

Process Design

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The Challenge of Process Design

Creativity is key

the Rule of Whacko: cultivation of the absurd

The intimidation of the blank sheet of paper

if we don't automate or tinker, what **are** we going to do?
where do we start? and how?

The bad news about design

it's not algorithmic

The good news about design

it's not magic and it need not be haphazard
there are recurring patterns

Our approach: jump-start the creative process

models and templates to stimulate possibilities
a catalog of patterns
the wisdom of Linus Pauling

Patterns for High Performance Process Design

Relocate work to customers: from performer to enabler (redefine value-added from result to capability)

electronics: equipment maintenance

manufacturing: small-scale purchasing

Relocate work from customers: add more value (optimize total process performance)

automotive: inventory management

insurance: equipment maintenance

chemicals: quality inspection

aircraft engines: spare parts and maintenance

insurance: quoting

mortgage insurance: underwriting

Simplify: minimize number of interconnections and dependencies by integrating transactions and reallocating activity (reduce complexity and reconciliation)

consumer durables: warranty claims, accounts payable

retailing: merchandise planning

insurance: claims payment

insurance: policy replacement

Patterns for High Performance Process Design

... continued

Eliminate non-value-adding intermediaries

insurance: claims processing

farm products: distribution

home building: contract approvals

Reconfigure and reorder steps to reflect potential parallelism and required precedence (avoid letting linearity degenerate into iteration)

high technology: product development

electronics: order fulfillment

health care: referral and admitting, pre-operative care

Make decisions early for efficiency (of labor and capital): predict, don't react

consumer goods: route sales management

electronics, financial services: customer service

communications systems: manufacturing and sales

entertainment: billing and auditing

auto parts: product design

fast food: order fulfillment

Patterns for High Performance Process Design

... continued

Make decisions late for flexibility: avoid premature choices

apparel: semi-finished goods

consumer goods: delivery routing

personal computers: components procurement

Create hybrid centralized and decentralized structures (virtual centralization, coordinated decentralization, standardization vs. diversity)

electronics: purchasing

banking: multi-divisional sales

auto parts: tooling

Move work to the best location for it to be performed

automotive: master parts picking

fast food: kitchen operations

chemicals: manufacturing

Patterns for High Performance Process Design

... continued

Integrate and compress tasks (case workers and case teams) to eliminate handoffs and avoid iteration

insurance: new business

communications: maintenance and repair

Introduce an integrator to coordinate a diverse set of experts performing very complex tasks (case manager and project management)

property/casualty insurance: complex claims management

electric utility: customer service

health insurance: disability rehabilitation

communications systems: system delivery

health care: treatment management

Perform the right amount of work for the situation (avoid excessive standardization)

computer services: accounts receivable, accounts payable

auto insurance: policy issuance, claims

universities: cross-charging

Patterns for High Performance Process Design

... continued

Decrease the range of alternatives: sacrifice precision for simplicity and convenience

insurance: underwriting

health care: materials billing

mortgage insurance: claims

Increase the range of alternatives: pay for precision

insurance: underwriting

banking: pricing

consumer goods: customer segmentation

Employ better information (more current, more relevant)

auto insurance: underwriting (redux)

consumer goods: product deployment

**The Key
Dimensions of
Process Design**

Who

When (relative and absolute)

**Redesign rearranges
the value-adding tasks**

Where

Whether

What inputs and information

What degree (how much)

What frequency (how often)

Principles of High Performance Process Design

Work should be done by whoever is in the best position to do it

irrespective of history or organizational boundaries

A process should be performed by as few people as possible

to minimize handoffs

Do work at the best time for it to be done

avoiding artificial linearity or generic rules

Location is a variable, not a given

to be explicitly factored in

Strive for simplicity

non-value-adding work breeds complexity

Structure in terms of alternatives rather than exceptions

triage keeps the basic flows clean

Consider the context when performing work

the virtues of uniformity have been greatly oversold

Control must be subjected to cost-benefit analysis, just like everything else

neither perfect nor free

Simplification and Rationalization

A useful adjunct to redesign

not strictly holistic reorganization of process, but a source of improvement nonetheless

redesign provides the context for surfacing and addressing a host of irrational aspects of operations

often a useful basis for initial implementation

Illustrations

consumer goods: SKU rationalization

consumer goods: customer rationalization

electronics: parts elimination

distribution: warehouse consolidation

electronics: channel simplification, package redesign, parts standardization

consumer goods: truck fleet optimization, systems standardization, vendor consolidation

Guidelines for Applying the Patterns

Pattern	Applicable circumstances	Payoffs
Relocating work/moving boundaries (to or from customer)	Strong differentials in scale, capability, importance, access; high degree of coordination overhead or transaction cost	Improved work performance, reduced coordination and overhead, elimination of liaisons and intermediaries
Natural parallelism	Lengthy sequential process, extensive rework	Reduced cycle time and rework
Minimal interfaces	Multiple interconnections with extensive reconciliation or duplication	Consistency, improved service, elimination of reconciliation and nodal functions
Hybrid centralization and decentralization	Multiple contacts with external party (customer, supplier, regulator, etc.)	Combining economies of scale or expertise with customer focus
Task integration and compression (case workers/teams)	Sequence of relatively simple tasks, slow throughput, errors, etc.	Reduction of handoffs, errors, delays, process administration overhead; improved control

Try this

if you are here

and want this

Guidelines for Applying the Pattern

...continued

Pattern	Applicable circumstances	Payoffs
Case manager	Disaggregated collection of diverse experts	Coordination, elimination of wasted effort
Eliminate intermediaries	Bottlenecks, low value-adding participants	Faster cycle time, improved service
Decreased alternatives	High cost of information collection and analysis, many similar process outputs	Reduced information collection overhead, faster decision-making, reduced complexity
Increased alternatives	Multi-modal input variability	Customer focus and service, improved resource utilization
Early decision-making	High resource costs, expensive or slow decision-making	Efficient resource utilization, reduced process management and control overhead
Deferred decision-making	High flexibility-related costs: inventories, poor resource utilization, broken commitments	Flexibility for changing conditions
Improved information	Poor resource allocation, buffers, suboptimal uniformity	Greater accuracy, precision of outcomes

The Question of Control

Control is:

risk management

a necessary evil

power

illusory (Welch's insight)

NVA

Strategy: apply cost-benefit thinking

the miracle of non-linearity

**The Design
Mindset:
A Matter of Style**

Maintain the customer's perspective

see things from the other side

Focus on process leverage points

what would make a very big difference (pro or con)?

Increase the value added

reengineer the product as well as the process

Work backwards

start with the good

"Is it worth it?"

sensitivity to tradeoff

Always ask "why?"

what's the real purpose? (goal vs. mechanism)

Keep things simple

complexity is the work of the devil

The Design Mindset: A Matter of Style

...continued

Concentrate on the right performance measures

what really counts, not what's customary

Envision the optimal and ideal: indulge in wishful thinking

work backwards from the perfect and approximate later: be unrealistic

Push the envelope

how would you do it in crisis mode?

Treat problems as additional design issues

don't be defeated by apparent infeasibility

Avoid the familiar

if it feels comfortable, discard it

Some New Terminology

Problem: process performance inadequacy

Rule: aspect of process design responsible for the problem

Assumption: belief about the environment underlying the rule

And now for a methodology

Applying the Terminology

	Problem	Rule	Assumption
Credit approval			
Hospital admissions			
Auto underwriting			
Store restocking			
Auto parts picking			

Constraining Rules and Obsolete Assumptions

Poor process performance is the result of antiquated rules that create flaws in the process design; these rules are in turn based on deeply embedded assumptions about the world in which we operate

<u>Assumption</u>	→	<u>Rule</u>	→	<u>Problems</u>
All cases are complex		We need specialists		Hand-offs and delay
Tooling has nothing to contribute to design		Tooling follows design		Rework and cost
Receiving doesn't know what's been ordered		We pay when we receive the invoice		Reconciliation problems
Field personnel are unreliable		Merchandising decisions are made at headquarters		Unresponsiveness to local markets
We don't know what's missing until we get to the store		Restocking decisions are made in the store		High inventory levels

Breaking the Rules and Shattering the Assumptions

Tracing back from poor performance to identify rules and flaws and to surface assumptions can lead to breakthrough process redesigns: the sketch of a methodology

recognize essential performance problems

identify the rules that are the sources of these performance problems

determine how the design would be better without these rules

surface the assumptions on which these rules are based

if invalid, reshape the constraining rules

if still valid, seek means to make them invalid (get around them)

N.B. connections not necessarily one to one

Breaking the Rules and Shattering the Assumptions

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Why do we need a methodology?

rules and assumptions are deeply buried

they're sensitive because they reflect history, beliefs, feelings, and vested interests

it's tough to start and even tougher to stop

most are irrelevant and most of the rest are true

Needed: a structured framework (starter kit)

rules and assumptions that commonly constrain performance

On the Validity of Assumptions: Beyond True/False

Not true in the first place

reflecting misunderstanding and misconceptions

No longer true

made obsolete by new circumstances

True

then and now

True but not inevitably so

can be made false by intervention

**Common Rule
Types: Templates
for the Sources of
Poor Performance**

Who performs the work (who rule)

individuals or organizations

e.g., only specialist underwriters underwrite

When the work is done (when rule)

absolute timing

e.g., we pay when we receive the invoice

Where the work is done (where rule)

geographical limitations

e.g., merchandising decisions are made at headquarters

Whether the work is done (whether rule)

conditions for the work

e.g., we check with the DMV for all drivers

Common Rule Types: Templates for the Sources of Poor Performance

...continued

Sequence in which work is done (what order rule)

relative timing

e.g., we complete design before beginning tooling

To what degree the work is done (how much rule)

the level of effort

e.g., we price based on exact usage

With what frequency the work is done (how often rule)

periodicity

e.g., we make forecasts monthly