



Managing Software Product Development – Key Differences from Service Projects

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Current Software Development Scenario

- World software market is over \$750 billion, half products and half projects
- Software projects – software product produced for a single (few) customer
- Product – millions of customers possible
- Though single-customer and multi-customer products are both software, approaches needed for development and management are very different



Scenario in India

- In India, most software development is customized, i.e. single-customer
- We have done very well in software service sector
- Service industry is as good a business as product; both are businesses
- But if products are to be developed, different approach is needed



High Level Differences Between Projects and Products

- Business models are different
 - Revenue per item vs. per project
- Funding/investment approach is different
 - High initial investment in dev needed in products
- IPR and copyright
 - In products the source code is owned by the vendor, in projects the customer owns it



High Level difference

- Role of creativity and innovation
 - In projects technical creativity needed in limited doses
 - In products both conceptualization as well as technical creativity needed in high doses
 - (In India and Indians creativity is not developed and orgs generally do not encourage it)
- They necessitate different engineering and management processes



Engineering Tasks Differences



Requirements

- Products do not have users to give the req. – they have to be conceived
- Requirement process is different – req evolve with technology and market
- This itself makes product development more proactive activity with more conceptualization content



Requirements...

- Requirements keep evolving; requirements for parts also evolve
- Important to have a shared vision for the product around which the requirements are conceived
- Many products have a vision doc
- Req freezing is more a strategic call rather than “sign off”



Design and Architecture

- Architecture and design have to support different kind of requirements like internationalization, customization
- Product lines are possible requiring diff architecture approach
- Lower level design is similar to projects



Post Release Monitoring

- Product development does not end with the warranty period
- It has to be supported by the company, as source code is not given out
- So, along with product development, there has to be a group for product support



Quality

- Cost of poor quality– loss of market share, product failure, updates, ...
- So cost of bugs is much higher
- Means that quality processes have to be more rigorous
- Quality processes do not end with delivery – it goes into post-delivery



Testing and Verification

- Heavy emphasis on testing
- Often have independent testing
- Some Beta release to get initial testing and feedback from actual users is there
- Multiple groups involved in testing – not necessarily coordinated
- Program checking tools are widely used



Process

- Projects can work with a waterfall kind of model; contracts easier
- Products are by the very nature cyclic, hence use iterative model
- Even within a release, the development is iterative
- Daily builds are common practice



Process...

- Current process frameworks not well suited for products
 - Most product companies do not use them
- As innovation and empowerment is important, process is relaxed with clear checkpoints (often around check-in)
- Process adherence not as important



Technology

- Technology innovation is often a key factor in product's strategy
- Pushing at the technology boundary is frequently present
- Products are often technology-driven, making them more techy-centric rather than manager-centric
 - A big difference in team culture



Release Process

- Due to the cost of post-release bugs, release process is more involved
- Typically multi level of pre-production and post-production testing done
- Often independent groups do this



Release Process...

- Release criteria often specified – typically in terms of bugs
- One criteria from MS – zero bug bounce
 - Open bugs (of some severity) touch 0
 - Does not mean no bugs, but means that release time is coming near
- Bug triaging an important activity



Development Management Differences



People

- Products often revolve around driven people who work with missionary zeal
- People empowerment is essential
- People management is different



People Management

- Hence, often people are not tightly managed in time
- Often no recording of hours spent, and no management focus on it
- Results in larger granularity tasks, and less tight daily management
- Empowerment of team members is much higher – small groups own different portions of the product



Team Structure

- Technology folks have a key role, hence they have their own growth ladder
- Requires different structure
- Often developers do not report to the project manager but to a development manager
- One structure – program management, development, testing, each reporting to a product lead



Configuration Management

- This is incredibly more complex
- Focus is primarily in code control, but allowing flexibility for different releases, different builds
- Remember, at a given time different versions may be used by different developer or test groups
- Use advanced tools like clearcase



Managing Tradeoffs

- Is a central mgmt activity, though not as important in projects
- Basic tradeoffs between resources, schedule, and features, like:
 - Given fixed cost, will chose a schedule and adjust the feature set as necessary
 - Given a fixed feature set, will chose a schedule, and adjust resources
 - Given fixed schedule, chose the feature set, adjust the resources



Risk Management

- Risks are very different – often technology and feature related
- Risk mgmt is not fully in the hands of the project manager
- Often the type of risk management done in projects is not done; is more at the org level or at feature level



Schedule

- Projects have a clear delivery deadline, often determined by the customer
- Products have release cycles, and often release dates for many versions
 - Development driven through milestones
 - Milestones wrt product capability level
 - Milestones are major synchronization pts



Project Monitoring

- Effort metrics rarely used (effort data not collected)
- Milestones are key monitoring aid
- Defects are logged and tracked religiously; defect levels tracked
- No “customer management” issues



Summary

- Product development is very different from executing projects
- There are basic differences in business models and approach
- Leading to differences in the way software is engineered
- Consequently, the development management is also different



Summary...

- There are also differences in culture, technology, and people management
- Project culture and product culture probably cannot mix
- Perhaps that is why service companies usually do not succeed in products!