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DEPARTAMENTO DE CIENCIAS DE LA TECNOLOGÍA E INNOVACIÓN
IND-330, PREPARACIÓN Y EVALUACIÓN DE PROYECTOS PARA INGENIERÍA



ESTUDIO DE FINANCIAMIENTO

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Tarija-Bolivia

Financial Study

1. Investments and Financing

1.1.Fixed asset investments

Investment in fixed assets is a critical component in the development of the bionic prosthesis project. This process involves the strategic allocation of financial resources to acquire tangible and intangible assets that support the infrastructure, production, and competitiveness of the project. The meticulous planning and execution of these investments are essential to ensure not only operational viability but also long-term financial performance.

Fixed asset investment is directly linked to the project's financial strategies. By improving production capacity, reducing operating costs, or strengthening the competitive position, these investments support clear and measurable financial objectives.

The following table details the categories of fixed assets and their respective costs:

Fixed Assets		Account (Bs)
Available Current	Cash box	200
Required	Provision of uncollectible accounts	300
	Clients	3000
Taxes	Tax Credit	630
	Withholding tax	250
Feasible	Supply Inventory	2426
Operational depreciable fixed	3D Printers	7000
	Computer Equipment	30000
	Oscilloscope	5200
	Sources	1738
	Multimeter	1440
Total Fixed Assets		52184

1.2.Intangible asset investments

These investments include crucial costs associated with market research, research and development (R&D), and are therefore considered and managed effectively to enhance the innovation and quality of the prostheses, contributing to the overall value of the project.

These intangible asset investments are linked to the project's financial strategies that favor the creation of sustainable and differentiating value in the bionic prosthesis market. The protection of intellectual property and the continuous development of knowledge position the project at the forefront of innovation and technical excellence.

A table is presented that details the categories of intangible assets and their associated costs:

Intangible assets		Account (Bs)
Internal Structure	Company image	200
	Patents & Permits	4000
External Structure	Contracting Services	5300
	Staff training	16800
	Company Structure	6000
Competence of staff	Value Generation	500
Total intangible assets		32800

1.3.Financing

ELANET (European Limb Amputee Network) emerged as a network supported by the Erasmus+ program of the European Union, focused on promoting social entrepreneurship. This initiative, in collaboration with higher education institutions in Latin America and Europe, receives the support of recognized international organizations such as Ashoka and Koalect. Its financing is aimed at the construction of a solid technological platform, intended for various actors in the entrepreneurial ecosystem, with special emphasis on social entrepreneurs. The platform provides resources such as consultation tools, relevant bibliography, dissemination of inspiring cases and support for the construction of projects through advice and financing.

At the same time, the European Commission provides funds to advance the development of prostheses, which have transformative potential in the quality of life of those who have suffered the loss of limbs.

In this context, SAFF Bionics is seeking funding of 45,441 bs to carry out the development of an innovative arm prosthesis.

2. Income and Expense Budget

2.1.Budget

N.	Description	Amount (Bs)
	Income	
1	ELANET Funds	45441
A	Total income	45441
	Production costs	
1	Arduino board	80
2	7 servo motors	210
3	PLA Filament	100
4	Protoboard	20
5	EMG Sensors	239
6	AD620	38
7	Resistors	3
8	TL071	6
9	Potentiometer	4
10	Capacitors	3
11	Battery 11.1V 5000mah	510
B	Total production costs	1213
C	Contribution margin (A-B)	44228
	Fixed project costs	
1	Project Manager/Signal Manager	525
2	Control Manager	525
3	Design Manager	525
4	Marketing and advertising manager	525
5	Biomedical engineer	200
6	AI expert	200
7	Biomechanical design expert	200
8	Marketing expert	200
9	Counter	1000
10	EMG expert	200
11	Lawyer	1000
12	Manager of resources and public administrations	200
13	3d printers	7000
14	Computers	14000
15	Multimeter	1440
16	Sources	1738

17	Oscilloscope	5200
D	Total fixed costs	34678
E	Difference (C-D)	9550
	Investments	
1	Biomaker. Bionic Prosthesis Course	4200
2	Marketing certificate	31
3	Health Registration of Medical Device	869
4	Certificate of Good Manufacturing Practices	2482
5	Legalized photocopy	12
6	Certificate of analysis of the finished device.	869
7	Labels, case	20
8	Payment for service concept	124
9	National prosthesis or implant Service through Health Registry Registration	869
10	Current company certificate	12
11	Certificate of Free Sale	62
F	Total investments	9550
G	Result (E-F)	0

2.2.Financial Schedule

Activity	Week 1	Week 2	Week 3	Week 4	Week 5	Fixed assets	Total
1. Management							20292.19
1.1 Risk management	4489					14000	18489
1.2 Identification of technologies	13.42	40.26					53.68
1.3 Technology evaluation		124.18	190.7				314.88
1.4 Technology selection			117.96	90			207.96
1.5 Communication			57	228.21			285.21
1.6 Resource				941.46			941.46

management							
2. Biosignals							9295
2.1 Acquisition system		359.13	82.13			1440	1881.26
2.2 Signal processing		46.84	46.84			1738	1831.68
2.3 Signal filtering			72.84			5200	5272.84
2.4 Signal selection			309.22				309.22
3. Control							1352.6
3.1 Obtaining signals with sensors			202.57				202.57
3.2 Driver investigation			147.05				147.05
3.3 Feedback by actuators			257.05				257.05
3.4 Functional tests			652.61	93.32			745.93
4. Biomechanical design							7541.81
4.1 Anatomical and physiological design			36.35				36.35
4.2 Structure design			270.23	235.23		7000	7505.46
5. Expansion							6959.4
5.1 Market research			300				300
5.2 Strategy design			160				160
5.3 Marketing and positioning			5573.4	926			6499.4
							45441

3. Project Financial Statements(tablas)

3.1.Balance sheet

This analysis provides a comprehensive overview of the project's strengths and recognizes opportunities for improvement with continuous monitoring and strategic adjustments to ensure the sustainability and healthy growth of the project. It was determined that:

- The project has sufficient current assets to cover its short-term obligations, but liquidity could be more comfortable.
- Fixed assets exceed long-term liabilities, so there is a solid foundation for long-term growth.
- Equity is positive, suggesting a healthy financial position.
- The project is financing part of its operations with long-term debt.

Finally, the project has a balanced financial structure, with the sum of assets equal to the sum of liabilities and equity.


SAFF BIONICS BALANCE SHEET						
ASSETS			LIABILITIES			
Current Assets			Current Liabilities			
Cash Box		\$16,063	Suppliers			\$16,000
Clients		\$3,000	Creditors			\$5,300
Inventory		\$2,426	Interest payable			\$550
			Taxes			\$720
Total Current Assets		\$21,489	Total Current Liabilities			\$22,570
Fixed asset			Long-term liabilities			
Operational Team		\$22,378	Staff training			4200
Contracting of services		\$5,300	Long-term payables			4000
Total Fixed Assets		\$27,678	Total Long-Term Liabilities			\$8,200
			SUM OF LIABILITIES			\$30,770
SUM OF ASSETS		\$49,167	STOCKHOLDERS' EQUITY			
			Capital Stock			\$16,063
			Credits			\$2,334
			Total Stockholders' Equity			\$18,397
			SUM OF STOCKHOLDERS' EQUITY			\$18,397
			SUM OF LIABILITIES + STOCKHOLDERS' EQUITY			\$49,167

3.2.Income statement

To prepare the Income Statement, it is essential to have sales data for a specific period to assess gains or losses. Although we lack detailed sales data because they were not made, the sale of assets is presented as an indicator of some financial stability. It was determined that:

- The sources of income must be diversified, reducing the dependence on unique events such as the sale of assets.
- Advertising strategies must be adjusted as needed to maximize the return on investment.

Despite incurring operating losses, Saff Bionics managed to record a positive net profit of \$10,256, thanks to the revenue generated by the sale of assets. It is essential to highlight that the operating losses are directly related to the absence of prosthetic sales during the analyzed period.

SAFF BIONICS			
INCOME STATEMENT			
REVENUE:			
Gross Sales		\$3,000.0	
Less: Returns & Forecasts		\$100.0	
Net Sales			\$2,900.0
COST OF GOODS SOLD:			
Initial Inventory		\$1,213.0	
More: Purchases		\$1,000.0	
Direct Labor		\$2,100.0	
Overhead		\$100.0	
Less: Ending Inventory		\$2,426.0	
Cost of Goods Sold			\$1,987.0
Gross Profit (Loss)			\$913.0
EXPENSE:			
Advertising		\$500.0	
Uncollectible		\$300.0	
Commissions		\$2,000.0	
Contract Labor		\$1,000.0	
Memberships & Subscriptions		\$4,200.0	
Insurance		\$2,482.0	
Maintenance		\$100.0	
Taxes on wages		\$869.0	
Permits & Licenses		\$869.0	
Property Taxes		\$715.0	
Total Expenses			\$13,035.0
Net Operating Income			-\$12,122.0
OTHER INCOME:			
Profit (loss) on sale of assets		\$22,378.0	
Total Other Income			\$22,378.0
NET GAIN (OR LOSS)			 \$ 10,256.0

3.3.Cash flow statement

A net cash flow of 32,808 bolivianos means that after subtracting all expenses from income, there is a cash surplus of 32,808 bolivianos. This surplus can be crucial to cover future costs, additional investments or to provide returns to investors. A positive net cash flow is a positive sign for the financial health of the project.

OPERATION ACTIVITIES	(Bs)
Net profit	10256
Uncollectible	300
Change in current assets	
Accounts receivable	-3000
Inventory	-2426
Change in current liabilities	
Accounts payable	0
Accrued liabilities payable	0
Cash from operations	5130
INVERSION ACTIVITIES	
In	
Sale of Fixed Assets	27678
Effect of investments	27678
FINANCIAL ACTIVITIES	
In	
Issuance of Common Shares	0
Out	
Dividend payment	0
Effect from Financing	0
Net Cash Flow	32808
Effective at the beginning of the period	-
Effective at the end of the period	-

4. Economic and financial indicators(calculo)

4.1.Internal rate of return (IRR)

TIR	28%
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An IRR of 28% means a return on investment of 28%. This indicates that the investment is considered profitable because the return is greater than the discount rate used to calculate the net present value.

4.2.Net present value (NPV)

VAN	\$ 11.499
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The NPV of Bs11,499 suggests that the present value of the cash flows generated by the investment is positive.

4.3. Payback period (PP)

PR	1,58
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This suggests that in just a year and a half, the total profit obtained from the investment will be enough to cover the cost of the initial investment.

4.4. Gross margin

$$\text{Gross Margin} = \frac{(\text{Revenue} - \text{Variable Costs})}{\text{Revenue}} = \frac{45441 - 1213}{45441} = 97,33\%$$

Measure of the profitability of sales. It is calculated as the difference between revenue and variable costs.

4.5. Net margin

$$\text{Net Margin} = \frac{(\text{Revenue} - \text{Total Costs})}{\text{Revenue}} = \frac{45441 - 35891}{45441} = 21,016\%$$

Measure of the overall profitability of a project. It is calculated as the difference between revenue and total costs.

5. Sensitivity Analysis

When developing this analysis, the significant influence of raw material costs on the company's profitability was evident, highlighting the importance of proactively managing price fluctuations. Likewise, the company's sensitivity to changes in market demand is observed, indicating the need for flexibility and consideration of diversification strategies. Furthermore, the possibility of obtaining substantial benefits through expansion and the consequent obtaining of economies of scale is highlighted. However, it warns of the risks associated with dependence on specific technologies, suggesting diversification in research and development. Resilience to changes in user preferences emerges as a crucial element for the sustainability and competitiveness of SAFF Bionics in the prosthetics market.

CONCEPT				
Investment required	45441			
Units to sell	25			
Window price	3000			
Variable cost units	1213			
Fixed operating costs	34678			
Growing	10%			
Temporality (years)	2			
Rate of return	25%			

Inversión	-45441		
Flujo de Efectivo	-45441	9997	14464.5
VAN	\$11,499.00		
TIR	0.28		
TASA	25%		

	Year 0	Year 1	Year 2
Units to sell		25	27.5
Sale price		3000	3000
Total revenue		75000	82500
Variable cost		1213	1213
Fixed cost		34678	34678
Total cost		65003	68035.5

Sensibility	Projected	Tolerant	Difference
Units	25	20	5
Sale price	3000	3000	0
Fixed cost	34678	24378	10300
Variable cost	1213	1213	0

6. Financial Evaluation

After the calculations carried out, it could be seen that high financing values are required, since 45441 Bs are requested to cover production costs, fixed costs and additional investments. The assets and liabilities were calculated and adjusted so that both are in balance, the IRR, NPV and PP indicators suggest that the project could be financially viable and profitable in the short term while the gross and net margin suggest positive profits. With a time frame of 2 years, it is thought that the project can be profitable.

7. Annexes

Appendix A: General data	
Name:	Bionic Arm Prosthesis
Institution:	International Foundation for Bionic Rehabilitation (IFRB)
Sponsors:	DEG
Region:	Tarija, Bolivia
Beneficiaries:	Disabled community with limb amputation
Appendix B: Obj. Financing	
Performance:	Purchase of licenses, materials, marketing expenses, hiring experts
objective:	Develop and implement accessible bionic arm prostheses to improve the quality of life of people with amputation in Tarija.
Application mode:	Written proposal and virtual agreement
Start date:	05/02/2024
Deadline:	05/02/2025
Execution time:	1 year
Financing amount:	45441
Type of financing:	economic financial
Counterpart:	The FRBI undertakes to allocate 10% of the requested amount as a counterpart, through its own resources and collaborations with companies in the sector.
Special considerations:	Collaboration with research institutions and medical experts will be considered to ensure the adaptability and optimal functionality of the developed bionic prosthesis.

Appendix A: General data	
Name:	Bionic Arm Prosthesis
Institution:	International Bionic Rehabilitation Foundation
Sponsors:	ELANET (European Limb Amputee Network)
Region:	Tarija, Bolivia
Beneficiaries:	Disabled community with limb amputation
Appendix B: Obj. Financing	
Performance:	Purchase of licenses, materials, access to marketing resources, expenses in hiring experts
objective:	Develop and implement accessible bionic arm prostheses to improve the quality of life of people with amputation in Tarija.
Application mode:	Proposal and agreement in person
Start date:	05/02/2024
Deadline:	05/02/2025
Execution time:	1 year
Financing amount:	45441
Type of financing:	Economic financial and resources available on social networks
Counterpart:	The FRBI undertakes to allocate 10% of the requested amount as a counterpart, through its own resources and collaborations with companies in the sector.
Special considerations:	Collaboration with research institutions and medical experts will be considered to ensure the adaptability and optimal functionality of the developed bionic prosthesis.

Appendix A: General data	
Name:	Bionic Arm Prosthesis
Institution:	International Bionic Rehabilitation Foundation
Sponsors:	Erasmus+
Region:	Tarija, Bolivia
Beneficiaries:	Disabled community with limb amputation
Appendix B: Obj. Financing	
Performance:	Purchase of licenses, materials, access to marketing resources, expenses in hiring experts
objective:	Develop and implement accessible bionic arm prostheses to improve the quality of life of people with amputation in Tarija.
Application mode:	Proposal and agreement in person
Start date:	05/02/2024
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Special considerations:	Collaboration with research institutions and medical experts will be considered to ensure the adaptability and optimal functionality of the developed bionic prosthesis.

Metodología Lean StartUp.

La metodología Lean Startup se centra en la creación eficiente de productos mediante la validación continua de hipótesis, la iteración rápida y el aprendizaje constante.

¿Por qué? La metodología Lean Startup en el desarrollo de prótesis biónicas ofrece ventajas significativas, desde la validación eficiente de hipótesis hasta la adaptabilidad a cambios tecnológicos y la eficiencia en el uso de recursos. Este enfoque no solo minimiza los riesgos inherentes al desarrollo de productos innovadores, sino que también maximiza la probabilidad de ofrecer soluciones efectivas y sostenibles en el dinámico campo de las prótesis biónicas.