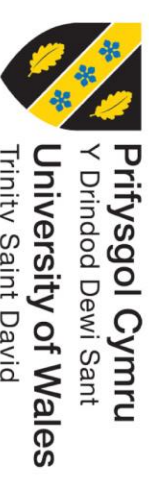
Option 4:

- Lease purchase / Higher purchase

Consideration:

Short Term / Long Term

Debt Finance / Equity Finance / Grant

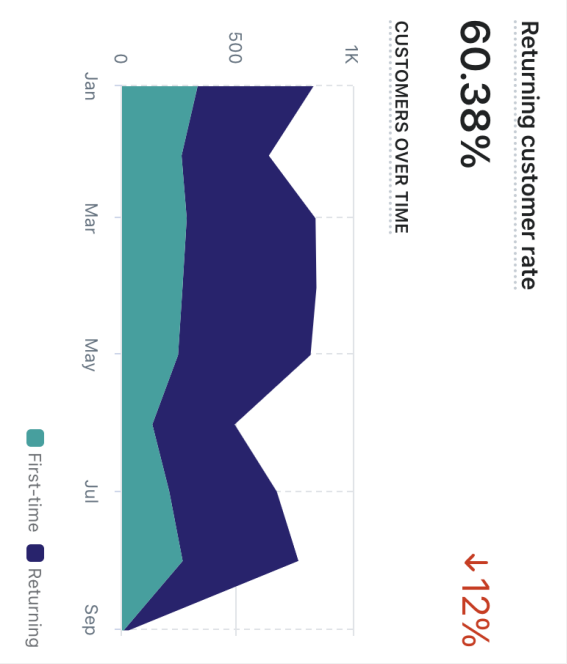




Conclusion.

Overall scope for this project is **positive**.

“Innovation is the management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of a new (or improved) product or manufacturing process or equipment.”
— Paul Trott



	Internal (Within company control)	External (Outside company control)
Positives	Strengths (e.g. Experienced project team)	Opportunities (e.g. Strong demand on project)
Negatives	Weaknesses (e.g. Limited capacity in project monitoring)	Threats (e.g. Risks to safety and security in project area)



Thank you.
Questions?

