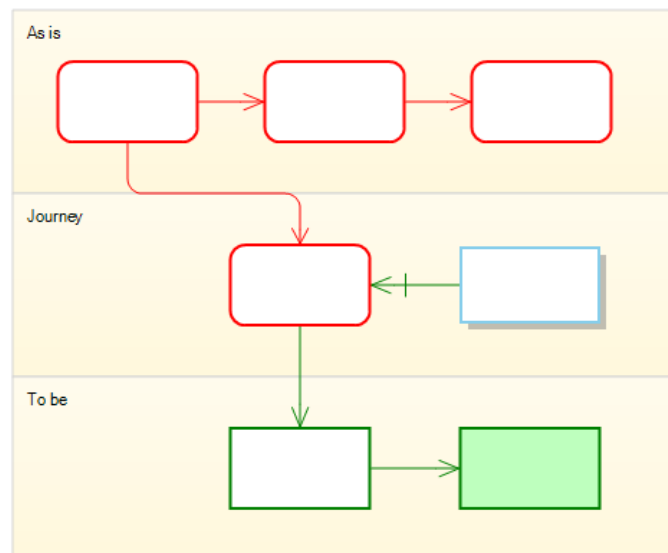


The Elements of Southbeach Notation 0.9.6

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History

Work to define the Southbeach Notation began in June 2005. A specification of version 0.8 was published by BPTrends.com in May 2008¹. Since then, the notation has evolved through practical use and as a result of feedback from the user community.

This new paper describes all of the elements of Southbeach 0.9.6, summarizes their definition and lists their English synonyms. The next version will be 1.0.

What are our plans for 1.0?

We are using this document to check for consistency and completeness, prior to the publication of Southbeach 1.0. As always, your input is welcomed, and hugely valuable. Please send feedback to feedback@southbeachinc.com

Is there an implementation?

Yes. Southbeach Solutions Limited² provides a software tool called Southbeach Modeller. It is designed for consultants and analysts and designers working in innovation, improvement or change projects – in business or engineering. This software implementation of Southbeach Notation can be considered the reference implementation of this specification.

What is Southbeach Notation?

Southbeach Notation is a new visual notation that helps with creative or analytical tasks such as innovation, improvement, problem solving, root cause analysis and change management. It appeals to consultants, enterprise architects, risk managers, futurologists, engineers and scientists.

The approach fosters joined up thinking - systems or situations that can only be fully understood by embracing multiple perspectives. Southbeach helps to clarify a situation or problem, untangling conflicting causes and effects so as to suggest solution directions.

Southbeach introduced the idea of 'situational improvement'. In the same way that a process modeling tool can be used to model and analyze any business process, Southbeach can be used to model and analyze any 'situation'. A 'situation' is something to be improved, e.g. an ailing business strategy, a weak idea, a dysfunctional design, a suboptimal system, an underperforming process, a loophole in a legal system, etc.

The notion of a 'situation' is very generic. Southbeach Notation is therefore very general purpose.

Southbeach can be used to describe any process, situation, scenario or trend in field such as business management, IT management, the law, global issues, education, marketing, service innovation, health care, the green agenda and politics.

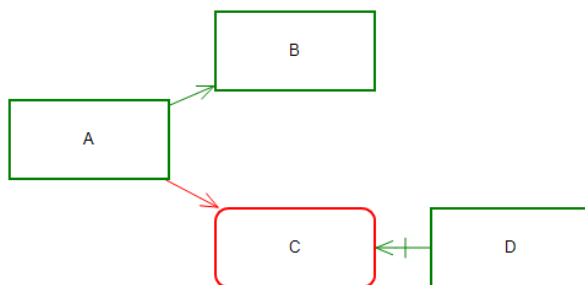
¹ <http://www.bptrends.com>

² www.southbeachinc.com

The semantics of Southbeach are applicable across a range of business and engineering methods. Southbeach Notation is therefore able to draw semantically equivalent diagrams such as all kinds of cause effect, concept maps, causal loop, sign diagrams, business motivation models, cognitive maps, polarity charts, force-field diagrams, influence maps, process flow, value chain, service blueprints, affinity diagrams, argument maps, SWOT charts etc.

Using one drawing style Southbeach Notation can emulate many of the core diagrams expected by practitioners of business analysis, IT change management, Six Sigma, Lean thinking, root cause analysis (RCA), theory of constraints, TRIZ and futures studies.

A Southbeach model takes the form of a 'box' and 'line' diagram. It describes a situation from the point of view of a client or stakeholder who seeks to improve the situation. Each box is marked useful (green) or harmful (red)³. The boxes can be considered to be 'actors' or 'agents' in the situation. The lines between the boxes represent 'effects' or 'influences' between them.⁴ For example:



This model states that 'A' produces 'B', and, also produces 'C'. Elements 'A' and 'B' are useful (green) but 'C' is harmful (red). Typically, in any situation, you want more of the useful elements, and less of the harmful elements.

To understand this model, think about what would happen if 'A' were to increase. 'B' would also increase, as would 'C'. The model therefore expresses the dynamics of the situation from the perspective of what is considered useful, and what is considered harmful.

In the situation above, 'D' is counteracting harmful 'C'. 'D' is therefore a partial solution, introduced into the situation in order to solve the problem of 'C', which is a harmful by-product of 'A'. However, 'D' may introduce its own harmful side effects. 'D' may also be a compromise solution as it may take resources to create 'D'. Southbeach Notation is designed to explore situations like this, understand the contradictions involved, and find pathways from the problem to the appropriate solution.

³ Tools that implement Southbeach are permitted to quietly distinguish useful and harmful agents via other means, for example, rounded corners for harmful agents permit them to be differentiated in black and white, or by people who are color blind. In addition, + and – signs at the corner of boxes can be used.

⁴ The words 'actor' and 'agent', and 'effect' or 'influence', can be thought of as synonyms in Southbeach. They are used interchangeably throughout this paper.

The colors of Southbeach have been chosen so that suitable marker pens are readily available in workshops for use on whiteboards and flipcharts: red, green, black, yellow and blue. Black is used when usefulness has not yet been determined, blue is for actions (or interventions) in the situation, and yellow is to indicate the area of focus. Often however, users find that green and red are sufficient to get a lot of useful work completed.

The visual elements can be combined with each other, without ambiguity. Despite the richness of the language, experience proves that it is surprisingly easy to learn. People with no modeling skills appear to be able to understand Southbeach models.

What is Southbeach for?

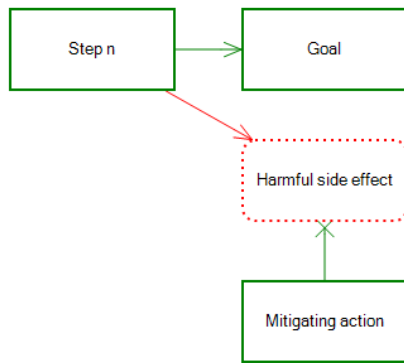
Southbeach helps with creative or analytical tasks such as innovation, improvement, problem solving, root cause analysis and change management. It is not for everyone who might otherwise use a simple hierarchical mind-map, but it is starting to form a visual 'lingua-franca' for consultants who want to take the next step forward in creative thinking. Just as a spreadsheet allows you to play 'what if?' with numbers, Southbeach lets you play with useful and harmful factors, goals and risks, issues, choices and actions.

Southbeach models are always drawn from one or more perspectives, and do not claim to be either objective, or to represent an absolute reality. They are deliberately subjective, and, users are forced to state whether something is useful or harmful. The power of this becomes evident as you start to work with the approach.

Models must reflect all of the necessary perspectives that drive towards the acceptable solution. When a project is using Southbeach the objective is often to find ways that break contradictions and so avoid compromise. In this respect, Southbeach is similar to TRIZ, whose practitioners are immediately at home with the approach. TRIZ is clearly far more than any notation, but many TRIZ experts find the Southbeach notation to be suitable for their work.

Why is Southbeach different?

In other business or engineering notations, the objective of 'modeling' is 'design', the depiction of structures as they are, or should be. A UML model, for example, represents the structure of a software system to be developed. A process model describes the steps, activities and interactions between participants. By contrast, Southbeach depicts a viewpoint on that situation. It describes what is useful or harmful about the process or the system, and how these perspectives interact. Here, for example, is a perspective on a process:



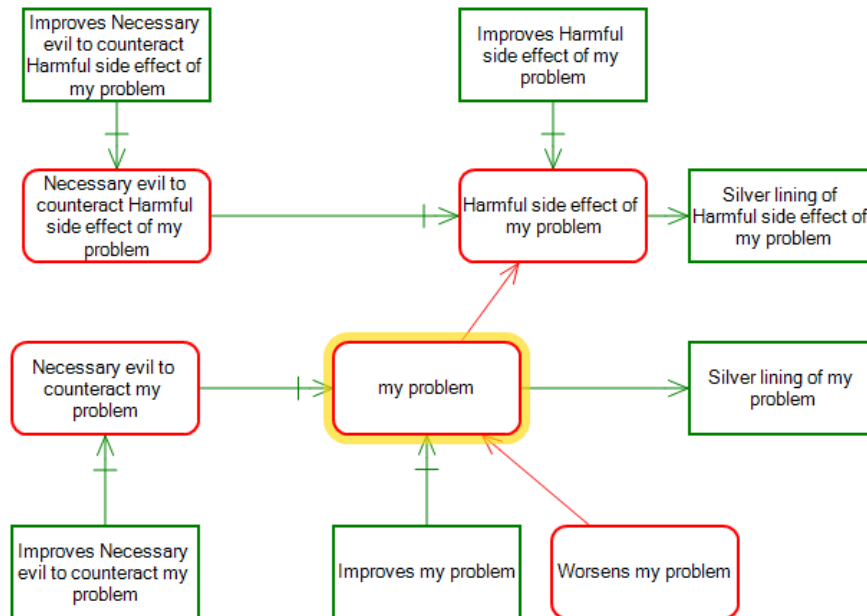
Step 'n' in the process helps reach the goal, but embodies a potentially harmful side effect (dotted red line). Thus, a mitigating factor has been introduced into the situation to 'prevent' (X arrow head) the side effect.

The use of simple effects such as 'produces', 'counteracts' and 'prevents', together with the ability to express perspectives as to whether things are useful (green) or harmful (red), allows many complex situations to be represented. Here, for example, is a contradiction common in many real world situations:

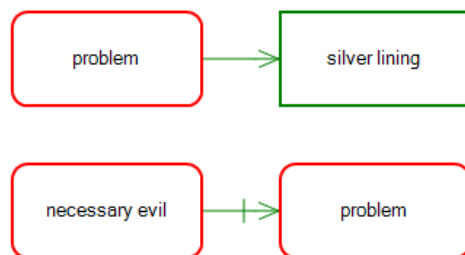


Useful 'A' (necessary for the system) is unfortunately counteracting 'B' which is also needed. It is contradictory because whilst we are saying 'A' is useful, we are also saying it counteracts 'B', and this counteraction is harmful - so 'A' is actually both useful and harmful, hence it is a contradiction. We always have to make a judgement call when deciding whether to represent something as useful or harmful - we say that 'A' is 'predominantly useful'. This is one example of many simple contradictory situations that can be illustrated using Southbeach.

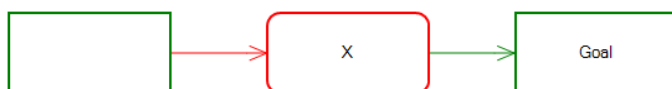
Here is a more complex example:



The highlighted block represents a ‘focus’ within this model. As you can see, the model consists of several pairs of boxes each of which can be thought of as a modeling ‘idiom’. For example:



Many consultants and analysts find that as they learn Southbeach they develop their own idioms for representing the common situations they encounter in their work with clients. In a software tool, these can be recalled as building blocks, to build up the picture. Here, for example, is a simple Southbeach model which represents a very common idiom:



The model says that to reach the goal, leads to ‘X’, which is painful.

When business analysts or engineers are learning Southbeach, they often ask whether the terminology of the language - ‘produces’, ‘counteracts’, ‘useful’ and ‘harmful’ etc. – has any formal definition? The answer is yes and no.

'A' produces 'B' means that 'A' is enabling or causing 'B'. It can also mean that if we increase 'A', we obtain more 'B'. Southbeach is an analogical language. 'A' produces 'B' could also mean that 'A' intensifies 'B' or that 'A' reveals 'B'.⁵

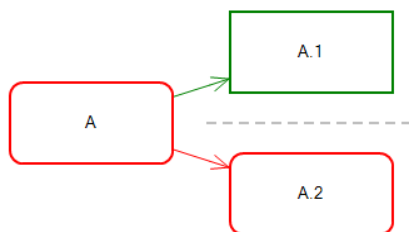
Each Southbeach element has a set of associated synonyms. This permits Southbeach to represent real world situations with sufficient fidelity for useful problem solving, without becoming so complex that the language can only be used by rocket scientists. The notation is in fact simple enough to be used by school children, yet powerful enough to be useful in realistic business and engineering contexts. It is also used to study or to unpick so called 'wicked' problems⁶ arising in society or in complex organizational change efforts.

Southbeach is a purely visual language. There is nothing hidden behind the model, and no formal definition of how quantities are linked to elements.⁷ Every element has a visual notation, a formal definition, and a set of synonyms. By combining these elements and building up the picture, a Southbeach model is able to express a complex situation and the ideas behind it with clarity. A picture can paint a thousand words.

Decomposition and separation

When first introduced to Southbeach, you may balk at the idea of stating whether something is wholly useful or harmful. Surely everything is a shade of gray? Doesn't everything have pros and cons? Yes, everything is useful and harmful. Yet unless each distinct element is decided upon, innovation cannot proceed.

By decomposing⁸ the elements of a situation or system it is possible to explain why it is harmful, and to solve the problem. Take this example:



⁵ A table of example synonyms corresponding to each of the Southbeach terms is provided at the end of the paper.

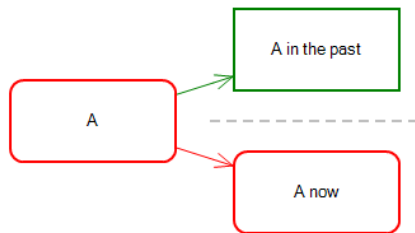
⁶ http://en.wikipedia.org/wiki/Wicked_problem

⁷ A software tool could add such features, including the ability to make notes on each element, link to documents or Web resources, add tags, provide alternative 'views' of the model, etc. However, these functions are entirely separate from the formal definition of the notation.

⁸ The term 'decompose' here should not be confused with system structure, 'parts of' relationships or 'containment'. A future version of Southbeach will add 'containment' relationships, and their visualization. This is for release in Southbeach 9.7.

The idiom states that 'A' is harmful. In fact, it is only one part of 'A' that is harmful. The other part is useful. 'A' has been decomposed into its useful and harmful elements. In this case, the decomposition is via the *structure* of 'A'. We say that 'A' has been *separated* by structure.

Southbeach provides several different ways to separate a model. Sometimes it is tempting to explain meaning using the text in the boxes, as in the next example. But this, of course, can only be 'understood' by a human reader. Later, we will introduce 'grids' for formally separating a model by time (or any other dimension).

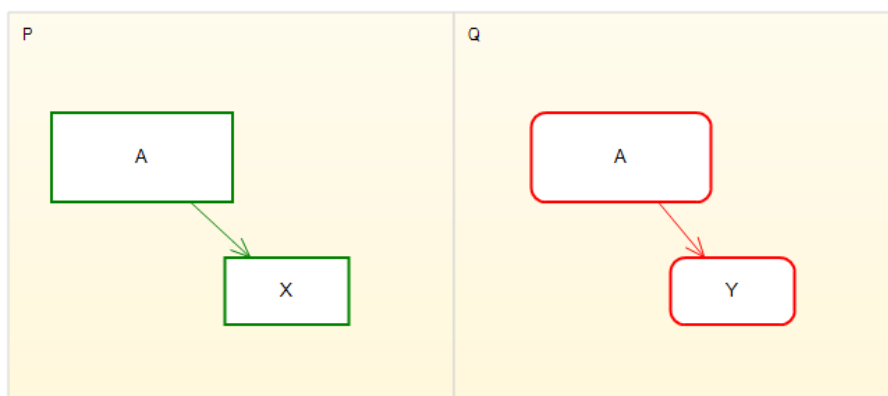


This model explains that 'A' was useful in the past, but is no longer useful. This is decomposition (separation) by time. By understanding how something is harmful, by separating it in one or more dimensions, it is possible to take steps forward and to solve problems. For example, perhaps it is possible to decompose 'A in the past' into its elements, and then bring the useful ones that are unchanged by the passage of time, forward into the present.

Southbeach provides a visual palette amenable for many different problem solving approaches.

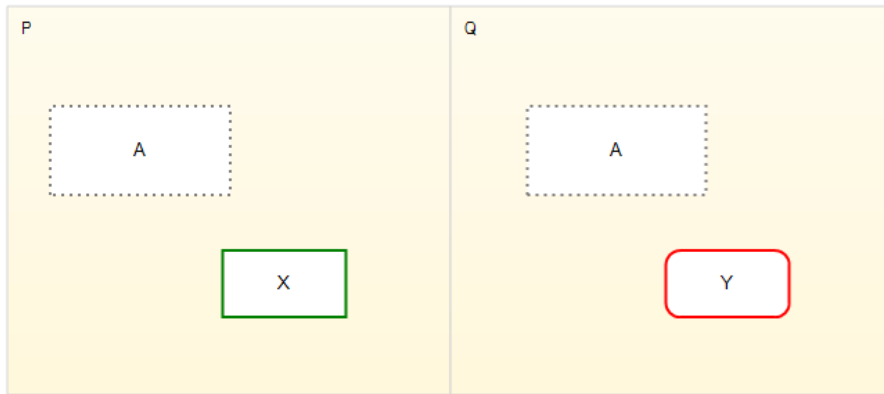
Whose perspective?

Separation is a powerful idea, particularly when combined with perspective. When someone states that something is useful, and another person claims it is harmful, this is often a signal that something more interesting can be discovered. In the model below, 'P' claims that 'A' is useful and producing 'X', whereas 'Q' says that 'A' is harmful and producing 'Y'. This model uses a grid to 'separate' and therefore clarify the situation. Grids are not just a background for the diagram. Grids are part of the Southbeach Notation itself:

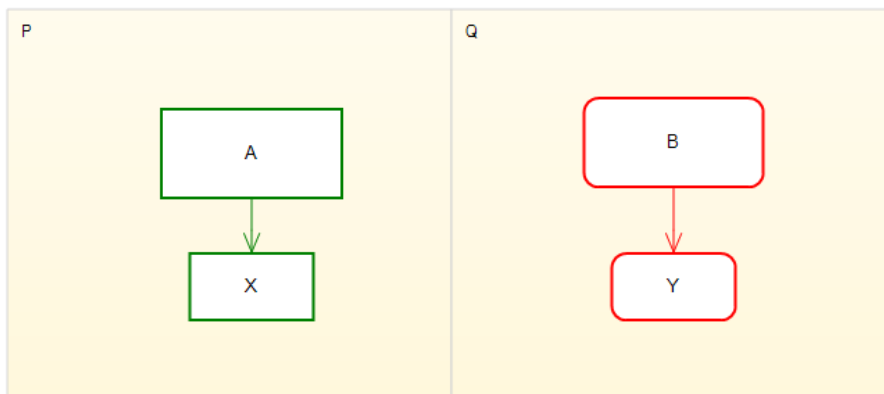


'P' and 'Q' cannot both be right in an absolute sense. Here are three different interpretations.

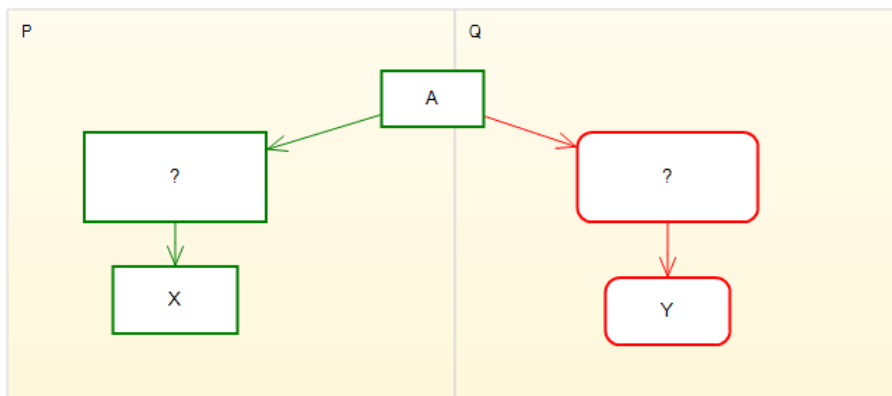
1. 'A' was just an illusion. 'P' and 'Q' were really talking about 'X' and 'Y'.



2. 'P' and 'Q' were talking about two different elements, 'A' and 'B'



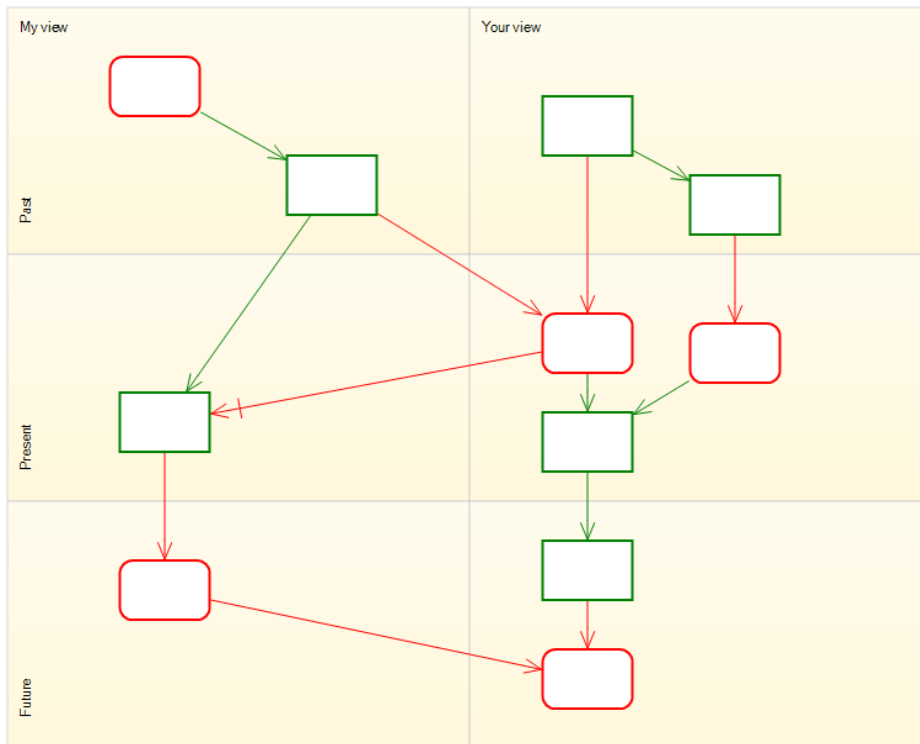
3. 'P' and 'Q' were talking about different *aspects* of 'A'



No doubt other interpretations could be imagined, such as:

- Either or both 'P' and 'Q' falsely concluded that 'A' affected 'X' or 'Y'
- 'X' or 'Y' was an illusion
- 'A', 'X' and 'Y' were all illusions ('P' know there is something useful here and something must have caused it)
- Etc.

Southbeach also provides a way to talk about two interacting perspectives. It is not uncommon, for example, for stakeholders to disagree about whether something was better or worse in the past, what needs to be done in the present, and how the future will be impacted. This separation by perspective *and* time can be represented using a window-pane grid as follows:

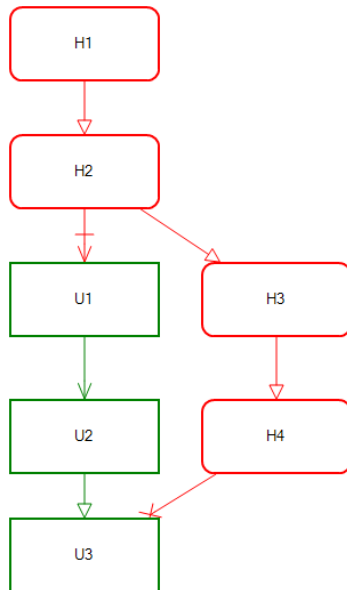


Using grids such as these, Southbeach can express differences of viewpoint, contradictions, dilemmas, ambiguity and other aspects of ‘wicked’ problems.

Causes and effect chains

While many users will create models using ‘produces’ and ‘counteracts’, it is sometimes useful, within a situation, to separate out the cause-effect chains that lead to impacts on the situation. Strictly speaking, A produces B means that B is increased by A. While it can also be used to mean that A leads to B, use of the ‘causes’ effect can be used both to highlight cause-effect chain paths and to distinguish creative suggestions that apply in each case.

The following model illustrates this:



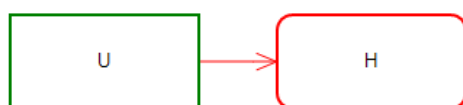
The model shows a harmful cause-effect chain. H2 is caused by H1. It is H2 that counteracts useful function U1. U1 is what produces U2 and so on to U3. Yet H2 also has further effects, leading to H4. H4 prevents U3, which is the goal of this situation. Thus, we have clarified the increasing, decreasing the causal effects in the model.

Generating suggestions

Southbeach models typically focus on those aspects of a situation that are pertinent to problem solving or improvement. There is no point drawing what is working: innovators focus on what is wrong. Therefore, rather than representing all elements of a system, as in detailed design work, Southbeach models are more selective. They typically include only those elements that help teams to understand a way to move forward.

Southbeach models tend to focus on certain areas; the idea is to keep the model as simple as it can be to help without being too simple. For instance, problem solvers may focus on what's wrong. However, innovators or change managers may focus on where they want to get to and what they have to achieve and overcome along the way... so they have agents in the Southbeach model for their goals, steps, enables, and blockers.

Because a Southbeach model states what is useful and harmful, it can suggest directions for change. Even a two block model can stimulate thinking. To illustrate, consider this example, perhaps the simplest of all situations:



Something useful, 'U', is causing a problem, 'H'. How many ways are there to solve this problem?

How about:

1. Find a way to eliminate H
2. Find a way to isolate H from its harmful impacts on other aspects of the situation
3. Find a way to minimize H so that the benefits of U outweigh any downside
4. Decompose U into parts. Find the part U.2 that generates H, and then modify the design of U so that it is not dependent on U.2
5. Find an alternative to U that provides the same useful function but does not produce H
6. Break the link between U and H, then treat H
7. Combine H with something else to turn harm into use
8. Find a way to separate the cause and effect in time so that you can get the benefit of U without the harm of H, e.g. by storing up H in a safe place and dealing with it later (as with nuclear fuel rods)
9. Find a way of separating the cause and effect structurally so that the harmful side effect of H is not experienced in the vicinity of where the usefulness of U is desired (e.g. car exhaust is outside and to the rear of the car, which is sealed... this escalates the problem to the containing system)
10. Remove the need for U

And so on ...

We call these types of statements 'creativity'.

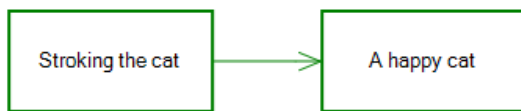
Southbeach Notation does not hard code or embed a specific set of creativity, but was designed to support the implementation of creativity rules. It allows for the programming of creative suggestions based around existing innovation or problem solving techniques that are already in use. In effect, Southbeach creates a visual link between your creativity, and models of concrete situations.

Working with the suggestions generated by a Southbeach model is one way that models are used in project work. Models are also useful simply for communication among stakeholders and participants. We are finding that Southbeach meets the 80/20 rule – sufficient for the majority of need from different disciplines. It has been used, for example, to bring business people and engineering together around innovation challenges.

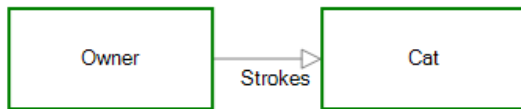
Styles of modeling

Within limits, Southbeach does not mandate a specific 'style' of modeling. For example, it can support both functional and subject-verb-object (SVO) styles:

1. Functional modelling



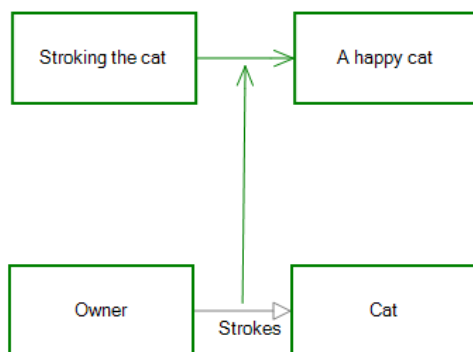
2. Subject-Verb-Object



While Southbeach supports both styles, and several others, certain styles are more ‘natural’ for situational improvement work. In our experience, functional modeling is most commonly used.

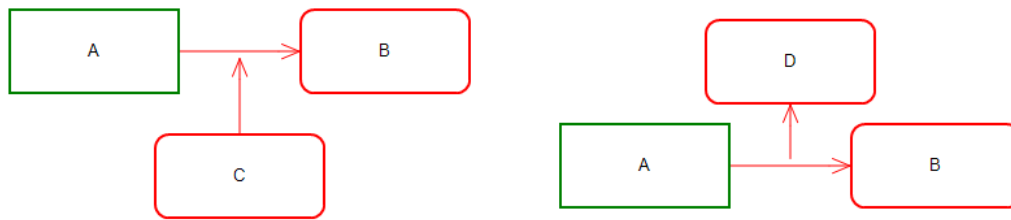
The difference between the two models above is itself a matter of perspective. In the first example, actors in the situation are understood in terms of their effect upon each other. Stroking the cat is useful because it produces happiness in the cat. It is clear from the model that increasing one increases the other. In the second model, things are so not so clear. Some might say the model is both confusing, and false. The model states nothing about the impact of stroking the cat, only that ‘stroking’ is occurring.

Practitioners from different analytic backgrounds will find ways to use Southbeach differently – that’s partly human nature, but also that different communities have traditions they find useful. Southbeach has been designed, as far as possible, to bridge these worlds. Take this model:



In the upper part of the model, ‘stroking the cat’ produces ‘A happy cat’. The ‘produces’ effect itself is ‘produced by’ the ‘strokes’ function in the lower model. (More strictly, it ‘implements’ the effect.). The general rule for translating SVO models to functional models is to recognize that the subject-verb-object idiom can be replaced by a single agent in the functional style of model. Southbeach also supports statements such as ‘A happy cat’ ‘Is A’ ‘Cat’ (specialization), a cat that is happy.

To meet these needs, in Southbeach, the influences between actors can themselves exert influence (effects on effects), and, be influenced (effects from effects), as in:



'A' is producing harmful 'B', in the presence of harmful 'C'. The process also generates a harmful side effect 'D'.

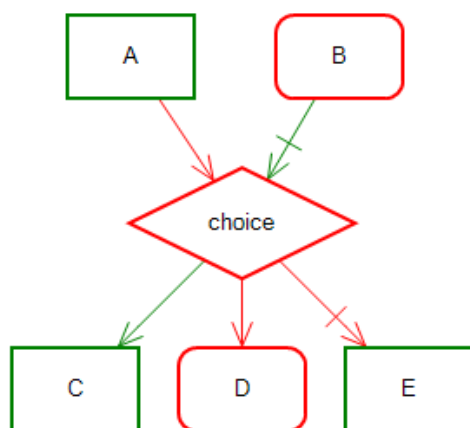
The 'science' of Southbeach, why it is the way it is, is not covered in any depth in this paper. If anyone wishes to explore this aspect, please write to us.

Making a choice

So far in this paper we have only shown two shapes, the green box (useful) and the red (rounded corner) box (harmful). Southbeach also provides a small number of other shapes that are useful for representing more detailed aspects of the situation.

A commonly used element is the 'choice', which is represented by a diamond-shaped box similar to that found in a flowchart. However, the 'choice' object in Southbeach does not mean quite the same as it does in a flowchart, although many users may never notice. To explain:

Every element in a Southbeach model is an 'actor' in the situation. They are the prime movers (the means) for anything to happen and for the situation to change or evolve. The same is true of the 'choice' shape. To understand this, look at this model:



The way to read the model is as follows: Firstly, look at the effects 'out of' the choice. These represent the different outcomes of making the choice. Only one of these will occur, if and when the choice is made. In this situation the choices are to produce 'C' (useful), to produce 'D' (harmful) or to counteract 'E'. We consider 'E' useful, but the choice appears to be to counteract it. That must therefore be harmful. Our choice seems to be between three outcomes, only one of which is useful, as signified by the green line to 'C'.

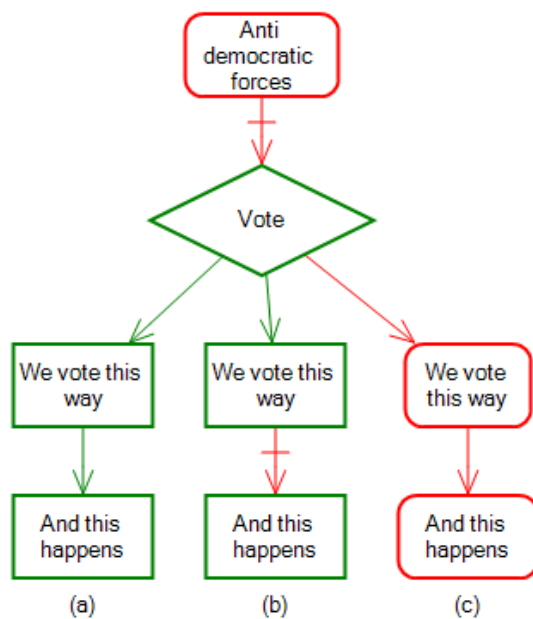
Now look at the input effects (influences) upon the choice. Actors in a Southbeach model are not 'steps' as they are in a business process. There is no sequence implied by Southbeach, just influences. Both 'A' and 'B' are influencing the choice – they are not preceding steps. 'A' is driving us towards the choice and 'B' away from the choice. If 'B' gets its way, the choice may not occur and its influences won't be felt in the situation represented.

It is when one starts to think carefully about semantics such as this, that one starts to understand the fundamental differences between Southbeach, and other business or engineering diagrams.

Choices in a Southbeach model are first class citizens just like any other box. They can be influenced like any other. They can be viewed as useful or harmful. They can be sufficient or insufficient, etc.

The only real difference between the rectangle and the diamond is that all of the effects out of the box always occur (to one degree or another) whereas only one effect of the choice can occur in the situation. The choice has, in effect, a bias towards the effect that is being chosen. It is as if each of the choices are 'hanging there' waiting to happen – differing views on how we perceive the situation evolving.

To illustrate: here is a common situation in the politics of developing countries:

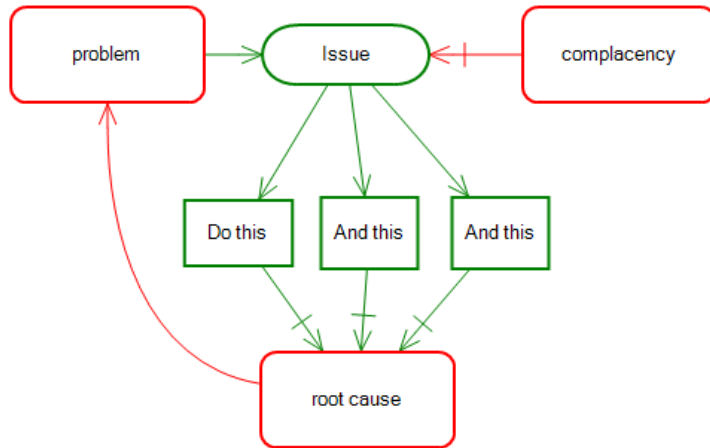


Anti-democratic forces are threatening the vote. The vote could have various outcomes. Only (a) is positive. Bad stuff could happen – either directly (c), or by counteracting useful changes taking place (b) before full democracy is established.

Not everyone will use 'choice' in the manner described above. In the example, 'voting' is part of the system that sustains over time. Its influence is felt. In other models, 'choice' may represent something that is transient, and part of the problem solving process. For example, 'choice' could be used to model transition to a future state of the system itself. 'Choice', in this sense, would be being used as a meta-model element – rather than to model parts of the system under scrutiny.

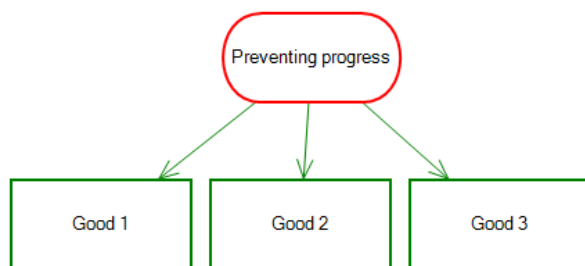
Raising an issue

Southbeach also allows for the modeling of ‘issues’. Some users think of these as the flip side to ‘choice’. Denoted by a lozenge shape, the ‘issue’ represents a hiatus in the situation. Until it is resolved, none of its influences occur. A simple example is:



A problem (harmful) is raising a useful issue which must be addressed. On the other hand, complacency (harmful) could lead us to ignore (or counteract) the issue. Whether we tackle the issue hangs in the balance between these two contradictory forces. If we can remove the harmful complacency from the situation, the issue can be resolved. Three useful improvement actions will then occur, each counteracting the harmful root cause of the original problem.

Issues can be useful, or harmful, like any other element. What does this mean? Intuitively, if an issue is preventing three good things from happening, it would be seen as harmful by most - and it would seem to be useful to counteract or destroy it in order that the three useful things can be allowed to happen. Consider this example:

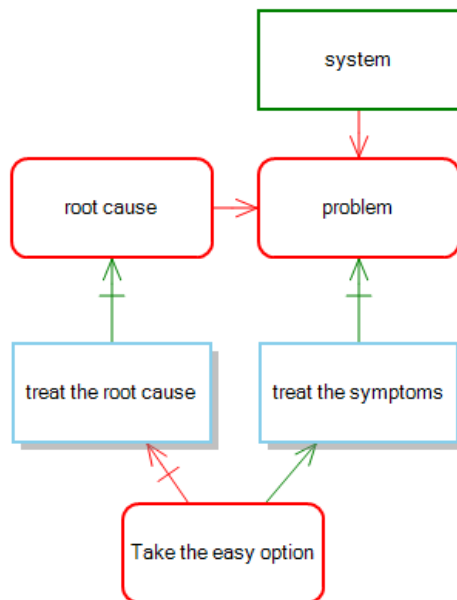


Once again however, everything is a matter of perspective. If a stakeholder is opposed to the three useful agents, they may model the issue ‘useful’ – that is, useful to them for the issue to persist.⁹

⁹ Disclaimer: There is some debate over the full interpretation of both ‘issue’ and ‘choice’ among Southbeach community. We are hoping to clear this up in 9.7 using more concrete examples.

Actions are always useful

It is often useful to be able to represent, in the *same* visual model, suggested interventions or solutions to be ‘added to’ or incorporated into the situation. For example, a consultant will make proposals to their client. To distinguish these suggestions from the elements that describe the situation, Southbeach simply uses a third color, the blue box, to denote the ‘actions’:

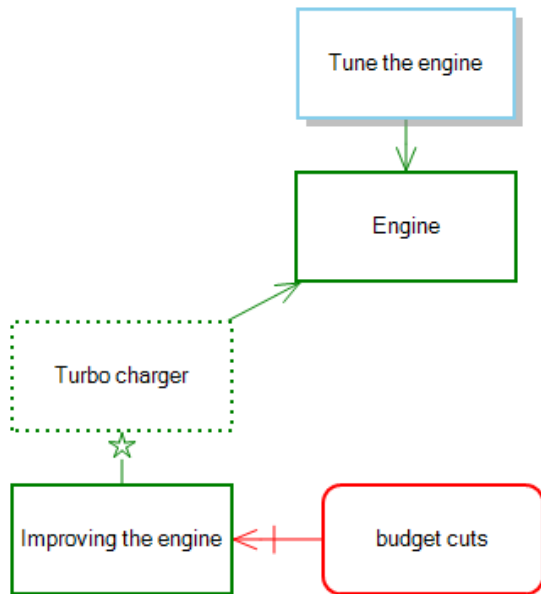


In the model, a problem and its root cause are illustrated. The consultant has suggested two actions: 1) treating the root cause, and 2) treating the symptoms.

Actions, like all other Southbeach elements can be full actors in the situation, and so may themselves come under influences. In this case, the consultant is aware that the client often prefers to “take the easy option”. The consultant therefore chooses to include that as a factor within the situation. It is counteracting the treatment of root causes. The interaction between consultant, and client organization, has therefore been modeled. Similarly, actions may themselves have harmful consequences. And so on.

Not everyone will use ‘actions’ in precisely this way. Actions do not need to be seen to be fully incorporated into the situation. They can also be seen as transitory actions that improve the situation. For instance ‘Tune the engine’ is an action that produces ‘Engine’ in the sense that it is a transient activity that improves the engine, but does not remain as part of the system. Conversely, the system may also be improved in other ways, for instance, one might show a turbo charger as a potential addition to the engine (dotted green box). The turbo charger does not exist now but if it did it would improve the performance of the engine, hence the production arrow.

Adding components could also be represented as an action; in this case ‘Improving the engine’ would create the potential turbo charger (star-shaped arrow). When the action is complete, it is removed from the diagram and the turbocharger becomes actual (solid green line). Note that there could be forces at play in the current system that counteract the proposed actions, such as ‘budget cuts’ (harmful) counteract ‘improve the engine’ (useful).

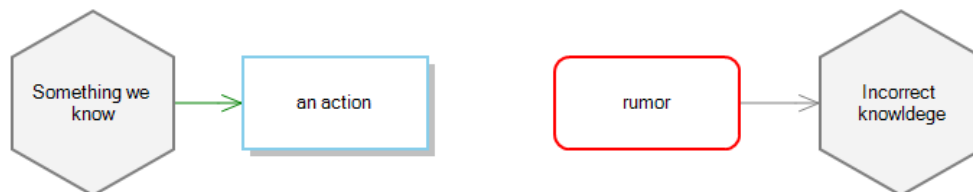


Knowledge just “Is”

When modeling any situation there is often some context or backdrop that can never be changed. It just ‘is’. In an engineering project the context may be a physical law. In business, the context may be an internal policy or the reality of a new competitor in the market. Southbeach represents such ‘knowledge’ using hexagons.

Hexagons are used to represent knowledge or facts that are pertinent to the system but they are not part of the system themselves, so they are neither useful nor harmful. They simply provide context to inform our understanding of why the system is the way it is - and provide more specifics that may help us to improve it.

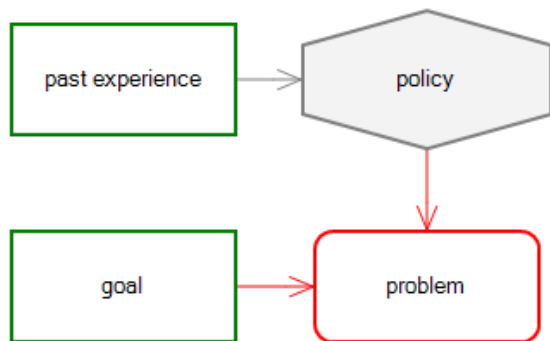
Knowledge is neither useful nor harmful. Since it cannot be changed it is pointless to take a perspective on it. Nevertheless, ‘knowledge’ is a full actor in the situation. It could have effects on other elements, and can be affected itself. For example:



Something we know is creating an action. A rumor is creating incorrect knowledge (which is then assumed in the situation).

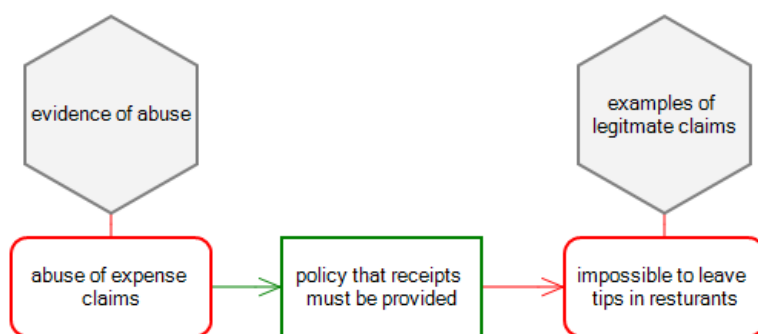
Note - You might think incorrect knowledge should be harmful. If it produced a harmful side effect, that effect would be harmful, but the knowledge itself is neither useful nor harmful. To illustrate:

Here is another example where useful past experience has led to a policy which, as far as the current problem is concerned, cannot be changed.



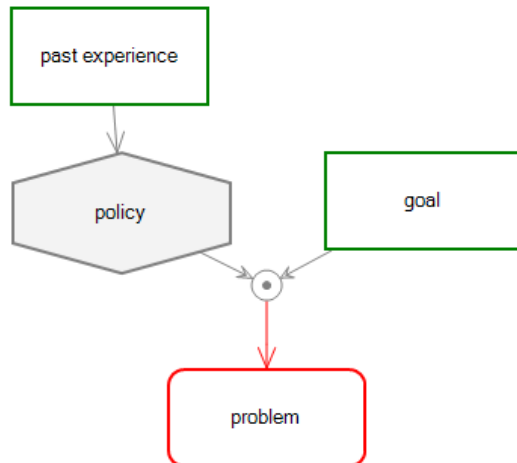
In this example, the company’s past experience (useful) has led to the establishment of the policy (which for the purposes of this improvement project, we have to work with and cannot change). However, a new goal, coupled to this policy, has led to a problem.

Whether or not you view hexagons as actors in the system will depend on the situation. For example, suppose consultants are abusing expense claims. This has led to a policy that receipts must be provided. This is making it impossible for consultants to leave tips in restaurants. You might use ‘knowledge’ hexagons to provide the facts or evidence or examples of claims that were made that led to the policy being put in place, including the total amount of fraudulent expenses claimed last year. Another ‘knowledge’ hexagon could be used to illustrate examples of expenses that are legitimate but now cannot be claimed.



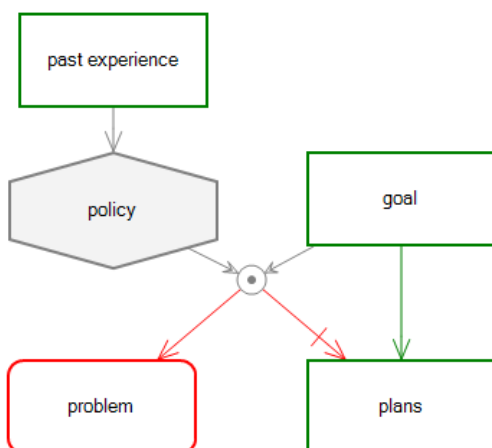
Conjunction

In the model above, it is not clear that it is the policy when combined with the goal that is the real cause of difficulty. To illustrate this, Southbeach provides a special shape called a ‘conjunction’. It signifies a confluence or ‘join’ of influences (software engineers and engineers will see the analogy with ‘AND’ gates).



By adding the 'conjunction' it is now clear that it is the combined effects of the policy, and the new goal, that is harmful. Something needs to give, or to be separated.

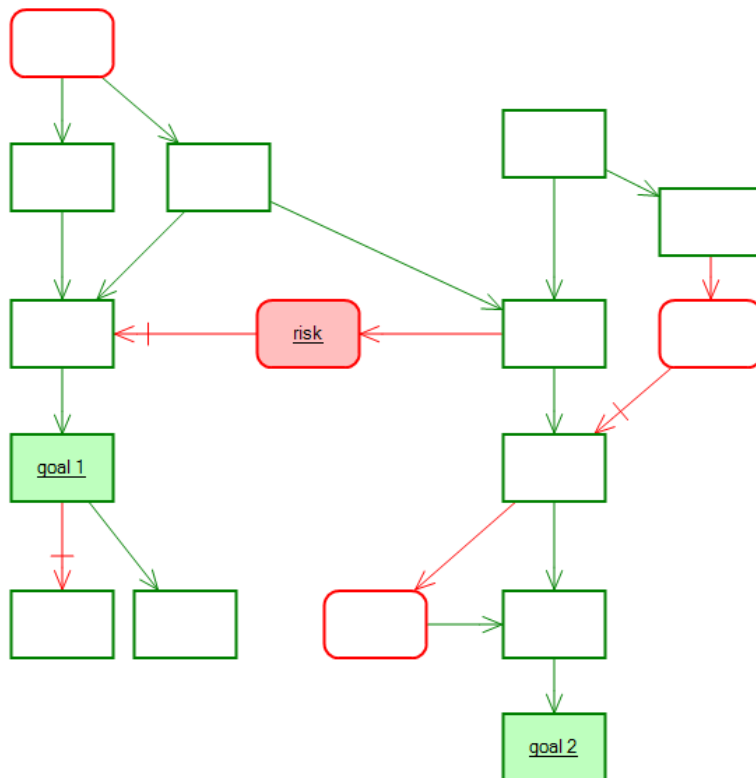
The 'conjunction' may have multiple outputs as follows:



The model above illustrates that the goal is leading to a useful plan, but this is thwarted (counteracted) by the combined effect of the goal and the policy constraint.

Goals and risks

Goals and risks hold a special place in both problem solving and in all innovation and business projects. For this reason, Southbeach Notation provides a simple way to mark their presence in the situation. Underlined text and/or color fill is used - green for goals, and red for risks, as so:



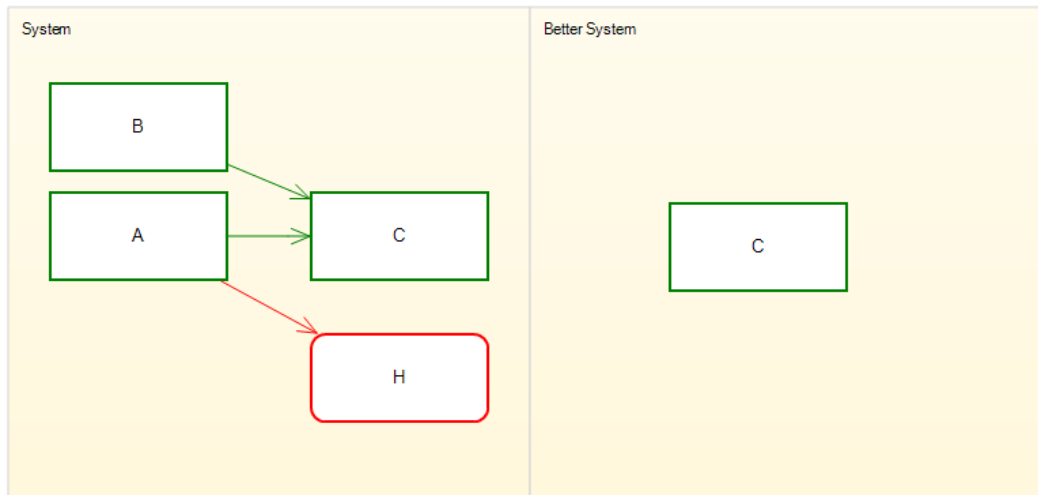
A goal represents the aim, purpose or intent of the system in which it exists. Like any other element, goals can have influences on other elements of the situation. For example, an overly ambitious goal could counteract the desire to pursue a solution.

Risks are the opposite of goals, i.e. something to be avoided.

Any Southbeach element can be marked as a goal or a risk. It could be the goal of a system to make a *choice*, or to highlight an *issue*. Think of goals and risks as clarifying the final result or objective of the situational improvement project. TRIZ practitioners may think of Southbeach goals as what they describe as the ideal final result (IFR).

Sufficiency

An ideal system is one that provides its useful output, without any unnecessary elements. Using what you have learnt so far, read the following model:



Clearly, it would be better to have 'C' without the need for 'A', since 'A' produces harmful 'H'. It would also be better to have 'C' without the need for 'B', which appears to be a resource utilized only for the purposes of producing 'C'. Another way to think about that is that 'C' is consuming a useful resource 'B':



Here, a different type of arrow head is being used to depict the consumption of 'B' by 'C'. We'll come back to the 'consumes' effect later in this paper. For the time being, note that the consumption of something useful, for the purposes of producing something else useful, is harmful (red line). This introduces the idea of 'sufficiency'. Is an agent 'sufficient' to have effects, and are those effects themselves 'sufficient'.

Sufficiency in Southbeach is modeled as follows:

- A dashed line signifies that an element is insufficient to meet requirements.
- A doubled line signifies that an element is excessive or surplus to requirements.
- A dotted line signifies that an element has the potential to have effects, but does not exist (or exists only marginally) within the situation.
- A broken (or jagged) line signifies that an element is dysfunctional: its effects may be unpredictable.

These line styles can be used for both the actors in the system, as well as the effects between them. Here are examples:



'A' is insufficient to produce 'B', whereas 'C' is insufficiently producing 'D'.



The problem has not yet occurred (potential only). If it did occur it would prevent progress. The solution is over-engineered (surplus) for counteracting a minor problem (insufficient to have serious effects).



'A' produces 'B' excessively, leading to dysfunctional 'B'. 'A' has the potential to produce 'B'. Despite this, there is surplus 'B'.

These qualifiers, and their associated line styles, can be used to enrich a model and clarify a complex situation.

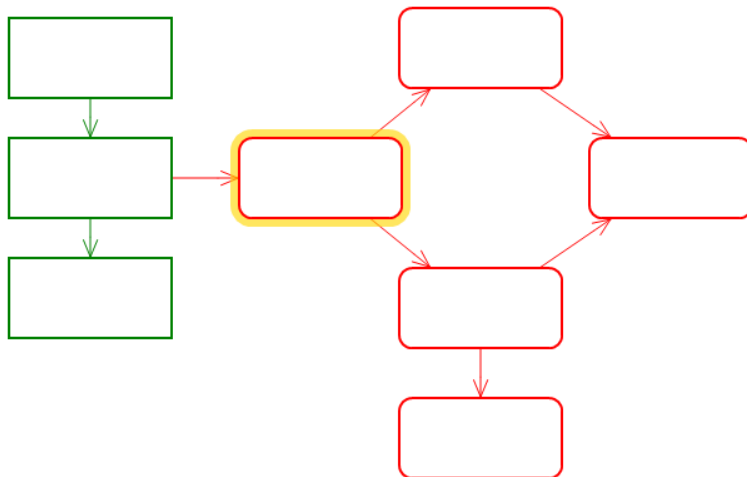
Having too little, or too much, of something, complements 'useful' and 'harmful' perspectives. It leads to being able to model useful insufficiencies, as well as harmful surpluses. For example, think about an empty warehouse, or a fully-stocked warehouse, during a downturn in demand. Equally, it is possible to have harmful insufficiencies (e.g. food shortage), and useful surpluses (e.g. personal financial saving).

Annotation

Southbeach is not a drawing style, it is a modeling language. Nevertheless, it is sometimes useful to annotate a model for greater clarity. A Southbeach modeling tool could provide a variety of symbols to annotate elements, such as a dollar sign to signify a financial resource. Such symbols, if provided, do not form part of the formal definition of the notation. Yet there are some annotation styles that do have an agreed meaning. We describe these next.

Focus

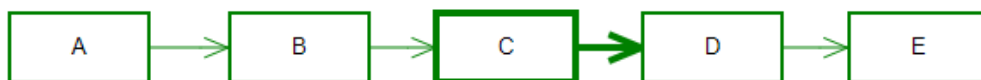
Within a situation there are often a small number of elements that play a special role in the situation, but which are not the goals or risks. For example, in problem solving there could be one element that is the lynch-pin to unraveling the situation, or perhaps a starting point for analysis that looks promising. In innovation, that could be an element that, if improved, has many useful side effects within the design. In Southbeach, 'focus' is used to highlight such elements. A yellow highlight effect is used as follows:



Useful and harmful elements, as well as goals, risks, choices, issues, etc, can each be highlighted. 'Focus' elements typically represent the salient aspects of the situation that, if addressed, will lead to improvement.

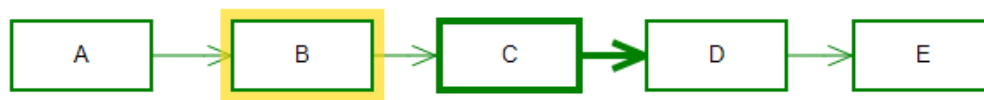
Emphasis

'Emphasis' is used to signify something of significance within the model. A thickened line is used. For example:



In this model, 'C', and 'C's ability to produce 'D', is especially significant in the chain.

At first sight, 'emphasis' (thick line) and 'focus' (yellow highlight) appear to be similar. The difference between them can be understood by looking at this model:



We may be focused on improving ‘B’ (yellow highlight) precisely because ‘C’ is significant (emphasized).

Tip - When drawing a Southbeach model, try not to litter it with too many ‘focus’ and ‘emphasis’ elements since the readability of the model will be reduced. Use these elements only when they genuinely help to clarify the situation.

Historical

Southbeach uses a simple cross (X) to denote that an element is ‘historical’. It means the element existed in the past, but no longer exists now. It exerted its effects in the past, but they are no longer occurring. The element is retired, or obsolete, or completed, or dead, or missing, etc.



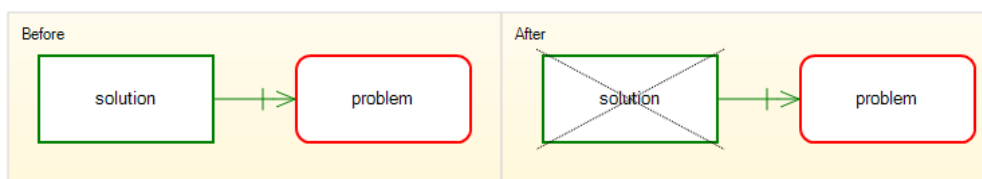
The two models above mean: The solution no longer exists to counteract the problem; The problem no longer exists to counteract the solution.

Any actor in a Southbeach model can become ‘historical’ – problems, solutions, risks, goals, choices, actions, etc.

We have observed that ‘historical’ is used in one of two ways:

1) ‘Historical’ is used for managing the lifecycle of a model during a project. Problems that have been solved, or actions that have been completed, can be marked ‘historical’. As the project progresses, more and more elements are marked ‘historical’ until the initiative is deemed to be complete. The same approach could be used for solutions to be implemented, issues to be resolved, choices to be made, etc.

2) A second way that ‘historical’ is used is as an intrinsic part of the model of the situation. Suppose in the past there was an actor in the situation that was useful in counteracting a problem, but it no longer exists in the present and the problem has recurred. This can be modeled as:



It is important to read this model correctly so that there is no confusion. It says that in the past ('before') that the solution existed and so was counteracting the problem. But now ('after') the solution no longer exists in order to counteract the problem.

Note that the use of the word 'solution' on both sides of the model is significant. It means that the model is talking about the same thing despite the fact they are different boxes. This feature allows Southbeach to express change in any dimension of separation.

Potential

We must try not to confuse 'potential' with 'historical'. Consider this model:



In the model on the left, 'A' would produce 'B' if its potential was realized. On the right, 'C' is no longer producing 'D'. The former is a statement about the future *if* 'A' were to exist. The latter is a statement about the past *when* 'C' did exist.

To clarify:

On the left, it is not the potential of 'A' that is producing 'B' – such as the influence of a major economic power to a weaker neighbor. Nor on the right, it is not the absence of 'C' that is producing 'D'. So could such different statements themselves be modeled?

In Southbeach, for something to have an effect it must be fully 'present' in the model, and not potential or historical. The only way to model the potential of something or the absence of something is to state it clearly:



Since Southbeach can also model potential effect, as well potential actors, questions also have to be asked about the meaning of models such as:



On the left, if 'A' existed, it would still only have the potential to produce 'B'. On the right, 'C' is present but insufficient, and is insufficiently producing 'D'. If the effect line was solid, 'C' would be producing 'D' sufficiently, even though 'C' was depleted.

Develop your own key

Misunderstandings in the application of Southbeach can never be completely eradicated. Indeed, some claim that Southbeach models are often ambiguous. In the whirl of a workshop, formal semantics is usually far from people's mind. For this reason, some users develop a 'key' to their own use of the notation for specific projects. The key will often use synonyms in language familiar to the project team. For example:



Inferring the color of effects

In a Software tool that implements the Southbeach Notation, the color of effects can be inferred by the 'use' or 'harm' of the two elements involved, and the 'type' of the effect between them. Can the color of the effect line be inferred in all situations?

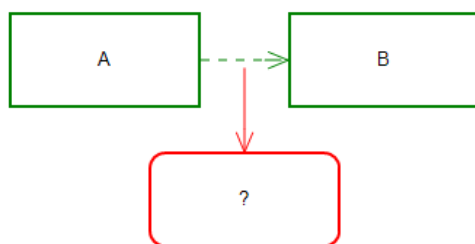
It is reasonably obvious that if something useful is 'producing' something harmful, then its effects in the world is also harmful. Thus, the effect line can be drawn in red. Similarly, suppose that something harmful is preventing something else harmful. It seems logical that its effect should be drawn in green despite the fact that the two agents influencing each other are both considered harmful:



In other situations, the color of an effect is less obvious. Take the following situation:

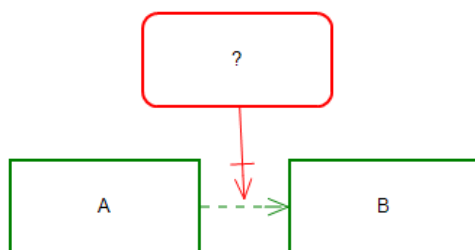


'A' is insufficiently producing 'B'. It seems that something is wrong, yet everything is green. Surely the effect line should be red? That depends on your point of view. One perspective says that it is useful for 'A' to be producing something useful, even if the production process is insufficient. Another viewpoint says that the process needs fixing. How does Southbeach model that? Rather than overwriting the color of the effect, the process itself is modeled as follows:



The insufficient production of 'B' has a harmful side effect. This is added to the model as another element. The line *out* of the insufficient effect is red, signifying harm.

The same approach can be used to model the cause of the insufficient production, as follows:

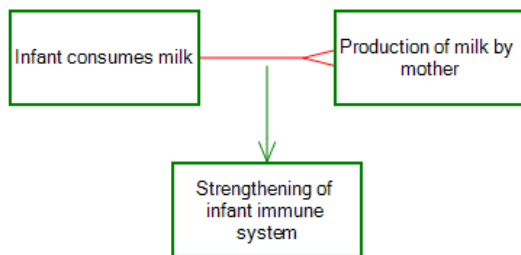


Something (?) is limiting the production of 'B' by 'A'.

When the color of an effect in a Southbeach model looks 'logically' wrong, ask: is it really the wrong color, or is there something missing from the model: the cause or implication of the situation? Even so, some situations appear to be subjective. Take this example:



Surely there is nothing harmful about a mother feeding an infant! From one perspective there is ... if the mother is not capable of producing enough milk, the infant may place too great a demand on the mother. In this example, both processes in the system are useful. The consumption however is harmful. Milk is a useful resource, and any consumption of a useful resource must surely be considered harmful. No. Like everything in the world, it is both useful and harmful. The harmful consumption is useful for the health of the infant as follows:



Another way about thinking about this 'system' is as follows:

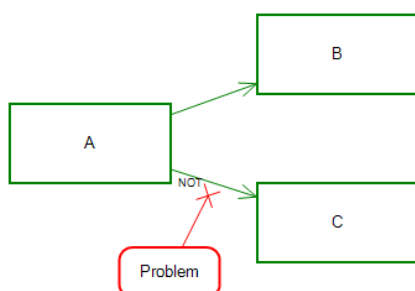


The production of milk by the mother creates a reserve of milk, which is consumed, strengthening the infant's immune system.

No doubt arguments will persist about the color of Southbeach effects. Software tools will make the best guess at the color of an effect. In some cases you may feel the need to override this. Our advice is to think carefully. Rather than disturb the logic of the notation, look for opportunities to extend the model with the missing information that clarifies the situation and your team's perspective of it.

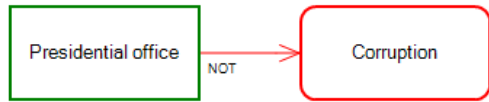
NOT

Saying that something is *not* happening can be as important as saying that it is happening. Either can be good or bad. In Southbeach, this is annotated in the model using the simple word 'NOT' as follows:

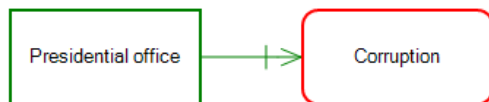


The model says that 'A' is producing 'B', but is not producing 'C'. A problem has been added to the model which is 'preventing' (X arrow head) the useful production of 'C'.

'NOT' is not about representing problems. It is useful that the President of a country is not creating corruption. This would be represented as:



Note that the effect line is still marked in red. Read this as 'not producing harm'. You might think that the line should be green, since not producing corruption is useful. This is a matter of perspective. This was discussed earlier, in the section entitled 'Inferring the color of effects'. If one needs to be clear in this situation, it might be helpful to model it using 'counteracts' as follows:

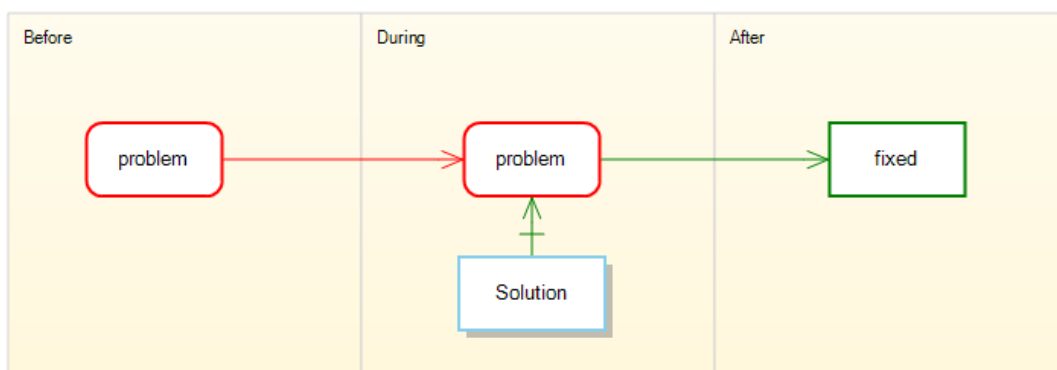


Now the color of the line is green.

Delayed and Accelerated

Just as concepts such as 'insufficient', 'excessive' and 'dysfunctional' help to clarify complex situations, Southbeach also allows for the modeling of time effects within a situation. There are two ways of achieving this.

- 1) Using a grid, and 'separation by time', elements can be explicitly placed in their respective time zones, for example:



A problem that originated in the past is still causing a problem in the present. An action introduced now, fixes the problem for the future. Modeling phases, epochs, cycles or moments in time, using a

grid, is a powerful way to clarify any situation where time is a factor. However, it is not always the most convenient.

Two other elements are provided, namely 'delayed' and 'accelerated'. These are used to signify something occurring too early (premature), or too late (retarded).



The production of 'B' by 'A' is being delayed. 'B' is occurring, or being increased, later in the process than would otherwise be the case. Think of 'delay' as a semi-permeable membrane that is stretching out time and prolonging the full effect of 'A' on 'B'.

Whereas:

The production of 'D' by 'C' is being accelerated. 'D' is occurring, or being increased, earlier in the process than would other be the case. Think of 'early' as an accelerator or a 'time machine', able to cause an effect to happen sooner rather than later.

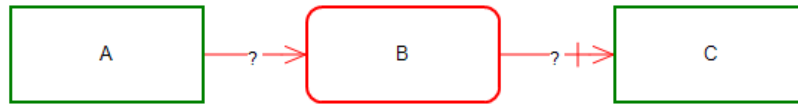
Once again, as with 'insufficient' and the other modifiers, Southbeach tools do not change the color of the effect line in this case, although clearly that would be what is intended in many situations. Southbeach regards the production of 'B' by 'A' as useful, even if it is late, or early. Again, there are two ways of clarifying such a situation:



By changing our perspective on 'B', by considering it harmful, the effect is now considered harmful. To stress the delay, the word 'late' has been added to the box. Of course, the word has no meaning, but it helps to clarify the model. In this form, it is then possible to model the effects of 'late B' on other elements in the situation. Alternately, in the model on the right, the harmful side-effect of the delay is explicitly added. Either could be used to go on to model their knock-on effects within the situation.

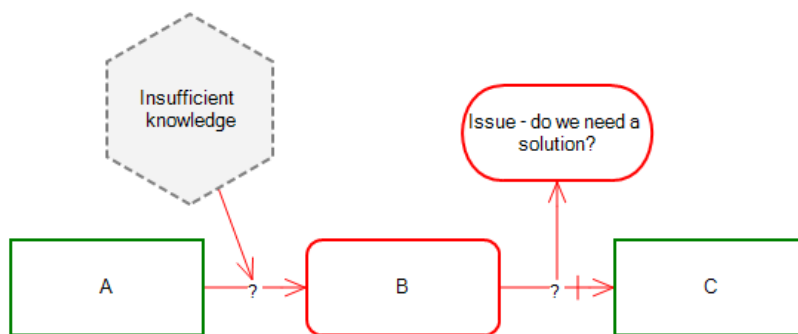
Questionable

In real life, the effect of one element upon another is often questionable. The existence of an interaction between two agents could, for example, be uncertain or debatable. This uncertainty is denoted by a question mark (?), interrupting the line of the effect as follows:



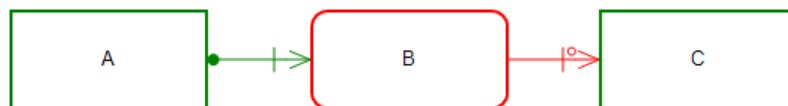
It is questionable whether 'A' is producing harmful B. It is also questionable whether 'B' is counteracting useful 'C'.

Use 'questionable' when you wish to explicitly model uncertainty in the effect of one actor on another. As before, it is also possible to model why these effects are questionable, and how that influences the situation. For example:



Necessary and Inevitable

It is sometimes useful to state explicitly what is 'necessary' for an effect to occur, and what will 'inevitably' occur. Southbeach uses small circles – filled and unfilled – to denote this information. The symbols are placed at either end of the effect line as follows:



The solid circle near 'A' says that 'A' is *necessary* to counteract 'B'. One can think of this as a 'requirement' on the system.

The open circle near 'C' says that 'B' will *inevitably* counteract 'C'. By using 'necessary' and 'inevitable', constraints, requirements or realities of the situation can be illustrated.

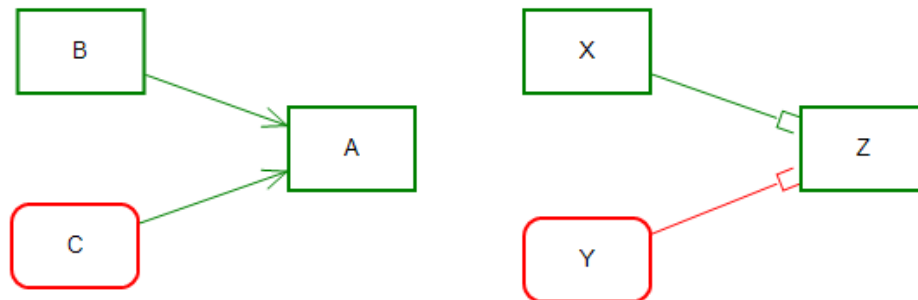
Note - do not confuse 'necessary' with its other meaning in English: 'required'. 'A' is *required* to counteract 'B' could mean something else entirely, i.e. that 'A' is being forced to counteract 'B'. This is not the same as 'necessary'. In fact, 'required' would be closer to 'inevitable' than it is to 'necessary' in Southbeach Notation.

Southbeach effects – produces, counteracts, prevents and consumes

So far we have seen effects such as 'produces', 'counteracts', 'prevents' and 'consumes'. Southbeach provides several others, each of which play their part in illustrating complex situations and which are useful for exploring directions for improvement.

Contributes to

Some users find they need nothing more than 'useful' blocks, 'harmful' blocks, and the two effects: 'produces' and 'counteracts'. While it's perfectly true that much useful work can be done with just these, it would be misleading to say they are sufficient for describing all complex situations. Take a look at these two models:

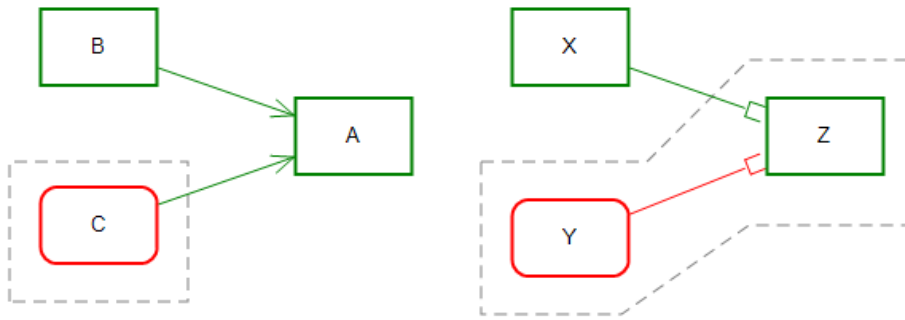


In the model on the left, 'B' and 'C' are both 'producing' 'A'. Their effects are both useful, since despite 'C' being harmful, it is still increasing 'A'.

In the model on the right, the distinct arrow head (shape \square) denotes 'contributes to'. 'X' and 'Y' contribute to 'Z'. They are both, in some sense, integral to 'Z'. They make 'Z' what 'Z' is! Without 'X' and 'Y', 'Z' loses something, and this would impact its role in the system. To remove the contribution of 'Y' to 'Z' would be something like closing down a business unit of a corporation, or a person losing their ability to speak, or a weak argument lacking important facts.

Look at the color of the effect out of 'Y'. Unlike the effect out of 'C', it is harmful (red). Why? Because a harmful element contributing to something considered useful, is surely harmful. Think about tossing a rotten apple into a barrel of ripe apples, or bad data creating a flawed argument, or a non-profitable business unit jeopardizing the next quarter's financial results.

The difference between 'produces' and 'contributes to' may be subtle, but it does change the suggestions we can generate from the two models.

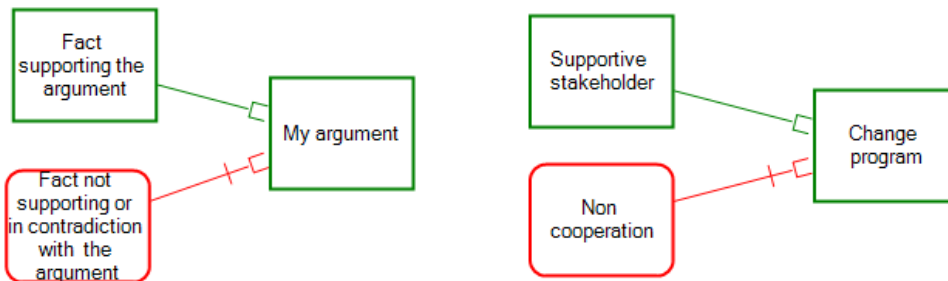


On the left, our strategy would be to favor ‘B’ over ‘C’. Ideally, we would prefer to remove ‘C’ from the system altogether, either by finding a useful replacement for ‘C’, or by finding a replacement for ‘A’ which has the same useful onward function but which is not dependent on ‘C’.

Similar strategies can be used for the model on the right. However, a new direction suggests itself. A system of contributions, in which some parts are harmful, reduces the ‘quality’ of the system. We must ask the question “How is the function of ‘Z’ impacted by the harmful contribution of ‘Y’?” This question does not arise in the model on the left, since the elements are not integral to each other.

Counter effects

Many of the effects in Southbeach have a corresponding ‘counter’ effect. For example, the counter effect to ‘produces’ is the effect ‘counteracts’. The counter effect to ‘contributes’ is the effect ‘detracts from’. Here is an illustration:



Stores and consumes

We introduced the effect ‘consumes’ earlier in the paper. The flipside (not strictly a counter effect) to ‘consumes’ is ‘stores’. This is denoted by a filled shape at the ‘store’ end of the line:



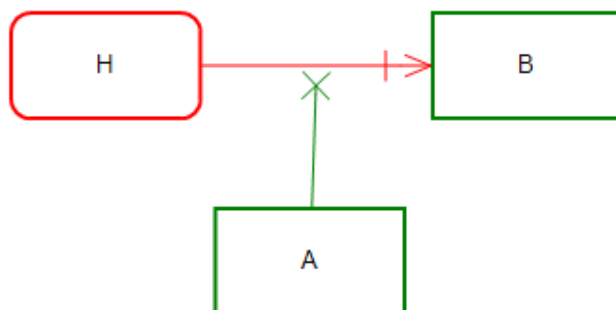
Once again, creative suggestions arise from the differences of meaning. A ‘store’ can be useful or harmful. What it ‘stores’ can affect how it is perceived. If it changes from being ‘useful’ to ‘harmful’,

attention moves to its contents. Why is the sales pipeline unhealthy? Is it because the sales opportunities were illusory? Has the security around the explosive storage unit been compromised? Etc.

Multiple relationships – What about ‘protects’?

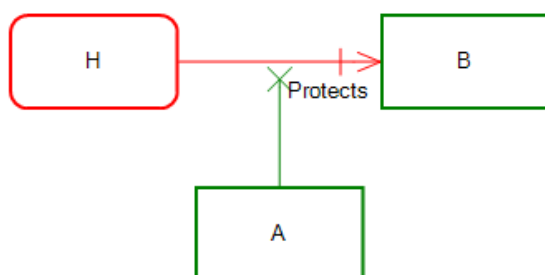
There is no ‘protects’ effect in Southbeach 0.9, but would such a word make any sense if it were to be added to the notation? Consider:

The phrase ‘A protects B’ begs the question: What is ‘A’ protecting ‘B’ from? There must surely be a third agent involved? How could this be drawn? A line can only connect two elements. Such tri-partite situations arise over and over again when modeling. In Southbeach they are accomplished by using ‘effects on effects’. Take a look at this model:

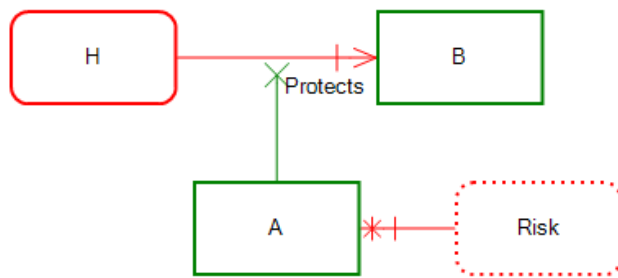


‘H’ is counteracting ‘B’. ‘A’ is preventing that effect from occurring. Thus, ‘A’ is ‘protecting’ ‘B’ from the harmful effects of ‘H’. There is no need for a special effect called ‘protects’. We have modeled ‘protection’ simply by using two different effects.

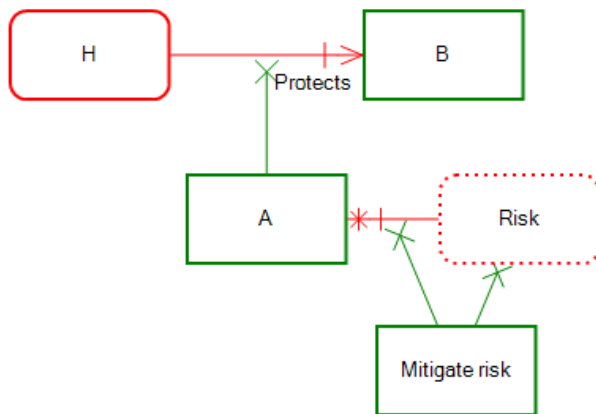
Note - To make the model clearer, a label can be added to the effect as follows:



The label can be thought of a synonym for ‘prevents’ in this situation. There are other ‘operator’ words where similar considerations would apply. If ‘A’ ‘isolates’ ‘B’ what it is isolated from? Etc. By using ‘effects on effects’ these 3-way relationships can be clearly visualized. For example:



Read this model as: The potential risk ‘destroys’ ‘A’, removing its preventative effect and thereby exposing ‘B’ to the harmful effect of ‘H’. It becomes obvious that we must add something to the model to ensure that the risk never occurs, or, if it does, that it must never harm ‘A’:

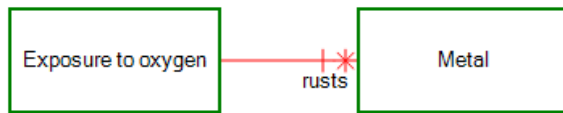


Synonyms in Southbeach

In the previous example, the word ‘protects’ was added as a label to the Southbeach effect ‘prevents’ in the situation where one agent was protecting a second agent from the effects of a third. Such use of synonyms is common in Southbeach. Each of the defined Southbeach terms are themselves terms in an upper level vocabulary. Like many English words, they will have exact, close and distant synonyms. For example:

- ‘Useful’ could also mean helpful, beneficial or positive
- ‘Produces’ could also mean generates, causes or emits
- ‘Destroys’ could also mean degrades, removes or rusts

It is entirely a matter of choice of how such synonyms are used in Southbeach models. Some users will label all of their effects with the precise word they mean. For example:



Other users may never use a synonym label, or only rarely.

In general, it is good practice to use synonyms and labels sparingly, and only where they help to clarify the situation or link to specific solution directions.

Because a Southbeach model is a structured diagram, rules can be developed that support various creative tools and analytic tasks. A rule that refers to 'rusting' can be more *specific* than one that refers to 'destroys'. The model can then 'suggest' directions for improvement at varying levels of abstraction.

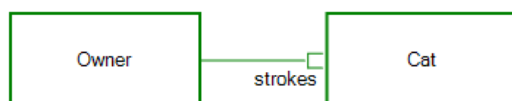
User Defined effects

Despite the flexibility of Southbeach, there will be times when you simply want to connect two boxes by an effect of your choosing. Not everything can be a synonym of a Southbeach term. For example, 'A loves B'. In such situations you have three choices:

- 1) If you feel such an effect is generally positive, use 'produces'. If generally negative, use 'counteracts', for example:



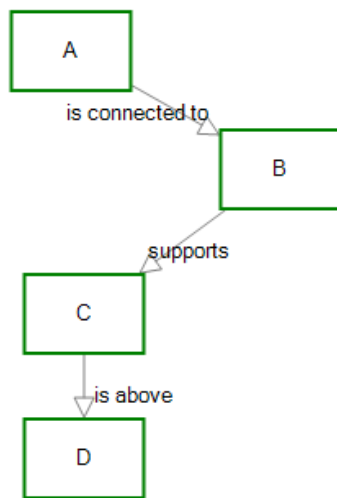
- 2) If the word you need to use has no positive or negative connotation, it may still be related to another Southbeach effect, even if only remotely. Suppose the word you had in mind was 'strokes', in the sense of 'stroking the cat'. It's a stretch, but this could be modeled using the 'contributes to' effect:



At first sight, stroking a cat seems to have no relationship to 'contributes to', but in some sense, the owner's stroking of the cat is contributing to the cat's well being, and, well, to what it is to be a cat.

- 3) However, when meaning is stretched too far, Southbeach provides a 'catch all' effect called 'User Defined'. It has a special shape to distinguish it from all other effects, and it can be

labeled like any other effect. Here, the user defined arrow type is used to show a set of relationships between elements:

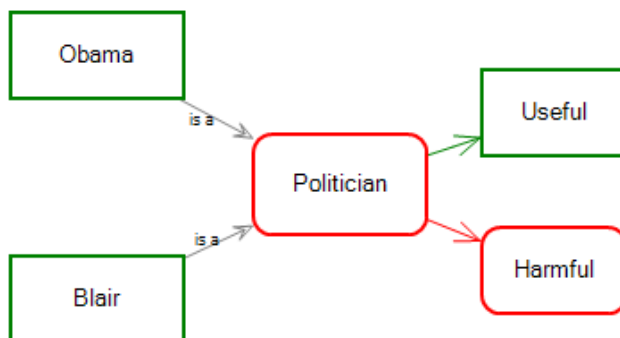


Is Southbeach (too) complex?

Albert Einstein is reported to have said that “everything must be made as simple as possible, but not one bit simpler.” Not all situations, and certainly not all Southbeach models, require the use of all effects and elements. You are unlikely to need, or want to apply, every aspect of the notation in a single model. However, knowledge of the full notation can enrich your analytical skills. We believe that learning Southbeach is itself useful. With this in mind, we now cover other Southbeach effects. Let’s make things even more complex

IsA

It is often convenient to be able to say that one thing is an example of another. The former inherits the properties of the other. For example:

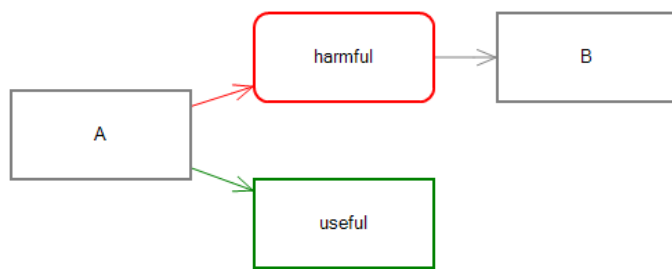


Judicial use of ‘IsA’ can simplify a Southbeach model, avoiding, in this case, repetition of the useful and harmful effects of politicians. In this model, politicians are regarded as harmful. This property is inherited by both Obama and Blair. The model is therefore prompting two primary directions:

1. To find an alternative to Obama and Blair, that nevertheless provide the useful functions, without the harmful.
2. With Obama or Blair in power, to find ways to minimize their harmful side effects of their otherwise useful function.

Neutral

The example in the last section suggests that it may sometimes be necessary to explicitly state that no view is taken one way or another, or that a view has not yet emerged. In this model:

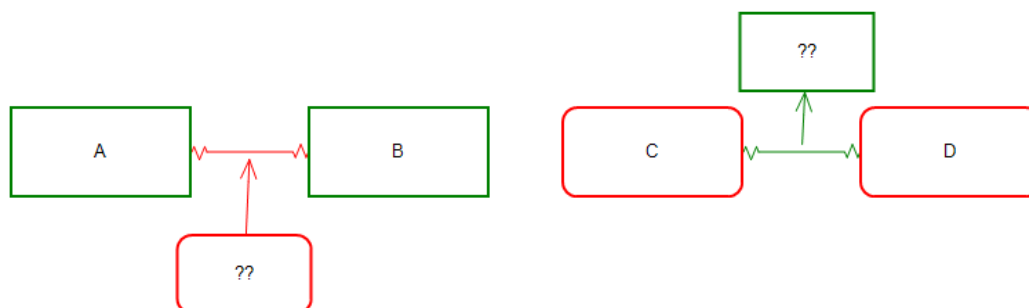


'A' is both useful and harmful, but it has been drawn in grey. This signifies that either we don't wish to take a perspective, or that the perspective is unclear. In such a model, suggestions for enhancing or removing 'A' may be suppressed. Perhaps it is because 'B', the implications of the harmful aspects of 'A', is also unclear.

Tip – don't use 'neutral' too often. If you are not taking decisions on whether an element is useful or harmful, you are not innovating and you won't be able to solve the attendant problems.

Opposed

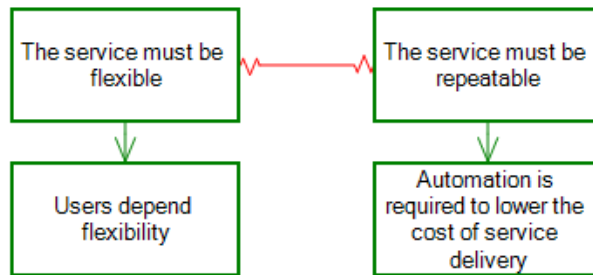
In any situation there can be incompatible states; elements which cannot occur together. TRIZ practitioners call these 'physical contradictions'. They typically arise from the nature of reality itself, not from the 'human' design of the system. For example, something cannot be at the top, and at the bottom, at the same time. Something cannot be both hot and cold. It is not possible for a company to innovate without investment. Etc. Southbeach refers to such situations as 'oppositions'. They are shown as follows:



The squiggly mark at each end of the effect line denotes that 'A' and 'B' cannot exist together in the situation, or at least, are finding it hard to co-exist. Since 'A' and 'B' are useful, we want both, their

opposition is harmful. There must be a reason for this, denoted by the agent '??'. Similarly, an opposition between two harmful elements 'C' and 'D' is useful. And this must have a useful effect.

The 'opposed' effect in Southbeach is used for everything from physical constraints, to opposed political views. Of course, everything is relative and always from a perspective. Maybe something can be both hot and cold – appearing hot to one person and cold to another with a different tolerance. All sorts of oppositions exist in complex situations. Whether they represent a problem depends on whether it is possible to separate them by some dimension. For example:



In this model, all of the elements are useful, and are therefore needed, yet there appears to be an opposed situation. How can the service be both flexible to user's needs, yet repeatable so that the service provider can automate the service to lower the cost of service delivery? Any situation like this, in which two elements are opposed, can be resolved by separating the situation via some dimension. In this case, three options that come to mind are:

- Separate in time – make the service flexible at the times it needs to be and standardized at all other times
- Separate by structure – make certain parts flexible, and all others standardized
- Separate on condition – users only care about flexibility for certain types of event that occur in the delivery of the service

Separations

Southbeach provides a standard set of dimensions for separate an element, decomposing it into conceptual parts, or structuring a model. They are:

- Structural
- In space
- By time
- By perspective
- As aspect
- By observing role

- By probability
- On conditions
- By version

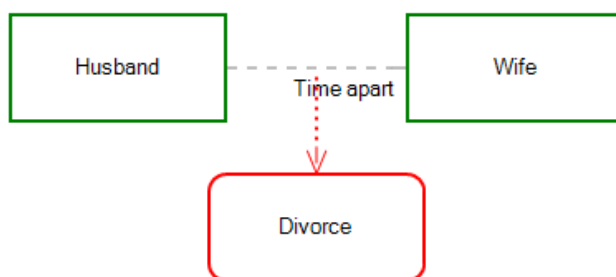
The synonyms of these Southbeach terms are given later in the paper. Separation, a concept well documented in TRIZ, becomes a powerful tool for solving many kinds of opposed situations.

Related

Understanding a situation often rests on understanding the relationships between elements, even when they may not be having effects or influences upon each other. For example, in a business, the personal relationship between the CEO and a favored manager could be the cause of why that unit is more successful than another. In engineering, the relationship of a part, to its supplier, could be the reason for occasional product faults. Southbeach provides a simple line to denote these types of relationships:



On the left, useful element 'A' is related to harmful element 'B'. The effect is marked 'questionable' in this example, signifying that we are unsure of whether a relationship exists and what its precise nature is. On the right, 'C' is insufficiently related to 'D'. Whether these situations are useful, or harmful, cannot be inferred from the diagram, so relationships are always drawn in grey. If the effect of the relationship needs to be modeled, add an 'effect from effect' as follows:



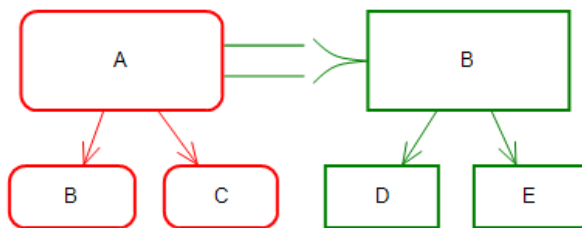
This model says: the relationship between husband and wife is insufficient.¹⁰ This situation could lead to divorce (potential dotted line). Like all other effects, Southbeach allows for a label to be added, in this case, time apart.

¹⁰ Also see <http://southbeach-idioms.blogspot.com>

Relationships, like all other Southbeach effects, can be processed using a rules engine. A wide variety of analytical applications can be developed in this way, for example, simple fault trees, Root Cause Analysis (RCA), dependency modeling, and Value Engineering (VE).

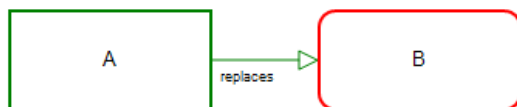
Becomes and replaces

All situations evolve. We have already seen the ability to model elements being 'created' or 'destroyed', but what about transformation? Southbeach provides two effects for modeling transformation:



This model says that 'A' is becoming 'B' (literally), that is, over time, the way 'A' is producing harmful elements 'B' and 'C' will change and instead it will be producing useful elements 'D' and 'E'. It's as if the nature of 'A' is changing to act like 'B' in the situation.

Another way to model transformation in Southbeach is to use the effect 'replaces'¹¹:



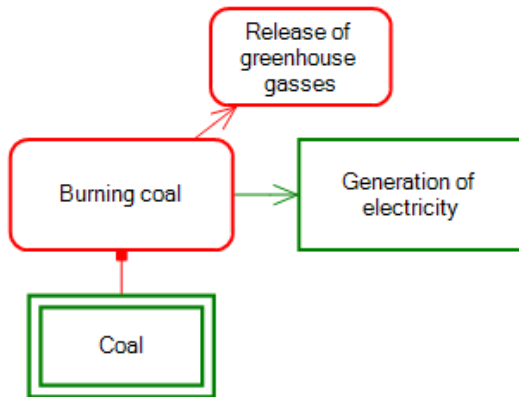
This model says that useful 'A' is replacing harmful 'B' in the situation. This is therefore a solution in this instance. The difference between the two effects is as follows:

- **Becomes** – one actor in the situation is changing so as to behave like another actor in the situation. Think of a leader, for example, demonstrating how others can become leaders. Or how disruption behavior in a classroom can degrade the learning of others.
- **Replaces** – one actor in the situation is replacing another in their role. Examples would include a change of leadership, or a pupil taking over the role of the teacher for a special lesson.

¹¹ At the time of writing, the visual effect for 'replaces' has not been implemented in Southbeach Modeller, so the shape of a 'user defined' effect is used, to which the word 'replaces' is added as an annotation at the source end of the effect.

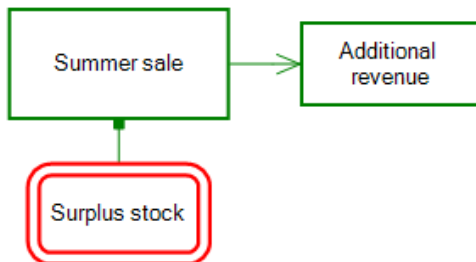
Uses

In nearly all situations, resources play a key role. Finance in the economy, raw materials in manufacturing, talent in a business, etc. Southbeach models a dependency on a resource as follows:

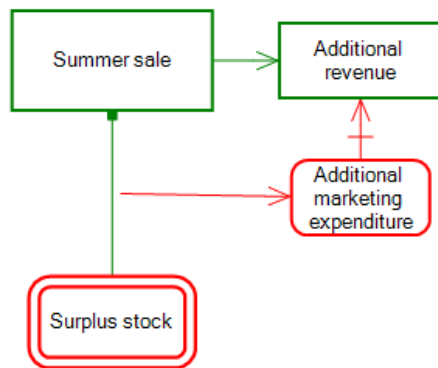


The model says that burning coal is both useful and harmful, but is dependent on the useful resource coal. In this model, coal is marked as 'surplus', to signify that it is too easy to be dependent upon it as a fuel.

Whether or not the use of a resource is considered useful or harmful depends on whether the resource itself is considered useful or harmful, and whether the element using the resource is considered useful or harmful. For example in this model:



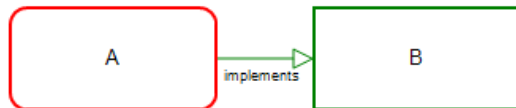
An excess of surplus stock is harmful waste, a cost to the business. A summer sale could help to shift that stock, generating useful additional revenue. Note how the color of the 'uses' effect is green, since the use of a harmful resource, by something useful, is considered useful (in most situations). However, it could have harmful side effects such as:



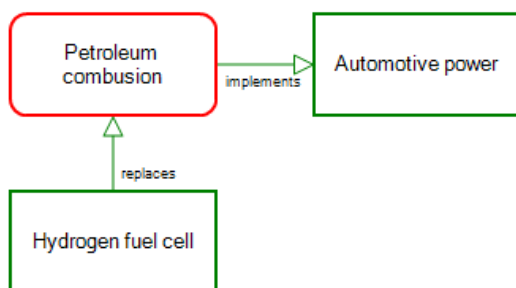
Implements and specifies

The final two effects in Southbeach Notation 0.9 are ‘implements’ and ‘specifies’¹². They hold a special place in innovation and problem solving.

The mechanism behind an actor or agent in a situation is vital to its correct operation. An engine only works because of the process of combustion within it. How something does what it does, or its design, determines how it behaves in practice. These two relationships therefore have a major impact on situational improvement. In this model:



‘A’ is the implementation of ‘B’, for example, petroleum-based combustion is the power behind an automobile engine. By stating that ‘A’ is harmful we are not saying that ‘B’ is working correctly despite ‘A’, rather, that we wish to remove the dependence of ‘B’ on ‘A’. For example, we may wish to replace ‘A’ by a cleaner fuel:



¹² At the time of writing, the visual representation of these effects had not been decided. As before, the shape of a ‘user defined’ effect is used, to which the name of the effect is added as an annotation at the source end.

Harmful elements in a Southbeach model are always those we wish to reduce or eradicate. In this case, we are replacing petrol with fuel cell technology in regard to its role of providing the automotive power. The model therefore places a requirement on fuel cells for use in automobiles.

Understanding the process behind another process, and developing models of its useful and harmful functions, can lead to creative directions for problem solving and innovation. In similar vein, consider 'specifies'.



In this model, a good design (useful) has specified a malfunctioning product (harmful). The implication is that there is something wrong with the design, despite the perception that it is useful.

Using 'specifies' and 'implements', it is possible to model a wide range of design and implementation related problems (see synonyms later in paper).

Putting it all together

Southbeach Notation has been designed so that all of the visual effects can be combined, without creating a visual ambiguity. While the semantic interpretation of some combinations is hard to grasp, the richness of the models possible enable complex situations to be described with considerable clarity. The fact that the models are more than ad-hoc diagrams allows them to be processed by a rules engine, generating output which can assist in:

- Model development
- Situational understanding
- Problem solving, and
- Improvement

It is expected that rule sets will be developed a wide range of creative brainstorming or structured problem-solving, methods. Moreover, the models can be structurally analyzed, for example to ask a questions such as "What are the elements that are most harming our goals?"

Why the name Southbeach?

The initial ideas for the notation were first drawn in the sand on South Beach, Miami, FL in June 2005.

Software for Southbeach

Southbeach has been designed so that it can be drawn on flipcharts and whiteboards, easily. But for more complex work, a software tool is essential. The Southbeach models included in this paper were

cut and paste from Southbeach Modeler; a product of Southbeach Solutions Ltd. Information about the software can be obtained from:

<http://www.southbeachinc.com>

About the Authors

Howard Smith and Mark Burnett developed Southbeach Notation.

Based in the UK, Howard Smith is CTO of CSC's European Group. He co-founded BPMI.org and is the author of two books: *Business Process Management: The Third Wave* and *IT Doesn't Matter? Business Processes Do*. Howard is also a research associate of the Leading Edge Forum.

Mark Burnett is a management consultant at BearingPoint. He is director of IT Strategy & Transformation. Mark is also team lead for the "Improving the Deployment Toolkit at One Laptop per Child" project. Mark specializes in Service Improvement, IT Governance, Organizational change and Enterprise Architecture.

Further reading

BPTrends have published several papers about Southbeach. They provide examples of using the notation. They include:

[1] "Red, Green and Blue – Situational Improvement with Southbeach", H. Smith, Jan 2011, BPTrends <http://tinyurl.com/2u76h4t>

[2] "Southbeach Notation – Improve Everything Always", H. Smith, M. Burnett, C. Young, BPTrends, May 2008, <http://tinyurl.com/3xfe6mf>

[3] Further examples can also be found at the blogs and Wiki of Southbeach Solutions:

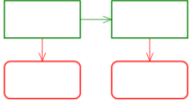
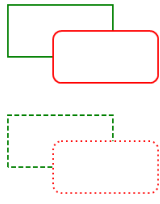
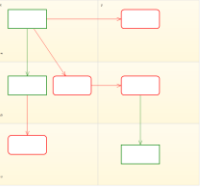
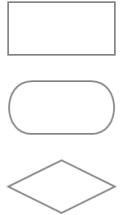
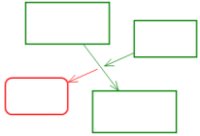
<https://sites.google.com/site/southbeachhelp/home/blogs>

<https://sites.google.com/site/southbeachhelp/>

Appendix A






What follows is a listing all of the elements of Southbeach 0.9.

Core Concepts




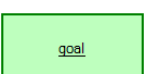
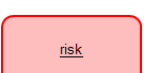
	Visualization	Definition	Synonyms
<p>Situation</p> 	<p>One or more Southbeach models – line and box diagrams</p> <p>See http://soutbeach-examples.blogspot.com</p>	<p>Combination of circumstances, complex, critical or unusual problem, misalignment, a needed change etc.</p>	<p>Condition, case, plight, predicament, difficulty, state of affairs, circumstances, picture ...</p>
<p>Perspective</p> 	<p>Color, line style (see below)</p>	<p>What is useful, what is harmful? Goals and risks. What is insufficient, what is surplus? What is working, what is not working? What could be, what has been? etc.</p>	<p>Viewpoint, as one sees it, frame of reference, opinion, position, judgment, argument, observation, outward appearance, relative view, context ...</p>
<p>Separation</p> 	<p>Placement on a 1D or 2D grid, e.g. swim lane diagram, pool or consultants 2x2, NxM ...</p>	<p>Looking at a situation in many dimensions. For example, in the past, present and future, from above, from below. Southbeach defines several dimensions of separation. See below.</p>	<p>Dimension, property, attribute, distance between, independence, grouping, partitioning, degree of freedom, arrange by class or kind, area reserved for some purpose ...</p>
<p>Agent</p> 	<p>A rectangle or other simple shape, e.g. diamond, lozenge</p>	<p>An actor within the situation. Agents have effects on each other within the situation. Southbeach defines several kinds of agent. See below.</p>	<p>Actor, cause, performer, active element, key role, factor, force, means, operator, worker, broker ...</p>
<p>Effect</p> 	<p>Directional or bi-directional lines between boxes, typically with a distinguishing arrow head at one or both ends.</p>	<p>Influences between agents. Southbeach defines several kinds of effects. See below.</p> <p>Influences between agents can also exert influence, or be influenced.</p>	<p>Influence, consequence, result, outcome, upshot, side effect, by-product, repercussion, force, impact, production, implication operation, intention ...</p>

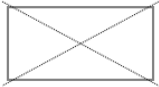






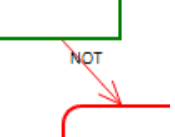
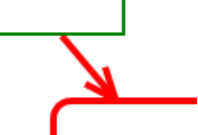
Agents

Agents are actors in a situation. The following kinds are defined:

	Visualization	Synonyms
Plain agent 	Rectangle	Actor, cause, performer, active element, key role, factor, force, means, operator, worker, broker ...
Choice 	Diamond	Option, alternative, selection, possibility, decision, pick list, path, route, way ...
Issue 	Lozenge	Question, crux, point in issue, matter raised, problem, trouble, precondition, hiatus, block, check, query, discussion, doubt ...
Action 	Shadowed blue rectangle	Proposal, effort, intervention, treatment, project, proactive step, planned activity, control, endeavor, positive influence ...
Knowledge 	Hexagon	Information, facts, context, assertion, opinion, belief, evidence, rumor, sacred cows, elephants in room, realities, principles, truth, laws ...

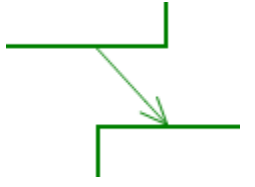
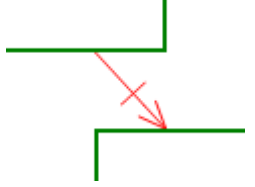
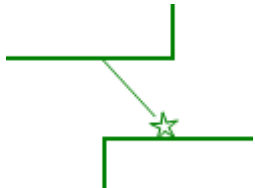
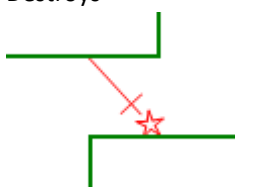
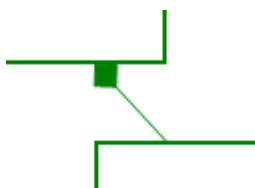
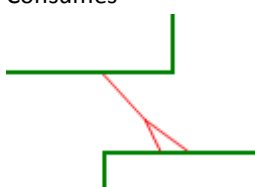
Perspectives

	Visualization	Synonyms
Useful 	Green	Positive, enabling, helpful, solution, worthwhile, profitable, beneficial, gainful, productive, valuable, effective ...
Harmful 	Red	Negative, inhibiting, harmful, disadvantage, problem, danger, contrary to interest, destructive, malign, subversive ...
Neutral 	Grey	Undecided, uninvolved, impartial, objective, remote, unaligned, indifferent, detached, ordinary, bland, isolated ...
Goal 	Green filled plus text underlined	Aim, purpose, intent, aspiration, ambition, ideal, objective, target, destination, terminus, home, pay off, finish, end ...
Risk 	Red filled plus text underlined	Hazard, danger, jeopardy, peril, liability, vulnerability, susceptibility, exposure, uncertainty, gamble ...

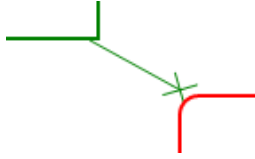
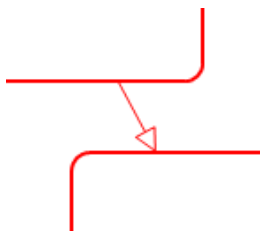
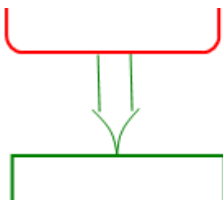
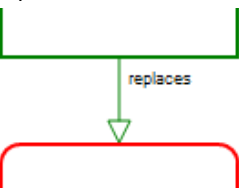
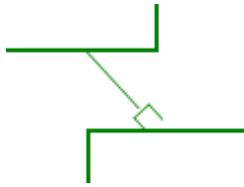
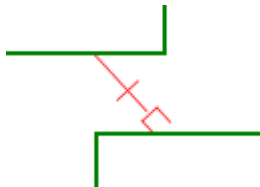
<p>Historical</p> 	<p>Cross out shape</p>	<p>In the past, no longer, retired, obsolete, strike-out, old news, noncurrent, not in play, completed, defunct, dead, missing ...</p>
<p>Focus</p> 	<p>Yellow outline highlight</p>	<p>Center, spot light, nub, core, kernel, heart, concentration, substance, zero in on, key element, pivot, axis, meeting place ...</p>
<p>Insufficient</p> 	<p>Dashed line – agent or effect</p>	<p>Deficient, in adequate, lacking, in short supply, at a premium, in capable, underpowered, too small, too little too late ...</p>
<p>Surplus</p> 	<p>Doubled line on agent</p>	<p>Surfeit, excess, oversupply, extra, glut, redundancy, spare, reserve, additional to need, superfluous, duplication ...</p>
<p>Excessive</p> 	<p>Doubled line on effect</p>	<p>Beyond limits, disproportionate, undue, immoderate, extreme, too much, overkill, overload, strained, uncertain outcome ...</p>
<p>Potential</p> 	<p>Dotted line – agent or effect</p>	<p>Possible, imaginable, unrealized, latent, dormant, untapped, inactive, passive, hidden, undisclosed, undeveloped, deferred, waiting ...</p>
<p>Dysfunctional</p> 	<p>Broken line – agent or effect</p>	<p>Impaired, imperfect, damaged, not serving purpose, diminished in quality or utility, unsatisfactory, incomplete, inadequate ...</p>
<p>NOT</p> 	<p>The word 'NOT' on the effect line</p>	<p>Negation, e.g. A does not produce B</p>
<p>Emphasis</p> 	<p>Thickened line – agent or effect</p>	<p>Accent, stress, underline, importance, significance, prominence, salience, priority, weight, strength ...</p>

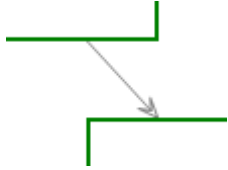
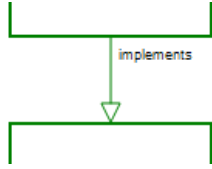
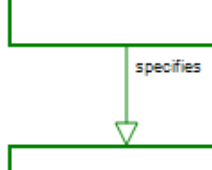
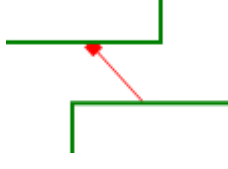
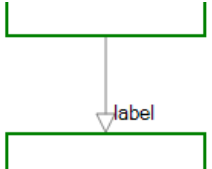
Effects

Effects are influences of one agent on another, or between agents and effects. They are unidirectional.

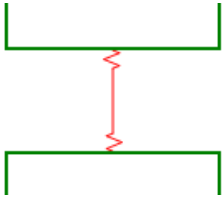
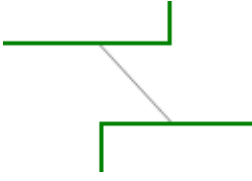
	Visualization	Synonyms
<p>Produces</p> 	<p>Standard arrow head</p>	<p>Increase, exaggerate, grow, increment, enhance, magnify, heighten, deepen, reveal, provide, supply, output, return ...</p>
<p>Counteracts</p> 	<p>Standard arrow head with tick across line</p> <p>The counter effect to 'produces'</p>	<p>Inhibit, obstruct, reduce, mitigate, hinder, restrain, conflict with, clash with, work at cross purposes with, offset benefit of, neutralize, cancel effect of ...</p>
<p>Creates</p> 	<p>Star</p>	<p>Make, cause to be, generate, originate, conceive, invent, design, build, construct, manufacture, establish, reveal, launch, expose, show ...</p>
<p>Destroys</p> 	<p>Star with tick across line</p> <p>The counter effect to 'creates'</p>	<p>Remove, delete, degrade, ruin, break, terminate, overthrow, subvert, defeat, erase, eradicate, cancel, expunge, wipe out, dismantle, disguise, hide, kibosh ...</p>
<p>Stores</p> 	<p>Filled block (at the storage end)</p>	<p>Accumulate, stock, save, stockpile, amass, cache, warehouse, deposit, conserve, preserve, value, appreciate ...</p>
<p>Consumes</p> 	<p>Funnel at the end being consumed</p>	<p>Expend, deplete, weaken, drain, exhaust, empty, use up, devour, squander, waste, wear out, ruin, wipe out, dispose, lose, misuse ...</p>

More Effects

<p>Prevents</p> 	<p>Cross at end being 'prevented'</p>	<p>Block, prohibit, disallow, stop, veto, avert, frustrate, thwart, inhibit, hold at bay, arrest, forestall, annul, foil, avoid, nip in the bud, render harmless, annul ...</p>
<p>Causes</p> 	<p>Arrow distinguished from 'produces' and 'counteracts'</p> <p>The counter effect to 'prevents'</p>	<p>Trigger, reason for, explanation of, stimulus for, initiator of, antecedent of, bring about, give rise to, start, root cause ...</p>
<p>Becomes</p> 	<p>Transformation arrow type</p>	<p>Transform into, change into, grow into, develop into, evolve into, convert into, mature into, progress towards, trend towards, turn out to be, is the fate of ...</p>
<p>Replaces</p> 	<p>Temporary visual</p>	<p>Succeed, supplant, supersede, follow, come after, substitute, exchange, act for, stand in lieu of, step into shoes, fill a vacancy ...</p>
<p>Contributes to</p> 	<p>Open box shape arrow head</p>	<p>Adds to, provides, supplies, brings in, amplifies, helps, imparts to, extends, bestows, subsidizes, cooperates with, advances, has a hand in ...</p>
<p>Detracts from</p> 	<p>Open box shape arrow head with tick across line</p> <p>The counter effect to 'contributes to'</p>	<p>Removes from, takes away, diminishes, hinders, steals from, deflects from, belittles, talks down, devalues, falsifies, counter example ...</p>

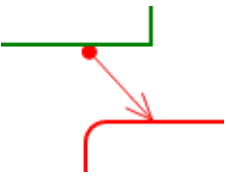
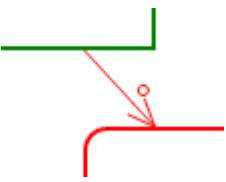
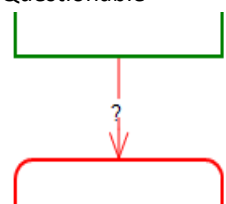
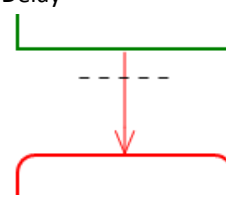
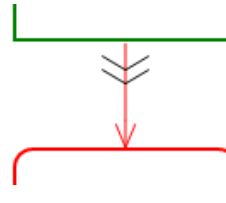
<p>Is A</p> 	<p>Special arrow head</p>	<p>Example of, type of, kind of, group member, category, relation ...</p>
<p>Implements</p> 	<p>Temporary visual</p>	<p>Fulfill, carry out, execute, mechanism behind, medium for, engine within, means of, performs, achieves, realizes, puts into effect, brings to life, essence of ...</p>
<p>Specifies</p> 	<p>Temporary visual</p>	<p>Defines, describes, provides the design for, details, determines, distinguishes, makes clear, explains, labels, nails down ...</p>
<p>Uses</p> 	<p>Small filled square at end that 'uses' the attached resource</p>	<p>Employ, apply, exercise, bring into play, put into service, profit by, reduce availability for others to use, turn to advantage, exploit, expend, needs ...</p>
<p>User Defined</p> 	<p>An arrow distinct from all others, with a user supplied label</p>	<p>User defined effects or relationships, e.g. A <u>affects</u> B</p> <p>Should not be used where a close synonym of a Southbeach effect is intended.</p> <p>Another appropriate use would be in subject-verb-object modeling, e.g. table <u>holds</u> vase.</p>

Bi-directional effects

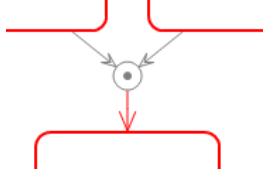
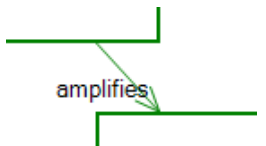
	Visualization	Synonyms
<p>Opposed</p> 	<p>Jagged at each end of the 'opposition'</p>	<p>Contradiction, conflict, tension, polarity, paradox, dilemma, balance of forces, incompatible states, extremes, disagreement, debate, opponents, deadlock, complex problem, impossibility, unthinkable, search for truth ...</p>
<p>Related</p> 	<p>Simple connecting line</p>	<p>Connected, correlated, corresponding, accompanying, attached, associated, coupled, adjacent, joined, linked, companion, paired, duality, reciprocal, Yin Yang ...</p>

Effect qualifiers

Qualifiers can be added to all effects.

<p>Necessary</p> 	<p>Small filled circle at the end of the effect which signifies the necessary element</p>	<p>Requirement, condition, essential, standard, demanded, mandatory, policy, obligatory, need, vital, basic, called for ...</p>
<p>Inevitable</p> 	<p>Small unfilled circle at the end of the effect signifying the inevitable effect</p>	<p>Always, certain, predictable, unavoidable, invariably occurring, fate, predetermined, inescapable conclusion ...</p>
<p>Questionable</p> 	<p>Question mark interrupting the line</p>	<p>Uncertain, maybe, alleged, doubtful, fishy, suspect, open to debate, not as expected, subject to discredit, without justification ...</p>
<p>Delay</p> 	<p>Dashed line across the path of the effect</p>	<p>Pause, lag, held back, restricted, postponed, slow, prolonged, impeded, hiatus, hesitancy, holding pattern, moratorium, reprieve ...</p>
<p>Accelerated</p> 	<p>Speed arrow across the path of the effect</p>	<p>Early, premature, too soon, ahead of time or need, in advance, too hasty, quickened, speeded up ...</p>

Special objects

	Visualization	Synonyms
<p>Conjunction</p> 	<p>Target circle</p>	<p>Together, union, joint action, join, logical AND, confluence ...</p>
<p>Effect label</p> 	<p>Text at appropriate end of effect</p>	<p>Synonym, clarification, distinction ...</p>

Separations

Separations are visualized by placing agents on a canvas grid. A swim lane, pool or labeled box style of grid shows one degree of separation between the agents placed on it. A window pane style of grid shows two degrees of separation. For example, a consulting 2x2, TRIZ 9boxes, etc.

Space	e.g. inside, outside	Where something is located in physical or abstract space, spatial bounds, point or extent, spatial relationship, inside-outside, up-down etc ...
Time span	e.g. past, present, future	A period reckoned from a fixed point or event, periods, intervals, before, after, during, past, present, future, near past, near future, now, epoch, era, phase, milestone ...
Structure	e.g. super system, system, subsystem	Parts, organization, relationship, composition, hierarchy, construction, configuration, arrangement, system, super system, sub-system, infrastructure, superstructure, segmentation, form ...
Aspect	e.g. brand, performance	Appearance, look, distinguishing feature, attitude, nature, character, quality, characteristic, trait, singularity, attribute indicative of ...
Probability	e.g. certain, probably, rare	Chance, frequency, likelihood, possibility, futures ...
Role	e.g. organizational role, role in a process	Participant, part, actor, in a process, actions and activities assigned or expected, of people, groups and organizations and systems ...
On condition	e.g. on, off, suspended, above threshold	State, at a point in time, validity, attributes, qualification, definition, delineate, specialize, designate, assign, delimit, determine, nail down, narrow, stipulate ...

Agent Types

Each agent can also be assigned a 'type'. Think of a type as a simple 'tag'.

Giving an agent a type can help to clarify the meaning of a situation. A type can also qualify the improvement directions generated. For example, knowing that a useful agent is a 'resource' as opposed to a 'process' could be used in a rule that generate different creative suggestions from the model.

Southbeach specifies a 'starter set' of types found to be useful in a range of business and engineering modeling tasks. Software tools and users may extend this type system. Other type systems may be added, e.g. 'tag' groups.

Process		Procedure, operation, treatment, action, change, computation, transformation, to manage, attend to, organize, systematize, categorize ...
Activity		Task, job, doing, work, operation, execution, effort, assignment, enterprise, exertion, labor, liveliness, action, motion, movement ...
Service		Provided to another, work on behalf of another, assistance, performance of duties, outsourcing, maintenance, meet a need, conduct of business, any specified activity ...
Capability		Capacity, competence, aptitude, ability, advantage, qualification, talent, knowhow, skill, understanding, features, selling point ...
Project		Plan, scheme, undertaking, enterprise, venture, operation, campaign, program, job, effort, work, contract, commitment, engagement ...
Product		Output, goods, offered for sale, work, artifact, representation, creation, result, consequence, outcome, fallout, repercussion, by-product ...
Function		Use, purpose, role, task, actions assigned, activity, operation, occupation, work, concern, perform as, mission, assignment, play the role of ...
Resource		Of material value or usefulness ... source of wealth, reserve supply, asset, gains, capacity to fulfill, help, reinforcements, store, money in the bank, natural resources, income, inventory ...
Quality		Individual nature, distinctive property, desirable or undesirable attribute, feature, trait, idiosyncrasy, ability, talking point ...
Event		A given time and place, occurrence, happening, incident, situation, special circumstance, moment, transition, eventuality, chance event, outcome, result, aftermath, sequel ...

State		Condition, value of attributes, situation, circumstance, state of affairs, current form ...
Idea		Concept, observation, abstraction, understanding, impression, assumption, suspicion, opinion, viewpoint, belief, feeling, culture, philosophy, principle, policy, plan, design, vision, theory, fantasy ...
Trend		Future, direction, movement, tendency, change, course, heading, track, fashion, inclination, orientation, bias, disposition, vogue, swing ...
Thing		Article, entity, concrete or abstract, manmade object, substance, concept, abstraction, element, a vaguely specified concern, un-typed ...

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Southbeach notation refers to the consistent body of work that brings together all of the semantic elements of Southbeach methodology into a comprehensive single visual notation, supported by the associated formal specification and reference implementation. These artifacts are maintained by the authors and manifest in the reference software implementation.

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