

# Breaking (down) the law of unintended consequences: systemic cause analysis

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*“The road to Hell is paved with good intentions”  
Saint Bernard of Clairiveaux<sup>1</sup>*

If problems are opportunities dressed in working clothes –as Henry J. Kaiser used to say<sup>2</sup>- , successful solutions to past problems often look like nesting dolls<sup>3</sup>, carrying inside a hidden array of unexpected new challenges to organizations and their stakeholders.

C.K. Prahalad<sup>4</sup> pointed out that most of organizations’ present challenges are consequences of solutions adopted several years ago.

Engineers, managers, social workers, politicians and entrepreneurs and many other forward-thinking leaders are continuously and painfully reminded of the unexpected impact of innovative and groundbreaking solutions –from drug-resistant superbugs to growth-induced environmental damage to food riots following commodities’ booms-.

Hospital infections tend to rise until becoming the main cause of mortality in those developed countries that achieve the coveted goals of universal healthcare and access to sanitary infrastructure<sup>5</sup>.

Rent-controlled housing designed to guarantee affordability and access turned progressive-minded and well-intentioned San Francisco and New York into the most expensive cities in the world<sup>6</sup>, pushing the middle class out to distant suburbs and leaving the inner city to the very poor and the very rich –the opposite of the intended outcome-

The triumph of early twentieth-century Temperance movement brought about Prohibition which in turn, generated the conditions for the rise organized crime during the thirties, forcing the creation of the FBI to fight gangsters during the forties and the advent of American Civil Liberties Union (ACLU) to fight the excesses of the FBI during the fifties. And that tab is still open.

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<sup>1</sup> *“L'enfer est plein de bonnes volontés et désirs”* Ammer , C. (1997), *The American Heritage dictionary of idioms*

<sup>2</sup> (Heiner, 1953, 1981) (Foster, 1989)

<sup>3</sup> A matryoshka doll, or babushka doll is a Russian nesting doll (Russian: Матрёшка) which is a set of wooden dolls of decreasing size placed one inside the other. (Wikipedia, 2011)

<sup>4</sup> (Prahalad & Hamel, 1994)

<sup>5</sup> (Bernardez, 2009)

<sup>6</sup> (Sowell, Ever wonder why?, 2006) (Sowell, The housing boom and bust, 2009)

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Financial meltdowns often follow extended homeownership programs pushing new and untested mortgage and financial tools such as ARM<sup>7</sup> loans and mortgage consolidation repackaged and resold as credit default swaps, until turning them into what Warren Buffett described as “financial weapons of mass destruction”, forcing a new cycle of hurried “solutions” such as bank bailouts and credit restrictions that will usher in turn, new crises. Access to global credit markets helps spreading both fast prosperity and equally faster global recessions –usually one after the other-.

In a previous article titled “*Surviving Performance Improvement solutions*”<sup>8</sup> we described how multiple, uncoordinated performance improvement solutions actually reduced performance, sank morale and shifted problems from one department to another, increasing the overall bill for the organization.

In his 1936 paper “*The Unanticipated consequences of Social Action*”<sup>9</sup>, Sociologist Robert K. Merton coined the term “the law of unintended consequences” to describe negative impacts generated by well-meaning and progressive human action when any of five conditions were present: *ignorance* of the consequences, *error* in anticipating the consequences, *immediate (or self-) interest* in consequences other than planned, *basic values* opposing the solution or a *self-defeating prophecy* – a defensive reaction to a prediction of an unavoidable result –a candidate’s sure victory-, provoking the opposite consequence –low voter turnout giving an unexpected victory to the underdog<sup>10</sup> -.

This article will propose a methodology to anticipate and manage unintended consequences, “breaking the law” –the fatalistic chain of events- by *breaking down* the causal processes with a systemic tool for analyzing multiple cycles of impact on multiple performance variables.

### Raising the game: from checkers to billiard

Regardless of their origin and the forces behind them, unintended consequences tend to be more harmful when they are met with confusion, inaction or wrong reactions that usually increase and spread the damage. Unfortunately those are the most common first responses to “black swans<sup>11</sup>”, because those suffering their impact cannot grasp their real causes and –as Von Mises time-honored observation states- “*where man doesn’t see any causal relation, he cannot act*”<sup>12</sup>.

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<sup>7</sup> Acronym for Adjusted Rate Mortgages, allow low income borrowers to get loans with very little or no down payment, but growing interests and payments afterwards.

<sup>8</sup> (Bernardez, 2009)

<sup>9</sup> (Merton, 1996)

<sup>10</sup> That was exactly what happened with the unexpected reelection of likely loser Harry Truman in 1948 –when Republicans preferred to stay home and follow the results, confident that Thomas Dewey’s victory was unavoidable, and with Marx’s prediction of capitalism’s self-destruction, that spurred trade unions into reforming and –paradoxically- saving it, according to Merton (Merton, 1996)

<sup>11</sup> Term coined by mathematician Nassim Taleb to describe the impact of highly improbable and unanticipated events (Taleb, The black swann. The impact of the highly improbable, 2007)

<sup>12</sup> (von Mises, 1949, p. 22)

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The second problem that must be addressed in dealing –and preventing- unintended consequences is realizing that actions and consequences are not part of a linear, mechanical device operated by a single individual but of a system with multiple operators and devices operating partial subsystems, blinded by “the fog of war” that surrounds systemic failure under stress, with asymmetric information and lacking or misleading feedback<sup>13</sup>.

Whether the victims of systemic failure are soldiers under friendly fire or brokers around the globe facing unexpected stock volatility, their reactions are not under their control, since they cannot tell who is firing at them or if they are selling or buying at the top or the bottom of the market.

The victims of unintended consequences usually end shooting “troubles” instead of their root causes.

A first step in dealing with unintended consequences is shifting the focus from stabilizing or “troubleshooting” the original “solution” turned into new problem to gathering all the variables causing the unexpected or paradoxical response they are experiencing.

Back in 1949, Kaoru Ishikawa<sup>14</sup> developed the Fishbone diagram to help assembly line workers and supervisors operating in quality circles figure out the multiple causes of deviations of process standards.

Although the Ishikawa diagram helped visualize and identify multiple concurrent causes of a given performance problem, it didn’t show how those factors interacted with each other or the sequence in which they generated the problem.

### **Figure 1: Fishbone diagram (example)**

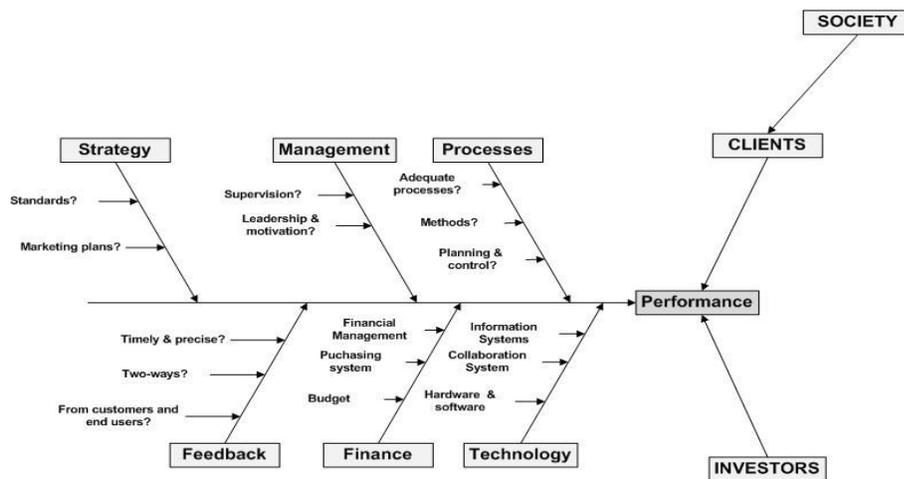
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<sup>13</sup> The study of Air France Flight 447’s black box determined that its crash was caused by misleading feedback from flight instruments, that confused pilots into doing the wrong maneuver –a nose dive- (CNN, 2011)

<sup>14</sup> (Ishikawa, 1982, 1984)

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Human Performance Technology (HPT) models, such as Geary Rummler and Dale Brethower's Anatomy of Performance (AOP)<sup>15</sup> or Don Tosti and Bob Carleton's SCAN<sup>16</sup> provide help in identifying larger variables and placing them in the context of an organization and its value chain.

Although these methods are useful in analyzing internal processes in the organization and fixing the disconnects between different internal subsystems, they are both insufficient and potentially misleading for understanding how unintended consequences of previous actions trigger highly improbable events - "black swans"<sup>17</sup> - bringing down entire organizations.

**Figure 2: AOP diagram (example)**

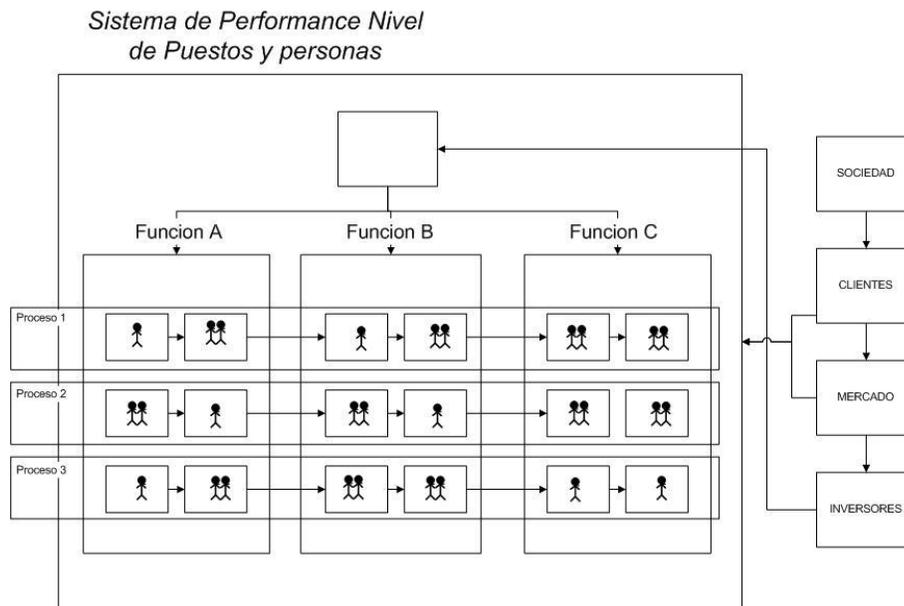
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<sup>15</sup> (Brethower, 1972) (Rummler & Brache, Improving performance: how to manage the white space in the organization chart, 1995) (Rummler, Serious performance consulting, 2004) (Rummler, Ramias, & Rummler, White space revisited: creating value through process, 2010)

<sup>16</sup> (Tosti & Amarant, 2006)

<sup>17</sup> (Taleb, The black swann. The impact of the highly improbable, 2007) (Taleb, Fooled by randomness: The hidden role of chance in Life and in the Markets, 2005)

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As Peter Drucker warned, engineers and middle managers tend to look the organization from the inside<sup>18</sup> prioritizing reengineering internal processes and managing operations, at the expense of “external” variables or “externalities” beyond their locus of control and analysis such as market, client, competitors, community, ecosystem, environmental, economic, political or regulatory forces..

The best first step in dealing with a systemic challenge is *a step backward to look at the problem from outside the organization* and see “the full picture”, seizing and comprehending the entire system, connecting all external and internal variables and agents that make unintended consequences happen.

Applying some of the principles of games theory<sup>19</sup> might help understand that unintended consequences operate not in a linear, distributive, zero-sum game –such as production or engineering problems- or a chess-like competitive zero-sum game against single rivals for a share of a single market, but in a scenario that resembles a carom billiard<sup>20</sup> table in which several players operate multiple variables, affecting all others along a non-zero sum game, generating a *non-zero sum result* –one that not just redistributes but *adds or subtracts value* to all players engaged on it-.

<sup>18</sup> (Drucker, 1988)

<sup>19</sup> (Von Neumann & Morgenstern, 1932, 2007)

<sup>20</sup> Carom billiards, sometimes called carambole billiards or simply carambole (and in some cases used as a synonym for the game of straight rail from which many carom games derive), is the overarching title of a family of billiards games generally played on cloth-covered, 5 by 10 feet (approximately 1.5 × 3 m) pocketless tables, which often feature heated slate beds. In its simplest form, the object of the game is to score *points* or “counts” by *caroming* one’s own *cue ball* off both the opponent’s cue ball and the *object ball(s)* on a single shot. Jean Piaget used carom billiard tables to study the highest level of thinking, what he called hypothetic-deductive, visible in the billiard tables when adolescents were able to predict multi-step shots. (Piaget, 1950, 1999)

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In a carom billiard match, players compete in scoring a maximum number of caroms –hitting with their cue balls the larger number of object balls possible with indirect shots, touching up to three sides –rail cushions- of the carom billiard board.

In an economic exchange between actual sellers and buyers, both parts can actually gain value, by triangulating their transactions -outsourcing or reselling to third parties- and leveraging their financial return –“flipping” a property or tailoring products or services to specific end user preferences<sup>21</sup>- , increasing their individual wealth and the common wealth –whether measured by GDP, market size or tax revenue increases-. 21<sup>st</sup> century globalized buyers and sellers act usually as “prosumers”, reselling through eBay or Amazon, creating “garage” companies that transform and reinvent consumer goods for other consumers –mailing DVDs as Netflix or selling minutes of cell phone usage as the “phone ladies” in India and Bangladesh.”

Like a cue ball hitting others on a carom billiard table, each business move changes all the variables –both internal and external- for all the other players, creating a new scenario where the good players know that they have to keep in sight all the variables and choose where and when to operate.

Once the first commercially successful PC entered the market, creating a new category, all other IT companies and categories were forced to offer PCs and redefine –or discontinue- the use of mainframes, typewriters, faxes, photocopiers and mini-computers. With the first successful introduction of non-PC platforms such as Apple’s iPhone and iPad and RIM’s Blackberry, the PC market and producers were forced to compete and also provide alternatives, such as cheaper netbooks.

In order to understand the causes of unexpected consequences we must frame them in the larger mechanism of wealth creation that is the main economic purpose of organizations. We must move beyond the linear analysis of internal processes confined within the boundaries of the organization simplified as a linear Input-Process-Output “box” , to the larger framework of the external context in which it operates –what Roger Kaufman calls the Mega level<sup>22</sup> –society, government, environment, market, external stakeholders-.

Starting our analysis from the market where the organizations does business with its customers and stakeholders, we can see the organization in its context as a firm that according modern

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<sup>21</sup> Companies successfully add value to customers and themselves by tailoring products to specific customers’ preferences: ZipCar offers rentals per hour, car dealers offer leasing or renting contracts, banks and communications companies create microloans and pay per use cell phones to meet specific BOP requirements. eBay and Amazon add value creating a market for reselling books and goods in peer-to-peer transactions and auctions. P&G and their competitors sell smaller packages at lower cost in BOP markets. (Pralhad C. K., 2005)

<sup>22</sup> (Kaufman, Corrigan, & Johnson, Towards educational responsibility to society needs: a tentative utility model, 1969) (Kaufman, Change, choices and consequences: a guide to Mega thinking and planning, 2006) (Kaufman, Oakley-Browne, Watkins, & Leigh, 2003) Rummler & Brache’s AOP model includes parts of Kaufman’s Mega level as the “supra-system”, but only as an external boundary that provides inputs and collects outputs from the organization’s processes. Conventional accounting and economics have also focused on specific economic transactions, leaving unintended consequences such as social impact and value added or subtracted to non-proprietary stakeholders and labeling as “externalities”

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economic theory<sup>23</sup> adds value by reducing the cost of economic transactions to all stakeholders, and follow the flow of external transactions connecting it with other firms, consumers, communities and their environment to better understand the variables that generate unintended consequences, before engaging in an internal, AOP-based process analysis.

In order to illustrate and explain the methodology, we will discuss a real case of a bank in a rural community.

### **A practical case: crisis at the Regional Credit Bank (RCB)**

The Credit Bureau team at the Regional Credit Bank (RCB) had finally arrived to a decision about its operations in the North of Argentina, a mostly agricultural region that had been a source of numerous headaches since the Bank, based in Buenos Aires had acquired new branches there, formerly belonging to a community bank.

The level of delinquency and bad loans had risen dangerously and the Bureau –after conducting an internal process reengineering program- had identified lack of consistent credit standards among local branches as the core cause of the problem –a consequence, the report established of the rush in the M&A process that failed to assimilate the new branches to the RCB culture, keeping heterogeneous credit procedures and relying excessively on local branch officers' criteria.

The new system recommended by the reengineering team would set new common credit standards based on RCB's experts criteria and reduced risk by embedding the new rules in an automated credit scoring system that would also speed up the loan application process and reduce costs. Local branch teams would be encouraged to seek new customers with a new compensation system that would tie their bonuses to their credit application turnover.

One year and several million dollars after, the results were paradoxical: delinquency was up, revenues were down and the bank was considering leaving the North region, which seemed plagued with high risk, insolvent farmers that were trapped in a declining industry.

An external consulting firm was hired to explore the problem and suggest alternatives for disinvesting.

This time, the external consultants started by spending a couple of months reviewing local operations and interviewing problem customers and developing a systemic cause analysis.

The results were dramatically different.

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<sup>23</sup> (Coase, 1991,1993) (Williamson, 1985)

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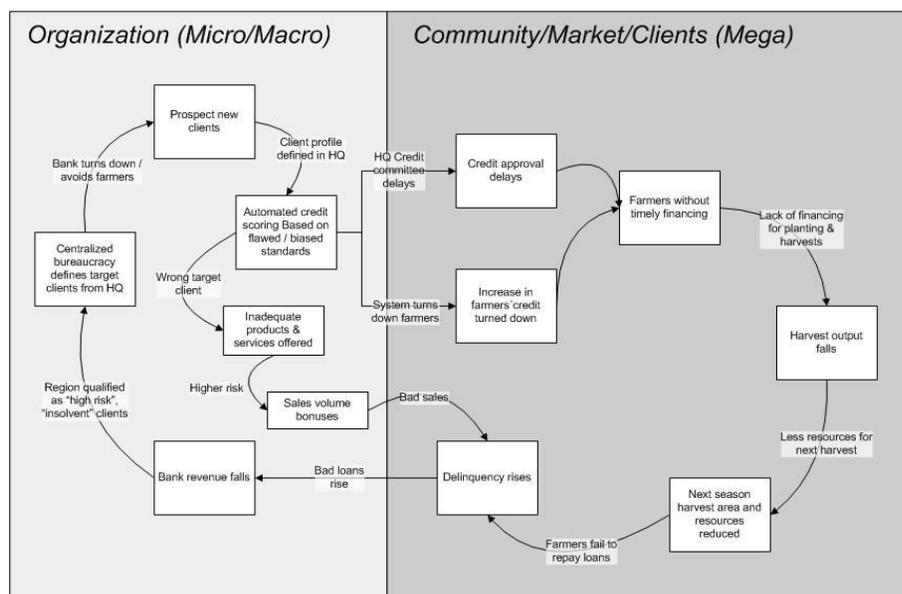
Drawing a cause cycle diagram – Figure 3 – to visualize both internal and external variables, the new team was able to connect the missing pieces creating the “unintended consequences”.

The diagram provided a full picture of the flow of events and the ways in which different factors impacted each other, generating paradoxical feedback loops and unexpected consequences and reactions.

By visualizing the cycles of influence and impact, bank officers were able to identify and correct the misperceptions and disconnects between the organization and the clients and markets it should serve, providing also a more complete understanding of the dynamic of the bank clients in that market.

**Figure 3: Cause Cycle Diagram (RCB case)**

*Cause analysis cycle (RCB bank case)*



The farmers that switched to other community banks for financing were doing considerably better than those that remained with RCB. From their perspective and experience as customers, the new credit scoring system had been a major source of problems for their business.

The automated system standards –originally designed to evaluate non-farming customers- were turning down farmers and when the local branch managers submitted to the HQ credit committee their recommendations for a revision to override the system, the committee’s response added

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additional delays in financing. Facing financial shortages, farmers were forced to reduce their planting for the next season, increasing the likelihood of missing payments of previous loans.

The products and services offered to farmers were also inadequate, and the compensation system based on applications operated as a stimulus for bad loans and bad sales that worsened farmers' financial position, making it look increasingly "insolvent" under the bank's HQ-defined credit standards. This in turn, both reinforced HQ credit bureau biases and created a "self-fulfilling prophecy"

What happened to RCB happens all the time. Optimizing subsystems or even reengineering the entire organization from "inside-out" often makes problems worse, by operating on the internal symptoms and ignoring the external –business- causes, subtracting critical value and alienating customers.

### **Analyzing systemic cause cycles**

There are four critical steps for the analysis of systemic cause cycles –the source of "unintended consequences":

1. *Looking at the problem from outside the organization*

Expanding the scope of analysis to external –Mega- factors by drawing two fields: the Micro/Macro field –all what happens inside the organization- and the Mega field –what happens to customers, end users, market, environment and community in a diagram such as shown in Figure 4- helps visualize the full picture of the unexpected consequences and gathering the information from all stakeholders affected by it.

By putting side by side and connecting the two "maps" the bank was able to track the actual value chain that –as Drucker said- started outside the organization, far away in the farms and markets the farmers served and generated their business cycles, creating a different timeline for financial processes than that of urban customers.

### **Figure 4: Micro, Macro and Mega perspectives**

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*Cause analysis cycle*



## 2. Track the actions and impacts along the value chain

Following the value chain –starting from any point inside or outside the organization-, identify the main actions and impacts using the Systemic Cause Cycle Matrix –Table 1 - helps collect the inputs and experience of all relevant stakeholders taking part or affected by the solution and its unexpected consequences.

**Table 1: Systemic Cause Cycle Matrix**

Action « solution »	Impact & consequences			Reactions to impact	Impact of reactions
	Direct/ Expected	Direct Unexpected	Indirect		
HQ defines credit standards	Bad loans reduced	Bad loans increased	Insolvency affects new loans	HQ adopts automated credit scoring	Farmers leave the bank Credit delinquency rises
New compensation system rewards new products	New products increase revenue	Revenue falls Delinquency rises	New products increase farmers' indebtedness	Farmers get into more debt with new products HQ considers leaving the region	Farmers with reduced repayment capacity fail to meet loan payments Farmers reduce crops and revenue, credit market shrinks

## 3. Flowchart the systemic cause cycle

Once all actions, impacts and reactions have been identified and summarize in Table 1 Matrix, a flowchart of the entire process and its unexpected turns and twists can help identify and visualize the dysfunctional system.

Each action is represented with a box and connectors identify the impacts in different directions.

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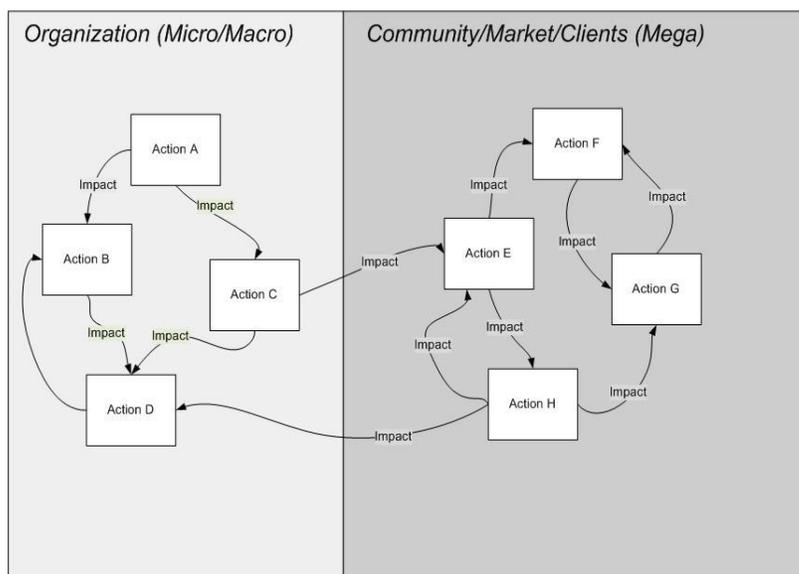
Those impacts can be unidirectional or reciprocal –when two or more factors create a “feedback loop” reinforcing each other, as in a stock market bubble or a bank run, when imperfect or asymmetric information make buyers and sellers rise their actions beyond logical levels, by reacting defensively to each others’ selling or buying and creating a panic sellout or a greed rally.<sup>24</sup>

Economists George Akerlof<sup>25</sup> and Joseph Stiglitz<sup>26</sup> have shown how asymmetric information and feedback loops often turn the benefic self-interest of Adam Smith’s “invisible hand” into a self-destructive mechanism.

Economic values can also be added to the connectors.

**Figure 5: Systemic Cause Cycle flowchart**

### *Cause analysis cycle*



#### 4. *Identify “entry points for first intervention”*

Once all the links between different factors inside and outside the organization have been established, the “full picture” of the Systemic Cause Analysis diagram –Figure 3- becomes the basis for identifying the entry points for first intervention.

<sup>24</sup> The history of these phenomena has been abundantly documented since MacKay’s 1852 classic “*Extraordinary popular delusions and the madness of the crowds*” (Mackay, 1852, 2008) to Galbraith’s 1984 “*A Short History of Financial Euphoria*” (Galbraith, 1990) to more recent and equally revealing analysis of Shiller, Cooper and Fox (Cooper, 2008) (Fox, 2009) (Shiller, 2005)

<sup>25</sup> (Akerlof, 1970)

<sup>26</sup> (Stiglitz, 1975)

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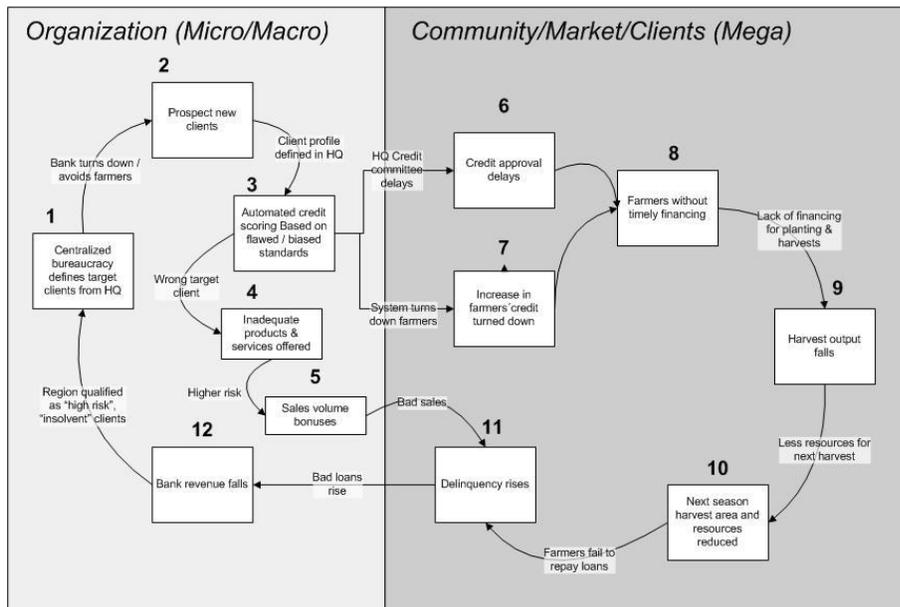
First intervention entry points must meet the following criteria:

- a. *Urgency* – which are the points that will have the most immediate effect in controlling the unintended consequences?
- b. *Impact* – which are the points that will have the most extended impact on all the key variables we are trying to control?
- c. *Cost/Benefit* – which are the variables that have the maximum impact on all others with the lowest cost?

Actions (1),(3),(4),(5),(6),(7),(8),(10) in the sequence of the cycle –see Figure 6- were selected as key factors

**Figure 6: Systemic Cause Cycle – Sequenced**

*Cause analysis cycle (RCB bank case)*



Applying the three criteria to the RCB case, we can identify the critical points in Table 2.

**Table 2: Critical entry points for intervention**

Key Factors	Urgency	Impact	Cost/Benefit	Leading indicator	Lagging indicator
(1) Centralized Standards	3	Highest, affects all	2 <sup>nd</sup> level ROI	✓	

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		other variables		
(3) Automated Credit Scoring	4	Medium, depends on (1) and creates negative feedback loop	3 <sup>rd</sup> level ROI	x
(6) Credit approval	1	High, creating future crisis	2 <sup>nd</sup> level ROI	x
(7) Farmers credit turned down	2	High, must be reversed	1 <sup>st</sup> level ROI	x
(8) Timely financing tied to farming cycle	1	Highest, affects all external variables	1 <sup>st</sup> level ROI	✓
(10) New season harvest	1	Highest, affects all external variables	1 <sup>st</sup> level ROI	✓
(4) Inadequate products / Bad sales	5	Medium, drives farmers to increase their risky debt level	3 <sup>rd</sup> level ROI	x
(5) Bonuses tied to sales volume	5	High, rewards bad sales criteria	2 <sup>nd</sup> level ROI	x

Based on the combined scores of Urgency, Impact and Cost/Benefit, the critical entry points are (8) Timely financing, tied to farming cycles –which will help the bank promptly redefine credit scoring criteria and priorities and (6) Fast intervention and redefinition of Credit Approval criteria based on co-defining strategic goals for (10) New Season Harvest with each client.

These three critical emergency steps create a “stop-loss” mechanism for the bank *and* its customers by interrupting the negative feedback loop between financing delays, future crop and revenue reduction and increased delinquency driving more restrictive credit standards. Unlike “panic measures” that accelerate the negative feedback loop, like the previous credit denial, these active measures will help turnaround the farmers’ financial situation fostering their ability to repay the loans and reducing delinquency.

Once the financial situation of each farming loan has been stabilized, a revision of the centralized standards (1) making them more compatible with agricultural cycles and decentralizing credit

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approval to give more input to those closer to the operation –local branch credit officers and managers- and the Automated Credit Scoring system (3) are the next step and the beginning of a credit process reengineering inside the organization.

Once the emergency and the new policies are in place, the incentive system (5) can be redesigned to align it with the new standards and prevent it from rewarding risky behavior and bad sales.

By understanding the systemic cause cycle that creates the unintended and unexpected consequences, both the organization and its customers can de-activate the negative feedback loop, streamline the value creation chain and align their businesses creating value in a non-zero sum process.

The systemic cause analysis can –and must- be established as a permanent framework for anticipating and managing the dynamics of business cycles and value creation, preventing “black swan” events.

The only way to navigate the “perfect storms” of a globalized and interconnected world and economy is to extend the scope and reach of our management and planning methods, exploring the context of our organizations, our customers and our every day more complex and shared world.

Analyzing systemic cause cycles will help following Roger Kaufman’s advice: *“if we cannot predict the future, create it.”*<sup>27</sup>

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<sup>27</sup> (Kaufman, Change, choices and consequences: a guide to Mega thinking and planning, 2006)

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