



Why good ideas and good science do not often make it into the marketplace?

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Implementation is harder than development



- ◆ Technology development is more straight forward since it depends mainly on science
- ◆ Implementation depends upon business aspects, timing, and human factors, as well as technology
- ◆ In addition, you are highly dependent on other people and need to sell them on the concept



Stumbling Blocks to Success

- ◆ Not understanding customers' needs
- ◆ Window of opportunity
- ◆ Not understanding economics
- ◆ Not understanding risk aversion
- ◆ Not prioritizing efforts
- ◆ Not minimizing hurdles before you reach them
- ◆ Not involving others early in the process



All technology involves people

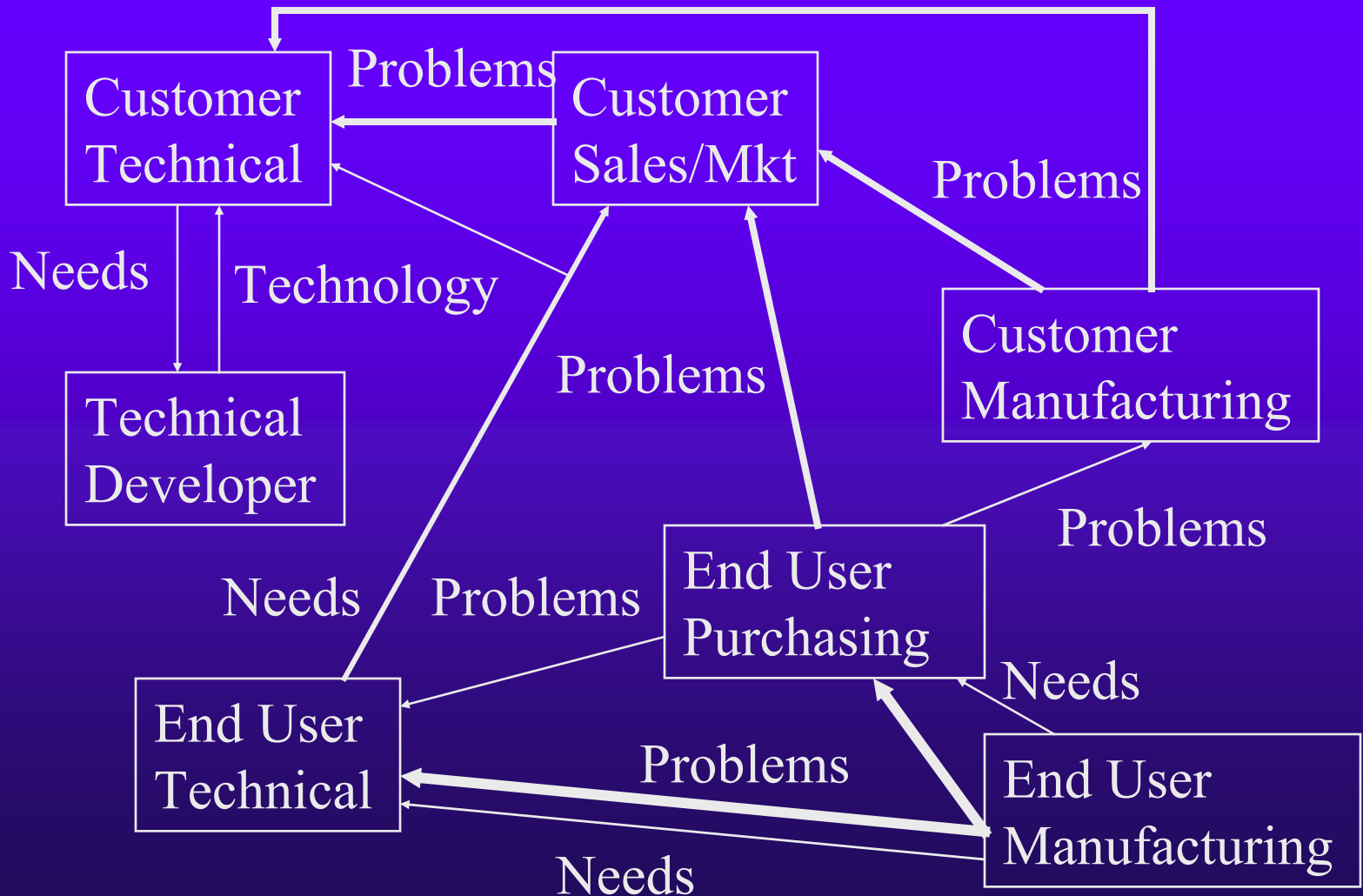
- ◆ Never lose sight that all technology implementation involves decisions by people
 - How does the person get rewarded?
 - Publications, sales volume or dollars, in-spec and timely product, or profit -- rarely new products
 - What happens if the technology does not meet expectations?
 - Being hounded by managers and sales/marketing personnel, reduced compensation, loss of position, etc.
 - Thanks for the good effort is unlikely



Not understanding customers' needs

- ◆ What is needed is not necessarily what is requested - better adhesive for printed bag
- ◆ Understand what the customer really needs
 - Best is to visit the customers operation to see the actual processes in action
 - Second best is to visit the customer and try to understand what needs they are trying to meet instead of what solutions they think that they need
- ◆ Understand the needs of your customer's customer and how your customer's product does not meet those needs.

Information flow for technology





Technology push versus market pull

- ◆ Technology push is transferring your product or process to the technical person at potential customers
- ◆ But technical efforts are much more driven by the business side and the technical person is so busy fighting fires that new technology sits – soybean wood adhesive
- ◆ Market pull involves selling your customer's customer on your technology so that they request that your customer provide this new product
- ◆ Brings business support to your technology

Window of Opportunity

- ◆ Technologies have certain times that they are more likely to be implemented through changes in
 - regulations
 - economic forces
 - consumer interests
- ◆ Can open a window by education of the end user of the technology's advantages

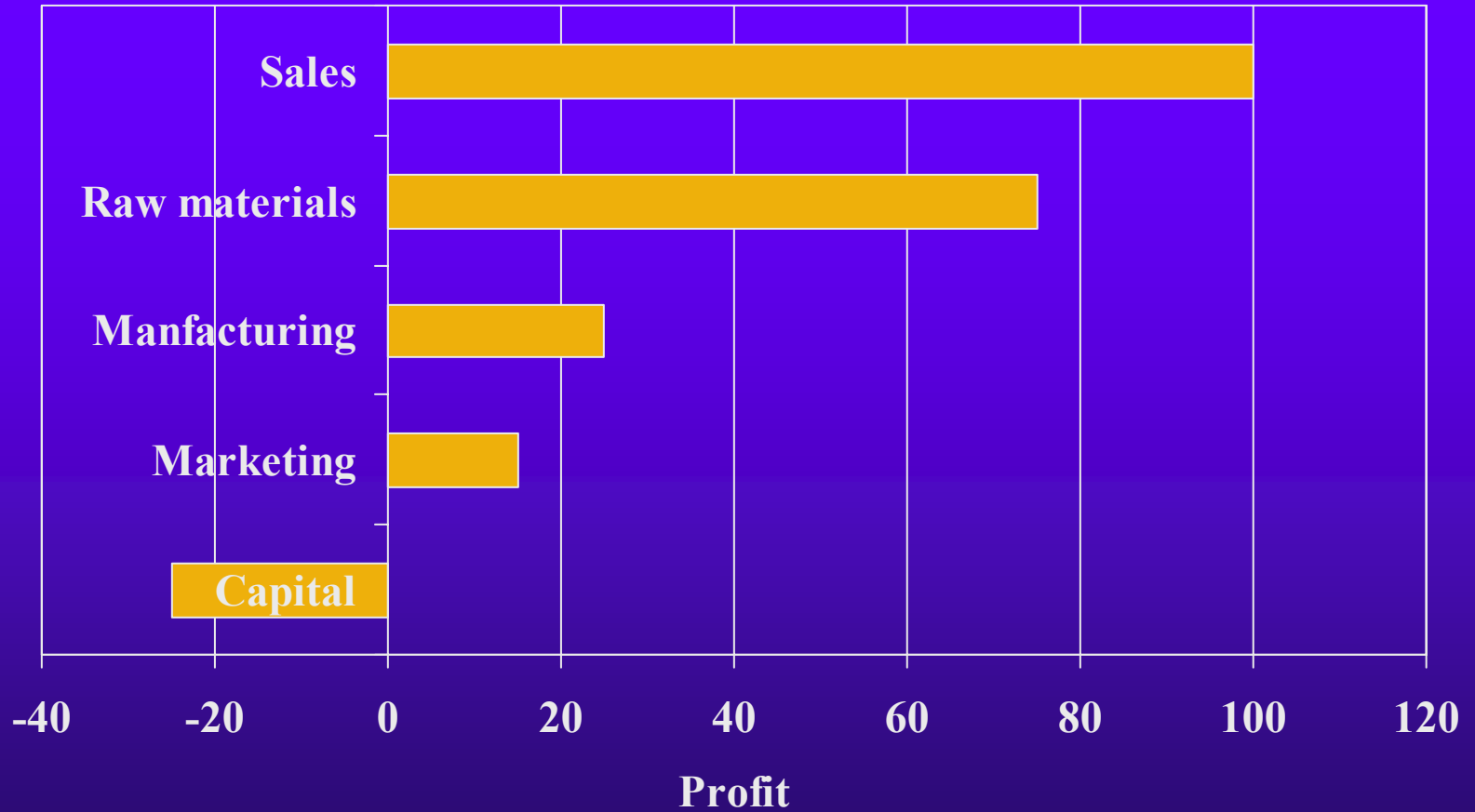




Not understanding economics

- ◆ Economics need to be positive and research should be directed to enhancing those economics in the most efficient manner

Economic Evaluation





Not understanding economics

- ◆ Economics need to be positive and research should be directed to enhancing those economics in the most efficient manner
 - Best is to fit into customers existing operations by reducing new processes and capital
 - Keep capital costs to a minimum for a non-proven market or technology
 - Get as much economic information from customers since they may do funny costing




Not understanding risk aversion

- ◆ Why should a person or company take the risk? Risk usually ranks higher than reward
 - Risk
 - Loss of customers when technology does not meet expectations in quality or timeliness
 - Too much effort to make technology work
 - Too slow in market acceptance
 - Reward
 - Profit increases seldom transfer down to lower levels




Not prioritizing efforts on basis of economics

- ◆ Where are you going to get the biggest bang for your dollars
 - Would you invest your own dollars?
 - Does decreasing raw material or processing costs, reducing amount of new equipment or operations, reducing labor costs, or finding alternative markets have the greatest impact?
 - Delay investigation of those items that have the smallest impact



Not minimizing hurdles before you reach them

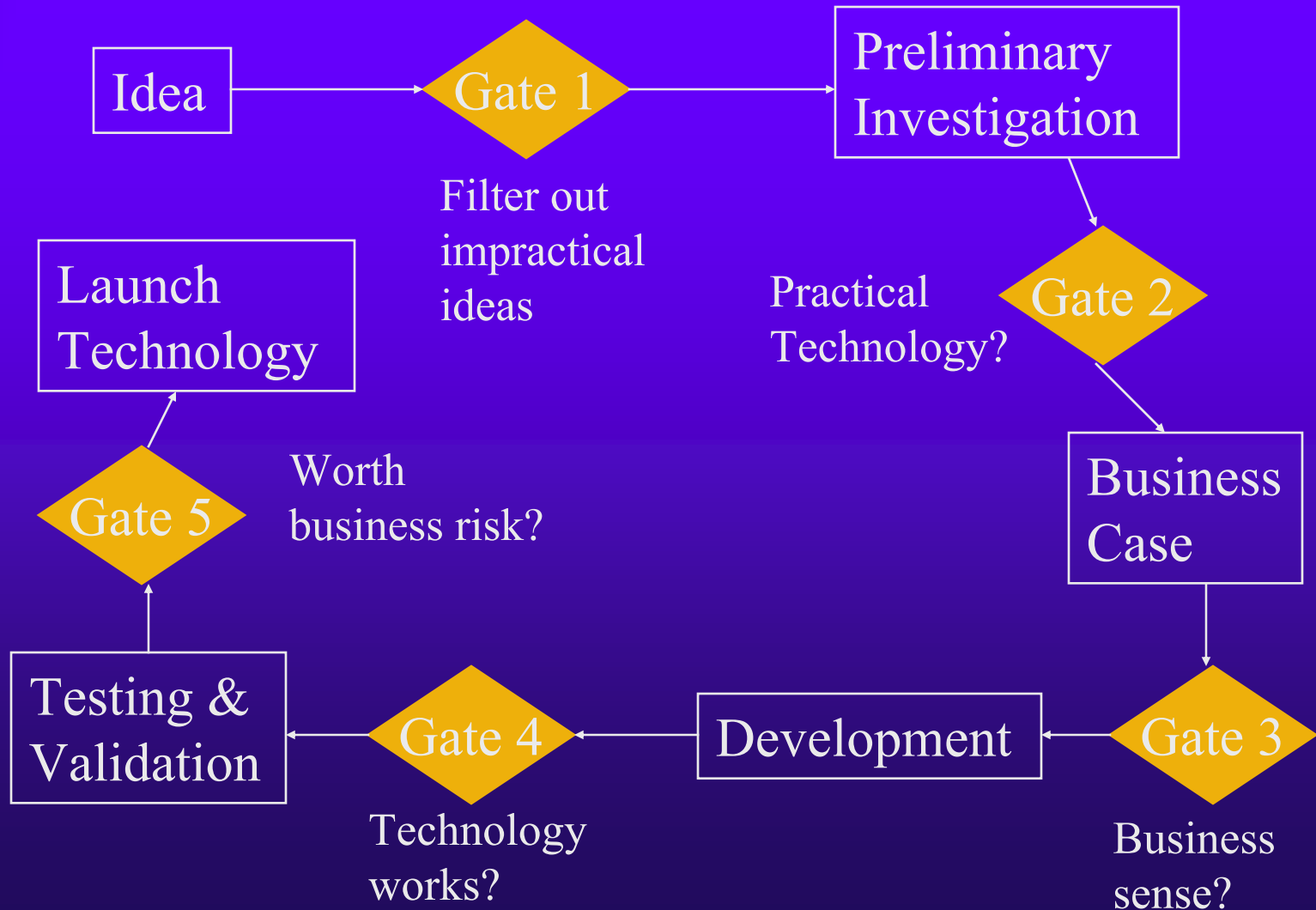
- ◆ The more you understand about what is critical in your customers operations, the more you can have the proper data the first time
- ◆ Seldom has a process been developed that there is no problem in implementation – robust process
- ◆ Acknowledge up front those items that you deferred investigating and why



Not involving others early in the process

- ◆ We are limited in our expertise
- ◆ Involve others with appropriate expertise early on as consultants is vital to:
 - addressing better the critical issues, such as economics or engineering
 - eliminating the need to redo the development work because poorly scalable technology or an economic hurdle

Stage-gate Evaluation





Portfolio management

- ◆ Large companies decide what programs go forward based upon the benefits to the company
 - Make sure that the market size fits the company
 - Make sure that market fits the company's business strategy – commodity vs. specialty, consumer vs. corporate customers
 - Put your efforts where there is the greatest chance of success



Summary

Hurdles

People

Economics

Technology

Victory

Hurdle knowledge

Planning far ahead

Teamwork

What would you do if it was your own money that was being invested?



Questions?