OperativeML

Touring Data Science

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Business Context

There are thousands of electronic music DJs performing at festivals and nightclubs in North & South America every single weekend. Until now, the agents and agencies responsible for building tour schedules have been relying upon leveraged business relationships and general domain expertise to place their acts in the right events.

OperativeML is the electronic music world's first data science firm specializing in predictive analytics centered around artist touring. By leveraging OperativeML's unique toolkit, agents and agencies can significantly reduce and eliminate inefficiencies throughout the event booking process.

During any given workweek, on average, an agent is in touch with approximately…

20+

Artists

20+

Managers, Travel Agents, Publicists

100+

Promoters or Venues

2,000+

Emails

Capital Planning & Cost of Capital

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- **San Francisco-based staff:**
  - CEO, also acts as the Chief Data & Analytics Officer and head of HR.
  - CFO, also in charge of accounts payable/ receivable, tax specialist, and accountant.
  - furnished office space in SF: $1,500/month
- **Berlin, Germany-based staff (remote):**
  - Software Engineer, also in charge of public relations.
- **Overhead:**
  - payroll is $12,000 per month for the first three years
  - professional tax services are $300/year
  - continuous learning resources are $1500/year
  - cloud storage needs (variable based on number of clients)
  - onboarding costs: $100 per artist and variable costs for agents/agencies)

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Project Selection

Brief Explanation and Detailed Calculations

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Project Selection

Projects 1 and 2 were selected for OperativeML's first three years in business. See next slides for NPV calculations.

SELECTED

1. SUPERVISED MACHINE LEARNING ALGORITHM

Provides agents with a playbook of booking strategies based upon nearly 100 inputs. Agent/agency-facing.

SELECTED

2. TOURING ANALYTICS

Provides artists and managers with comprehensive touring data, performance history, and road metrics. Artist/management-facing.

NOT SELECTED

3. MONTHLY PODCAST

Explores how groundbreaking data science initiatives are improving the electronic music industry.

Public-facing.

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Project #1: Supervised Machine Learning Algorithm

- Feeds six years of previous booking data into model and creates recommendations/predictions for future decision making
- Income based on a $5,000 initial fee + $200 monthly subscription to this service
- Requires full-time updating, monitoring, and troubleshooting
- This project is the company's core competence and part of the company's minimum viable product

Project 1															
Year 1	**2023**	January	February	March	April - launch	May	June	July	August	September	October	November	December	Total Revenue	Total Costs
	revenue				$ 15,000	$ 10,600	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 26,000	$ 2,000	$ 2,000	$ 59,600	
	costs				$ 1,000					$500					$ 1,500
Year 2	**2024**														
	revenue	$ 17,000	$ 17,600	$ 18,200	$ 18,800	$ 19,400	$ 20,000	$ 20,600	$ 21,200	$ 21,800	$ 22,400	$ 23,000	$ 23,600	$ 243,600	
	costs	$ 1,000						$ 1,000							$ 2,000
Year 3	**2025**														
	revenue	$ 29,200	$ 10,000	$ 10,000	$ 30,000	$ 10,800	$ 10,800	$ 30,800	$ 11,600	$ 11,600	$ 31,600	$ 12,400	$ 12,400	$ 211,200	
	costs	$ 2,000						$ 2,000							$ 4,000

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Project #2: Touring Analytics

- Summarizes individual artist touring statistics and creates quarterly deliverables.
- Income based on quarterly subscription to this service, which is 1% of the artist's gross performance fee income.
- Requires full-time updating and monitoring.

Project 2																
Year 1	**2023**	January	February	March	April - launch	May	June	July	August	September	October	November	December	Total Revenue	Total Costs
	revenue							$ 8,000			$ 10,000			$ 18,000	
	costs				$ 2,000		$ 500				$ 500				$ 3,000
Year 2	**2024**														
	revenue	$ 10,000			$ 12,000			$ 15,000			$ 17,000			$ 54,000	
	costs	$ 1,000						$ 500							$ 1,500
Year 3	**2025**														
	revenue	$17,000			$19,000			$20,000			$21,000			$77,000	
	costs	$ 1,000						$ 500							$ 1,500

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Project #3: Monthly Podcast

- Income based on monthly number of streams / active listeners
- Requires outsourcing of audio editor and a monthly creator subscription on several media platforms (YouTube, Spotify, Apple Music, etc)
- Initially there are no monthly listeners, but that number increases by 100 people per month each month thereafter. Each listener generates $0.50 in revenue.

Project 3

Year 1	2023	January	February	March	April - launch	May	June	July	August	September	October	November	December	Total Revenue	Total Costs
	revenue				$ -	$ 50	$ 100	$ 150	$ 200	$ 250	$ 300	$ 350	$ 400	$ 1,800	
	costs				$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500		$ 4,500
Year 2	**2024**														
	revenue	$ 450	$ 500	$ 550	$ 600	$ 650	$ 700	$ 750	$ 800	$ 850	$ 900	$ 950	$ 1,000	$ 8,700	
	costs	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500		$ 6,000
Year 3	**2025**														
	revenue	$ 1,150	$ 1,200	$ 1,250	$ 1,300	$ 1,350	$ 1,400	$ 1,450	$ 1,500	$ 1,550	$ 1,600	$ 1,650	$ 1,700	$ 13,500	
	costs	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500	$ 500		$ 6,000

Net Present Value Calculations

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$$NPV_0 = C_0 + \sum_{t=1}^{T} \frac{C_t}{(1+r)^t}$$

NPV Project 1			
Discount Rate	10%		
Payback Period	1		
End of Year		Cashflow	Discounted Cashflow
Year 1 t=1		58100	52818
Year 2 t=2		241600	199669.42
Year 3 t=3		207200	155672.43
NPV	**$408,160**		

NPV Project 2			
Discount Rate	8%		
Payback Period	1		
End of Year		Cashflow	Discounted Cashflow
Year 1 t=1		15000	13888.89
Year 2 t=2		52500	45010.29
Year 3 t=3		75500	59934.33
NPV	**$118,834**		

NPV Project 3			
Discount Rate	3%		
Payback Period	1		
End of Year		Cashflow	Discounted Cashflow
Year 1 t=1		-2200	-2635.92
Year 2 t=2		2700	2545
Year 3 t=3		7500	6863.56
NPV	**$6,773**		

Project 1 has the highest NPV

And is selected to move forward.

Project 2 has the second-highest NPV

And is selected to move forward.

Project 3 has the lowest NPV

Along with the lowest projected income, despite the most-favorable discount rate.

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International Division

Project Details, Cashflow and NPV

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International Division – Berlin, Germany

- One part-time employee working remotely, beginning at t=0 along with the rest of the company.
- Employee is the company's lone Software Engineer, in charge of company website, API, and technology updates. Hard to measure cashflow/ROI since the international employee is a critical part of the company's existence.
- Employee is paid USD to their German bank account. Currency is converted from USD to EUR by their bank, using the current exchange rate on payday.

NPV Project 4				
Discount Rate	6%			
Payback Period	1			
End of Year		Cashflow	Discounted Cashflow	
Year 0 t=0		-10000		
Year 1 t=1		15000	14150.94	
Year 2 t=2		20000	17799.93	
Year 3 t=3		22000	18471.62	
NPV	**$40,423**			

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Journal Entries & Trial Balance

Projects 1, 2, and 4

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Expected Journal Entries

- For Projects 1, 2, and 4 including year 0.

Year 0

			Dr. Accounts								Cr. Accounts					
Year	Month	Description	Cash		Tangible Assets		Intangible Assets		Expenses		Accts Receivable		Revenue		Loans Payable		Shareholder Equity	
0	0	Starting Cash	20000															20000
0	0	Small Business Loan	100000													100000		
0	3	Press Release		2500					2500									
0	0	Computers, Relational Database, Cybersecurity		3500	2500		1000											
0	0	Cloud Storage		1000			1000											
0	12	Loan Payment		4000											4000			
0	12	Loan Interest		200					200									
		Ending Balance	108800		2500		2000		2700							96000		20000
			Debit	Credit														
Trial		Dr. Accounts	116000															
		Cr. Accounts		116000														

Expected Journal Entries – Year 1

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			Dr. Accounts								Cr. Accounts							
Year	Month	Description	Cash		Tangible Assets		Intangible Assets		Expenses		Accts Receivable		Revenue		Loans Payable		Shareholder Equity		Accumulated Depreciation	
1	4	Beginning Balance	108800		2500		2000									96000		12800		
1	4	Initiation Fee Income (Project 1)									15000			15000						
1	4	Cloud Storage Subscription		1000					1000											
1	4	Payroll		12000					12000											
1	4	SF Office Rent		1500					1500											
1	4	Incoming Artists' Data Import (Project 2)		2000					2000											
1	5	Init. + Monthly Subscription Income (Project 1)									10600			10600						
1	5	Payroll		12000					12000											
1	5	SF Office Rent		1500					1500											
1	6	Monthly Subscription Income (Project 1)									1000			1000						
1	6	Incoming Artists' Data Import (Project 2)		500					500											
1	6	Payroll		12000					12000											
1	6	SF Office Rent		1500					1500											
1	7	Monthly Subscription Income (Project 1)									1000			1000						
1	7	Payroll		12000					12000											
1	7	SF Office Rent		1500					1500											
1	7	Touring Analytics Revenue (Project 2)									8000			8000						
1	8	Monthly Subscription Income (Project 1)									1000			1000						
1	8	Payroll		12000					12000											
1	8	SF Office Rent		1500					1500											
1	9	Cloud Storage Subscription		500					500											
1	9	Monthly Subscription Income (Project 1)									1000			1000						
1	9	Payroll		12000					12000											
1	9	SF Office Rent		1500					1500											
1	10	Init. + Monthly Subscription Income (Project 1)									26000			26000						
1	10	Touring Analytics Revenue (Project 2)									10000			10000						
1	10	Incoming Artists' Data Import (Project 2)		500					500											
1	10	Payroll		12000					12000											
1	10	SF Office Rent		1500					1500											
1	11	Monthly Subscription Income (Project 1)									1000			1000						
1	11	Payroll		12000					12000											
1	11	SF Office Rent		1500					1500											
1	12	Monthly Subscription Income (Project 1)									1000			1000						
1	12	Payroll		12000					12000											
1	12	SF Office Rent		1500					1500											
1	12	Loan Payment		10000											10000					
1	12	Loan Interest		200					200											
1	12	Software / Hardware Depreciation							500											500
1	12	Professional Tax Services		300			300													
1	12	Continuous Learning Resources		1500			1500													
		Ending Balance	**46400**	138000			1800		126700		75600			75600	10000					500
			Debit	Credit	2000											86000		12800		
Trial	Balance	Dr. Accounts	214100																	
		Cr. Accounts		214100																

Expected Journal Entries Years 2 and 3

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See “OperativeMLexcel.xlsx” for Years 2 and 3
(too many entries to superimpose on Power Point, font would be illegible)

Trial Balances Years 0, 1, 2, 3

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OperativeML Trial Balance		
Year 0	Account Balances	
Account	*Debit*	*Credit*
Cash	108800	
Tangible Assets	2500	
Intangible Assets	2000	
Expenses	2700	
Shareholder Equity		15800
Expenses & Loans Payable		96000
Loan Payment & Interest (eoy)		4200
	$116,000	$116,000

OperativeML Trial Balance		
Year 1	Account Balances	
Account	*Debit*	*Credit*
Intangible Assets	1800	
Expenses	126700	
Accounts Receivable	75600	
Loans Payable	10000	
Cash		138000
Revenue		75600
Accumulated Depreciation		500
	$214,100	$214,100

OperativeML Trial Balance		
Year 2	Account Balances	
Account	*Debit*	*Credit*
Intangible Assets	1800	
Expenses	166200	
Accounts Receivable	297600	
Loans Payable	10000	
Cash		177500
Revenue		297600
Accumulated Depreciation		500
	$475,600	$475,600

OperativeML Trial Balance		
Year 3	Account Balances	
Account	*Debit*	*Credit*
Intangible Assets	1800	
Expenses	166200	
Accounts Receivable	288200	
Loans Payable	10000	
Cash		177500
Revenue		288200
Accumulated Depreciation		500
	$466,200	$466,200

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Income Statement & Balance Sheet

Years 1, 2 and 3

Income Statements Years 1, 2, 3

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OperativeML Income Statement		OperativeML Income Statement		OperativeML Income Statement	
Year 1		Year 2		Year 3	
Revenue		*Revenue*		*Revenue*	
Initiation Fees	$50,000	Initiation Fees	$180,000	Initiation Fees	$60,000
Monthly Subscription Fees	$7,600	Monthly Subscription Fees	$63,600	Monthly Subscription Fees	$151,200
Touring Analytics	$18,000	Touring Analytics	$54,000	Touring Analytics	$77,000
Expenses		*Expenses*		*Expenses*	
Rent	$18,000	Rent	$18,000	Rent	$18,000
Salaries	$144,000	Salaries	$144,000	Salaries	$144,000
Supplies	$1,500	Supplies	$1,500	Supplies	$1,500
Operating expenses	$3,000	Operating expenses	$3,000	Operating expenses	$3,000
Total Expenses	$166,500	Total Expenses	$166,500	Total Expenses	$166,500
Net Income (Year 1)	($90,900)	Net Income (Year 2)	$131,100	Net Income (Year 3)	$121,700

Balance Sheet at the end of year 3

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Operative ML Balance Sheet		
as of December 31, 2025 (end of Year 3)		
	Assets	
Cash		$156,500
Accounts Receivable		$288,200
Equipment		$1,500
Intangible Assets		$1,800
Total Assets		$448,000
	Liabilities	
Rent		$18,000
Payroll		$144,000
Loan		$10,000
	Shareholders' Equity	
Share capital		$12,800
Retained earnings		$5,000
Total liabilities and		
shareholder equity		$189,800

- Due to overhead getting off the ground, the company operates at a loss in year 1.
- Company begins being profitable halfway through year 2.
- By the end of year 3, there are 55 artists using the analytics service and 62 companies using the supervised machine learning model to make decisions about touring.
- The only person with a stake in the company at the end of year 3 is the CEO (hence the low share capital).
- In year 4, the CEO awards the CFO and Lead Software Engineer partnership. Salaries increase substantially. Employment also increases with client load.

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Financial Ratios

Measuring liquidity, solvency, and profitability

Financial Ratios at the end of year 3

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While startups may not worry about margins initially, by year 3, it's do or die.

By the end of the third year, the company has a relatively comfortable level of liquidity.

Chipping away at the small business loan while enjoying fast-paced growth earns OperativeML a very favorable debt-to-asset ratio by end of 2025.

Liquidity Ratios	
current ratio = current assets/current liabilities	
448000 / 189800	**2.36037935**

Gross (Net) Profit Martin	
GNPM = gross net profit / revenue	
121700 / 288200	**0.4222762**

Solvency Ratios	
debt-to-asset ratio = total debt/total assets	
66000 / 448000	**0.14732143**

References

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- Brealey, R. A., Myers, S. C., and Allen, F. 2016. *Principles of Corporate Finance* (Twelfth Edition). New York: McGraw-Hill.
- Heisinger, K., Hoyle, J. 2023. *Managerial Accounting*. Saylor Foundation.

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