

Principles of Product Development Flow

Part 2: The Economic View

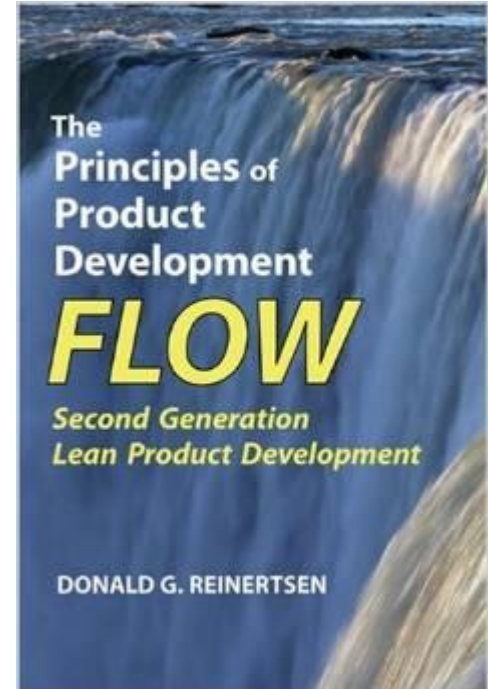
About Me

- Started programming in 1981
- Owner of Enoki Solutions Inc.
 - Consulting and Software Development
- Exposed to several industries
- Running VanDev since Oct 2010

Book:

The Principles of Product Development Flow

- ~\$45 on Amazon.ca
- Published in 2009
- Award winning
- Difficult material
- Generally ignored :(
- Awesome IMNSHO



Why?

Why do we change our process?

Eliminate waste?

Increase quality?

Raise efficiency?

Shorten cycle time?

No.

Why?

To Increase Profits

E1 The Principle of Quantified Overall Economics: Select actions based on quantified overall economic impact.

- Ship now, or test for another 4 weeks?
 - Find more bugs early, cheaper to fix
 - Lose 4 weeks of sales, bugs harder to fix
 - Real costs?
- Gather data for real costs & revenue
- Maximize profit.

E2 The Principle of Interconnected Variables: We can't just change one thing.

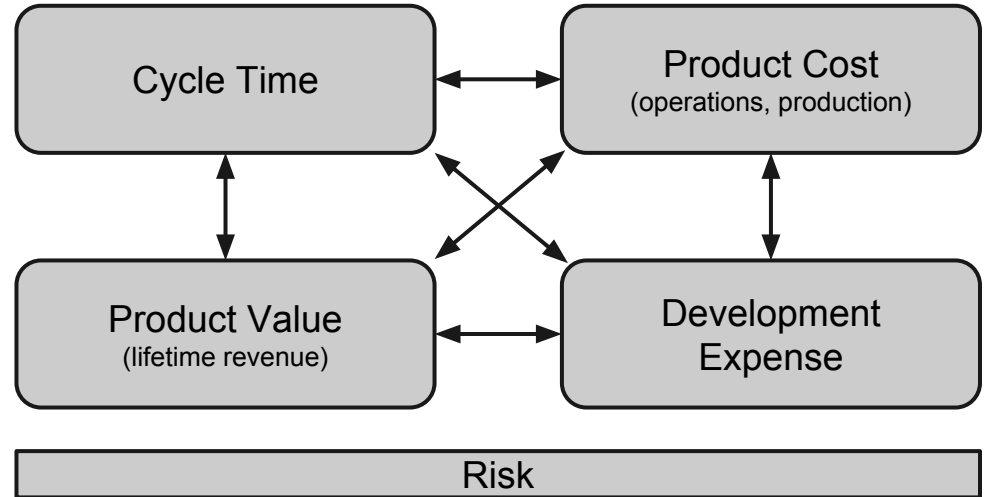
- The real world is trade offs
- Real world changes always affect multiple proxy variables
 - Putting a single coding standard in place affects:
 - Production time, quality, bug rate, developer happiness, etc.
- The economic impact is complicated

The Economic Framework

The five key economic sensitivities:

- Cycle time
- Product cost
- Product value
- Development expense
- Risk

We can trade between these. To measure trades we need a common unit: 'life-cycle profit impact'



E3 The Principle of Quantified Cost of Delay:

If you only quantify one thing, quantify the cost of delay.

- 85% of companies do not do this.
- How much value is lost in a 60 day delay?
 - 50:1 estimate variation for large projects
- COD -> cost of Queue

E4 The Principle of Economic Value-Added:

The value added by an activity is the change in the economic value of the work product.

- Value-add is the increase in price to customer? - No
- Value-add is the increase in **total** economic value of the product
 - A tested product sold at the same cost as the untested product will make more over its **lifetime**.

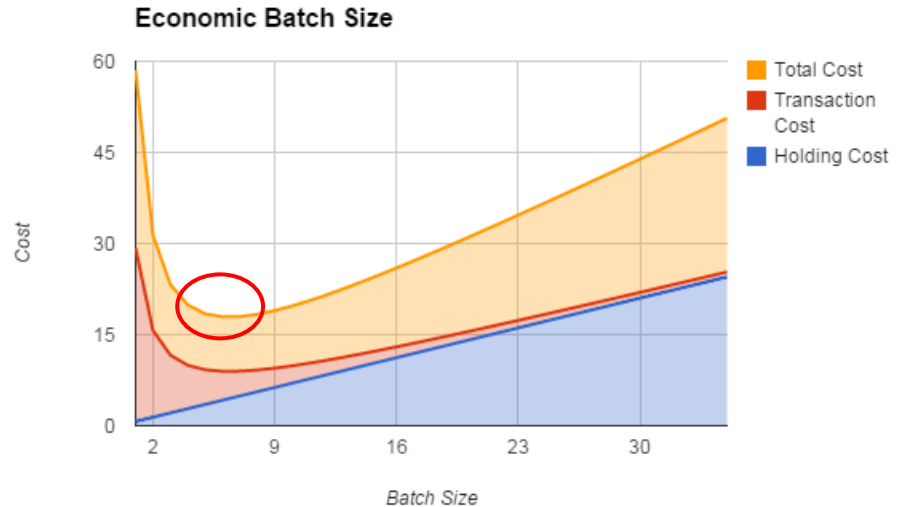
E5 The Inactivity Principle:

Watch the work product, not the worker.

- Make waste visible in economic terms
- Work product sitting idle is waste
- Reducing WIP is more important than keeping workers busy
 - i.e. Having a worker start something new increases inventory; it is better to leave them idle so they are available to work on existing inventory when it is ready.

E6 The U-Curve Principle: Important trade-offs are likely to have U-curve optimizations.

- $\text{cost}(x) = a/x + b \cdot x$
- “fat” band of optimal
- precise data is less import for these areas.



E7 The Imperfection Principle:

Even imperfect answers improve decision making.

- More data -> better decision
 - Not perfect decision
- Any analysis based on real data is better than using intuition
- Any framework will start to challenge assumptions

E8 The Principle of Small Decisions: Influence the many small decisions.

- Pareto Principle
 - 80% of the leverage lies in 20% of the problems
- We overmanage the 20%
- Pareto Paradox
 - There is more **actual** opportunity in the 80% than the overmanaged 20%
- We need methods to influence the 80%

E9 The Principle of Continuous Economic Trade-offs: Economic choices must be made continuously.

- Lots of small trade-offs made at random times by many people
- Significant process deviation from manufacturing realm
- We evolve product as we go and as new information comes in

E10 The First Perishability Principle:

Many economic choices are more valuable when made quickly.

- Opportunities appear random and often are offer their best economic value if exploited immediately, and rapidly lose value.
- We need to methods to shorten decision times.
- Often the front line is first to encounter opportunities.

E11 The Subdivided Principle: Inside every bad choice lies a good choice.

- Decompose choices into parts
- Identify the good
- Work around the bad
- Reshape

E12 The Principle of Early Harvesting: Create systems to harvest the early cheap opportunities.

- “Buy” cycle time
- Budget by authority
 - Review required to exceed
 - Autonomy within budget
 - More budget at you go “up” the chain

E13 The First Decision Rule Principle:

Use decision rules to decentralize economic control.

- If the majority of opportunity lies in the front line acting quickly they need the authority to do so.
- Find ways to control decisions without having to participate directly in them.
 - e.g. zero-sum resource trading between teams

E14 The First Market Principle:

Ensure decision makers feel both cost and benefit.

- Use data to drive home costs and benefits.
 - e.g. Front-of-line service between teams costs extra.
- The internal resource trade economy reacts to demand and supply
 - Too many teams wanting Front-of-line service and the price goes up.

E15 The Principle of Optimum Decision Timing: Every decision has its optimum economic timing.

- Delay decisions as long as possible
 - More information about the decision can accumulate
- Avoid front loading decisions

E16 The Principle of Marginal Economics: Always compare marginal cost and marginal value.

- A fancy way of saying look at profit values, not revenue values.
- Feature creep: increases costs, not marginal value
 - Costs more to make
 - Sells for the same, or only slightly more
- Focus on finishing something; not everything

E17 The Sunk Cost Principle:

Do not consider money already spent.

- Project A is 90% complete and will return \$1M when finished
- Project B hasn't started and will return \$10M when finished
- Which do you work on?
 - is $\text{Cost}(B) < 10\% \text{Cost}(\text{finishing } A)$?
 - at what risk levels?

E18 The Principle of Buying Information:

The value of information is its expected economic value.

- If the fair-market-value ($E(x)=1$) of a lottery ticket is \$1 how much should you pay for information that makes you 10x as likely to win?
- \$9 (since you still have to pay \$1 for the ticket afterwards)
- Failed projects generate information!

E19 The Insurance Principle:

Don't pay more for insurance than the expected loss.

- Project A has a 10% chance of failure
- We can spin up two teams to do competing implementations to mitigate risk.
- This doesn't make economic sense:
 - $2 * \text{Cost} * .99 > \text{Cost} * .90$
- Have the second team do a different product and accept failure if it happens!

E20 The Newsboy Principle:

High probability of failure does not equal bad economics.

- You make $\text{¢}50$ per paper sold and lose $\text{¢}25$ for each paper not sold how many papers do you order to maximize profit against uncertain demand?
- Aim to run out $\frac{1}{3}$ of the time ($p/(p+1)$)
- \$1 to $\text{¢}1$, run out 99% of the time.
 - i.e. fail to predict demand 99% of the time!
- High failure rate \rightarrow Asymmetric pay out function.

E21 The Show Me the Money Principle:

To influence financial decisions, speak the language of money.

- Trade-offs coached in \$ and ¢ are easy
- Decision delay is often caused because cost/benefit is not clear

Conclusions

- Find a way to focus on \$ and ¢
- Split decisions up, defer, defer, defer
- Normalize to life-cycle profits
- Focus on Cost-of-Delay (COD)
- Focus on Work Product in the queues
- Communicate costs and benefits across teams

Q&A