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Insurance Claims Capacity Analysis within System Dynamics Framework

Greg Szwartz
215.888.7888
Robert Judson
301.802.2409

Authors

This presentation was prepared by:

Greg Szwartz, Manager
BearingPoint
One Radnor Corporate Center
100 Matsonford Road, Suite 500
Radnor, PA 19087
Tel: 215-888-7888
E-mail: gszwartz@bearingpoint.net

Robert Judson, Senior Manager
BearingPoint
1676 International Drive
McLean, VA 22102
Tel: 301-802-2409
E-mail: rjudson@bearingpoint.net

Business Need

Property and casualty insurance businesses track three key metrics for the claims process:

- Loss Adjustment Expense (costs)
- Severity (the claim amount)
- Customer satisfaction.

Historically, companies have managed the three metrics separately with specific initiatives targeted at specific metrics without recognizing interdependencies.

- Loss Adjustment Expense (LAE) initiatives are cost-cutting
- Severity (the loss amount) is something that can surprisingly be impacted by the quality of the claim handler, the amount of time there is to negotiate and settle, and the level of customer service provided. It is clearly a function of underwriting.
- Customer satisfaction initiatives are more "talked about" than acted on, but at times they have been successful (State Farm Insurance is a classic example)

The result has been unintended consequences on the metrics not targeted, and a cycle of continually re-working the three metrics as they keep coming out of alignment.

Modeling Response

Understanding the relationship between the three metrics (LAE, Severity, Customer Sat.) is the only way to make effective estimates of the impact of initiatives targeted only at loss adjustment expense (LAE/cost = the latest industry focus).

A system dynamics model with all three metrics and the relationship between them allows the client to test LAE-reduction initiatives in a “risk-free” simulation environment and expose potential un-intended consequences.

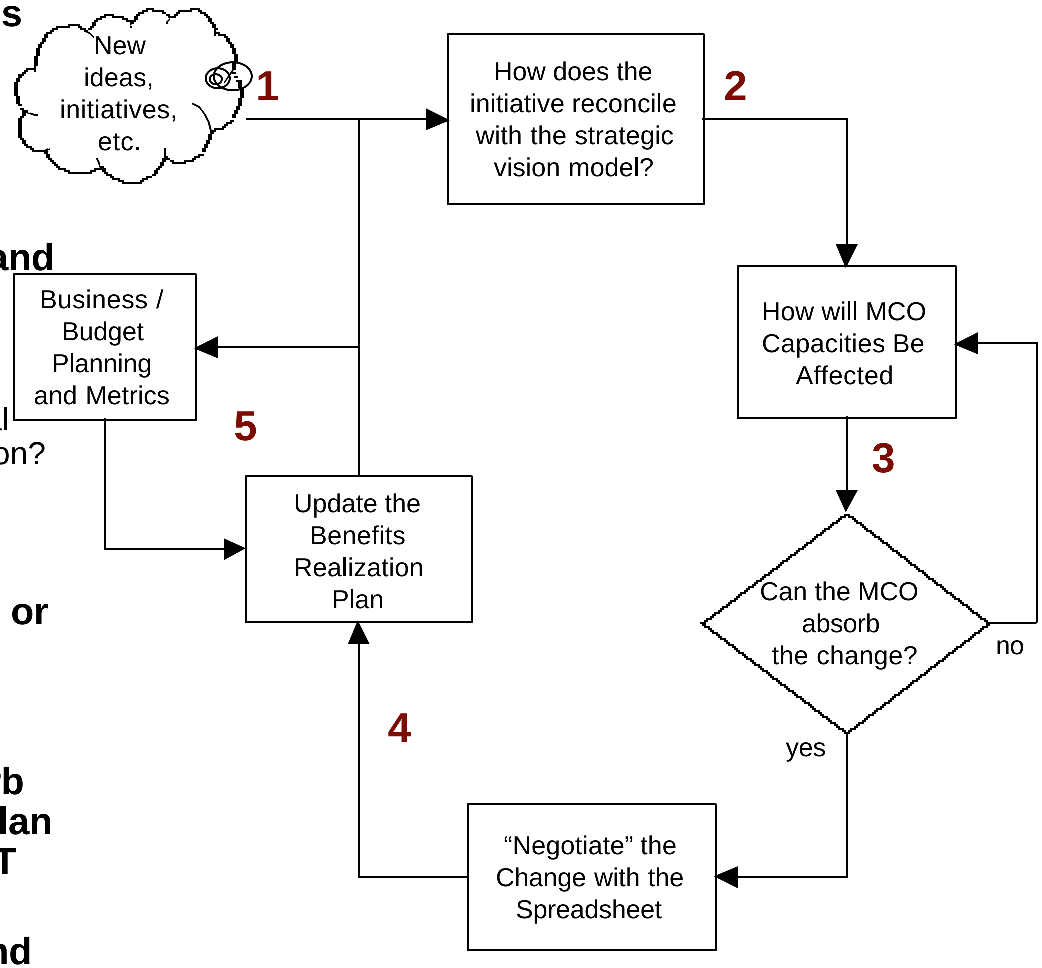
The simulation focused on finding break-points in initiative success rates where given the uncertainty in the model parameters, it was confident to assume the business would respond UP TO the break-point and after that it would be difficult to expect LAE (cost) reduction benefits without knowing more.

The simulation is delivered as part of a new process and analytical toolset to analyze initiatives before they are fully funded

The presentation offers an analogy to the Ideal Gas Law to make a quantitative client excited about a model without having an SD background.

The model is part of a new process for capacity analysis prior to changes, consolidations, and new benefit estimates

1. **New ideas or initiatives that impact the baseline set of model conclusions are identified and enter the capacity analysis process**
   - Holistically viewing potential issues around consolidating locales
   - Thinking through potential impacts of new technologies
2. **The strategic vision model is reviewed and the initiative is "mapped" against the physics of the business**
   - Will locale consolidation put stress on claims closure at new locale, and what are the potential implications for severity and customer satisfaction?
   - How should new technology adoption rate be tempered by other concerns for surrounding severity and customer service?
3. **Production pressure, capacity, severity, or customer satisfaction implications are different for different Claim Handling Centers**
4. **After identifying how an MCO will absorb the change, a new benefits realization plan is negotiated (e.g. no FTE reduction BUT severity must drop)**
5. **Benefits realization plans are tracked and updated in a process critical to closing the loop and actually realizing benefits**



An analogy for the "Physics of the Business" helps engage the client

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Ideal gas law applied to claims processing: P*V = n*R*T

- P = production pressure
- V = volume of claims that can be handled by the existing capacity
- n = notice counts (number of new claims)
- R = Relief valve associated with severity maintenance
- T = The quality of non-core non-closure processes like reserve maintenance and customer care

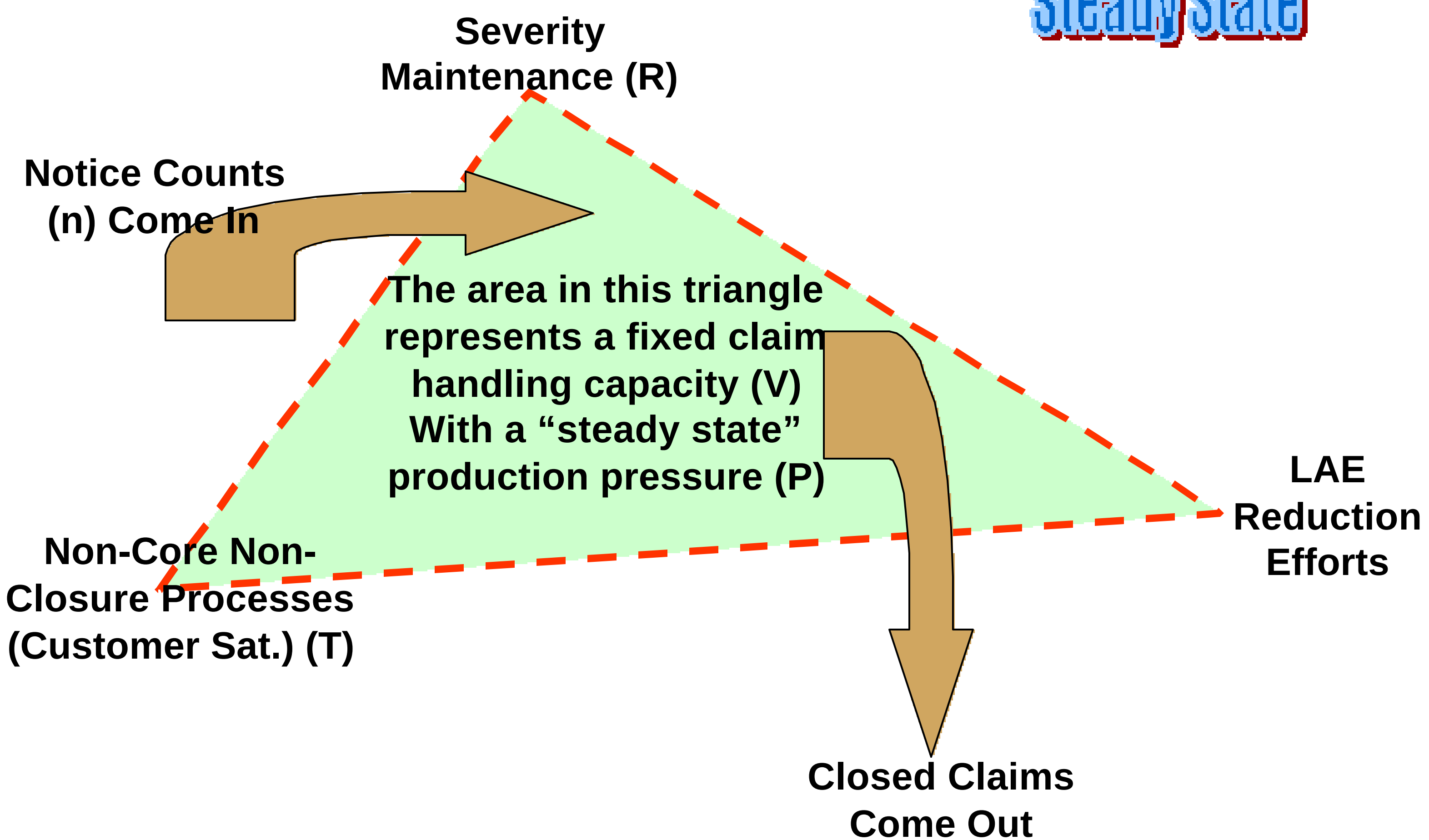
Solving for each variable:

- P = nRT/V
  - When notice counts (n) increases, production pressure increases
  - When process improvements and technology increases the volume of claims that can be handled by the existing capacity (V) then the production pressure drops
- R = PV/nT
  - When notice counts (n) increases, the severity maintenance relief valve is opened (lowering the value of severity maintenance [R]) IF WE WANT PRODUCTION PRESSURE TO STAY CONSTANT
  - When management puts more focus on T, R must go down, or capacity V must go up
- V = nRT/P
  - With a fixed claims handling capacity (V), increases in notice counts (n) must be associated with decreases in severity maintenance (R) and / or decreases in T. If R and T don't go down, then the ideal gas law applied to claims processing would predict increasing production pressure (and this ultimately must be relieved with R, T, or variables not included like staff burn-out, attrition, etc.

A fixed claim volume ….

Time = 0

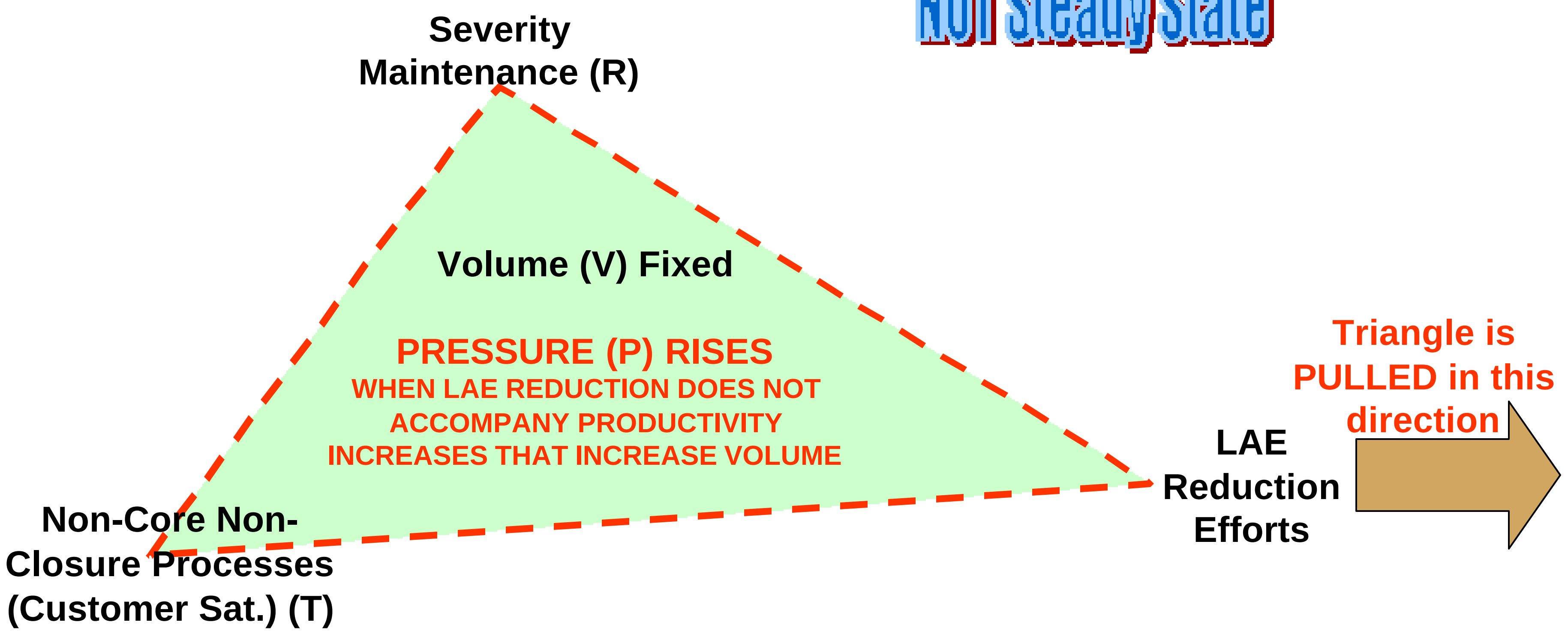
Steady State



Shortly after a reduction effort, production pressure rises, but this is not steady state

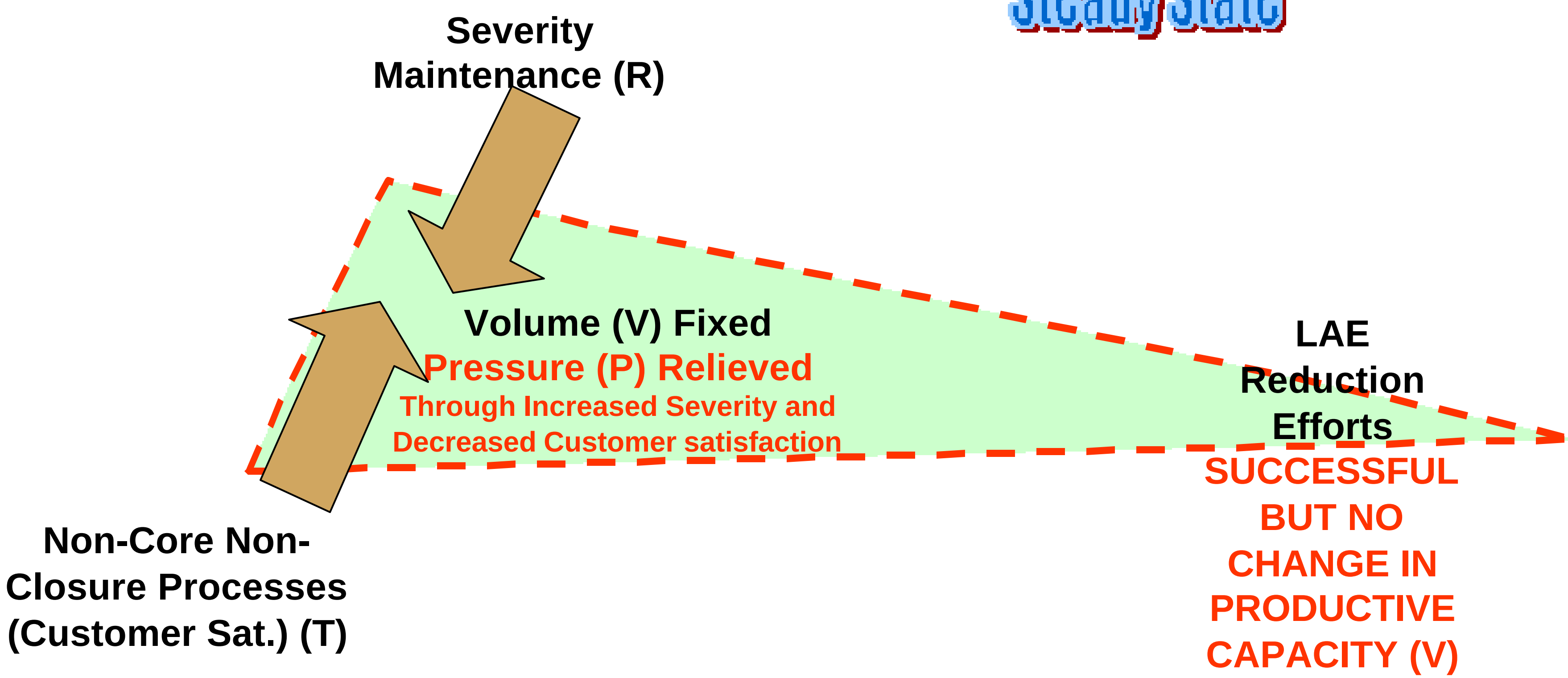
Time = 1

NOT Steady State



Pressure COULD be relieved by a drop in R and T to reach steady state

Time = 2
Steady State



But if we increase productive capacity (V) with productivity, the new steady state is “win-win”

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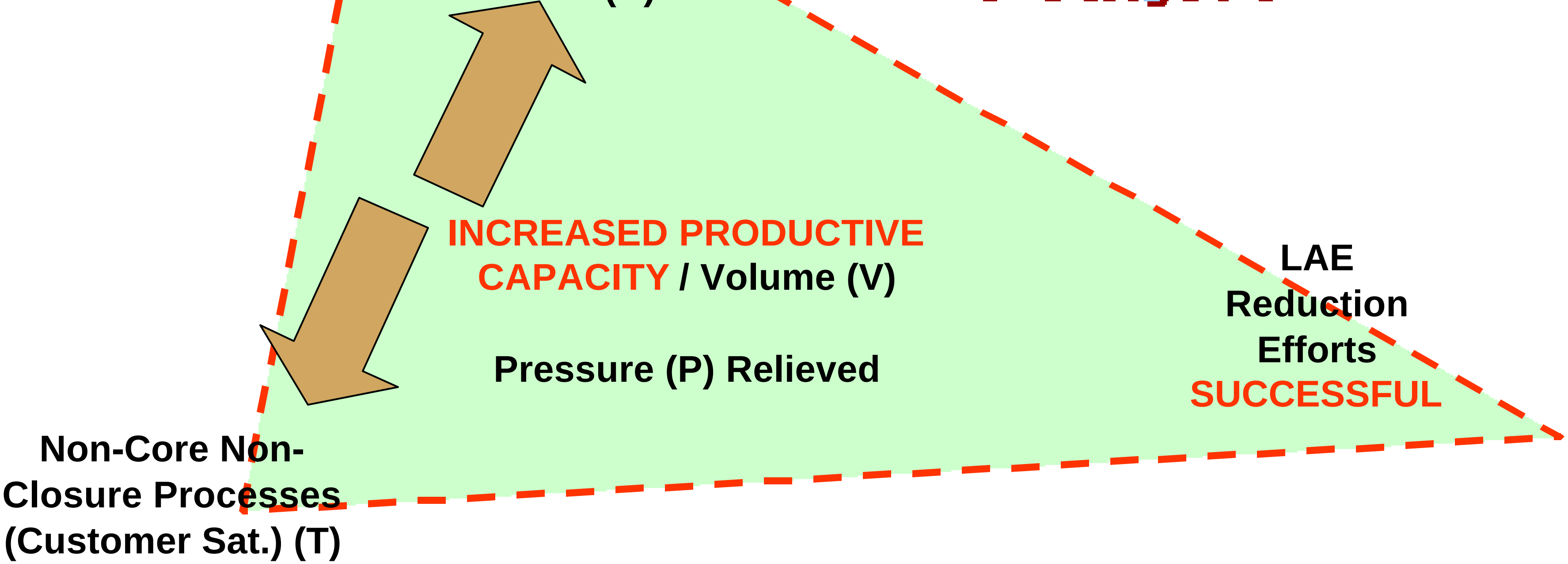
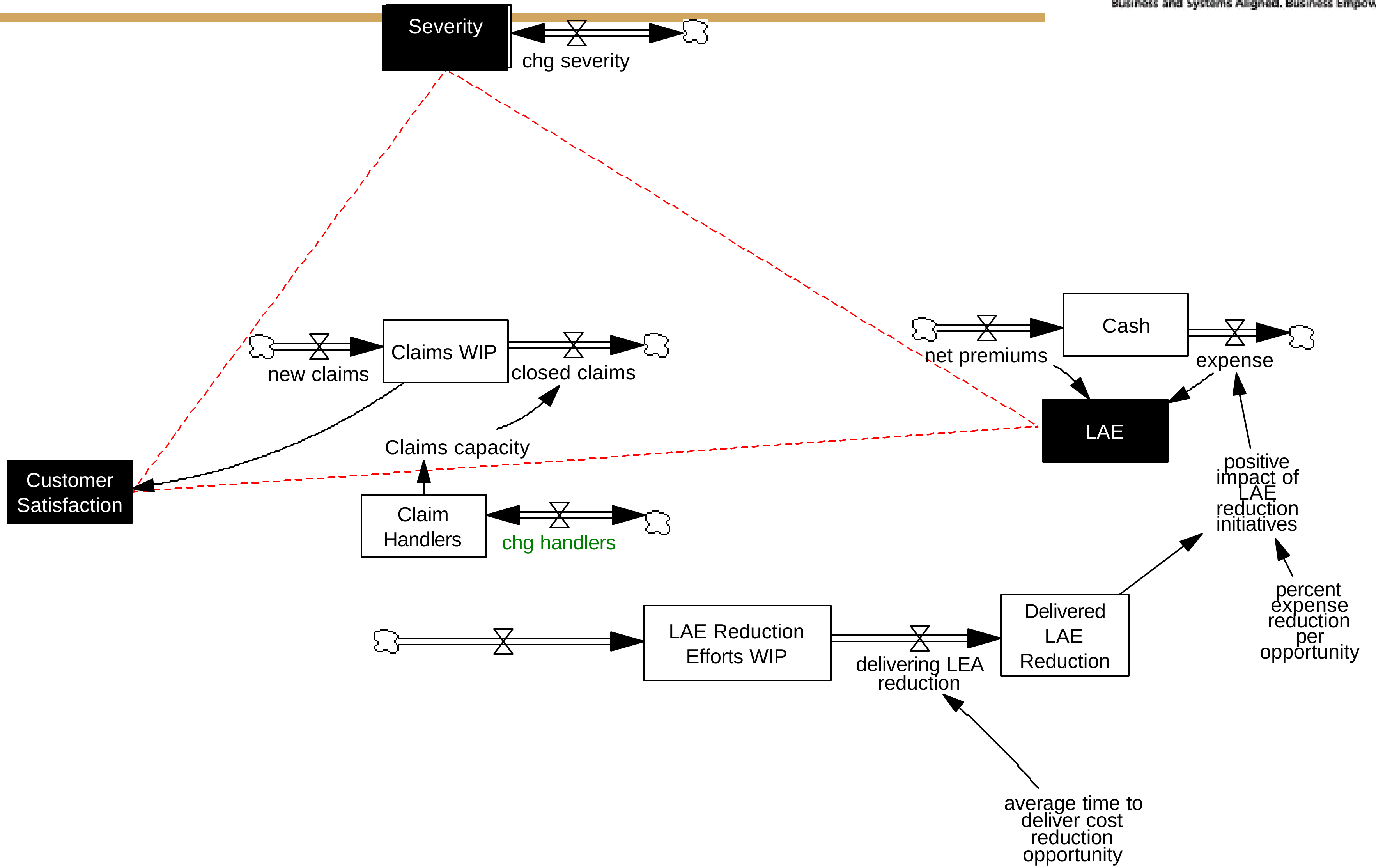
alt. Time = 2
New Steady State



Managing the "Triangle" Successfully is the Key to Sustaining Profitability while Reducing LAE



LAE reduction effort "risk" and cost may be what causes increased pressure on claim handler capacity

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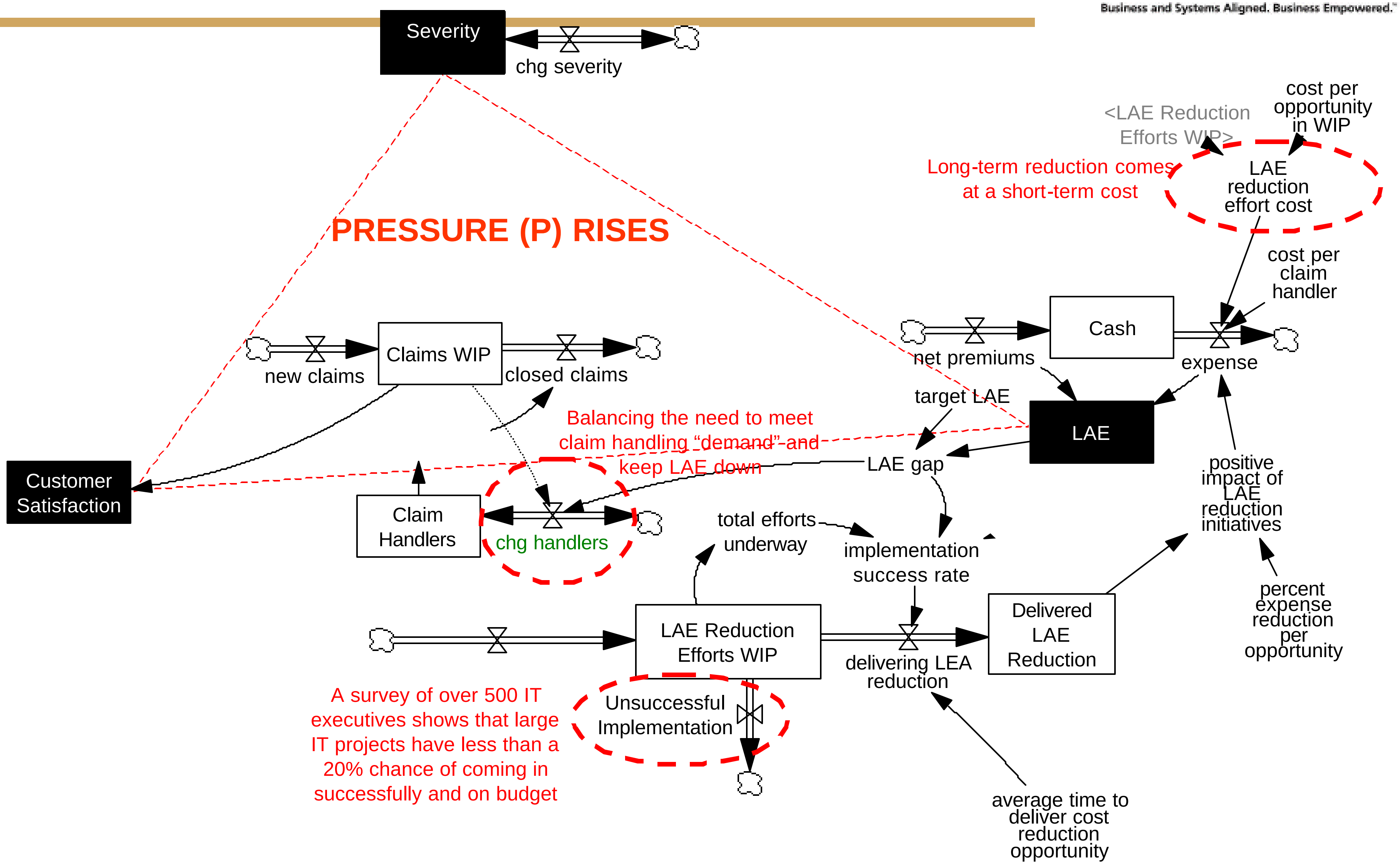
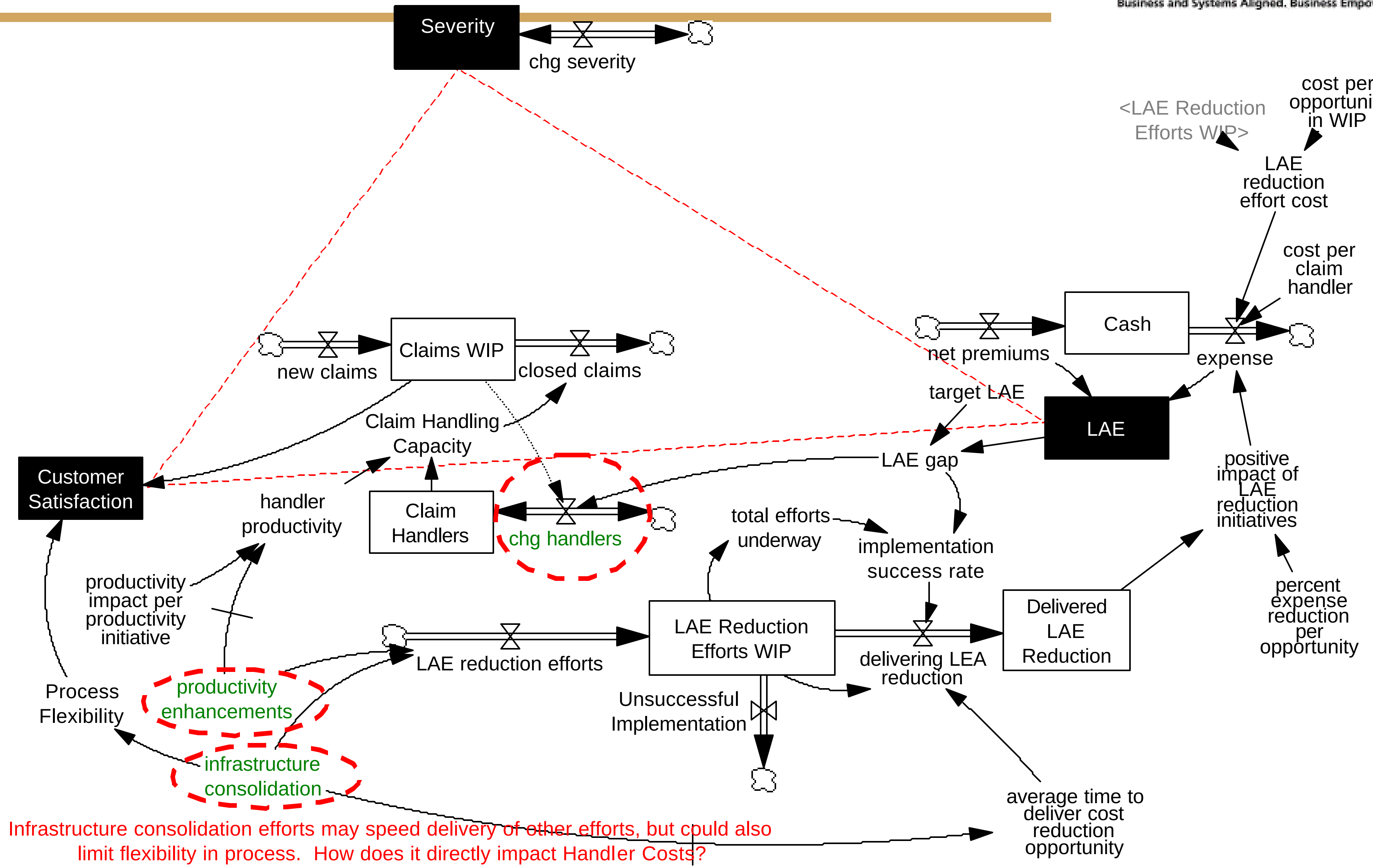
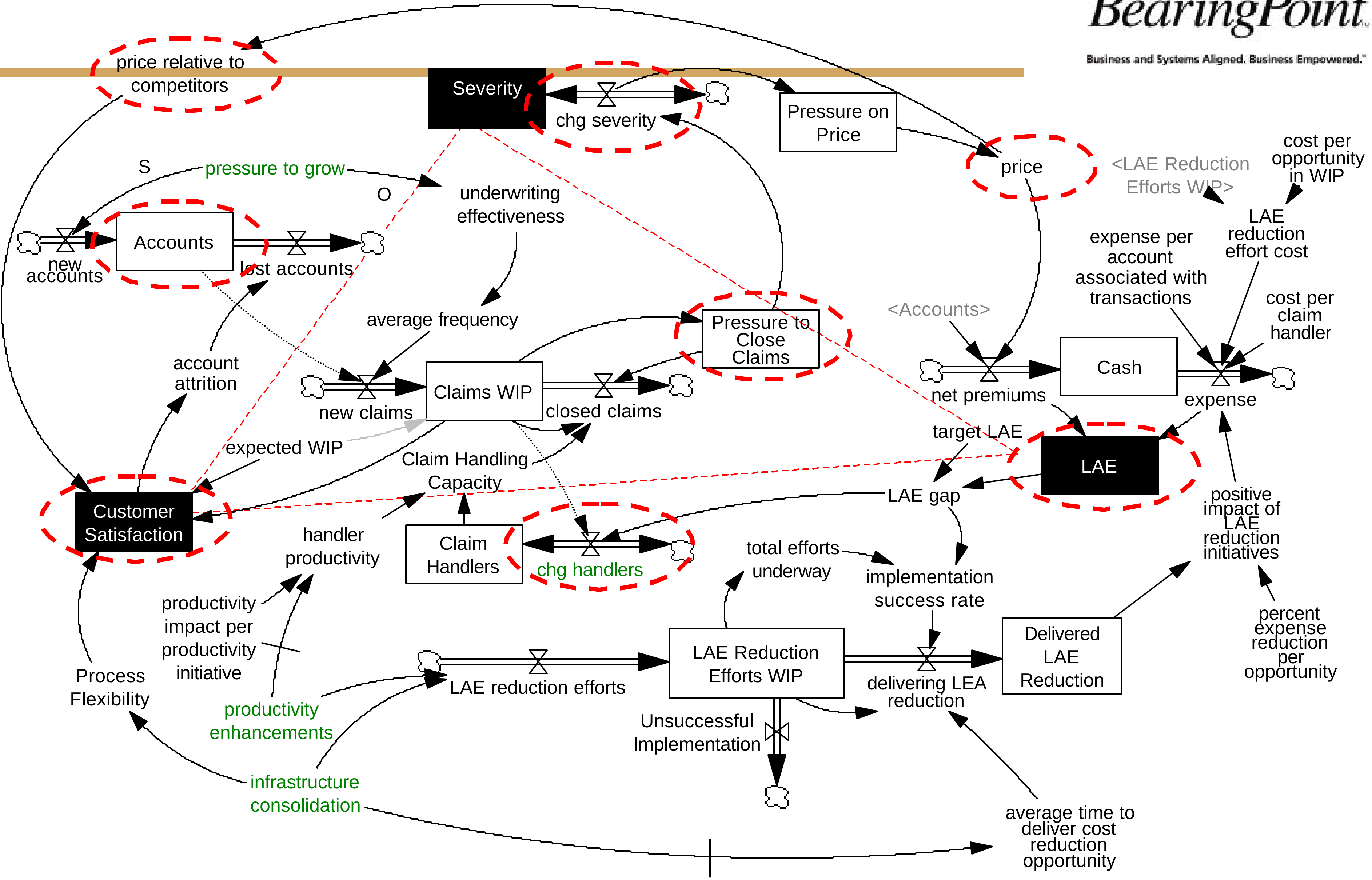


Drilling-down on LAE reduction effort "types" reveals "systemic" impacts



Another Loop is Closed through Severity



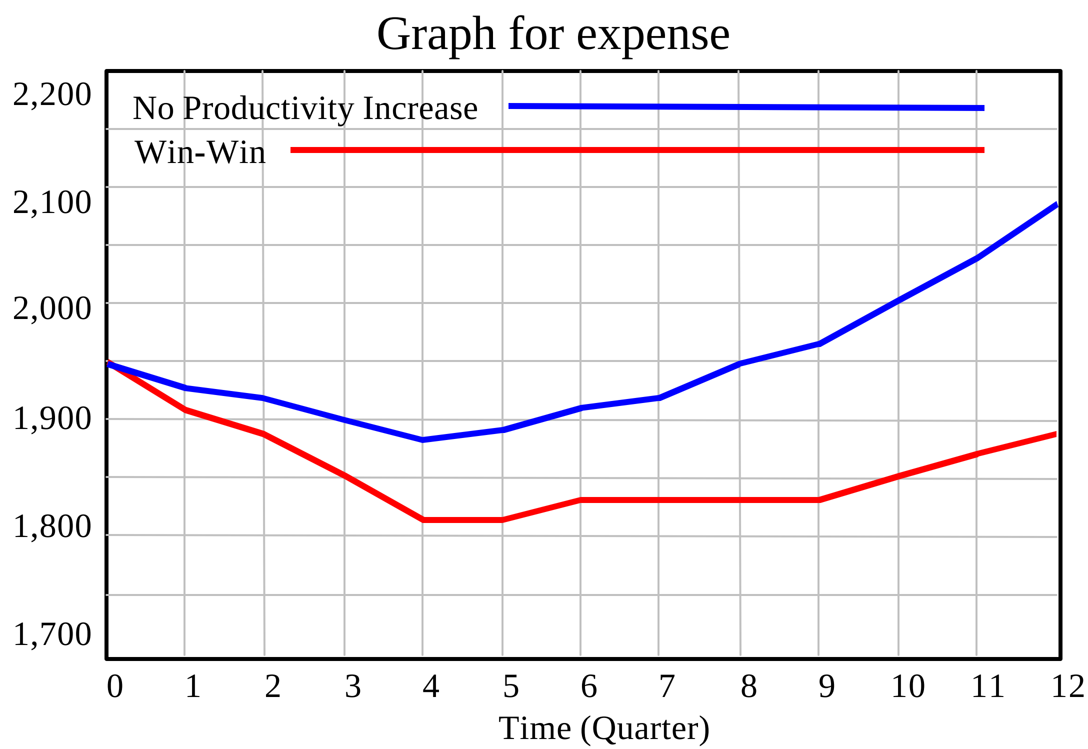
Model Results

Looking at two expense scenarios

LAE reduction efforts without increases in productivity result in quarter 1-6 expense decreases, BUT THIS BENEFIT IS LOST in quarters 6-12 as production pressure (which builds without increased capacity [V]) is relieved by falling customer satisfaction and lost accounts

The win-win scenario allows for capacity increases from productivity initiatives at the same time that LAE reduction efforts take hold. This scenario enables maintaining the expense reduction.

Note: the expense increase after quarter 9 is due to increased customer satisfaction driving accounts up and an associated **short-term** increase in costs



Model “Takeaways”

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The strategic view leads to new questions to ask prior to acting on LAE reduction initiatives

- How will the initiative impact the governing equation (PV=nRT) in the short-term and long-term?
  - Before productivity measures completely take hold (thus raising V), will there be a short-term increase in severity maintenance (R) or increase in T (the quality of non-core non-closure processes like reserve maintenance and customer care)?
  - If LAE reduction opportunities result in stream-lined operations that ALSO improve customer satisfaction and lead to account growth, how will the limited capacity respond in the long term?
- How quickly can the initiative be delivered, and what are the implications for other active or planned initiatives?
  - How does the initiative amplify or balance the effectiveness of other initiatives?
  - What is the cost of delays or limited success?

The holistic view forces new answers from the business units

- If productivity initiatives take hold and FTEs are not reduced, what will be delivered with respect to severity reduction and customer satisfaction?
- What is the minimal capacity to maintain baseline operations, and what changes in notice counts and other volume assumptions result in major increases in cycle time

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