

# 290T: The Business of Software From Product Concept to Revenue

Professor Kurt Keutzer  
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EECS  
keutzer@eecs.berkeley.edu

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## Class News

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- **Class slides should be up by 6PM the day of the lecture**
- **Homework**
  - **Due at 8AM on the Wednesday of the case discussion**
- **Please introduce yourselves and mention something about**
  - **Your background (MBA, MS/PhD – CS, EE, SIMS)**
  - **Your software experience**

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## Today's Lecture

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- How software products get conceptualized and their markets defined ... but
- Lots of questions about the entire process behind software company formation and evolution – before we go over documentum let's look at the entire process
- Cannot cover all the different alternatives but will try to give some sense of the process

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## Many inter-related factors

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- Founding and sustaining a successful software business requires managing a complex set of inter-related elements
- We will spend two weeks trying to untangle these



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## In the beginning

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- One way or another, all software products begin with people, the team – even a team of one individual
- Typically:
  - A group of like-minded engineers
  - An individual marketer
  - An individual entrepreneur
  - Or a combination of the above



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## Importance of the team

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- The team – the initial group of individuals exploring the product concept and forming the business team
  - Most important factor for success
  - Will most determine likelihood for funding
    - Funding, great product concept, innovative business model may help to attract new team members
  - Hardest to evolve – initial team is almost always a glass ceiling

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## Types of initial teams

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- **Engineers –**
  - **Notoriously easy to keep happy**
  - **Last project may have gotten cancelled**
  - **They may have gotten laid off**
  - **Or their next door neighbor made a bundle on his start-up**
  - **Or perhaps they are just cheerleading a new idea in the company**
- **Marketers**
  - **More business awareness**
  - **More financial sensitive**
  - **May not have gotten corporate mindshare for a market they see – but management doesn't**
  - **Or may just be doing their job – finding new markets**
- **Entrepreneurs – relentlessly driven to increase their sphere of influence, initiate new ideas, and most importantly of all – driven to make money**

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## At this team formation

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**If the plan is to start-up a company**

- **The engineers and marketers are conspiring after softball practice at their current company**
- **The entrepreneur may be**
  - **At large**
  - **An Entrepreneur In Residence (EIR) at a venture capital firm**

**If they are intra-preneurs (inside a larger company)**

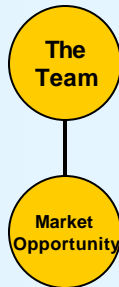
- **Relatively rare (Fortune 500?) that a company can devote significant resources to a formal new product planning process**
- **Typically corporations rely on innovation as a by-product of the ordinary product development process**
- **Best-practice is to have an established method so that any individual in the company can get a new product idea noticed and formally reviewed**
- **So:**
  - **The engineers and marketers are doing their old job but trying to get management attention for their new idea**
  - **The entrepreneur wants to spin-out the idea – or start a new business unit with profit and loss responsibility**

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## marketing driven team

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- A marketing driven team will most often begin not with a product but with a market opportunity



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## Market opportunities

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### Simple formulas

- Find a lucrative existing market with a lot of headaches
  - Enterprise corporations with
    - Human resource management issues
      - Payroll
      - Benefits
      - Incentive stock-options
      - Non-qualified stock options
      - Vacation/paid-time off/leave-without pay
      - Part-time employment/parental leave
    - IC design teams failing to keep up with Moore's Law
  - Meet an emerging market (Internet) with a killer application
    - The browser for the internet (Netscape)
    - The portal to the internet (Yahoo)
    - The search tool for the internet (Google)

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## Market opportunities – most often

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Notice a big headache that can be met with existing technology

- Relational databases (Ingres) applied to automating document management in an enterprise (Documentum)

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## Sizing the opportunity

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Bottom up analysis

- $\text{Number\_of\_users} * \text{average\_sales\_price\_of\_sw} = \text{total\_available\_market}$
- $\text{Number\_of\_users\_you\_can\_service} * \text{average\_sales\_price\_of\_sw} = \text{serviceable\_market}$
- Compute “penetration rate” of the market

Top down analysis

- Average tool budget of IC design team/industry 1-3% of expected revenue
- Average enterprise corporation Information Technology budget
- Size these down by the relative importance of your application (what other products will your customers give up to buy yours)

If you're lucky these numbers are available from Dataquest, Gartner Group, International Data Corporation – otherwise

- Private industry analysts (e.g. Will Stauss, Handel Jones)
- International trade shows (Design Automation Conference), Journals (EE Times) and organizations (ACM- SIGDA, IEEE etc.)

That gives you a market opportunity – what's next?

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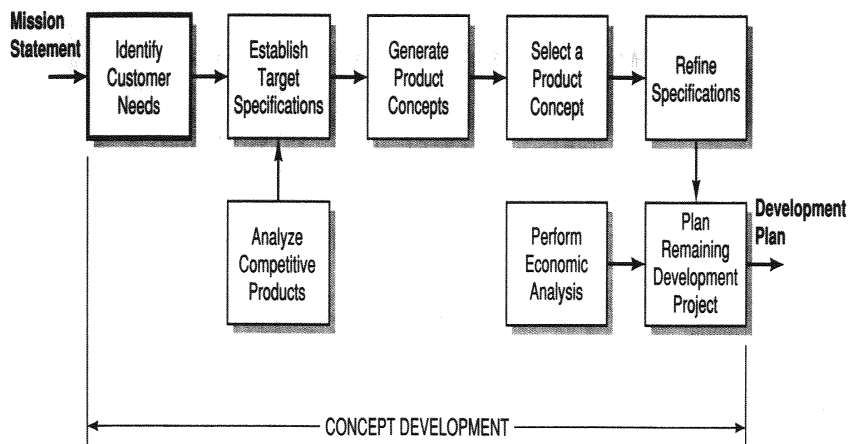
# Product concept

- Now that you've identified a market opportunity you need a product to meet that market opportunity



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# Concept Development



**Exhibit 3, Chapter 2: Ulrich and Eppinger  
Product Design and Development, 1995**

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# Planning

Adapted for SW from Exhibit 2-2 of Ulrich and Eppinger, 2004

## Marketing

- Articulate the market opportunity
- Define market segments
  - By needs
  - By hardware platform
  - By budget/willingness to pay
  - By sophistication (leading adopter, follower, laggard)
  - End consumer
    - Geographic
    - Demographic
    - Psychographics

## Design

- Software architecture
- Target hardware platform(s)
- Software development methodology
- Perform technology inventory – what key technologies are required? Are any missing? Where do we get them?

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# Product Concept Development

## Marketing

Adapted for SW from Exhibit 2-2 of Ulrich and Eppinger, 2004

- Identify key customer needs
- Identify “lead customers” – imaginative
- Identify competitive products

## Design

- Scope development time and resources
- Prototype
  - For customer feedback
  - To resolve key technical challenges
- Examine intellectual property (patent) issues

## Manufacturing and distribution

- We thought we had it easy – but still: licensing, keying, distribution

What did Documentum do?

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## Product Concept Development – DCTM - 1

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Engaged Geoffrey Moore late in 1993, *Crossing the Chasm* published in 1991  
On his advice initiated what seems almost like the act of a desperate organization

Harvested application proposals from the entire organization

- Draw on the breadth of expertise within the organization
- Every person writes up a short, punch proposal
- 100 Scenarios developed

Select the most compelling application

- First cut: Rate each application on
  - Economic buyer: Identifiable, well-funded, buyer
  - Compelling reason to buy: Quantify
  - Ease with which whole product can be acquired and assembled
- Next cut:
  - Strength of current relationship with partners and allies
  - Attractiveness of whole products total price
  - Fit with current distribution
  - Absence of entrenched competition
  - Fit with company's current positioning
  - Bowling pin potential

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## Product Concept Development – DCTM -2

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Communicate the focus to the entire company

- Used the opportunity to get buy-in
- All employees could understand the reasoning – better motivated
- Executed through a company meeting

Make organizational adjustments and execute

- Swiftly adjusted sales, marketing, engineering, and partners groups
- Allowed Documentum to quickly enter target market

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## Refining the Product Concept

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### Qualitative methods

#### Imaginative user

- Find that “imaginative user” and squeeze them for all the information and insights you can get
- “If our entire company were at your disposal, what would you have us do?”
- Inevitably superior to any other alternative

#### Focus groups

- Small groups of potential customers
- Gathered for small price (or for the opportunity to gripe)
- Moderated by a professional
- Observed/filmed through a one-way mirror

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## Refining the Product Concept

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### Quantitative methods

#### Customer surveys or questionnaires

- Must be able to be answered on a coffee break
- Don't expect creative thinking
- Questions must present clear alternatives:
  - A. Which is your biggest headache in using Matlab?:
    1. Price of license
    2. Compilation time
    3. Run-time of simulation
    4. Manual translation of Matlab code to C-code
  - B. How much would you pay for:
    1. 10% simulation speed improvement
    2. 50% simulation speed improvement
    3. 5X simulation speed improvement

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## A product concept ... but

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In itself a product concept is almost useless

Without a vision as to how to execute, the marketing driven team is susceptible to:

- Engineers that really don't know what they're doing
- Getting scooped by anyone that they show their fledgling product plan to
- Losing credibility with those who have invested time and money so far

What do these marketers need?

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## The Astute Marketer

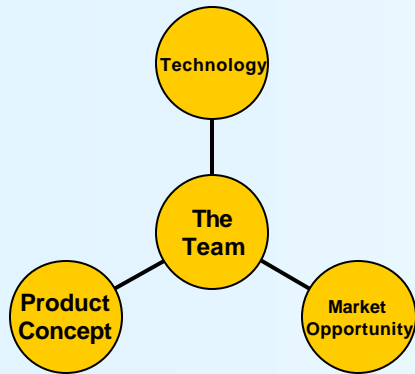
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## Identifying key technologies

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To be continued 9/10/2003

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