

9/9/2025

Foundations of Software Management (Sections A, B&R)

Ravi Thomas
Office: B23 124
Tuesday: 5:30 – 7:20 PM (B & R)
Tuesday and Thursday 2:00-3:20 (A)

Week 3

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Weeks 1 & 2

Week 1:

Course Overview

Company Assignments

Week 2: (Task 1)

- **Business Model (Software Companies)**
 - **Product Strategy (multiple)**
 - **Revenue Logic**
 - **Subscription**
 - **Other**
 - **Distribution Model**
 - **Services and Implementation**



Team Assignments

Company	Student			
Adobe (ADBE)	Purav Desai (A)	Maulina Ghoniya (A)	Yona Naqo (A)	
AirBnB (ABNB)	Jenny Cao (A)	Christina Lam	Heath Sun	
Alphabet (GOOG)	Ifra Aijaz (B)	Quan Shi	Gary Shuster (R)	
CloudFlare (NET)	Roxy He	Haoyuan Li	Matheus Manganeli De Macedo (B)	
DataDog (DDOG)	Yi-Chun Chen (A)	Harshavardhini Gunuraj	Xiangchen Kong	
DropBox (DBX)	Shatakshi Chaudari (A)	David Ma	Jessie Xiong	
Figma (FIG)	Hanzah Ahmadi (B)	Tanya Hema	Victoria Wei	

Team Assignments

Company	Student			
Meta (META)	Saloni Parekh(A)	Jenny Shen	Kristen Wang	
Microsoft (MSFT)	Vicki Lin	Harshini Sivachitravel	Nicholas Wang	
Palantir (PLTR)	Shirley Li	Adrian Pratama	Yuexuan Qi	Lakshita Rahoria
Palo Alto Networks (PANW)	Richa Pragat	Xiaowen Yu	Yi Zhang	
Pinterest (PINS)	Mengchao Ren	Sammy Ren	Jiameng Sun (R)	
Salesforce (CRM)	Ayesha Parvez	Xue Piao (R)	Kush Presh Thaker	Yiwen Wei
Uber (UBER)	Searen Da	Siwei Tan	Peijun Ying	
Workday (WDAY)	Andy Chen	Aonika Parrish	Jean Wang	

Revenue Logic

- What are the sources of revenue?
 - License
 - Subscription
 - Maintenance

Companies

Company	Core	Other	Future	
Adobe (ADBE)	Digital Media	Digital Experience Publishing / Ads		
AirBnB (ABNB)	Guest and Host Fees	Experiences	Ads, Insurance, etc	
Alphabet (GOOG)	Search and Youtube ads Google network, Maps ads	Google Cloud Infrastructure, Tools, Professional Services	Waymo, Verily, Nest	
CloudFlare (NET)	Subscription (security, performance, networking)	Service and Professional	Secure network access, edge computing	
DataDog (DDOG)	Subscription (Monitoring)	Professional services		
DropBox (DBX)	Subscription	Professional Services		
Figma (FIG)	Subscription	Professional Services		

Companies

Company	Core	Other	Future	
Meta (META)	Advertising	Hardware API Charges Transaction Fees	AI Models and services	
Microsoft (MSFT)	Productivity and Business Software	Intelligent Cloud Personal Computing		
Palantir (PLTR)	Software Licenses and Subscriptions	Professional Services		
Palo Alto Networks (PANW)	Subscription and Support	Product Sales (Hardware and Software)		
Pinterest (PINS)	Advertising		Affiliate, Creator Monetization, Data	
Salesforce (CRM)	Subscription and Support	Professional services		
Uber (UBER)	Mobility Delivery	Freight Ads		
Workday (WDAY)	Subscription	Professional Services		

Sample P & L in % Terms for Public Companies (Profitable Technology Companies)

	Range	Sample %
Revenue		100%
Cost of Goods Sold (COGS)	20%-50%	40%
Gross Margin	50%-80%	60%
Expenses (by Department)		
Sales & Marketing	25%-35%	30%
R&D	10%-15%	10%
G&A	4%-6%	5%
Total Expenses		45%
Operating Profit (EBITDA) Earnings Before Interest, Taxes, Depreciation/Amortization		15%

Box

BOX		Year Ended January 31,		
	2025		2024	
Consolidated Statements of Operations Data:				
Revenue	\$ 1,090,130	100%	\$ 1,037,741	100%
Cost of revenue (1)	228,105	21%	260,612	25%
Gross profit	862,025	79%	777,129	75%
Operating expenses:				
Research and development (1)	264,853	24%	248,767	24%
Sales and marketing (1)	380,154	35%	348,638	34%
General and administrative (1)	137,384	13%	128,971	12%
Total operating expenses	782,391	72%	726,376	70%
Income from operations	79,634	7%	50,753	5%
Interest income	23,709		18,714	
Interest expense	(6,075)		(3,841)	
Other expense, net	(12,108)		(3,040)	
Income before income taxes	85,160	8%	62,586	6%
(Benefit from) provision for income taxes	(159,461)		(66,446)	
Net income	244,621		129,032	

VEEVA

	January 31,				
VEEVA	2025			2024	
				(in thousands)	
Consolidated Statements of Comprehensive Income Data:					
Revenues:			%		%
Subscription services	\$ 2,284,659		83%	\$ 1,901,593	80%
Professional services and other	461,960		17%	462,080	20%
Total Revenues	2,746,619		100%	2,363,673	100%
Cost of revenues (1):					
Cost of subscription services	323,070		14%	290,577	15%
Cost of professional services and other	376,566		82%	386,714	84%
Total cost of revenues	699,636		25%	677,291	29%
Gross profit	2,046,983		75%	1,686,382	71%
Operating expenses (1):					
Research and development	693,078		25%	629,031	27%
Sales and marketing	396,726		14%	381,472	16%
General and administrative	265,744		10%	246,545	10%
Total operating expenses	1,355,548		49%	1,257,048	53%
Operating income	691,435		25%	429,334	18%
Other income, net	227,946			158,689	
Income before income taxes	919,381		33%	588,023	25%
Income tax provision	205,243			62,318	
Net income	\$ 714,138			\$ 525,705	
(1) Includes stock-based compensation as follows:					

CROWDSTRIKE

CROWDSTRIKE					
	2025		2024		
Revenue					
Subscription	\$ 3,761,480	95.14%	\$ 2,870,557	93.95%	
Professional services	192,144	4.86%	184,998	6.05%	
Total revenue	3,953,624	100.00%	3,055,555	100.00%	
Cost of revenue					
Subscription	835,509	22.21%	630,745	21.97%	
Professional services	155,972	81.17%	124,978	67.56%	
Total cost of revenue	991,481	25.08%	755,723	24.73%	
Gross profit	2,962,143	74.92%	2,299,832	75.27%	
Operating expenses					
Sales and marketing	1,523,356	38.53%	1,140,566	37.33%	
Research and development	1,076,901	27.24%	768,497	25.15%	
General and administrative	482,316	12.20%	392,764	12.85%	
Total operating expenses	3,082,573	77.97%	2,301,827	75.33%	
Profit/Loss from operations	(120,430)	-3.05%	(1,995)	-0.07%	
Interest expense	(26,311)		(25,756)		
Interest income	196,174		148,930		
Other income, net	5,101		1,638		
Income (loss) before provision for income taxes	54,534	1.38%	122,817	4.02%	
Provision for income taxes	71,130		32,232		
Net income (loss)	(16,596)		90,585		

Distribution Model

- Marketing and Selling
 - B-2-C versus B-2-B
 - Example Box versus Dropbox

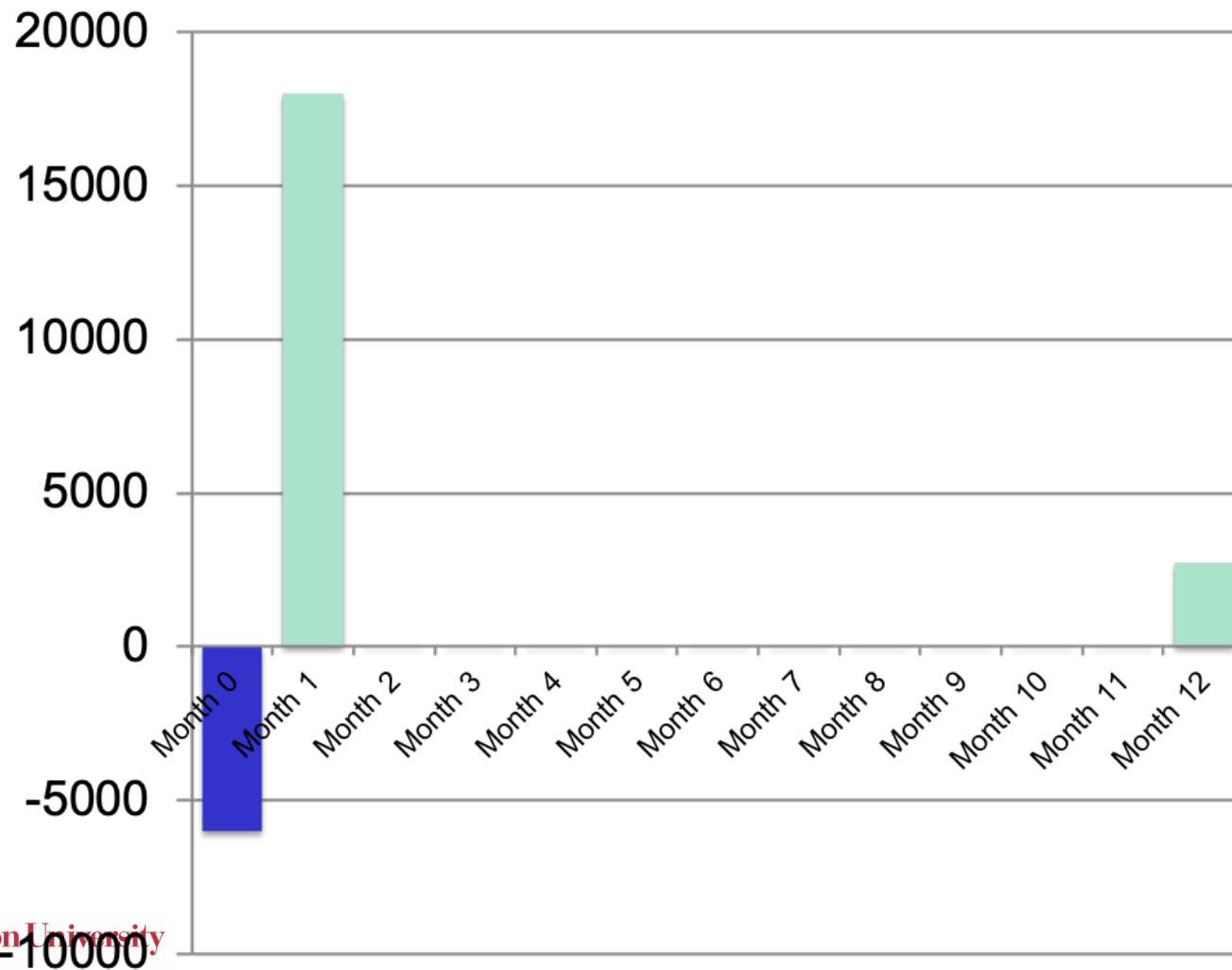
Service and Implementation

- How does your company deliver and support its product/service?

The SaaS Business Model

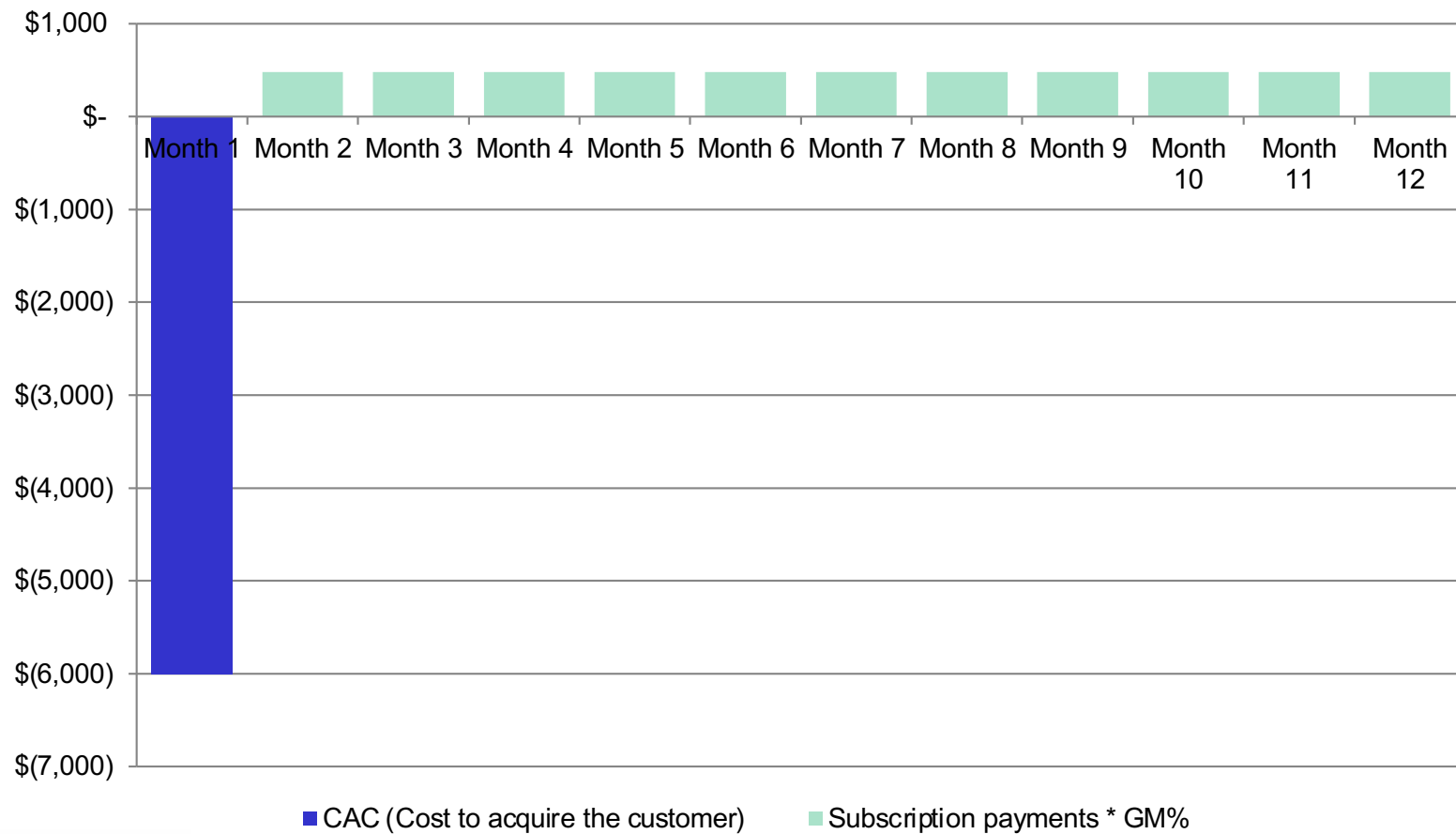
David Skok, Matrix Partners

What we were used to: Licensed Software

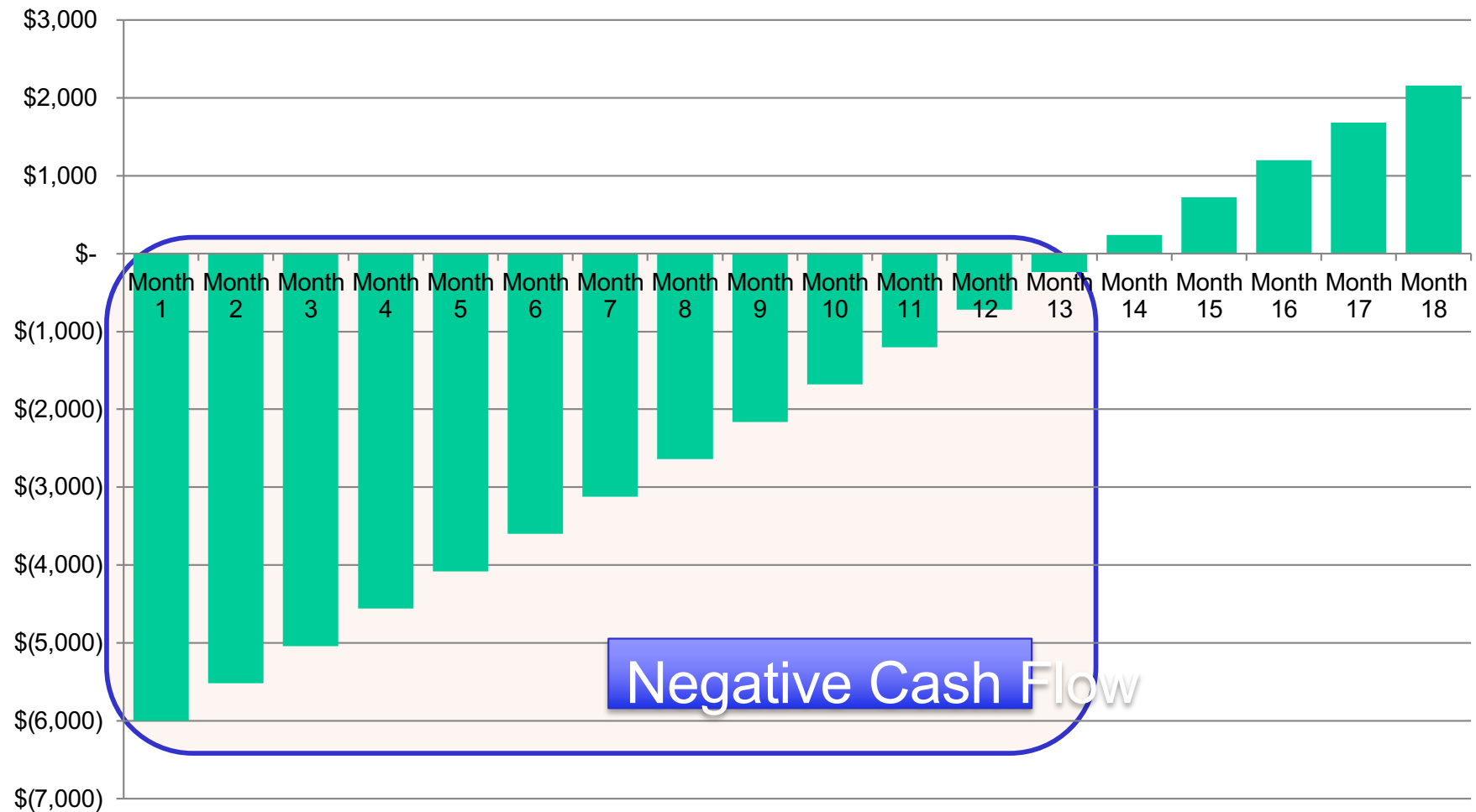


What's so different about SaaS?

Cash Flow for a Single Deal



Cash Impact of a typical deal



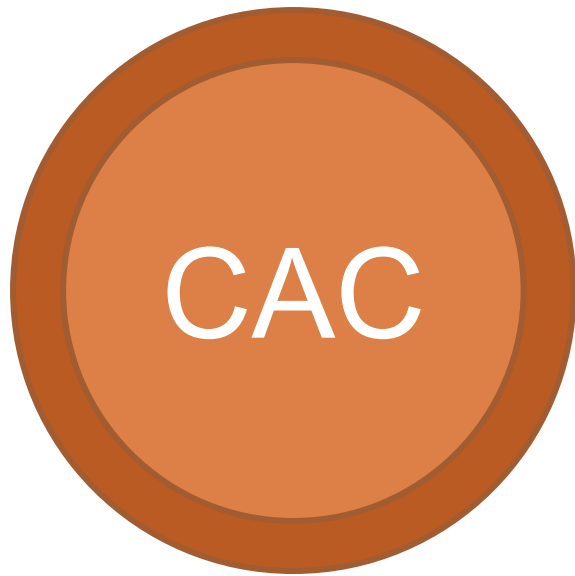
UNIT ECONOMICS

A Powerful Tool

Unit Economics

Can I make more profit from my customers than it costs me to acquire them?

Unit Economics

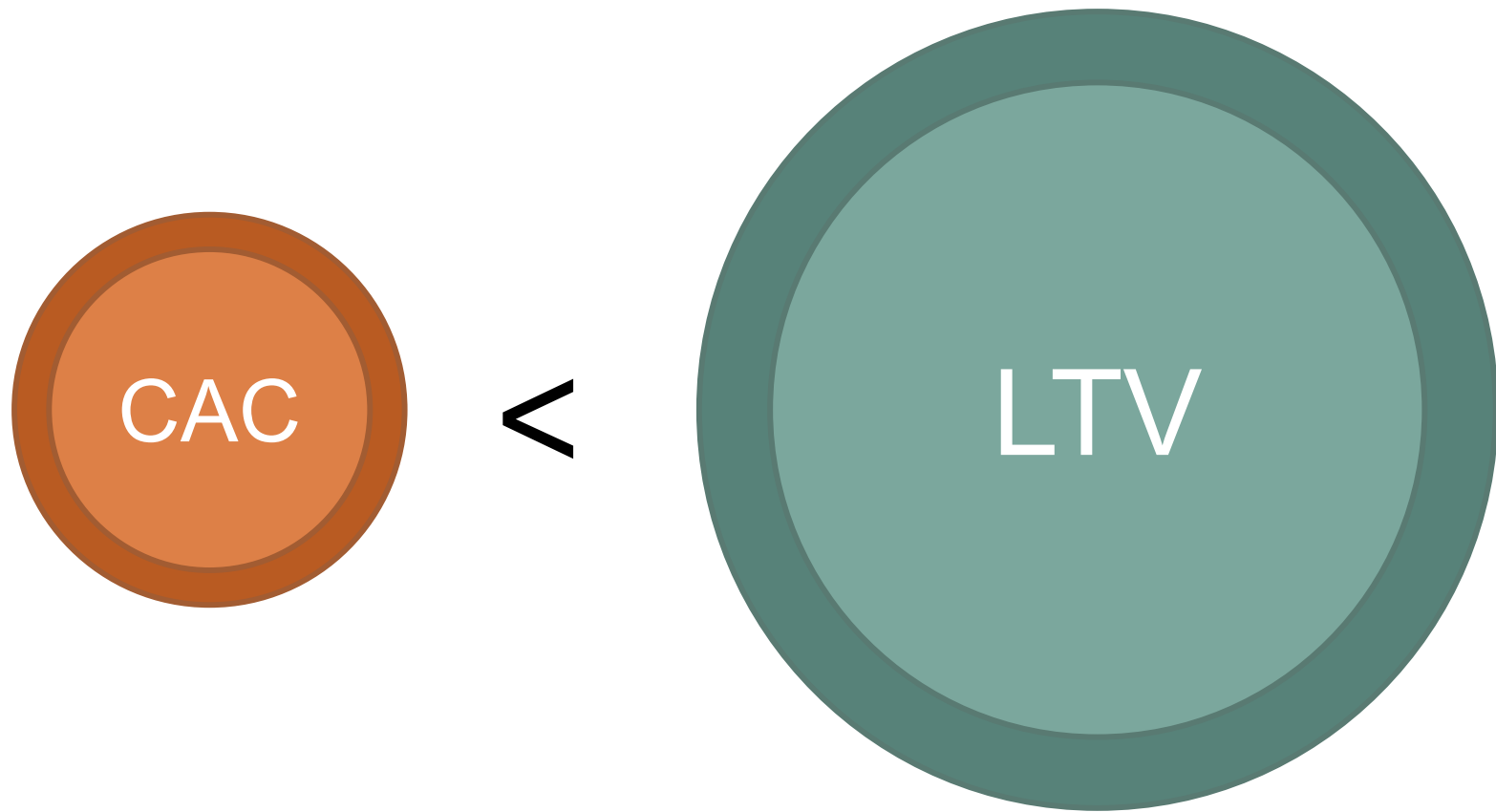


Cost to Acquire a Customer



Lifetime Value of a Customer

A Viable Business Model



But surprising how many
Entrepreneurs underestimate CAC

Basic Accounting

- **Understanding Key Terms**
- **Introduce some Accounting Principles**
- **Generate the following Financial Statements from the General Ledger**
 - **Income statement**
 - **Balance Sheet**
 - **Statement of Cash Flows**
 - **Statement of Ownership**

Income Statement

- The company's profitability over a chosen period of time
 - Transactions are recorded using **principles** such as revenue and expense recognition, depreciation, amortization, and the matching principle.
 - (The **matching principle** is that expenses are matched with revenue)
 - The role of governing tax jurisdiction.

Balance Sheet: Assets

- **A Balance Sheet provides a "snapshot" of a company's financial position at a specific point in time.**
- **Assets: Assets are resources owned by the company that have future economic value, such as Cash, Capital Equipment, and Accounts Receivable, etc..**
 - Accounts Receivable represent money owed to the company for services provided but not yet paid for.
 - Inventory is an Asset

Balance Sheet: Assets

- **Cost Principle:** Assets are generally recorded at their original cost, and their recorded value is not increased even if their fair market value rises.
- **Conservatism Principle:** Accountants may decrease an asset's value if its net realizable value falls below its original cost.
 - Example Goodwill
- **Depreciation:** For assets with finite lives (e.g., vehicles, equipment), their cost is systematically allocated to Depreciation Expense on the Income Statement over their useful life to comply with the **matching principle**. For example, a \$6,000 Computer with a two-year useful life might have $\$6,000/24$ of Depreciation Expense matched to revenues each month. The "carrying amount" or "book value" of the asset on the balance sheet is its original cost minus accumulated depreciation.
 - *It's important to note that the balance sheet does not report assets at their current market value.*

Balance Sheet: Liabilities

- **Liabilities:** Liabilities are obligations or amounts owed to others as of the balance sheet date.

—Examples

- include loans (Notes Payable),
- interest owed (Interest Payable),
- amounts owed to suppliers (Accounts Payable),
- and wages owed to employees (Wages Payable).
- Money received in advance for services not yet performed is also a liability, recorded as Unearned Revenue.

Balance Sheet Stockholders Equity

- **Stockholders' Equity:**
 - For a corporation, this section represents the owners' interest in the company, calculated as assets minus liabilities.
 - It includes accounts like Common Stock (increased by owner investments)
 - and Retained Earnings (increased by profits and decreased by losses).
 - Net income increases stockholders' equity, while expenses decrease it, illustrating a link between the income statement and balance sheet.
 - **Stockholders' equity is not equivalent to the corporation's market value or "net worth".**

Statement of Cash Flows

The Statement of Cash Flows reports how a company's cash balance changed over a specific period.

It details cash generated and used by

- **operating,**
- **investing,**
- **and financing activities.**

General Ledger

- **Detail List of all transactions**

General Ledger and Chart of Accounts

- **Chart of Accounts:** To organize transactions, a detailed listing of all possible accounts a business might use is created, known as a Chart of Accounts.
- **In the General Ledger, financial transactions are allocated to the account created by the Chart of Accounts.**
 - This chart typically categorizes accounts into assets, liabilities, equity, revenues, and expenses.

Sample transaction

Prepaid expenses (**Matching Principle**)

- **Prepaid Rent: The Company pays \$1,500 for January rent in December.**
 - Cash (Asset account) is debited for \$1,500 in December
 - Prepaid Expense (Asset Account) is credited for \$1,500 in December
- **The balance sheet remains in balance, with changes only on the asset side.**

(spreadsheet)



Chart of Accounts

- **Group Headings**
 - Revenue
 - Cost of Goods Sold
 - Engineering
 - Sales
 - Marketing
 - G&A
 - Interest expenses



Revenue

- **Sub Groups**
 - Product
 - Service and Support
 - Subscription
- **Revenue Recognition Issues**
 - GAAP Guidelines are murky
 - Backlogs or Bookings (not yet Recognized Revenues)
 - Deferred Revenue? Liability??

When should Revenue be recognized?

- **Contract is signed**
- **Product or service is delivered**
- **Invoice is sent out**
- **When the bill is paid**
- **Answer?**
- **Example: Copy machine with 12 month maintenance contract sold in October**
 - **2 components Copy machine + 12 months of services**

Cost of Goods Sold

- Think of this as Variable Costs
- All costs **DIRECTLY** involved in producing a product or service (*Up to interpretation*)

Expenses:

Capital Expense vs Operating Expense

- **Remember Operating Expenses reduce the bottom line immediately**
 - Temptation to classify operating expense as capital expense
- **Rule of thumb (not always observed)**
 - Equipment less than 5,000 is expense
 - Greater than 5,000 is capital expense

Operating Expenses

- **Think of this as Fixed Costs**
 - **G&A**
 - **Engineering**
 - **Marketing**
 - **Sales**

Engineering

- **Salary & Wages Expense**
 - Engineers, VP Engineer, etc
- **Benefits**
- **Travel**
- **Contract Services**
- **Information Technology Expense**

G&A

- **Salary & Wages**
 - CEO, CFO, Account, Admin
- **Office Expense**
- **Travel**
- **Bank Fees**
- **Legal Expense**
 - Corporate
 - Patent



Sales & Marketing

- **VP Sales and others**
- **VP Marketing and Others**
- **Trade Shows**
- **Advertising**
 - **Lead Generation**
 - **Awareness**

Definition of COGS

- **Cost of Revenue, Cost of Sales, Cost of Goods Sold (COGS)**
- **Cost of goods sold (COGS for short) is the expense a company incurred in order to manufacture, create, or sell a product.**
 - **It includes the purchase price of the raw material as well as the expenses of turning it into a product.**

Types of Accounts

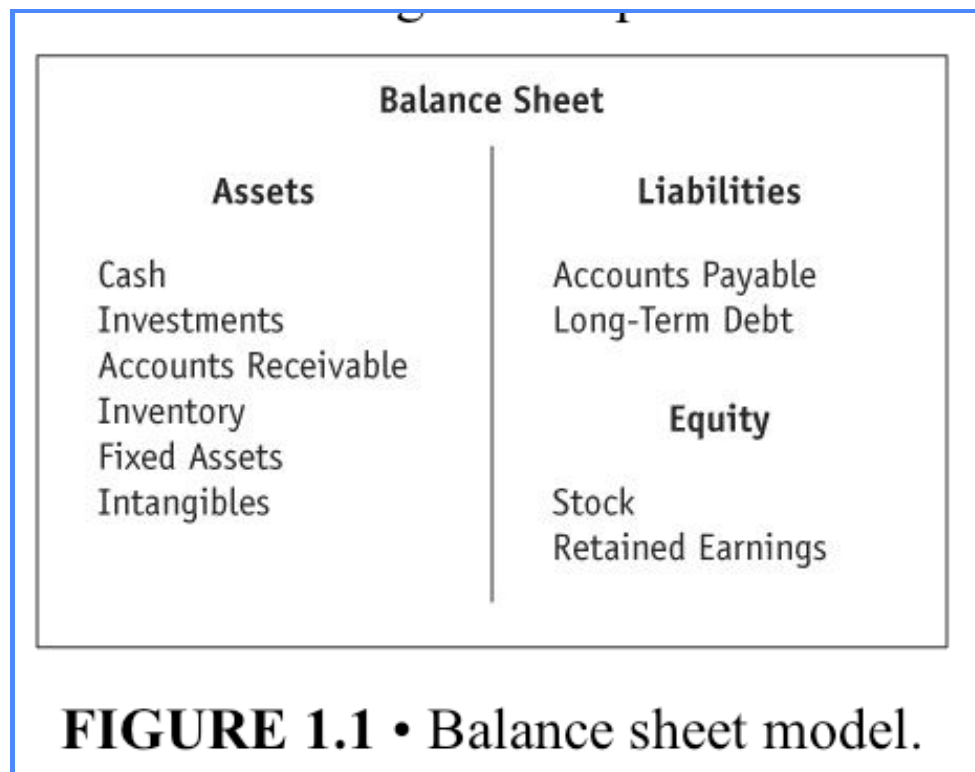
- **Asset Accounts**
 - Cash, Bank Accounts, Accounts Receivable, Equipment, Pre-Paid Expenses
- **Liability Accounts**
 - Accounts Payable, Bank Loan, Accrued Interest
- **Equity Accounts**
- **Revenue Accounts**
 - Sales, Service, Support, Subscription
- **Expense**
 - Utilities, travel, meals, insurance

CASH versus ACCRUAL and the Matching Principle

Accounting Method	Revenues Recognized	Expenses Recognized
CASH	Receipt of cash	Cash paid out
ACCRUAL	Product (shipped/invoiced)	Receipt of Invoice

Balance Sheet

(Super Summary of the General Ledger)



Income Statement (P&L)

Income Statement	
Sales	
Less cost of goods sold	
<hr/>	
Gross margin	
Less operating costs	
<hr/>	
Operating margin	
Less taxes, other	
<hr/>	
Net income or net profit margin	

FIGURE 1.2 • Income statement model.

Income Statement and Balance Sheet

([Figure 5.2](#)) through the retained earnings figure.

Income Statement		Balance Sheet	
		Assets	Liabilities
Sales		Cash	Accounts Payable
Less cost of goods sold		Investments	Long-Term Debt
<hr/>		Accounts Receivable	
Gross margin		Inventory	
Less operating costs		Fixed Assets	
<hr/>		Intangibles	
Operating margin			Equity
Less taxes, other			Stock
<hr/>			Retained Earnings
Net income or net profit margin			

Cash-Flow and Balance Sheet

