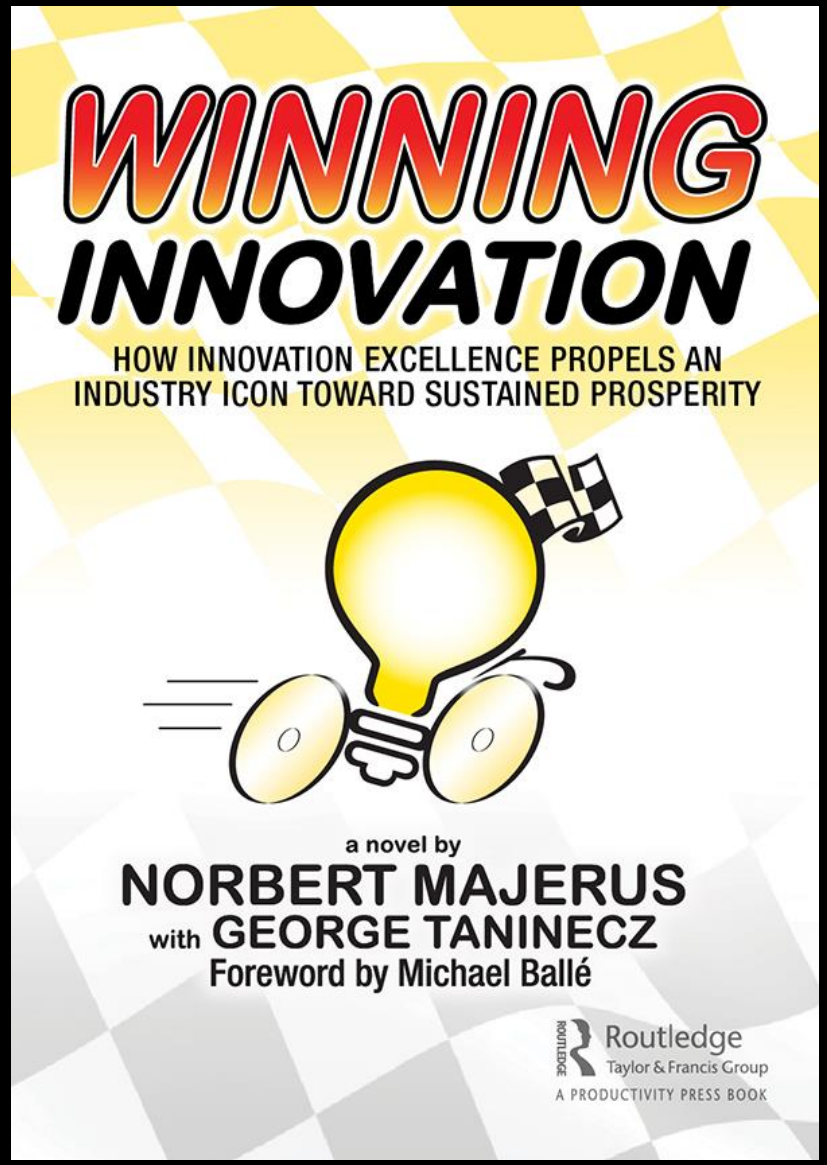


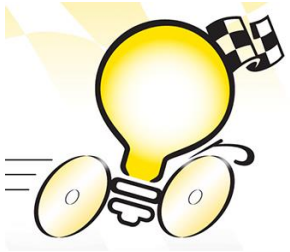
Principles and Practices for Lean Product and Process Development

Lean Innovation 101

Norbert Majerus

norbert majerus consulting llc

Intro’s



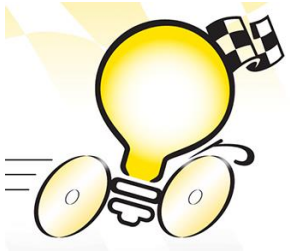
Please introduce yourself

Please tell us your company and what you do **in one sentence**

One Sentence on experience with lean

What are you most proud of? .. or where would you rather be

Me …



6-170

39

60

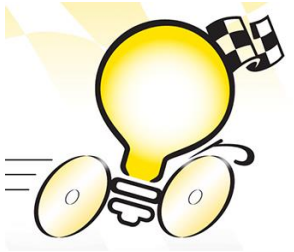
12

978-1-4822-5968-1

22.9068° S, 43.1729° W

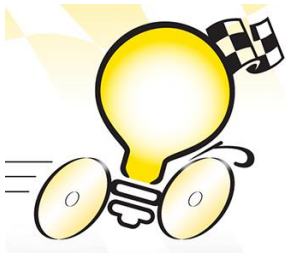
Class Expectations

Know and Do



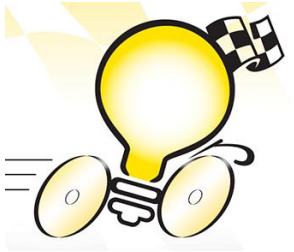
At the conclusion of this workshop, your should be able to:

1. Describe the reasons for applying lean in RDE&Q or in the office.
2. Understand customer value and waste
3. Identify and understand a value stream
4. Know the different phases of innovation and how lean principles apply to them
5. Understand the main principles of flow, kanban, pull
6. Know what metrics are and where they are used
7. Understand the key principles of change management



Introduction to Innovation Excellence

Why do great companies fail at innovation?



Companies do not fail because they fail to build a product

Companies fail because they fail to build what customers want*

•*Diana Kander, All In Startup, Wiley, 2014

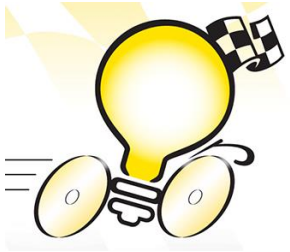
Coming out of Nowhere

Uber
Amazon
Google
Zappos
Progressive

Tesla
Airbnb
Facebook
iphone

How many tried?

Lean and Innovation Today



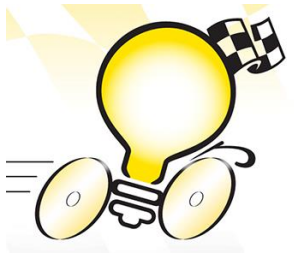
GLOBAL Economy

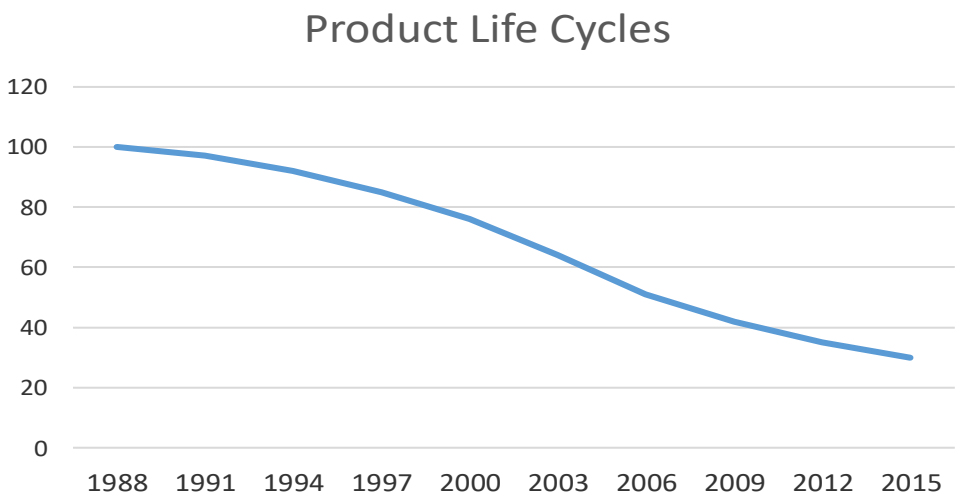
Economic growth is largely a function of:

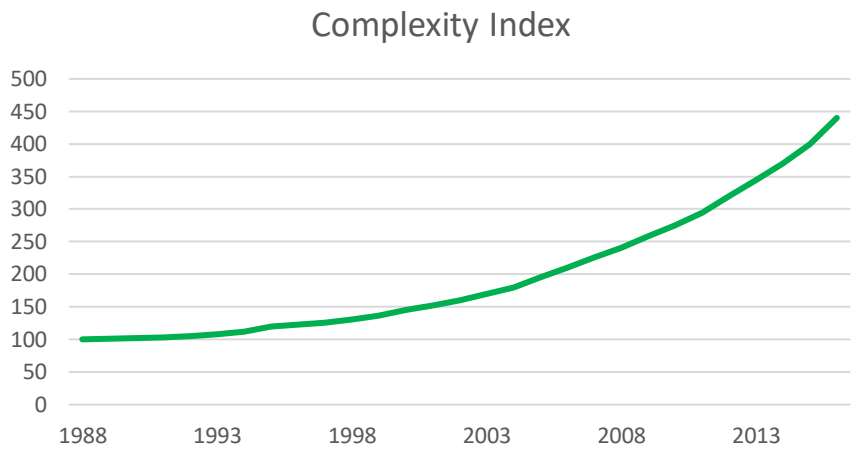
- Population Growth
- Market Growth
  - **Productivity/Efficiency >>> Lean Manufacturing**
  - **Innovation >>> Lean Innovation**

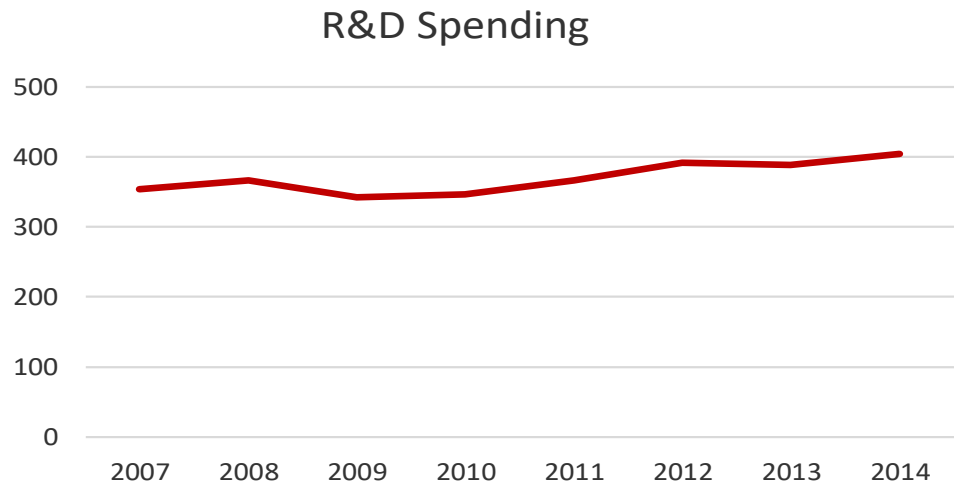
Get better at WHAT we do and how we do it

2016 Global R&D

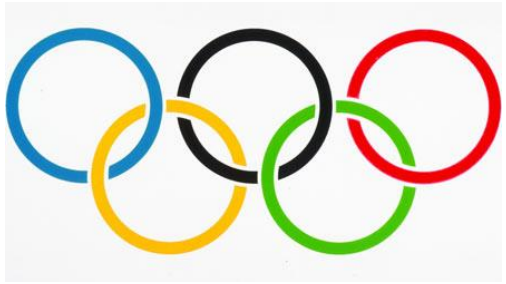








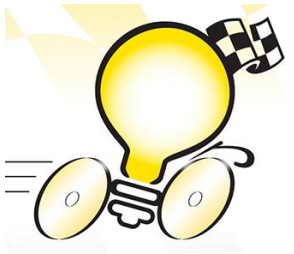
Global Competition



Get better at WHAT we do and how we do it

Why Lean?

2005



Safety/quality were good (must continue trend)

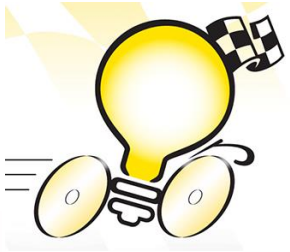
Late on almost all launches

Less than 50% of the new products were profitable

Low engagement scores and people quit for lack of work

“We could help you improve your process if you had one”

Goodyear Lean Innovation



Safety, quality – all time high

1,500, 95%, 100%

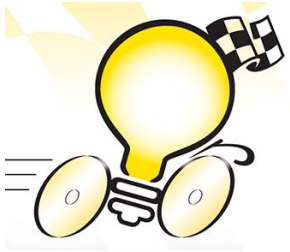
75%

3x

Better engagement

•2016 Recipient of the AME OpEx Award

Agenda



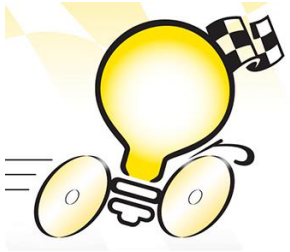
Understanding innovation excellence

Preparing the organization

The Process

The People in the lean innovation organization

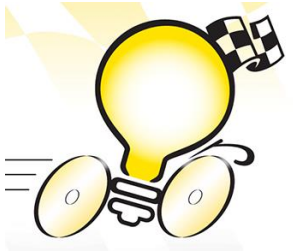
MY Definition of Innovation



Taking an IDEA and turning it into a profitable PRODUCT, SERVICE, PROCESS, Computer Program, Building …

I = C + E Innovation = Creation + Execution

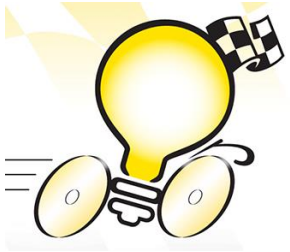
Goal of Innovation Excellence



Be the BEST at what you do and how to do it

Achieve sustained prosperity

Lean Schools



Manufacturing

Toyota

Knowledge

Set based/concurrent

It is all about flow

Lean start-up

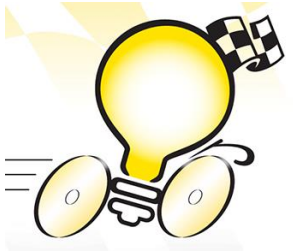
And many MORE

Roadmap for Lean Product Development Implementation

No consultant/book has all the answers

The key is to understand the principles …
and then figure out where to apply them

The SWOT Approach



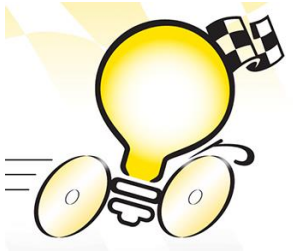
Build on your strengths

Improve your weaknesses

Catch the opportunities

Mitigate the threats

Preparing the Organization



Industrial Innovation

Purpose of R&D

The shadows

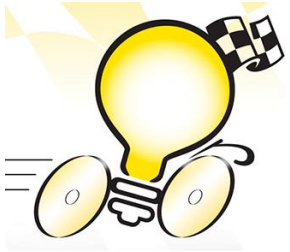
The true NORTH

The one with the most tools wins

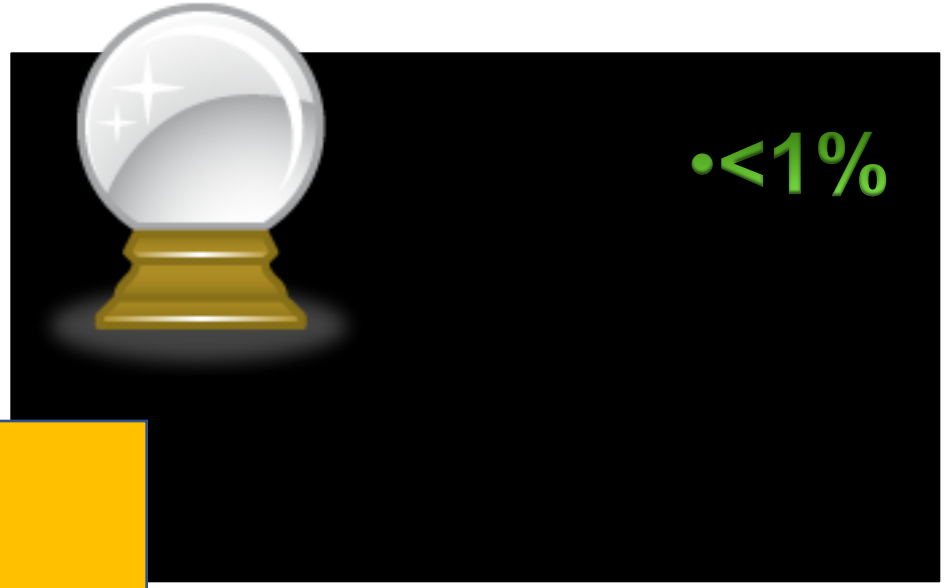
You may just as well do something that matters

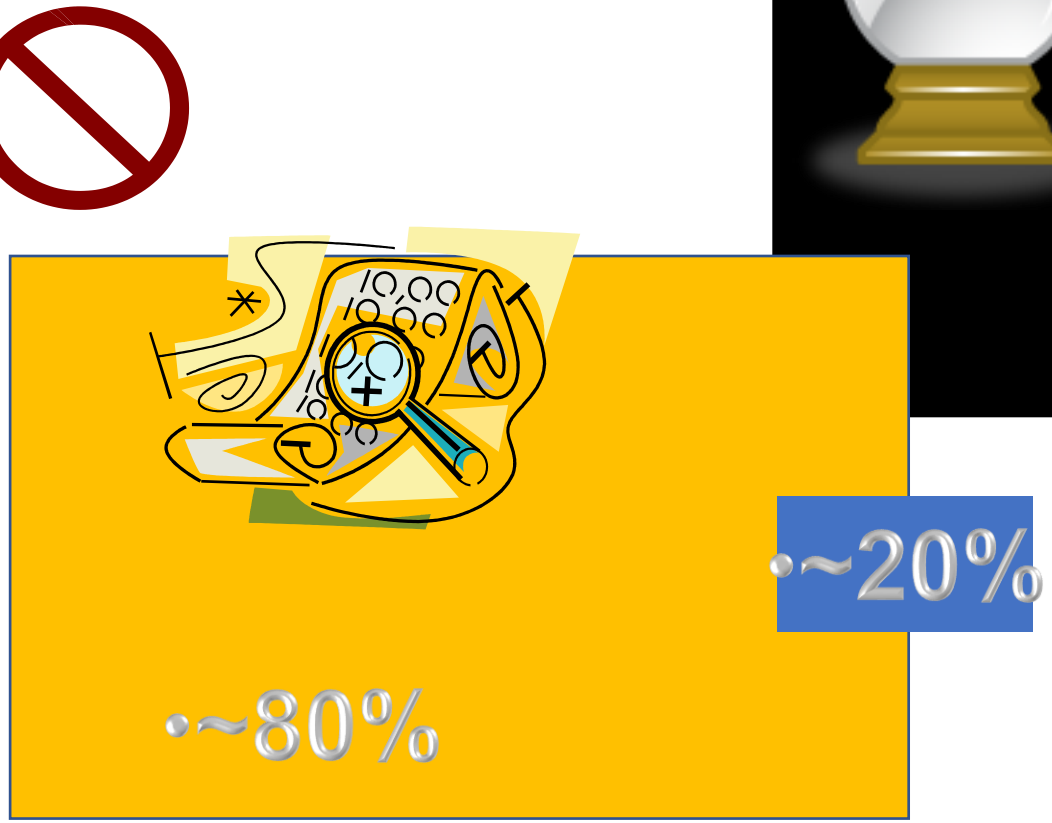
The Lean office

•Innovation Grid



•Project Uncertainty

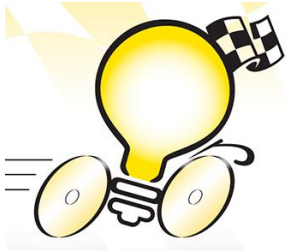




•~20%

•Project Value

Best Innovation Primers



Google – get it all from the outside

Discretionary Funding (past @ Goodyear)

15-20% (3M) - the money will be spent???

Give people the opportunity to experiment a little without approval - red box credit card

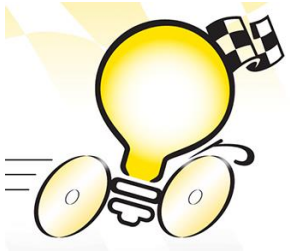
The right metrics (30% sales from new products)

The right process

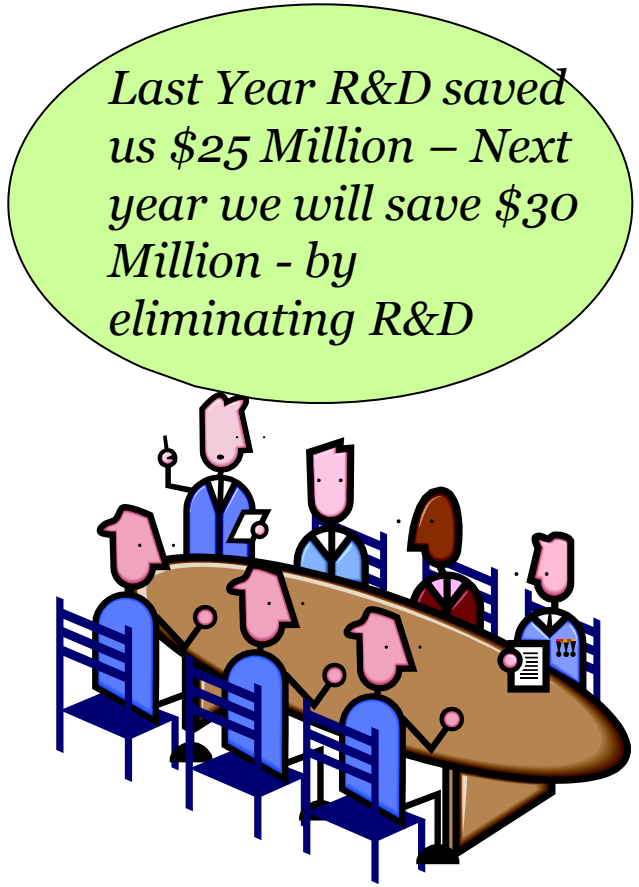
Complete freedom is not the best setting for creativity

Different individuals have different needs for structure in order to be creative

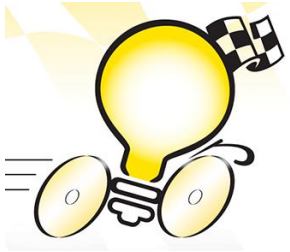
Purpose of R&D



Why should we do Research, Development (or Engineering)?



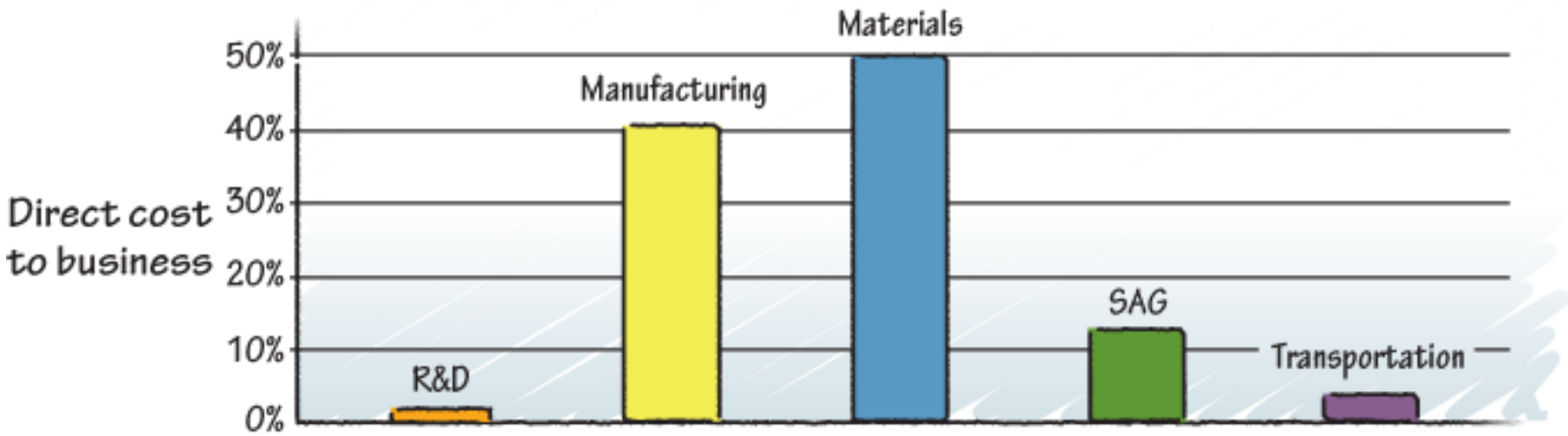
What is the Purpose of R&D?



„ to help company generate revenue „

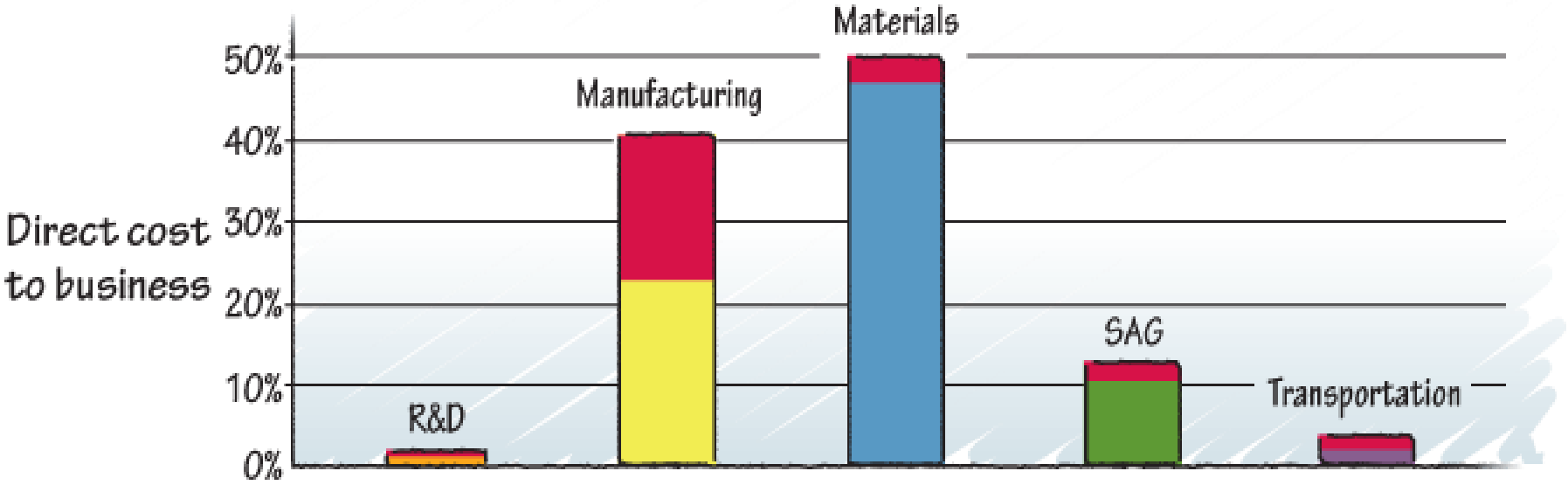
R&D is an INVESTMENT, not a cost

Direct Cost to the Business



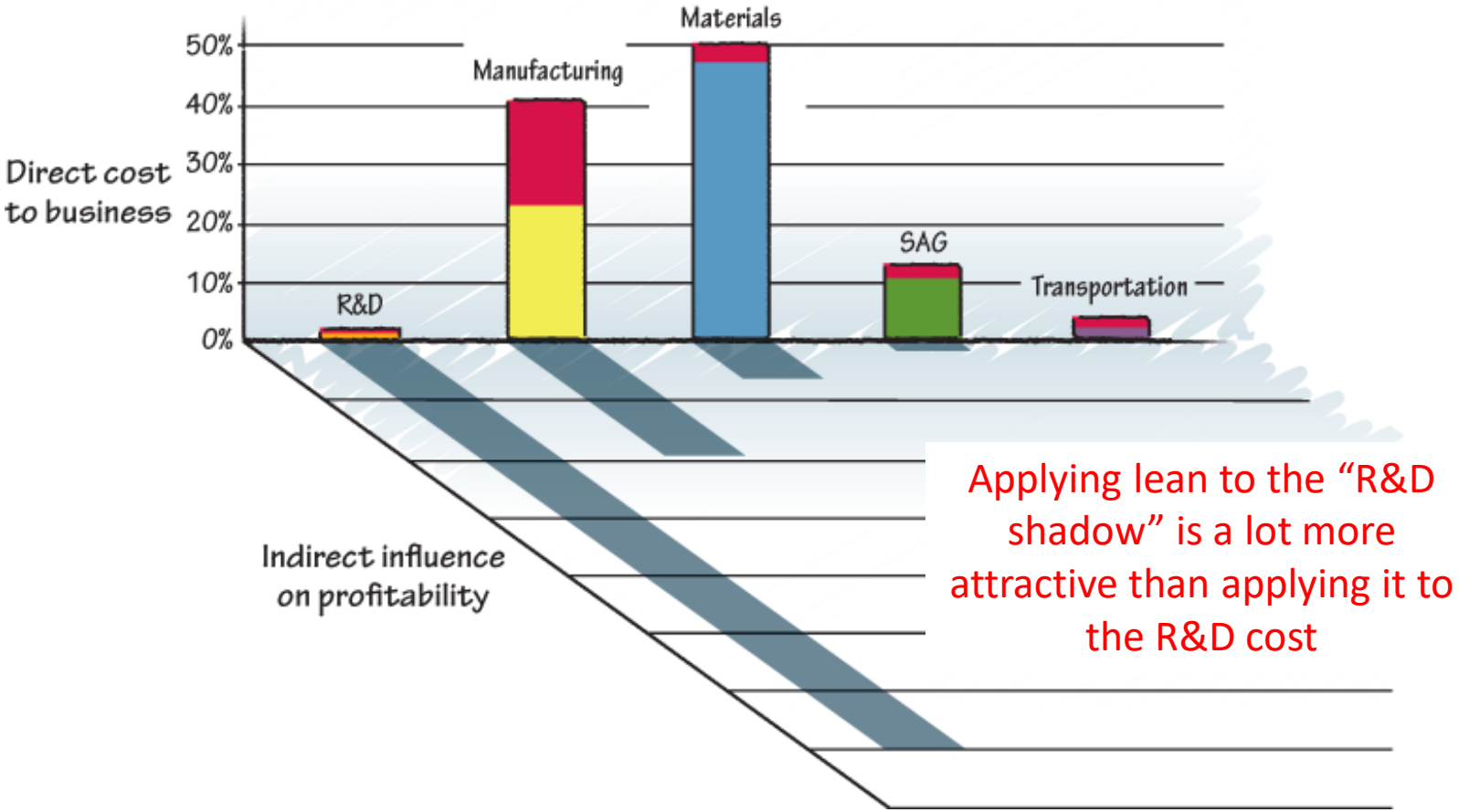
1-6%

Application of Lean



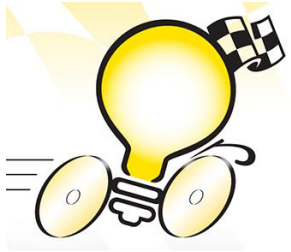
Why Bother??

Influence on Profitability of Value Stream



Applying lean to the "R&D shadow" is a lot more attractive than applying it to the R&D cost

RDEQ MISSION

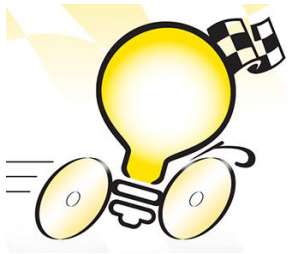


True North!

<u>Efficiently</u> deliver continuous flow of <u>consumer-relevant,</u> <u>innovative</u> products and processes that align with business strategy and drive profitable growth.

Set the right strategy for the company and cascade it down to align all parts of the organization.

Cascade



Top Down

OGSM

Alignment

Need for HELP

Bottom Up

The One With The Most Tools Wins….

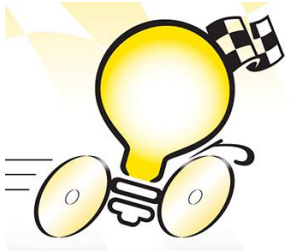
Mindset,

Skillset,

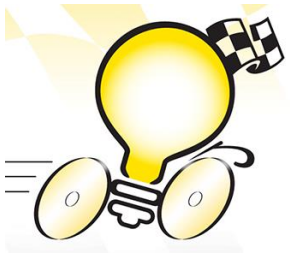
Toolset

Agile ….

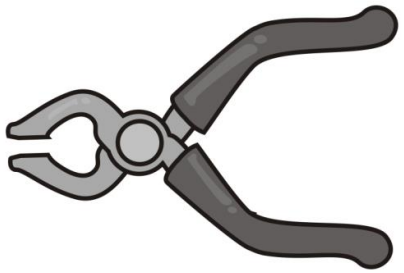
Which is the Best Lean (Innovation) Tool



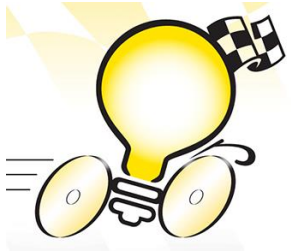
- ❑ Hackathon
- ❑ Lean Startup
- ❑ Design Thinking
- ❑ Agile
- ❑ TRIZ
- ❑ SCRUM
- ❑ Quick Learning Cycles
- ❑ Others

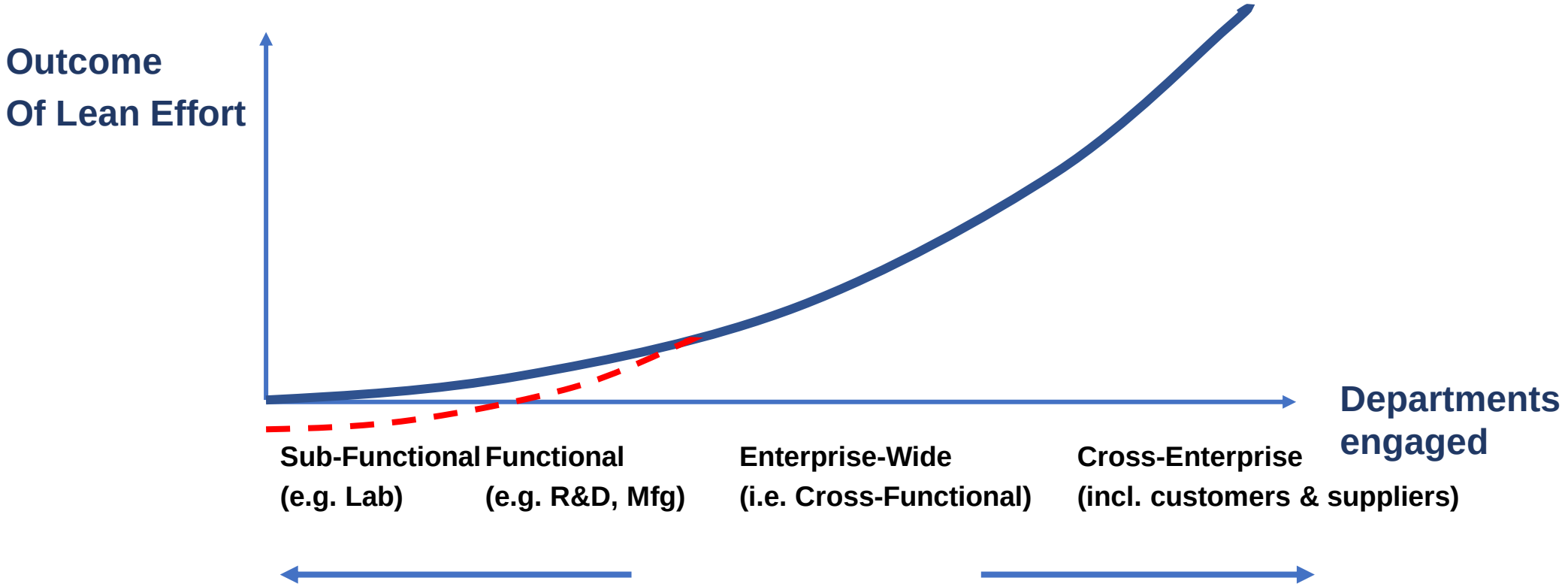


What is the best tool



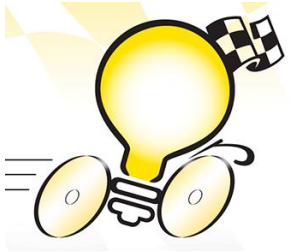
You may just as well do something meaningful





Chances for visible results are better if lean is applied on the highest level of the process

Plan to see RESULTS

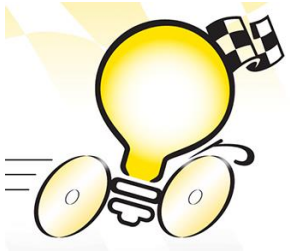


Must happen sooner than later

Should translate into currency

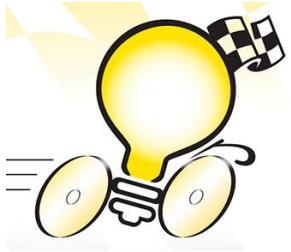
Take longer to get something meaningful than bags full of trivial results

The Lean Office

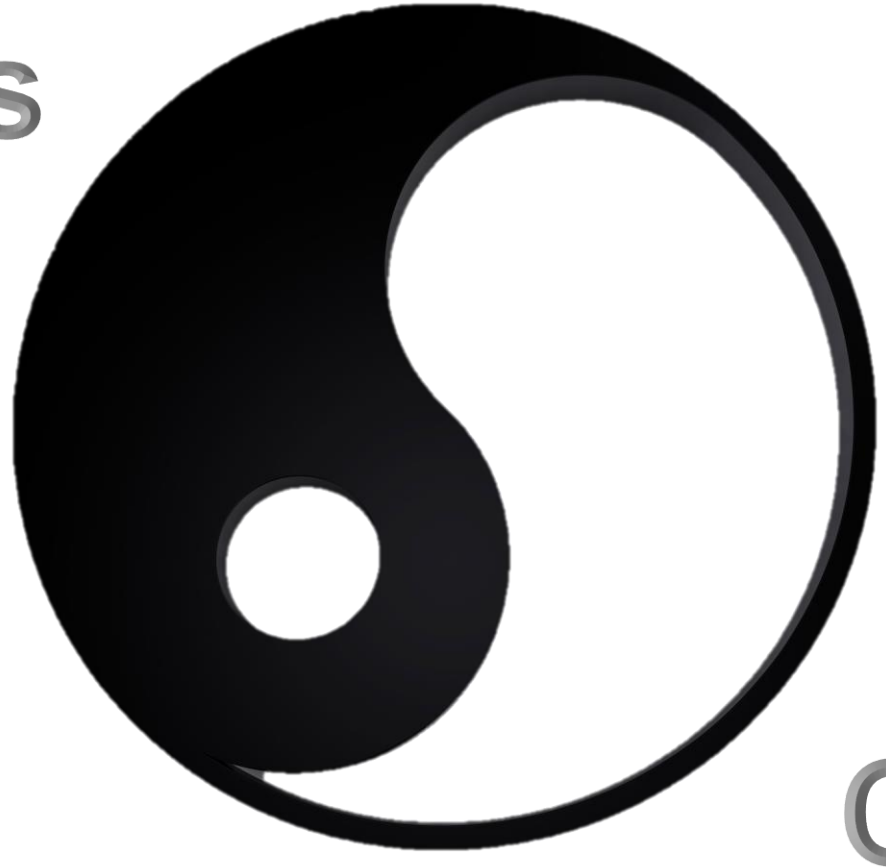


- Education
- Coaching
- Knowledge management
- Formal is better than informal
- Vision/goals for initiative
- Change management
- Maybe lead some teams

Winning Innovation



Process

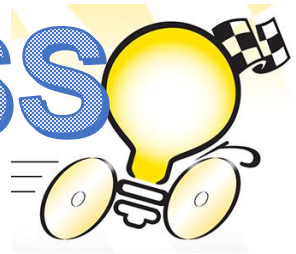


Culture

What is a good innovation process

- The right product
- Fast
- On time- on target
- Successful
- Efficient

INNOVATION PROCESS

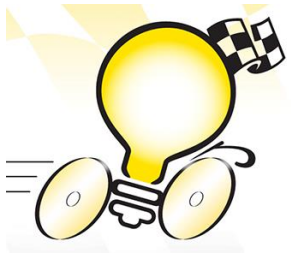


Creation

Technology Development

Mass Design

Fail fast and often



Creation

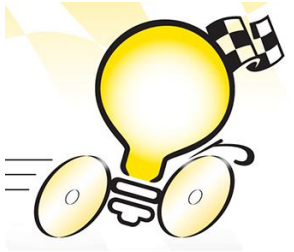
Technology Development

Efficient Knowledge Creation

Mass Design

Failure is not an option

The Culture



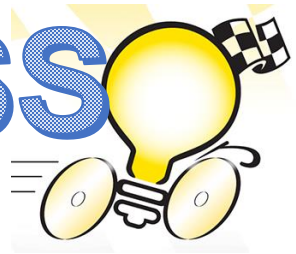
Inspired by Toyota/NUMMI

Engaged workforce

Respect for everybody

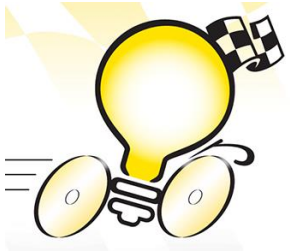
Humble leadership

INNOVATION PROCESS



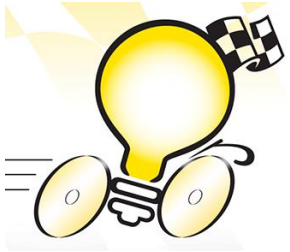
Creation

Creation



- Inspiration
- Getting Ideas
- Key Principles of exploration
- Agility
- Examples

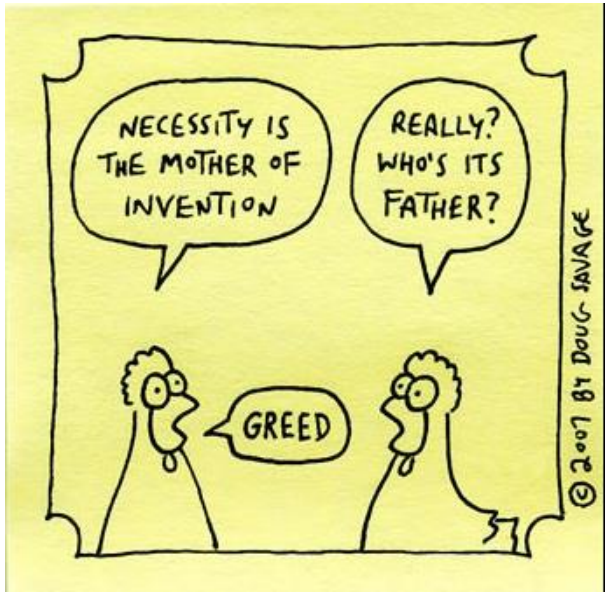
Innovation Fact



Most of the big discoveries in the last 20 years originated in R&D

Necessity is the mother of invention

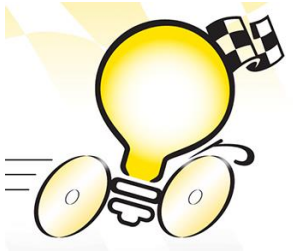
Invention is the mother of necessity



My Dream Process

H&M

Basic Principles



The more you try, the higher your chances

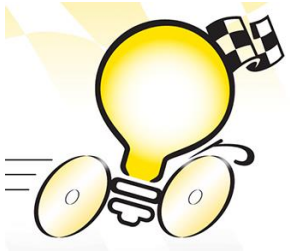
You do not know until you work on it

Efficient risk elimination

Agile thinking – the scope can change

Good is good enough

Idea Generation



Methods

- Brain storm
- Brain blog
- Hackathon
- Open Innovation
- Red Box
- ……

Not Enough Ideas

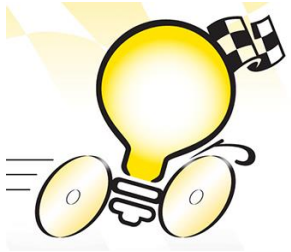
or

Too Many Ideas

CUSTOMER

IVERGE

D

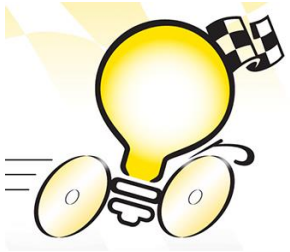


Edison tested 3,000 filaments to select 2

Steven Burley:

It takes 3,000 ideas for one successful product

2 Leading PRINCIPLES



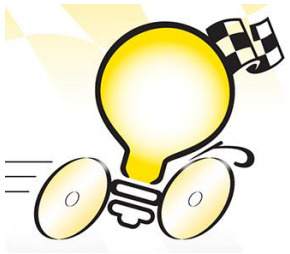
You know nothing about the project until you start working on it

And things will change every day

CUSTOMER

DIVERGE

Lean Innovation



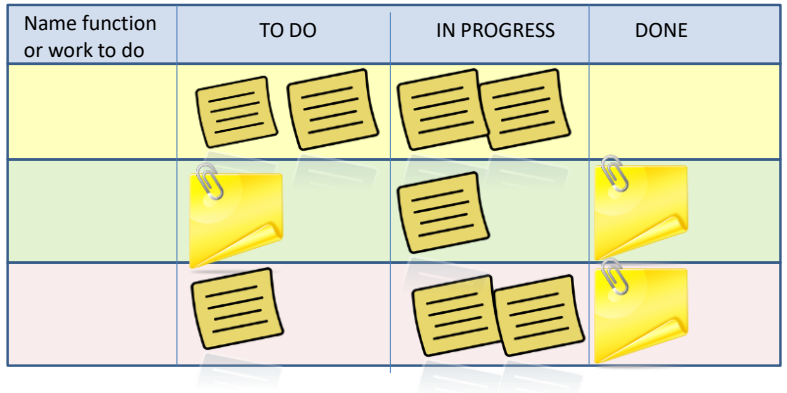
CUSTOMER

LEAN

Quick Learning Cycles – SCRUM, sprints, agile …

Time Period

Goal, deliverable ….



Potentially Shippable Product after every cycle

Work in very small steps, FAST – often time limited steps

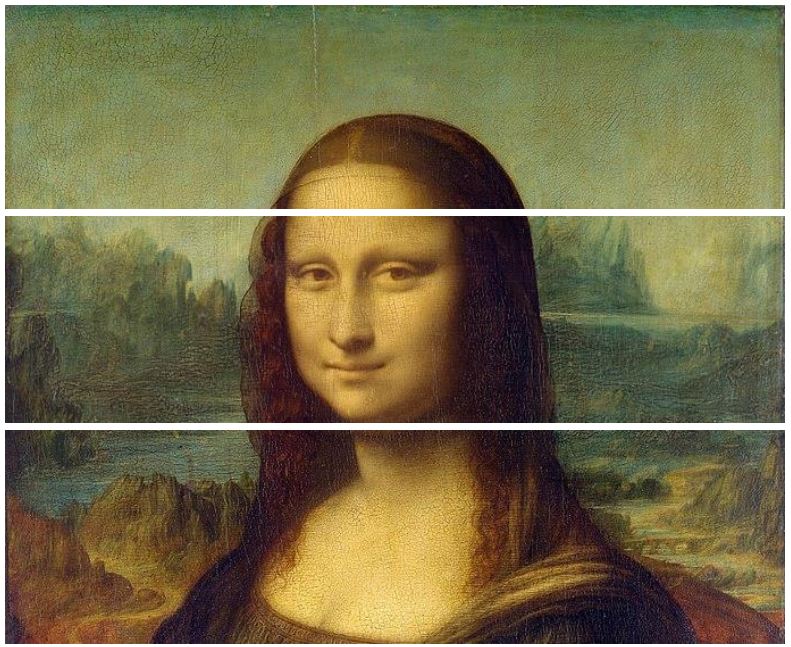
Cross functionally from the beginning

Retain flexibility through the process – launch or pivot at any time

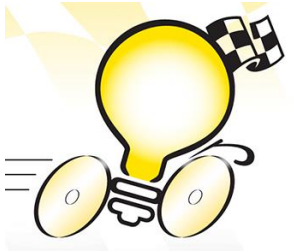
Use technology/world as our lab

And

With the minimum effort



Building a house



~~Start Digging~~

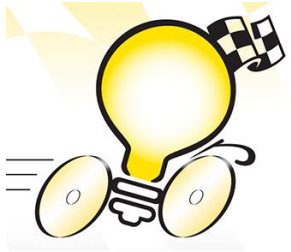
Buy land

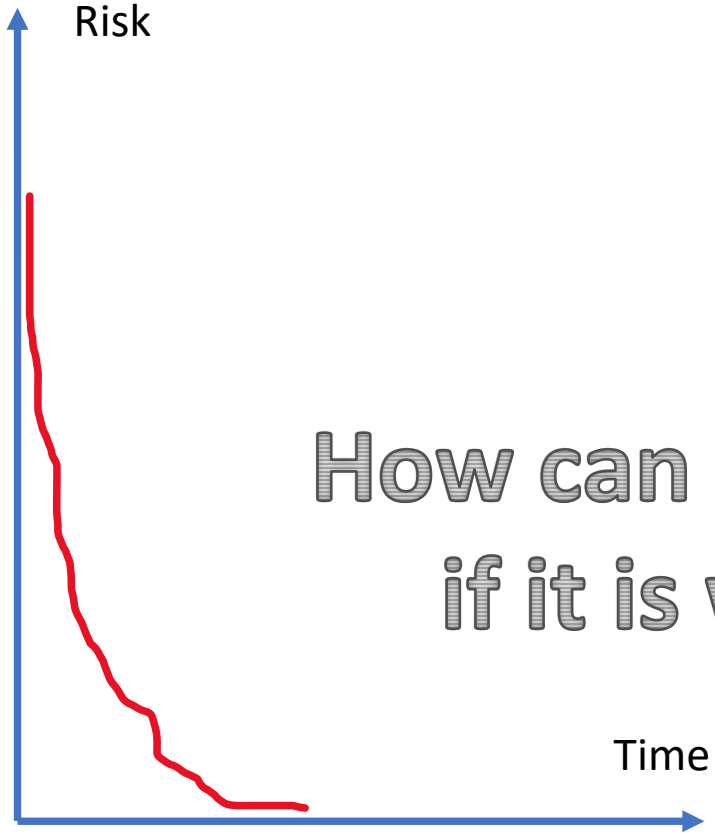
Make a drawing

Get a permit

Start digging

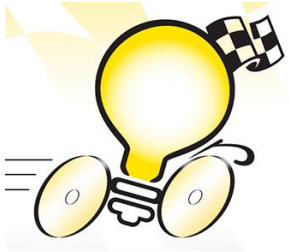
Follow the Risk Scale With Critical Questions





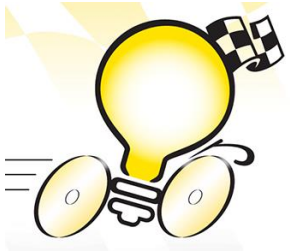
How can I know after the first experiment if it is worth continuing the project?

The Big Bang Theory episode



- https://www.youtube.com/watch?v=CdF2zVoXi-s

Lean Experimentation

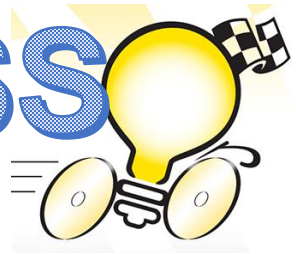


Zappos.com
POWERED by SERVICE®

Maximum Learning

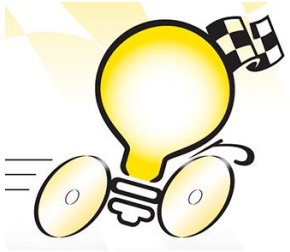
With Minimum Effort

INNOVATION PROCESS

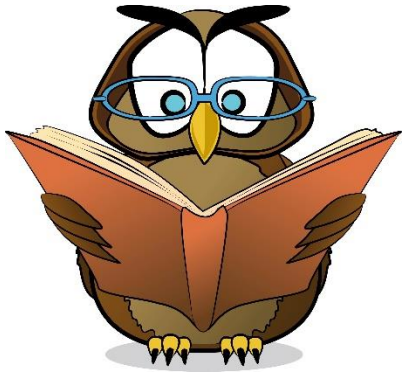


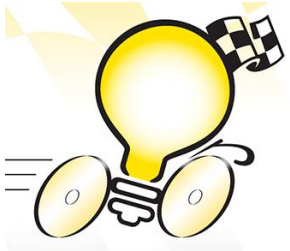
Technology Development

Technology Development



- Knowledge Management
- Experimentation
  - Scientific
  - SBCE





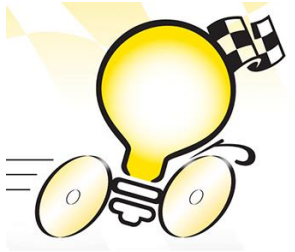
Creating a Knowledge Management System

Norbert Majerus
April 2022

What did your company spend on knowledge?

$Billions over the history of the company

Why knowledge management?

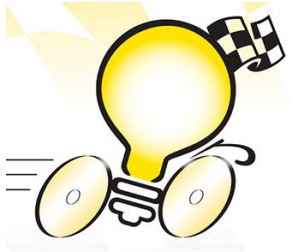


Eliminate waste and cost in a development process by preventing reinvention

Manage the risk in product development

Speed up the development

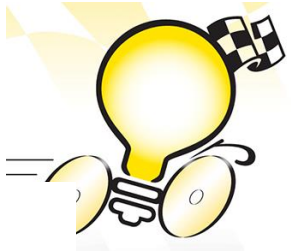
Was easier to manage with strong functions



30%

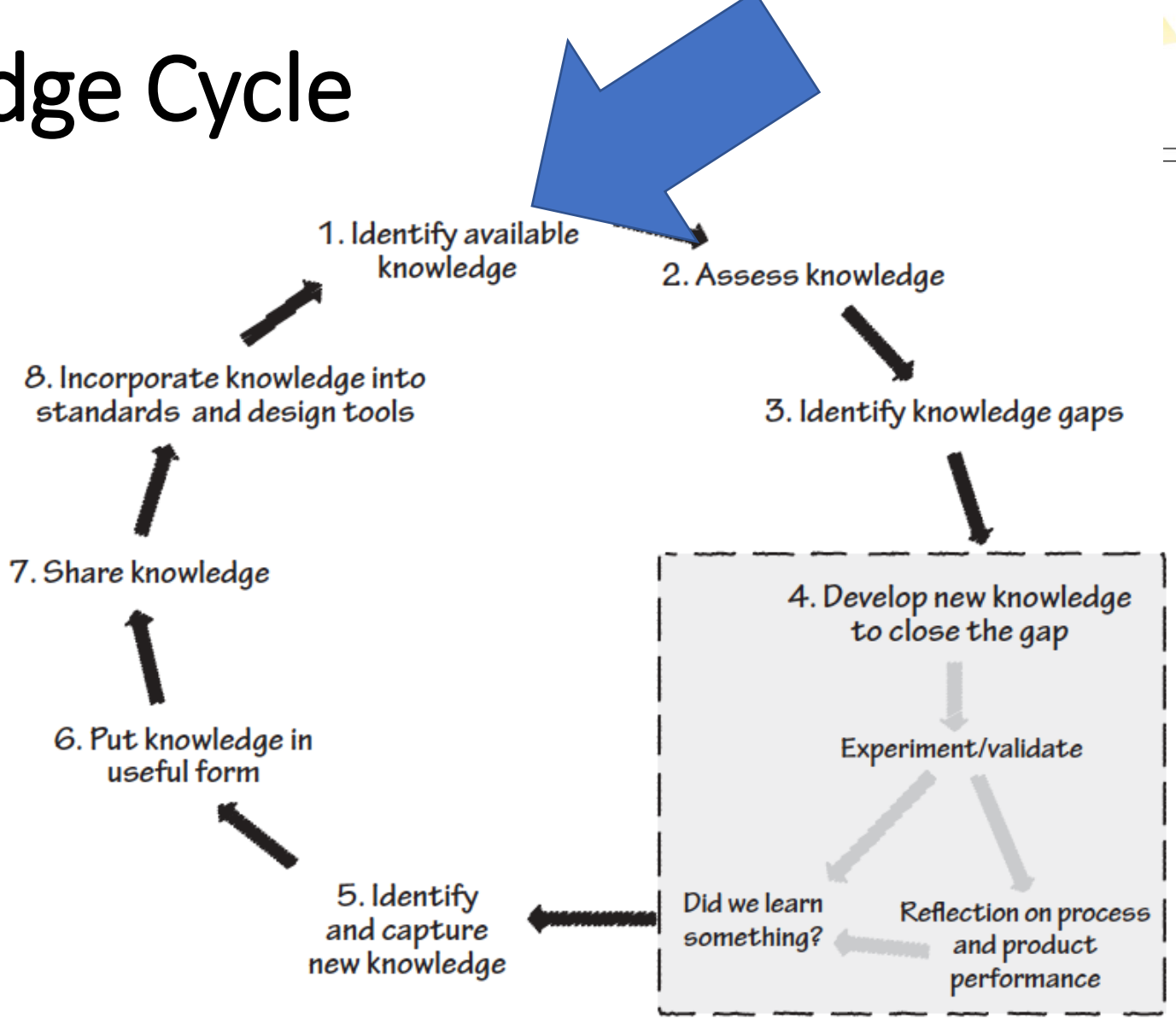
Of knowledge is re-used

My Knowledge Cycle

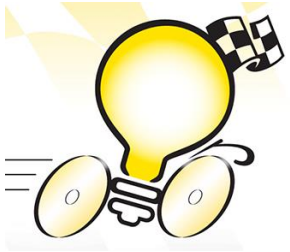


- Combining many movable parts into a SYSTEM

- No Best Place to start

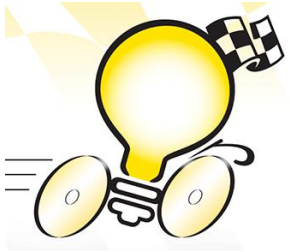


Chemical Abstracts



Knowledge repertoire

Encouraging the RE-use of knowledge



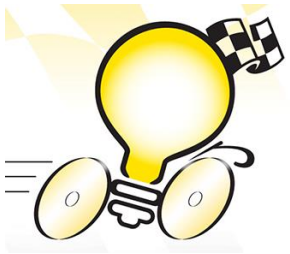
Engineers do not like to do this

- NO fun
- Trust issue
- Feel incompetent

Creativity should be used to create new knowledge, not replicate existing knowledge. (biggest challenge)

Good practices that can encourage the reuse of knowledge:

- Managers and leaders must ask for it
- Knowledge search and reuse must be part of project plans, playbooks, checklists, etc.
- Engineers must be trained in the value of knowledge reuse.
- Personal performance management should include knowledge management.

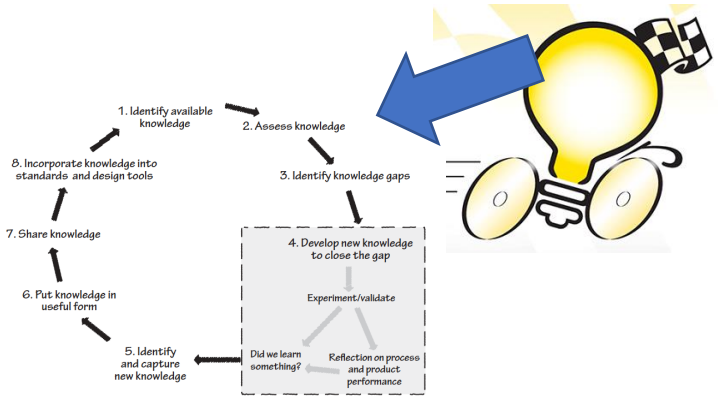


BUY IT

Get it for free

BENCHMARK (Research)

(2) Assess existing knowledge

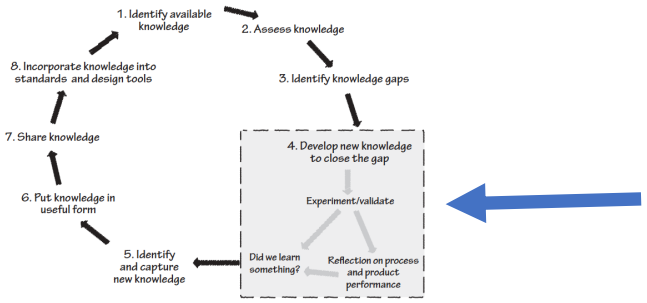


The knowledge must be assessed for

- Validity (including statistical)
- Fit

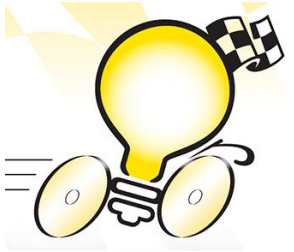
(3) Identify knowledge gaps

(4) Develop new knowledge to close the gap



- Fun part!
- Only develop NEW knowledge if a gap exists
- Develolp KNOWLEDGE – not random experiments

Experiment A3



Focus on the gap

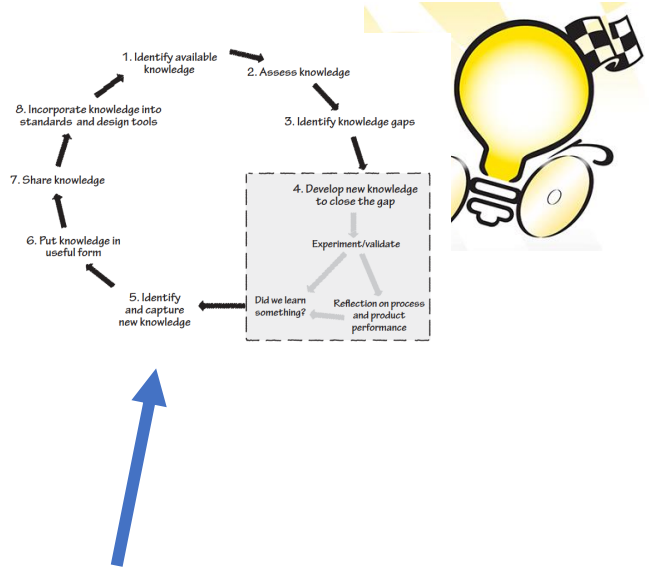
Hypothesis

>>>>Identify/capture the knowledge

Documentation

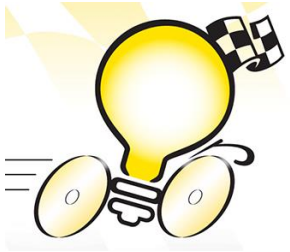
Team building

(5) Capturing Knowledge



- Identify, visibility, responsibility …
- **Validate**
- Knowledge Workers vs owners
- The “book of failures”

The Perils of Reflection



Project Success

OE example – reassigned to ballast on the blimp

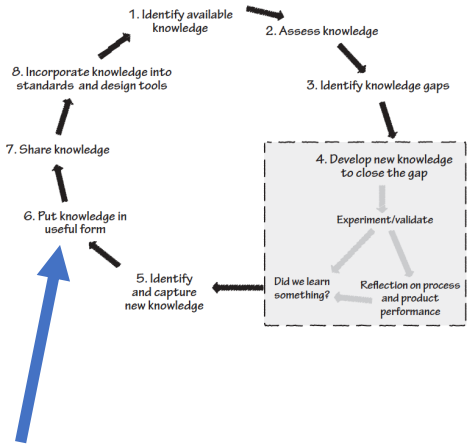
There has to be cultural acceptance that you learn by mistakes

MUST BE IMPERSONAL

Disconnected from results of the project

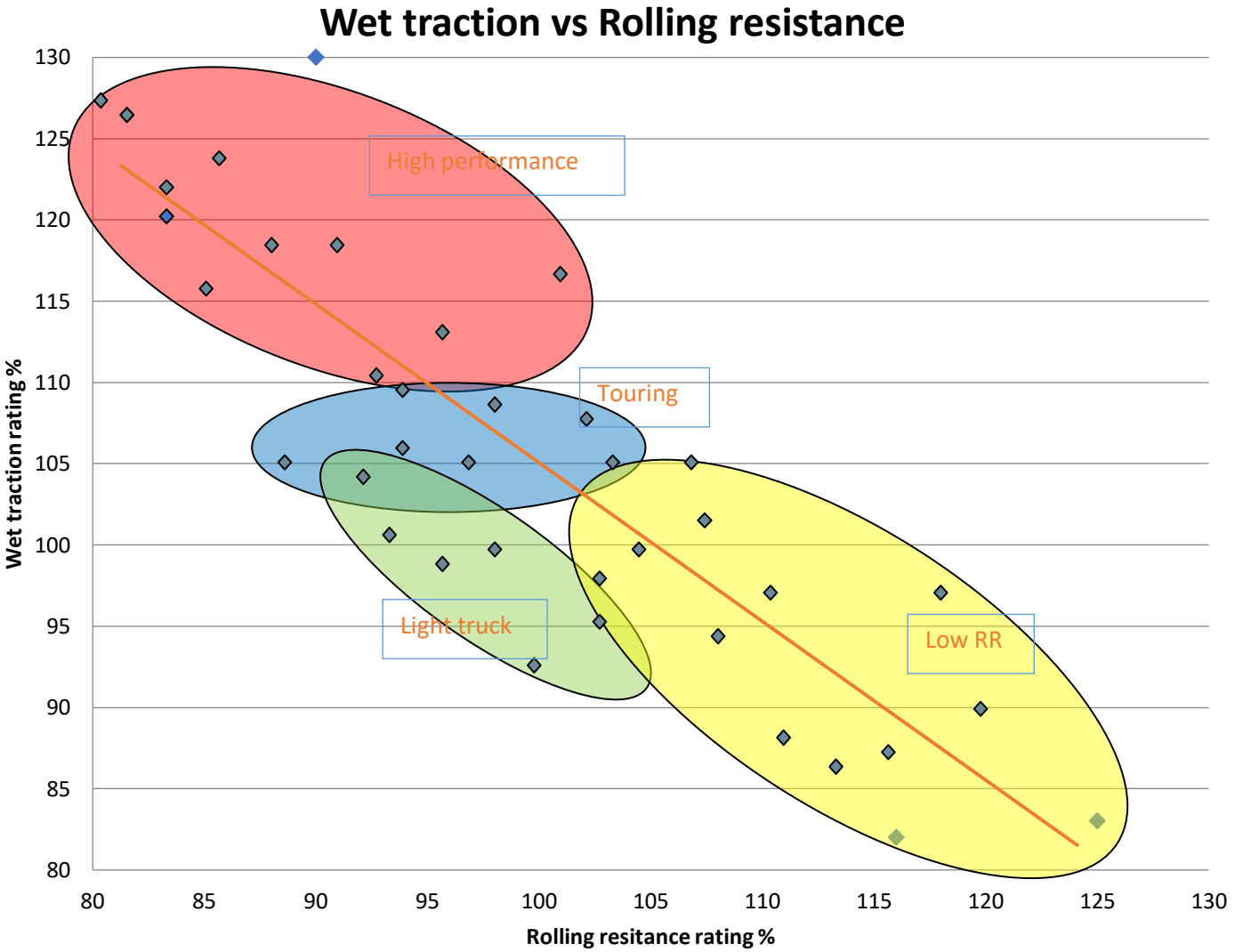
Focus on what we learned to close the gap

(6) Put knowledge in a useful form

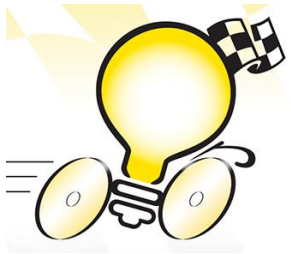


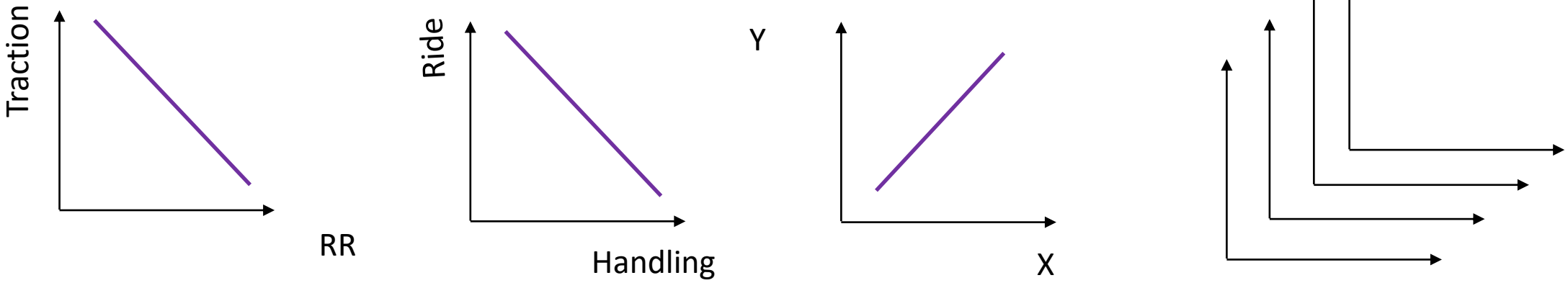
- Engineering language, not text or database
- TEACH it
- Find it

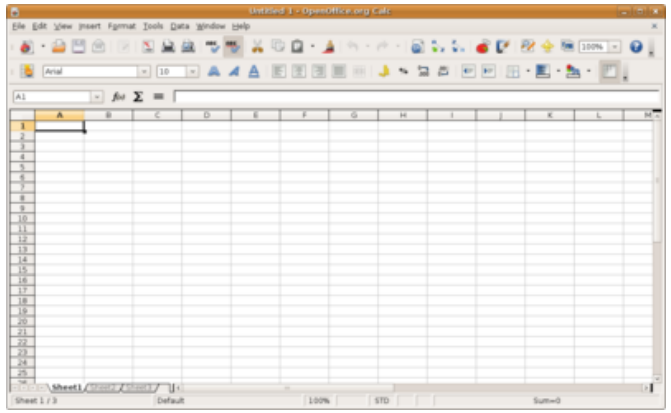
A REAL trade Off Curve

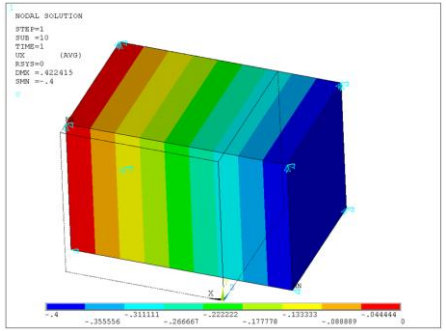


Appropriate Use of Trade Off Curves





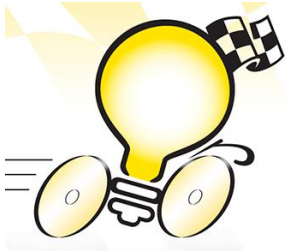




DOE
Set Based
Tagushi
…..

Set based OR OTHER experimental set
– focused on knowledge gaps

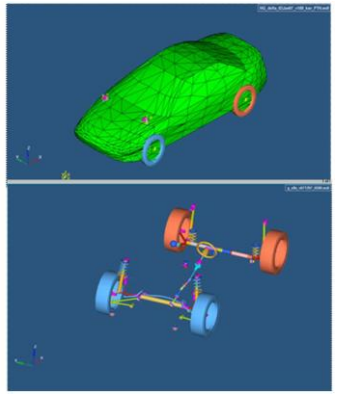
Modeling and Knowledge Reuse



Use knowledge to build good computer modeling or “predictive” tools

Test to validate/improve the models

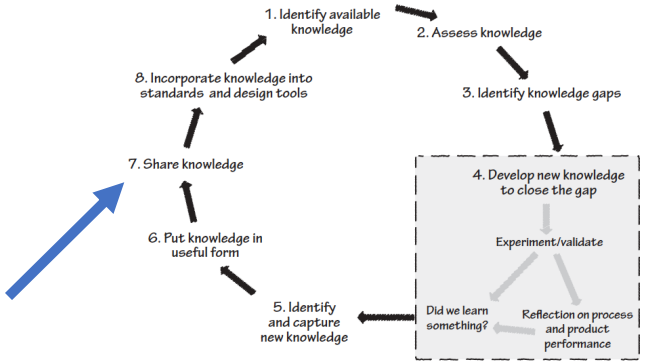
Allows quick set based and DOE’s



Tires for Chevy “VOLT” were developed **virtually** with a vehicle model supplied by *GM* – no tire/car built before “approval”

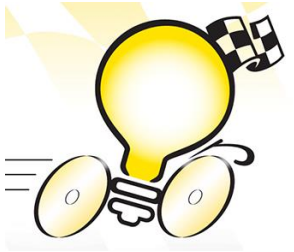
Tires and vehicle were developed concurrently

(7) Share the knowledge



- Knowledge is power
- Yokoten
- Design tools???

The Yokoten Process

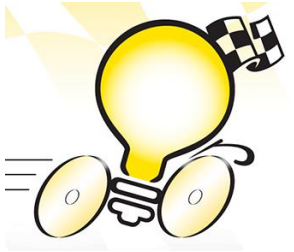


The person who discovers new knowledge is responsible for:

- Identifying who else in the company could use that knowledge
- Communicating the knowledge and provide training if appropriate
- Assuring that the knowledge is understood and report on usage

Testing example

Security Issues

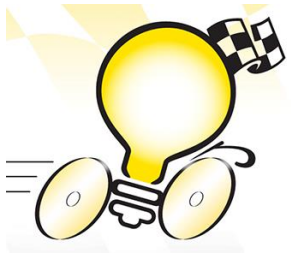


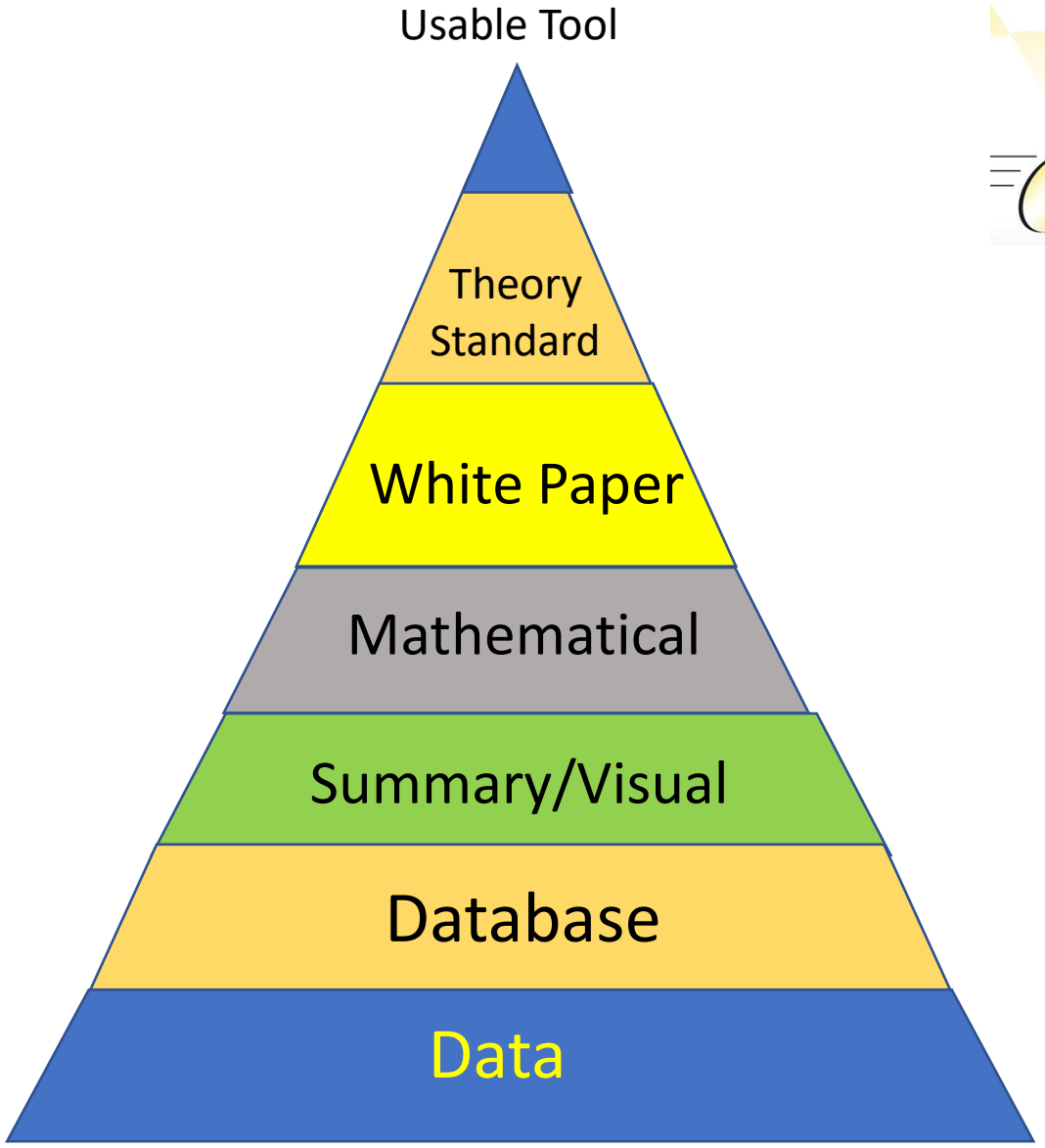
Urbon Book

Wikipedia

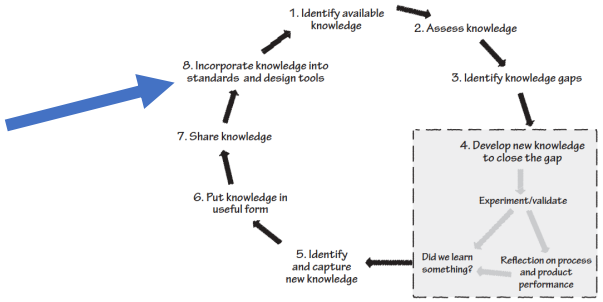
Design tools solve that problem

Places For Knowledge

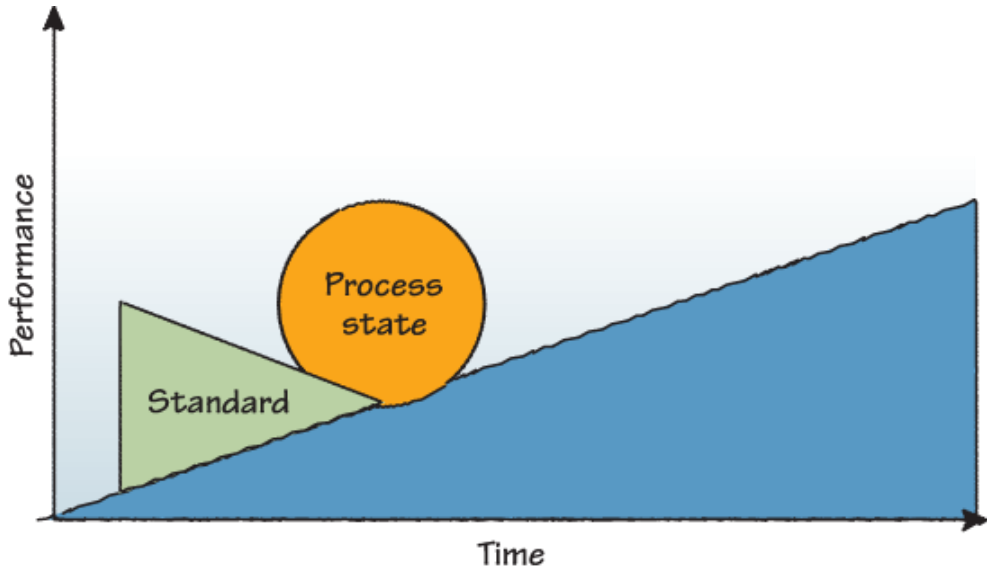




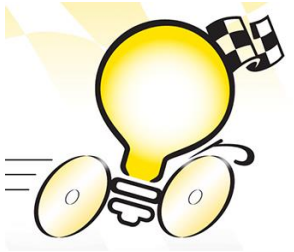
MOST IMPORTANT – Put Knowledge into Standards



- Standards are best ways to do something
- They must allow exceptions to promote innovation (must have's and flexible)



Goodeyar Examples

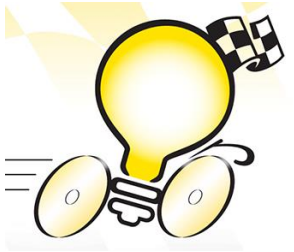


Design Manual/Wikipedia

Test Grid

Catalogue

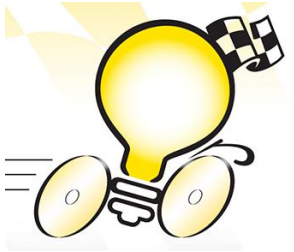
Reduction in Prototypes



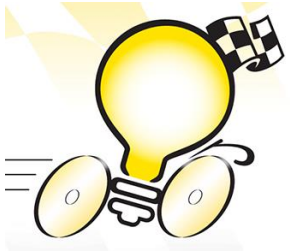
Yearly total savings – 100 Million/year

1. Standards, catalogue
2. Put KN into tools, FEA's …
3. KM office
4. White papers
5. Wikipedia
6. Dual ladder/Experts/Councils
7. Mining
8. Ownership
9. Experiment A3
10. Playbooks – How to do things

Lean Experimentation



Technology Development



Industrial REALITY

- Scientific
  - Define area of research
  - Literature search/assessment
  - Hypothesis
  - Experiments
    - One variable at a time
    - DOE
  - Confirm/Refute
  - Report
  - Recommendations
- Industry
  - Precise Goals
  - Knowledge Reuse
  - Hypothesis - rarely
  - Experiments
    - DOE/Taguchi
    - Set Based Concurrent Engineering
    - Proprietary
  - PDCA
  - Knowledge Documentation
  - Recommendations

Driven by budget

~30% of the time

Targets

Project Management

budget, time, results

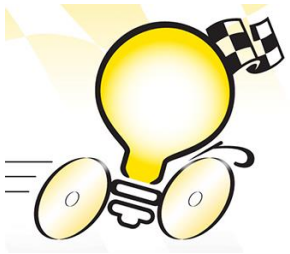
PD??

Management

Presentations

Leadership Direction

LEAN Technology Development

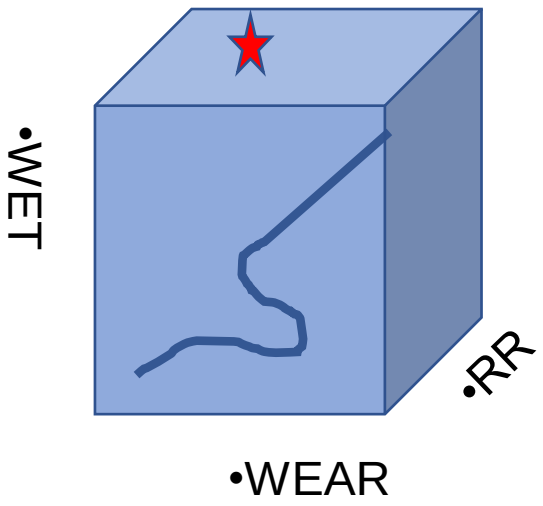


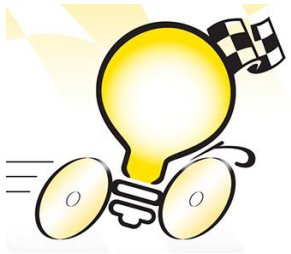
Focus on Knowledge Gaps – NOT Product

ONE Practice:

Set Based Concurrent Engineering

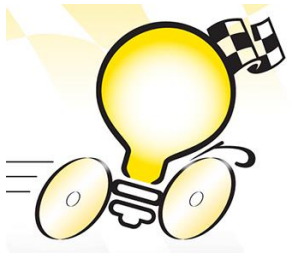
Set Based Concurrent

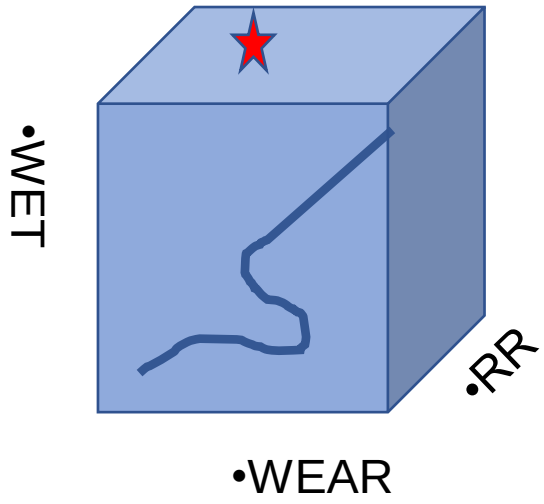


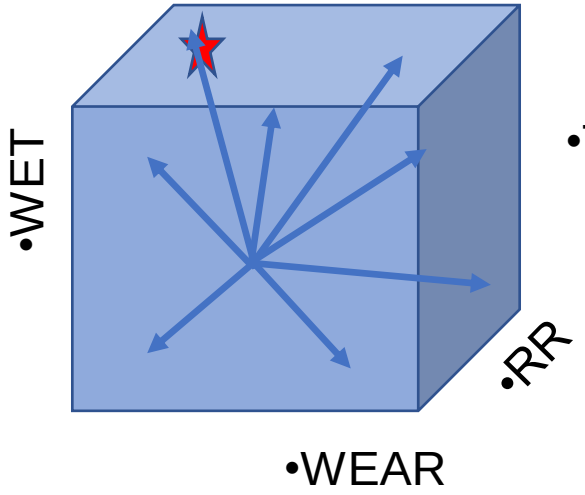


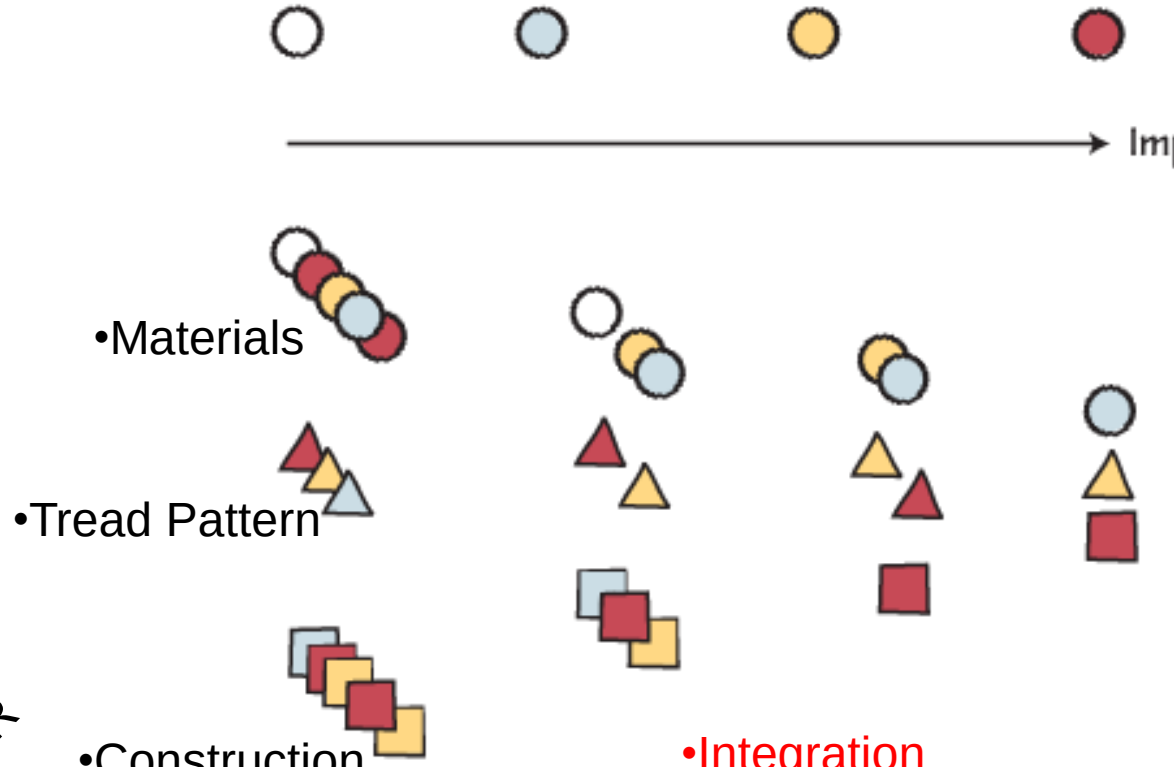
- **Product**

Set Based Concurrent







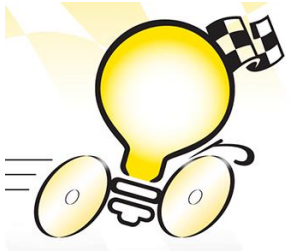


•Product

•Knowledge

•Maybe Equation or use of visible knowledge

Principles



Focus on knowledge gap(s) – not the product

Start with a wide space

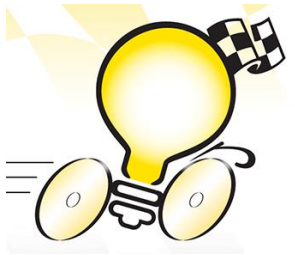
Work concurrently on sets

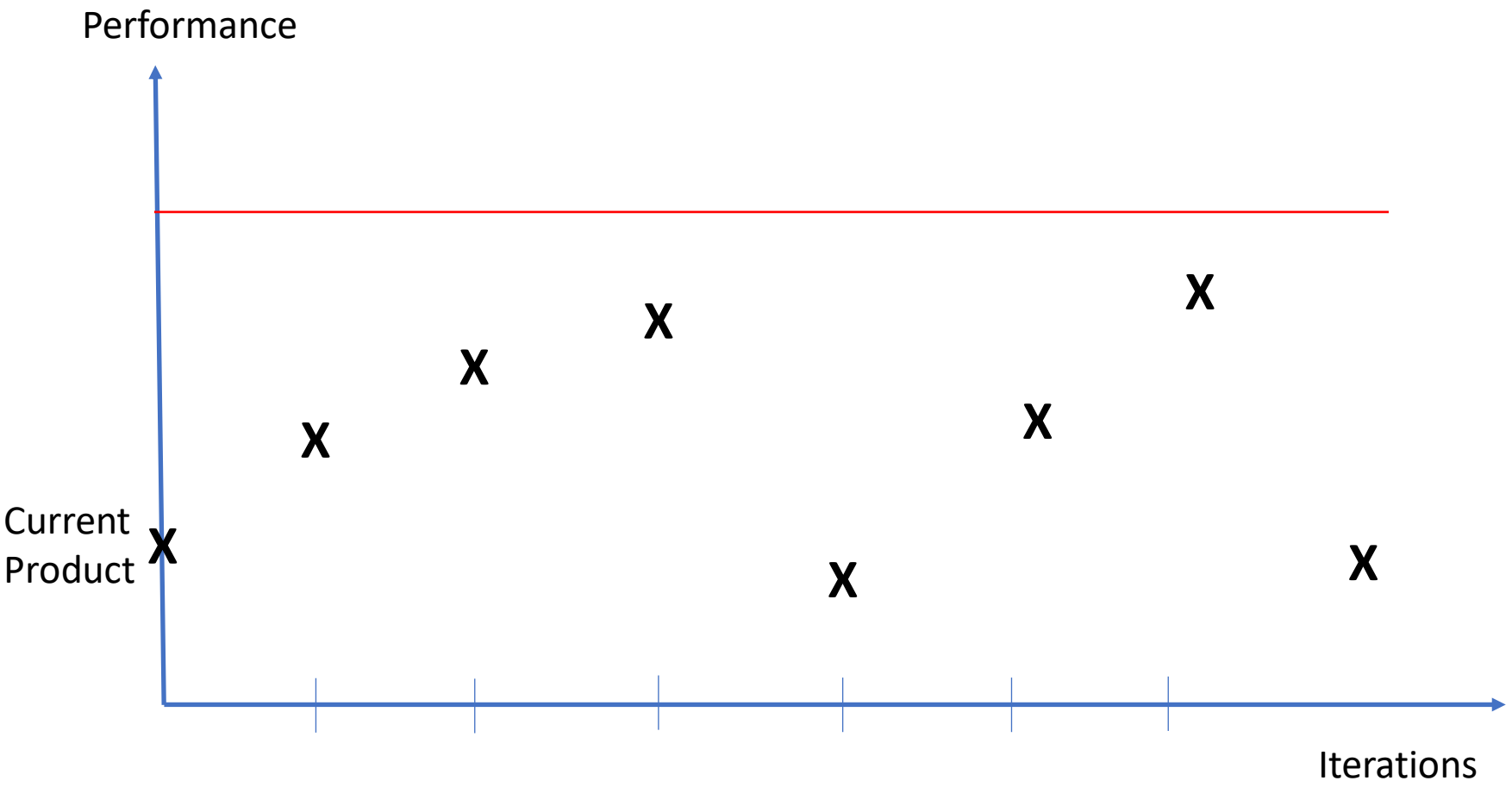
Eliminate as **appropriate**

Retain options as long as possible

Study interactions at integration events

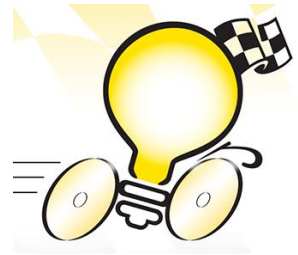
Single Point Iteration vs Set Based/Concurrent

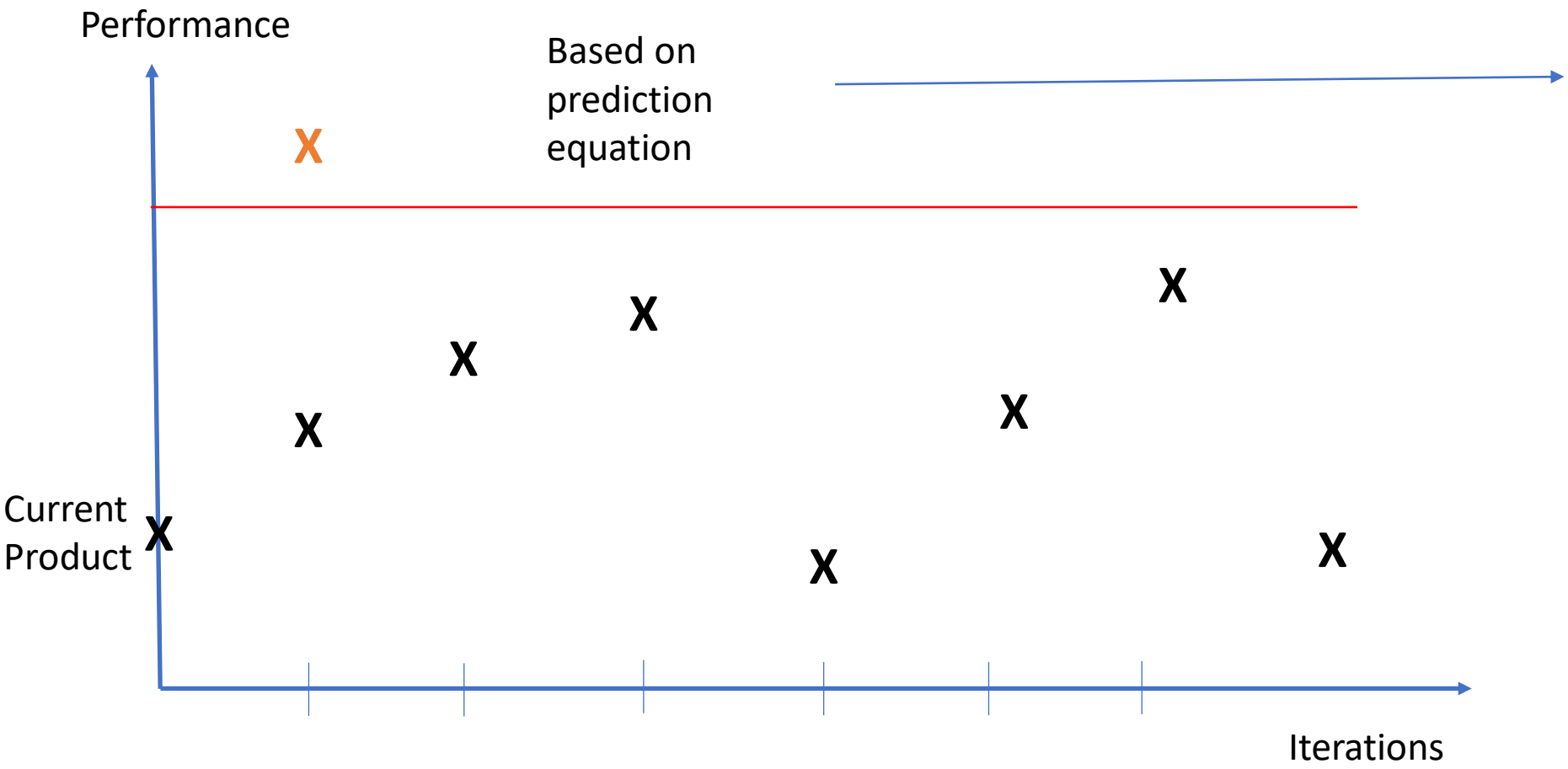




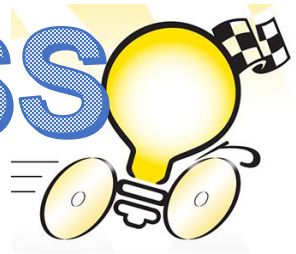
Bring in all key variables in sets
Model based on existing knowledge
Develop missing knowledge
Equations …
Predict best solution
Re-use/leverage new knowledge

Single Point Iteration vs Set Based/Concurrent



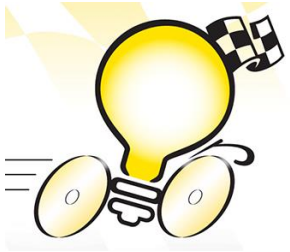


INNOVATION PROCESS



Mass Design

What it is



At Goodyear more than 1,000 new products every year are derivatives - based on platform but their own tread design, mold, government testing ….

Similar to car industry and many other industries (not packaging differences)

70 to 80% of resources

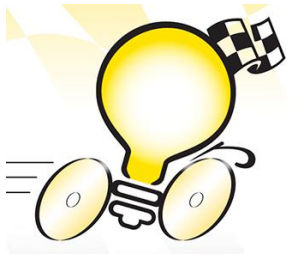
Work is highly standardized

Close to Lean Manufacturing

Execution Phase

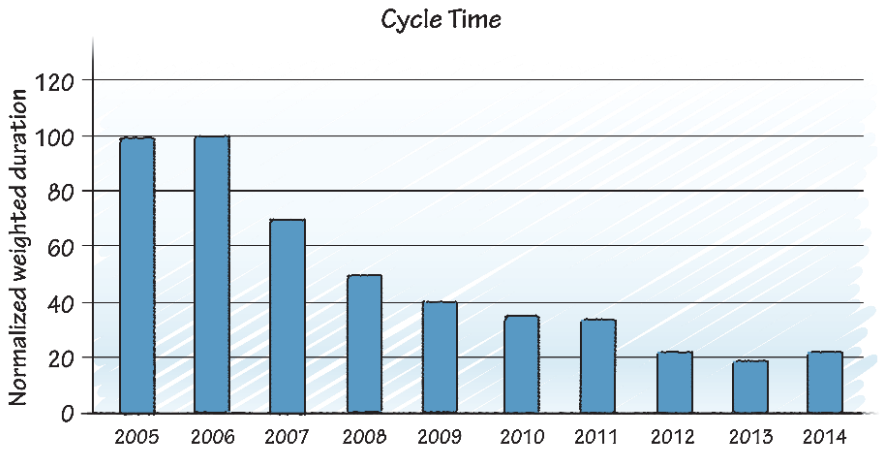
- Generates company income – and platform for launching innovation
- Inspired by lean manufacturing
- Goodyear 2016 AME Excellence Award - Innovation Center
- 100% delivered on time
- Fast is better than slow

Innovation Speed



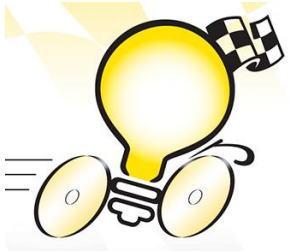
If I had only one thing to focus on, it would be SPEED

- Competitive advantage
- Faster learning, better risk management
- Better cash flow
- **Collaterals of efficiency AND QUALITY**



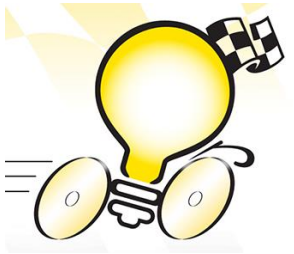
Some Goodyear iterations require more time than others. In order to track cycle time across all iterations, regardless of the varying time, Goodyear established a measure of normalized weighted duration, establishing a base of 100 in 2005.

In this ORDER

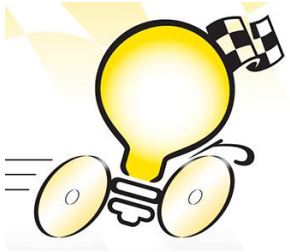


1. Safety
2. Quality
3. Delivery
4. Speed

Value and Waste



Waste and Value-Creating Activity

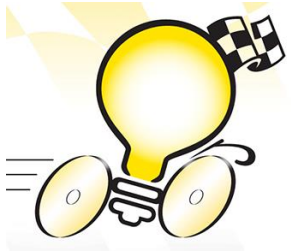


Value-Creating: An activity that the consumer pays for willingly because it seems truly necessary to meet the consumer's need.

Process Waste: An activity that takes up time, resources, or space, but does not add value to the service or product.

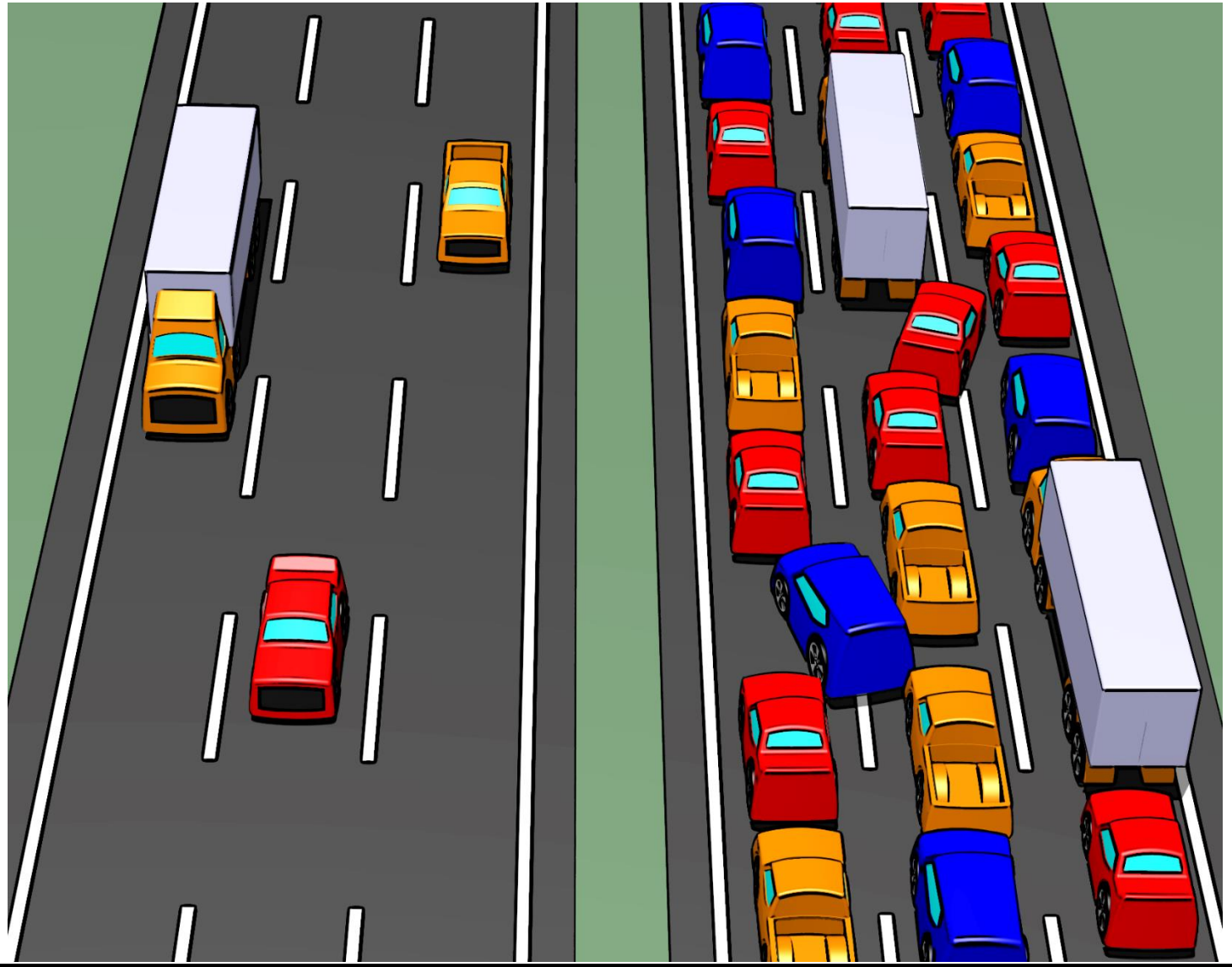
Business-required Non-Value Creating: An activity that may not be value creating, but is required for business reasons *(e.g., planning, budgeting, auditing, Sarbanes-Oxley, regulatory requirements, etc.).*

Examples of WASTE



- 50% of experimental tires are used
- Running tests that are not needed
- Keeping tires that will never be tested
- Travel expense
- Useless meetings – important people not showing up
- Wasting TIME (what is the cost of time?)
- Follow up
- Changes and fixes
- Not having the information needed
- Waiting on stuff
- Providing information that nobody looks at (reports)

What is the biggest expense in R&D?



What is the biggest waste in R&D?

- game

The biggest waste is thinking that you cannot do it.

Jim Womack - *Gemba Walks,*

Lean Enterprise Institute Version 1.0 – Feb 2011

#1

#2

Convincing yourself that you are already doing it and ….

….that it is implemented already

….or that it did not work

…and move on the next big thing …

New initiatives correlated to management rotation cycles

Shingo award and other assessments ….

Unfortunately it takes many years to get good at lean R&D .. Toyota still works on it ..

The companies who have been at it the longest seem to realize how far they have to go ….

#4

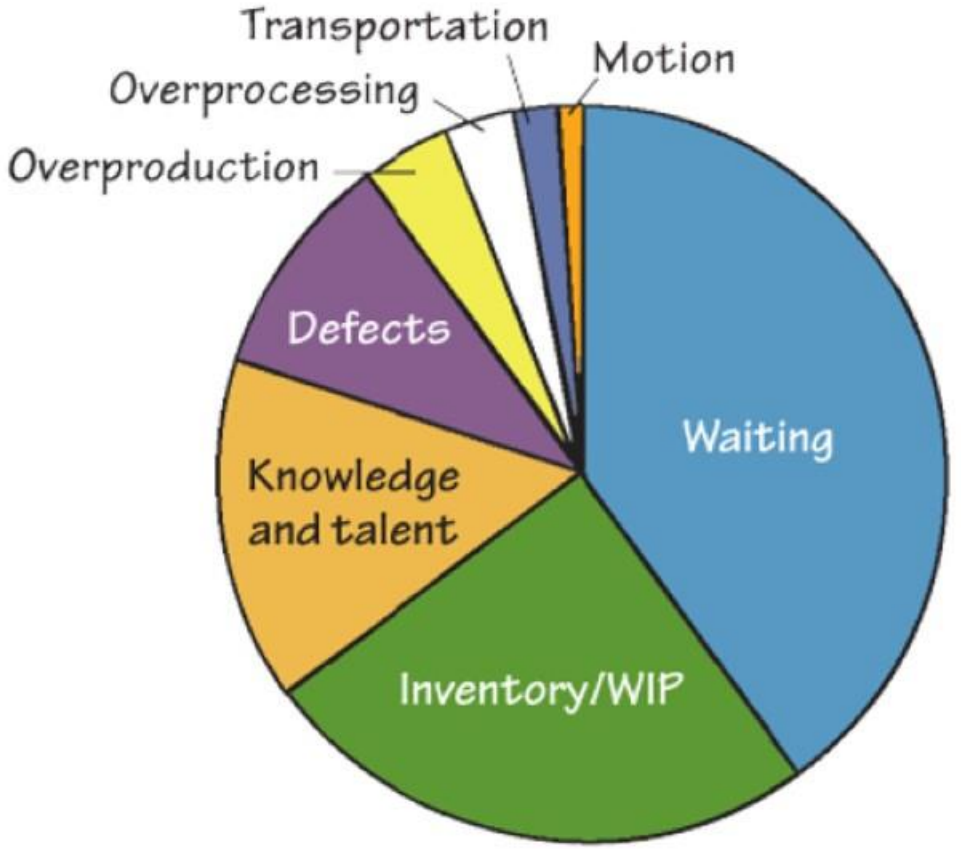
Focus R&D effort ONLY on functional goals rather than the profitability of the value stream

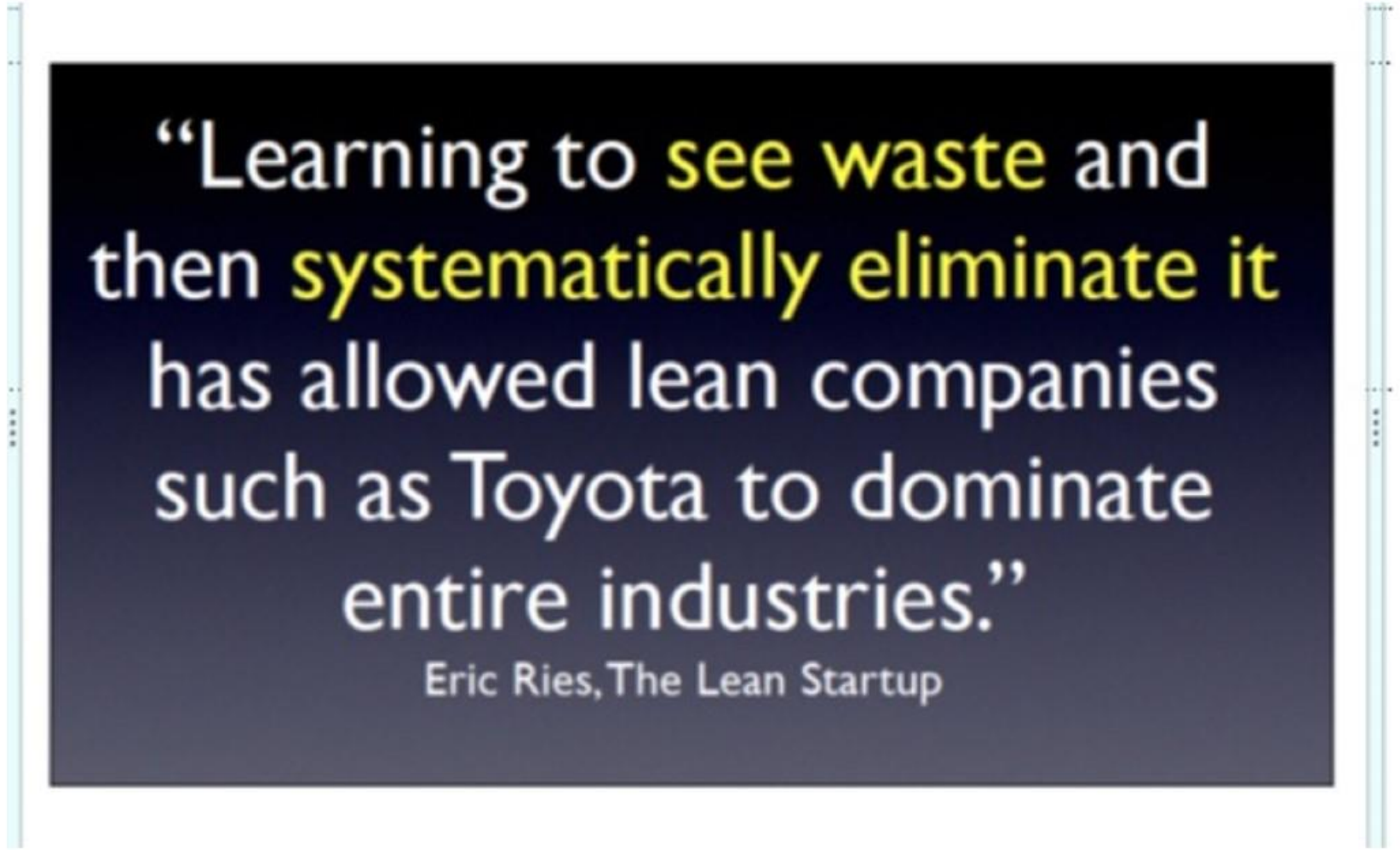
#5

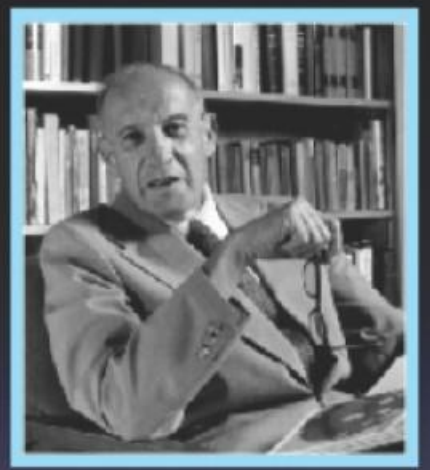
System Kaizen vs random Kaizen

Highest level, end to end, adjacent

Waste


Transportation
Motion
Overprocessing
Overproduction
Defects
Waiting
Knowledge and talent
Inventory/WIP

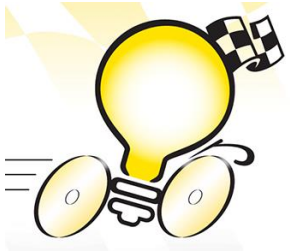

"Learning to see waste and then systematically eliminate it has allowed lean companies such as Toyota to dominate entire industries."
Eric Ries, The Lean Startup



"There is nothing so useless as doing efficiently that which should not be done at all."
– Peter Drucker

"The hard part about developing eyes for waste is that most waste is caused by doing things right within the conventional system."

Delivery, Flow, Speed, Efficiency



Schedule to CAPACITY

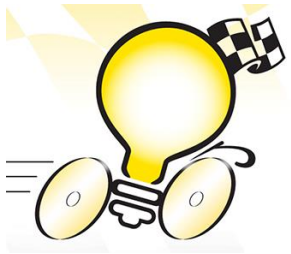
Cadence – customer demand

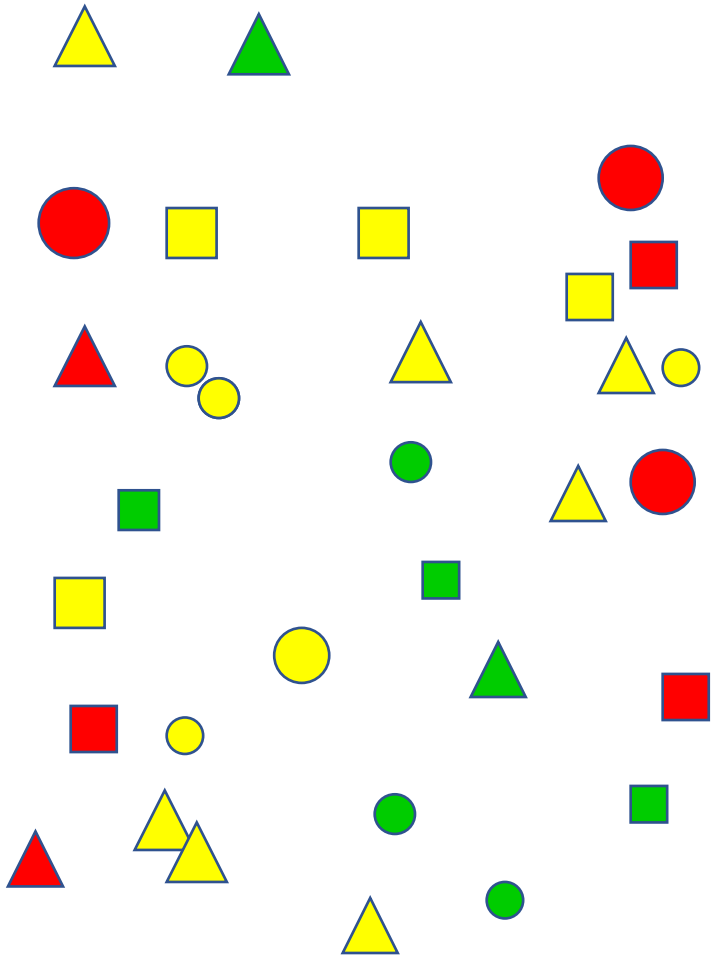
Kingman equation

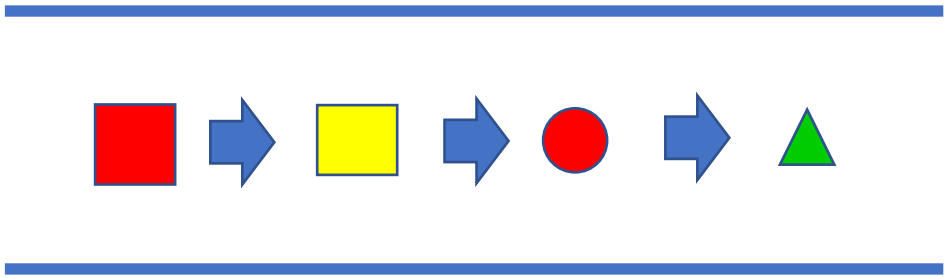
Little’s Law

Simulations

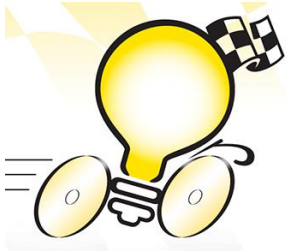
Schedule For Flow

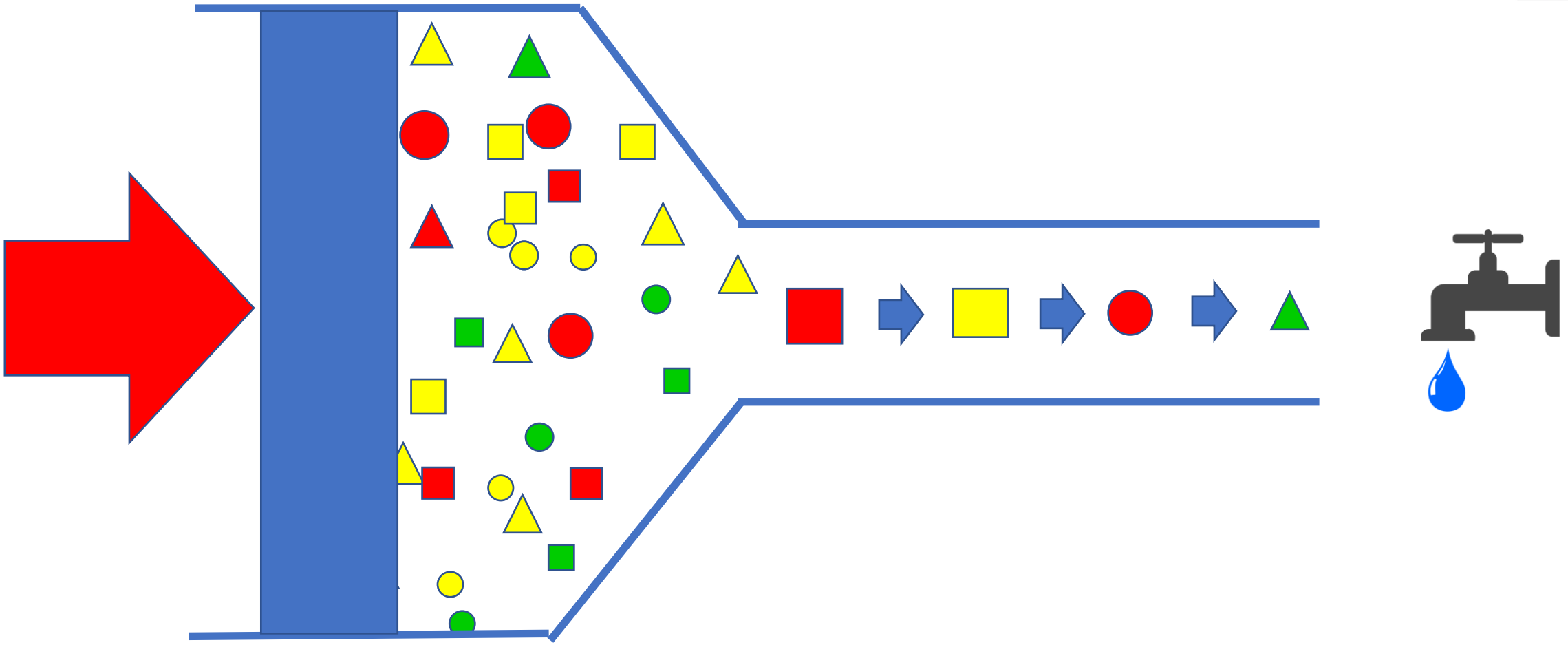




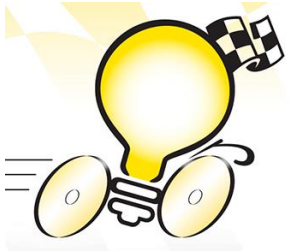


Hydraulic Principle



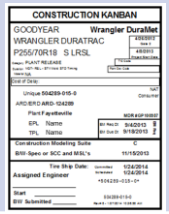
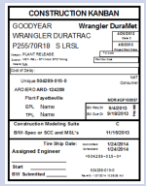
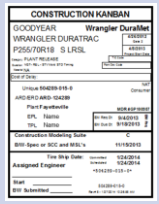
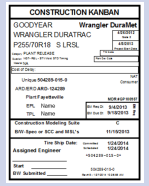
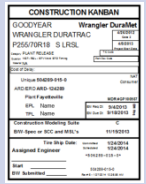
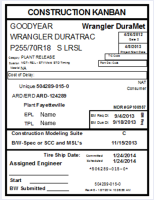
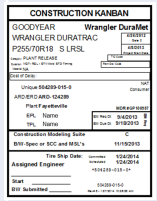
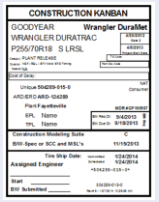
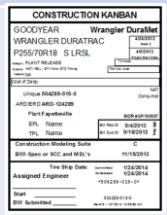
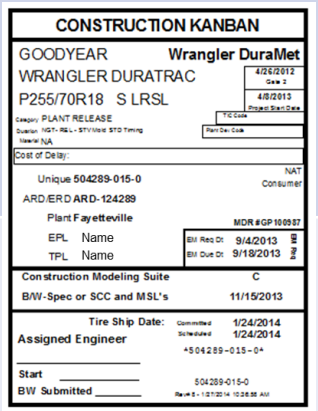
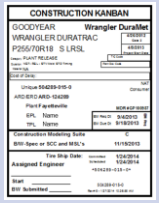
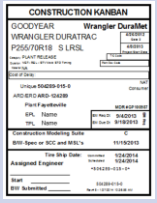
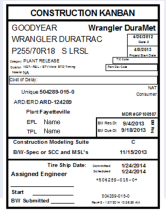


Visual Planning

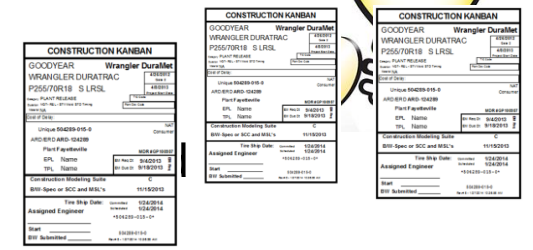


They can have ANYTHING but not EVERYTHING

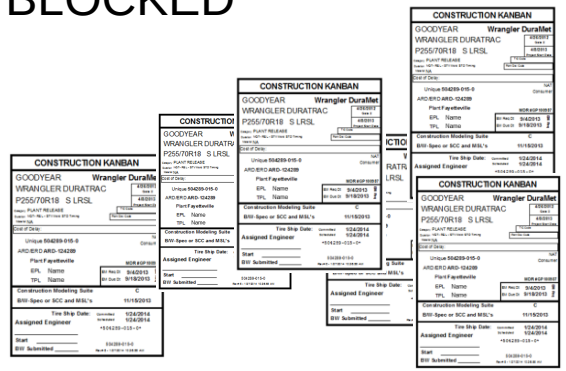
Tom's Hijunka Box

Jim	Ihor	Samantha	Olga	Pete
				
				Filler
			Filler	Filler
	Filler		Filler	Filler

•Incoming



BLOCKED



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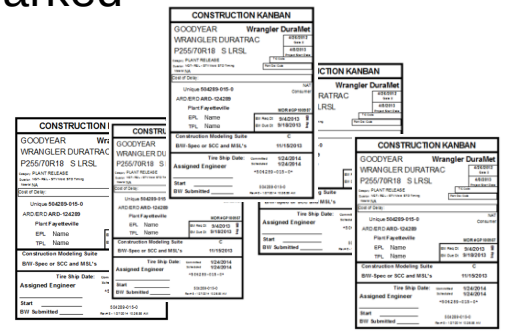
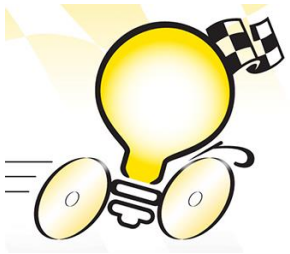
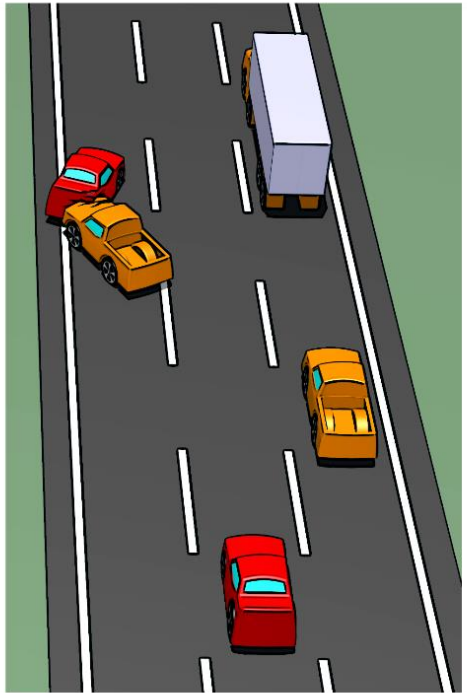
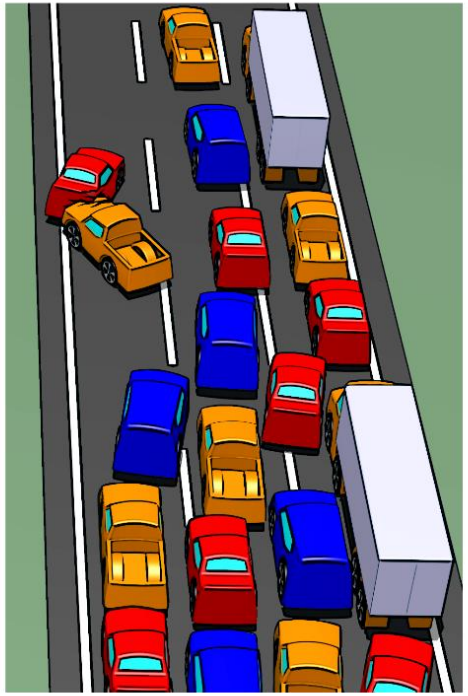




Law of Utilization

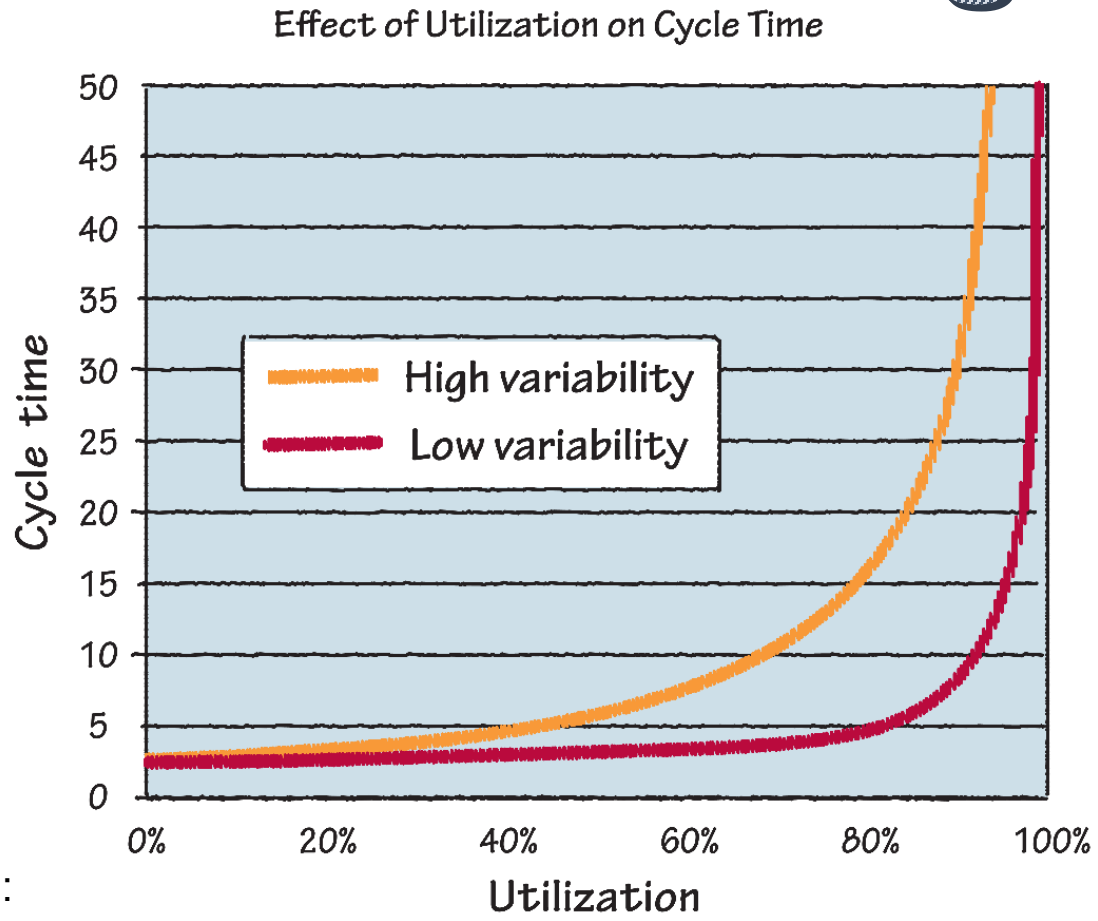
The Effect of Utilization





Utilization and Cycle Time

Kingman Equation

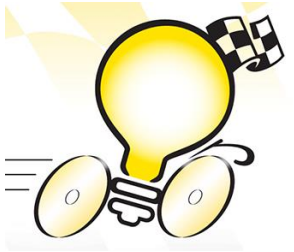


*The basic relationship:

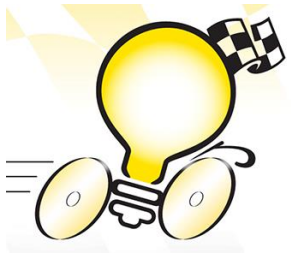
CT = Average Processing Time * (Utilization Ratio / (1-Utilization Ratio)).

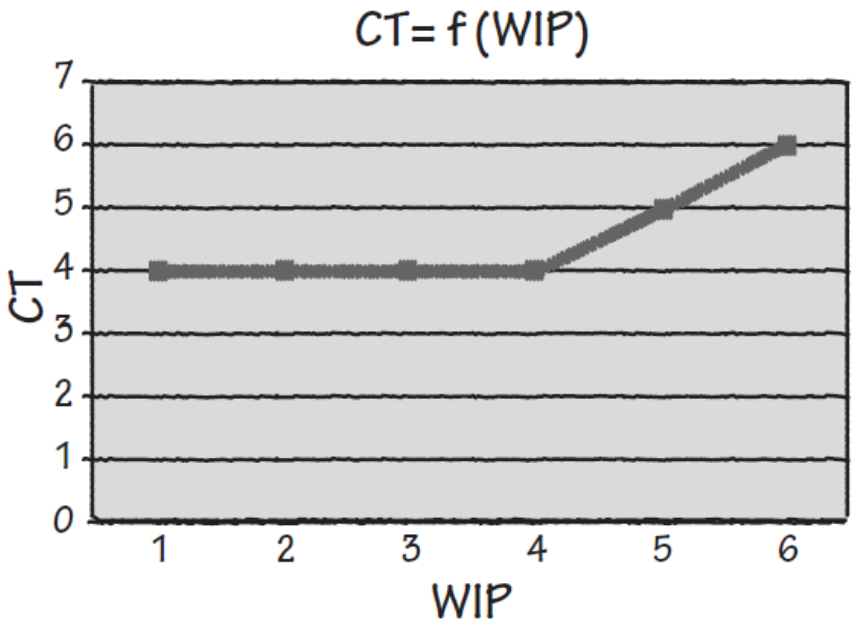
Search “Kingman’s formula” and related for more information.

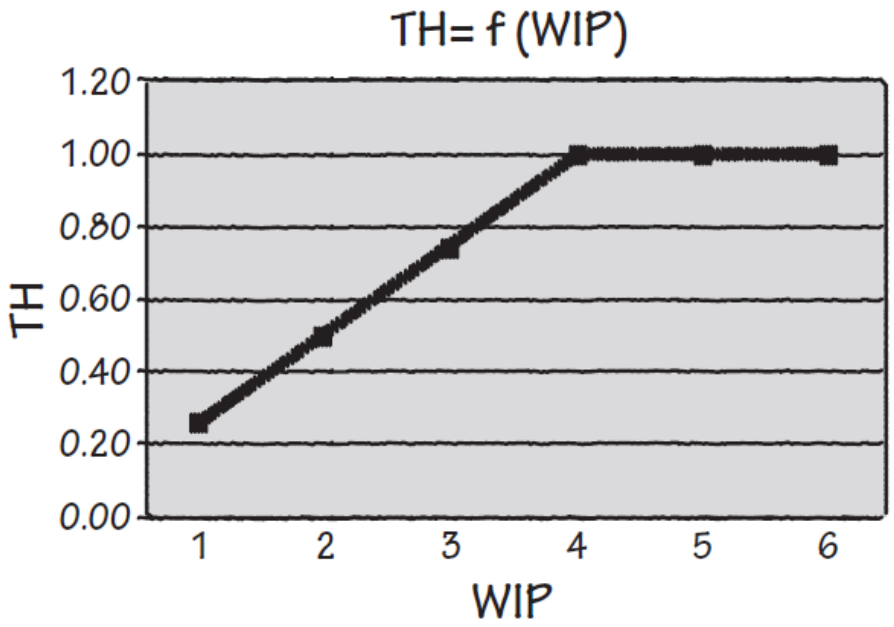
Little's Law



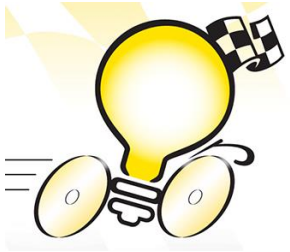
Little's Law

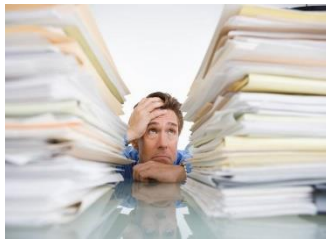



CT= f (WIP)
CT
WIP
0
1
2
3
4
5
6
7


TH= f (WIP)
TH
WIP
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1
2
3
4
5
6

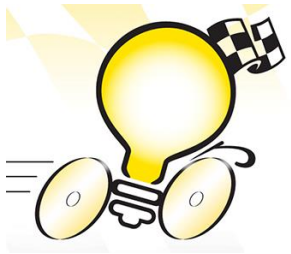
Little's Law

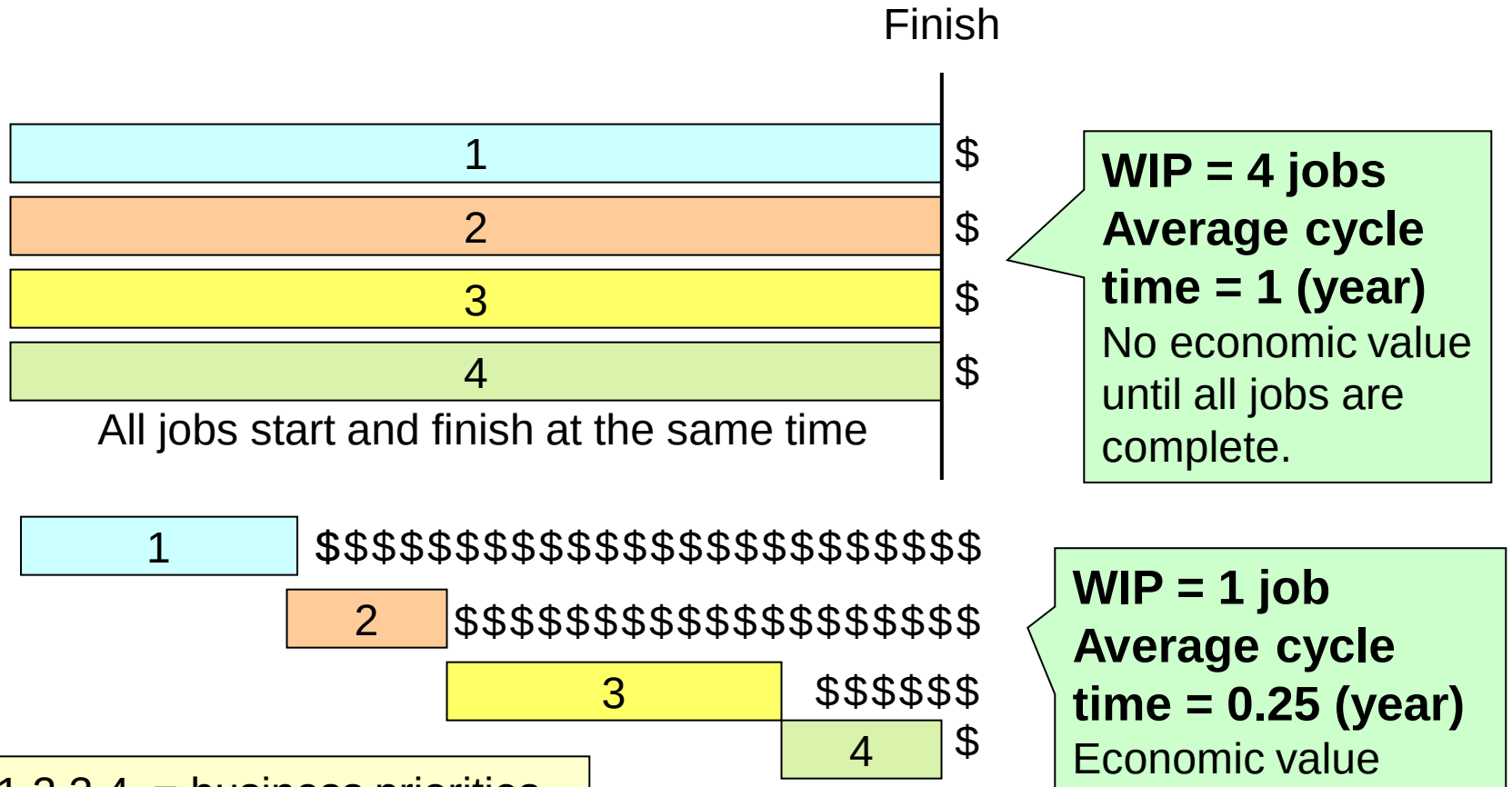




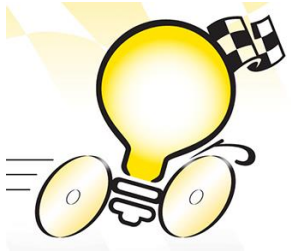
$$CT = \frac{WIP}{Th}$$

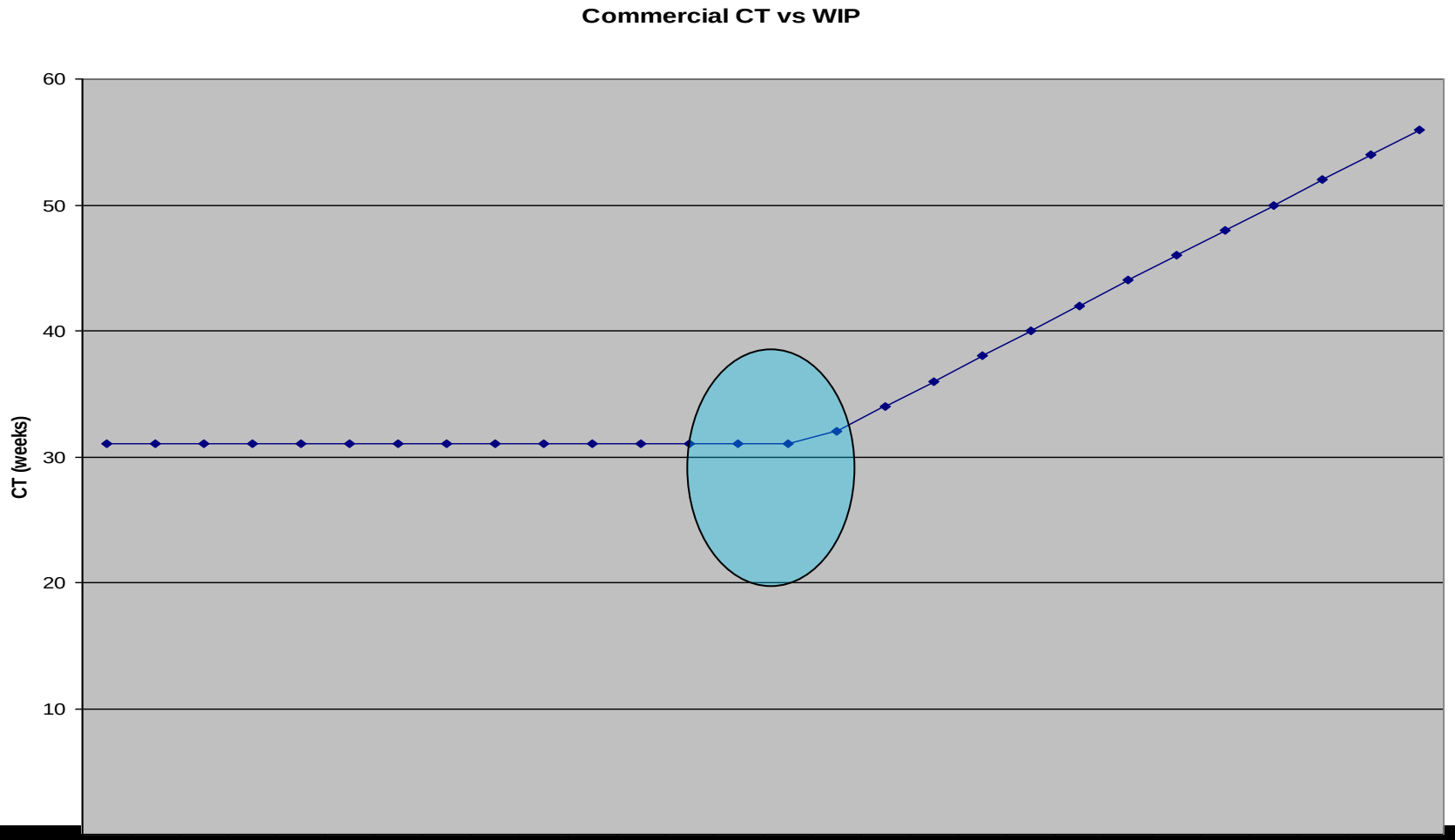
Multi-tasking (= Batching)
One Engineer, Four Jobs



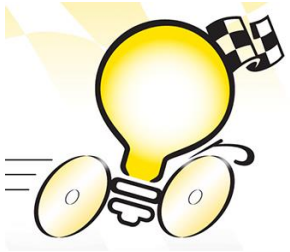


Little's Law CT=WIP/TH





CONWIP



One comes out,
one goes in

Takt at Work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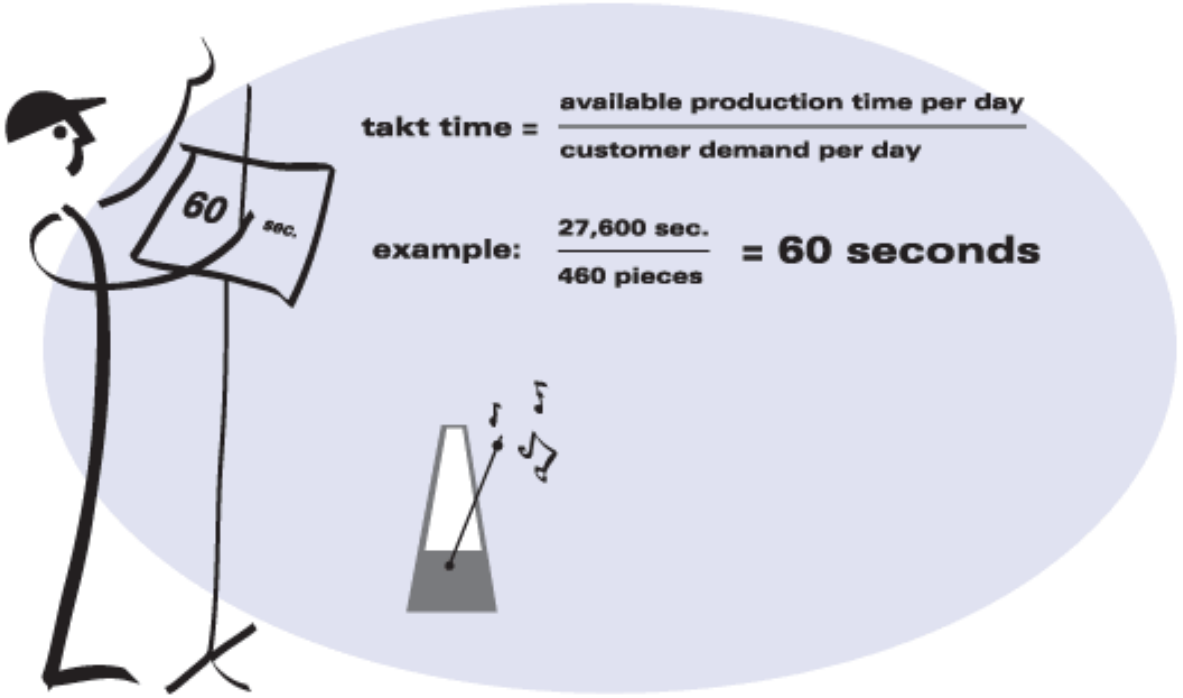
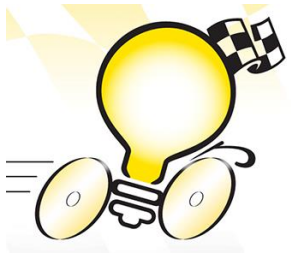
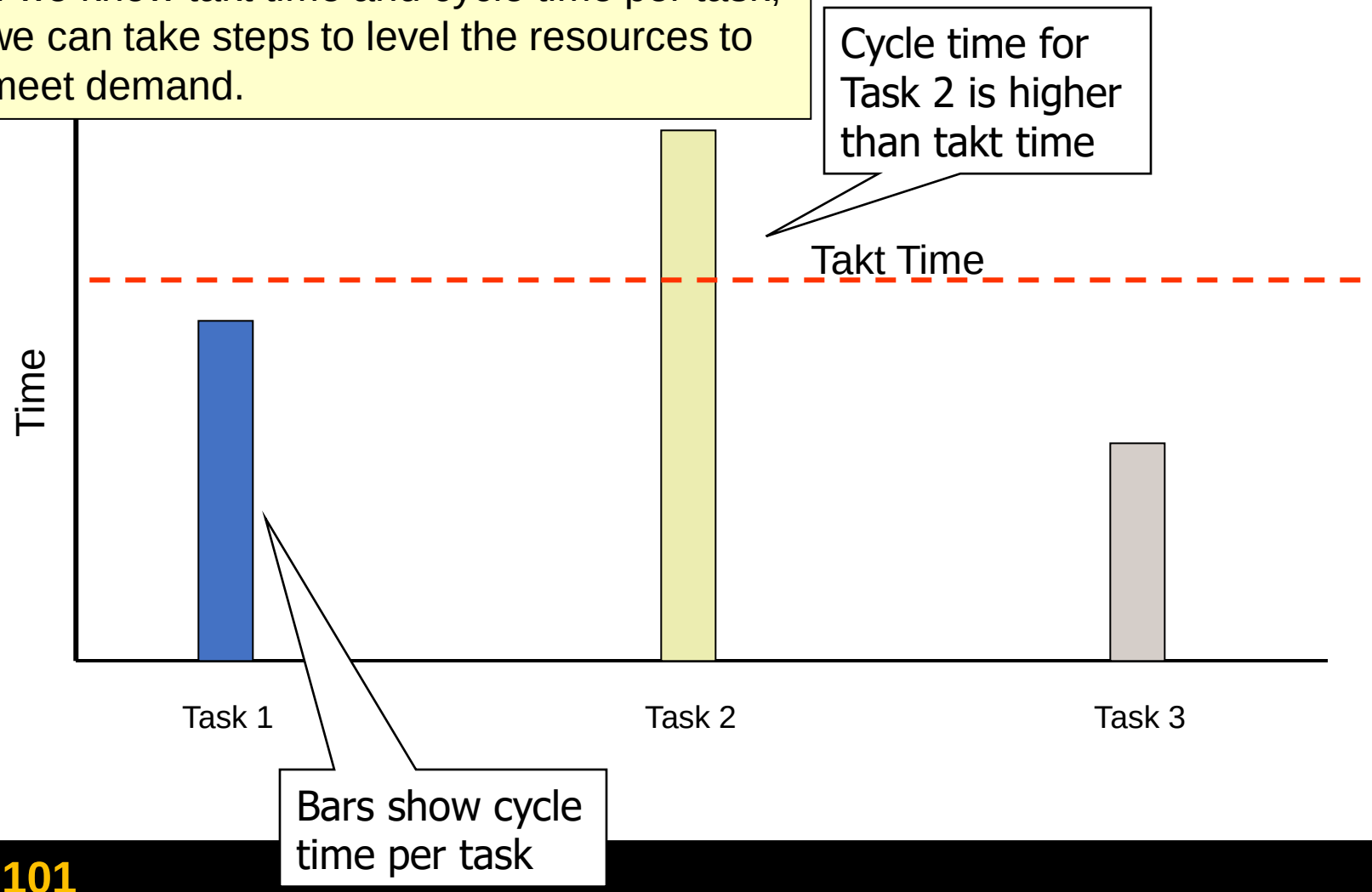


An example of calculating takt time.

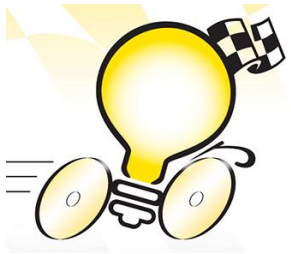
Resource Leveling

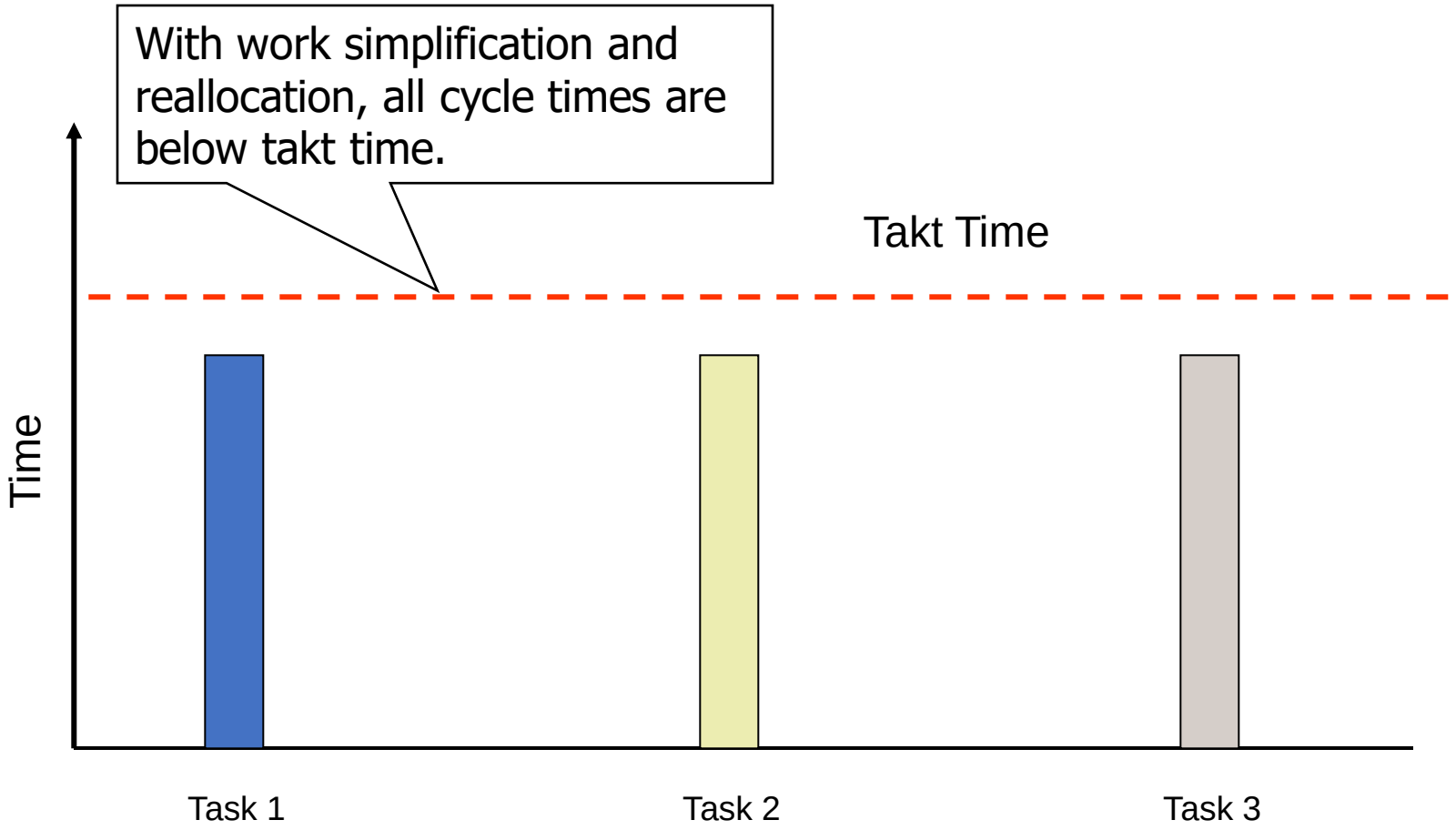


If we know takt time and cycle time per task, we can take steps to level the resources to meet demand.

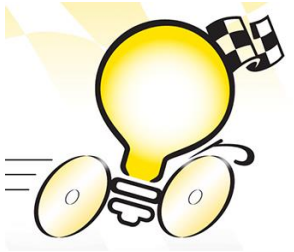


Resource Leveling



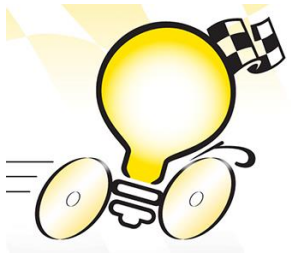


After the Takt is set,

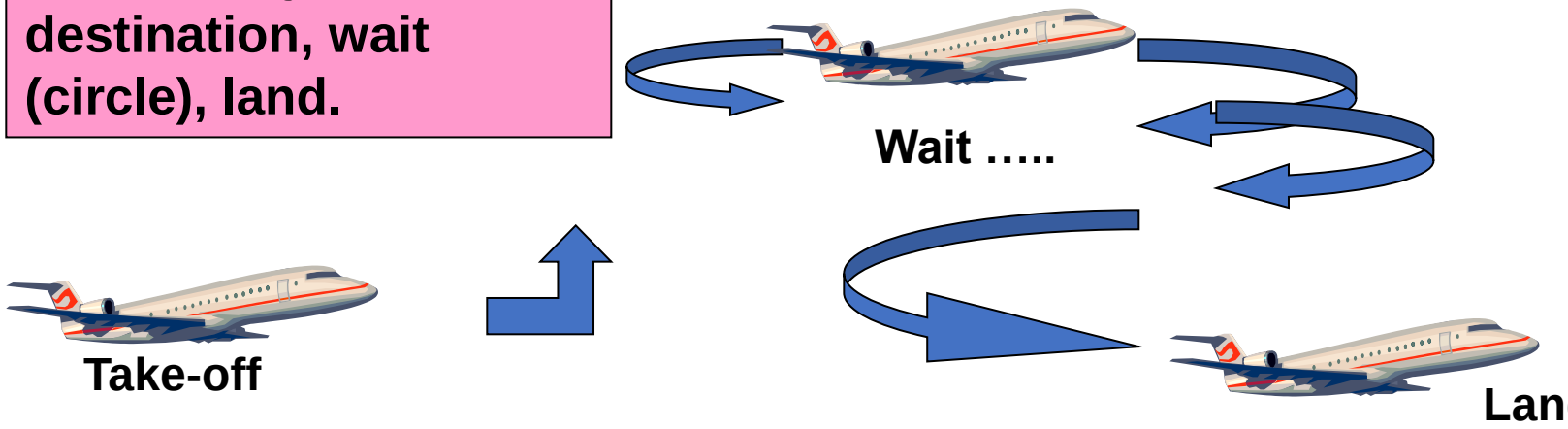


Resources are assigned to meet the takt

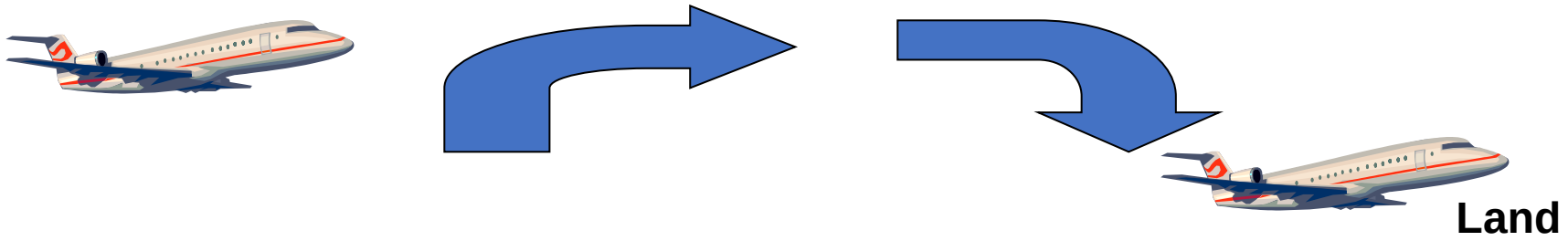
Lean Air Traffic Control: The Model for GIC



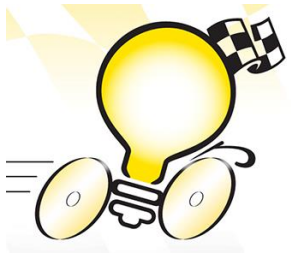
Take-off, fly to destination, wait (circle), land.



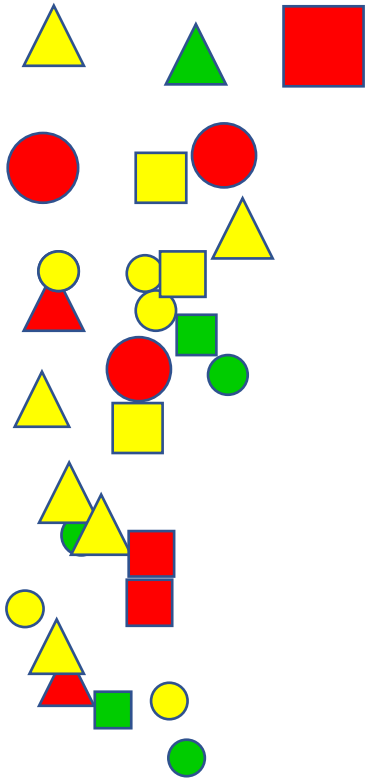
Wait for the take-off, fly to destination, land.



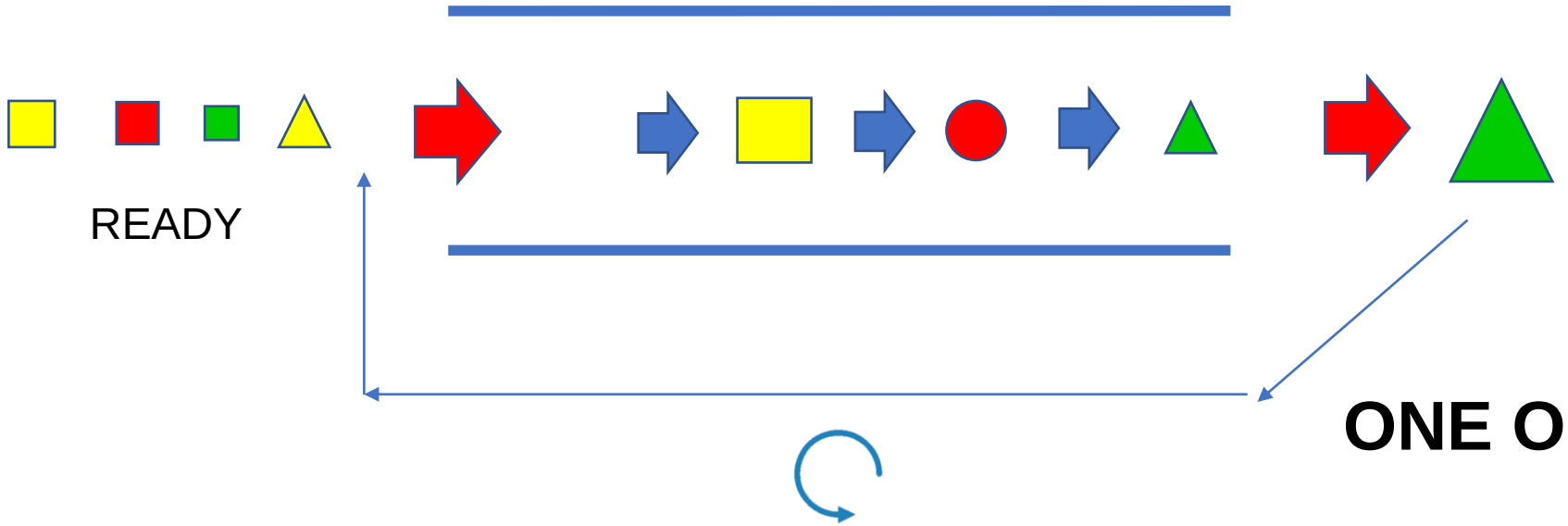
Pull



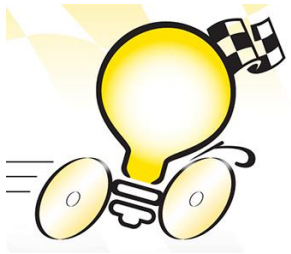
- Virtual
- Queue

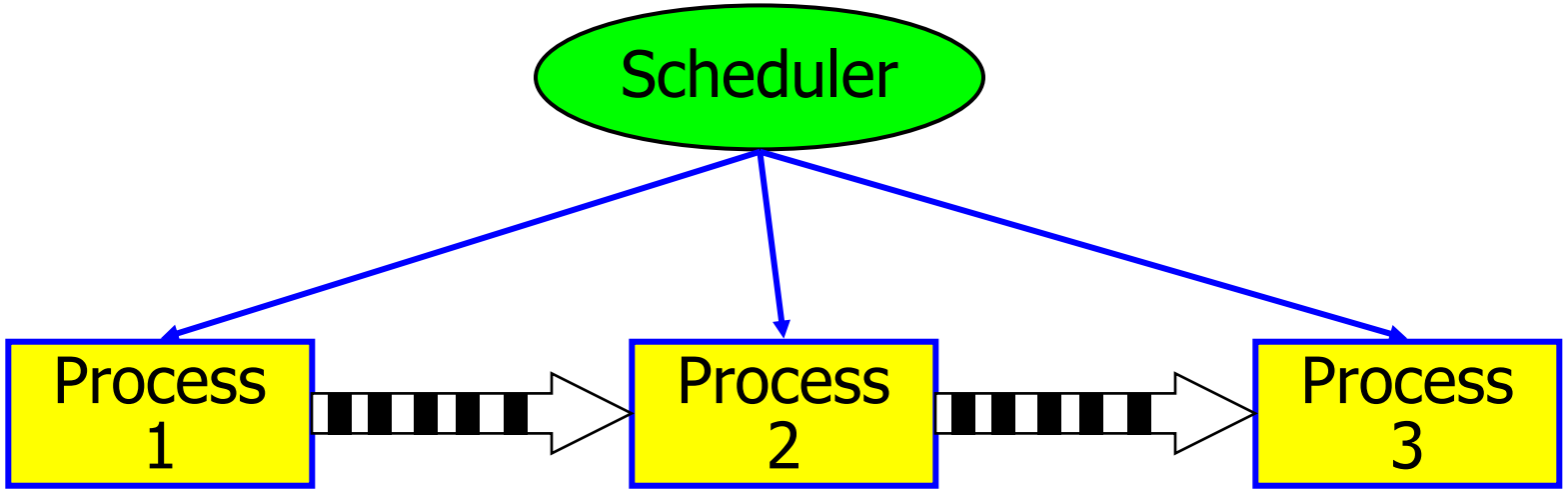


- **ONE IN**



Push System

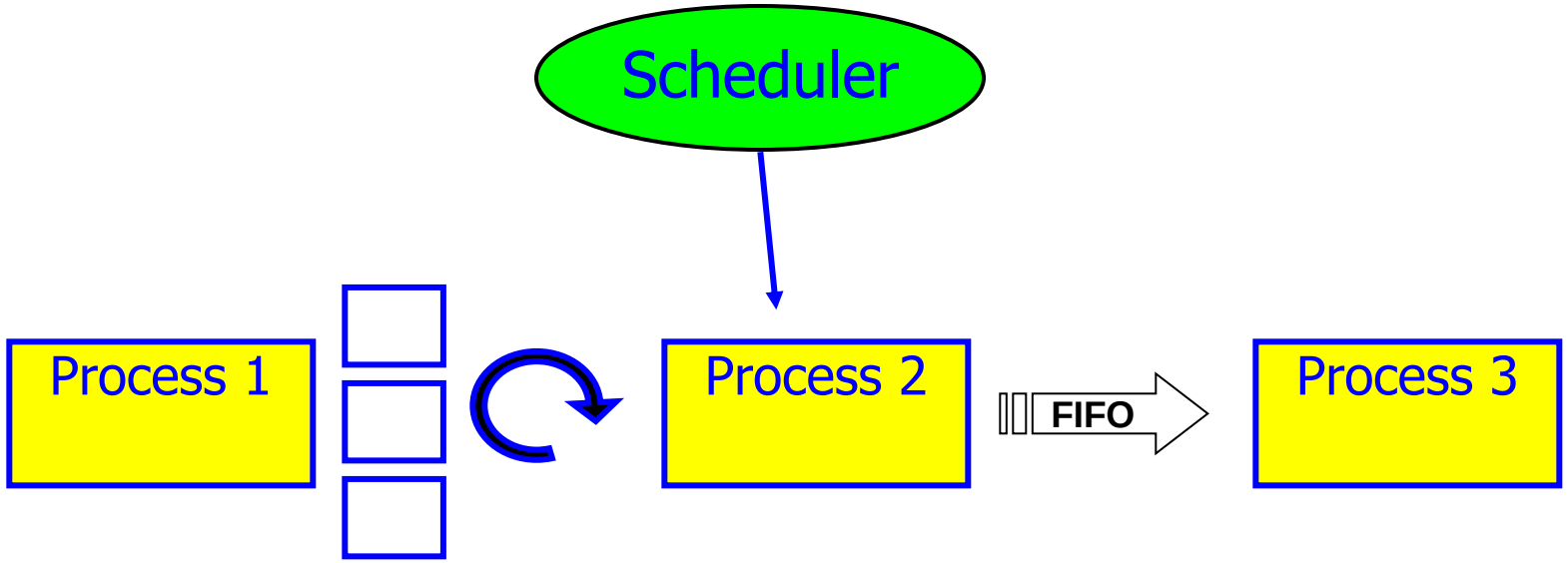




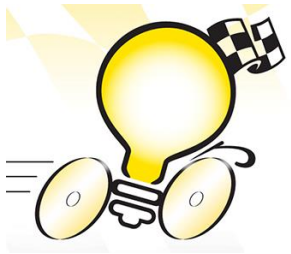
Schedule tells each process what to produce

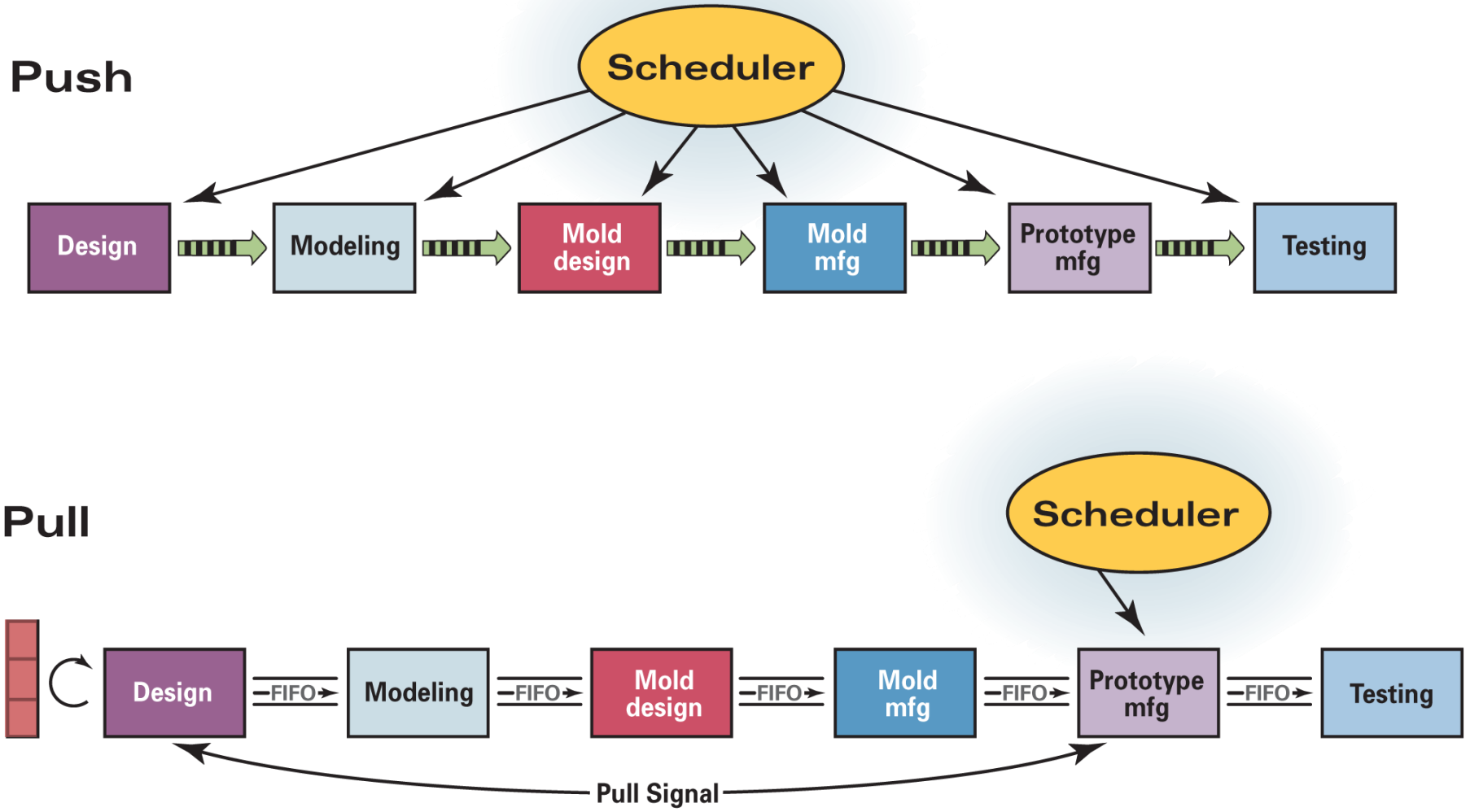
Material is produced and sent to the next process

Pull System

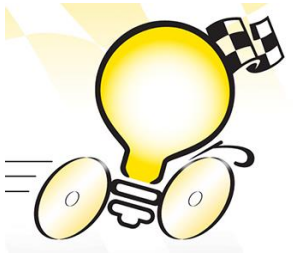


Push and Pull



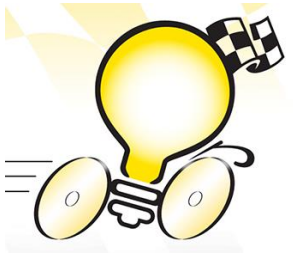


Why Speed?



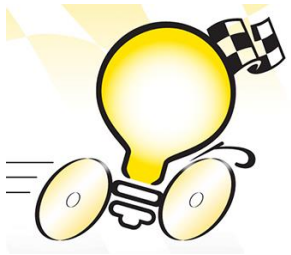
1. Profitability – first to market
2. **Efficiency**
3. **Quality**
4. Agility
5. Better Risk Management
6. Employee engagement
7. ROI and Cash Flow
8. Faster learning

Traditional Methods to Increase Speed



- Invest more money
- Allocate more people
- Hire better people
- Buy computers/software
- Invest in technology
- Install faster equipment
- Start continuous improvement initiative

Do More With Less



Effectiveness

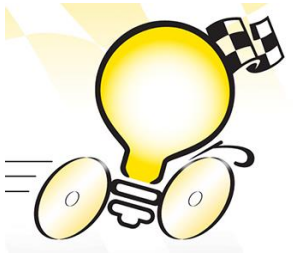
Get better at how you work

LEAN

Computers
Tools, Technology

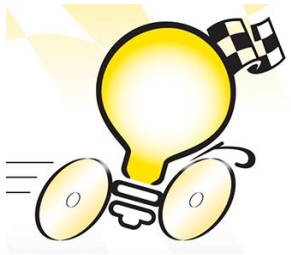
Cost

Top 10 “lean for speed” principles



1. Flow and Pull – schedule to capacity, spf, cadence, resource balance
2. Lean project management (agile, vis plan, daily huddle, decisions, portfolio , COD…)
3. Knowledge management and re-use
4. People management, talent, engagement …
5. Standard work & product/test standards
6. Front end innovation management
7. Remaining waste elimination – overprocessing,
8. Managing variability (buffers, agile, …) 70% capacity
9. Late start
10. Critical path management, overlapping tasks and sequence

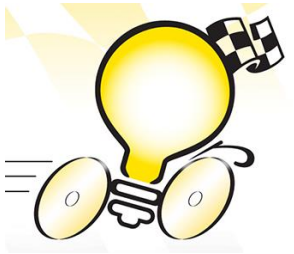
Winning Innovation



Process

Culture

What is the right culture



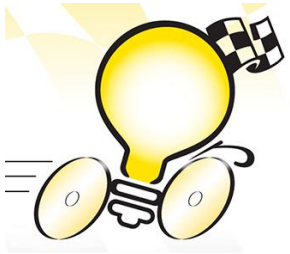
Enables innovation

Caring, appreciative

Aligned

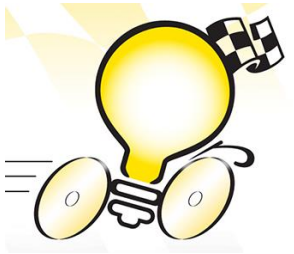
Rewarding/fun

Principles



True North
Engagement
Empowerment
Respect
Upside down leadership
Motivation
Collaboration
Diversity

Cultural Transformation



There is no transformation without a people transformation

ALL about the people - Change Management is CRITICAL

From “must do” to “want to do”

Collaboration

Humble leadership and respected individuals

ENGAGEMENT

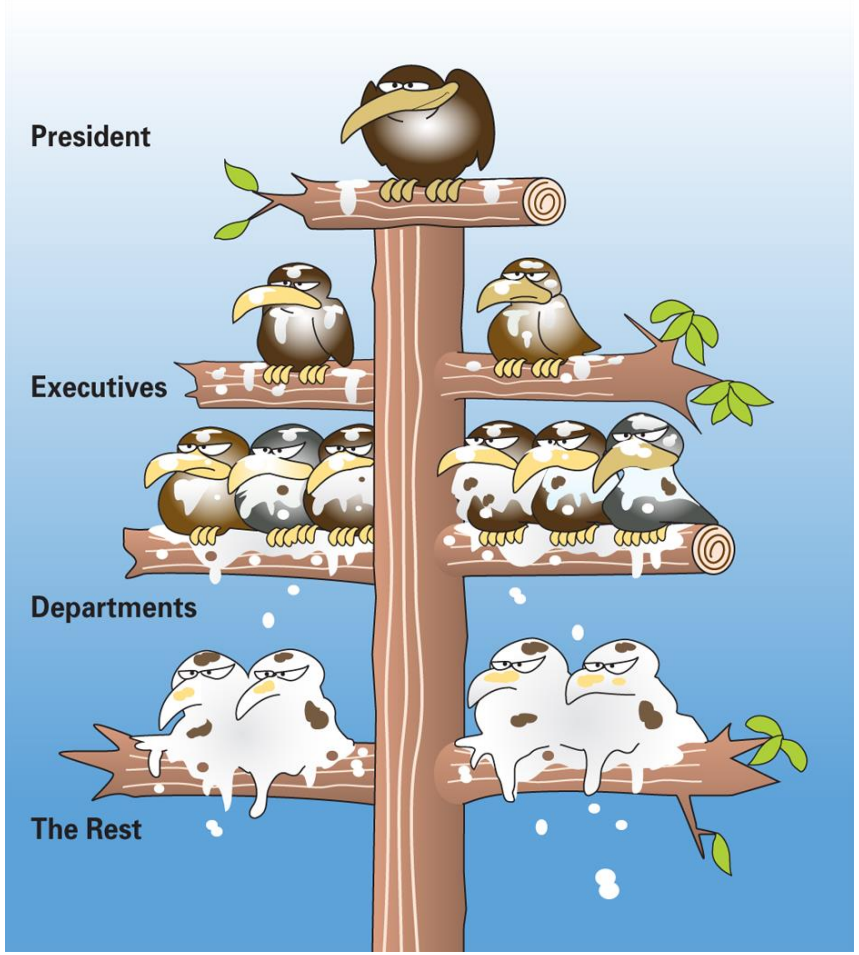
Upside Down Leadership

Billy Taylor, Director
NAT Manufacturing

Ellis Jones, Plant
Manager Akron

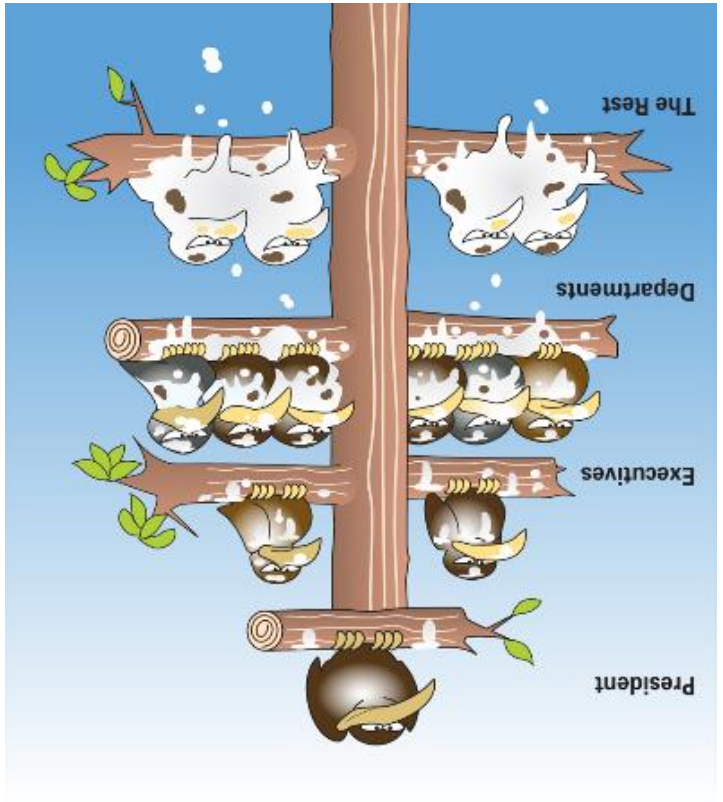
Best NASCAR tire builders in the world

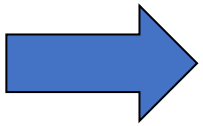
Leadership

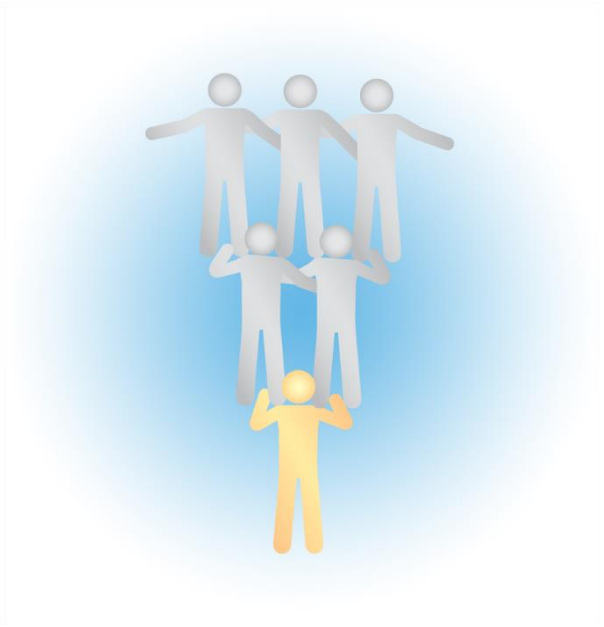


*Inspired by unattributed graph

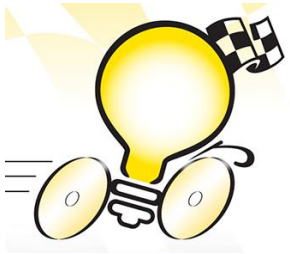
Lean Leadership



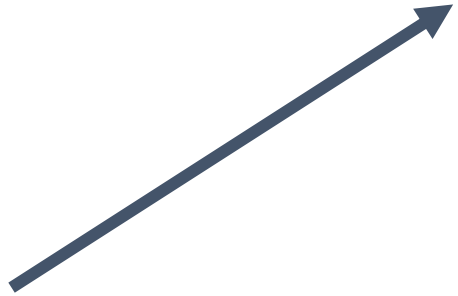




Leadership Transformation

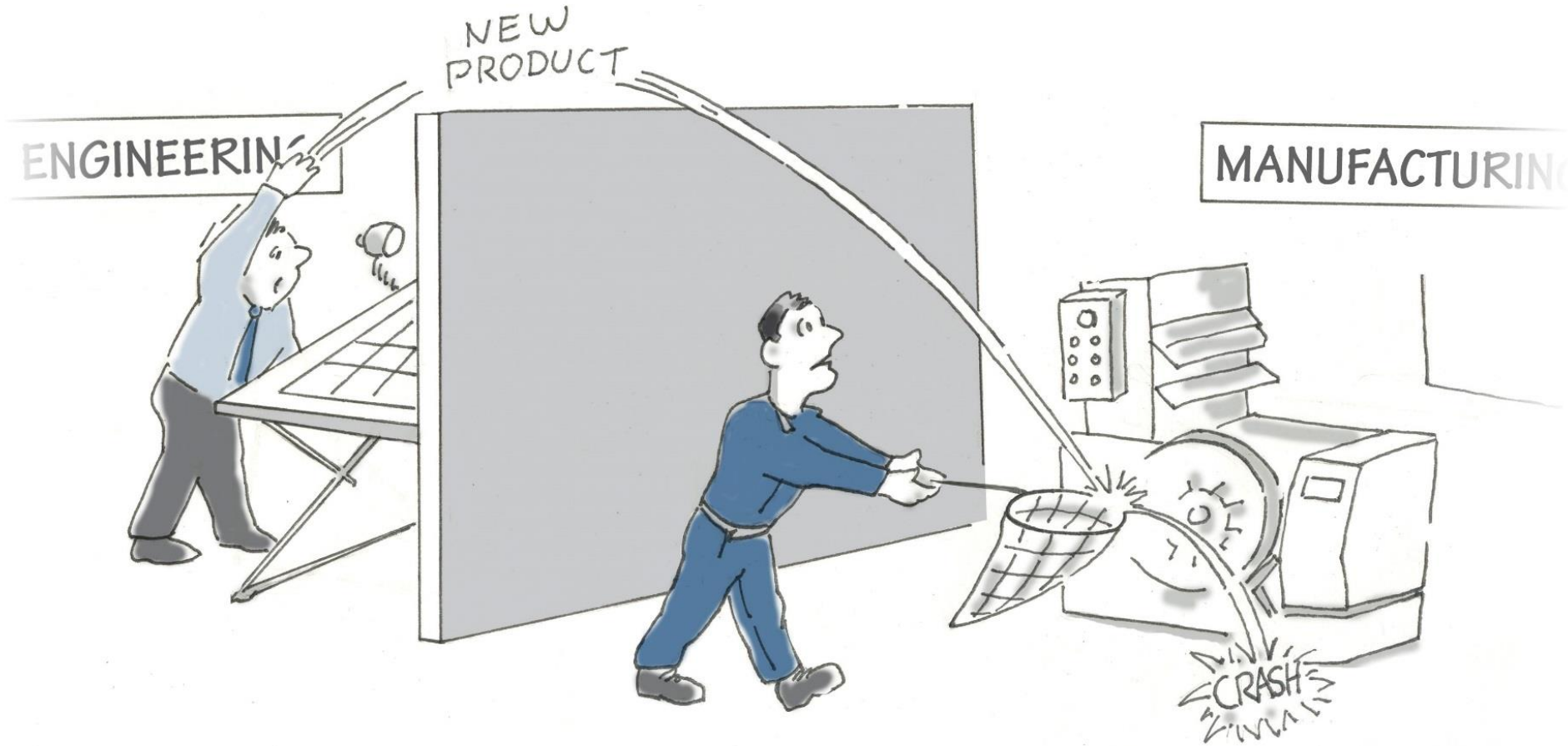


Helping People to be successful

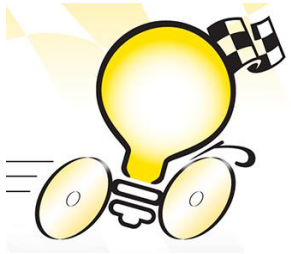


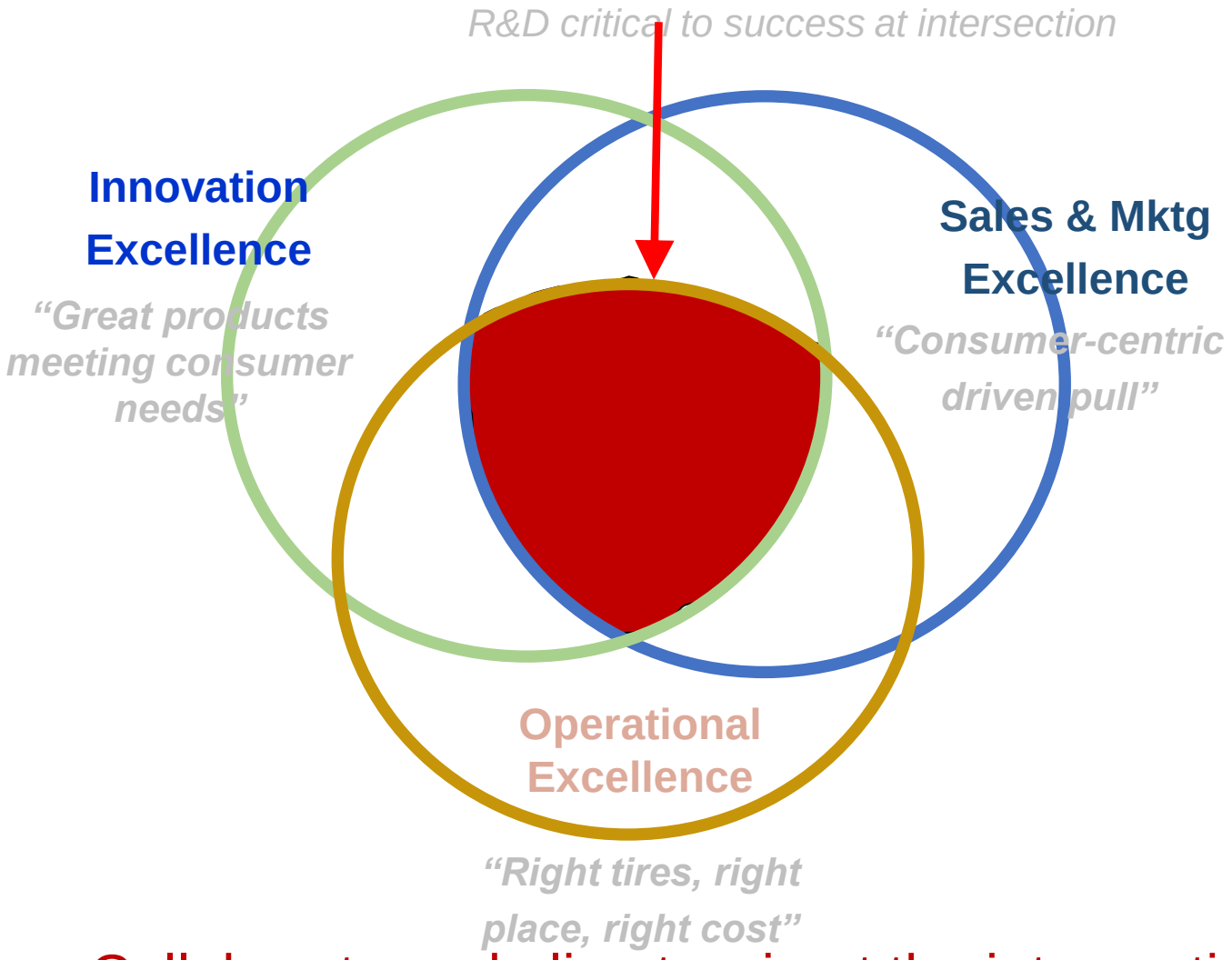
Tell people what to do

New Product Launch



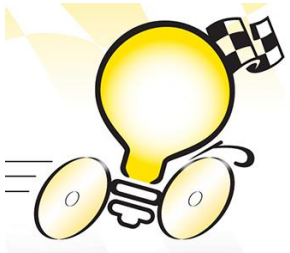
Integrated Excellence

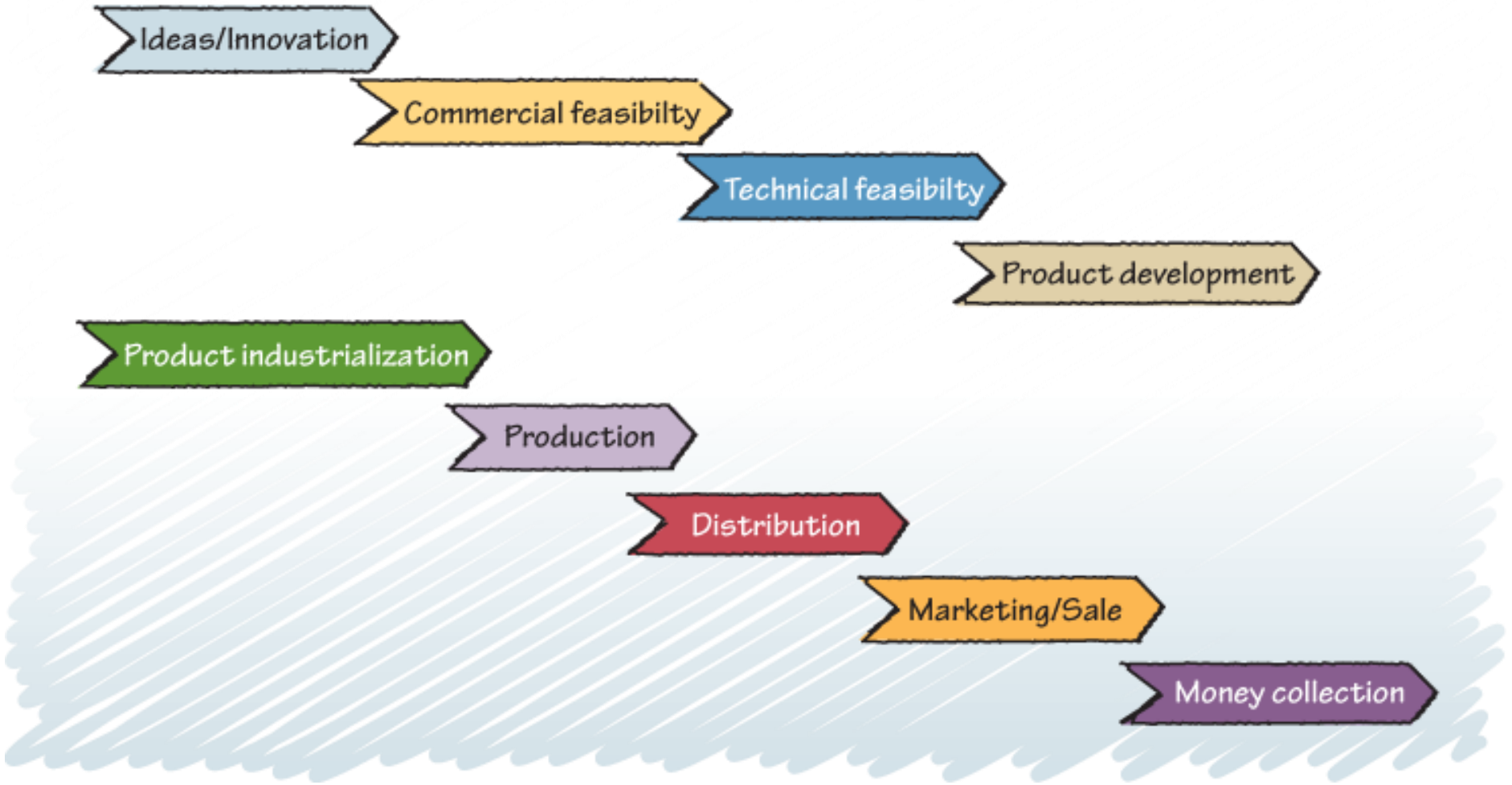




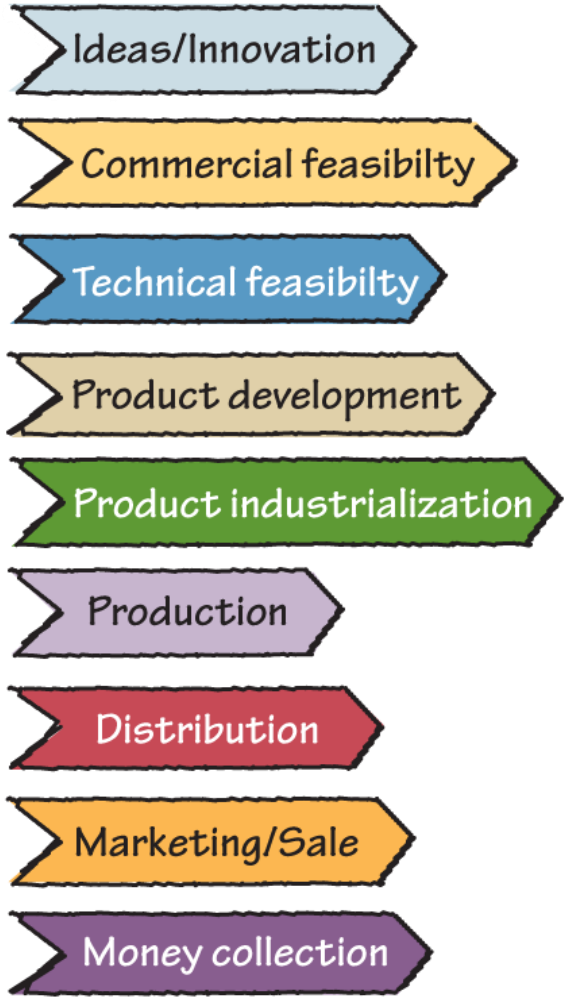
Collaborate and align to win at the intersection

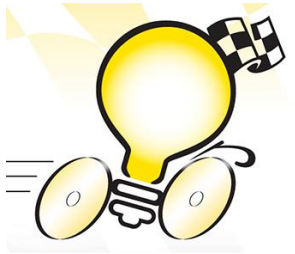
Typical R&D Value Stream





Value Stream Collaboration





Targets set JOINTLY – but they evolve

Targets reflect value for customer and company growth

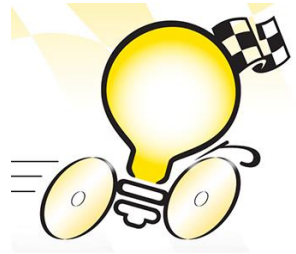
CONCURRENT development

Functional and personal agenda take a back seat to the value for the customer and the growth of the company

Engaging Associates
Respect for People

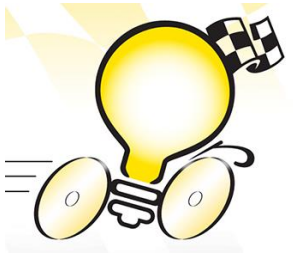
Engaging Associates

"We came here to die"



I build the BEST NASCAR tires!

What Made the Difference



He did not get paid more

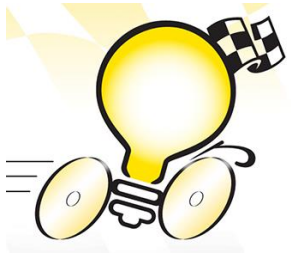
He found a purpose

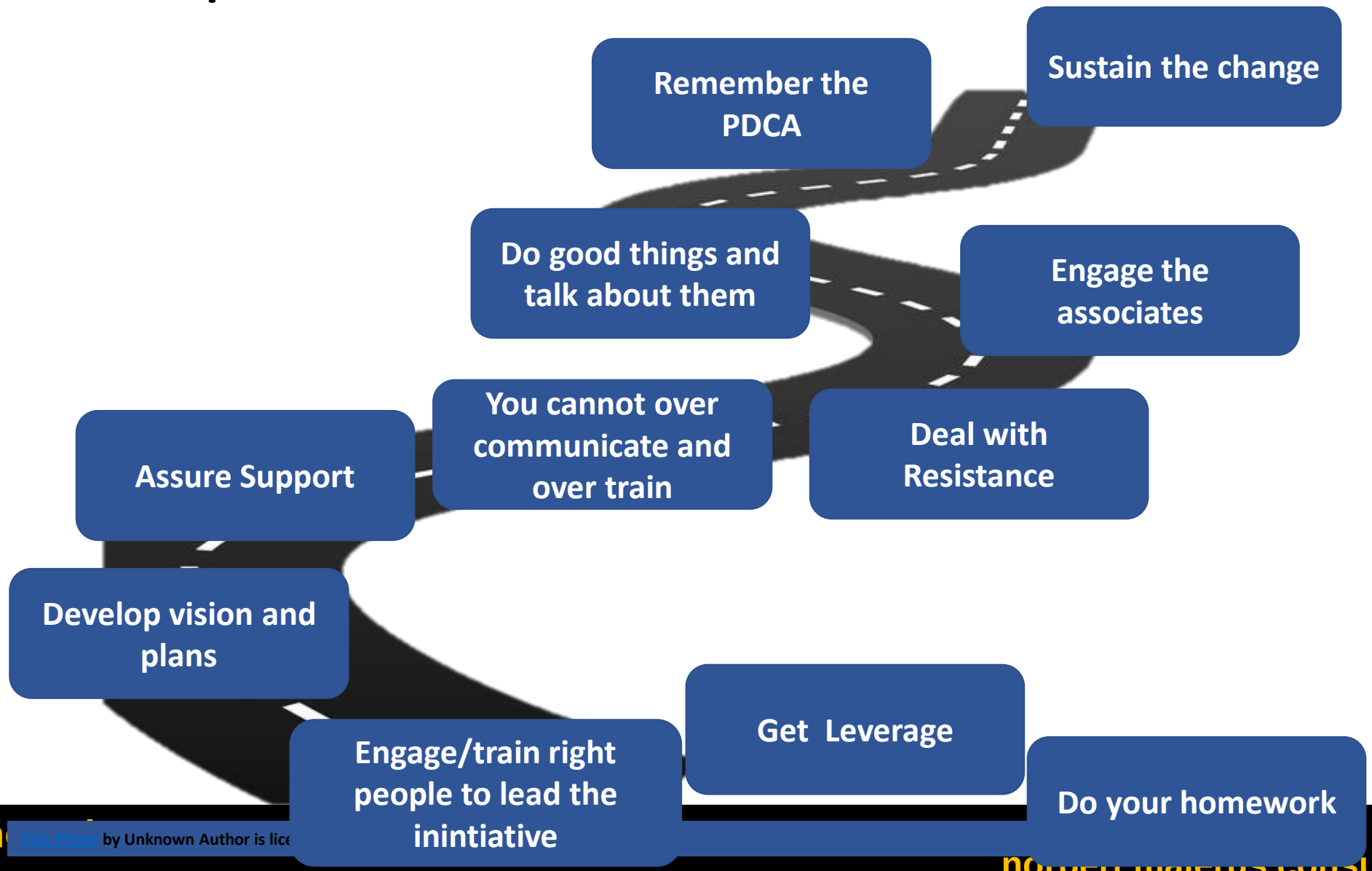
He gets the respect he deserves

He owns the machine and the product

He loves to help

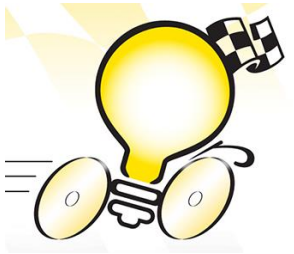
MY Roadmap to a Lean Culture





norbert majerus consulting llc

“Plus and Delta” for the Day

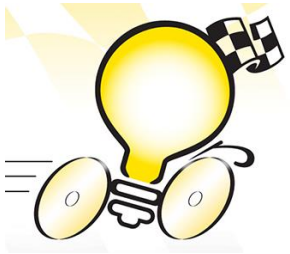


In few minutes, meet in your work teams of list the pluses (what went well?) and the deltas (what would you change, and how?)

Describe to the rest of the class.

- On-line survey: You will receive short questionnaire about this course. Please take a few minutes to respond to this anonymous, on-line survey. Past responses have been very helpful.

Thanks



If everything seems under control, you're just not going fast enough.

-- Mario Andretti

Contact Information

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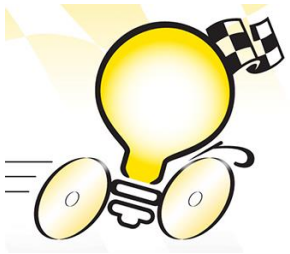
Cell.: 330 801 3184

leandriveninnovation.com



The end