PRECISION:

THE SCIENCE OF COMPLIANCE

Nth Degree
FINANCIAL SOLUTIONS

Table of Contents

Introduction

Objective of Webinar

1. Share industry trends
2. Provide details of most recent breakthroughs
3. Add to participants' demonstrated thought leadership
4. Resolve major industry-recognized problems
5. Inspire webinar participants to act – *NOW*

Introduction

"*All Science is motivated by the desire to bring order to the world around us*."

Hopp, Wallace J. and Spearman, Mark L,
Factory Physics, Waveland Press, Inc., 2008

- Never before, in my 30 plus years in the financial services industry, have I seen a time where the need for order and understanding has been more prominent than today
- Especially with respect to the world of compliance and compliance management in financial services

Introduction

Why "Science of Compliance"

- Financial services industry needs ***precision***
  - Meaning the opposite of risk
- Financial services people need to build ***intuition***
  - Meaning knowledge of cause and effect
- As the distance grows between clients and providers of financial services
  - The need for ***precision*** increases
  - The need for better ***intuition*** increases
  - The need for cause and effect thinking increases
  - The need for an integrated risk framework is required
- Science addresses all of these needs . . . and more
- A "Science of Compliance" is ultimately an applied discipline whose purpose is to help us better design and manage rule-based control systems in financial services

Introduction

Laws, Rules, and Regulations

- Has something changed to drive this need?
  - 12 CFR 30 Safety and Soundness Standards Appendix D:
    - Appendix D to Part 30 - OCC Guidelines Establishing Heightened Standards for Certain Large Insured National Banks, Insured Federal Savings Associations, and Insured Federal Branches (published 2014)
- The requirement for independent testing outlined in the OCC's guidelines is not new and is not limited to large financial services institutions
  - In 2005, the FFIEC provided guidance for "independent testing" of BSA/AML and continue to require that such testing be independent:
    - As part of the scoping and planning process, examiners should obtain and evaluate the supporting documents of the independent testing (audit) of the bank's BSA/AML compliance program. The federal banking agencies' reference to "audit" does not confer an expectation that the required independent testing must be performed by a specifically designated auditor, whether internal or external. However, the person performing the independent testing must not be involved in any part of the bank's BSA/AML compliance program (for example, developing policies and procedures or conducting training). Audit findings should be reported directly to the board of directors or a designated board committee composed primarily of or completely of outside directors.

Introduction

Laws, Rules, and Regulations

- Business environment moves from Descriptive Rules to Prescriptive Rules

Descriptive		Prescriptive
(what for)		(how to)
Laws		Regulations
Policy		Procedures
Strategic Objectives		Operational Objectives

- This is a movement towards standardization
- Further movement towards reducing risk by increasing precision
- In other words, a movement towards ***quality***

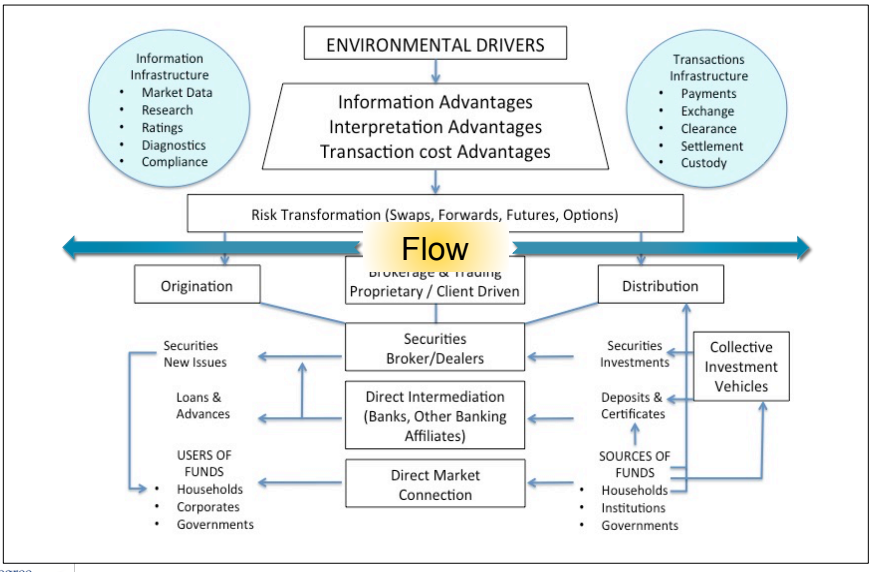
Quality Movement

Flow Versus Rocks

- In other words, to effectively regulate flow

Quality Movement

Banking Products & Services → flow



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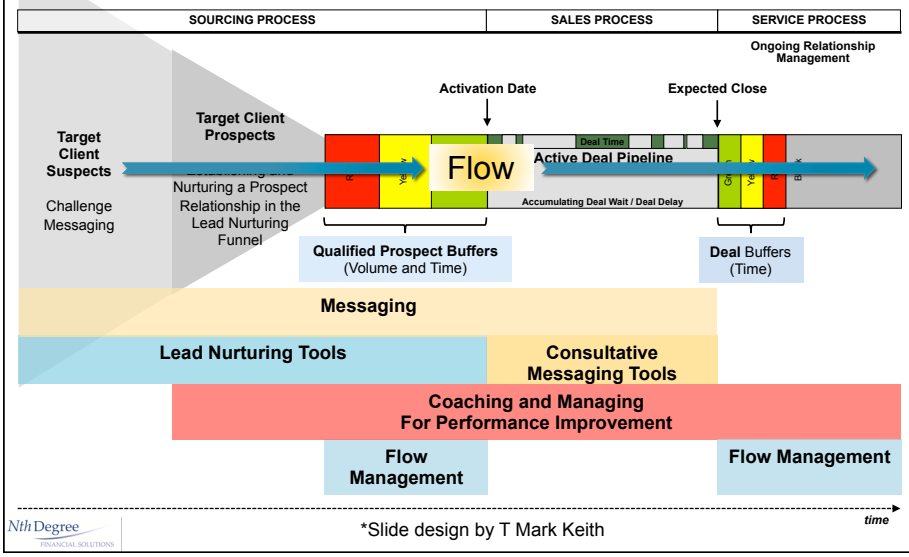
Quality Movement

Sourcing, Sales, and Service Funnel → flow



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*Slide design by T Mark Keith

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Quality Movement

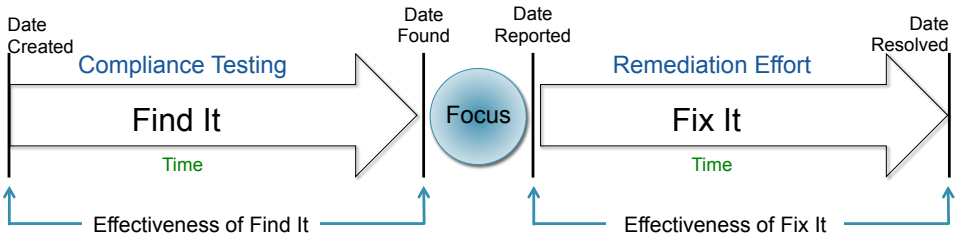
What happens when water level is lowered?

Quality Movement

Effectiveness of Precision Testing and Remediation Program

- In manufacturing industry, defects are seen
  - In financial services, they must be detected
- Detection of GAPs is done through testing
  - Like BSA/AML testing, compliance, audit programs
    - Such tests are required to be independent, precise, and comprehensive
  - We have to Find It, Focus, and Fix It. Fast! And FASTER

Warning: Flaws in test ***design*** could destroy the credibility of ALL tests!



Risk-Based Prioritization

Focus

- What happens with test results?
  - How do we focus?
  - What does it mean?

Current Operational Risk Measurement Formula:

Operational Risk = (p_e × s_e × f_e)

Where:

p_e is probability of [risk] event

s_e is severity of [risk] event

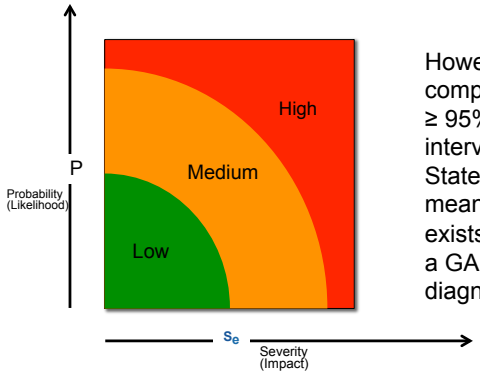
f_e is frequency of [risk] event

Risk-Based Prioritization

Focus

Operational Risk = (p_e × s_e × f_e)

- Historically, low precision qualitative measures where heat maps used to prioritize



However, post compliance testing @ ≥ 95% confidence interval, then p_e = 1. Stated in words, that means the risk event exists. Thus, there is a GAP that must be diagnosed

Risk-Based Prioritization

Converting to compliance risk

Operational Risk = ($p_e \times s_e \times f_e$)

Once compliance testing is performed at ≥ 95% confidence interval then p_e = 1.0, s_e = H, M, or L, and the f_e is the number of exceptions identified at each Severity level.

The example below illustrates compliance testing results for Operational Risk where 10 exceptions were identified as High Risk items, 15 exceptions were identified as Medium Risk items, and 50 exceptions were identified as Low Risk items.

Severity	$p_e \times s_e \times f_e$		Ops Risk
HIGH	1.0 X **H** X 10	=	10**H**
MEDIUM	1.0 X **M** X 15	=	15**M**
LOW	1.0 X **L** X 50	=	50**L**

Compliance Risk = ($p_e \times s_e \times f_e$) × *time*

Risk-Based Prioritization

To convert operational risk to *compliance risk*, multiply operational risk results by average # of days that the compliance exceptions have been outstanding.

Q: Where does this # come from?

A: Find It Focus Fix It

Ops Risk		Avg Days*		Compliance Risk Days**
10**H**	×	10	=	100
15**M**	×	100	=	1,500
50**L**	×	100	=	5,000

High Compliance Risk Days

Medium Compliance Risk Days

Low Compliance Risk Days

Overall Objective:

- Reduce "Find it" and "Fix it" times
- Learn lessons of why High *compliance risk* exceptions exist to reduce their frequency of occurrence

* Average number of days for illustration purposes only

**A *compliance risk* day is the average number of days that a High, Medium, or Low level *compliance risk* exception has existed within the testing area until it is fixed

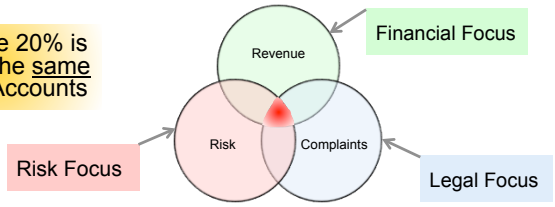
Resistance

Why Different Focus

- Why has there been so much resistance?
- Is Management's Focus different?

Pareto's Law
Aka The
80/20 Rule

. . . but the 20% is **not** from the same group of Accounts



Flow – Management's Focus

Little's Law Defined

- Flow is measured and controlled by the relationship between three process variables:
  1) Work in Process (WIP)
  2) Throughput (TH)
  3) Cycle Time (CT)
- Little's Law, named after John Little, states that work in process is calculated by multiplying the throughput of that work by the amount of time that work takes to move through one cycle. The formula[1] is expressed as follows:

$$WIP = TH \times CT$$

- Where:
  - Work in Process (WIP) is the average amount of work in a process that is between start and end points is defined as *work in process*. (Qualified leads in a sales process, audit engagements in fieldwork, loans transitioning to a securitized debt instrument, etc.)
  - Throughput (TH) is the average output of a serial process (i.e., sales, new account on-boarding, underwriting, account review, audit engagements, etc.) per unit time (i.e., new revenue per month) is defined as the system's *throughput*. Note: this definition requires zero defects. If the process produces defective output then it is not throughput; the output remains WIP because the defect requires more work to fix it.
  - Cycle Time (CT) is the average amount of time that transactions spend as work in process.

[1] This expression of Little's Law is taken from the book, Factory Physics, and is described therein as a "key Factory Physics" principle

Flow – Management's Focus

Financial Relationships Based on Little's Law

- Throughput (TH) is the rate at which a business operation generates cash (revenue) through sales. For example, Revenue per Year.
- Investment (I) is the amount of money and talent invested in a business represented in Financial Services by financial and intellectual capital allocated to a given business unit.
- Operating Expense (OE) is the amount of money that a business uses to convert Investment (I) into Throughput (TH).
- Therefore:

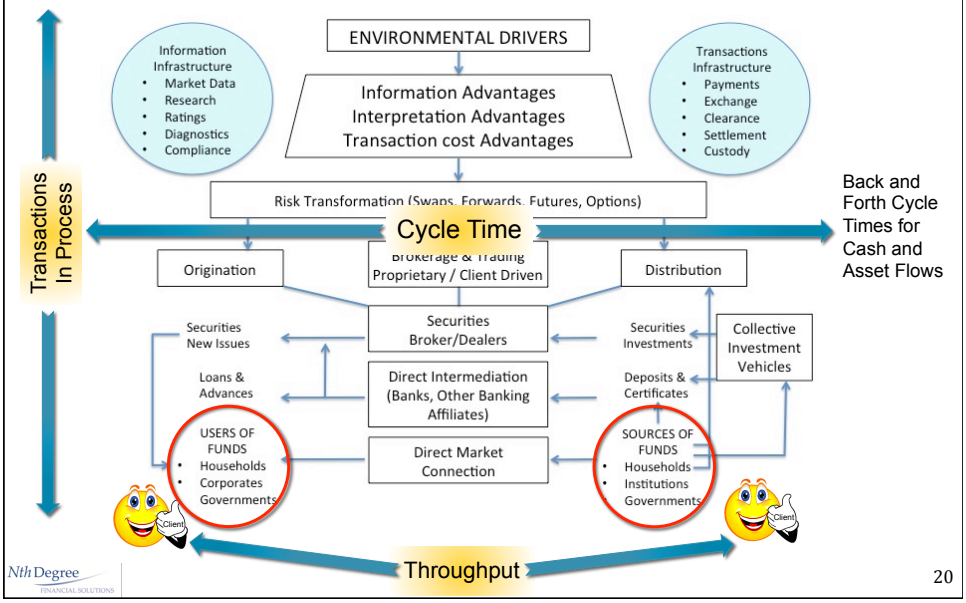
Net Profit: NP = (TH - OE)

Investment Return: ROI = (NP/I)

…and so on

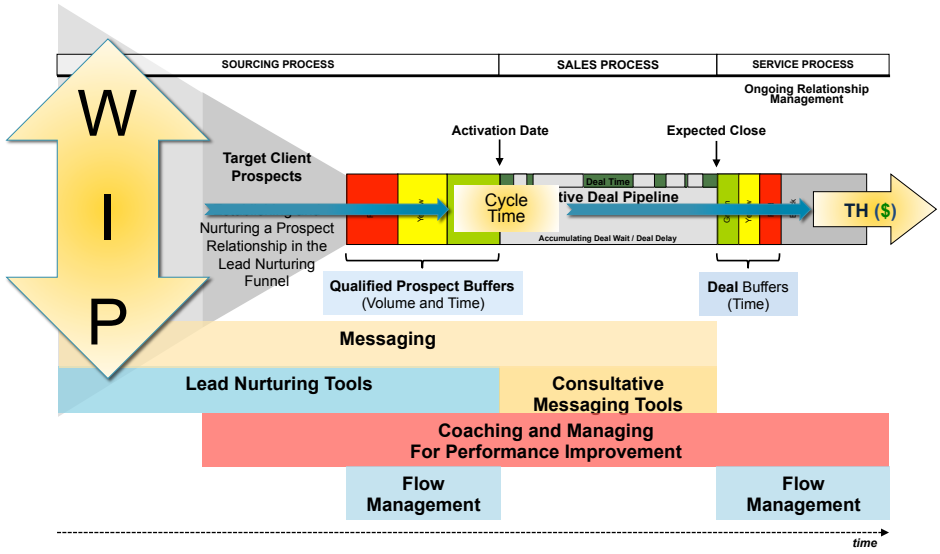
Flow – Management's Focus

Applied to Banking Products & Services



Flow – Management's Focus

Applied to Sourcing, Sales, and Service Funnel



*Slide design by T Mark Keith

Conclusion

Summary: The Complete Iterative Program

How to install a Process of On-Going Improvement (aka POOGI)

1) Testing is required and it is necessary
   - Develop appropriate tests.
   - Execute effectively
2) Identify GAPs and prioritize
   - Risk probability equals 1.0
   - Risk rank GAPS
   - Calculate compliance risk by adding time component
   - Manage "***Find It - Focus - Fix It"***
3) Know that flow matters
   - Constantly monitor impact on Cycle Times (CT)
   - Ensure that Throughput (TH) can be maintained within tolerance
4) To improve flow, find and manage the rocks.
   - Use testing methods to detect "Rocks"
   - Apply Little's Law to safely and soundly improve flow.
5) Repeat

- A transparent, measurable, and controllable POOGI has been installed

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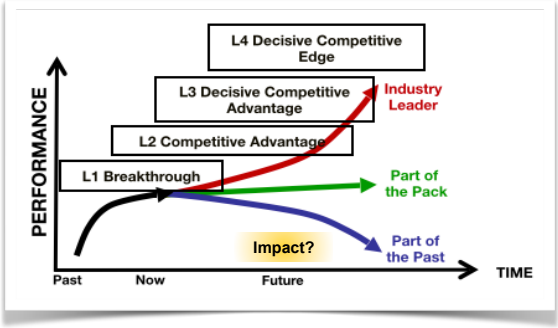
Conclusion

Three Keys to Success

- The three keys to success of this project are:
  1. Measures alignment. (Flow Rate vs. Risk Level)
  2. Integration of measures into existing management and control systems
  3. Training staff, first level managers, middle managers, and executives



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Conclusion

Next Steps

1. Implementation teams have been set up
2. Beginning in two weeks, we will start specific guidance on implementation
3. Find an implementation partner and start
4. Specific applications will be developed product by product
5. This webinar will be repeated August 8 @ 3pm CDT

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Follow Up

Putting It All Together

- This webinar sets the foundation for our scientific approach to developing the basics, intuition, and synthesis skills needed by the modern Financial Services organization
- The main observations about the need for and use of this approach are as follows:

1) *Financial Services management needs a science*. Although considerable folk wisdom exists about running the firm, there is still only a small body of empirically verified, generalizable knowledge for supporting the design, control, and management of the financial system. If we are to move beyond fads and slogans, researchers and practitioners need to join forces to evolve the science that has emerged.

Follow Up

Putting It All Together

2) *A scientific approach is a valuable management tool*. By using a holistic view of the enterprise and promoting a clear link between policies and objectives, improvements in performance and control are both significant and predictable.
3) *Good descriptive models lead to good prescriptive models*. Trying to stabilize a system not understood is ***futile***. We need descriptive models to sharpen intuition and focus attention. Furthermore, policies based on accurate descriptions of system behavior are more likely to work with, rather than against, the system's natural tendencies. Such policies are apt to be more robust than those that try to force the system to behave unnaturally.
4) *Models are a necessary, but not complete, part of a manager's skill set*. Because systems analysis demands that alternatives be evaluated with respect to objectives, some form of model is needed to make trade-offs for decision problems. Models can range from simple to complex. The *art* of modeling is in the selection of the proper model for a given situation and the coordination of the many models used to assist the decision-making process.

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Follow Up

Putting It All Together

5) *Financial accounting typically provides poor models for process and procedure decisions*. The purpose of accounting is to tell where the money is/went, not where to spend new money. Operations decisions require good characterization of *marginal expense* and appropriate consideration of resource constraints.
6) *A coherent and unified methodology for improvement must be employed*. A good scientific framework is only the beginning. To be successful there must be a clear methodology that takes into consideration management issues such as "measures alignment" as well as integration into existing management systems. Furthermore, the methodology must provide for training at the appropriate level of detail for all levels of management and in the workforce.

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Science of Compliance Implementation

Warnings, Signals, Insights

Warning

- Something to avoid, a problem or mistake

Signal

- An indicator which provides direction

Insight

- A lesson learned from experience

Science of Compliance Implementation

Warnings, Signals, Insights

Warning

- One of the most disastrous situations for any organization is when **the capacity of people is exhausted**.
  - Humans under pressure and scrutiny feel threatened
  - Additional mistakes are made due to the pressure and scrutiny
  - Then mistakes are hidden, disguised, or others are blamed
- Even when the testing is done by an independent and objective group, the testing itself, and its outcomes, generate more load on the capacity of the workers.

Warning
Something to avoid, a problem or mistake
Signal
An indicator which provides direction
Insight
A lesson learned from experience

Science of Compliance Implementation

Warnings, Signals, Insights

Insight

- There is a basic requirement to **streamline testing**, along with the correction efforts, **to an acceptable pace**, making sure the burden on workers is not too high
  - This requires **prioritization** and building a Pareto Chart of the procedures being tested
  - It also requires determining how many different procedures can be tested at the same time without disrupting the regular performance of the organization

Science of Compliance Implementation

Warnings, Signals, Insights

Insight

- Part of what made TQM (Total Quality Management) powerful within the quality movement was the idea that the worker themselves is expected to check and correct any mistake or big enough deviation from the standard
  - Practically, this means the workers should be part of the testing, particularly during the test design phase, even though much of the testing is performed by independent testers
  - The dialogue between the workers and the testers is absolutely necessary to avoid major mistakes in the test design itself

Science of Compliance Implementation

Warnings, Signals, Insights

Warning

- Flaws in test ***design*** could destroy the credibility of ALL tests!

Science of Compliance Implementation

Warnings, Signals, Insights

Insight

- Another lesson learned from TQM is the use of control charts to identify and define which deviations from any standard are “normal” and which are truly GAPs
  - This insight also pushes towards prioritization of defects found in testing

Science of Compliance Implementation

Warnings, Signals, Insights

Signal

- Testing reveals several defects in the existing process – what happens then?
  - Is it always obvious how to correct the defect?
  - Maybe the defect was created because of a reason? If we do not understand the reason we might make a major mistake by just trying to fix the defect.
  - Who is in charge of correcting the defects?
- Answers to these questions should be part of the overall Testing Process

Science of Compliance Implementation

Warnings, Signals, Insights

Signal

- A material defect, or damaging exception, points to a GAP between regulators and/or executive management expectations and the existence of the defect or exception
  - This GAP should invoke a learning session regarding why such a GAP exists
  - A learning session should be performed by a team, including a seasoned facilitator, at least one person who was directly involved with the environment that created the defect/exception, and one person relatively independent from the specific process

Science of Compliance Implementation

Warnings, Signals, Insights

Warning

- Correcting a defect is a CHANGE and it adds load on the workers
  - This could easily lead to misunderstanding, blame, and embarrassment

Science of Compliance Implementation

Warnings, Signals, Insights

Insight

- There is a need to prioritize the defects and implement the changes according to the established and agreed upon priority
  - To ensure the pace of implementation is monitored so that overall pressure is kept under quantifiable control
- This regulated pace is in addition to controlling the pace of the testing

Science of Compliance Implementation

Warnings, Signals, Insights

Insight

- Cultural Change
- When testing, checking, and correcting actions are part of the new "normal" in an organization, it is critical to remember the constructive value of:

Everyone can make mistakes, thus, mistakes have to be clearly forgiven, provided that the lessons have been learned!

Science of Compliance Implementation

Warnings, Signals, Insights

Signal

- Cultural Change
- Learning from GAPs that were found and fixed requires implementing a structured learning process
  - Including being able to differentiate between the trivial and the critical
- And requires implementing the cultural change, where mistakes are **clearly forgiven**, as long as the lessons have been learned.

Science of Compliance Implementation

Warnings, Signals, Insights

Insight

- **Testing involves workers**
- Changes to business processes in Financial Services should be implemented with one or more events involving all the business process associates who actually do the work. It is particularly important to involve them for two reasons:
  - Buy-in, since they will either make it work or not
  - They have knowledge of process details that management and control functions never will

*Provided by world-renowned implementation expert, Eli Schragenheim

Sources

Little's Law taken from Wikipedia, 2017[1]

- In queueing theory, a discipline within the mathematical theory of probability, Little's law is a theorem by John Little which states:
  - The long-term average number of customers in a stable system L is equal to the long-term average effective arrival rate, λ, multiplied by the average time a customer spends in the system, W; or expressed algebraically: L = λW.
- Although it looks intuitively reasonable, it is quite a remarkable result, as the relationship is "not influenced by the arrival process distribution, the service distribution, the service order, or practically anything else."[3]
- The result applies to any system, and particularly, it applies to systems within systems.
  - So in a bank, the customer line might be one subsystem, and each of the tellers another subsystem, and Little's Law could be applied to each one, as well as the whole thing.
- The only requirements are that the system is stable and non-preemptive; this rules out transition states such as initial startup or shutdown.

1. *Wikipedia: The free encyclopedia*. (2004, July 22). FL: Wikimedia Foundation, Inc. Retrieved July 10, 2017, from https://en.wikipedia.org/wiki/Little%27s_law
3. Simchi-Levi, D.; Trick, M. A. (2013). "Introduction to "Little's Law as Viewed on Its 50th Anniversary"". *Operations Research*. **59** (3): 535.

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