Market Research Drives Revenue

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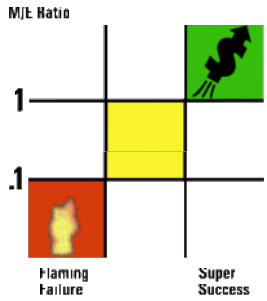


I am an engineer; an electrical engineer. In my career, I have experienced the excitement and the professional and financial rewards from being in successful companies. I have experienced the agony of defeat, the grief, and the professional and financial setbacks from working for failures and being laid off. I have seen my fellow engineers suffer personal tragedies.

I have helped launch new products, new companies, and new fields that gainfully employ thousands of my fellow engineers; and which are now worth more than ten Billion dollars. I earn my living as a VP of Marketing for startups, as a Marketing Consultant, and as a temporary executive. Pro-bono, I support the institutions of technology-based business and entrepreneurship, write about Marketing, teach Marketing, and research how Marketing drives successful technology-based enterprises.

This morning, I would like to share with you some observations and data from those experiences. ***Investors would like to see revenue. Here is how to get some.***

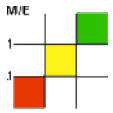
Handout - Download a copy of the Marketing/Engineering Investment Ratio data at http://marketingVP.com/download/revenue.pdf to read with these slides:

- Slide 8, "The evidence"
- Slide 11, " How much did Evidian invest in Marketing?"
- Slide 23, " How much did BD invest in Marketing?"
- Slide 24, " Team with a Market Researcher"

Myth – Sales drives revenue

- Reality –

  Market Research drives the entire process with revenue as the result



Myth – Sales drives revenue
Reality – Market Research finds the customers, understands their needs, and drives the sales process.

Myth – First, we must get the product out there!
Reality – First, Market Research guides engineering to develop products that customers want to buy.

Myth – Who needs Market Research, I will hire a super salesman!
Reality – If you have a product for which there is no need, a super salesman will sell nothing.
Reality – Market Research understands the customer need and guides engineering to develop products that deliver benefits for which customers will spend money to receive.

Myth – Nothing happens until a salesman sells it.
Reality – Nothing happens until Market Research finds out "Who is the customer?" – until Market Research guides engineering to develop products that customers want to buy, until Market Research points the sales force to where the customers are, and until Market Research trains the sales force in how to sell the product.

Myth – How can you dare suggest, Ralph, that we devote some of our precious capital to Market Research when we have this heavy-duty technology to develop?
Reality – If you develop a product which nobody wants to buy, you have just wasted all the capital. Market Research identifies the benefits that customers want to spend money to receive.
Reality – Engineering develops the technology, but Market Research develops the business. It is the business which is the value. Market Research creates that value.

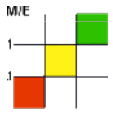
Myth – Who needs Marketing? The product is not ready yet.
Reality – Don't confuse Marketing with promoting and selling. Marketing (Market Research) comes before the product is ready.
Reality – Investors invest in validated business opportunities, not technology. Market Research validates the business.

Myth – Market Research will slow us down. We must get the product out fast.
Reality – Market Research speeds up the process by focusing engineering on only the benefits that customers want to spend money to receive, and relieving engineering of everything that does not matter to the customer. ***Market Research SPEEDS TIME-TO-MARKET***. With customer understanding, Market Research drives the promoting and selling process.
Market Research SPEEDS TIME-TO-REVENUE.

Myth – First revenue, then expenses.
Reality – Revenue is the LAST step in the process, NOT the first.
Reality – Market Research drives the entire process with revenue as the result

Business is checking all the boxes

- ☑ Market Research to understand the customer
- ☑ Market Research drives engineering
- ☑ Market Research drives promotion
- ☑ Market Research drives selling motion
- ☑ Market Research drives sales support & service
- ✓ Purchase orders
- ☑ Market Research drives manufacturing
- ☑ Sales (shipments)
- ☑ Invoices
- ✓ Revenue



Myth – the path to revenue has two steps:

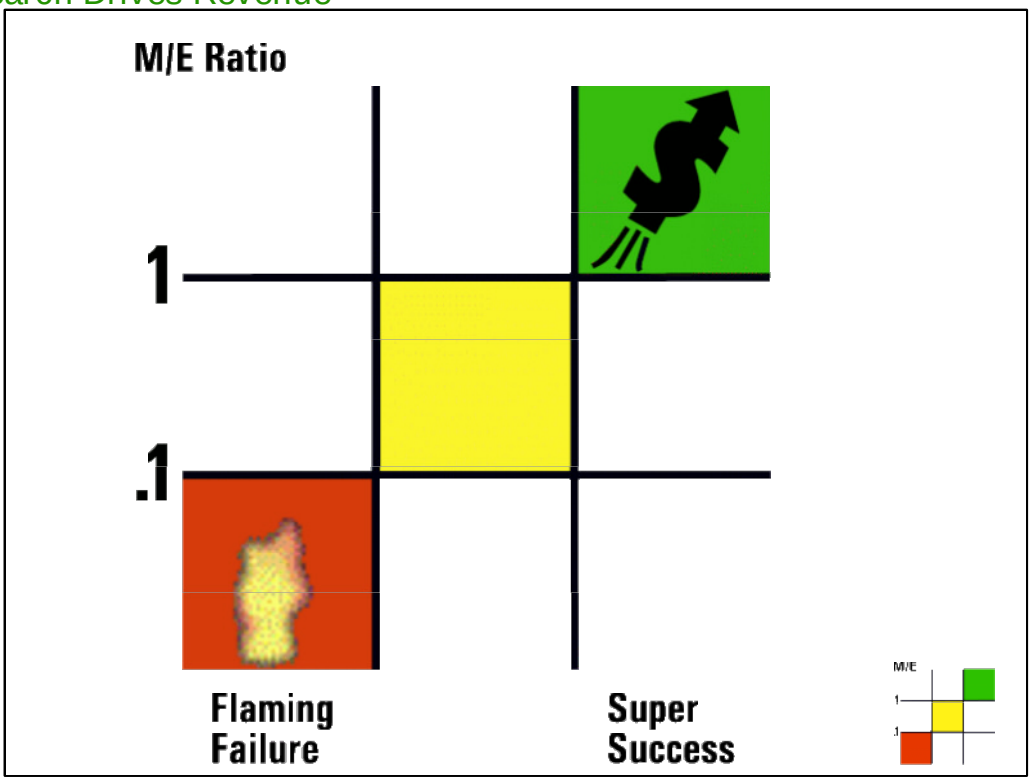
1. [Sales obtains] Purchase orders
2. Revenues

Reality – There are more than two steps to revenue.
It begins with the front-end process of understanding the customer:

1. Market Research to understand the customer
2. Market Research drives engineering
3. Market Research drives promotion
4. Market Research drives selling motion
5. Market Research drives sales support and service
6. Purchase orders
7. Market Research drives manufacturing
8. Sales (shipments)
9. Invoices
10. Revenue

Business can be considered a process of checking off all the boxes in a check-off list.
If you skip a few and don't check off all the boxes, or if you check them off out of order, you must go back and fill them in.

Market Research Drives Revenue



The graphic on the title slide is there for a reason. Let's take a closer look.

You have just heard from a successful businessman, Richard Langevin. I would call him a ***"super success."*** Across the broad landscape of technology-based enterprises are other super successes like Dell Computer and EMC. There are also business basket cases such as Thinking Machines, Polaroid, and Genuity who have all gone down in flames and/or in bankruptcy. I would call them ***"flaming failures."***

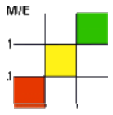
Here is a graphical way to summarize what we might learn from these outcomes. We can picture the relationship between investment in up front Market Research and success or failure. The axis on the left is the ratio of Market Research investment to engineering investment, called the Marketing-to-Engineering Investment Ratio (M/E Ratio), on a logarithmic scale.

Above (an M/E Ratio of) 1, the enterprise is investing more in Market Research than in engineering. In the right column are super successes. I have called the symbol in the upper right corner the "***revenue rocket***," because it represents the way entrepreneurs like Richard Langevin rocket to revenue and to financial success.

Below (an M/E Ratio of) 0.1, there is essentially no investment in Market Research. In the left column are the failures. The flickering flame in the lower left corner symbolizes the high-flyer "going down in flames, crashing, and burning."

Why do Market Research?

- Technology-based enterprises which do not invest in Market Research fail
- Successes invest more in Market Research than in engineering
  - Surprising, counterintuitive data



I am often asked, "Who needs Marketing? The product's not ready yet. How can you possibly suggest that we devote our precious capital to Marketing, much less more to Marketing than in engineering, when we have this heavy-duty technology to develop?"

Because ***the evidence shows that technology-based enterprises which do not invest in Market Research fail.***

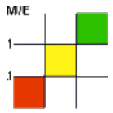
Invest more in up-front Marketing, exclusive of promoting and selling, than in engineering! Furthermore, invest heavily in Market Research, either before the engineering begins, or concurrently with the engineering effort, or both; before the product is ready. To an engineering audience, to the technologists, that might seem outrageous.

In fact, the evidence shows that successful technology-based enterprises do just that. ***Super successes in this survey have a Marketing/Engineering Investment Ratio (M/E Ratio) greater than 1,*** investing, on average, more than two dollars in Marketing, exclusive of promoting or selling, for every dollar invested in engineering. They invest up-front, before the product is ready. They maintain a higher investment in Marketing even at the extremes of technology where you might expect more investment in engineering.

Every flaming failure suffers from an M/E Ratio of 0.1 or lower. The average failure invests only about two cents in upstream Marketing for every dollar in engineering.

What is Marketing?

- Market Research
  - Neither promoting nor selling
- Up front, early intervention
- Fact gathering, analytical
- Understand the customer



Marketing is differentiated from promoting and selling in function, as well as by time.

Marketing is the upstream process that occurs before the product is ready; perhaps even before the product is committed to engineering. Marketing is an iterative process conducted as a team with technologists.

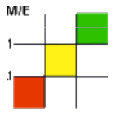
Upstream Market Research is early intervention to validate and size the business opportunity, to guide engineering to develop products that deliver benefits that customers are willing to spend money to receive, and to steer the enterprise.

Market Research is a simple name for a complex series of fact gathering, analytical processes including market segmentation, market sizing, market validation, Competitive Intelligence (CI), food chain analysis, modeling the customer, calculating customer payback, and quantifying customer needs.

Marketing is not selling.

Market Research delivers

- Gathers the facts
  - "Strategy must be based on facts, not on wishes." Dr. Barry Unger
- Validates the market
- Drives the enterprise
- Reduces risk for investors
- Market Research drives revenue



"Strategy must be based on facts, not on wishes. Market Research is the fundamental intellectual discipline underlying the creation of effective business strategy."?

Dr. Barry Unger, co-Founder of the MIT Enterprise Forum and author of the SBIR act of 1982

"Market risk is the most deadly. Technical risk is the least worrisome."

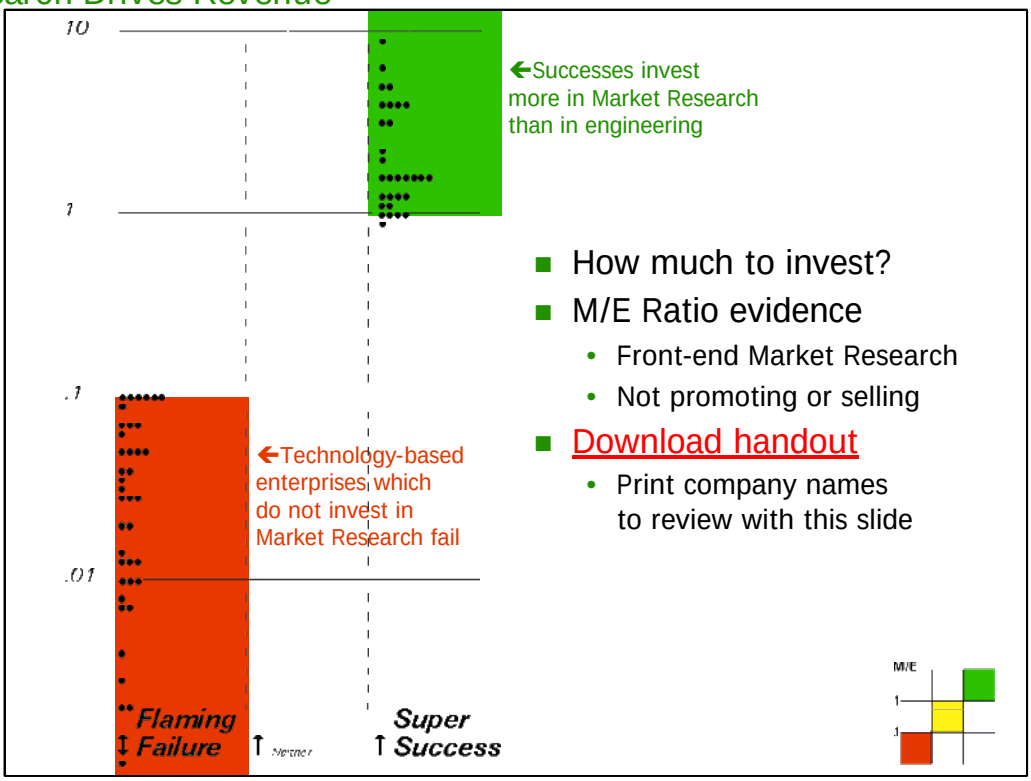
L. John Doerr, a partner is the Silicon Valley venture-capital firm Kleiner Perkins Caufield & Byers, as quoted by John Heilemann in "Letter From Silicon Valley - John Doerr is revolutionizing the high-tech business, for the second time" The New Yorker (August 11, 1997) 28-36

Why do some new products take off, while others don't sell at all? What is the origin of the highly visible super successes, and outright failures, that are all around us?

Market Research is the up-front process of ascertaining needs which customers are willing spend money to satisfy, thus guiding engineering to design products that sell successfully. How much shall we invest in Market Research to enable that success, and when? Engineers work out how to achieve an engineering challenge; sizing the engineering budget and staffing. ***How do we size, budget, and staff the corresponding marketing challenge?***

The surprising, counterintuitive data shows that successful technology-based enterprises invest more in market research than in engineering. Take a look at page two of your handout.

Market Research Drives Revenue



The magnitude of the upstream Marketing process requires decisive resources. ***The enormity of the challenge simply requires it.***

Some have called me one-dimensional. I suggest that the evidence shows that ***upstream Market Research is the one dimension that matters.***

More than $1 Trillion is represented either in value creation by the successes, or in capital squandering by the failures. The human impact has been more than 400,000 jobs created by the winners, or lost by the basket cases; and more than 150,000 engineering slots fashioned or vanished. The data are consistent from the 1950s into this new century, from startups to Fortune 500 firms, and across a broad range of technology-based enterprises.

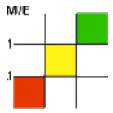
How much investment is needed to gather facts, to develop the questions, and to surface the answers? The MIT Enterprise Forum asked me to invent a method to answer these questions.

A new metric has been developed to address these issues, the Marketing/Engineering Investment Ratio (M/E Ratio). This model separates Market Research from the functions of promotion and selling. Formulating a ratio of Marketing to engineering installs Marketing concurrently with engineering, and sizes the Marketing budget with a readily identified number (technology investment).

Thus the Marketing/Engineering Investment Ratio (M/E Ratio) was developed at the request of the MIT Enterprise Forum to guide technology-based enterprises. The theory, data, and practice of the M/E Ratio were then taught for several years during MIT's entrepreneurship program, and subsequently incorporated into the foundation of the popular MIT Sloan School of Management graduate course, "Starting and Running a High Tech Company."

What did Richard Langevin do?

- Learn from his success
- Learn from other successes (and failures)
- Increase Market Research for success
- M/E Ratio > 1



How much must we invest in Marketing, when we have this heavy-duty technology to develop? Are there any ***data*** on how much companies like us invest in Market Research, to help us develop our ***Marketing budget***?

Collect data from successes and failures so that we might learn.

This invited paper was presented in the 128 Venture Capital Group's twentieth year. In honor of the 128VCG, and its Chairman, Michael Belanger, we are publishing three new M/E Ratio data points this morning, from Richard Langevin's experience at Evidian USA:

1. Before Langevin, from 1992-1996, Evidian USA was a failure with an M/E Ratio = 0.03 – in five years they achieved an annual sales rate of only $500 K.

2. Mr. Langevin succeeded during 1997-1999 by increasing the M/E Ratio to 1.1 – sales rocketed up to $14 million.

3. After Langevin, Evidian USA dropped the M/E Ratio back down to 0.03. Sales ceased. Literally, Evidian never made another sale. After they had shipped all the units on backlog, revenues ceased. They shut the doors in 2002 after three years of no sales and no revenue.

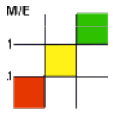
Myth – How can we invest in Market Research when we have a limited budget?

Reality – It is not that you have a limited budget. It is rather that you choose to limit how you invest the budget that you do have. You choose to invest in Market Research - or not. You can choose to invest in Market Research in balance with engineering at a M/E Ratio of one or higher, or you can choose to invest essentially all in engineering. ***The choice is yours.***

Richard Langevin chose to invest in Market Research; at an M/E Ratio of 1.1.

Magnitude of Richard's success

- Increased a 5-year old company's sales from $0.5 mil to $14 mil in 1 year
  - Same products, people, market, competitors
  - Slashed engineering, promoting, & selling $
  - While increasing Market Research



What Richard Langevin did was absolutely incredible! For five years, this startup, Evidian USA, struggled mightily, spending somewhere between $40 and $50 million, yet only achieved $500 K per year in sales.

Evidian USA had been spending $2 million per year on promoting and selling, yet only achieved $500 K per year in sales. Richard slashed the promoting and selling dollars by a factor of 20, from $2 million per year to $.1 million per year. Yet, with the same products and people, sales shot up a factor of 28 to $14 million. In other words, sales dollars per dollar of promoting and selling rocketed up by a factor of 560. Wow!

Evidian USA had been spending $3 million per year on engineering, yet only achieved $500 K per year in sales. Richard slashed the engineering dollars in half, from $3 million per year to $1.4 million per year. Yet, with the same products and people, sales shot up to $14 million and the average order size rocketed from tens of thousands of dollars to the million dollar range.

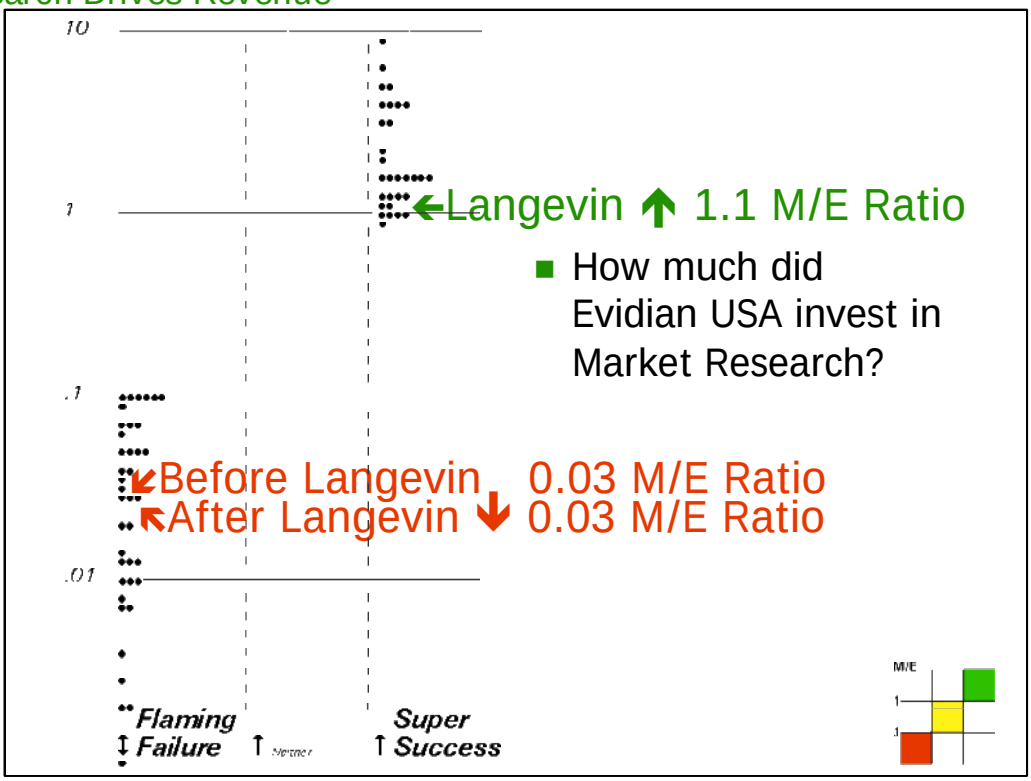
Under Mr. Langevin, the first five customers in North America produced $14 million in sales. For example, when Evidian's competitor, Computer Associates, bid $750 K at Microsoft, Evidian started at $1.1 million and closed the deal at $2.4 million.

Mr. Langevin increased the Market Research investment to understand the customer! He increased the M/E Ratio from 0.03 to 1.1. For example, Richard Langevin's Market Research determined that customers' needs were in security, network management, and asset management in that order. While Evidian had strength in security, his Competitive Intelligence (CI) identified that competitors focused on the other two. Therefore, Richard targeted the security need as Evidian's entry point.

Richard Langevin ***understood the customer's language and needs*** so well that he was able to slash the engineering dollars, to slash the promoting and selling dollars, and still out-sell his predecessors by $14 million to $.5 million.

That is the result of Market Research! Market Research drove revenue.

- Market Research Drives Revenue



"None of my success at Evidian would have been possible without the Market Research." *Richard Langevin.*

How much did Richard Langevin invest in Market Research at Evidian USA to understand the customer, to speak their language, and to articulate their needs? How much investment was required focus engineering, to target a new entry point, to craft a new promoting and selling strategy, to develop new collateral, and to implement a new selling approach?

Richard performed the serious, formal market research that had never been performed at Evidian USA. Richard checked off all the boxes! How much did this market research cost?

1. Before Langevin from 1992-1996, a failure with an M/E Ratio = 0.03 – in five years they achieved an annual sales rate of only $500 K.

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Myth – Now that we have finished the Market Research and have the answer, we can get back to the serious stuff, the engineering.

Reality – Market Research is a continuous process, not an event.

Reality – Market Research is like breathing; once you stop, you will die!

Reality – The time series of M/E Ratio in this slide, slide 23, and in other data are evidence that success (and failure) directly follow investment (or non-investment) in Market Research.

- Market Research Drives Revenue

In an earlier slide, we said that we might learn from other successes and failures, to draw a general lesson.

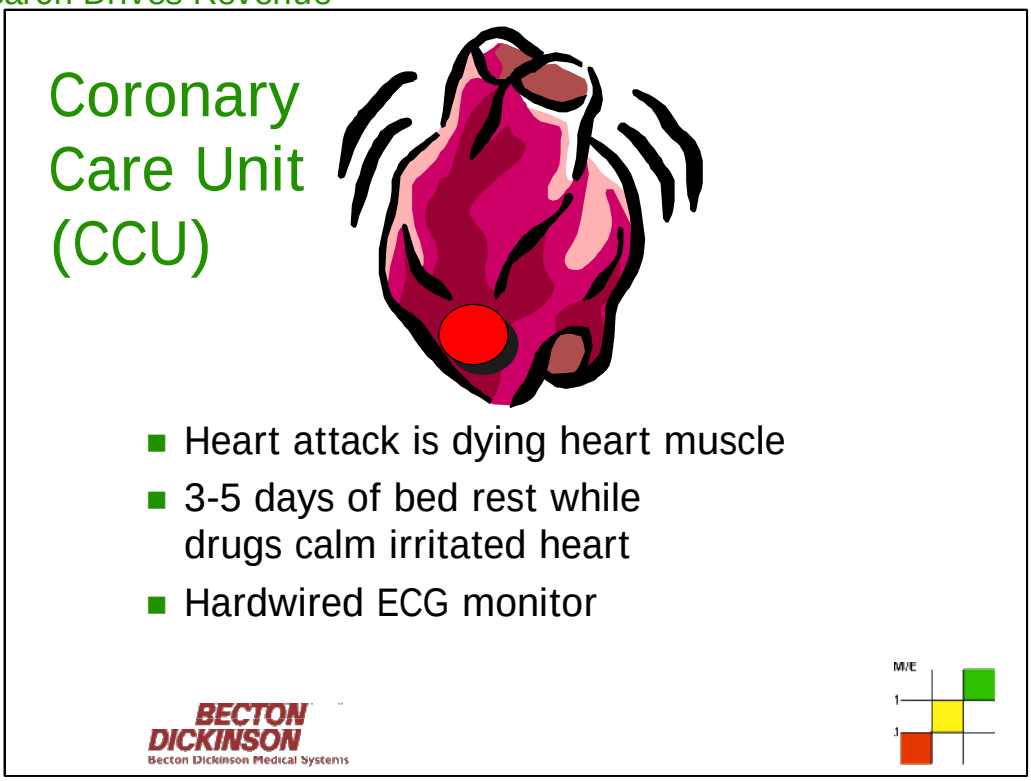
Consider the re-start of Becton Dickinson Medical Systems (BD). BD pioneered several technologies over the course of their twenty-five (25) year history …

- The first defibrillator
- The first portable defibrillator
- The first pacemaker
- The first implantable pacemaker
- The first patient monitoring system

Yet with all their technology, BD did not invest in Marketing, suffering from a Marketing/Engineering Investment Ratio of 0.01. Without Marketing direction, BD frittered away all their technologies and all of their businesses. BD found themselves with no growth, with losses, and reduced to seventh out of ten in the market, with a declining market share. The re-start begins with a new, Marketing oriented, management team.

Their only significant remaining business was patient monitoring systems for the Coronary Care Unit (CCU), pictured here. Note the patient in bed in the upper right; with electrodes on his chest picking up his heart ECG signal. Wires go from his chest to the bedside monitor over his head. That signal is repeated and carried in conduit in the walls to the Central Nursing Station in the foreground where nurses and a computer can monitor every heartbeat while leaving the patient resting comfortably.

- Market Research Drives Revenue



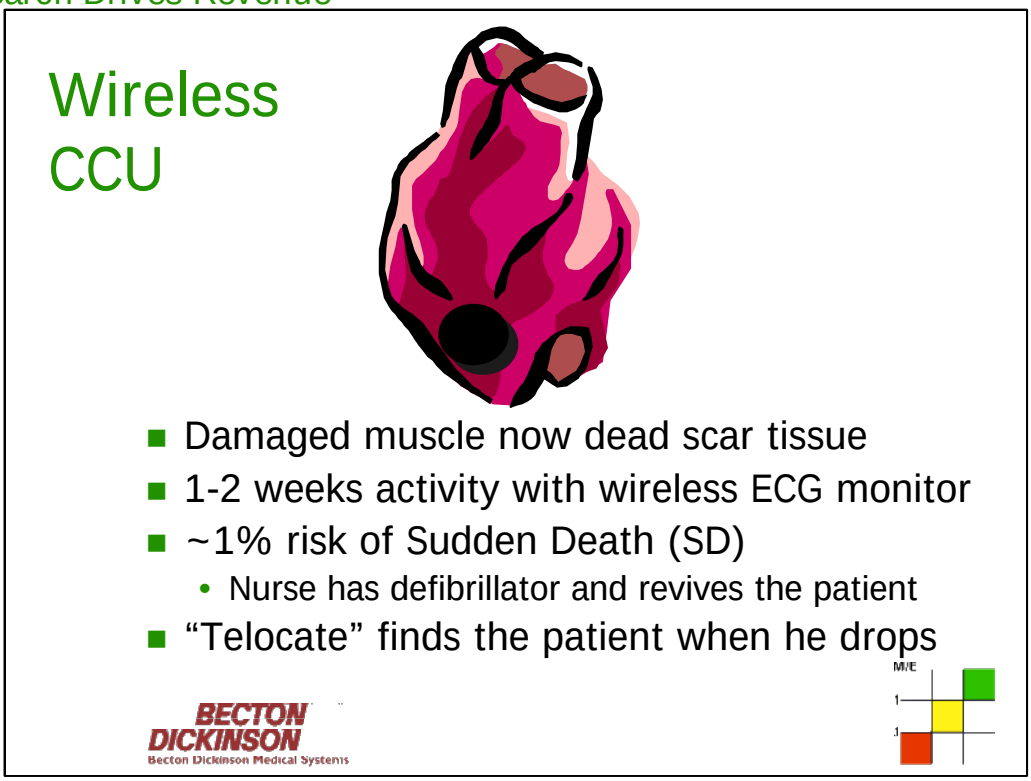
Here is a little bit of medical talk to help you understand the story.

A heart attack is an interruption in blood flow to a part of the heart muscle. Without blood flow, that portion of the heart proceeds to die. However, during the few days that it takes for that piece of the heart muscle to die, that highly irritated piece of muscle will send out electrical signals which might interrupt the heart's normal rhythm and cause the heart to stop!

The first stop in a Coronary Care Unit is 3-5 days of bed rest while a Cardiologist administers powerful drugs to calm the irritated piece of heart muscle and prevent those damaging electrical signals.

The patient is highly drugged and kept calm in bed. The patient is not moving around.

- Market Research Drives Revenue



After a few days, the damaged piece of heart muscle is now dead scar tissue and will no longer send out a damaging electrical signal.

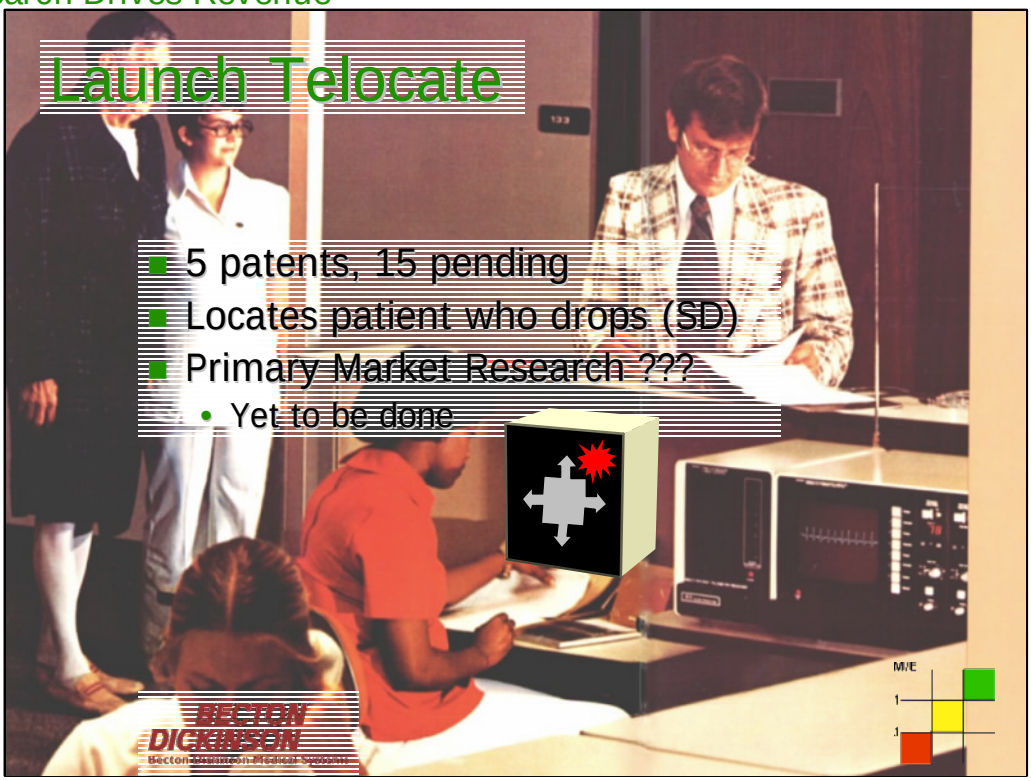
Now the problem is to get the patient moving again; to avoid a "cardiac cripple." The patient is moved into a second portion of the CCU, fitted with wireless ECG monitoring, and told to move around.

Yes, the patient will be there for another week or two and still monitored because, for that week or two, there is about a one percent chance that the heart will abruptly stop, called Sudden Death (SD). The heart stops and the patient drops to the floor. The good news is that the patient's heart is monitored, the alarms go off, and the nurse has a defibrillator to revive the patient.

BD was an established player in the wireless ECG monitoring market segment.

BD invested $300 K and 5 years of development to create a revolutionary new feature, "Telocate," which would tell the nurse WHERE the patient dropped. After all, if the nurse cannot find the roaming patient for a few minutes for a prompt defibrillation and revival, the patient will be brain dead or permanently dead.

- Market Research Drives Revenue



The patient carries a wireless transmitter in his pocket, with wires to ECG electrodes on his chest. The ECG wires are also his antenna. You can see the receiving antenna on the desktop monitoring station. In the basic wireless system, if the patient drops with Sudden Death (SD), the alarms go off and the nurse finds the patient and defibrillates him.

Becton Dickinson Medical Systems invested $300 K in engineering over five years, developing new patient location technology for the Coronary Care Unit. BD had received five US Patents, with fifteen more pending.

Telocate adds a mimic panel with a map of the hospital. When the patient alarms, ***Telocate tells the nurse WHERE THE PATIENT DROPPED.***

Market Research had not been done. BD had to go back and check off that box.

Sell electrical specs – WRONG !

Feature	BD	vs.	HP
Resolution	10 bits	← 10	8 bits
Battery life	30 day	← 30	1 day
Range	2 miles	← 10^2	100 ft.
RF power	20 ì W	← 10^3	20 mW
RF efficiency	40 db	← 10^4	0 db
Market share	#7		#1

BECTON DICKINSON
Becton Dickinson Medical Systems

What happened? What is wrong with this picture?

Here is how BD had been selling; by comparing electrical specifications (specs) with the competition, principally Hewlett Packard (HP).

Here, for example, are some of the specs of the basic wireless unit (not counting Telocate).

•HP's unit had a one-day battery life while BD's Unit had a one-month battery life.
BD enjoyed a factor of thirty (30) times superiority.

•HP's unit had an antenna range of 100 feet while BD's Unit had two miles (10,000 feet).
BD enjoyed a factor of one-hundred (100) times superiority or two orders of magnitude.

Everywhere BD looked, their wireless unit enjoyed ***ONE TO FOUR ORDERS-OF-MAGNITUDE SUPERIORITY*** over HP. However, there were ***four things wrong*** with this engineering-directed and sales-directed picture:

1. This comparison is not in THE CUSTOMER'S LANGUAGE

2. If BD's wireless unit already had such incredible product superiority, what were they thinking about to launch a new feature, Telocate?

3. BD was spending 70% more in the sum of Marketing, promoting, and selling as HP was spending, yet

4. BD was #7 in market share, while HP was #1

- Market Research Drives Revenue

Market Research to understand the customer

Rank	Weight	Benefit	BD	Brand X
1	9.0			
2	8.5			
3	7.4			
4	7.0			
5	6.8			
- customer will NOT spend money -				
6	6.1	Locate	✓	No
7	5.8			
8	5.6			

Benefits in customer language

Abandon Telocate!

Becton Dickinson Medical Systems installed a new management team in who began investing heavily in Marketing, raising their M/E Ratio from 0.01 to 4. ***BD recruited staff who possessed distinct upstream Marketing skills, tools, and experience***; and who proceeded to rigorously apply formal market research methods. New people were brought in for their ***Marketing process knowledge, not for industry knowledge***. Clearly BD already had plenty of people with industry knowledge, but who were failing because they were without Marketing process knowledge.

Market Research quantified the customer needs in the customer language!
BD's Marketing professionals used the "11 steps to (Market Research) heaven©" method.

Part of that research has the customer draw a line. Above the line are benefits that the customer is willing to spend money to receive. Below the line are benefits that the customer will not spend money to receive.

Telocate was below the line. Customers would not spend money for Telocate. After interviewing thirty-nine (39) Head Nurses who commanded wireless units, BD found only one nurse who once had a problem locating a patient, five years before, and for only a few seconds.

Wireless ECG in the CCU was about ten years old. BD's current telemetry model was six years old.

While Marketing could have been performed before this project was started, BD initiated primary Market Research only after engineering was complete. That $3 K (internal labor plus external fee) market survey to understand customer needs established that BD had developed a ***technology for which there was no need!*** BD abandoned their $300 K investment.

- Market Research Drives Revenue

What did BD miss?

After a few days in bed the the first CCU, the patient has learned what "SD" means and has learned about the purpose of the second CCU, the wireless unit.

The patient knows that the nurse knows where the defibrillator is and that she knows how to use it to revive him when he drops. When the nurse tells the patient, "Ok, now walk around. Get out of my sight," the patient will ***NOT GET OUT OF THE NURSES SIGHT***. He is still frightened. He may even grab onto her skirt to hang on for dear life!

Myth – We know the market, we know the customer.

Reality – A formal, rigorous, disciplined Market Research process is essential.

For example, BD had been in the hospital CCU ever since they helped pioneer the CCU more than twenty years before. BD's salesmen had been selling wireless gear for about ten years. Without a formal, rigorous, disciplined Market Research process, BD missed it!

Market Research – Competitive Intelligence (CI)

Rank	Weight	Benefit	BD	HP	GE	A/O	E4M
1	9.0		✓	✓	✓	✓	✓
2	8.5	Waterproof	No	✓	✓	✓	✓
3	7.4		✓	No	✓	No	No
4	7.0		✓	✓	No	✓	No
5	6.8		✓	✓	No	No	No
- customer will NOT spend money -							
6	6.1	Locate	✓	No	No	No	No
7	5.8		No	No	No	No	No
8	5.6		No	✓	✓	✓	✓

BECTON DICKINSON
Becton Dickinson Medical Systems

BD continued primary Market Research, continued to assemble facts, and gathered Competitive Intelligence (CI).

The second line of the analysis stood out. Nurses said they wanted a ***waterproof case*** for the wireless transmitter carried by the patient. Every competitor, except BD, had a waterproof case. BD had a case which could be readily opened to plug in new modules, such as Telocate, to add additional features.

At first, this data seemed to make no sense. Heart attack patients do not go swimming. Hospitals do not have swimming pools. BD checked with nurses about showering patients. Nurses told BD that patients shower with the wireless unit removed and dry, since the chest electrodes (similar to bandages) would come off in the water and would be changed anyway. A nurse would always stand watchfully over the showering patient so monitoring was not required in the shower.

Why did the nurses ask for a waterproof case? BD continued probing to find out that patients would sometimes drop the wireless unit in the johnny. The nurse would have to clean the unit. BD had been tricked by all the competitors who touted their waterproof cases. ***The real customer need was to clean the unit after it had been dropped into the toilet***.
However, the customer nurses had grown accustomed to using the term "waterproof" by all the competitors' salesmen.

- Market Research Drives Revenue

Market Research drives support

Rank	Weight	Benefit	BD	HP	GE	A/O	E4M
1	9.0		✓	✓	✓	✓	✓
2	8.5	Clean	OK	✓	✓	✓	✓
3	7.4		✓	No	✓	No	No
4	7.0		✓	✓	No	✓	No
5	6.8		✓	✓	No	No	No
- customer will NOT spend money -							
6	6.1	Locate	✓	No	No	No	No
7	5.8		No	No	No	No	No
8			No	✓	✓	✓	✓

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Armed with this understanding of real customer needs, BD guided field sales and service support. Being that BD's turf was the hospital, BD had a staff of CCU nurses both in the home office and in the field. BD trained their nurses to train the customer nurses to snap open the BD wireless unit, pore saline solution over it, then hold a hair dryer in one hand with the unit in the other hand until dry.

Now, to an electrical engineer, the ideal is de-ionized water for purity, cleanliness, and non-reaction with electronics. Next is distilled water. Tap water will do in a pinch. Saline solution, used in hospitals, is slightly salty water like the human body Saline solution is in the bag seen on the pole in TV dramas. ***To a nurse, saline solution is like holy water is to the Pope!***

BD trained their sales people to counter the competitor's cry of a waterproof case by pointing out that the competition's unit, too, would still have to be cleaned after being dropped in the johnny. BD changed the basis of competition from "waterproof case" to "can be cleaned."

BD's understanding of customer needs and real-world customer situations neutralized a potential competitive disadvantage. Guided by Market Research, BD's nursing staff focused their support practices on real customer needs. The customers, also nurses, came to believe that BD understood their needs better than the competition understood their needs.

Note the grey area, below the line at which customers will spend money.
No support effort was spent below this line.

- Market Research Drives Revenue

Market Research drives promoting & selling of "more key benefits"

Rank	Weight	Benefit	BD	HP	GE	A/O	E4M
1	9.0		✓	✓	✓	✓	✓
2	8.5	Clean	OK	✓	✓	✓	✓
3	7.4		✓	No	✓	No	No
4	7.0		✓	✓	No	✓	No
5	6.8		✓	✓	No	No	No
- customer will NOT spend money -							
6	6.1	Locate	✓	No	No	No	No
7	5.8		No	No	No	No	No
8	[illegible]		No	✓	✓	✓	✓

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Once the cleaning issue was addressed, careful, detailed examination of the competitive landscape revealed that all the other brands had at least one "NO" in the benefits list that customers would spend money to receive.

Only BD had them all!

Incredibly, BD had a competitive advantage for six (6) years in their six-year-old wireless unit and did not realize it until, finally, formal Market Research was performed.

BD's Market Research now guided promoting and selling. ***BD delivered "more key benefits that nurses want!" In a zero growth market, BD's wireless sales took of like a rocket, doubling in six (6) months.***

The salesman were told that Telocate was a technology for which there was no need; and were shown the formal Market Research results. Note the grey area, below the line at which customers will spend money. The salesmen were told that Telocate was abandoned, that no further engineering investment would be made below this line, and that no promoting or selling effort was to be spent below this line.

The sales force reacted positively to direction from Market Research. Sales per salesman more than doubled! With guidance from Market Research, the sales force used the discount tool less and sold more at full price as they became more proficient in addressing customer needs; the average discount dropped from 7% to 3%.

- Market Research Drives Revenue

Market Research drives revenue

- Wireless sales doubled in 6 months
  - In a zero growth market
  - With no engineering effort
- M/E Ratio ↑ from 0.01 to 4
  - BD rocketed from #7 to #2 in 18 months
  - Market share tripled in 18 months
  - Sales/salesman more than doubled
  - Sum of Mkt+promo+selling $ slashed

BECTON DICKINSON
Becton Dickinson Medical Systems

Becton Dickinson Medical Systems installed a new management team in who began investing heavily in marketing, raising their M/E Ratio from 0.01 to 4.

With an understanding of the customer, Market Research drove promoting and selling. ***In a zero-growth market, wireless sales doubled in six (6) months.*** Before this even happened, Market Research drove manufacturing to ramp up production with an accurate forecast. Manufacturing was ready to ship as the surge in orders materialized.

By the time BD's new management team arrived, there were fifteen major projects already going on in engineering. The patient location technology, Telocate was one of the fifteen. New BD Marketing staff rigorously examined all fifteen against three questions:

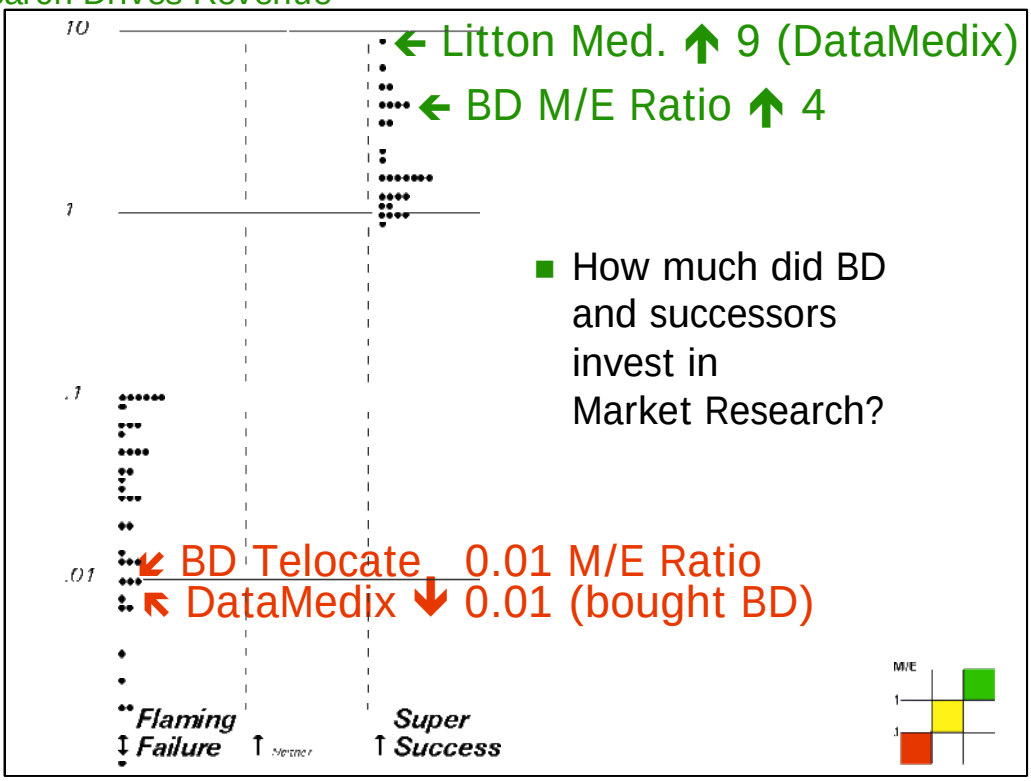
1. What benefits does the customer wish to spend money to receive? Quantify them.
2. Considering only those, where might we already have, or develop in engineering; a decisive, defensible competitive advantage?
3. In which market segment(s) can we deliver the most value to the customer?

Armed with customer and market data, in six months, BD marketing abandoned or shelved fourteen out of the fifteen engineering projects as unneeded, ill conceived, or not decisive.

Marketing identified and plainly specified the technology for engineering to focus on for decisive competitive advantage. BD returned to profitability, tripled market share, and rose to #2 against HP as #1 within eighteen (18) months!

Accurate forecasts from Market Research enabled manufacturing to ship three times the dollar volume per manufacturing employee.

- Market Research Drives Revenue



How much did BD invest in Market Research to understand the customer, to speak their language, and to articulate their needs? How much did BD invest to drive engineering, promoting, and selling? How much did this market research cost?

•BD Telocate, 0.01 M/E Ratio, a failure.

•BD raised the M/E Ratio from 0.01 to 4 and became a success within 18 months. Market Research drove revenue.

•DataMedix bought the Becton Dickinson Medical Systems division, pumped more millions in, but dropped the M/E Ratio back down to 0.01. They were bankrupt within 18 months.

•Litton Medical bought DataMedix, but raised the M/E Ratio from 0.01 to 9 and successfully rose from the ashes of DataMedix. Market Research drove revenue.

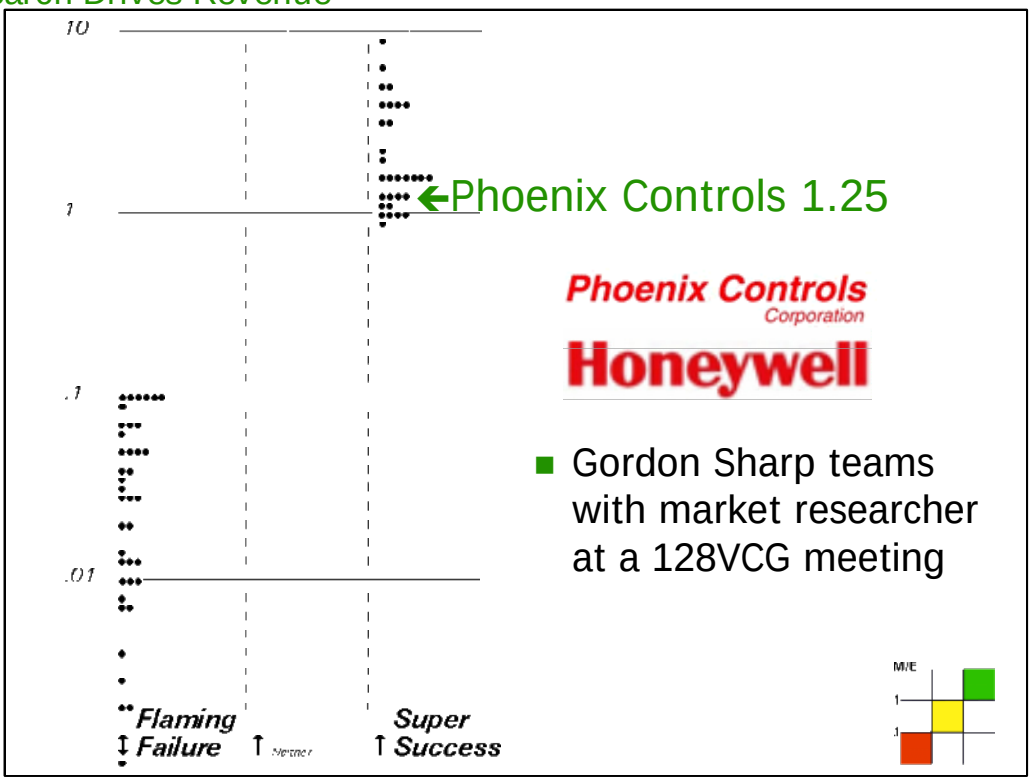
Same people, same customers, same market, same products –
the difference is that Market Research drives revenue.

Myth – Now that we have finished the Market Research and have the answer, we can get back to the serious stuff, the engineering.

Reality – The market changes. Customer needs change. The competition reacts to your actions and also launches new products. Market Research is a continuous process, not a one-time event.

Reality – Even if you have the Market Research answers for this generation of your product, you will launch new products which will require their own, new Market Research.

- Market Research Drives Revenue



Let me close by pointing out that one purpose of the 128 Venture Capital Group, and other support organizations, is to foster team formation. Another entrepreneur, Gordon Sharp, came to one of the very first 128VCG events, twenty years ago, because his startup was floundering. He had a unique electric motor controller for laboratory fume hoods used in chemical and biological sciences.

Gordon teamed with a market researcher at that meeting. Together, raising the Marketing/Engineering Investment Ratio to 1.25, they performed the up front Marketing process to validate the market, establish customer payback, and launch the company. Most importantly, Competitive Intelligence (CI), led to significant product changes, two patents, dramatic product differentiation, decisive market viability, and a defensible position.

"Market Research that gave us a handle on where to go," said Gordon Sharp. Phoenix Controls created a new market, Variable Air Volume (VAV) building controls, dominated their market, and was sold to Honeywell with a handsome return for the investors and for Gordon Sharp.

Look to your left. Look to your right. Ask each person if they know how to conduct up-front market research. If that person says, "Yes," inquire about his or her track record. If that person says, "No," then say, "Excuse me, I must ***find a market researcher***."

Market Research Drives Revenue

128 Venture Capital Group
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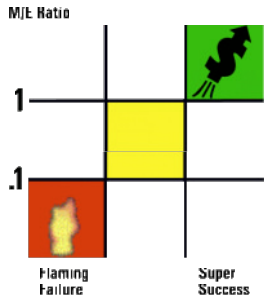

Invest more in Market Research than in Engineering.

Inquire not only about the quantity of Marketing, but also about the relevance of the Market Research, the caliber of the Market Research staff, and the quality of their activities.

Failure of Market Research is not isolated to the Market Research department, but has consequences across the organization. Market Research failure jeopardizes both the engineering investment and the enterprise. Companies which do not invest in Market Research fail.

Evidence is now available, demonstrating that successful technology-based enterprises invest more in Market Research than in engineering. The implication is a fundamental shift in management attention and investment commitment toward decisive, upstream Marketing.

Aim for success, by demanding the appropriate

- Market Research budget
- Market Research staffing
- Market Research people with Marketing process skills, not industry experience
- Market Research methods
- Market Research processes
- Market Research tools