

Capital Project Appraisal Business Report

Financial Management and Planning

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Introduction

Hiut Denim is an SME based in Cardigan, West Wales that makes jeans. Their ethos 'Do One Thing Well' keeps their focus on producing high quality jeans from high quality denim. This project looks at the cutting process and how we can improve the efficiency and accuracy which will help lean into custom made jeans. The cutting team is made of 3 staff members and currently cut 200 pairs per week.

The current cutting method is all manual and done by hand. Shear scissors, handheld electronic scissors and an Eastman Blue Streak knife are the tools which are used. The scissors are used for single ply garments, where the Eastman Blue Streak can cut up to 35 ply of denim of around 14oz in weight. By having a wide offering of every waist size (Womens 24W - 36W, and mens 28W - 42W), and three different leg lengths, there are over 750 plotted product possibilities, leading to more single garments to be cut. Although already a bespoke offering, Hiut would like to offer a custom made service where the fit was completely bespoke to a customer. This would include a choice of fabric, thread colour, rise (low, mid, high), inside leg length (crop, regular, long) as well as fastening and patch. This pattern would then live on the system for future orders in their specific fit.

For this project, we will be weighing up the benefits and comparison in investing in an automatic cutting machine against the current manual cutting. The machine in discussion is an FK Group Biliardo Cutting System. An automatic static table cutting system with a choice of cutting heads for different productions, in this instance different weight of fabrics.

What does the project bring or solve for the business?

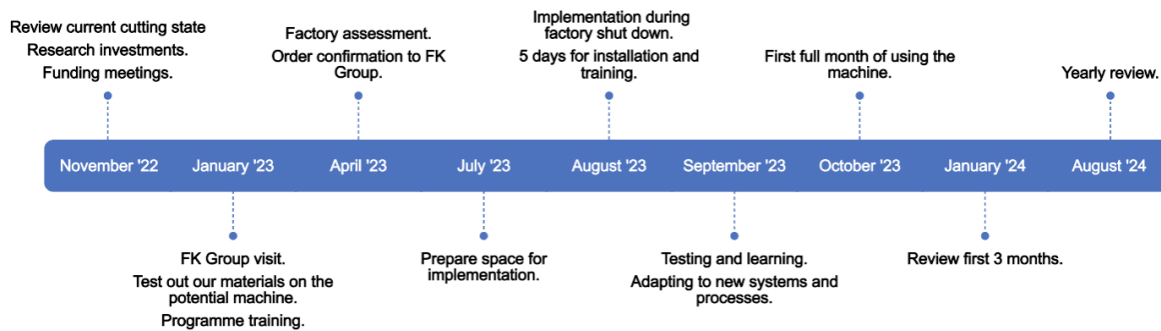
There are many benefits to this project of introducing an automatic cutting machine into Hiut's production process. Moving into bespoke made-to-order jeans would lead into more singular cutwork and less bulk cutting. With the current process there is loss in efficiency and costs, as the time to cut 1 garment would be the same as to cut 5 garments of the same style and size and not utilising the ability of the Eastman Blue Streak of cutting up to 35 ply. At current it takes around 23 minutes to cut a pair of jeans manually by hand, whereas the Biliardo can do so in less than 2 minutes. Time saved per jean cut is drastically reduced, leading to an improvement in financial, commercial, and organisational benefits.

The investment of the automatic cutting machine will help speed up the development process of new product innovation, with employees able to spend more time innovating and developing, rather than cutting. Efficiency can be improved for the whole production floor. It will reduce the amount of re-cutting needed, leading to less fabric wastage, as well as reduce the disruption on the factory floor. All details will be marked automatically through the machine from notches and darts.

The ecological benefits of the machine enables reduction in fabric waste, which also leads to a financial benefit, saving on materials and minimising waste. Although the machine will run on electric, the Biliardo has a small carbon footprint that runs on a low power consumption with the average consumption of energy starting from 5.6kw. The machine also has an ecopower programme which includes intelligent vacuum management. Investing in the Biliardo cutting machine, will take Hiut into Industry 4.0 standards. The machine also facilitates a Just in Time programme. This would be greatly beneficial for us in the ordering process, to reduce our time to market and improve our customer service.

Timeline for implementation

Based on implementation happening in August 2023, the timeline looks as follows :



The Findings

Cost of project

To invest into a Biliardo FK Group machine which measures 170cm wide by 270cm length, the investment cost is just over £65,000. This includes a uniquely bespoke machine, as well as a calibrator and set up costs. There will be additional yearly costs of electricity, annual service and maintenance.

Although a large initial investment, adopting this project will also lean into some cost savings.

The current gerber plotter, which prints out the patterns, will not be needed and can be sold. This will also save on rolls of plotted paper which costs £124.36 per roll. One roll covers 160 plotted jeans. A yearly saving of £7,772.50. The machine will only require one member of staff, instead of three which is currently needed for manual cutting.

Selling price is £202.50. Units made have been capped at 14,400 a year which would make 300 per week, based on 48 working weeks. Hiut wants a slow and steady growth, capping production capacity at 300 is the benchmark before needing to invest in additional machinery and staff.

Variable cost is based on the direct materials, labour and utility costs for the product (CFI Team. 2022). The variable cost for manual cutting is £82.50. Automatic cutting reduces to £60 because of labour time, overheads and fabric savings. For example a selvedge fabric usage will go from 2.5m per jean to 2.3m. As well as. Overheads have a growth of 5% each year.

By comparing the cost saving, although the initial investment will have a big impact, the cash savings are seen from year 1 at £245,000, leading to £348,000 in year 5.

What is the full lifespan of the project?

The Biliardo machine has a lifespan of 15 - 20 years. For this project we are looking at a 5 year lifespan. This enables Hiut to review in 5 years if they want to sell and upgrade, keeping relevant with new and emerging technologies.

Any issues that implementation will cause?

Implementation can take place over the two week factory shut down in August 2023. This will reduce disruption, and cutwork will be done in advance to feed the factory floor when training is happening.

As a big machine, there will need to be a strong team involved to move the current cutting machine into the overflow factory. This will allow plenty of space for the new machine, as well as possibility for the manual cutting machine to be used in the same factory if needed.

Flow of the factory will remain the same, which at the moment works well with handing over from cutting to sewing.

There are three people in the cutting team at present. The automatic cutting machine will only require one full time member of staff, and there's a possibility of the 200 garments (all cut singular) to be cut in one and a half working days. Implementation here would require upskilling staff, sharing the role and responsibilities.

What is the rationale of the business?

The rationale for capital projects include a 5 year payback period, with anything under a three year period to be more desirable.

Net Present Value (NPV) and Internal Rate of Return (IRR) are methods based on the time value of money concept, where the sum of money is worth more now than the same sum at a future date due to earnings potential (Fernando, J. 2022). According to Atrill, P & McLaney, E. (2019). 'NPV is the most logical approach to making business decisions about investments in productive assets'. NPV and IRR are both measures of profitability, risk issues and are incorporated into the analysis for this report (Davies, T & Crawford, I. 2011). For Hiut, the rational would need a positive NPV from a WACC of 10% and an IRR greater than 20%.

Model the project

NPV has been the chosen method as it takes into account the timing of the cash flows, the whole of the relevant cash flows and the objective of the business (Atrill, P & McLaney, E. 2019 p386). The simple idea of time is money. A positive NPV is worth pursuing (Weetman, P. 2013). Based on the cash savings comparison of manual versus automatic, the NPV for investing in the automatic cutting machine would be just over £1.7 million pounds. 'A positive net present value indicates that the investment opportunity being measured is more profitable than the company's minimum ROI requirement.' (Fields, E. 2011).

The Internal Rate of Return (IRR) which 'represents the yield from a particular investment opportunity' (Atrill, P & McLaney, E. 2019), comes out as 386% for 5 years. Profitability Index (PI) and Benefit-Cost Ratio (BCR) have also been modelled to back up the project appraisal. The PI equals 16.42, and the BCR at 15.42. If a project has a PI greater than 1.0 the project is expected to deliver a positive NPV (Fields, E. 2011, p200), and BCR is used to determine the viability of cash flows from an asset or project (CFI Team, 2022), the higher the ratio, the more attractive the project.

Accounting Rate of Return (ARR) comes to 763.37%. This method is based on profit not cash flow and ignores the time value of money (Davies, T & Crawford, I. 2011 p588), so will not be of focus for this appraisal.

What are the options for funding the project?

Possible funding options for the project :

1. A business bank loan for 25 grand would result in an interest rate of 9.8% which would add an additional £6.7 grand to the price and not cover the total needed.
2. Finance lease. Responsible for paying for most of the item's cost over the period of its life, and responsible for maintaining the asset as if we own it.
3. Welsh government's funding through grants / Smart Digital Accelerator

FK Group does not offer hire purchase or operating lease as the machines are made specifically for the business based on the cutting needs. Second hand machines would not be beneficial based on the price.

Conclusion

Based on the findings, the conclusion is as follows :

- The project is credit-worthiness and has a strong NPV and IRR to lead Hiut Denim into a new and innovative process which also helps from an ecological and financial perspective.
- Based on the appraisal methods used for this project and Hiut Denims aim to move into custom made jeans, investing in the Biliardo FK Group machine is a strong and positive investment. The custom-made

market was valued at 4556.3 million USD in 2021 and is forecasted to grow by 10.73% from 2021 to 2027. (Market Reports World. 2021).

- Allowing single cut jeans with a bespoke service can lead to a more sustainable, high quality, better fitting jean for the customer.
- This project can lead to a reduction in returns as they will be a better fit.

Recommendations

Based on the findings recommendations as follows :

- Redundancies would not be in line with Hiut Denims values. In result to this I'd recommend investing in the Automatic Cutting machine as the implementation timeline and upskilling and / or spreading the skills between all members of staff.
- In regards to funding, I'd recommend to commence with the Smart Digital Accelerator funding as soon as possible to ensure funding meets timeline.
- Investing now will not only improve efficiency and accuracy, but it will fall in line with the companies aim of making the lowest impact jean they possibly can. Further research into the impact of the machine could be done to measure our impact.
- Hiut Denim is a company where everything is handmade. There's a possibility for the brand to lose their values through investing in an Industry 4.0 machinery which may lead to challenges from customers. I recommend for Hiut to take the customer on this journey and to educate them on the reasoning behind this process. There could be opportunities to offer a 'manual made product' from start to finish but would need to be at a higher price point to achieve margin.
- To organise training with FK Group to learn their programme as soon as possible. Hiut Denim currently uses Gerber which is a Lectra system, and will need to be trained up on the FK Group programme.

Appendix

Selling price

Selling Price			
Weak	20%	£150.00	£30.00
Medium	40%	£195.00	£97.50
Strong	35%	£250.00	£75.00
			£202.50

Current Cutting Cashflow

MANUAL CUTTING						
Year	0	1	2	3	4	5
Inflation	0%					
Selling Price	£202.50	£202.50	£202.50	£202.50	£202.50	£202.50
Units	0	10,000	11,000	13,200	14,400	14,400
				Cap at 14400 (300 per week) for factory floor production		
Revenue	£0.00	£2,025,000.00	£2,227,500.00	£2,673,000.00	£2,916,000.00	£2,916,000.00
Inflation	0%					
Variable Cost (per unit)	£82.50	£82.50	£82.50	£82.50	£82.50	£82.50
Variable Cost	£0.00	£825,000.00	£907,500.00	£1,089,000.00	£1,188,000.00	£1,188,000.00
Inflation	0%					
Overheads		£670,000.00	£703,500.00	£738,675.00	£775,608.75	£814,389.19
Net Cashflow		£530,000.00	£616,500.00	£845,325.00	£952,391.25	£913,610.81

Project Appraisal Cashflow

AUTOMATIC CUTTING						
Year	0	1	2	3	4	5
Inflation	0%					
Selling Price	£202.50	£202.50	£202.50	£202.50	£202.50	£202.50
Units	0	10,000	11,000	13,200	14,400	14,400
				Cap at 14400 (300 per week) for factory floor production		
Revenue	£0.00	£2,025,000.00	£2,227,500.00	£2,673,000.00	£2,916,000.00	£2,916,000.00
Inflation	0%					
Variable Cost (per unit)	£60.00	£60.00	£60.00	£60.00	£60.00	£60.00
Variable Cost	£0.00	£600,000.00	£660,000.00	£792,000.00	£864,000.00	£864,000.00
Inflation	0%					
Overheads		£650,000.00	£682,500.00	£716,625.00	£752,456.25	£790,079.06
Net Cashflow		£775,000.00	£885,000.00	£1,164,375.00	£1,299,543.75	£1,261,920.94

Cash Saving of Manual Cutting vs Automatic Cutting

	Year 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Cash Saving	-£65,275.00	£245,000.00	£268,500.00	£319,050.00	£347,152.50	£348,310.13

Net Present Value

Net Present Value	Year 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Present Value	-£65,275.00	£245,000.00	£268,500.00	£319,050.00	£347,152.50	£348,310.13
Discount Rate (WACC)	10%					
Denominator	1.00	0.909	0.826	0.751	0.683	0.621
Future Value	-£65,275.00	£222,705.00	£221,781.00	£239,606.55	£237,105.16	£216,300.59
NPV	£1,072,223.30		Excel NPV	£1,072,443.10		

Profitability Index

Profitability Index				
NPV of Cash Flows		£1,072,223.30		
Investment	equals	£65,275.00	equals	16.42624734

Benefit Cost Ratio

BCR				
NPV - Investment		£1,006,948.30		
Investment	equals	£65,275.00	equals	15.42624734

Internal Rate of Return

Internal Rate of Return				
IRR		386%		

Annual Rate of Return

Annual Rate of Return	equals	Average Annual Profit (Initial Investment + Future Residual Value)/2		
Project Investment		£65,275.00		
Residual Value		£12,000.00		
Net Profits	Yr 1	£245,000.00	Total Cashflows	£1,528,012.63
	Yr 2	£268,500.00	Depreciation	£53,275.00
	Yr 3	£319,050.00	Net Income / Profit	£1,474,737.63
	Yr 4	£347,152.50		
	Yr 5	£348,310.13	Initial Investment	£65,275.00
			Residual Value	£12,000.00
			Average Investment	£38,637.50
			Total Net Income	£1,474,737.63
			Average Net Income	£294,947.53
			Average Investment	£38,637.50
			Average Net Income	294,947.53
			Average Investment	38,637.50
			ARR	763.37%

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