'A or B' to 'A and B'

Darrell Mann

Contradictions and conflicts abound in the world around us. Traditional responses to such situations predominantly involve trade-off and compromise. This either/or thinking style almost invariably leads to lose-lose outcomes. This in turn despite the inordinate amount of literature and methodology available for 'optimising' those outcomes. Highly fashionable talk of 'third ways' or 'win-win' or 'A and B' solutions are an emerging counter to such thinking. Unfortunately, the literature-base for such approaches is largely non-existent, and hence win-win remains as precisely fashionable talk to most observers. This paper discusses the positive role TRIZ may be expected to play in beginning the task of turning win-win from nice idea to practical reality. Mass-customization is used as an exemplar contradiction problem.

Introduction

Most people are at least beginning to recognize the inherent weaknesses of compromise-based thinking approaches. The idea of win-win solutions is, conceptually at least, highly appealing. The database of win-win solutions in the business environment is both sparse and at the same time starkly revealing; win-win solutions pay enormous dividends in terms of business performance.

In the business environment, win-win is commonly viewed from a 'nice to have, but there is no method, so we can't do it' perspective. There is probably also a considerable element of conditioning to several millennia of either/or thinking systems. One of the basic tenets of the Russian originated Theory of Inventive Problem Solving, TRIZ (Altshuller, 1988; Salamatov, 1999) is that 'someone, somewhere has most likely already solved something like your problem'. One of the key findings of the TRIZ philosophy is that different disciplines don't talk to each other, and consequently much re-inventing of wheels takes place. Another key finding of TRIZ – via the analysis of a considerable proportion of the world's most successful engineering solutions – is that the most effective solutions occur when the inventor has identified and 'eliminated' a contradiction rather than doing what his or her prevailing contemporaries have done in accepting the trade-offs. The net result of this patent analysis is that there are – so far at least – just 40 different strategies available to help in this process of contradiction elimination. Subsequent research appears to confirm that it is precisely the same 40 strategies that are being used in achieving contradiction-eliminating, win-win solutions (Mann & Domb, 1999a).

This article explores the codification of these strategies in a business context and the construction of a tool to help problem, conflict or opportunity owners achieve win-win outcomes in a systematically reproducible manner.

The much discussed topic of mass-customization – the subject of over 3000 academic publications in the year 2000 alone – is used as an exemplar to compare traditional and TRIZ approaches to contradiction elimination. Mass-customization is, of course, a directly contradictory statement; companies are traditionally 'either' low-cost, mass-producers, *or* high-benefit, exclusive-cost customizers. Mass-customization, as originally defined, is supposed to be about simultaneously achieving low-cost *and* high-benefit. That most organisations are still struggling to effectively implement any kind of sustainably profitable mass-customization business model suggests that somewhere there is a distinct mis-match between desired outcome and method of getting there.

The main hypothesis of this article is that the roots of this mis-match lay in applying traditional either/or, trade-off thought processes to a concept fundamentally about eliminating compromise. We suggest that the

successful mass-customizers are those who have truly thought about achieving mass *and* customisation solutions. We further show how they have used strategies consistent with the inventive strategies recommended by TRIZ, and conclude that these strategies are amenable to use by others in whatever field of endeavour – be that product, process or service, technical or non-technical – in systematically reproducible ways.

An additional series of findings uncovered by TRIZ mining of patent databases relate to the highly predictable ways in which systems evolve (Mann, 1999b). The exploration of the mass-customization dilemma begins by examining the concept in terms of its relation to these system evolution patterns.

Mass-Customization in Trend Terms

The classic text (Pine, 1992) predicted that mass-customization represented a whole new business paradigm. Many have since asked, when and if such a paradigm shift will ever take place. The answer to this question is of course highly intractable; there probably is no global 'mass-customization' paradigm per se. There are on the other hand a whole series of paradigm shifts that have or likely will take place when considered on an industry, product and possibly specific customer basis. Accepting that extracting a generic model from specific individual models is going to be somewhat simplistic, it is nevertheless proposed that the following model is at least useful in understanding the underlying mechanics of paradigm shifts. Thus, for a given individual product, a business model progression may be seen in Figure 1. In the figure, 'value' – here defined as (perceived) benefits divided by the sum of costs plus harms – is plotted versus time for the progression of business models from 'craft'-based to 'mass-production' to the emerging 'mass-customization' (or 'techno-craft paradigm).

The relative position of each successive s-curve against the vertical axis is of course dependent on customer perception. Some industries continue to be 'craft-based' – the arts or some high-value jewellery production for example – because perceived customer value remains much higher than for cheaper mass-produced equivalents. The majority, however, switched to the 'mass-production' business model because the net value gained through substantially lower cost outweighed the inevitable reduction in benefits that resulted.

The emergence of a new s-curve occurs because of fundamental limitations that emerge in the existing curve. S-curves being s-curves, the fundamental limit is manifested as the flattening (and probably decline – if we are plotting 'perceived' value) at the top of the curve. TRIZ research suggests that this flattening occurs because a system hits a 'limiting contradiction' (Mann, 2000). In the case of the craft-based manufacture s-curve, the limiting contradiction is usually one associated with output rate versus cost or availability of skilled labour. The advent of automated machinery (TRIZ inventive strategy number 20) was the thing that created the ability to overcome this contradiction.

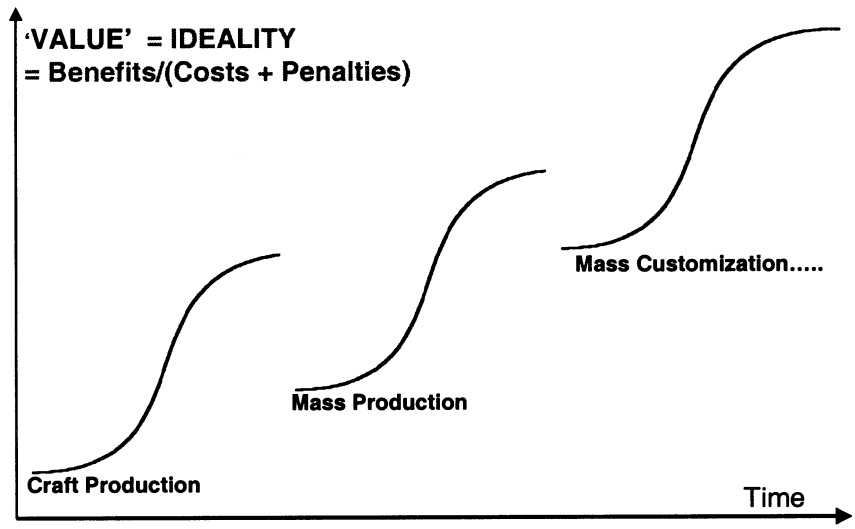

Figure 1. Generic Evolution Patterns For Manufactured Products

TRIZ research has further shown that it is also fundamental that new s-curves emerge following the resolution of the limiting contradictions associated with the current system. Again, this applies to both technical and non-technical systems.

S-curves being s-curves, again, many mass-production-based systems may be seen to be hitting their own fundamental limiting contradictions. Specifically, many organisations in the throes of continuous improvement programmes producing ever-lower value returns for each unit of effort expended. Unfortunately, fundamental means fundamental, and a limiting contradiction is precisely what it says.

The shift from the mass-production model demands the resolution or elimination of such limiting contradictions. In TRIZ terms, there are so far just 40 possible strategies that can help us to achieve such a goal. Transitioning out of the emerging fundamental value-adding benefits of the mass-production paradigm will demand the successful application of one or more of these strategies.

Whether the new s-curve that mass production shifts to is one called 'mass-customization' cannot be stated with absolute certainty. What is clear, however, is that in order for the new s-curve to enable further increase in benefit, it can only come – based on the previous definition of value – from either increased (perceived) customer benefit or reduction in harm. It cannot come from reduced cost as this is the source of the limiting contradictions in the mass-production model. Increased benefit appears the more likely of the two viable routes, although in certain sectors 'reducing harm' (or reducing environmental impact) may become the mechanism through which the curve shift takes place. Recent history suggests that without significant legislation, increased benefit is a more likely emphasis shift than decreased harm, however. This being said, it is highly likely that the new s-curve model replacing the mass-production model will in most sectors be mass-customization – or whatever label the world chooses to label a paradigm in which the customer receives significantly increased benefit at or below the current level of cost.

Successful Mass-Customizers

One of the great problems of any kind of case study analysis is that it is too often possible to shoot holes in the point being made by the example. At the roots of this phenomenon are usually problems of the 'most important numbers are the ones you'll never know' kind. There are always too many stories (and don't we all relish them) of how company W used method X to achieve success Y, and one year later bad thing Z happens to them. This is not to be defensive about the following list of mass-customization examples – they all come from Pine's classic book on the subject – merely that the point they are being used to make is solely about how prevailing business models were destroyed and higher value ones found. Whether any was successful in the longer term is more about did those organisations solve subsequent contradictions or not. As it happens, many of the examples are still thriving.

Table 1, then, reproduces a modified version of a table of mass-customization strategies taken from Pine in which a new column has been added. This new column details the TRIZ inventive strategy employed to achieve the contradiction elimination used to successfully achieve mass-customization. All of the examples are consistent with the TRIZ contradiction 'elimination' model framework. More details can be found in (Mann & Domb, 1999c).

Regarding the 'elimination' term, it is perhaps worth clarifying the underlying philosophy of TRIZ and two ideas; one that all systems must contain contradictions, and two that all systems evolve in the direction of an 'ideal final result' in which the contradictions disappear because, although the function is still delivered somehow – the system that used to be required no longer is. One of the consequences of these two phenomena is the concept of A versus B conflicts being eliminated over a sequence of successive contradiction eliminations. The idea is illustrated in Figure 2. The point is to use the TRIZ tools to actively seek win-win elimination of conflicts.

Customer Perspective on Trade-Offs

Although usually aware of cost versus benefit trade-offs (and often being acutely willing to present suppliers with the idea they don't), by and large, **customers don't understand the concept of trade-off**. They don't understand that if they select an air-conditioning option when buying their next car that there will traditionally be implications in terms of inferior fuel economy or vehicle reliability; they don't understand that traditionally at least, you can only make something stronger by making it heavier; they don't understand that increased talk time on a mobile phone traditionally means a bigger battery. The typical response of engineers to this phenomenon

Table 1. Mass Customization Strategies

Mass Customization Principle	**Example**	**Equivalent TRIZ Inventive Principles**
Customization of services around standardized products and services	IBM System/360 Marriott hotel chains Flexible travel packages	Segmentation Local Quality Composite Structures
Customizable products and services	Gillette Sensor razor Reebok Pump shoes Adjustable office furniture	Universality Dynamics Feedback Parameter Changes
'Point of delivery' customization	Dealer-fit car accessories Lenscrafters/Eyelab/etc 1 hour photo-processing	Preliminary Action Separation Segmentation
High responsiveness throughout the value chain	Benetton Peerless Saw Company Levi Strauss Nissan '3 Day Car'	Dynamics Skipping Boosted Interactions
Modularization of components	Lutron Electronics Black & Decker Getaway Vacations	Merging Another Dimension Preliminary Action Copying

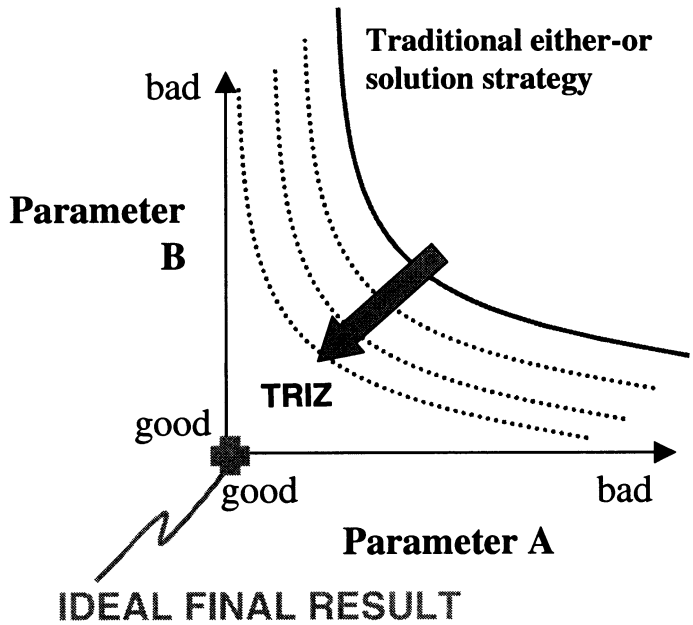

Figure 2. The Relationship Between Contradiction Elimination and Ideality

is usually one of either frustration or a demand that 'someone' – preferably someone else – educates the customer. A better response might be to assume that not only do customers not understand trade-offs, or that they never will, but that why on earth should they. A useful consequence of this approach might be the realisation that it is the job of the designer or situation owner to help the customer by designing counter to 'tradition' and looking to eliminating contradictions rather than manipulating the trade-offs.

Business Contradictions In General

The mass-customization contradiction is of course just one of a wide-ranging array of possible business related contradictions. In the same way that TRIZ has tried to codify successful strategies employed by inventors in eliminating contradictions in technical systems, a new tool has recently been assembled to offer managers and businesses similar access to the successful win-win, A-and-B, contradiction eliminating strategies of others (CreaTRIZ™ for Managers; Mann, 2001). As with the classic TRIZ tool, the underlying philosophy is to abstract and codify the good practices of all disciplines and make them accessible to others in similar situations in quite likely very different fields. Thus, for example, although a particular organisation might have a specific risk-versus-cost or quality versus production time conflict, experience suggests that they aren't the only ones; other organisations have successfully solved similar situations in win-win ways. TRIZ allows everyone else to access these solutions.

'A or B' problem solving strategies force customers into trade-offs they neither understand nor desire, and consequently almost always eventually lead to lose-lose outcomes. 'A and B', win-win thought processes offer the proven potential of much more robust technical and business solutions. TRIZ is in no way a panacea, but it does systematically make the known, proven win-win strategies of others accessible to all.

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Darrell Mann is Industrial Fellow in the Engineering Design Centre at the University of Bath and the TRIZ Editor for *Creativity and Innovation Management.*