Disasters I Have Known

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A Simple Disaster Example

- We invited new friends from work over for dinner
- We were into experimental gourmet cooking
- We decided on bouillabaisse, a French fish stew
- We went all out:
  - Prawns, lobster, clams, various types of fish
  - Saffron! Fennel! Wonderful spices!
  - It was great!
Vegetarian?! But It’s Kobe Beef!

• You can guess what happened
  – The food came out great! We served it and started in.
  – After one spoonful, there was this awful silence.
  – Oops.

• As it turned out…..
  – They were fresh from the Midwest, land of mild food
  – They did not know how to deal with an exotic fish dish

• I forget what we did, but it all worked out.
Lessons Available for Learning

• Be careful with surprises
  – Check that what you want to give, they want to receive
  – Especially when it seems obvious!

• We could have asked.
  – But that would have spoiled the surprise!
  – It will be so Wonderful, we just know they will like it!
  – And we’ll make it even more Wonderful, just in case.
My First Disaster

- The family business was egg grading machines
  - My dad and his brothers ran it, very successfully
- They were made of sheet metal on an iron frame
- I had this idea for the ultimate egg machine
  - It would be all sheet metal, modular, precision!
- I designed it, with T-square and drafting templates
- They built it.
On the Day of the Test Run

• The new machine was beautiful
  – Brave with new paint, precisely assembled, ready to go
  – It was a big machine, full configuration, the ultimate!

• We turned on the drive motor
  – The motor drove the machine through a roller chain
  – The drive chain promptly bent over the first idler shaft!
  – And then, nothing moved……
But It Sure Was Pretty

• It was quietly retired, with few words said
  – It wasn’t fixed because the whole thing wasn’t needed

• It was a solution looking for a problem.
  – The all sheet metal approach eliminated the iron frame
    • But the iron frame worked fine and was cheap enough
  – It was modular to handle any configuration
    • But there were only three configurations used
    • And multiple modules cost more than standard configurations
My Second Disaster

• In 1980, I had a hardware design company
• We got a contract to design a computer system
  – It was the basis for an instrumentation product line
  – It was to use a NOVA minicomputer emulation
  – It needed a basic CPU + various I/O: disk, video, etc.
• We decided to build a full system on one board
  – Everything on one board: CPU, memory, all I/O etc.
  – And we talked the customer into it
My Second Disaster - Continued

• The board schematic was 3’ wide by 10’ long
  – Cad tools were a drafting table and a logic template
• The board was 12” x 18” and crammed full
  – Its design cost $12K = 4 Volkswagens at that time
  – PC cad tools were an Exacto knife and layout tape
• We made the board and started to assemble it
  – I still have one!
My Second Disaster – Continued

“Adde parvum parvo magnus acervus erit.”
[Add little to little and there will be a big pile] *Ovid*
And the Winner Is…. 

- The project was killed for other reasons
  - We were “saved by the bell.”
  - We built it, but may never have finished debugging it
- I fell into adding little to little => a big pile
  - One big board wasn’t cheaper than several small ones
  - You can do each feature but maybe not all together
  - The big surprise happens when you try to bring it up!
Would That I Had Remembered
Watching a Disaster Unfold

- Company X has a successful basic uP product
- Product Planning to define the “next generation”
  - The “432” [Not Intel’s 432….]
- The next generation will be much better!
- We can put in every feature we want!
  - If a few features are good, a lot is better
  - Besides, silicon is so cheap
Watching a Disaster Unfold – Continued
Watching a Disaster Unfold – Continued

• Massive project uses most engineering resources
  – Each feature requires engineering
• Schedule slip becomes a landslide
  – And sucks in more engineering to save it
• Result: Chip is Big, Hot and Slow
  – As in, much too big, too hot & too slow!
  – Competitors products are much simpler, smaller, faster
• End result: It’s dead, Jim.
Lessons Available for Learning

• Feature gallop happens incrementally
  – Each feature seems good, logical, important, easy
  – The result seems so satisfying, so magnificent!

• You exceed the complexity limit w/o knowing it
  – Each feature adds just a little size, schedule slip, etc.
  – You won’t know as you are doing it when it’s too big
  – You will learn too late - at bring up or full chip layout
After the Battle, Mother

• Disasters happen because we want to do well
  – We want to do our very best, “be the best we can be”
• You have to have some confidence, some ego
  – Otherwise, you won’t try the new and invent
• You have to believe you know the customer
  – Even in the face of contrary data [Drucker]
  – Otherwise, you will never get anything done
• Good judgment comes from experience
  – Experience comes from bad judgment
Coda – A Relevant Image

- “Bit between one’s teeth”
  - When the horse clamps the bit between its teeth, stops listening to the rider, and does what it wants
End