TRIZmeta

A Game Of Rules For Breaking Rules

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Abstract

TRIZ is the world's leading breakthrough solution generation methodology. TRIZ is in effect a series of heuristics that offer innovators the 'rules for breaking the rules'. TRIZ tells us that there are many, many ways to solve problems badly, but only a small number of strategies that deliver successful breakthrough solutions. TRIZ is centred around the idea of contradiction solving. The primary tools within the TRIZ toolkit for solving contradictions are the 40 Principles. TRIZmeta teaches game-players the 40 Principles and how to get the best out of those Principles to break existing rules and create innovative contradiction-solving new rules. Thus, TRIZmeta works on two distinct levels: at the hands-on, practical level, it teaches players the rules for breaking rules effectively. Then, perhaps more importantly, at the philosophical level it teaches players the truth of the statement that innovation is indeed about breaking current rules to find better rules.

Introduction

"We could see the children's toys here and there, and we saw a game that the children had made themselves out of dirt, deer antlers and abalone shells, but the game was so strange that only children could tell what it was."
Richard Brautigan

Contradictions. Why do humans love games? Conversely, why do some appear to loathe the prospect? On the positive side, if we are to believe Joseph Campbell[1], games are a metaphor for life. Games make heroes. They are competition in a safe environment. Like wrestling lion-cubs, they teach us about life. Unlike the play-fighting cubs, most human games, and all games that have been designed, the rules are pre-determined. Board games, video games and sports effectively teach us that in order to 'win' we need to obey the rules.

Many people, at the same time, purport to not liking games. Listening to the reasons people give for not wanting to participate, two things stand out: a) we don't like the prospect of losing, and, b) we don't like the artificiality and 'stupidity' of too much order. As in life, we seem to develop a strong aversion to overly constrictive rules.

There is something strange here. Like lion-cubs, small children almost all love games. Watch kindergarten and early primary school children playing games and two things become noticeable. First, the rules of the game are often very fluid. And, second, the reason they're fluid is that the overriding objective of the game is not to create a winner or loser, but rather to keep the game interesting and to ensure it lasts for as long as possible.

We teach children to play games with progressively more and more rigorous rules, because this is what life is like. To be a 'good citizen' means following society's rules. This is a fundamental purpose of education.

But, as our knowledge of how the world works expands, we also know that by forcing people to follow rules, we inhibit innovation. Innovation is all about breaking rules. One may go so far as to say that innovation is defined by the idea of breaking a rule in a way that realizes better rules.

The fluidity of the rules in kindergarten games shows us that we're innately good at 'breaking rules'. What we lack as small children is the ability to 'know' whether the new rules we're creating are 'better' than the ones we started with. We start life knowing how to break rules because we haven't been told what they are yet. Then, once we've been told, we can very easily turn into automatons. Six Sigma automatons. Lean automations. The opposite of innovation.

If society solved the contradiction, we'd have a population that knew the rules, but also knew the value of sometimes breaking those rules in order to find better rules. We want to follow the rules *and* we need to break them.

The world is full of games that teach people how to follow rules. Perhaps, what we need at this stage in humanity's evolution is a new generation of games. Games where the rules are fluid. So-called 'nomic' games[2][3] have offered up a crude attempt to do this job. Most people will never have heard of nomic games because nomic games are not much fun. They rely on trade-off discussions between players and as such they actually serve to reinforce another problem inherent in society: a belief that we make progress by trade-off and compromise. Nomic games create nugatory stalemate outcomes because players get stuck in the same trade-off paradigm they started with[4].

Perhaps the problem is that the designers of nomic games don't know the rules for breaking the rules. Most people don't know that such a thing might exist. TRIZ, of course, being the study of successful rule-breakers, has unwittingly decoded the first-principle level DNA of what works and what doesn't. TRIZ is, in effect, a set of meta-rules for breaking rules.

Therein lies an irony. For the last thirty years the TRIZ community has looked to other domains and seen the power of games as a way of teaching, and has made numerous attempts to create equivalent games to teach TRIZ. But all of them – like the no doubt wonderful examples in this book – have fundamentally failed to *use* TRIZ in the design process. A TRIZ game, by rights, if it is to teach TRIZ has to be a game where the rules are changing. But not just 'changing' in the trial and error sense of the word, but to actually teach something meaningful about how the innovation world works.

98% of innovation attempts fail[5] because 98% of 'innovators' didn't know the rules of innovation. The study of the 2% that were successful in their innovation attempt reveals a first set of 'meta-rules'. They include:

- The need for a clear compass heading pointing towards an 'Ideal Final Result' destination.
- The need to focus on and deliver the outcomes intended customers are looking to achieve.
- The need to identify and resolve contradictions, where the 'successful' strategies can be distilled down to the (so far!) 40 Inventive Principles revealed by the TRIZ research.

The underlying motivation behind TRIZmeta is to design these pillars into the design of a game that systematically allows players to 'break-the-rules' in a manner that moves them towards better versions of whatever host game they might be playing.

Educational Objectives and competencies

Use of the TRIZ Principles offers a means of developing right-brain creativity skills within players. The higher level philosophical objective of TRIZmeta is to teach players (and observers) that innovation happens when we bring to bear an overall purpose and direction for a game, when we break rules, and makes use of heuristics – 'meta-rules' if you will – that teach players how to break rules in such a way that 'better' solutions emerge.

Duration and number of participants

TRIZmeta sits 'above' any existing host game, and as such the duration of a game will be similar to that of the host. Thus, for example, if the host game is chess or poker or Monopoly or Backgammon or Mortal Kombat XL, the TRIZmeta version of that game will have a corresponding duration. One of the intended benefits to the game-player (or to the facilitator teaching TRIZ to a group of individuals) is that they have a high level of control over the duration of a session. If a TRIZ teacher, for example, is looking for a 30minute exercise to teach some of the Inventive Principles to students, they may choose to use Backgammon as the host game. If they wish to fill an hour or more, they may choose chess or Monopoly.

Material list and preparation

TRIZmeta consists very simply of a deck of (52) cards and a single instruction sheet describing the 'meta-rules'. The only other required materials are those associated with the 'host game': if chess is the chosen host then traditional chess-sets need to be provided; if Monopoly is the host, traditional Monopoly sets need to be provided. Again, the overall aim is to make best use of readily available resources.

The cards are available as a bespoke set, or, for users wishing to explore the dynamics of the game in a simple manner, can utilize a standard pack of playing cards. In this

situation, the means of translating the playing cars into their corresponding TRIZ Principle is as shown in the following Table:

Table 1: Playing Card – TRIZ Principle Conversion

	Hearts	**Diamonds**	**Spades**	**Clubs**
Ace	Other Way Around	Self-Service	Change Function	Blessing-In-Disguise
King	Change State	Change Concentration	Change Flexibility	Change Size
Queen	Change Colour	Change Transparency	Change Pressure	Change Temperature
Jack	Separate In Space	Separate In Time	Separate On Condition	Separate By Transition
10	Enriched Atmosphere	Inert Atmosphere	Feedback	Remove Tension
9	Another Sense	Fields	Pneumatics/Hydraulics	Copying
8	Intermediary	Active Elements	Holes	Nesting
7	Dynamization	Smart Materials	Relative Change	Flexible Shells/Thin Films
6	Periodic Action	Vibration/Resonance	Skipping	Continuous Action
5	Preliminary Action	Separate/Take-Out	Preliminary Anti-Action	Beforehand Cushioning
4	Curvature	Another Dimension	Asymmetry	Local Quality
3	Merging	Universality	Homogeneity	Composite
2	Segment	Partial/Excessive Action	Discard/Recover	Cheap Disposable

The number on the card corresponds to the number of Capability Points required to utilize that card. Picture-cards count as 10 Points, and the Aces count as 11. The more powerful the TRIZ Principle is, the more Points it has attributed to it. So, for example, the Ace of Hearts, 'Other Way Around' is capable of delivering a much more significant change in the rules of the host game than, say, the Two of Diamonds, 'Partial or Excessive Action'.

Instructions

The default instructions for TRIZmeta players are as follows:

1) Players choose their Host game (chess, backgammon, Monopoly, etc), intended Ideal outcome ('competition', 'intrigue', 'entertainment', 'win-win', etc) and whether they wish to alter the number of Capability Points they wish to play with from the default of 15.
2) The pack of TRIZ cards is shuffled and laid face down.
3) Players commence the Host game using its default rules.
4) At any point during the ensuing play, when it is their turn, a player can elect to design a rule change to the game. To do this, the select a card from the top of the TRIZ deck. If the player possesses sufficient Capability Points for the

card they have selected, they are free to utilize the TRIZ Strategy described on the card to alter the rules of the game according to their interpretation of the Strategy.

5) The Host game continues, with the newly designed rule in force and applying to each of the players.

The overall idea is to minimize the additional playing complexity of the Host game. There are, however, a small number of additional restrictions regarding the utilization of the TRIZ Cards. These are as follows:

a) If the Card selected by the player has a value higher than their current number of Capability Points (e.g. if a player has 5 remaining Capability Points and draws the seven of Clubs) then they are not able to utilize the Card to affect a rule change to the game, and play continues as normal until their next turn.

b) If the player chooses not to deploy a selected TRIZ card to make a rule change, they lose one Capability Point.

c) No player can re-design an existing Host game rule in such a manner that they win the game during their current turn (e.g. changing the rule for moving a chess piece such that the player is able to put their opponent in immediate check-mate is not allowable).

Meta-TRIZmeta

Where TRIZmeta is played in the context of a TRIZ workshop, the facilitator is free to make their own modifications as to how the game is played. The simplest effect facilitators can create involves varying the number of Capability Points they allocate to players at the start of a session. The more Points they allocate to players, the more turbulent the Host game becomes. By offering different numbers of Points to different player also enables a very effective means of handicapping players of different abilities. Thus, in a workshop situation where participants may well have very different levels of expertise at playing the various different Host game options, a more equitable playing scenario can be created very easily.

The next most frequently used TRIZmeta control mechanism for facilitators involves controlling the level of randomness associated with having players select the next card from the face-down deck of TRIZ cards. The simplest modification involves turning the cards so they are face-up and segmenting them into different piles (e.g. all the same numbers clustered together) so that players can select cards according to the TRIZ Inventive Principles they are most familiar with. This can be a useful strategy when exposing TRIZmeta to players that have never experienced TRIZ before: some Inventive Principles are more abstract than others, and are thus more difficult to get the best out of. A related modification to help in this kind of novice situation is to

have the facilitator prepare in advance and then provide players with suggested rule-change interpretations of each TRIZ card in the context of different Host games.

The next easiest attribute of TRIZmeta for the facilitator to manipulate to make a range of different learning points at the end of the session, is to impose different Ideal outcome goals on different teams. Thus, if three groups of players are given Backgammon as their Host game, but then each is instructed to play to a different Ideal outcome (e.g. one playing 'winner-takes-all', one playing, 'win-win' and one playing 'out-of-the-box'), comparing the results from each game at the end of the session can be very revealing.

More subtle, but often an effective strategy for ensuring that the pace and energy of a group session is maintained, is for the facilitator to impose a time limit on how long players have to design their rule-changes once a TRIZ Card has been selected. Such a time limit – 2 minutes seems to be a good heuristic for most Host games – avoids the common problem of player procrastination, which can very easily sap the interest and motivation out of opponents.

Finally, the facilitator is able to control the type and span of Host games they bring to a workshop session. Sometimes it is useful to encourage participants to all work with the same Host; in others it is better to bring along a spectrum of games so that participants are able to connect to games that they already enjoy and know how to play. By deploying a breadth of games, the intention is to demonstrate that TRIZmeta and the concept of rule-breaking as a means of creating breakthrough playing experiences applies to just about any game.

An Example

It is often easiest with any kind of game to offer up a tangible illustration rather than describing abstract theory and rules. The monthly Systematic Innovation ezine[6] is increasingly featuring example TRIZmeta. Herein is a simple, excerpt example of TRIZmeta applied in a typical game of chess:

Figure 1 illustrates the current state of play in a game of chess between two players of well-balanced playing capability. The game started with the primary motivation of 'maximum enjoyment', and thus far, neither player has utilized any of the 15 Capability Points they allocated to each other at the beginning of the game.

It is white's turn to play. They are concerned about the bottom-left-to-top-right diagonal and the threat posed to their Queen by the black Bishop. In theory, they could solve the problem temporarily by taking the Bishop with their Knight. But then there is the black pawn threatening the Knight and the whole situation could easily devolve into one where both Queens are pinned on the diagonal protecting the Kings.

White decides now is the time to choose a TRIZ card from the top of the face-down deck.

The card revealed is the Ten of Diamonds, 'Inert Atmosphere' – Figure 2. No immediate rule-change ideas come from the card in the first minute of contemplation, and white is tempted to pass and thus lose one Capability Point as a penalty instead of potentially wasting ten. But then, just before doing this, the idea of freezing pieces appears. Thinking this concept through for a few moments while looking at the state of play, the rule change, 'all Bishops are made inert and cannot move for the next three moves' is declared.
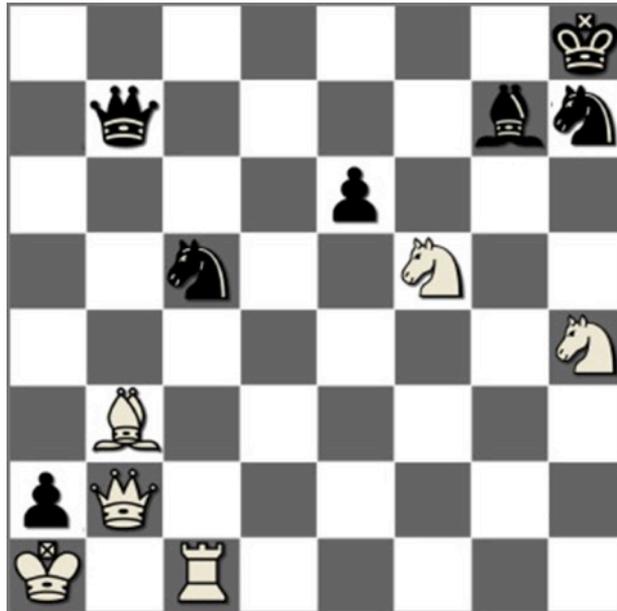
Figure 1: Exemplar Chess Game – Current State Of Play

Having now protected the immediate threat to the Queen, white proceeds to take the black Knight with the Rook.

Now being at a definite disadvantage, black decides it is necessary to select a TRIZ Card of their own. It turns out to be Four of Clubs, 'Local Quality'. After contemplating having different parts of the board behaving in different ways, or different Knights having different movement rules, although potentially interesting, don't seem to offer any immediate insight. The decision is made to take a one Capability Point penalty for not using the card, and then, because they are still in a difficult position, to select the next card in the deck.

This card turns out to be the Ace of Hearts, 'Other Way Around'. Deploying this card to design a rule-change will demand use of eleven of the remaining fourteen Capability Points, a potentially big future risk in terms of inhibiting the ability to change the game in later moves. Nevertheless, black has an idea. One that offers up the opportunity to dig out of the current hole, and potentially transform the game into one that could remain interesting for quite a while… 'every four moves, we swap places,' is the call, 'I become white; you become black. And then four moves later, we flip again.' Now the game needs a whole new level of thinking in order for a player to win: any work to build a commanding position that doesn't pay off within four moves, suddenly turns against you.
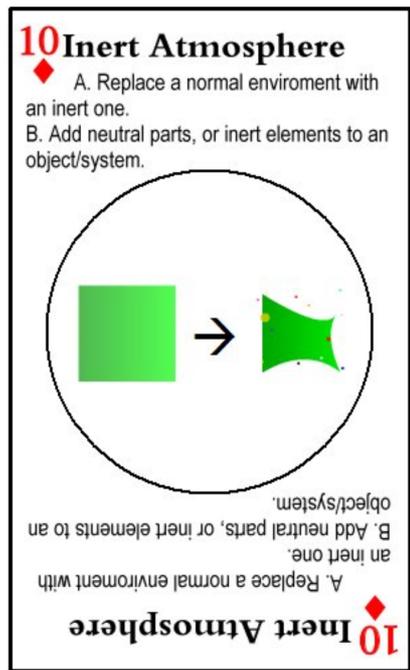

Figure 2: Exemplar TRIZ Card – Ten Of Diamonds, 'Inert Atmosphere'

This, of course, opens up the possibility that the game tails-off into a dull stalemate, but because both players have declared that 'maximum enjoyment' is the objective' and because they still have a small number of Capability Points available to make use of, it probably won't. Who knows, they might start using those points to start bringing pieces back onto the board…

Summary

The metaphorical connection between innovation and TRIZmeta is intended to work on multiple different levels. After having played the game now with several hundred 'guinea-pig' participants, a number of observations have emerged that allow facilitators to convey a number of meta-level learning points to players.

Firstly, points relating to the design of TRIZmeta:

- Some inventive leaps are bigger than others: the bigger the leap, the greater the level of Capability it requires innovators possess in order to successfully execute the resulting solution. Limiting the number of Capability Points players have to play with is about demonstrating the need to tailor ambitions to suit available resources. Knowing when and how to deploy Capability Points to achieve the best effect demands a level of strategic thinking about the overall game.
- If a player draws a TRIZ card requiring more Capability Points to play with than they possess, this corresponds to real-life innovation situations where projects fail. The fact that the player has to wait until their next turn to draw another card, is intended to represent the fact that failed innovation attempts cause an inevitable loss of time.
- Not knowing what the next TRIZ card pulled from the deck contains corresponds to the inherent element of luck associated with any real-life innovation activity.
- The higher the number of Capability Points provided to players at the start of the game the higher the level of complexity of the Host game and how it is played. Above a threshold level of Points, the game can easily transition from complex to chaotic. Which again offers up a strong analogy to real-world innovation efforts in complex environments. Chaos is often an essential pre-requisite of any meaningful change in organisations, but it definitely doesn't feel comfortable when we're caught in the middle of it.
- When a player decides not to deploy a selected TRIZ card to affect a rule change, the penalty point they have deducted from their Capability Points total is about the real-life penalties that occur when organisations choose not to take advantage of the opportunities given to them.
- When players of different playing ability of the Host game are playing together, under normal situations, the superior player would almost inevitably win. Playing ability of the Host game is analogous to Operational Excellence: a good chess player is good because they've played a lot and have spent time optimizing their playing strategy. By handicapping a 'good' player with fewer (innovation) Capability Points than their 'inferior' opponent, TRIZmeta creates a scenario where the novice is often able to beat

the expert. This offers up a very elegant metaphor for industrial life, where it is almost always the case that the more Operationally Excellent an organization is, the worse they are going to be at the innovation job.

- The simpler the Host game, the more difficult it is to design rule-changes in a manner that improves the playing experience. There is a strong connection here to the idea of the evolutionary goal of almost any system: solving the contradiction of high capability and low complexity. 'Simple', in other words, as an evolutionary goal.
- As in the real innovation world, the more familiar players become with the TRIZ Principles, the better solutions they will create.

And, secondly, relating to how players tend to play the game:

- In the majority of observed games, rule-changing behavior is predominantly triggered only when a player perceives that they are losing. The rule-change is then typically designed to get them out of their problem. This mimics the reality in most organisations where managers are much more likely to innovate defensively rather than as an offensive strategy.
- Players can very easily find themselves in a tit-for-tat situation where after one player designs a rule-change that gives them a distinct advantage, the other player(s) are forced into an immediate response in order to restore a semblance of order. 'Punctuated equilibrium' is a common characteristic of any complex system – long periods of (rule) stability, punctuated by intense bursts of rule-changing until a new – hopefully 'better' – stability emerges.
- When players are embarked on a 'win-lose' competitive end outcome, it is very easy to see the various rule-change designs increasingly being used to cancel each other out. What this tells us is that most rule changes (i.e. innovation attempts) do not work. Conversely, when the overall Ideal outcome shifts from competition to cooperation, the proportion of successful rule changes increases dramatically. The final, crucial, lesson being that innovation demands that all of the perceived stakeholders perceive a 'win'.

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