OUTLINE

- PHILOSOPHY - THE MEANING OF (CORPORATE) LIFE
- PROGRAMS & PLANNING
- QUANTITATIVE PROGRAM EVALUATION
- SLRP GUIDANCE - WHAT WOULD YOU LIKE?

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. FOR WHAT REASONS DOES A CORPORATION LIKE INTEL EXIST?

Founders

- PSYCHIC REWARD
- $

Investors

- RETURN OF INVESTMENTS (PRICE OF STOCK INCREASING)

KEY

- IF FAILS APART EVERYTHING DOES -

PRIMARY

EMPLOYEES

- JOB CONTINUITY
- INCREASING REAL INCOME
- PSYCHIC REWARD (DOING & HAVING DONE SOMETHING SIGNIFICANT)

CUSTOMERS : CONTINUITY

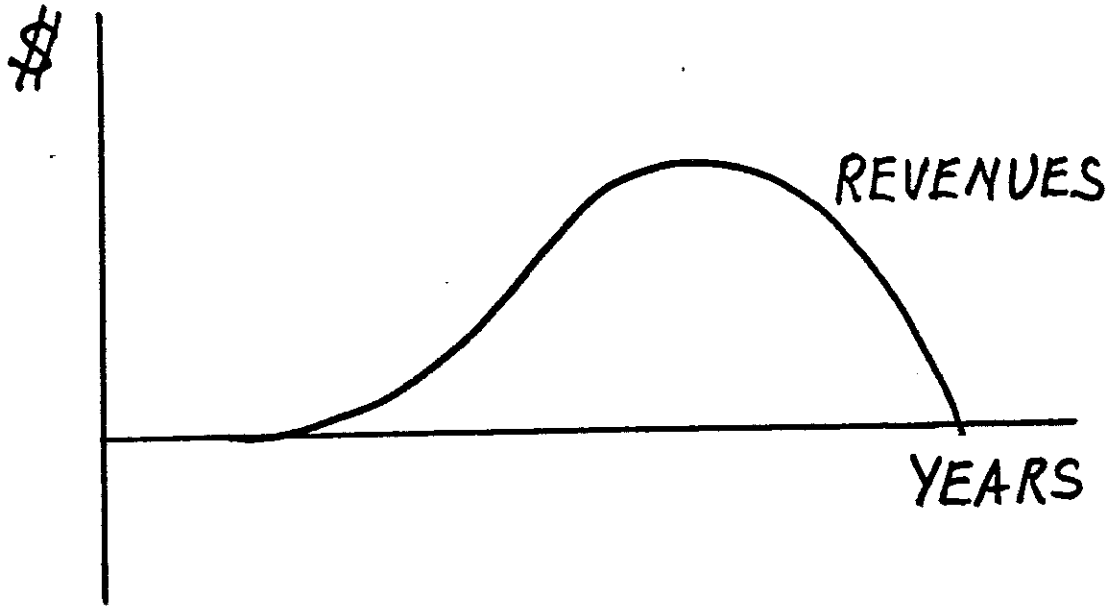
SUPPLIERS

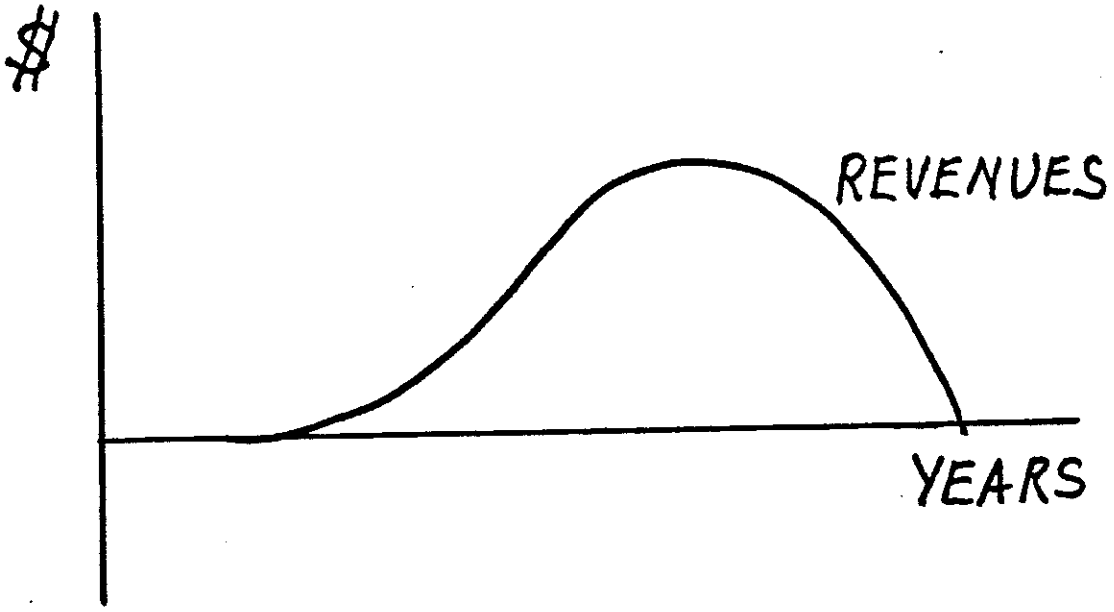
COMMUNITY (GOVNMT)

- JOBS
- TAXES
- PARTICIPATION

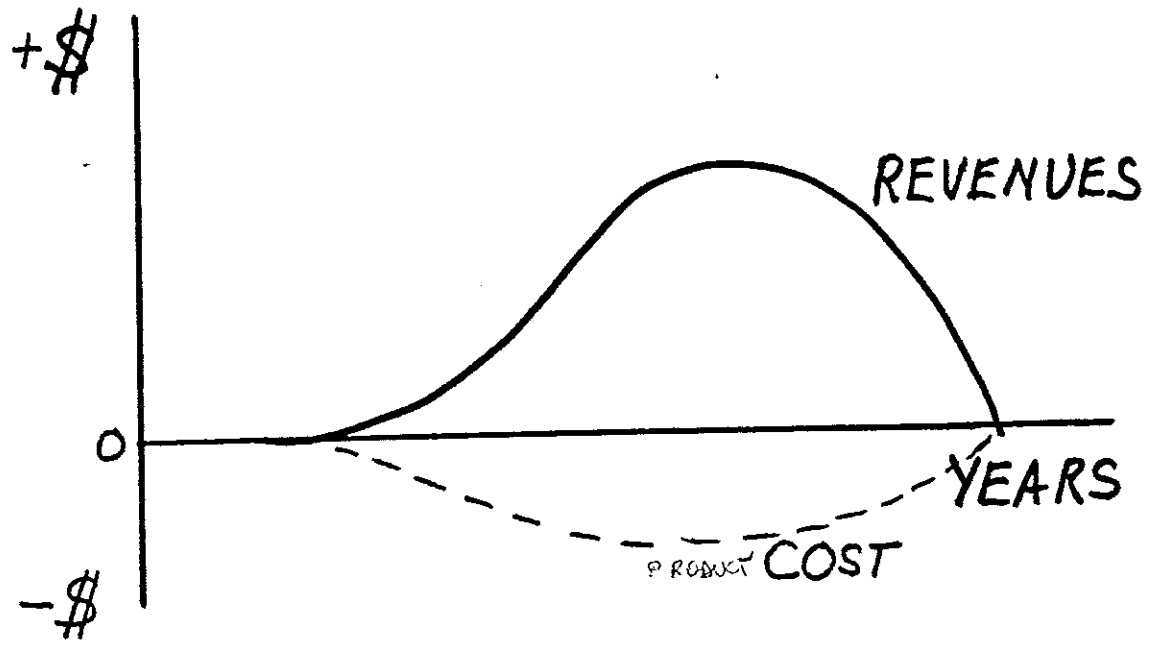
WHICH IS A GOOD PROGRAM?

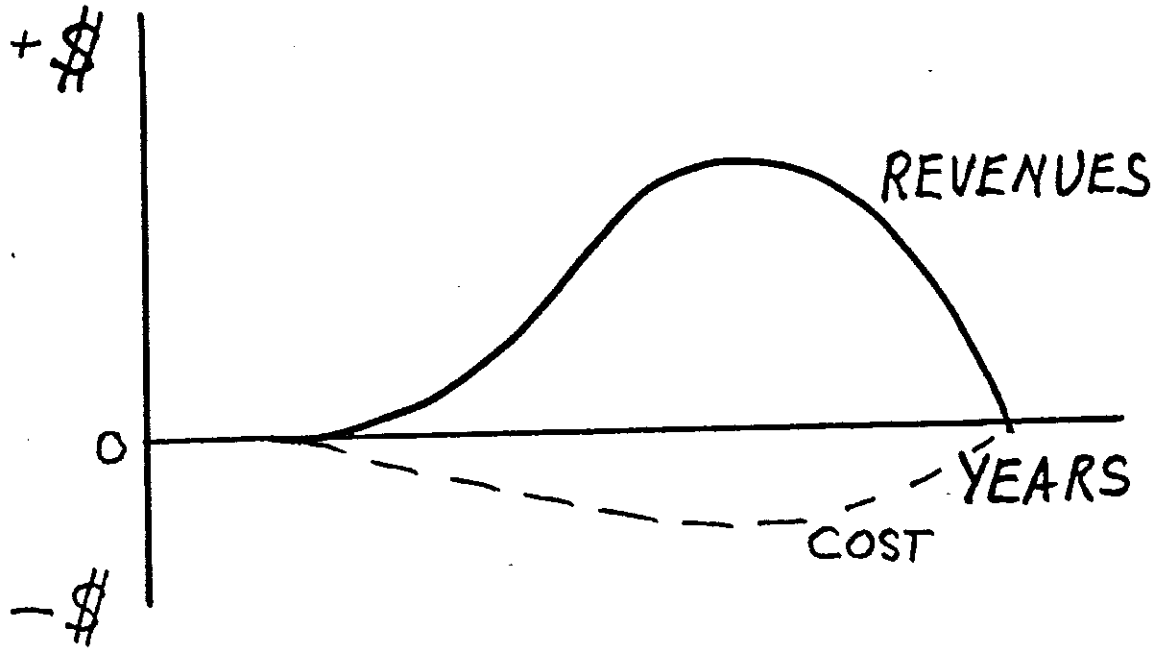
WHICH IS A BAD PROGRAM?



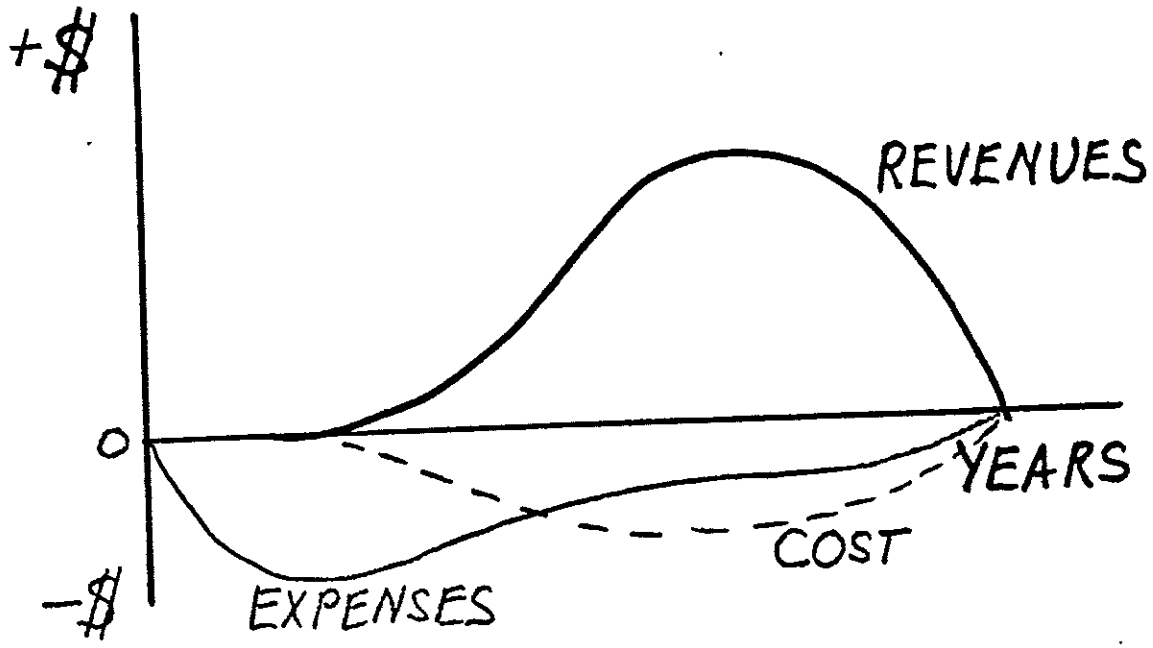


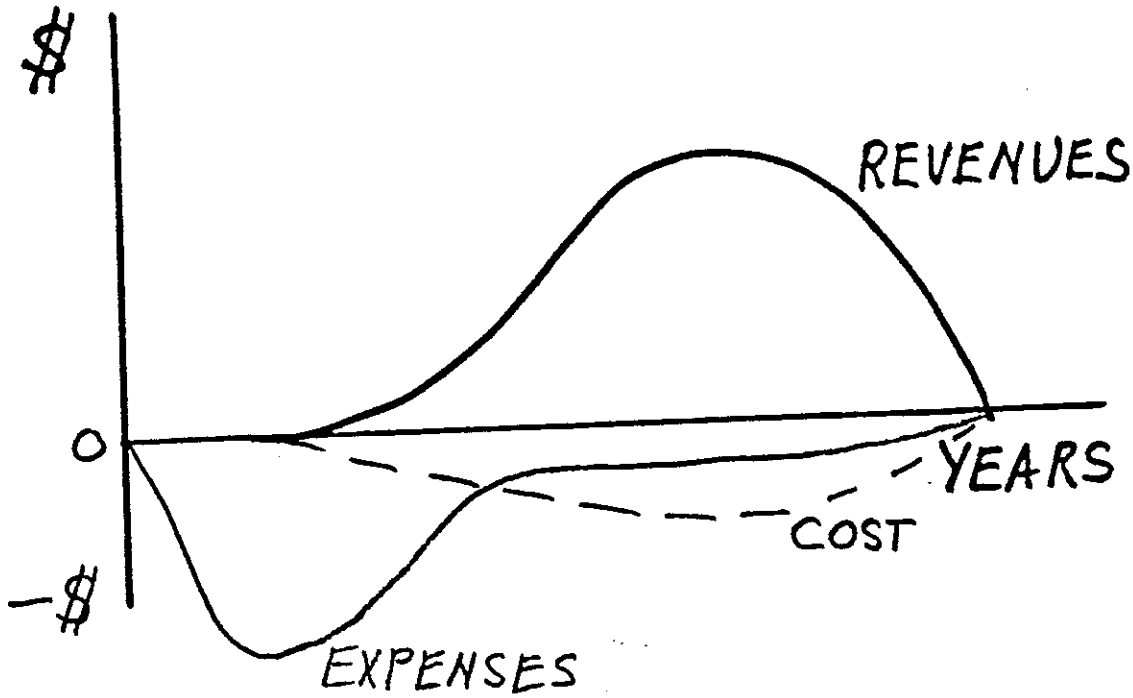
ANY HELP?





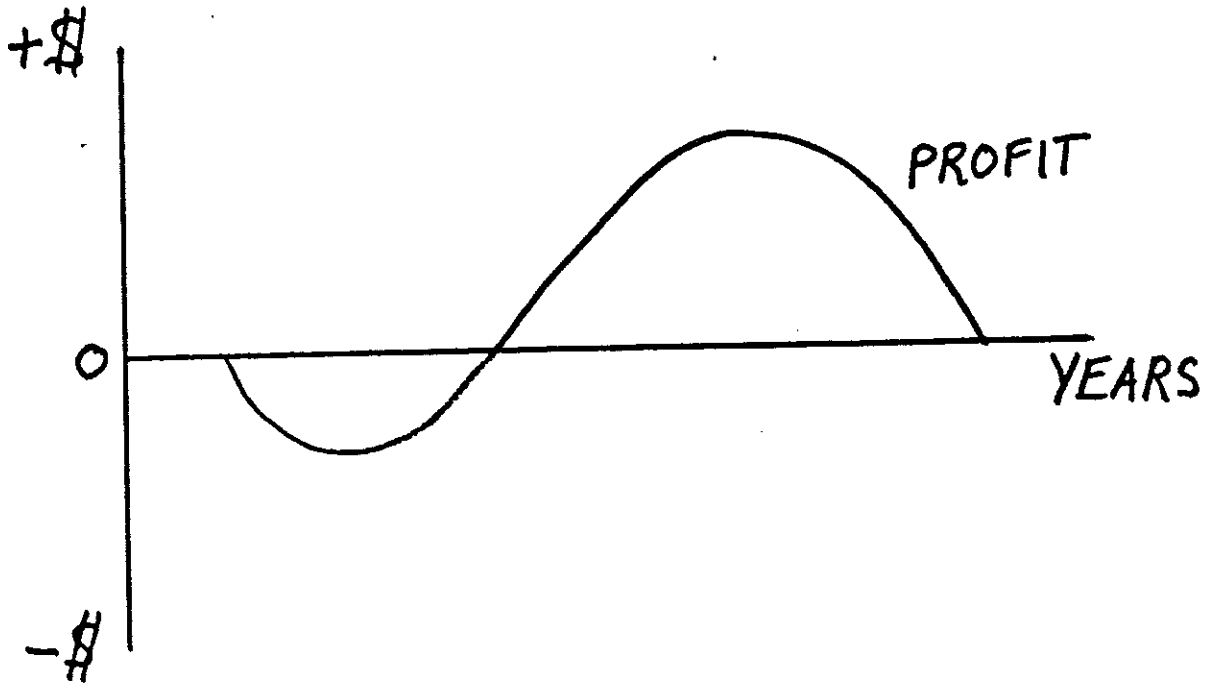
HOW ABOUT NOW?

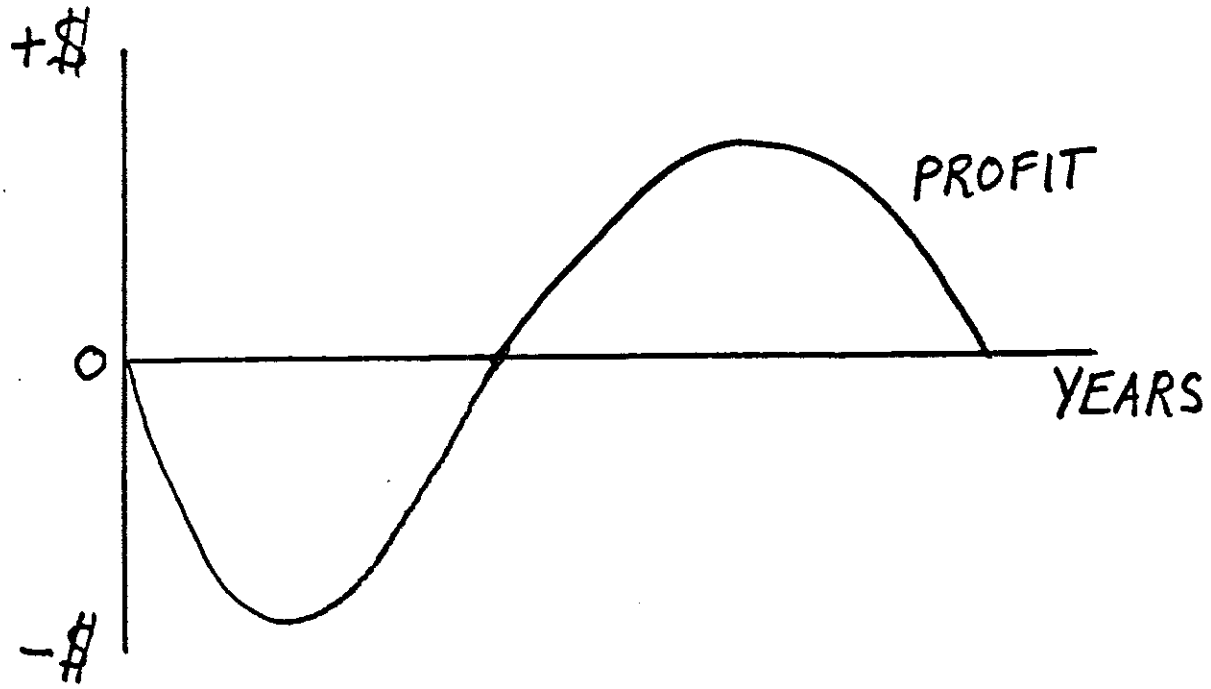




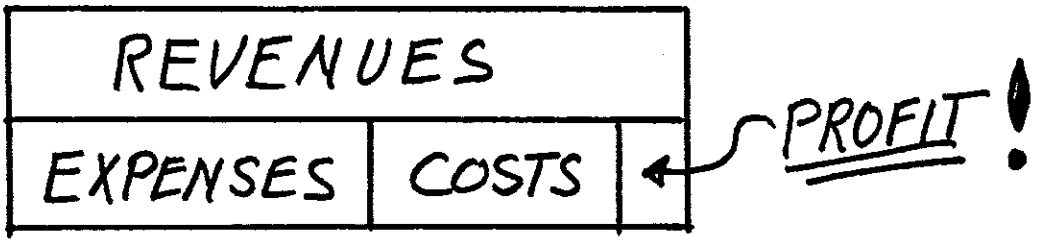
WHICH IS A GOOD PROGRAM?

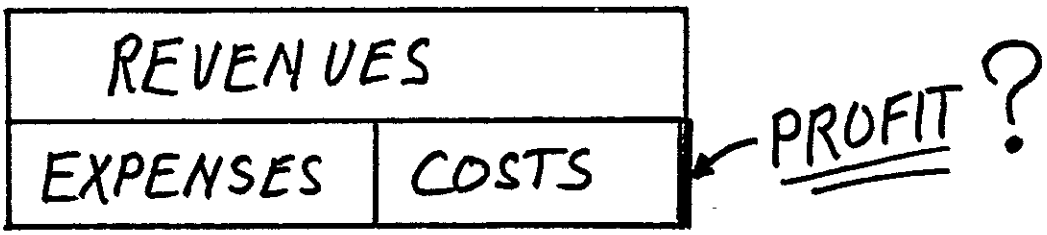
BAD PROGRAM?





REMEMBER WHAT HAPPENS WITH SMALL DIFFERENCES
BETWEEN LARGE NUMBERS



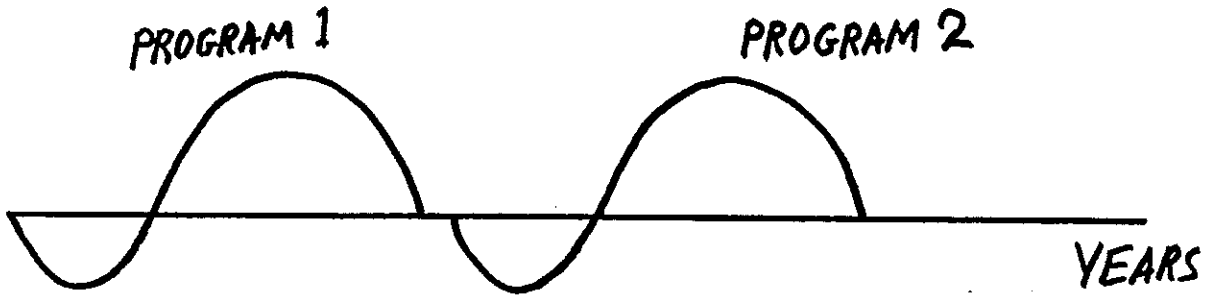


$$P = R - E - C$$

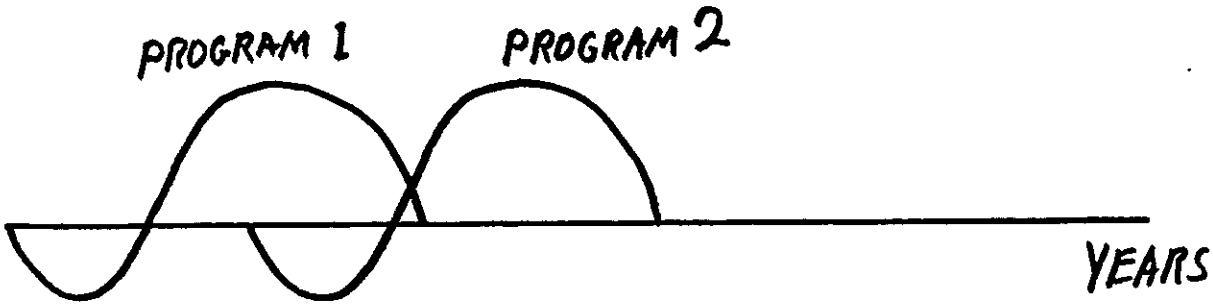
THIS IS A GOOD PROGRAM.

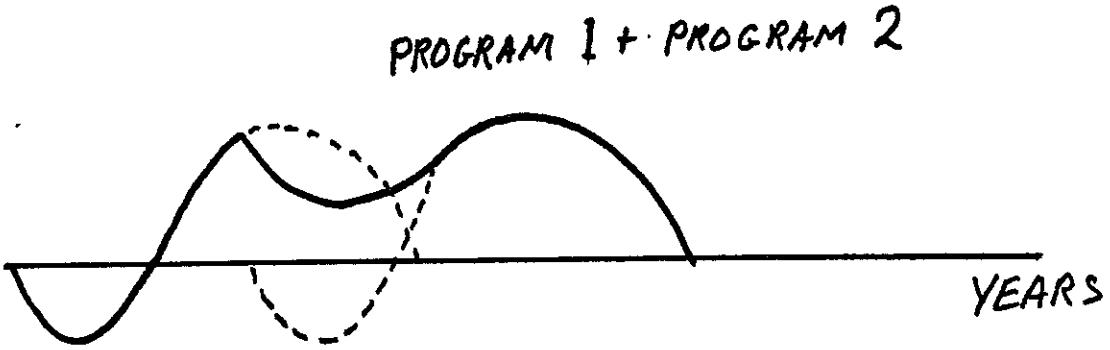
IS IT A GOOD ENTERPRISE?

IS THIS A BETTER ENTERPRISE?

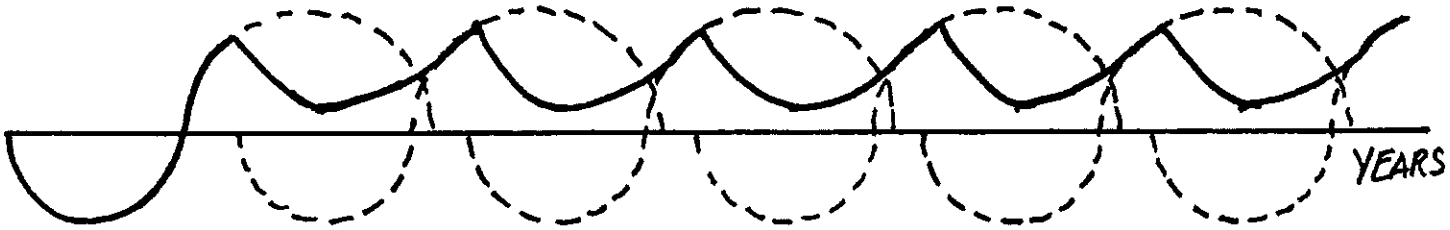


HOW ABOUT THIS ONE?



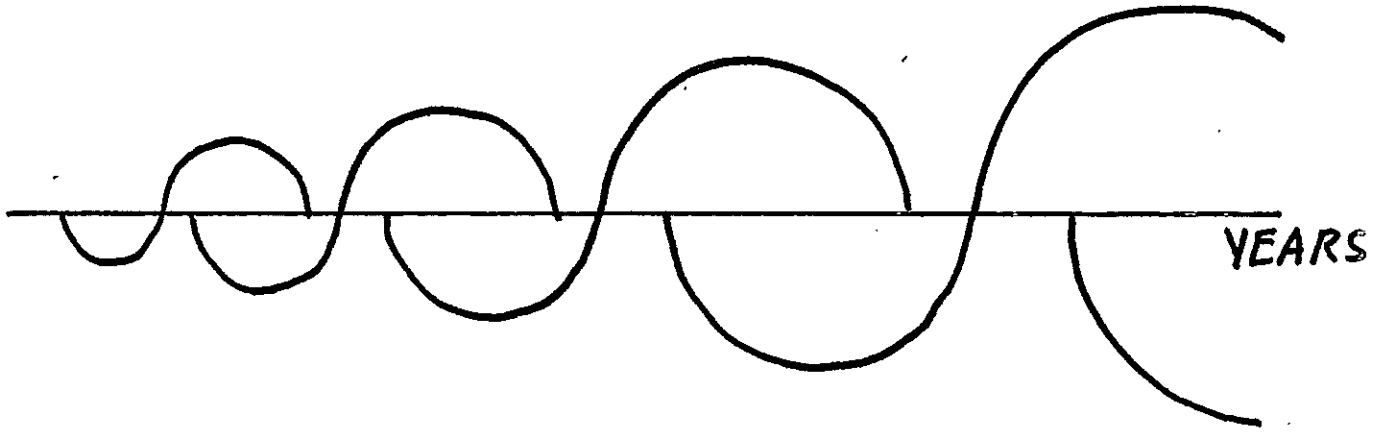


IS PROGRAM 1 STILL A GOOD PROGRAM?

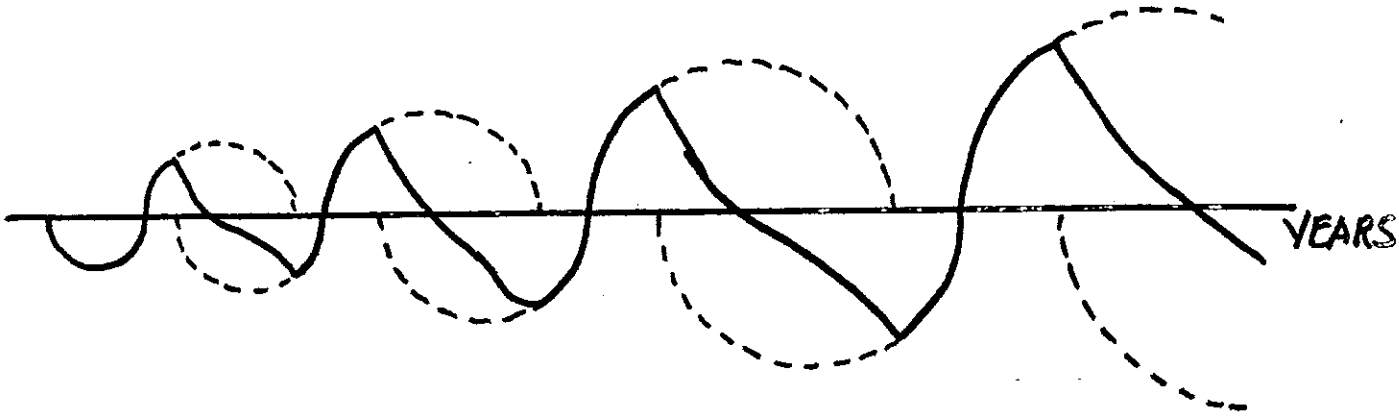


A PROFITABLE, CYCLICAL, NO-GROWTH, PERPETUAL ENTERPRISE

HOW ABOUT WITH GROWTH?

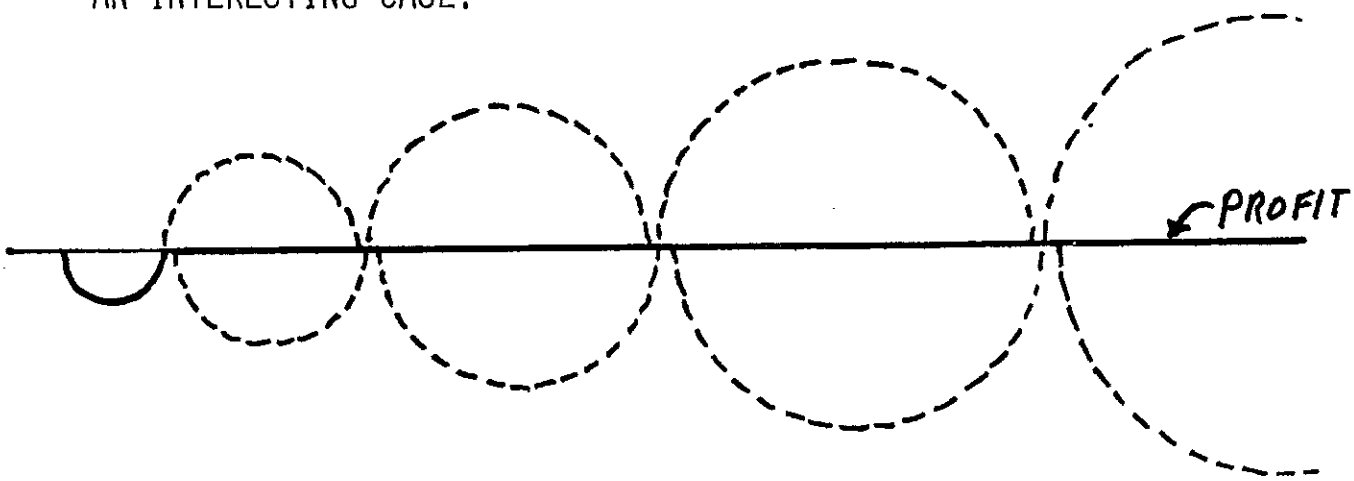


ARE THESE GOOD PROGRAMS?



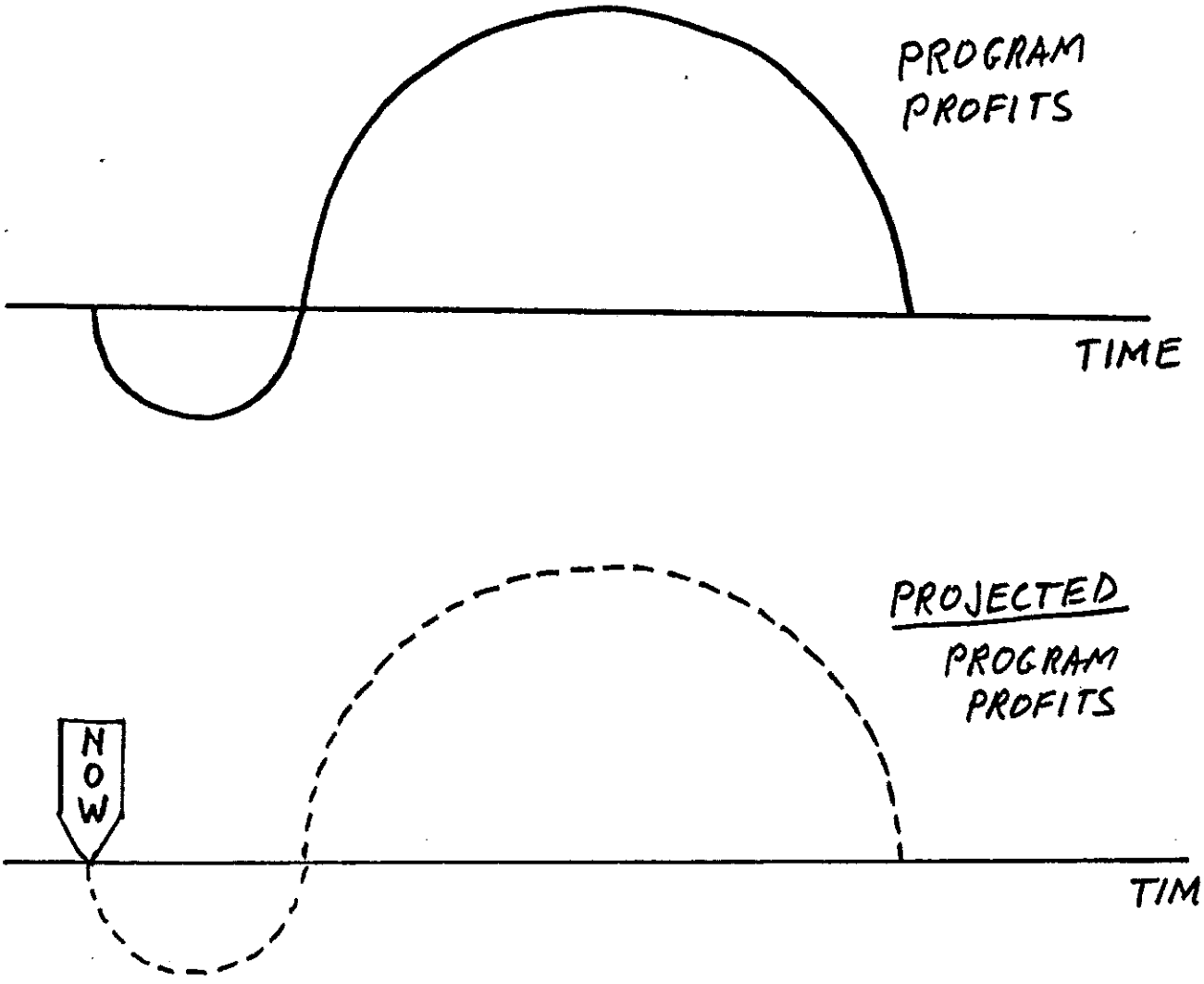
IS THIS A GOOD ENTERPRISE?

AN INTERESTING CASE:



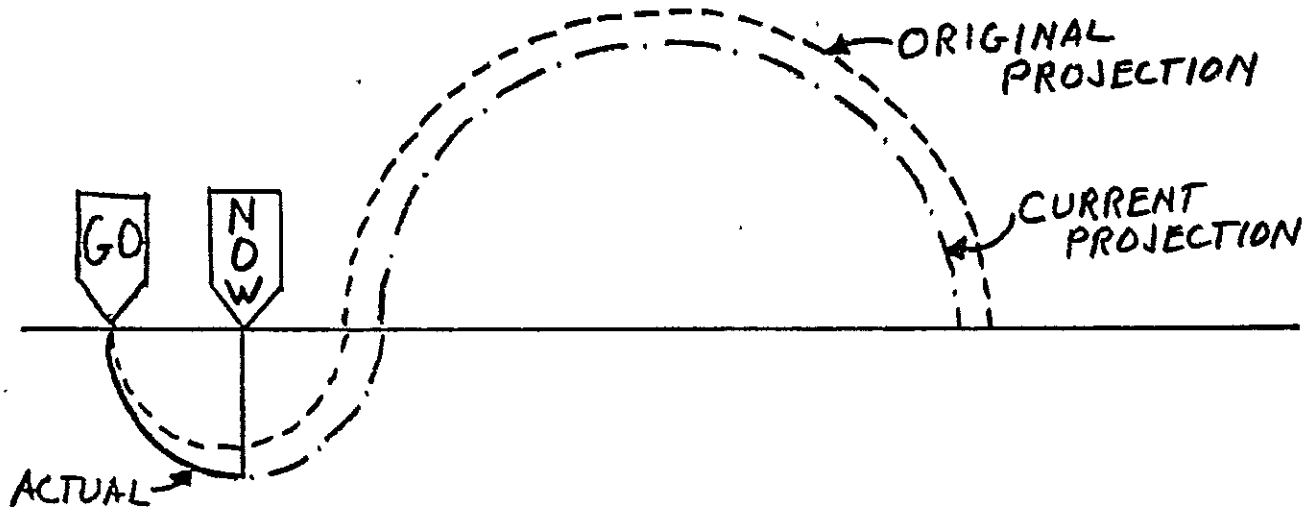
"CHASING THE RABBIT"

A GOOD PROGRAM, RIGHT?



ALL CRITERIA SATISFIED

DECISION: GO



- SPENDING RATE HIGHER THAN PLAN
- MAXIMUM INVESTMENT ALSO HIGHER
- BREAK-EVEN OCCURS LATER
- MARKET PROJECTIONS LESS NOW
- PRICING WILL BE ERODED SOONER
- PRODUCT WILL BE OBSOLETED SOONER

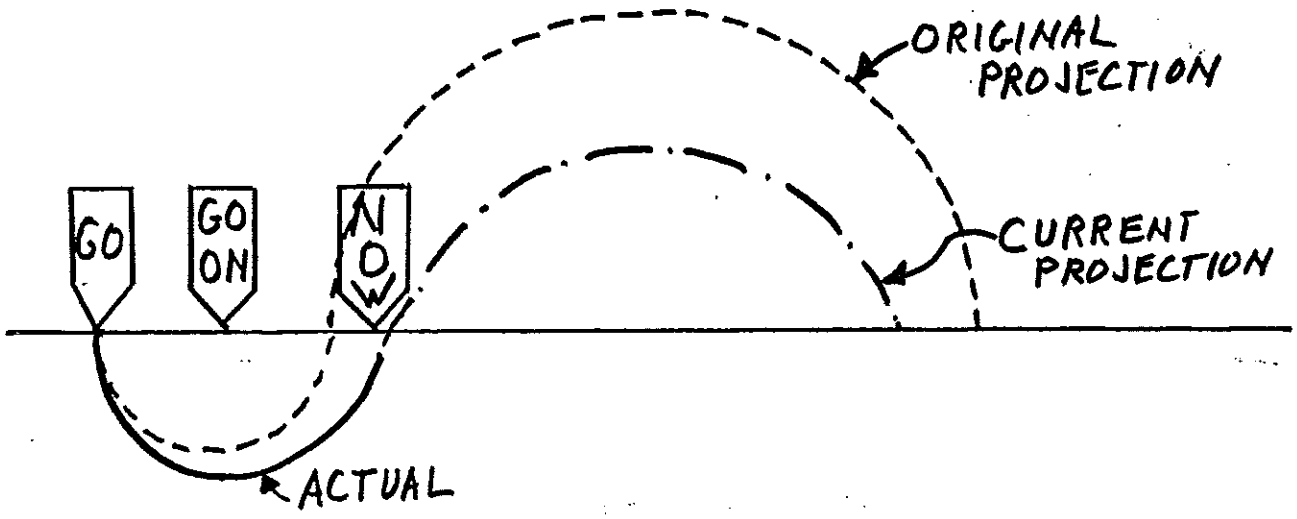
BUT

THIS IS STILL A GOOD PROGRAM

ESPECIALLY

*SUNK-COST NOT CONSIDERED.

DECISION: GO ON

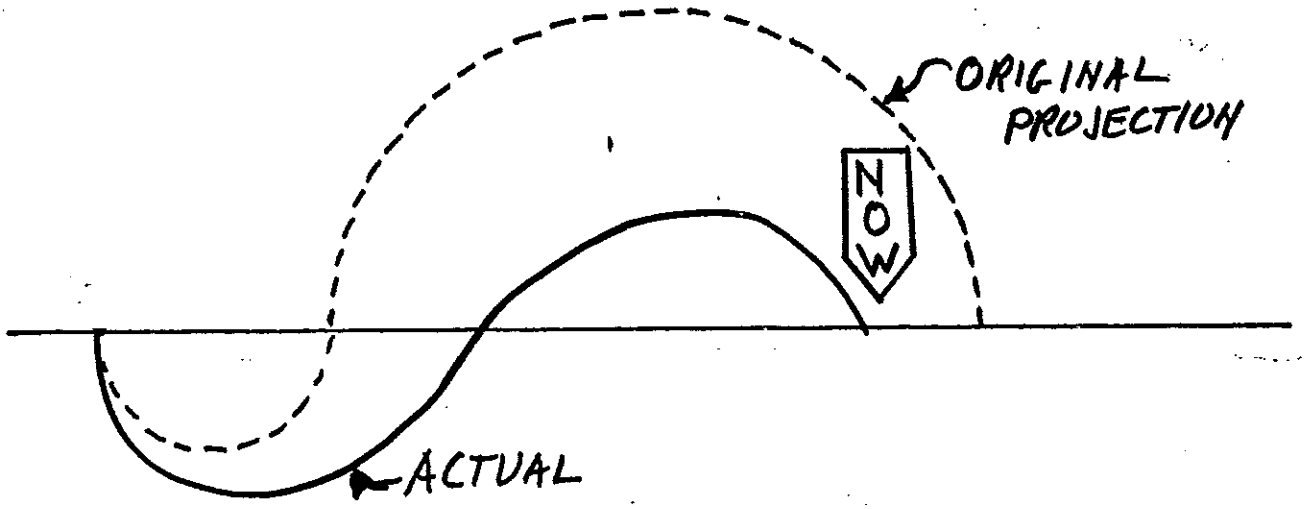


- ALL PROGRAM FINANCIALS HAVE DETERIORATED FURTHER
- CONTINUATION OF THESE TRENDS GIVES RISE TO BAD PROGRAM

BUT

*SUNK-COST NOT CONSIDERED, THIS IS STILL A GOOD PROGRAM - WITH SO LITTLE LEFT TO INVEST, THERE COULD HARDLY BE A BETTER PROGRAM ANYWHERE!

DECISION: 



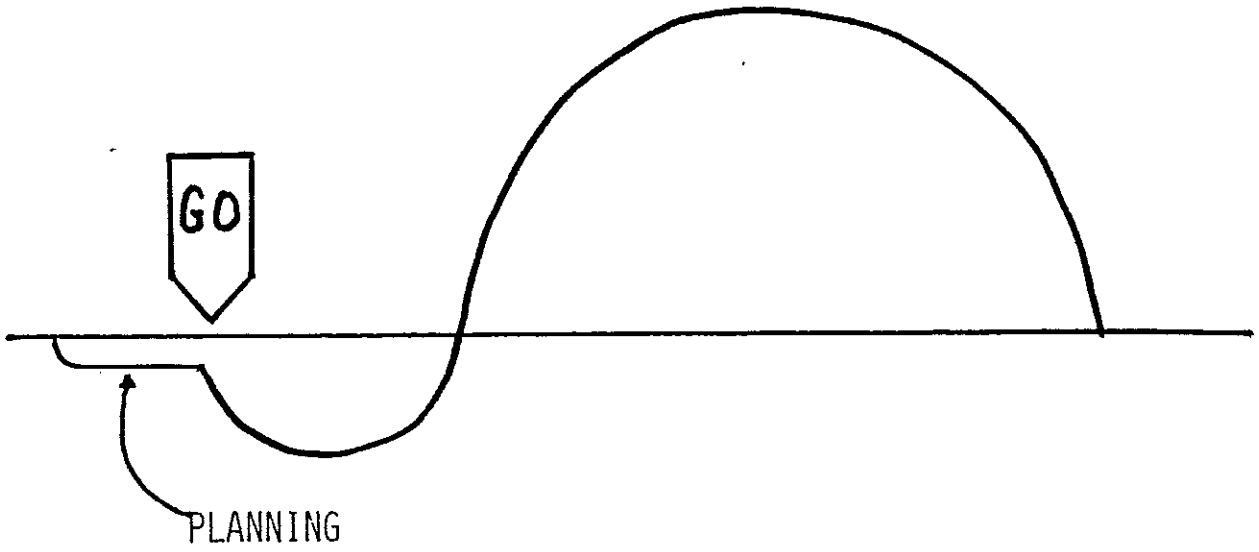
WAS THIS A GOOD PROGRAM?

WHAT CAN BE DONE NOW?

DECISION: F.T.P.*

*F.T.P. FIRE THE PLANNER

SOLUTION:



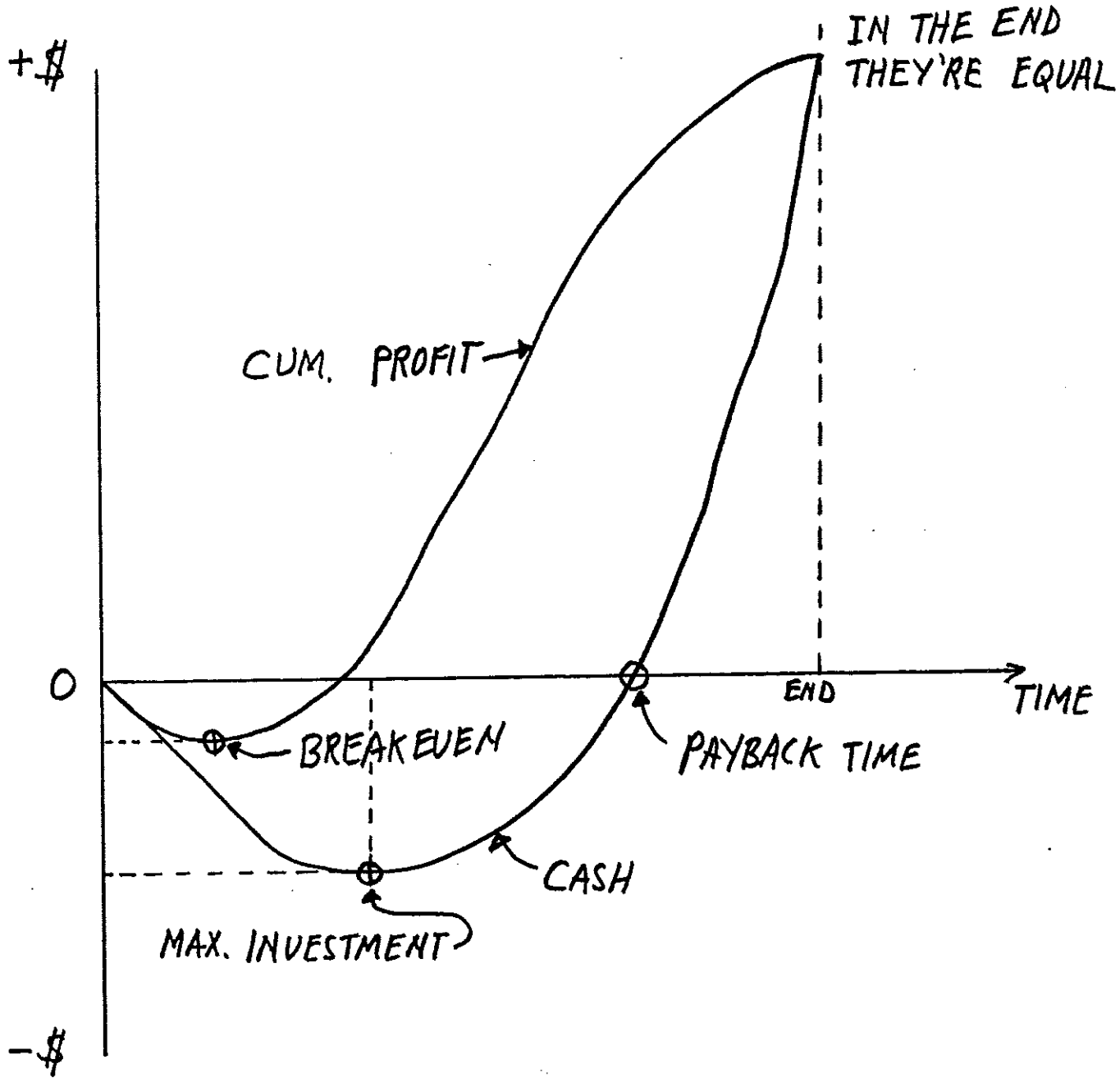
- INVEST TIME AND MONEY IN PLANNING BEFORE "GO" DECISION
- MANAGE THE PROGRAM WELL
- FORGET ABOUT REVIEWING THE PROGRAM FOR CANCELLATION.

PLANNING IS CHEAP, BUT HARD.

LET'S BE MORE QUANTITATIVE ABOUT
WHAT MAKES A GOOD OR BAD PROGRAM

TO START, WE NEED THE ANSWERS TO THESE FOUR QUESTIONS:

- WHAT DO WE PUT IN? WHEN?
- WHAT DO WE GET OUT? WHEN?



AND WE NEED A METHOD TO REDUCE THIS TO AN INDEX OR TWO THAT DESCRIBE THE "GOODNESS" OF THE PROGRAMS.

THE INDICES WE WILL USE ARE:

NPV - NET PRESENT VALUE

IRR - INTERNAL RATE OF RETURN

BOTH ARE IMPORTANT TO DETERMINE THE "GOODNESS"

NPV TELLS HOW MUCH THERE IS.

IRR TELLS HOW SWEET IT IS.

DEFINITIONS:

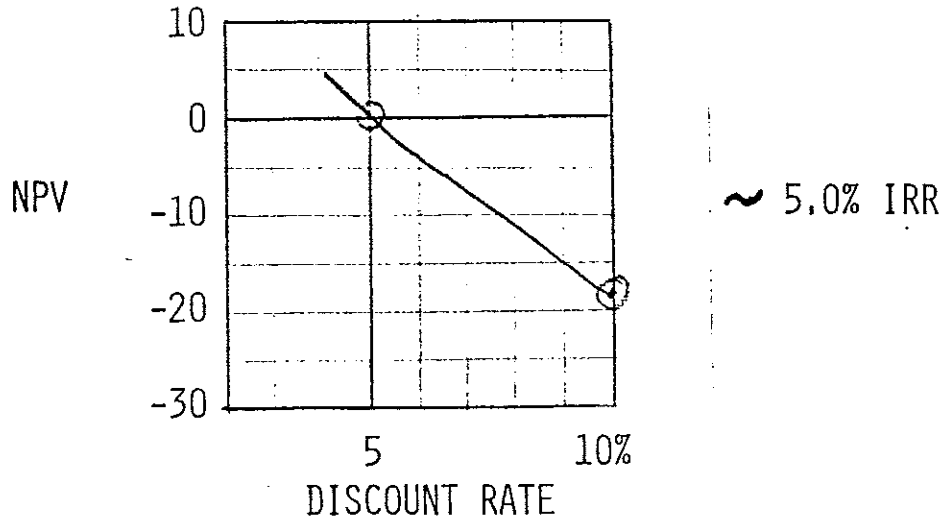
NPV OF A PROGRAM - THE VALUE OF THE CASH STREAM THAT THE PROGRAM CONSUMES AND/OR GENERATES REFLECTED TO THE PRESENT TIME BY DISCOUNTING FUTURE VALUE AT SOME FIXED RATE. IT SHOULD ALWAYS BE USED WITH THE DISCOUNT RATE, SUCH AS:

"THE NPV AT 20% FOR PROJECT X IS $32 MILLION."

IRR - THE DISCOUNT FACTOR AT WHICH THE PROGRAM HAS ZERO NPV.

EXAMPLE: WHAT IS THE INTERNAL RATE OF RETURN (IRR) FOR A FIVE-YEAR BOND WITH A 10% COUPON?

	YEAR 0	1	2	3	4	5	
PRINCIPAL CASH	-100	0	0	0	0	100	
INTEREST	0	10	10	10	10	10	
TAXES PAID	0	0	-10	-5	-5	-5	
NET CASH FLOW	-100	10	0	5	5	105	
							NPV
DISC. FACTOR @ 10%	1.0	0.91	0.826	0.751	0.683	0.621	-
P.V.	-100	9.1	0	3.77	3.43	65.52	(18.18)
DISC. FACTOR @ 5%	1.0	0.952	0.907	0.864	0.823	0.784	
P.V.	-100	9.52	0	4.32	4.12	82.32	(0.28)



WHAT IF THESE WERE TAX-EXEMPT BONDS?

	YEAR 0	1	2	3	4	5	
CASH FLOW	-100	10	10	10	10	110	
PV @ 10%	-100	9.09	8.26	7.51	6.83	68.30	NPV (0.01)

∴ IRR = 10.0%

IF INTEREST COMPOUNDS TAX-FREE

CASH FLOW	-100					161.05	
PV @ 10%	-100					100.00	(0.00)

∴ IRR = 10.0%

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		SOURCE / YEAR	1	2	3	4	5	6	7	8	9	10
A.	NET REVENUE	ESTIMATE										
B.	COST OF GOODS SOLD	ESTIMATE										
C.	R & D	ESTIMATE										
D.	MARKETING, SALES, G&A	ESTIMATE										
E.	TAXABLE INCOME	A-B-C-D										
F.	NET INCOME	0.6 X E										
G.	CAPITAL EXPENDITURES	ESTIMATE										
H.	DEPRECIATION	5 YEAR LINEAR										
I.	WORKING CAPITAL Δ	0.25X Δ REV.										
J.	NET CASH FLOW	F-G+H-I										

(INCREASE OF WORKING CAPITAL)

- RECEIVABLE
- INVENTORY
- ~~PAYABLE~~

A. REVENUE

DON'T FORGET RETURNS AND ADJUSTMENTS. i.e. NET REVENUE

B. COST OF GOODS SOLD

PROJECTED PRODUCT COSTS, INCLUDING ANY

- START-UP OR SHUT-DOWN EXPENSES
- INVENTORY WRITEOFFS
- ON-GOING COST-REDUCTION PROGRAMS
- PRODUCT ENGINEERING NOT INCLUDED ELSEWHERE

C. R & D

ALL THE DEVELOPMENT EXPENSES PROJECTED FOR THE PROGRAM.

IS THERE A "TAX" FOR TECHNOLOGY DEVELOPMENT?

IS THERE CONTINUING R & D INVESTMENT REQUIRED FOR THIS PROGRAM?

D. MARKETING,SALES AND G & A

ANY SPECIAL MARKET INTRODUCTION EXPENSES?

CONSULTANTS?

ADVERTISING?

ON-GOING COST TO SELL INCLUDING COMMISSIONS, ETC.?

HOW ABOUT PRODUCT SERVICE SET UP AND ON-GOING EXPENSES?

G & A "TAX" MUST BE INCLUDED -- I NEED MY SALARY.

THIS IS A GOOD PLACE TO INCLUDE ANY MISCELLANEOUS DEALS, LIKE GRANTS.

E. NOW THAT WE'VE PICKED UP EVERYTHING, WE CAN CALCULATE OUR PRE-TAX INCOME STREAM.

F. IN GENERAL WE PAY ABOUT 40% TAX. IN SPECIAL CASES (FOR EXAMPLE, PUERTO RICO MANUFACTURE), THE SPECIFIC TAX RATE APPLICABLE SHOULD BE INCLUDED.

G. CAPITAL EXPENDITURES

THESE HAVE TO BE SEPARATED OUT FROM ALL THE COST AND EXPENSE CATEGORIES BECAUSE THE TIMING OF WHEN WE SPEND AND WHEN IT AFFECTS THE P & L ARE OUT OF SYNC.

THIS SHOULD INCLUDE SPECIFICATLLY IDENTIFIED CAPITAL ITEMS AND ALLOCATED PORTIONS OF BUILDINGS, WAFER-FAB, FACILITIES, ETC.

H. DEPRECIATION

THIS IS THE OTHER HALF OF THE CAPITAL TIMING. IT TELLS WHEN IT HITS EXPENSES. WHEN IT DOES, IT DECREASES INCOME, BUT AT NO CASH OUTLAY. THEREFORE, IT MUST BE ADDED IN TO GET CASH FLOW.

ON THE AVERAGE A 5-YEAR LIFE FOR EQUIPMENT AND 15 YEARS FOR BUILDINGS MATCH OUR ACTUAL PRETTY WELL.

REMEMBER: FOR ANY PROGRAM THE TOTAL CAPITAL EXPENDITURES MUST EQUAL THE TOTAL DEPRECIATION TAKEN. CHECK THIS.

I. CHANGE IN WORKING CAPITAL

WHEN BUSINESS GROWS, RECEIVABLES, ~~INVESTING~~ INVENTORY AND PAYABLES GROW.
WHEN BUSINESS SHRINKS, THEY SHRINK.
25% OF THE GROWTH OR SHRINKAGE IS A FAIR AVERAGE GUESS.
DISTI RESERVE ALSO GENERATES CASH WITHOUT SHOWING UP
IN NET INCOME.

BUT OVER THE COURSE OF A PROGRAM, THE TOTAL WORKING CAPITAL CHANGE IS 0. (i.e. collect all receivable, sell your inventory, pay your ~~payables~~ payables)

CHECK THIS.

J. CASH FLOW

OUT FOR CAPITAL EXPENDITURES AND WORKING CAPITAL INCREASES.
IN FROM NET INCOME AND DEPRECIATION.

OVER THE PROGRAM THE CUMULATIVE CASH FLOW EQUALS THE
CUMULATIVE NET INCOME.

CHECK THIS.

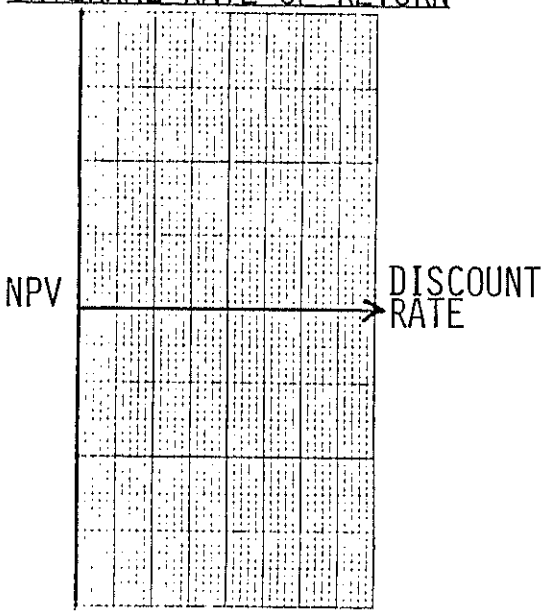
THOSE TWO LITTLE SQUARES ON THE RIGHT ARE TO BE SURE TO INCLUDE ANY REMAINING DEPRECIATION AND WORKING CAPITAL IN THE LAST YEAR OF THE PROGRAM.

IRR WORKSHEET

		SOURCE \ YEAR	1	2	3	4	5	6	7	8	9	10
A.	NET REVENUE	ESTIMATE										
B.	COST OF GOODS SOLD	ESTIMATE										
C.	R & D	ESTIMATE										
D.	MARKETING, SALES, G&A	ESTIMATE										
E.	TAXABLE INCOME	A-B-C-D										
F.	NET INCOME	0.6 X E										
G.	CAPITAL EXPENDITURES	ESTIMATE										
H.	DEPRECIATION	5 YEAR LINEAR										
I.	WORKING CAPITAL Δ	0.25X Δ REV.										
J.	NET CASH FLOW	F-G+H-I										

Individual additions here

INTERNAL RATE OF RETURN

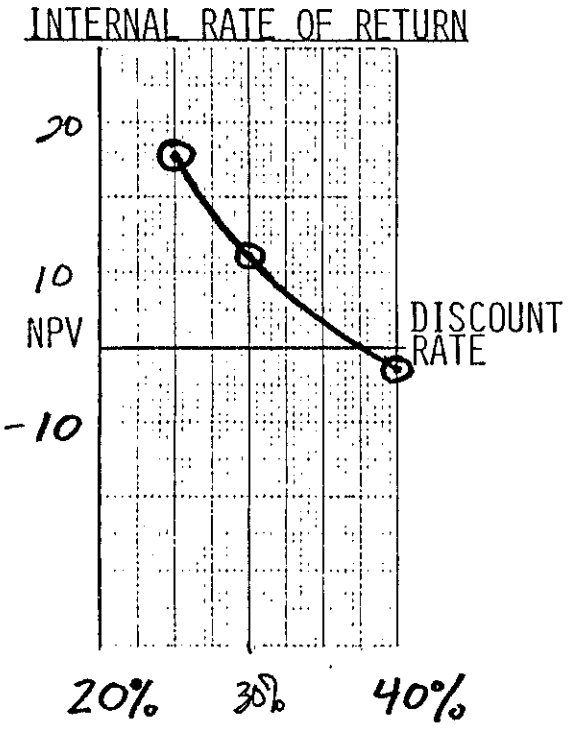


	1	2	3	4	5	6	7	8	9	10	NPV
0%	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
10%	0.95	0.87	0.79	0.71	0.65	0.59	0.54	0.49	0.44	0.40	-
15%	0.93	0.81	0.71	0.61	0.53	0.46	0.40	0.35	0.31	0.27	-
20%	0.91	0.75	0.63	0.53	0.44	0.37	0.31	0.29	0.21	0.17	-
25%	0.89	0.71	0.57	0.45	0.37	0.29	0.23	0.19	0.15	0.11	-
30%	0.88	0.66	0.52	0.40	0.31	0.24	0.18	0.14	0.10	0.08	-
40%	0.85	0.60	0.43	0.30	0.22	0.16	0.11	0.08	0.06	0.04	-
50%	0.82	0.54	0.36	0.24	0.16	0.11	0.07	0.05	0.03	0.02	-
60%	0.79	0.49	0.31	0.19	0.12	0.08	0.05	0.03	0.02	0.01	-

BASE CASE (AAA)

IRR WORKSHEET

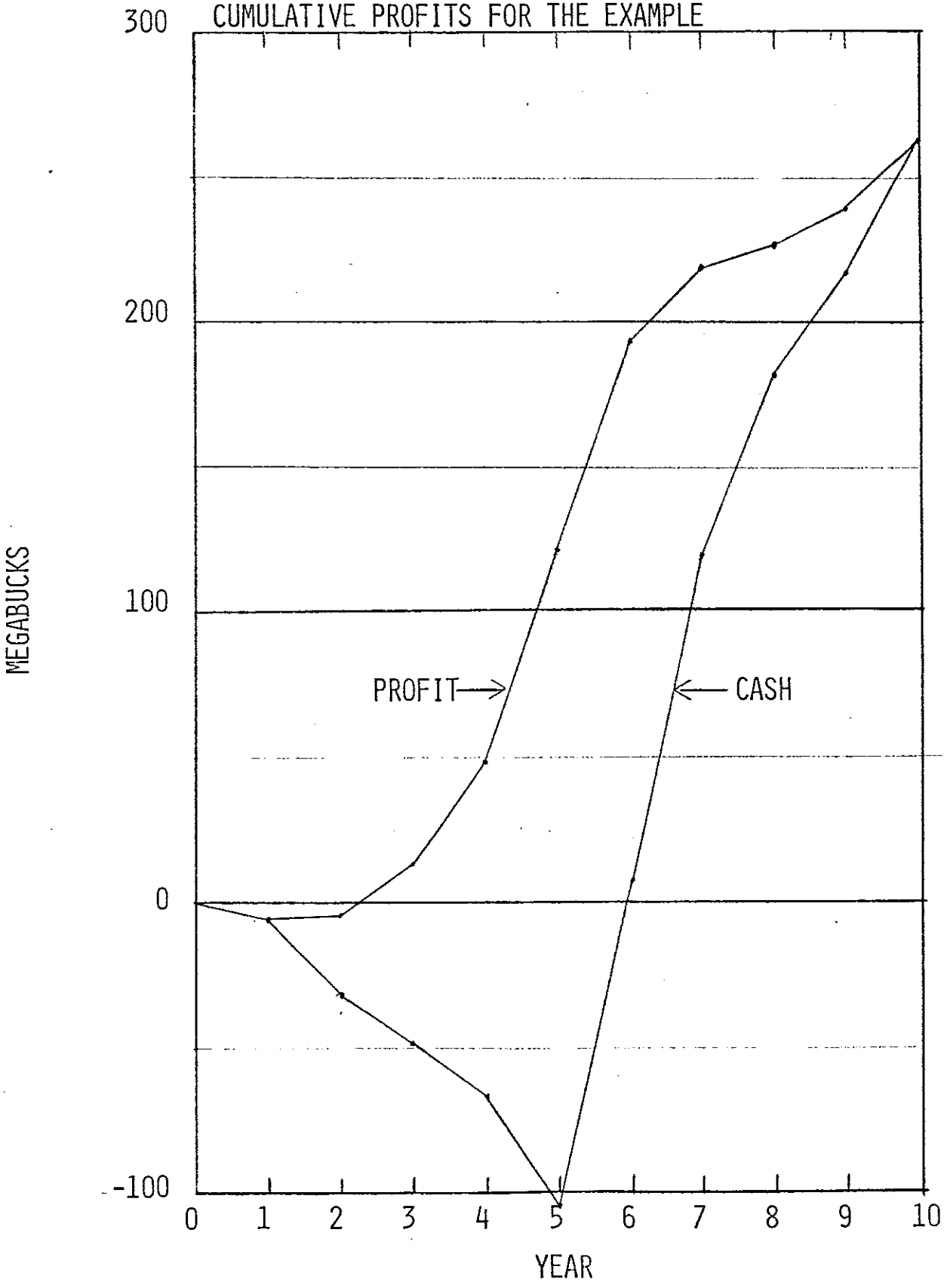
		SOURCE \ YEAR	1	2	3	4	5	6	7	8	9	10	
A.	NET REVENUE	ESTIMATE		40	100	200	400	400	200	100	100	100	
B.	COST OF GOODS SOLD	ESTIMATE		24	60	120	240	240	136	80	70	50	
C.	R & D	ESTIMATE	10	10	0	→						→	
D.	MARKETING, SALES, G&A	ESTIMATE		4	10	20	40	40	20	10	10	10	
E.	TAXABLE INCOME	A-B-C-D	(10)	2	30	60	120	120	44	10	20	40	
F.	NET INCOME	0.6 X E	(6)	1.2	18	36	72	72	26.4	6	12	24	
G.	CAPITAL EXPENDITURES	ESTIMATE		20	30	50	100	0	→			→	
H.	DEPRECIATION	5 YEAR LINEAR		4	10	20	40	40	36	30	20	0	
I.	WORKING CAPITAL Δ	0.25 X Δ REV.		10	15	25	50	0	(50)	(25)	0	(25)	INC. ≤ 12
J.	NET CASH FLOW	F-G+H-I	(6)	(24.8)	(17)	(19)	(38)	112	112.4	61	32	49	



IRR ≅ 37%

	1	2	3	4	5	6	7	8	9	10	NPV
0%	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
10%	0.95	0.87	0.79	0.71	0.65	0.59	0.54	0.49	0.44	0.40	-
15%	0.93	0.81	0.71	0.61	0.53	0.46	0.40	0.35	0.31	0.27	-
20%	0.91	0.75	0.63	0.53	0.44	0.37	0.31	0.29	0.21	0.17	-
	(5.5)	(18.6)	(10.7)	(16.1)	(16.7)	41.4	34.8	17.7	6.7	8.3	47.3
25%	0.89	0.71	0.57	0.45	0.37	0.29	0.23	0.19	0.15	0.11	-
	(5.3)	(17.6)	(9.7)	(8.6)	(14.1)	32.5	25.9	11.6	4.8	5.4	24.9
30%	0.88	0.66	0.52	0.40	0.31	0.24	0.18	0.14	0.10	0.08	-
	(5.3)	(16.4)	(8.9)	(7.6)	(11.8)	26.9	20.2	8.5	3.2	3.9	+12.7
40%	0.85	0.60	0.43	0.30	0.22	0.16	0.11	0.08	0.06	0.04	-
	(5.1)	(14.9)	(7.3)	(5.7)	(8.4)	17.9	12.4	4.9	1.9	2.0	(2.3)
50%	0.82	0.54	0.36	0.24	0.16	0.11	0.07	0.05	0.03	0.02	-
60%	0.79	0.49	0.31	0.19	0.12	0.08	0.05	0.03	0.02	0.01	-

COMPARISON OF CUMULATIVE CASH FLOW AND CUMULATIVE PROFITS FOR THE EXAMPLE



BUT

THE BEST PLANNED LAYS OF MICE AND MEN GO OFT AWRY.

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12/81

RATIO OF ACTUAL TO ESTIMATED TIME FOR COMPLETION OF R & D PROJECTS IN PROPRIETARY DRUGS

TIME RATIO	% OF PROGRAMS
$\leq$ 0.79	3
0.8 - 1.19	12
1.2 - 1.59	3
1.6 - 1.99	7
2.0 - 2.99	30
3.0 - 3.99	22
$\geq$ 4.0	23

65% OF THE PROJECTS TOOK OVER TWICE AS LONG AS ESTIMATED.

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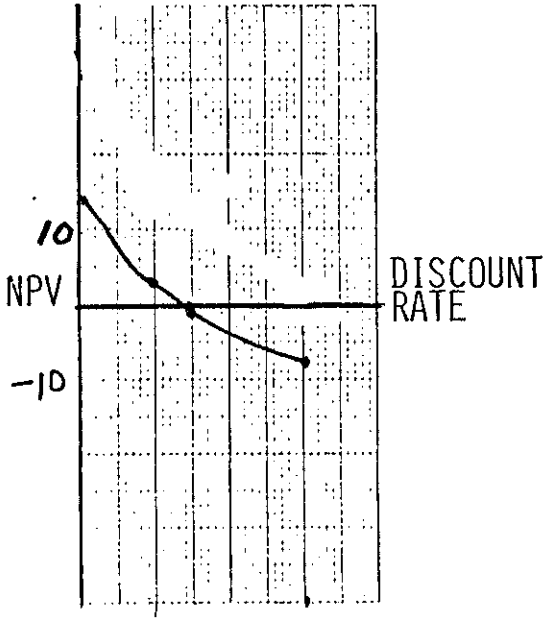
+ 1 YEAR DEVELOPMENT (CCAA)

IRR WORKSHEET

		SOURCE \ YEAR	1	2	3	4	5	6	7	8	9	10
A.	NET REVENUE	ESTIMATE			40	100	200	400	400	200	100	100
B.	COST OF GOODS SOLD	ESTIMATE										
C.	R & D	ESTIMATE	10	10	10	0	→	→	→	→	→	→
D.	MARKETING, SALES, G&A	ESTIMATE										
E.	TAXABLE INCOME	A-B-C-D										
F.	NET INCOME	0.6 X E										
G.	CAPITAL EXPENDITURES	ESTIMATE			20	30	50	100				
H.	DEPRECIATION	5 YEAR LINEAR										
I.	WORKING CAPITAL Δ	0.25 X Δ REV.										INC. ≤ 12
J.	NET CASH FLOW	F-G+H-I	(6)	(6)	(24.8)	(17)	(19)	(38)	112	112.4	61	57

INTERNAL RATE OF RETURN



25% 30% 35% 40% 45%

IRR ≅ 32%

											NPV
0%	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
10%	0.95	0.87	0.79	0.71	0.65	0.59	0.54	0.49	0.44	0.40	-
15%	0.93	0.81	0.71	0.61	0.53	0.46	0.40	0.35	0.31	0.27	-
20%	0.91	0.75	0.63	0.53	0.44	0.37	0.31	0.29	0.21	0.17	-
	(5.5)	(4.5)	(15.6)	(9.0)	(8.4)	(14.1)	34.7	32.6	12.8	9.7	32.7
25%	0.89	0.71	0.57	0.45	0.37	0.29	0.23	0.19	0.15	0.11	-
	(5.3)	(4.3)	(14.1)	(7.7)	(7.0)	(11)	25.8	21.4	9.2	6.3	13.3
30%	0.88	0.66	0.52	0.40	0.31	0.24	0.18	0.14	0.10	0.08	-
	(5.3)	(4.0)	(12.8)	(6.8)	(5.9)	(9.1)	20.2	15.7	6.1	4.6	2.7
40%	0.85	0.60	0.43	0.30	0.22	0.16	0.11	0.08	0.06	0.04	-
	(5.1)	(3.6)	(10.6)	(5.1)	(4.2)	(6.1)	12.3	9.0	3.7	2.3	<7.4>
50%	0.82	0.54	0.36	0.24	0.16	0.11	0.07	0.05	0.03	0.02	-
60%	0.79	0.49	0.31	0.19	0.12	0.08	0.05	0.03	0.02	0.01	-

IRR AS PLANNED	37%
IRR DELAYED 1 YEAR	32%

NOT MUCH DIFFERENCE HERE BECAUSE BOTH THE LARGE INVESTMENTS AND THE REVENUE ARE DELAYED

BUT

NPV @ 20% AS PLANNED	$47.3M
NPV @ 20% DELAYED	$32.7M

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BASE CASE IS 37% IRR

HERE'S A METHOD TO INCORPORATE POSSIBLE VARIATIONS

(IN STATISTICAL MECHANICS THIS IS CALLED A MONTE CARLO METHOD FOR OBVIOUS REASONS.)

CONSIDER THE FOLLOWING PROGRAM RISKS:

DEVELOPMENT:

A. 30% CHANCE IT'S COMPLETED ON SCHEDULE

B. 50% CHANCE OF A 1/2 YEAR SLIP

C. 20% CHANCE OF A 1 YEAR SLIP

PRICING:

A. 60% CHANCE IT'S OK

B. 30% CHANCE IT'S 10% HIGH

C. 10% CHANCE IT'S 20% HIGH

LATER YEARS:

A. 60% CHANCE IT'S OK

B. 20% CHANCE MARKET TRUNCATES IN 8 YEARS

C. 20% " " " 6 "

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IF WE NOW GO TO A TABLE OF RANDOM NUMBERS, WE CAN CHOOSE SEVERAL SETS OF THREE DIGITS, ONE FOR EACH PARAMETER BEING VARIED.

DIGIT	DEVELOPMENT CASE	PRICE CASE	MARKET TIME CASE
0	A	A	A
1	A	A	A
2	A	A	A
3	B	A	A
4	B	A	A
5	B	A	A
6	B	B	B
7	B	B	B
8	C	B	C
9	C	C	C

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I DID THIS AND PICKED OUT THE FOLLOWING 3 DIGIT NUMBERS CORRESPONDING TO CASES AS SHOWN:

594	BCA
192	ACA
801	CAA
626	CAB
873	CBA
181	ABA
830	CAA
113	AAA
003	AAA
383	BBA
071	ABA
562	BBA
163	ABA
407	BAB
571	BBA
326	BAB
235	AAA
299	ACC
426	BAB

CASE	TIMES	IRR
AAA	3	37%
ABA	3	23%
ACA	1	12%
ACC	1	17%
BAB	3	30%
BBA	3	18%
BCA	1	12%
CAA	2	32%
CAB	1	35%
CBA	1	23%

19 IS A CONVENIENT (BUT SMALL) NUMBER OF CASES TO TAKE. POINTS ARE AT 5, 10, 15, ETC. %.

49 AND 99 ARE ALSO CONVENIENT (BUT LARGE) NUMBERS

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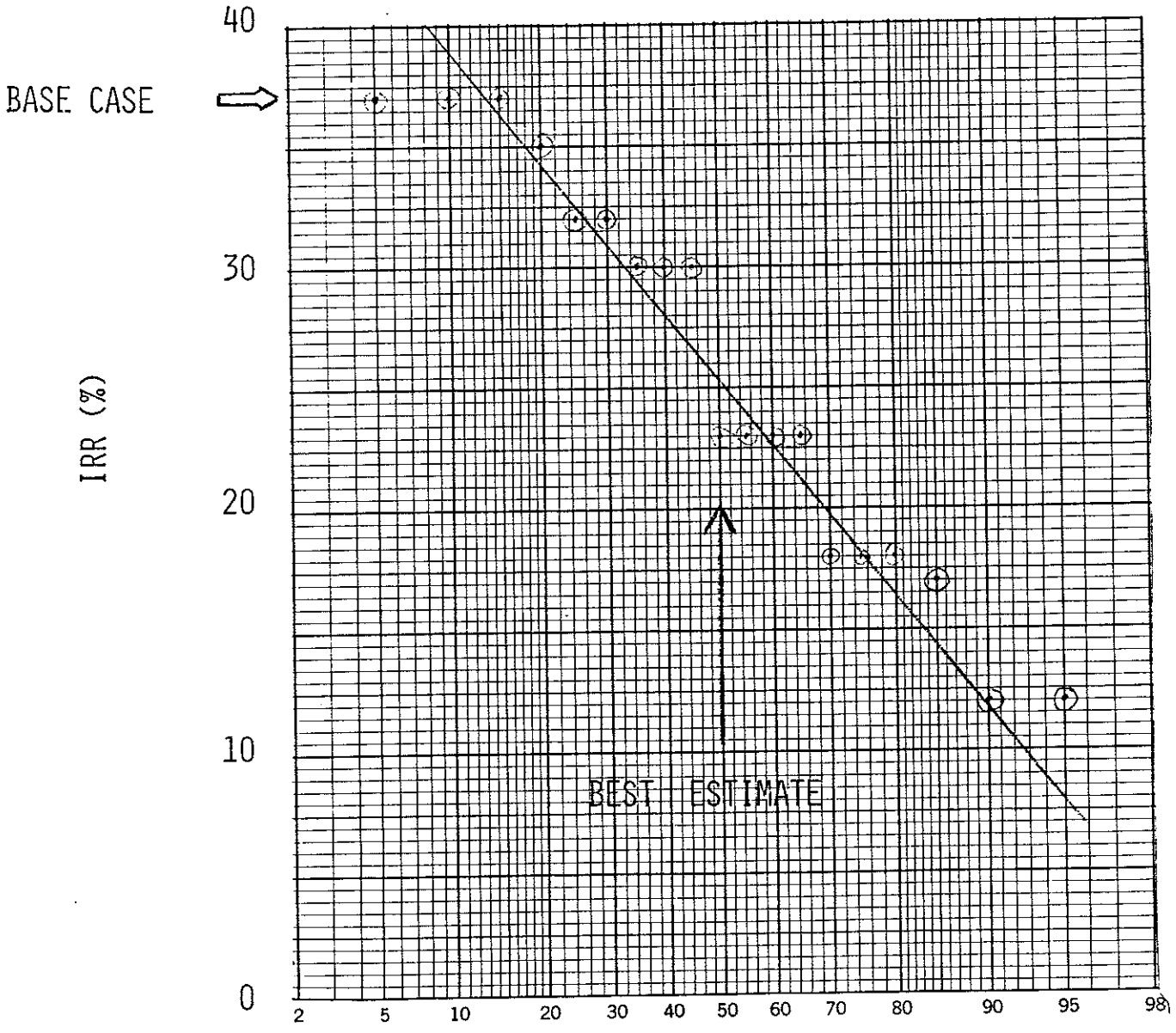
ARRANGE THEM IN ORDER AND PLOT ON PROBABILITY PAPER



SO WHAT'S GOOD?

AN INVESTOR CAN GET 12% ON TREASURE BILLS OR A 12% TAX-FREE RETURN ON MUNIS. THESE ARE VERY LOW RISK.

FOR RISK HE NEEDS SOMETHING MORE. OUR B-SCHOOLERS SAY 8% OR SO FROM THE AVERAGE EQUITY.

∴ ~20% IS WHAT HE REQUIRES.

IF ALL INTEL'S PROGRAMS WERE EXACTLY AT HIS REQUIREMENTS, THE STOCK IS PROPERLY VALUED AND WILL INCREASE IN PRICE AT THE INVESTOR'S EXPECTED RATE.

IF OUR PROGRAMS ARE BETTER, PRICE OF THE STOCK SHOULD INCREASE EVEN FASTER.

∴ A GOOD PROGRAM WILL HAVE AN

IRR >20%

WITH HIGH PROBABILITY

OUR STOCK PRICE HAS DROPPED IN HALF NOT BECAUSE THE INVESTOR HAS CHANGED HIS REQUIREMENTS THAT MUCH, BUT BECAUSE HIS PERCEIVED VALUE OF OUR PROGRAMS HAS CHANGED.

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INTEL'S MARKET VALUE IS ABOUT

44 MILLION SHARES @ $23	$1,012 MILLION
OUR BALANCE SHEET "BOOK VALUE" IS	$490 MILLION
THE DIFFERENCE OF SOMETHING OVER	$500 ~~B~~ MILLION

CAN BE VIEWED AS THE PERCEIVED NPV OF INTEL'S PROGRAMS, ORGANIZATION, FACILITIES, PEOPLE, ETC. THAT ARE NOT ON OUR BALANCE SHEET.

EVERY PROGRAM WE UNDERTAKE WITH AN NPV @20% OF $10 MILLION SHOULD (WHEN IT IS RECOGNIZED BY THE INVESTOR) INCREASE OUR STOCK PRICE BY ABOUT 25¢.

PROGRAMS BELOW 20% IRR SHOULD LOWER THE STOCK PRICE.

> A REALLY GOOD PROGRAM WILL HAVE AN IRR >20%
> WITH HIGH PROBABILITY, AND
> A LARGE NPV @ 20%.

IT WILL ALSO NOT CONSUME A DISPROPORTIONATE SHARE OF LIMITED RESOURCES, SUCH AS:

- ENGINEERING
- MANAGEMENT TIME
- SPECIAL FACILITIES

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