

Problem Solving & Domain Knowledge

Robert L Gallick
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Rationalizing the End

Part of the basics of problem solving is gathering as much information as possible about a problem followed by creating hypothetical solutions for the problem and then trying to mentally match the best feasible solution to the problem. Sometimes we have something in mind for a product or service and we mentally work backward trying to understand the problem being solved with the proposed service or feature. The exercise becomes one of justifying the desired product or product feature. You may first think that this is bad, but think of it in a different way. The problem in essence is not the product or feature but the justification of doing the product or feature. On a positive side, this often leads to new products that would have never materialized if traditional rationalization was pursued. An overbeaten example probably is that of the personal computer. In the late 70s and early 80s, the personal computer was something for hobbyist including terminal emulation and as history has told us it was envisioned that perhaps housewives would store their recipes on them. The personal computer was a product that the philosophy was “build it and the uses and applications will come“- and they did.

Technical Success and Business Failure

Sometimes products are a technical success in their definition and implementation but they are business failures. If you were approaching this from a business point of view, you may rightfully conclude that the domain knowledge of the designers/developers was sufficient, but the knowledge of those making the decision to market such a product was lacking. In fact there are many examples of products that were great technical successes but channel strategy or market forces prevented them from succeeding. I have personally seen great technical products that were failures because the company did not know how to price, distribute, or market such products. Engineers and designers often have “visions” of great products in their minds that they take to their management for approval. Somehow these ideas have to be filtered as far as being compatible with company goals and resources and if the products were developed what is their chances of success. As an engineer I have often found myself thinking – “I can design a product better than this” or “If I had deigned this I would have...” Sometimes as we problem solve we let our egos help us collect information about a problem using a bias. We think of all the good things about “our vision” and we fail to balance that with the bad.

Only One Competitor Allowed

Sometimes there is not enough room in a marketplace for multiple competitors. And, sometimes users of products are even satisfied with mediocrity in order to have consistency across the industry. The mass acceptance of Microsoft's Windows and their office applications is probably a good example of this. Adobe PDF has now been accepted as a common way of transmitting "read only" document. However the business world in general accepts that the way you transmit an editable document from one person to another is MS Word. And when it comes to spreadsheets, the standard is MS Excel. This is an example how industry wide knowledge has basically locked in tens of millions of people to a certain standard. I currently have, what I think, is a better idea for the equivalence of a spreadsheet. But what are the chances that such a product would be accepted by anyone. And how much time and money would have to be put into such a product to make it a business success? Sometimes it just isn't worth the effort to solve some problems. There are those who have tried: IBM OS/2 went head to head with MS Windows and lost. The DEC Alpha tried to compete with Intel and lost. Corel tried to compete with Adobe Photoshop and lost. Sony's BetaMax tried to compete against VHS and it lost. As industries mature, one often see's want to be competitors that want a piece of the pie. Sometimes there just isn't room once products start to fall in price and perhaps more importantly, the profit margin in producing such products.

Technology Leap Frog

Sometimes as we problem solve, our solutions are based once again on our domain knowledge. Sometimes, we find ourselves with such blinders on that we can't see that there are other technologies emerging which completely displace what we are currently doing. I hate to admit it, but when I was starting out in the industry, the standard to connect to a computer was 110 and 300 baud modems that worked by placing a telephone (POTS) handset into an acoustical adapter. Those have now been replaced for most users with cable modems delivering up to 20Mbps. We also saw the discussion of delivering digital content using telephony ISDN BRI and PRI for broadband. I remember in the late 1980's a colleague telling me we would never see broadband delivered to the home because it was just too expensive and that the world had too many other problems to solve. It is now hard to imagine not having a cable modem and cable programming. I suppose the lesson is that while we are solving our current problems, we need to keep in mind that there may be a disruptive technology just waiting to displace everything we are working on.