
The System Archetypes

By William Braun

Abstract

The Systems Archetypes describe common patterns of behavior in organizations. As diagnostic tools they provide insight into the underlying structures from which behavior over time and discrete events emerge. As prospective tools, they alert managers to future unintended consequences. Collectively they challenge managers to consider the merits of fundamental solutions by making time an explicit variable in decision making.

The System Archetypes are highly effective tools for gaining insight into patterns of behavior, themselves reflective of the underlying structure of the system being studied. The archetypes can be applied in two ways - diagnostically and prospectively.

Diagnostically, archetypes help managers recognize patterns of behavior that are already present in their organizations. They serve as the means for gaining insight into the underlying systems structures from which the archetypal behavior emerges. This is the most common use of the archetype.

Archetypes are effective tools for beginning to answer the question, “Why do we keep seeing the same problems recur over time?”

Archetypes are also useful prospectively for planning. As managers formulate the means by which they expect to accomplish their organizational ends, the archetypes can be applied to test whether policies and structures under consideration may be altering the organizational structure in such manner as to produce the archetypal behavior. If managers find this to be the case, they can take remedial action before the changes are adopted and embedded in the organization’s structure.

Archetypes and Modeling

Archetype are useful for gaining insight into the “nature” of the underlying problem and for offering a basic structure or foundation upon which a model can be further developed and constructed. The archetypes are rarely sufficient models in and of themselves. They are generic in nature and generally fail to reveal important variables that are part of the real system structure of a specific organization. Without an explicit awareness of these real variables, it is difficult for managers to pinpoint specific leverage points where changes in structure can achieve sustainable changes in system behavior.

THE ARCHETYPES

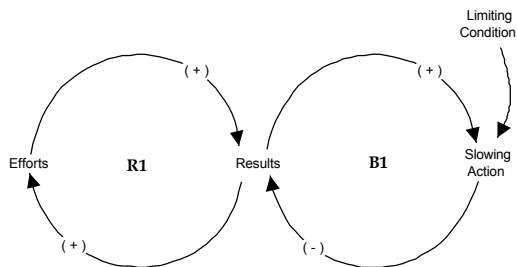
Ten archetypes are generally acknowledged as forming the set of tools that reveal patterns of behavior in systems.

- Limits to Growth (aka Limits to Success)
- Shifting the Burden
- Eroding Goals
- Escalation
- Success to the Successful
- Tragedy of the Commons
- Fixes that Fail
- Growth and Underinvestment
- Accidental Adversaries
- Attractiveness Principle

Each of the archetypes will be illustrated and discussed, along with general guidelines, prescriptive action(s) and a set of seven steps that are useful for applying the archetypes for successful managerial interventions.

Limits to Growth

Limits to Growth was introduced by Donella Meadows, Dennis Meadows, Jørgen Randers and William Behrens in 1972 in their book of the same name². The book has spawned a generation of “World” models that critically examine the policies that deplete natural resources over long periods of time, arguing that we are sowing the seeds of our own future destruction.



Generic Archetype

The theory is not without its challengers and detractors. Nevertheless, it does put forth the premise that growth cannot continue unabated in an unrestricted reinforcing dynamic.

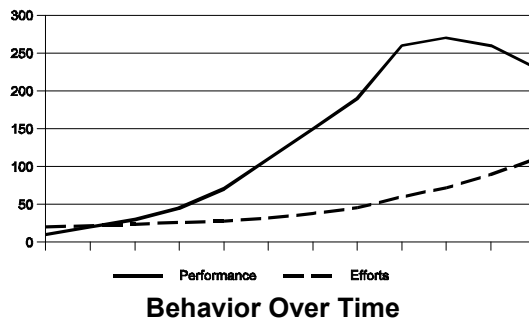
In simple terms, the lesson from Limits to Growth is that something always pushes back. There is no such thing as unrestricted positive reinforcing behavior. There are always limits that eventually make themselves known and felt.

Dynamic Theory³

This archetype states that a reinforcing process of accelerating growth (or expansion) will encounter a balancing process as the limit of that system is approached. It hypothesizes that continuing efforts will produce diminishing returns as one approaches the limits.

Behavior Over Time

Efforts to grow an effect are successful in initial stages, perhaps exponentially so. However, as the limits to growth are approached, the growth engine begins to lose its effectiveness and the rate of growth begins to flatten. In the end, despite continued pressure from the growth engine, the rate of growth stops and then reverses.

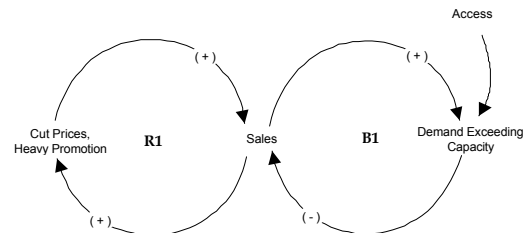


Application⁴ - Planning

If we don't plan for limits, we are planning for failure. This archetype shows that being successful can be just as dangerous to long-term health as being unsuccessful. By mapping out the growth engines and potential danger points in advance, we can anticipate future problems and eliminate them before they become a threat.

Example

America-On-Line experienced initial success on a fee-per-minute business model. Their competition offered a flat-rate for connecting and accessing the internet. In an effort to both recapture their eroding market share and grow subscribers, AOL began an aggressive marketing campaign, flooding the market with CDs designed to make subscribing and connecting easy and attractive.



The campaign was an enormous success, so much so that the demand completely overwhelmed their technical capacity to deliver service. Not only were new subscribers alienated, so too were existing subscribers who left in significant numbers.

Prescriptive Action⁵

- Focus on removing the limit (or weakening its effect) rather than continuing to drive the reinforcing process of growth.
- Use the archetype to identify potential balancing processes *before* they begin to affect growth.
- Identify links between the growth processes and limiting factors to determine ways to manage the balance between the two.

Seven Action Steps⁶

- Identify the growth engines.
- Determine the doubling time of those processes.
- Identify potential limits and balancing loops
- Determine change required to deal effectively with the limits identified.
- Assess the time needed to change. Is there a discrepancy between the doubling time and the changes required to support growth?
- Balance the growth. Identify strategies for achieving system balance.
- Reevaluate the growth strategy. Continuously challenge assumptions.

What Does This Really Mean?

Managers are encouraged to be “action oriented” and “proactive”, constantly engaged in the process of pushing on people and situations to make them change or move. Typically, they focus their attention on the sphere of activity in the organization that coincides with their title and job description.

The Limits to Growth archetype (or Limits to Success as it applies) reminds managers to take the time to examine what might be pushing back against their efforts. The counter-force may come, and most likely will come, from either (a) parts of the organization not under the control of the manager or (b) from the external environment. Expansionistic thinking is a key competency for locating Limits to Growth.

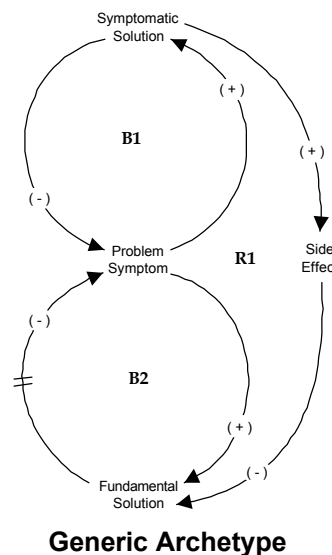
By focusing their attention on these limits, managers may find opportunities to either continue the improvement curve they were on, or identify the elements in the system that represent the counter-force and devise new improvement initiatives that would reduce or remove the limits.

Shifting the Burden

Shifting the Burden is the first of several archetypes that illustrate the tension between 1) the attraction (and relative ease and low cost) of devising symptomatic solutions to visible problems and 2) the long-term impact of fundamental solutions aimed at underlying structures that are producing the pattern of behavior in the first place.

The tension between the two is understandable. Long-term solutions tend to demand deep understanding and learning about the underlying problem, take a long time to formulate, require a relatively large, up-front commitment of funds, and test managers' patience. All this in the face of pressures from many angles that demand that managers fix problems promptly and move on.

The essence of Shifting the Burden is that once the symptomatic solution (which by contrast requires less understanding, is easier to formulate, is relatively less expense - in the short run - and produces instant gratification) has had its effect, there is little perceived need to pay any more attention to the fundamental, underlying systemic problem.



Generic Archetype

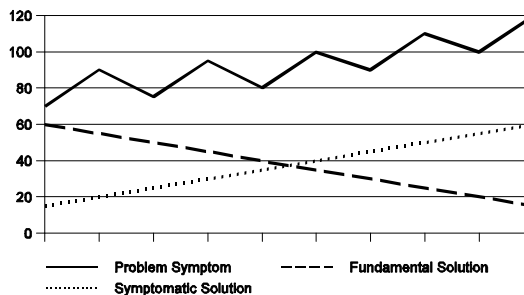
Dynamic Theory

This archetype states that a problem symptom can be resolved either by using a symptomatic solution or applying a fundamental solution. It hypothesizes that once a symptomatic solution is used, it alleviates the problem symptom and reduces pressure to implement a fundamental solution, a side effect that undermines fundamental solutions.

Behavior Over Time

Shifting the Burden is one example of how management intervention works. Each time an intervention is aimed at problem symptoms, some temporary improvement in performance is experienced (this assumes a well planned intervention).

The underlying problem persists however and the reappearance of problem symptoms invariably happens.



Behavior Over Time

Application - Break Organizational Gridlock

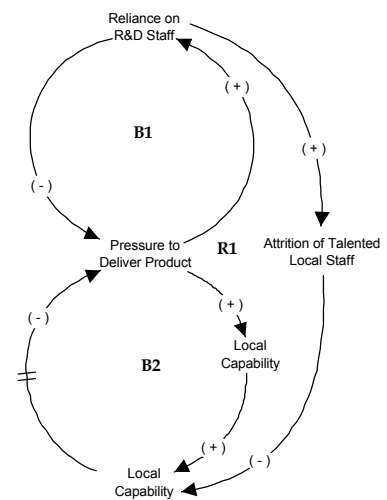
Organizational gridlock can be caused by interlocking "Shifting the Burden" structures, as one function's "solution" creates problems in an other area. The archetype provides a starting point for breaking gridlock by identifying chains of problem symptoms and solutions that form walls between functions, departments, or divisions.

Example

A manufacturing facility experiences periodic problems reaching production targets as a result of difficulties making adjustments to changing production requirements. Each time the R&D people, who know the product very well, are called upon to fix the problem. When the problem symptoms disappear, the incentive to fix the underlying problem likewise disappear. Additionally, since the production staff has received no training to improve their ability to respond to the problems, they feel disaffected and leave.

Prescriptive Action

- Focus on the fundamental solution. If necessary, use the symptomatic solution only to gain time while working on the fundamental solution.
- Elicit multiple viewpoints to differentiate between fundamental and symptomatic solutions and to gain consensus around an action plan.
- Use the archetype to explore potential side-effects of any proposed solution.



Example: Manufacturing Facility

Seven Action Steps

- Identify the original problem symptom.
- Map all “quick fixes” that appear to be keeping the problem under control.
- Identify the impact of the symptomatic solutions on other parts of the system.
- Identify fundamental solutions. Develop multiple perspectives.
- Map side-effects of quick fixes that may be undermining the usability of the fundamental solution.
- Find interconnections to fundamental loops. Find links between the interaction effects and the fundamental solution that may be causing gridlock.
- Identify high-leverage actions from both perspectives.

What Does This Really Mean?

Shifting the Burden is an example of creative tension⁷ at work. The archetype draws attention to the gap between the pressures to perform in the short-term with the insights and long-term sustaining decisions to which systems managers seek to respond.

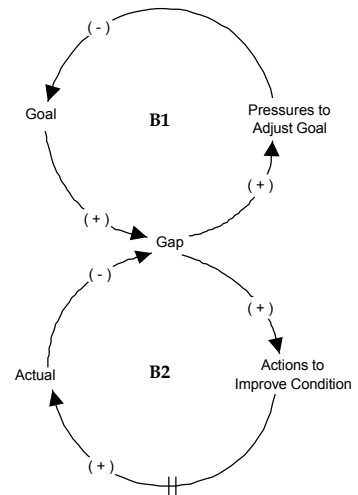
It also points to the critical importance of developing patience as one of the skills that systems managers include in their Personal Mastery of competencies. It illustrates the challenge and difficulty of demonstrating forward-thinking leadership in the face of mounting pressure to “fix it” and “get on to the next problem”.

Without a clear and convincing picture in the manager’s mind’s eye (Personal Vision) as well as in the collective mind’s eye of everyone (Shared Vision), the pressure to go for the quick fix may overwhelm the manager, condemning her/him to a recurring pattern of interventions that aim to solve the same set of problem symptoms.

Eroding Goals

Eroding Goals shares a basic similarity with Shifting the Burden - the dynamic tension between a symptomatic solution and a fundamental one. In the case of Eroding Goals, managers are faced with performance that fails to meet a stated goal. They seek a rationale (the symptomatic solution) for changing the goal to one that appears to be more attainable rather than rigorously determining what prevents the organization from performing as originally expected (the fundamental solution).

Unlike other archetypes, Eroding Goals examines dynamic behavior in the present that is the result of forecasts of the future made in the past. The argument for adjusting the goal is not without merit - the future cannot be known with certainty, so if the forecast turned out to be wrong, what is the harm in making adjustments that reflect current knowledge about reality? Without some objective metric to autonomously assess performance, against some benchmark for example, the temptation to lower goals is difficult to challenge - no measurement, no data, no problem.



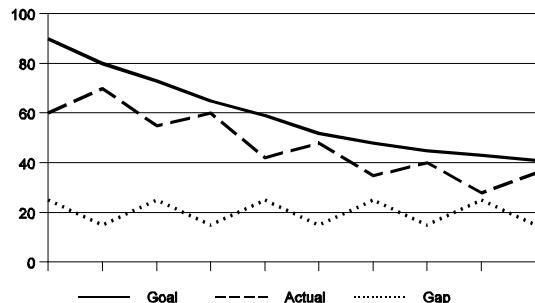
Generic Archetype

Dynamic Theory

This archetype states that a gap between a goal and an actual condition can be resolved in two ways: by taking corrective action to achieve the goal, or by lowering the goal. It hypothesizes that when there is a gap between a goal and a condition, the goal is lowered to close the gap. Over time, lowering the goal will deteriorate performance.

Behavior Over Time

Eroding goals has a long term effect on goal setting within the organization. Each time goals are adjusted downward in the organization, a reinforcing dynamic occurs which anchors a lax orientation to goal setting in the culture of the organization. After some period of time, the organization finds itself aiming lower and lower to ensure that its goals are always met.



Behavior Over Time

Application - Stay Focused on Vision

Various pressures can take our attention away from what we are trying to achieve. This archetype helps explain why an organization is not able to achieve its desired goals. Used as a diagnostic tool, it can target drifting performance areas and help organizations attain their visions.

Example

Quality standards are common in organizations. If a gap occurs between what the organization targeted and its actual performance, a tension develops between pressure to live up to standards and the pressure to roll the standards back to something achievable.

If the quality standard is anchored to an internal perception of customer expectations rather than an industry standard (what the competition is doing) there is the risk that the pressure to scale back the standard will prevail.

Prescriptive Action

- Anchor goals to an external frame of reference to keep them from sliding (i.e., a benchmark or the voice of the customer).
- Determine whether the drift in performance is the result of conflicts between the stated goal and the implicit goals of the system (such as current performance measures).
- Establish a clear transition plan from current reality to the goal, including a realistic time frame for achieving the goal.

Seven Action Steps

- Identify drifting performance measure.
- Look for goals that conflict with the stated goal.
- Identify standard procedures for closing the gap.
- Examine the past history of the goal. Has the goal itself been lowered over time.
- Anchor the goal to an external reference.
- Clarify a compelling vision that will involve everyone.
- Create a clear transition plan.

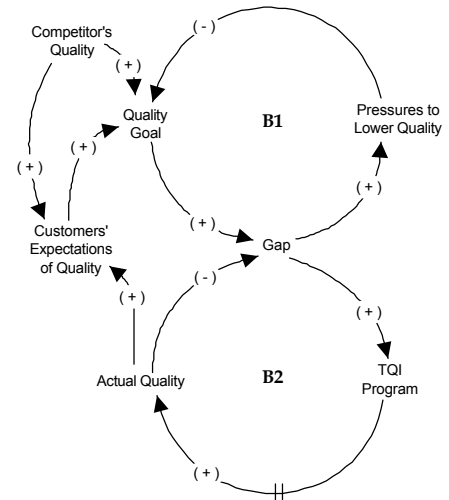
What Does This Really Mean?

Eroding Goals has two important ramifications for systems managers. First, the immediate short-term effect is the failure to critically examine the underlying causes that explain why 1) performance is lacking and 2) managers feel pressure to revise goals to match what the organization is currently capable of achieving.

Second, repeatedly falling into the trap of Eroding Goals eventually becomes embedded in the organization's culture as a justifiable and even reasonable thing to do. Over time, the organization falls farther and farther behind the expectations of its customers and eventually fails altogether.

On the other hand, how do managers assess whether the original goals were attainable? What about managers who repeatedly set goals that everyone knows are unattainable and uses them as catalysts to prod people into higher and higher levels of performance?

What about events in the external environment that could not have been predicted and that may be legitimate grounds for revising goals downward? What about goals that turn out to be mistakes in judgement or weaknesses in the forecasting process?



Example: Internal Quality Standards

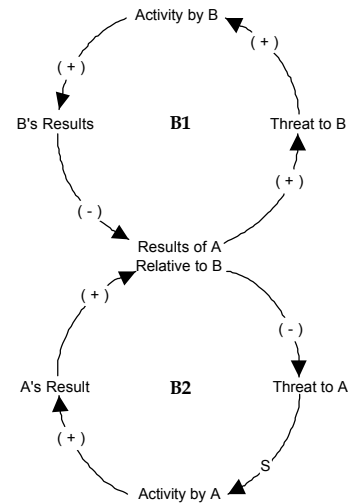
Since there are (potentially) legitimate reasons to adjust goals downward, systems managers must take extreme caution when considering an adjustment to goals. The two most important considerations are 1) an honest and rigorous examination of the organization itself and 2) an equally candid look at competitors and their performance, and at customers and their expectations.

Escalation

A commonly held belief of competition is mounting an appropriate response to the actions of competitors (a) to sustain one’s own competitive advantage, (b) to maintain momentum toward gaining competitive advantage, or (c) because that’s what managers are supposed to do.

The Escalation archetype presents an irony of management - in the name of protecting and/or furthering the best interests of their organization, managers engage in escalating behavior to the point where they harm their organizations and reduce the value to customers, stakeholders and shareholders.

The archetype also presents an opportunity to think expansionistically, the behavior described by the archetype itself being the [at least partial] result of reductionistic thinking. By expanding their view, managers may find the means through which an encompassing, unifying or overarching goal may be established whereby they discover and option to the perceived need to resort to escalation as a primary competitive response.



Generic Archetype

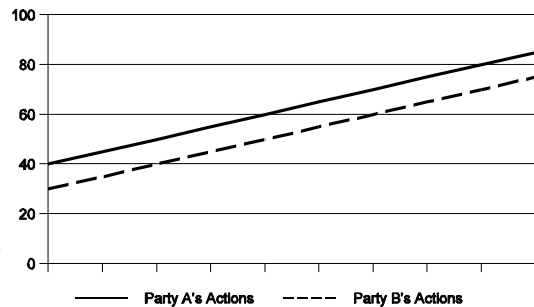
Dynamic Theory

The Escalation archetype occurs when one party’s actions are perceived by another party to be a threat, and the second party responds in a similar manner, further increasing the threat. It hypothesizes that the two balancing loops will create a reinforcing figure-8 effect, resulting in threatening actions by both parties that grow exponentially over time.

Behavior Over Time

The behavior of escalation is relatively simple and predictable. The actions (and reactions) of each party are similar in nature, though they become increasingly competitive as time goes by.

What the Behavior Over Time graph does not illustrate is the potential for collapse if the escalation goes on for too long.



Behavior Over Time

Application - Competition

One of the reasons we get caught in escalation dynamics may stem from our view of competition. This archetype suggests that cutthroat competition serves no one well in the long run. The archetype provides a way to identify escalation structures at work and shows how to break out of them or avoid them altogether.

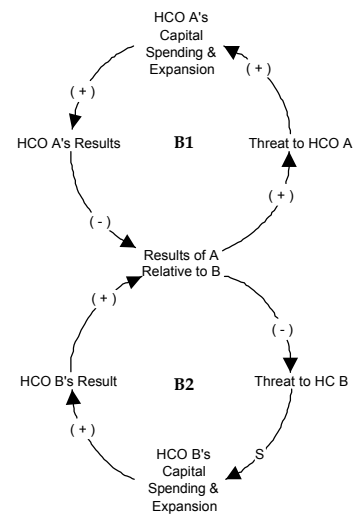
Example

In the health care industry, especially in a geographically defined market, it is not uncommon for competitors to engage in a campaign of erecting buildings as a tactic for securing market share. Each facility is seen as a threat by the competitor, who after some delay, will respond in kind. This can continue for some time until the cost of doing so becomes prohibitive and the escalation stops.

This may result in one competitor's eventual market dominance (if it had the resources to support the construction boom) or in one competitor's collapse due to overextending itself financially.

Prescriptive Action

- Identify the relative measure that is pitting one party against another, and explore ways it can be changed or other ways the parties can differentiate themselves in the market place.
- Quantify significant delays in the system that may be distorting the nature of the threat
- Identify a larger goal that encompasses the individual goal of both parties.



Example: HCO Expansion

Seven Action Steps

- Identify the competitive variable. Is a single variable the basis of differentiation between competitors?
- Name the key actors in the dynamic.
- Map what is being threatened. Are your actions addressing the real threat or preserving a status quo value which may no longer be relevant?
- Reevaluate competitive measure. Can the variable that is the foundation of the game be shifted?
- Quantify significant delays that may be distorting the nature of the threat.
- Identify a larger goal encompassing both parties' goals.
- Avoid future Escalation traps by creating a system of collaborative competition.

What Does This Really Mean?

This archetype is difficult to apply - it appears to strike at the heart of the core tenets of free enterprise. Thinking and/or behaving any other way could have ramifications for the manager and the firm - engaging in anti-trust practices for example.

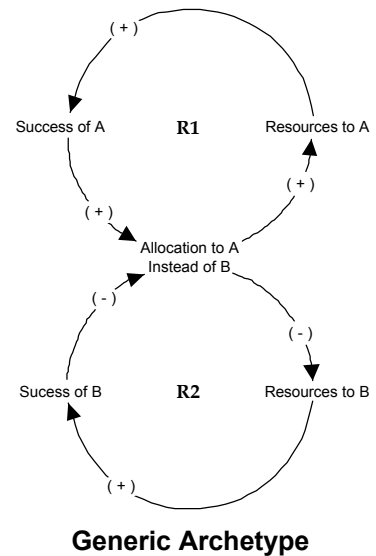
It may be that this archetype may find its value in the public policy arena, or in industry and/or community based assessments of the needs, expectations and requirements of customers and other stakeholder constituencies.

Success to the Successful

A common piece of wisdom is not to throw good money after bad. In managerial terms this archetype is often the basis for citing the “80/20” rule.

The Success to the Successful archetype describes the common practice of rewarding good performance with more resources in the expectation that performance will continue to improve. There is a belief that the successful [people, departments, products, etc.] have “earned” their increasing share of resources through past performance.

The potential downside to this assumption is the continued under-performance of people, departments or products that perform at their current level through no intrinsic lack of skill or capability. In other words, current performance may be a better reflection of the initial or starting conditions than they are of true ability for commitment to top performance.



In practice, one cannot conclude one way or another that a performance gap between two people, departments or products is or is not attributable to a bona fide performance gap simply from taking this archetype into account. The true value of the archetype is to raise the question. With the question on the table, carefully tracing the history of the gap will frequently provide valuable insights into the origin of the gap in the first place.

If the gap can be explained as one person, department or product truly performing better, through his/her/its own intrinsic merits, then managers can make operational or strategic decisions with the full knowledge that the long-term interests of the firm are well served.

On the other hand, managers may discover that current performance is more a matter of initial conditions and, with sound planning, careful resource allocation and good execution, under-performing people, departments or products can be transformed into winners, likewise for the long-term best interests of the firm.

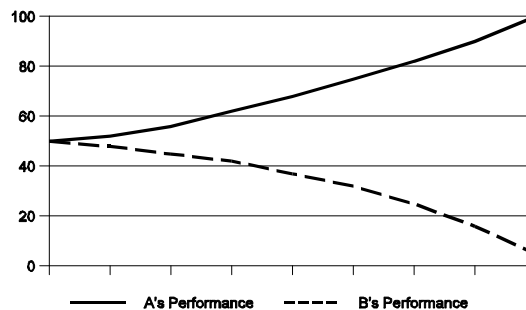
Dynamic Theory

The Success to the Successful archetype states that if one person or group (A) is given more resources than another equally capable group (B), A has a higher likelihood of succeeding. It hypothesizes that A’s initial success justifies devoting more resources to A, further widening the performance gap between the two groups over time.

Success to the Successful rewards the winner of competition with the means to win again; it may also penalize the losers.

Behavior Over Time

A dynamic of success to the successful can be identified from trended data by looking for diverging patterns when individuals, departments or products are examined. As resources are diverted to the successful party, their success improves even more. Correspondingly, the other party's performance, as resources are diverted from it, continues to erode.

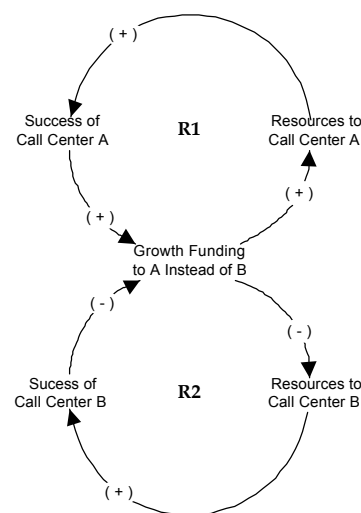


Application - Avoid Competency Traps

This archetype suggests that success or failure may be due more to initial conditions than intrinsic merits. It can help organizations challenge their success loops by “unlearning” what they are already good at in order to explore new approaches and alternatives.

Example

Two call centers are established in different parts of the country. Some rationale for resource allocation results in one of them experiencing better performance than the other. Not only is the lesser performer looked down upon, but its lack luster performance is cited as a sound rationale not to put any more resources into it.



Example: Call Centers

Prescriptive Action

- Evaluate the current measurement systems to determine if they are set up to favor established practices over other alternatives.
- Identify goals or objectives that will refocus the definition of success to a broader system.
- Calibrate internal views of market success against external indicators to identify potential competency traps.

Seven Action Steps

- Investigate historical origins of competencies; identify potential competency traps.
- Investigate initial conditions and the origin of the rules.
- Evaluate current measurement systems; are they set up to favor current systems over other alternatives?
- Map internal views of market success. What are the operating assumptions around success in the market?
- Obtain external views of market success. Ask “outsiders” for alternative strategies.
- Assess effects on the innovative spirit. Is the current system excluding or limiting the spirit of experimentation that will lead to a new alternative.
- Continually scan for gaps and areas for improvement.

What Does This Really Mean?

Managers should exercise caution before quickly concluding that intrinsic merit is a complete explanation for good performance. This archetype may also reveal in depth the axiom that “we manage what we measure”. Stated otherwise, are the measurements that have historically been used to assess performance still relevant? Are they still accurate? Is there an increased level of “noise” in the data that is used for decisions making? Have delays in information caused managers to reach conclusions that appear to favor one person, department or product over another, when in fact refining measurements to better reflect what customers think, want and/or need would offer a different view of performance?

Finding itself bogged down in this archetype can also lead to the erosion of innovation and change. Concluding that “this is our best product” and “we have to stay with it” because it is the best performer (at present) can obscure a long, slow decline in the product’s position in the market. Taking a fresh look at “marginal” performers, in a new light, may lead to insights that can rejuvenate an organization’s approach to its internal management, its products or to its customers.

Tragedy of the Commons

The Tragedy of the Commons provides unique insights into the effect that an un-systemic approach to organizational structure can have on overall, long-term performance.

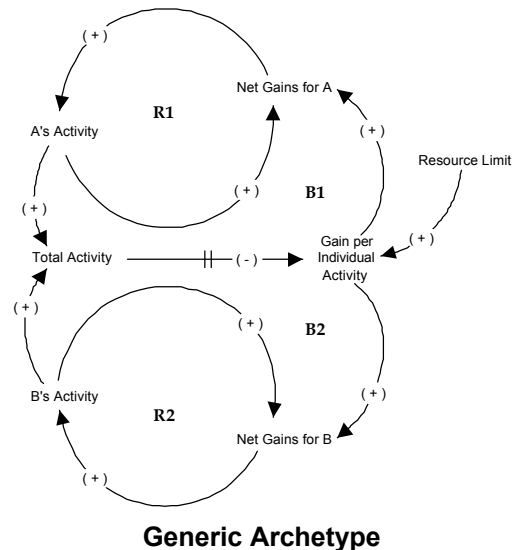
The commons in an organization is a resource (people, materials, space, tools, etc.) that is simultaneously made available to multiple people and/or teams. The initial rationale for creating the commons is typically economies of scale.

As each person or team claims their “share” of the commons, within the context of the goals and objectives that they have set for themselves, they regard the commons as being uniquely available for their own purposes. Although their lack of awareness of the demands other people or teams place on the commons are not the result of thoughtless disregard, the effect on the commons is the same.

As each person or team increases their demands and expectations of the commons in the name of their own goals, the commons itself finds itself under steadily increasing pressure to perform while simultaneously feeling that its control over its own destiny steadily erodes toward collapse. In the case of commons such as materials or space, there is no conscious awareness of increased demand, but the concrete, physical limitations have no elasticity, and the satisfaction of people or teams placing demands on the commons erodes.

As aggregate performance of the commons slides, several consequences can be felt in the organization. One, individual or team performance declines as the erosion of the commons affects their ability to meet individual goals and objectives.

Two, aggregate organizational performance erodes as the interaction and interdependency of multiple individual and/or team performance begins to reflect the declining performance of the individuals or teams.



Three, organizational goals themselves begin to erode and to reflect the diminished ability of the commons to support the goals and objectives of the individuals and teams that depend on the commons. This can have far reaching consequences in terms of the firm's competitive advantage in the markets in which it competes.

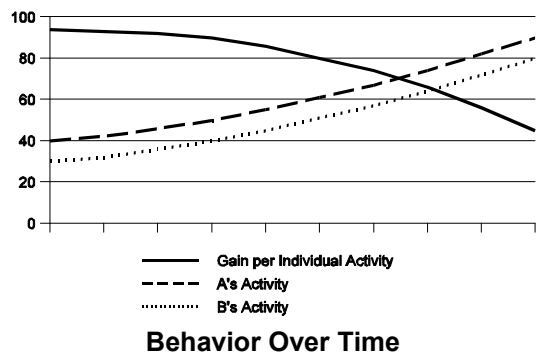
Four, the commons itself deteriorates as a valued and valuable resource to the point where it is regarded as a cause of failure rather than success. When these perceptions become embedded in people's collective assumptions, they can lead to deep beliefs about the organization and its ability (and willingness) to be successful in the long-term.

Dynamic Theory

This archetype identifies the causal connections between individual actions and the collective results (in a closed system). It hypothesizes that if the total usage of a common resource becomes too great for the system to support, the commons will become overloaded or depleted and everyone will experience diminished benefits.

Behavior Over Time

Any time a declining trend is seen in the overall performance of each part of the system even as it increases its demand on common resources, there is a good possibility that a Tragedy of the Commons is taking place. This is often accompanied by puzzlement, as each party placing demands on the system cannot understand why their demands are not being met, which typically results in the party increasing its demands yet further. This may continue until the commons collapses.

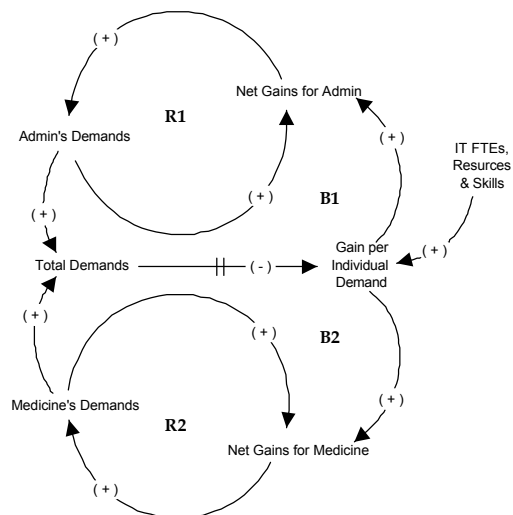


Application - Resource Allocation

In this archetype situation, the complex interaction of individual actions produces an undesirable effect, such as the depletion of a common resource. The archetype can be used to help connect the long-term effects of individual actions to the collective outcome, and develop measures for managing the common resource more effectively.

Example

IT resources are typically organized into a "commons" department, with each part of the organization seeking their support on an as-needed basis. Since separate parts of the organization typically do not keep track of the IT problems in other parts of the organization, it is fairly common for each part of the organization to see the IT department as "its own". When the IT department is crushed under the weight of all the demands placed upon it, its performance for every department begins to erode or fail.



Example: IT Project Requests

Prescriptive Action

- Establish methods for making the cumulative effects of using the common resource more real and immediate to the individual players.
- Re-evaluate the nature of the commons to determine if there are ways to replace or renew (or substitute) the resource before it becomes depleted.
- Create a final arbiter who manages the use of the common resource from a whole-system level.

Seven Action Steps

- Identify the “commons”. What is the common resource that is being shared?
- Determine incentives. What are the reinforcing processes that are driving individual use of the resource?
- Determine the time frame for reaping benefits.
- Determine the time frame for experiencing cumulative effects of the collective action.
- Make the long-term effects more present. How can the long-term loss or degradation of the commons be more real and present to the individual users?
- Reevaluate the nature of the commons. Are there other resources or alternatives that can be used to remove the constraint upon the commons?
- Limit access to resources. Determine a central focal point - a shared vision, measurement system, or final arbiter - that allocates resources based on the needs of the whole system.

What Does This Really Mean?

In many respects the Tragedy of the Commons is a classic example of reductionistic thinking. By remaining unaware of the effect of the parts on the whole, people continue to think and behave as though there are no connections within the organization that affect their ability to meet goals and objectives. Focused on their own part, behaving as though it depended on no other, demands on the commons are issued with only the present in mind.

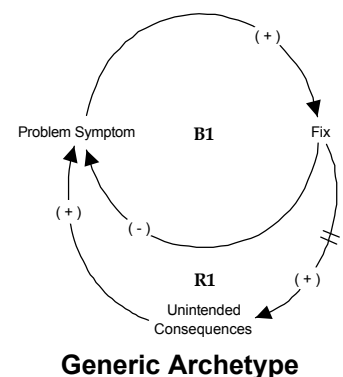
Sustainability is increasingly put forward as a guiding principle for the planet we inhabit. Sustainability has applications within organizations, with respect to their structure and practices, with an eye on the long-term future. Structures that create commons and policies and practices that govern them (leading to depletion or replenishment) are critical success factors.

Ultimately, firms may conclude that structures that include a commons are ineffective means of distributing and allocating resources. Alternately, they may gain insight into how commons have to be governed, and recognize that structures and policies, other than the commons itself, all interact and have a pronounced effect upon the utility the commons bring to organizations.

Fixes that Fail

When managers find themselves saying, “I thought we fixed this - why is it worse than it was before?”, the Fixes that Fail archetype may be at work in the organization. This archetype is also a good reflection of the perils of reductionistic thinking - despite their best efforts (good try’s that miss the mark) managers find themselves dealing with the same problem symptoms, albeit in a variety of different colors and flavors, over and over again.

When problem symptoms are assumed to be a unique set of circumstances that exist in their own (relatively) small, isolated subsystem, unconnected to other problem symptoms



or other parts of the larger whole system, it is reasonable to assume that focusing one's attention on the problem symptom is (a) a reasonable response and (b) one that will be effective.

Fixes that Fail bears a strong resemblance to Shifting the Burden, in that the managerial response is primarily aimed at the problem symptom rather than spending time on the more difficult and time consuming task of identifying the underlying, systemic problem (or as is more often the case, the system of problems).

The difference between Shifting the Burden and Fixes that Fail lies in the unintended consequence that emerges from the quick-fix that functions as a reinforcing loop, exacerbating the initial problem symptom. By contrast, the Shifting the Burden archetype suggests that while the fundamental problem will not have been addressed, the repeated intervention in response to the problem symptom(s) may still have some palliative effect for a limited time.

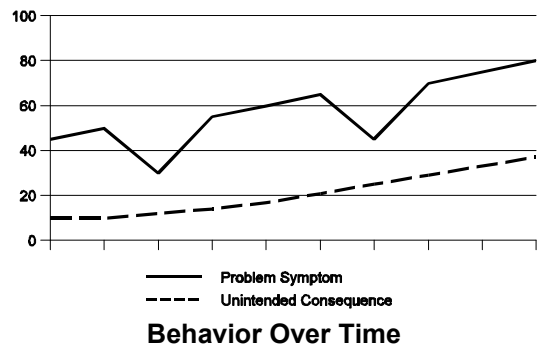
The Fixes that Fail archetype displays a steadily worsening scenario, where the initial problem symptoms are worsened by the fix that is applied to them. The reinforcing loop, which contains a delay, contributes to a steadily deteriorating problem symptom, not in spite of the fix (which is the case with Shifting the Burden) but because of it.

Dynamic Theory

This archetype states that a quick-fix solution can have unintended consequences that exacerbate the problem. It hypothesizes that the problem symptom will diminish for a short while and then return to its previous level, or become even worse over time.

Behavior Over Time

The classic behavior over time for Fixes that Fail is the trend that illustrates that management intervention appears to have a beneficial effect, even as the long-term trend continues to deteriorate. Likewise there is an accumulation of side effects that take on lives and energy of their own, each of which consumes time and resources that could otherwise be devoted to fixing the "original" problems.

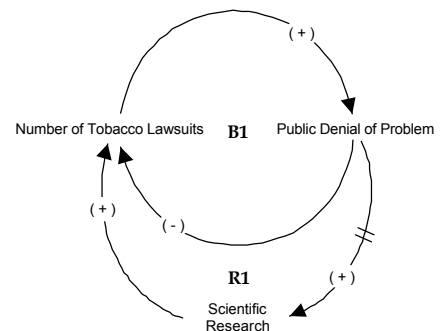


Application - Problem Solving

Almost any decision carries long-term and short-term consequences, and the two are often diametrically opposed. This archetype can help you get off the problem solving treadmill by identifying fixes that may be doing more harm than good.

Example

For years the tobacco industry steadfastly denied that there were any ill health effects from smoking, pouring vast amounts of money into advertising and a pattern of denials. The tactic served the industry well. However, each time it denied that smoking caused health problems, it stiffened the resolve of scientists, and research into the effects of smoking on health steadily grew. Ultimately, the amount of evidence grew so large that no amount of PR or advertising could overcome the industry's claims.



Example: Tobacco Industry

Prescriptive Action

- Focus on identifying and removing the fundamental cause of the problem symptom.
- If a temporary, short-term solution is needed, develop a two-tier approach of simultaneously applying the fix and planning out the fundamental solution.
- Use the archetype to map out potential side-effects of any proposed intervention.

Seven Action Steps

- Identify problem symptom(s).
- Map current interventions and how they were expected to rectify the problem.
- Map unintended consequences of the interventions.
- Identify fundamental causes of the problem symptoms.
- Find connections between both sets of loops. Are the fixes and the fundamental causes linked?
- Identify high-leverage interventions. Add or break links in the diagram to create structural interventions.
- Map potential side-effects for each intervention in order to be prepared for them (or to avoid them altogether).

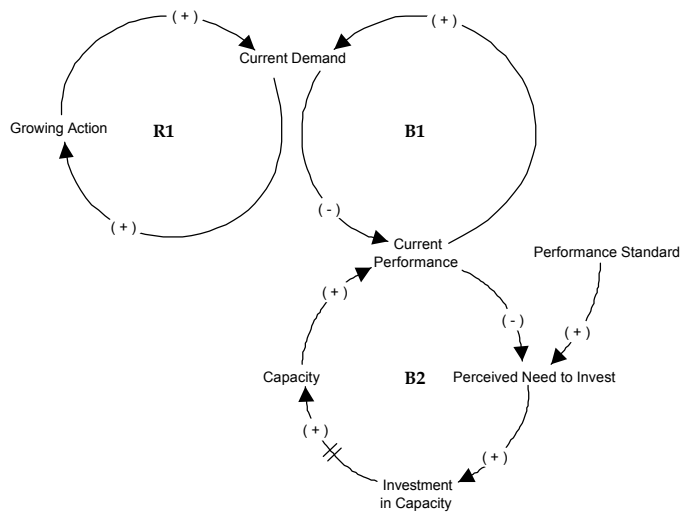
What Does This Really Mean?

The key to appreciating the Fixes that Fail archetype is the delay in the balancing loop. The time that elapses between the fix and the worsening problem symptoms frequently makes the connection between the fix and the deteriorating problem symptoms hard to identify. Managers tend to attribute the worsening problem symptom to something other than the prior decision(s) they made in their efforts to fix the problem symptom(s).

Despite its apparent simplicity, Fixes that Fail can be devilishly hard to unravel. It requires a deep commitment to setting aside mental models that may strongly influence managers not to see, or even consider, that there may be a connection between the problem symptoms that are visible and the fix(es) they are applying in an effort to alleviate the problem symptoms.

Growth and Underinvestment

The Growth and Underinvestment archetype builds upon Limits to Growth by explicitly addressing a firm's need to invest in its own resources, capabilities and core competencies. A growing action seeks to stimulate and reinforce demand while the firm's current performance level may behave as the limit to its growth. Similar to Limits to Growth, if current performance is adversely affecting demand, no amount of growing action will overcome customers' reluctance to reward the organization with sales.



Unique to Growth and Underinvestment is the long-term requirement to continue to keep its capabilities and core competencies at a level that ensures its competitive advantage. There are several characteristics of the investment balancing loop that are critical from a managerial decision making point of view.

First, although performance standards are presented as a constant (no causal influences are working on it), they themselves may be subject to the Eroding Goals archetype. This may be situational or it may be a trend that has developed over long periods of time, as the organization loses confidence in its own ability to perform at the level of customer needs and expectations.

Second, when coupled with the firm’s current performance, performance standards combine to exert a corrosive influence on the perceived need for investment. At any given performance standard (regardless of any declining trend it may be exhibiting over time), if current performance is falling short, the adage, “why throw good money after bad” can gain a hearing within the organization.

Third, as confidence declines, so too may investment itself. Additionally, declining performance leads to declining revenue which in turn reduces cash available for investment.

Fourth, even if the organization makes an investment, if it has not anticipated the delay in bringing the increased capacity and capability on line, it may turn out to be a long run for a short slide.

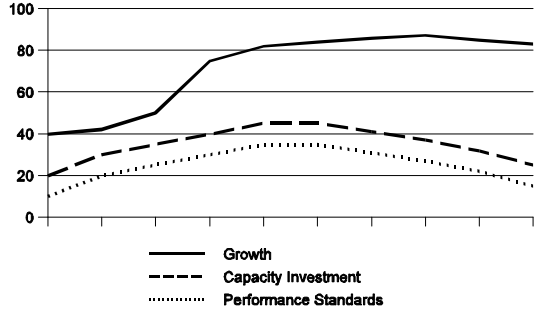
Dynamic Theory

This archetype applies when growth approaches a limit that can be overcome if capacity investments are made. If a system is stretched beyond its limit, it will compensate by lowering performance standards, which reduces the perceived need for investment. It also leads to lower performance, which further justifies underinvestment over time.

Behavior Over Time

Data that shows declining performance and growth at the same time that the rate of investment is slowing or falling may signal that this archetype is at work.

Correspondingly, it is not uncommon for performance standards to erode as the degree of difficulty in reaching performance standards increases.

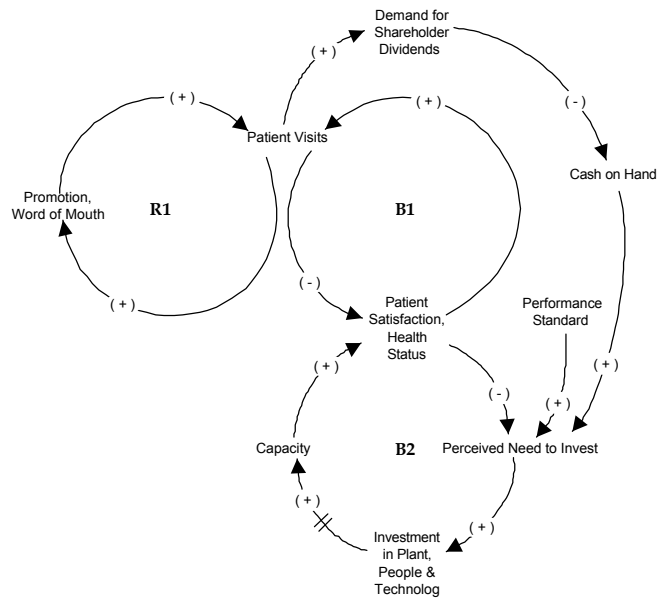


Application - Capital Planning

If demand outstrips capacity, performance can suffer and hurt demand. If this dynamic is not recognized, the decrease in demand can then be used as a reason *not* to invest in the needed capacity. This archetype can be used to ensure that investment decisions are viewed from a fresh perspective, rather than relying on past decisions.

Example

In private practice, shareholders historically treat the business firm as a wealth generator for their families. There is typically a tension between the desire to remove profits from the practice and the need to invest in infrastructure, especially technology. Over time, performance slips so far, that patients find it increasingly difficult to receive care at the practice, mostly for operational reasons (though clinical equipment and technology could likewise be affected.)



Prescriptive Action

- Identify interlocking patterns of behavior between capacity investments and performance measures.
- Shorten the delays between when performance declines and when additional capacity comes on line (particularly perceptual delays about the need to invest).
- Anchor investment decisions on external signals, not on standards derived from past performance.

Seven Action Steps

- Identify interlocking patterns of behavior between capacity investments and performance measures.
- Identify delays between when performance falls and when additional capacity comes on line.
- Quantify and minimize acquisition delays.
- Identify related capacity shortfalls. Are other parts of the system too sluggish to benefit from added capacity?
- Fix investment decisions on external signals, not on standards derived from past performance.
- Avoid self-fulfilling prophecies. Challenge the assumptions that drive capacity investment decisions.
- Search for diverse investment inputs. Seek new perspectives on products, services and customer requirements.

What Does This Really Mean?

Growth and Underinvestment is the archetype that brings special attention to planning for limits. In this case, it is the capabilities and core competencies that give firms their competitive advantage. This is part and parcel of strategic planning as well as internal policy formation.

It also draws attention to the insidious nature of the failure to meet customer demands over long periods of time - the constant (albeit hard to notice in any one period) decline in the firm's opinion of itself and in its commitment to, and ability to perform at, customer demands and expectations.

Accidental Adversaries

Accidental Adversaries is similar to the Escalation archetype in terms of the pattern of behavior that develops over time. It is different from it insofar as the intent of the parties is concerned. Accidental Adversaries begin their relationship with win-win goals and objectives in mind, generally taking advantage of their respective strengths, minimizing their respective weaknesses, with the objective of accomplishing together what cannot be achieved separately.

Unwittingly and unintentionally, one party (“the party of the first part”) takes an action that the other party (“the party of the second part”) interprets as outside the spirit, if not the letter, of their understanding. The “offended” party perceives that the action gives the “offending” party unfair advantage in the partnership (at best) or harms the “offended” party (at worst). The spirit of partnership turns to one of contentious adversaries, typically as a function of the mental model(s) each party holds. Rather than communicate and engage in dialogue, the offended party assumes (a) it knows everything there is to know about the action (including the foreknowledge that it was willful and hostile), (b) there is no point in discussing it, and (c) their only option is to right the wrong through retaliatory action.

In reality, the first party may not be aware of its action’s “harmful” or “hurtful” nature. When the second party retaliates, the first party is as surprised and wounded as the second party, and proceeds to make the same assumptions that the second party did. The first party’s recourse? Retaliate.

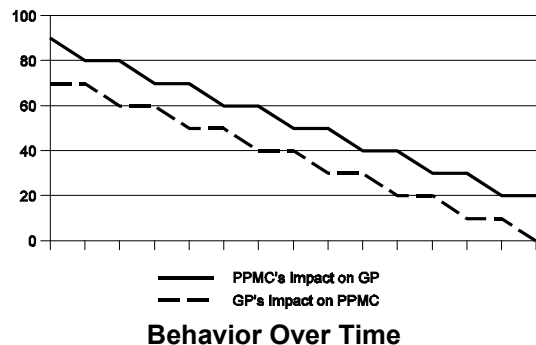
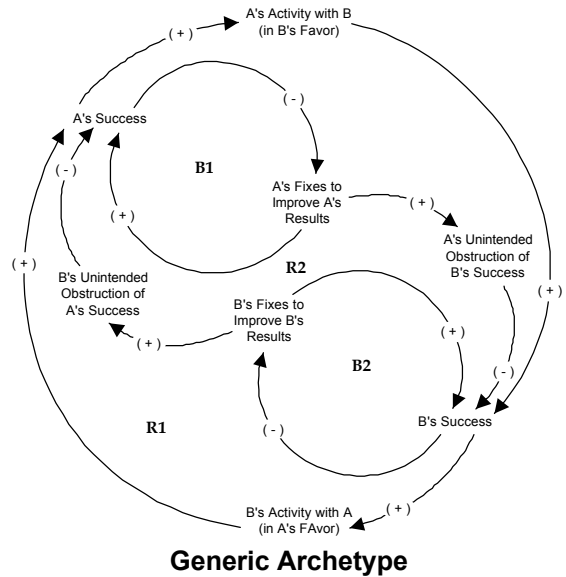
Once the adversarial (partnership turned sour) relationship takes hold, the behavior is very similar to the Escalation archetype. However, the outer reinforcing loop is still available to the parties should they suspend their mental models and engage in dialogue. The root of misunderstandings, unrealistic expectations, performance problems or mistakes can be revealed, giving the parties a fresh start on their partnership.

Dynamic Theory⁸

This archetype states that when teams or parties in a working relationship misinterpret the actions of each other because of misunderstandings, unrealistic expectations or performance problems, suspicion and mistrust erode the relationship. If mental models fueling the deteriorating relationship are not challenged, all parties may lose the benefits of their synergy.

Behavior Over Time

The trend of each of the adversaries follows a similar direction and rate of change, with one of the adversaries trailing the other (the delay as information travels through the systems and is interpreted). The pattern will



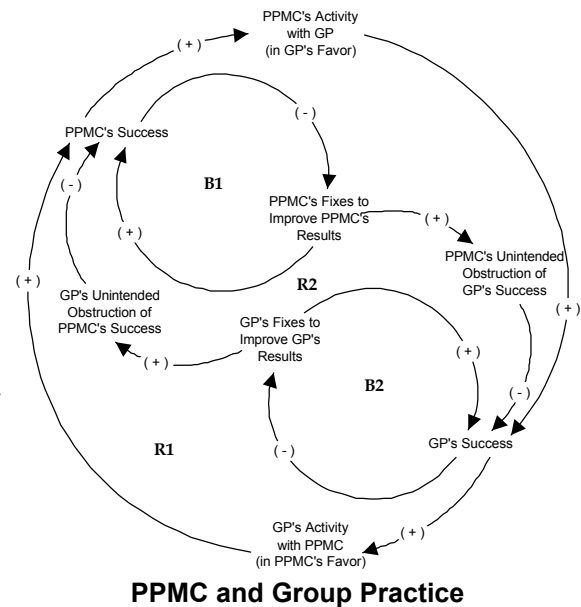
show periodic leveling periods, though overall the trend will be in a direction that adversely impacts both parties.

Application⁹ - Collaboration

Many cooperative efforts begin on a good note only to deteriorate over time, often as the need for collaboration deepens. This archetype helps the parties to a collaborative effort gain insight into how the actions of one party are filtered through mental models to produce unintended interpretations.

Example

In the early 1990's the Physician Practice Management Corporation industry emerged. PPMCs purchased the hard assets of a practice in return for a percent of revenue for operational services rendered. Initially the relationships fared well. Eventually however, when performance and growth lagged, physicians became uneasy with the relationships and began to interpret every move by the PPMC as potentially (or actually) injurious to their interests. The result was the downward spiral of both parties' interests.



Prescriptive Action¹⁰

- Revisit the original opportunity that brought the parties together into a collaborative relationship.
- Use the archetype to identify the origins of adversarial attitudes.
- Renew the Shared Vision of the collaborative effort and commit to Team Learning.

Seven Action Steps¹¹

- Reconstruct the conditions that were the catalyst for collaboration.
- Review the original understandings and expected mutual benefits.
- Identify conflicting incentives that may be driving adversarial behavior.
- Map the unintended side effects of each party's actions.
- Develop overarching goals that align the efforts of the parties.
- Establish metrics to monitor collaborative behavior.
- Establish routine communication.

What Does This Really Mean?

The lesson of Accidental Adversaries lies in the power of mental models to supply all too ready explanations of situations. Unless judgement is suspended these mental models can drive one, both or all parties to conclusions that bear remote resemblance to the underlying reason the "breach" in the relationship occurred in the first place, if indeed any breach actually took place.

There is also a lesson on Shared Vision in this archetype. The degree to which the parties hold a vision in common and have articulated their deep needs and expectations is a significant contributor to tempering reactions of the parties when breaches are perceived.

Breaches in the agreement(s) may happen; the probability of deteriorating into Accidental Adversaries is decidedly lower when the parties believe there are overarching values and objectives that unite them in Shared Vision.

Shared Vision will contribute insight to the extent that partners actually engage in helping fix problems (or problem symptoms) in their partner’s organization because of their understanding of the long-term impact their efforts will have on their own firm’s success. This suggests that Shared Vision is connected to a sense of mission higher than money, that a sense of purpose to customers and an underlying, shared sense of organizational values and culture must be the bedrock of the partnership in the first place.

The archetype also draws attention to Team Learning. If the partners in the venture adopt a principle of continuous joint improvement and learning, the probability that breaches to the partnership will happen in the first place is diminished, as well as a higher probability that if and when misunderstandings, unrealistic expectations or performance problems do occur, the parties will have mechanisms in place to meet each other half way and work them out.

Attractiveness Principle¹²

The Attractiveness Principle archetype is lesser known than those discussed above. References were found in *The Systems Thinker*¹³ and in *The Fifth Discipline Fieldbook*¹⁴, in articles both authored by Michael Goodman and Art Kleiner as part of their presentation of the “Archetype Family Tree” (see the following section). Gene Bellinger offers a variation of the Archetype Family Tree at the Outsights website¹⁵.

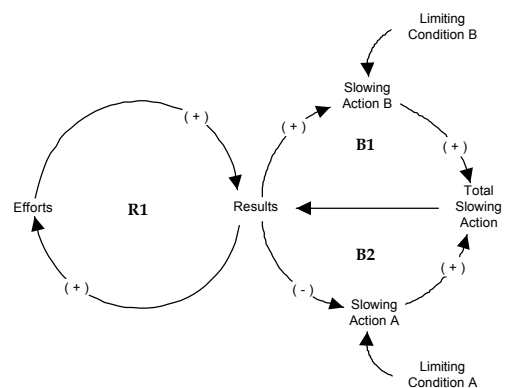
This archetype bears strong resemblance to Limits to Growth with the addition of multiple slowing actions. Each slowing action is a challenge the firm faces and which must be addressed if the firm is to overcome the aggregate limits to growth.

The archetype takes its name from the dilemma of deciding which of the limits to address first, that is, which is more attractive in terms of the future benefit to the desired results that are being pushed by the effort (or growing action).

With limited resources and multiple limits impeding growth, managers are faced with comparing the potential future value of removing or reducing each of the slowing actions, including any synergistic effect they may have in reducing or removing interdependent limiting conditions. In some cases the manager may have few options, given the resources available. The lesser ambiguity may be offset by the limited benefits the firm can expect.

Dynamic Theory¹⁶

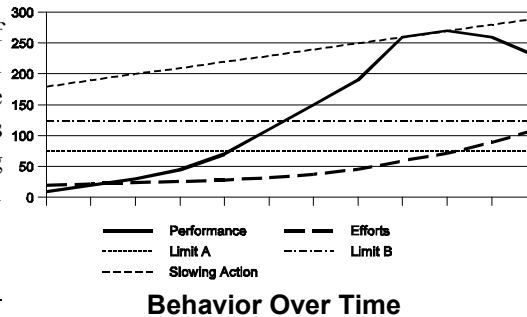
This archetype states that the result sought by a firm and which is the target of a growing action may be subject to multiple slowing actions, each of which represent an opportunity and an opportunity cost to managers. Insight into the interdependencies between the slowing actions is a critical insight into deciding how scarce resources should be utilized to reduce or remove the slowing actions.



Generic Archetype

Behavior Over Time

The attractiveness principle presents itself frequently in organizations. When faced with multiple challenges, managers must decide which problem/problem symptom appears more attractive as a potential for improving the organization's general health (operational, financial, or both).



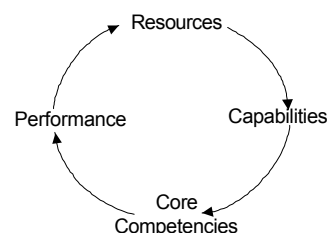
Application - Planning, Improvement, Strategy

Planning

The lessons from the Attractiveness Principle, with respect to planning are similar to Limits to Growth. The insight is complicated by interacting limits. As systems and planning becomes more complex, so too must anticipation into the future limits.

Improvement

Continuous improvement frequently unearths multiple, interconnected problems (the "system of problems" that ideally replace the orientation to problem symptoms taken separately and treated as unique problems unto themselves).



Careful and systemic inquiry into the interconnected problems can reveal where synergies can be realized when available resources are devoted to carefully chosen limits, and the reduction or removal of the selected limits result in (a) additional resources that can be devoted to the remaining limits or (b) the reduction or removal of other limits as a dynamic side effect of addressing the limits first selected.

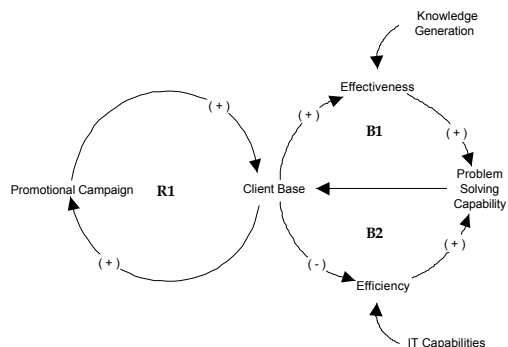
Strategy

The archetype is especially powerful when addressing long-term decisions that affect the availability of resources, their conversion to key capabilities, and the development and maturation of selected capabilities into core competencies.

This is especially true in organizations that pursue resource based strategies. These firms face the challenge of constant renewal if they are to retain their competitive advantage. The requirement of mapping out the growth engines and potential danger points in advance (as is the case with Limits to Growth) is reinforced many-fold in this archetype.

Example

A consulting firm is faced with the decision/dilemma on how to improve its overall performance for clients, choosing between shoring up its IT capabilities or growing its knowledge base, both of which are under attack from existing clients, and are acting as deterrents to acquiring new clients.



Example: Consulting Firm

Prescriptive Action¹⁷

- Focus on identifying interconnected and interdependent limits.
- Use the archetype to identify potential synergistic tactics to remove the balancing processes *before* they begin to affect growth.
- Establish priorities; carefully match available resources with specific slowing actions.

Seven Action Steps¹⁸

- Identify the growth engines.
- Map the growth engine to each limiting or slowing action; establish a time line for each slowing action (avoid fixes before they are required).
- Map the interdependencies between the slowing actions.
- Model the dynamics of potential synergies between the slowing actions.
- Review available resources; develop a list of options.
- Establish metrics to assess the impact of efforts to reduce or remove slowing actions; periodically reassess slowing actions.
- Reevaluate plans, expected continuous improvement programs and strategies for potential slowing actions. Continuously challenge assumptions.

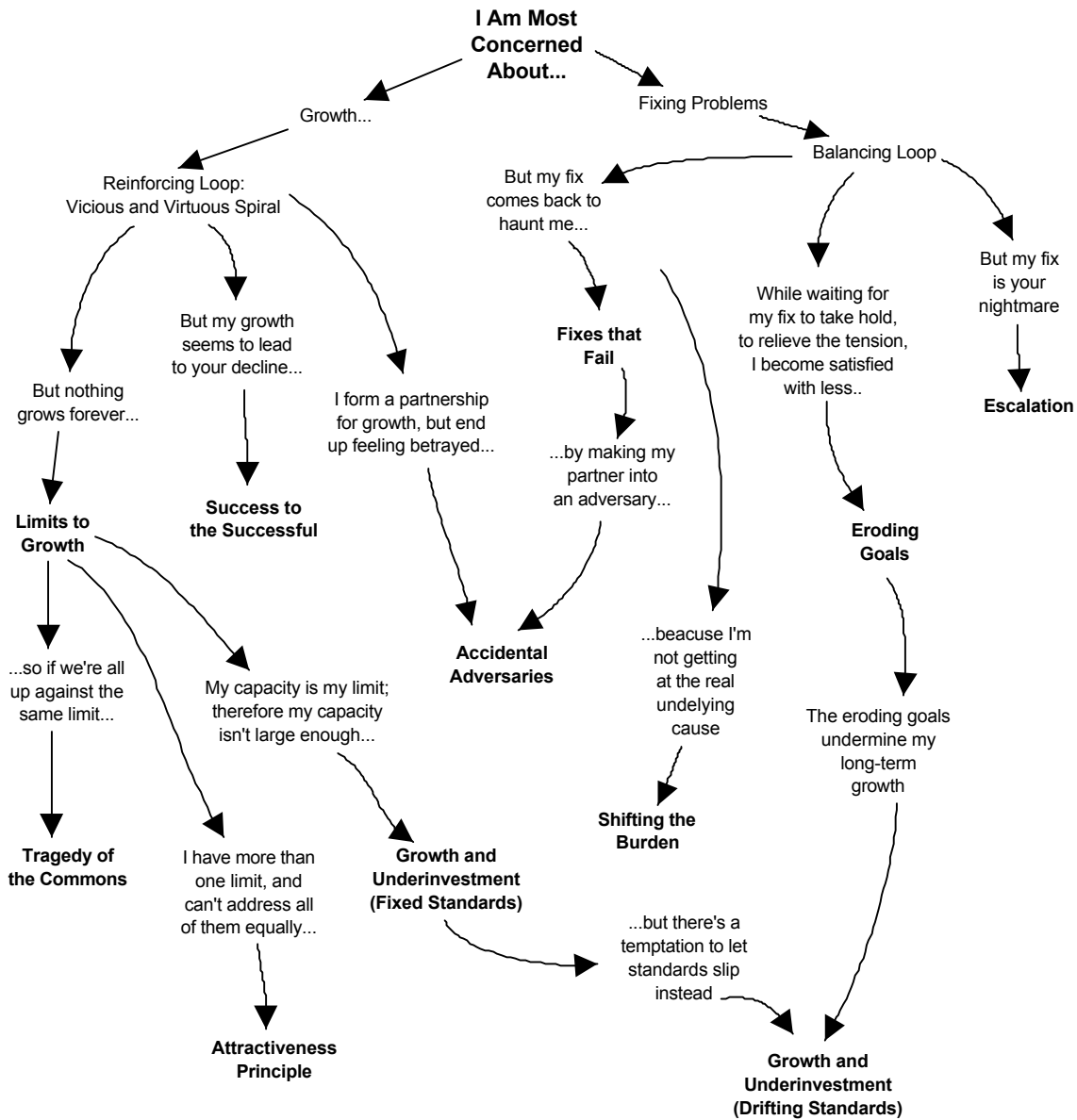
What Does This Really Mean?

The Attractiveness Principle pits managers against growing complexity and the interactions between parts that are increasingly difficult to anticipate. Although implied with many of the archetypes, it makes a strong case for dynamic modeling to reveal the synergies that may emerge from the firm's response to growth engines as complexity increases.

At its core is expansionistic thinking; the requirement that managers seek to solve systems of problems in the largest system to which they have access. The archetype reinforces the distinction between understanding and knowledge. Knowledge, the "know-how" managers rely on to make decisions, precedes from the "contained" parts of the whole to the "containing whole", while understanding precedes from the "containing whole" to its parts¹⁹.

Connections Between the Archetypes

There are many ways in which the archetypes can interact with each other. Michael Goodman and Art Klien have mapped the archetypes, and their interactions, in an article published in *The Systems Thinker*²⁰ in the December, 1993/January, 1994 issue. The work was subsequently republished in the *Fifth Discipline Fieldbook*²¹, by Peter Senge et al.



CONCLUSION

The Systems Archetypes are patterns of behavior that emerge from the underlying system structure. They can be used diagnostically to reveal insights into the structure that already exists, or prospectively to anticipate potential problems and/or problem symptoms.

Archetypes do not describe any one problem specifically. They describe families of problems generically. Their value comes from the insights they offer into the dynamic interaction of complex systems.

Use them with the other systems thinking tools that are available. As part of a suite of tools, they are extremely valuable in developing broad understandings about organizations and their environments, and contribute to more effectively understanding problems.

“We don’t need better solutions, we need better thinking about problems.”²²

END NOTES

1. This material is a chapter from *The Systems Modeling Workbook* by William Braun. References to modeling are forward and backward links to material in other chapters in the workbook.
2. Donella Meadows, Dennis Meadows, Jørgen Randers, William Behrens, *Limits to Growth*, (New York: New American Library), 1972.
3. Except where otherwise credited, the notes on Dynamic Theories of the archetypes are taken from Daniel Kim, “Archetypes as Dynamic Theories”, *The Systems Thinker*, June/July, 1995.
4. Except where otherwise credited, the notes on Applications of the archetypes are taken from Daniel Kim and Colleen Lannon-Kim, “A Pocket Guide to Using the Archetypes”, *The Systems Thinker*, May, 1994
5. Except where otherwise credited, the notes on Prescriptive Action for the archetypes are taken from Daniel Kim, “Archetypes as Dynamic Theories”, *The Systems Thinker*, June/July, 1995.
6. Except where otherwise credited, the notes for the Seven Action Steps for the archetypes are taken from Daniel Kim and Colleen Lannon-Kim, “A Pocket Guide to Using the Archetypes”, *The Systems Thinker*, May, 1994
7. Peter Senge, *The Fifth Discipline* (New York: Doubleday Currency), 1990, 142, 150-55, 156, 226.
8. Adapted from Jennifer Kemeny, “‘Accidental Adversaries:’ When Friends Become Foes”, *The Systems Thinker*, February, 1994.
9. Ibid.
10. Ibid.
11. Ibid.
12. Archetype based on the work of Gene Bellinger; see www.outsights.com
13. *The Systems Thinker*. Pegasus Communications, Inc. Waltham, MA.
14. Senge, P. et. al. *The Fifth Discipline Fieldbook*. New York: Doubleday Currency, 1994.
15. See www.outsights.com/systems/theWay/theWay.htm, June 14, 2000.
16. The Dynamic Theory, Application, Prescriptive Action and Seven Action Steps for this archetype are the work of the author.
17. Review the Prescriptive Actions for Limits to Growth
18. Review the Seven Action Steps for Limits to Growth

19. Russell L. Ackoff, *Ackoff's Best*, (New York: Wiley & Sons), 1999, 20.
20. Michael Goodman and Art Kleiner, "Using the Archetype Family Tree as a Diagnostic Tool", *The Systems Thinker*, December, 1993/January, 1994.
21. Peter Senge et. al., *The Fifth Discipline Fieldbook* (New York: Doubleday Currency), 1994, 149-150.
22. Attributed to Russell Ackoff, source unknown.