Technology Disruption, Now What?!?!

Jarod Schultz

Director of Specialized Services
initial.aec

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AUTODESK. UNIVERSITY

Session: BLD124098

@JarodJSchultz

Questions

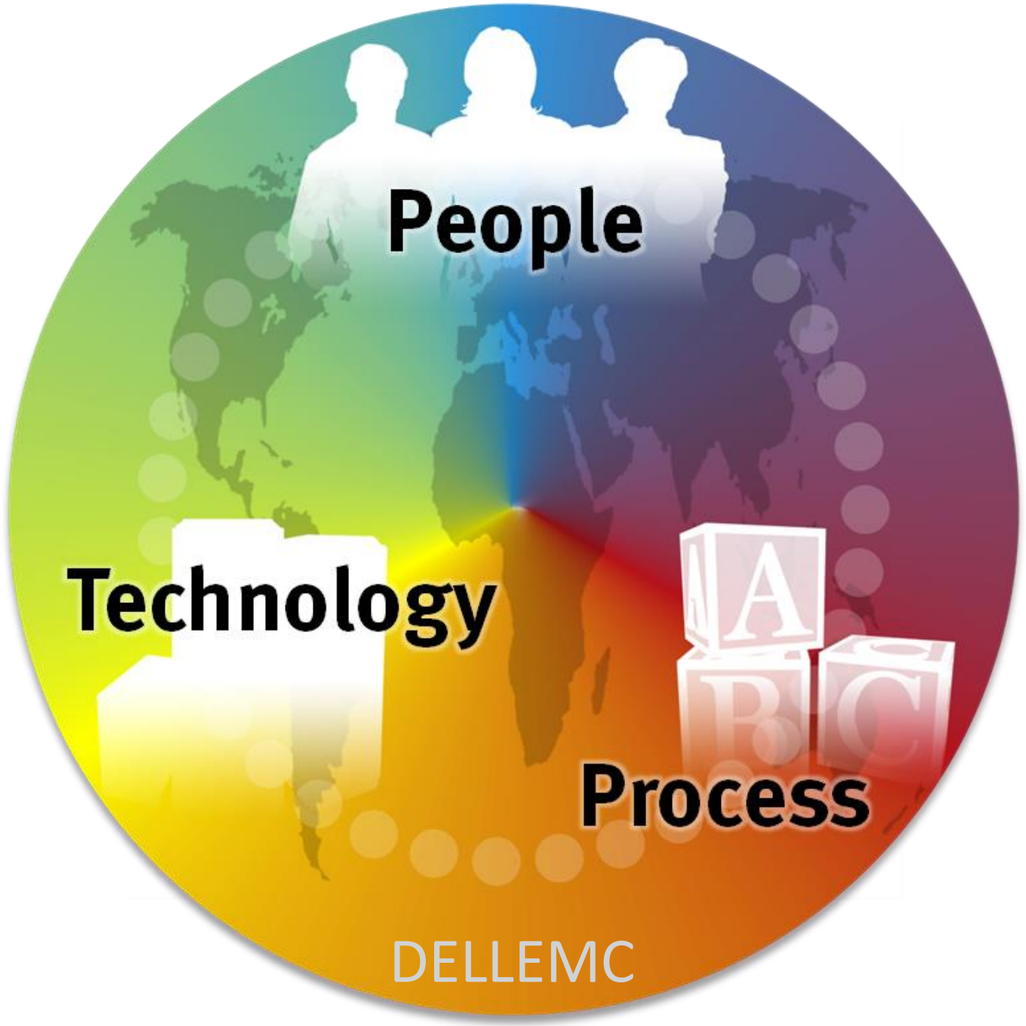
Technology is moving at a fast pace these days and with it comes technology disruptions. We will look at what has happened in the past and what is happening today and see how “you” and your firm can come up with a strategy moving forward.

Some items to start thinking about;

- How is your firm been dealing with these disruptions?
- What lessons has your firm learned?
- Where is your firm in the “bell curve” of adoption?
- Are you and your staff being proactive?
- Are you walking and talking “Return on Investment” on your processes?

Asking these questions and more, we will start looking at how to connect strategies together, so your firm adopts and progresses with technology, staff, and workflows.

Continuous Improvement Cycle

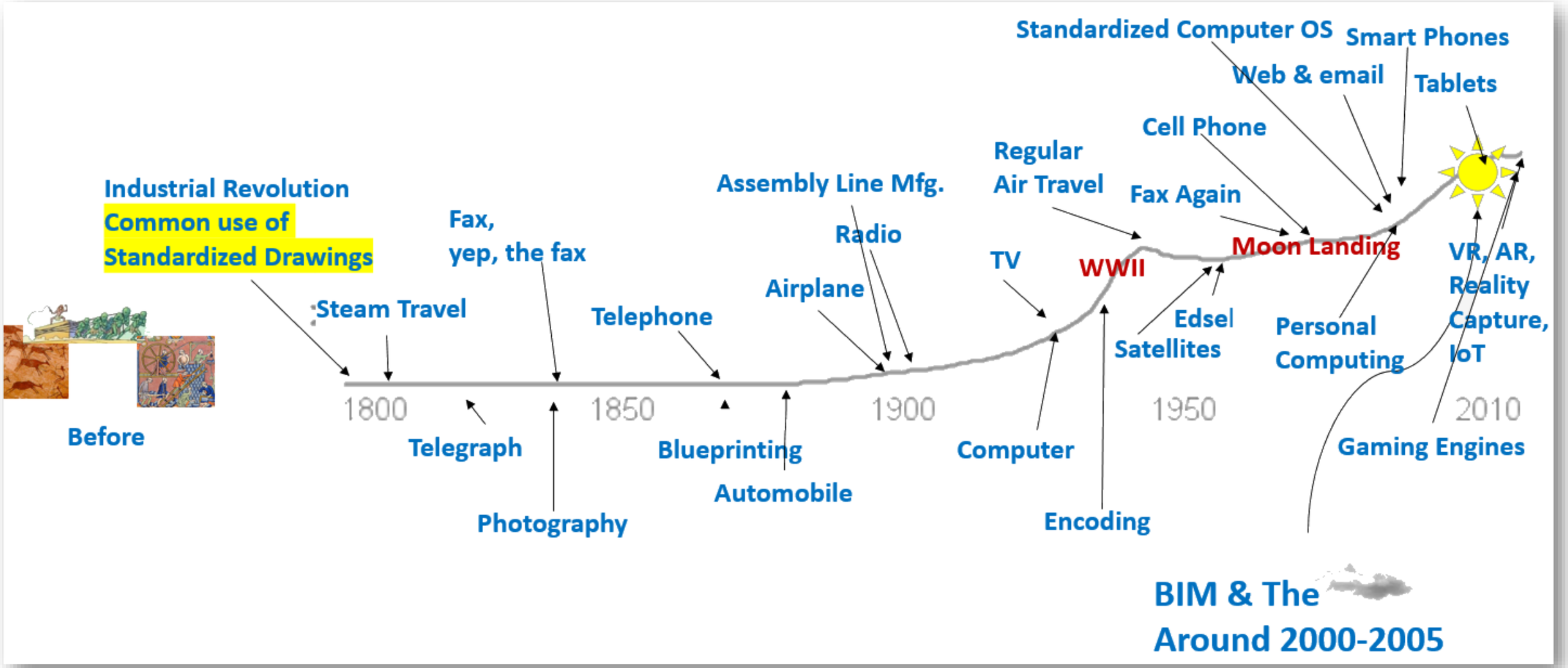


For the rest of the presentation we will look at what is involved in each step of the "Continuous Improvement Cycle"

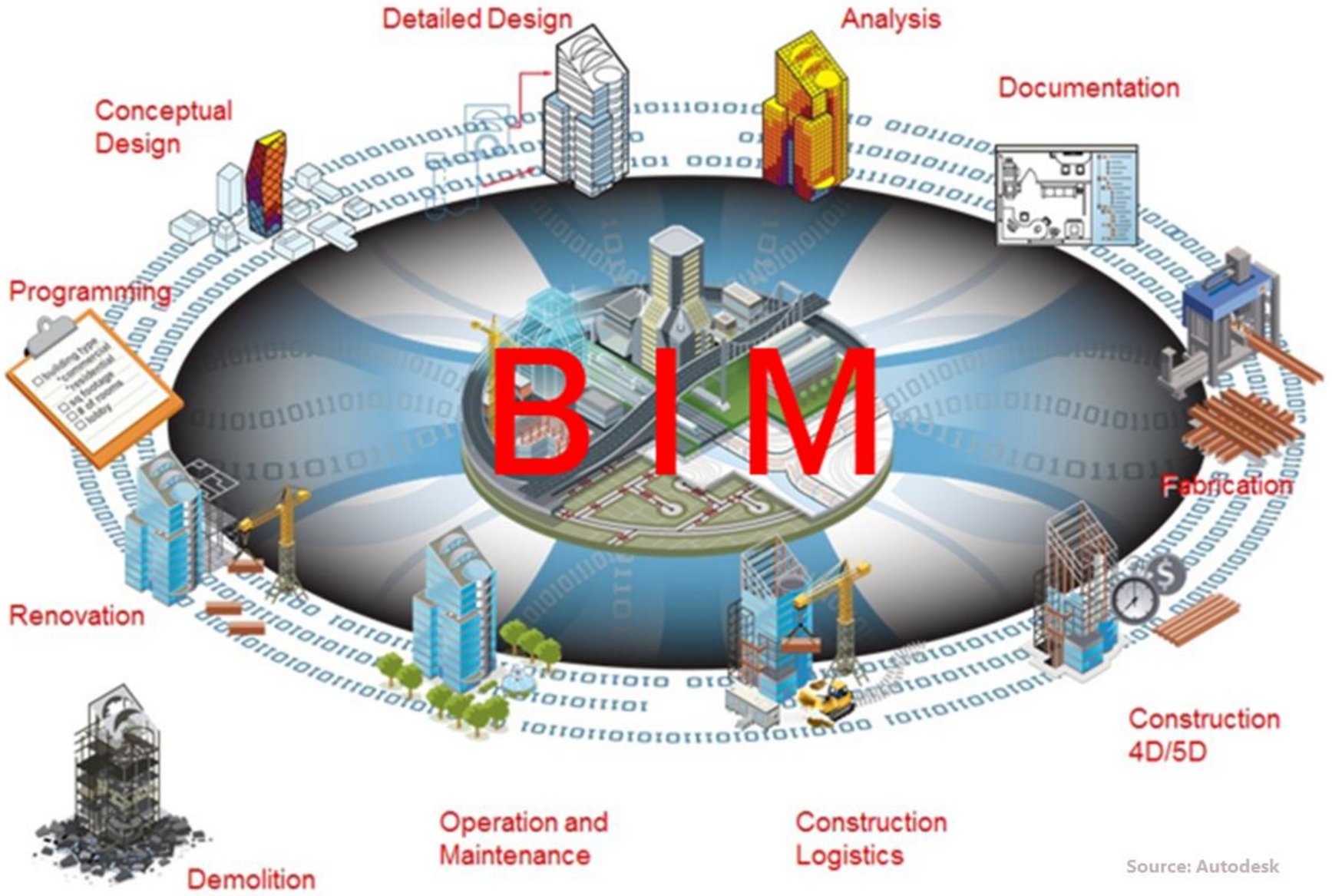
Objectives

- **Understanding Processes and Workflows of the 3 Legs of Improvement.**
  - *People, Process, and Technology*
- **Getting Off the Merry-Go-Round of "It's All About the Technology".**
  - *Kaizen Event / Emotional Intelligence*
- **Learn how You and Your Firm can Adopt Technology the Right Way.**
  - *Six Sigma Wastes*
- **Learning How to Talk to Management/Owners about ROI.**
  - *Rubber Hits the Road*

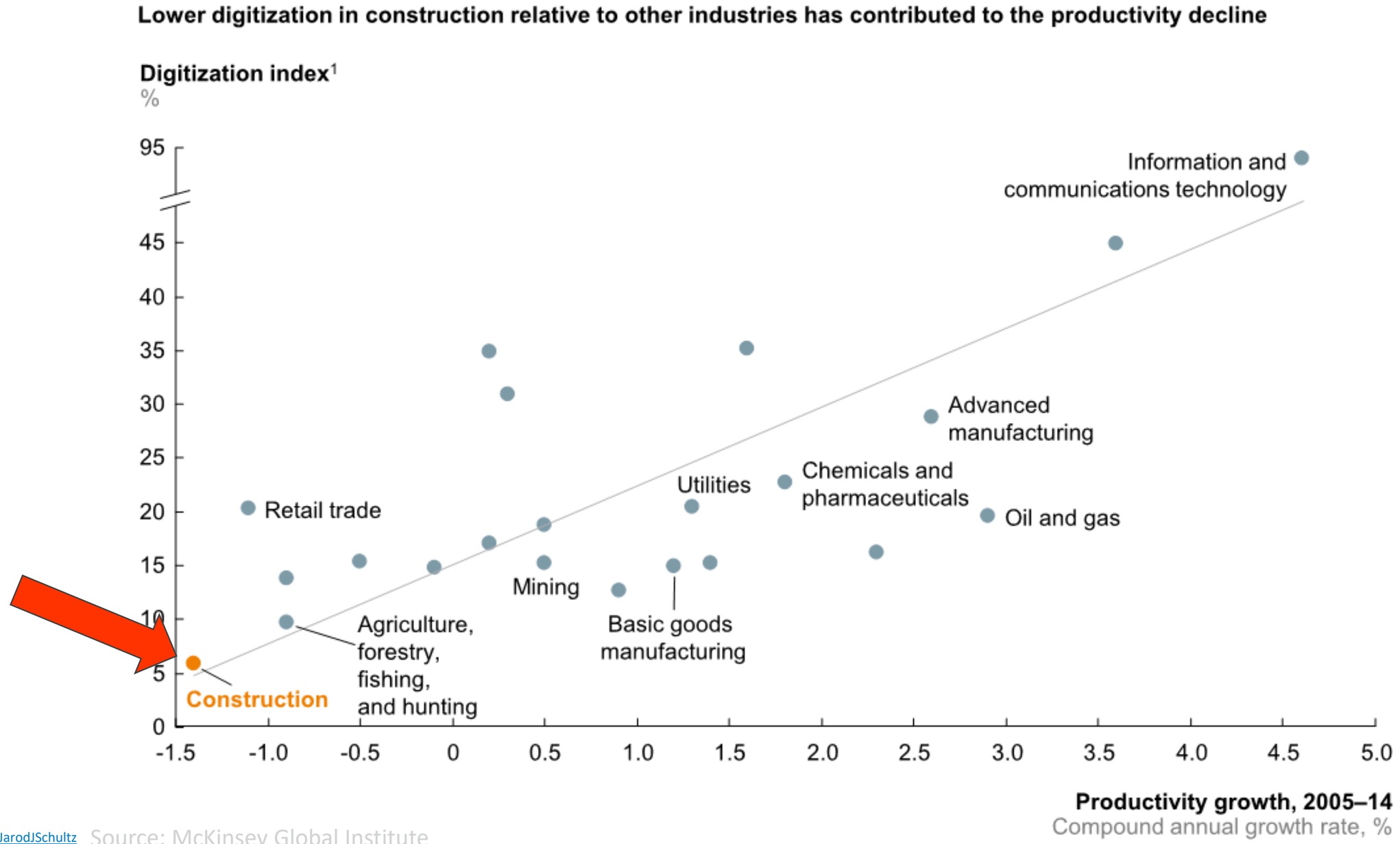
Technology History



BIM Enters Our Lives



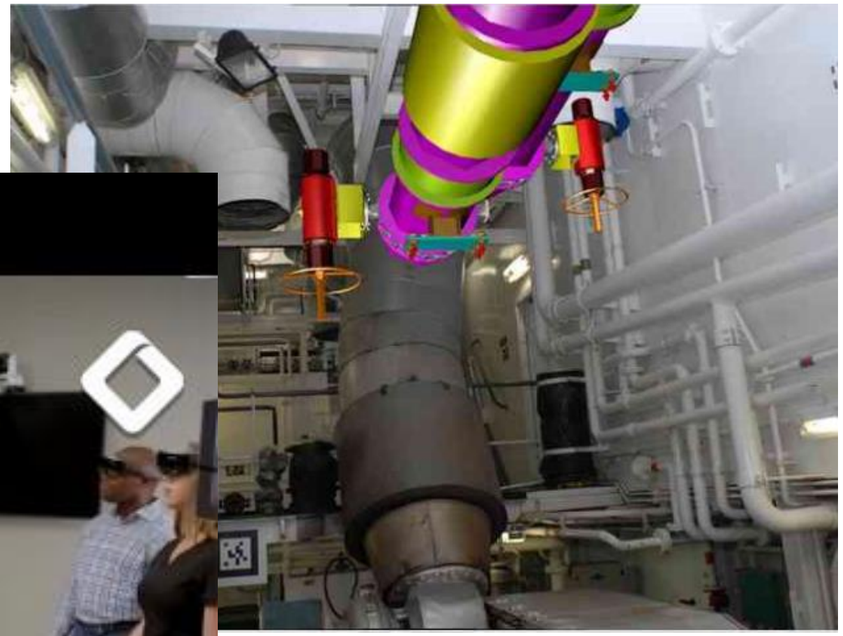
Technology Adoption



 Source: McKinsey Global Institute

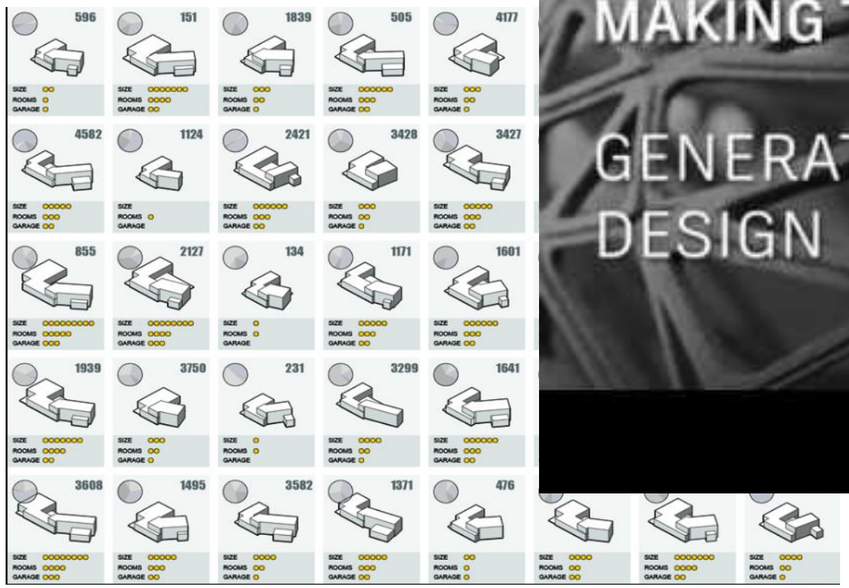
Reality Capture

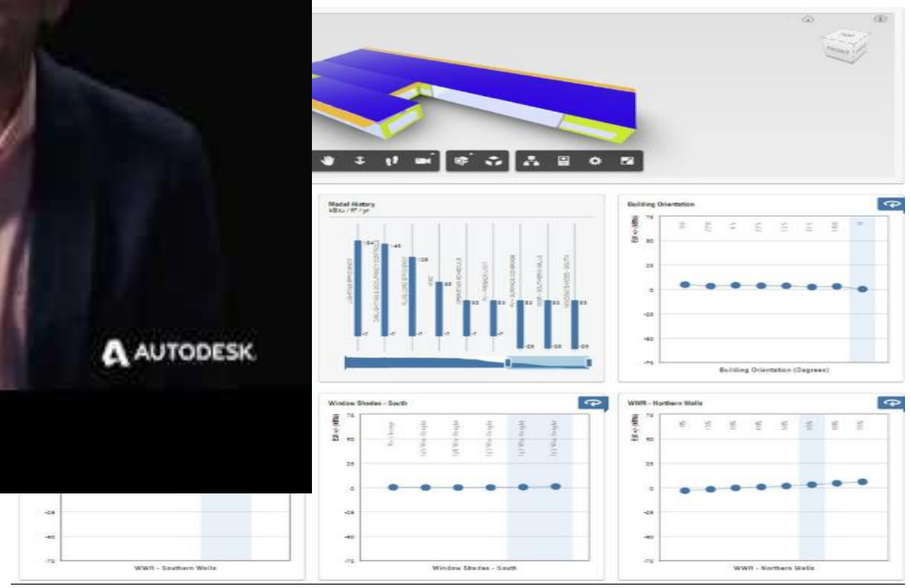
Virtual and Augmented Reality



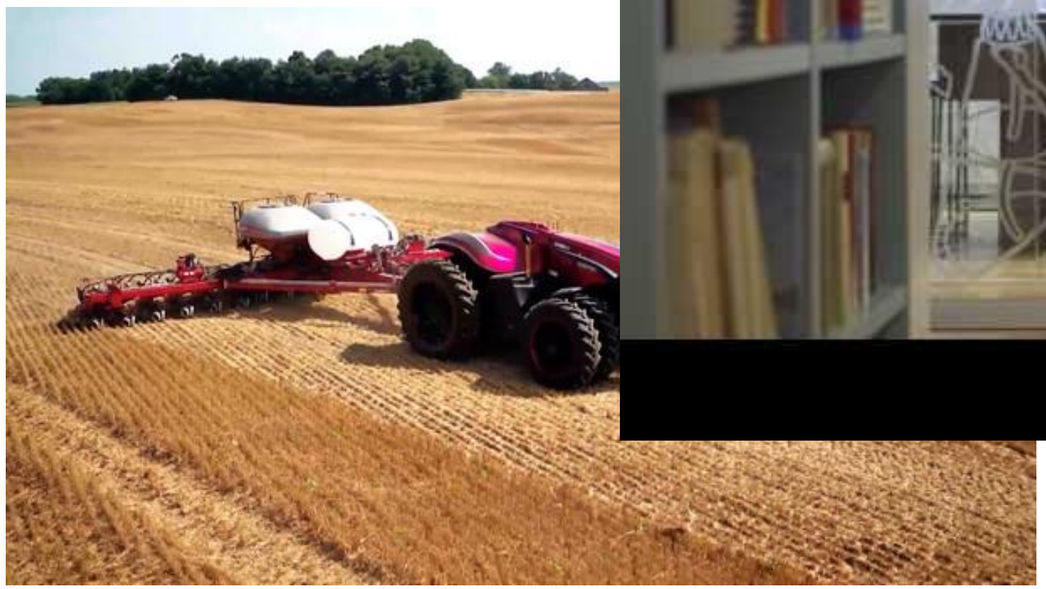
Generative and Computational Design

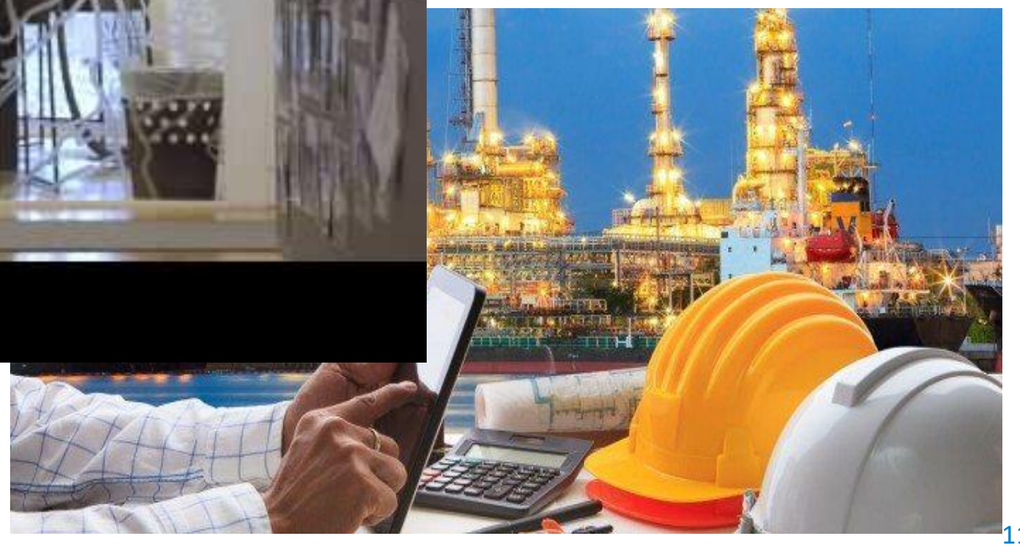
Machine Learning / Artificial Intelligence



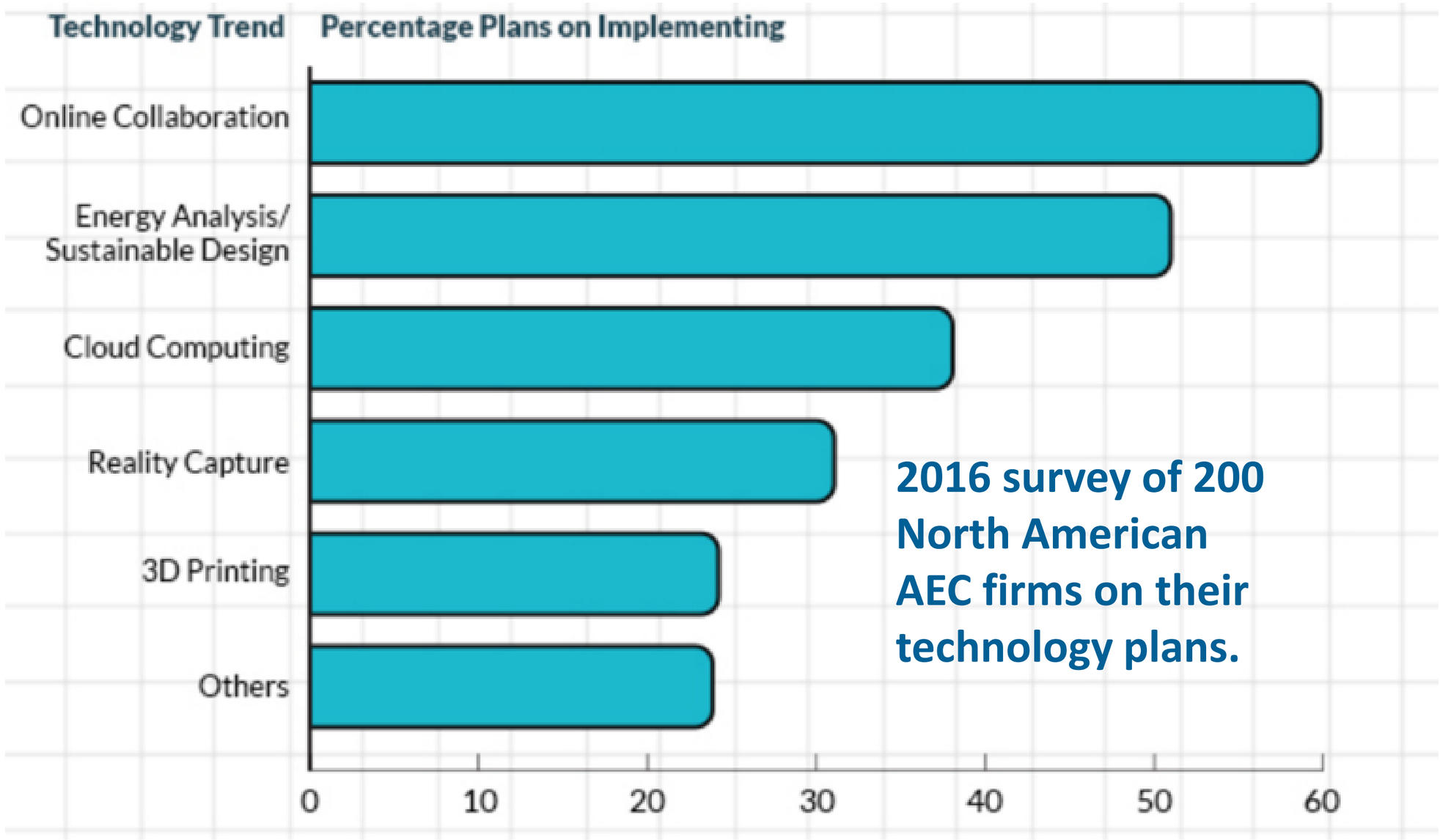


Internet of Things





Adopting Technology

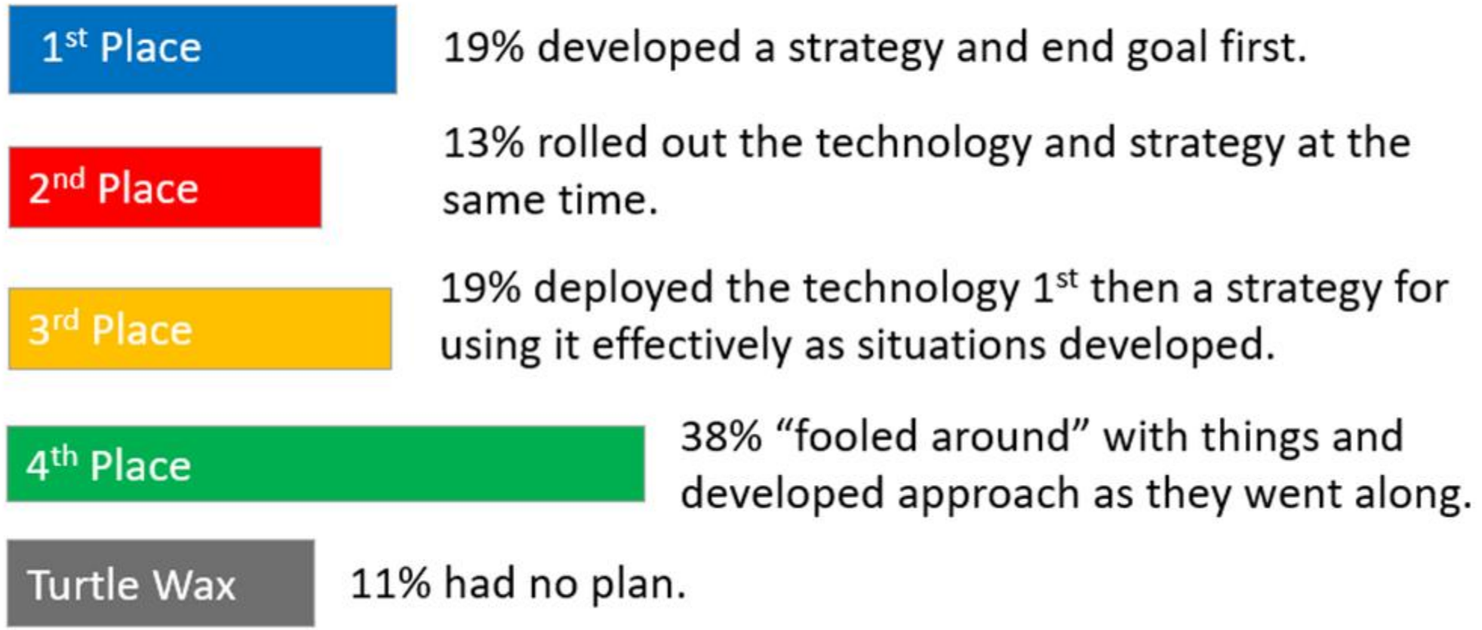


2016 survey of 200 North American AEC firms on their technology plans.

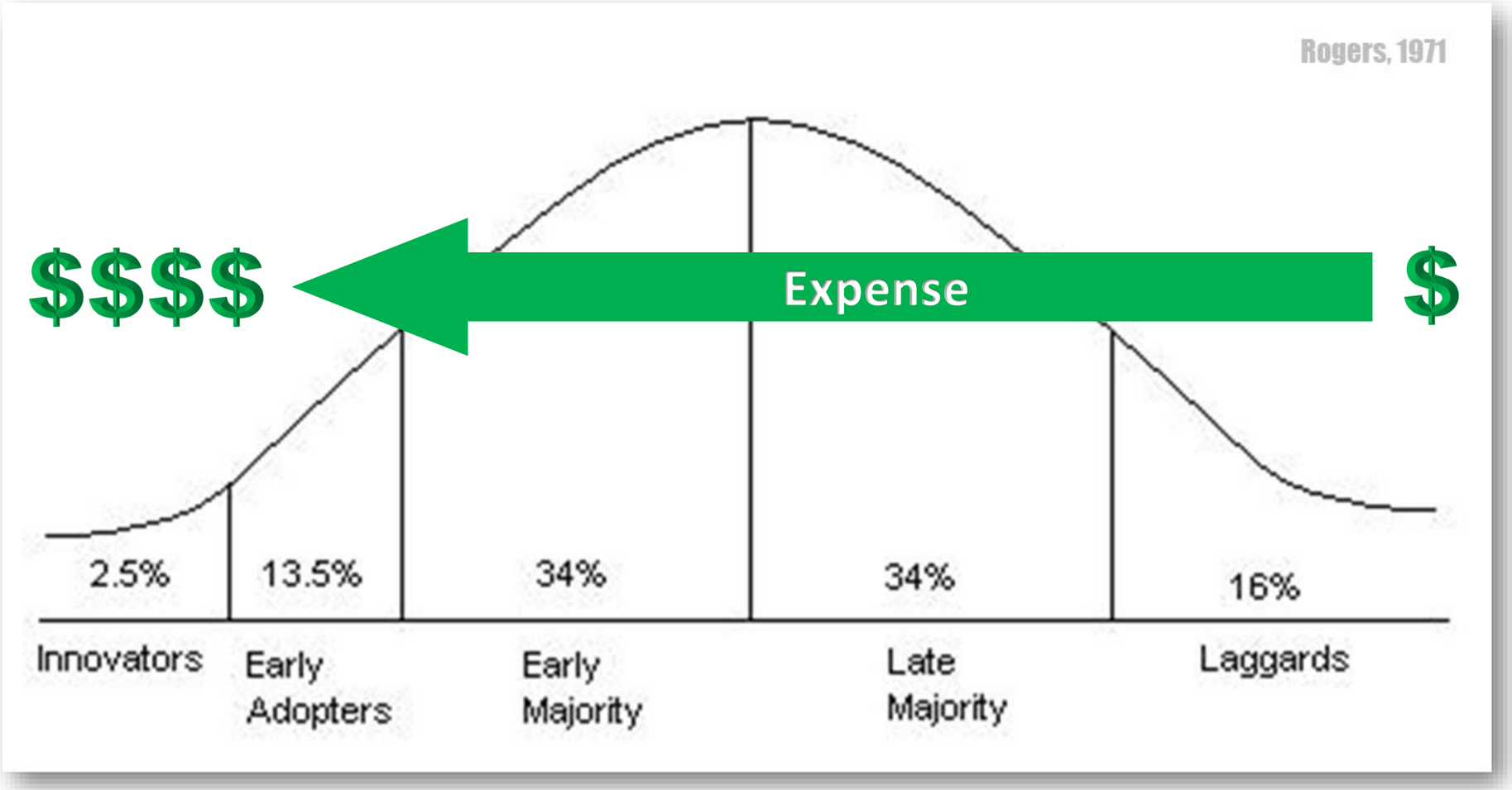
Strategy BEFORE Technology

AEC Firms spend an average of $4000 per year/ per employee on technology

- Most companies begin with the technology – the surest path to frustration and possible failure
- Understand the desired goal before exploring how to get there.
- What is the business value and what is the use case?



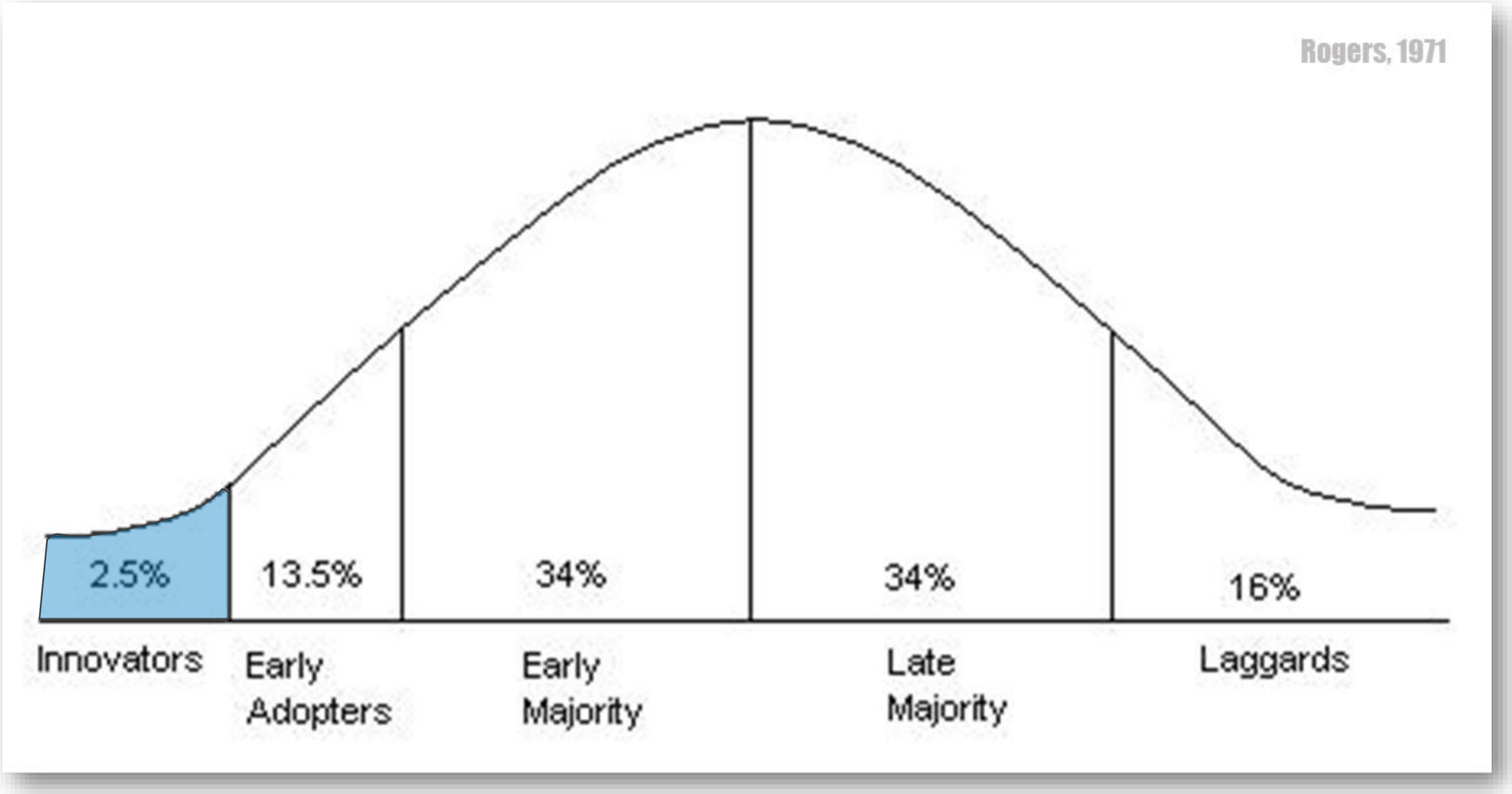
Diffusion of Innovation Theory



Where are you at?

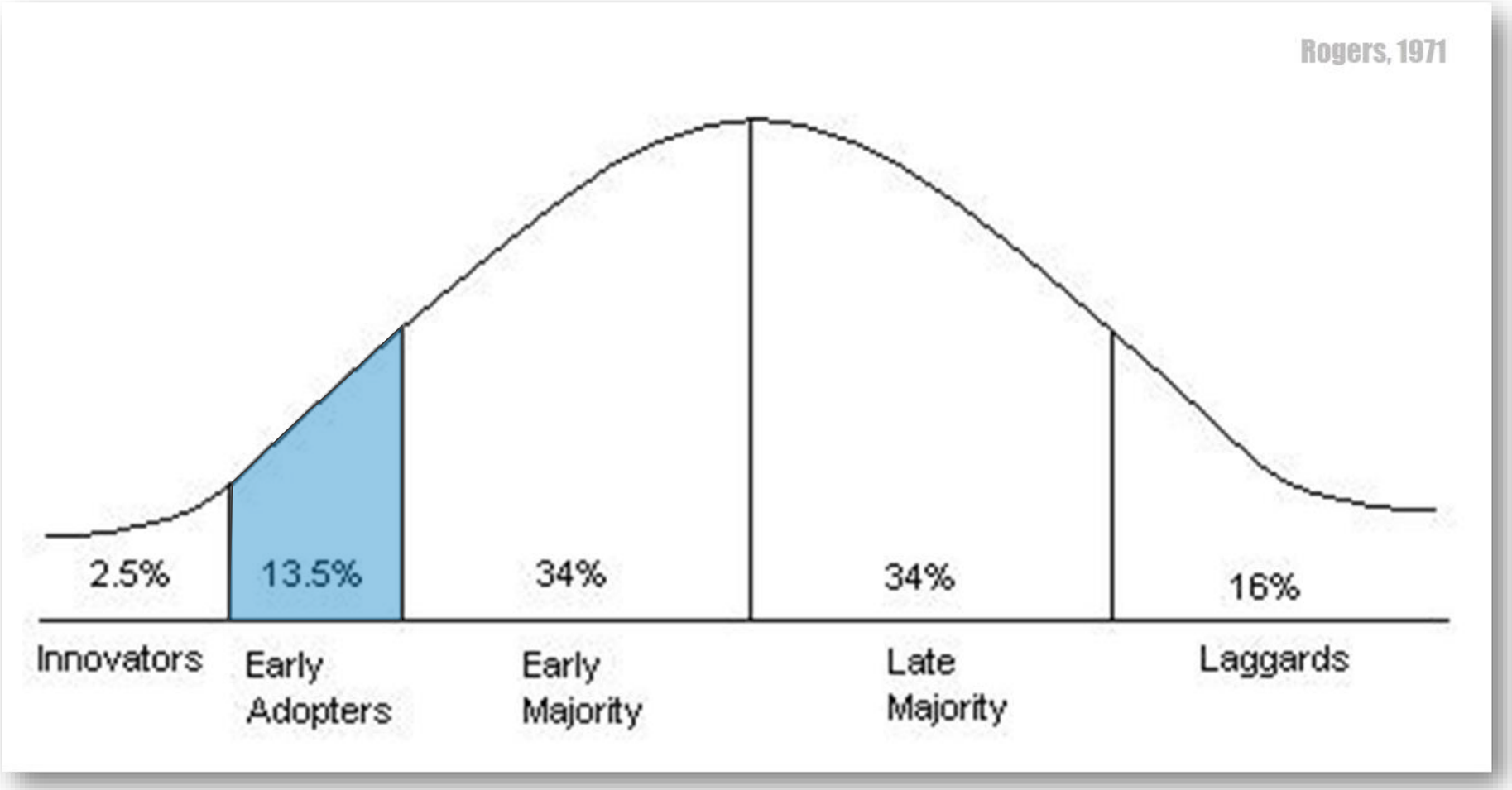
Where is your firm?

Diffusion of Innovation Theory



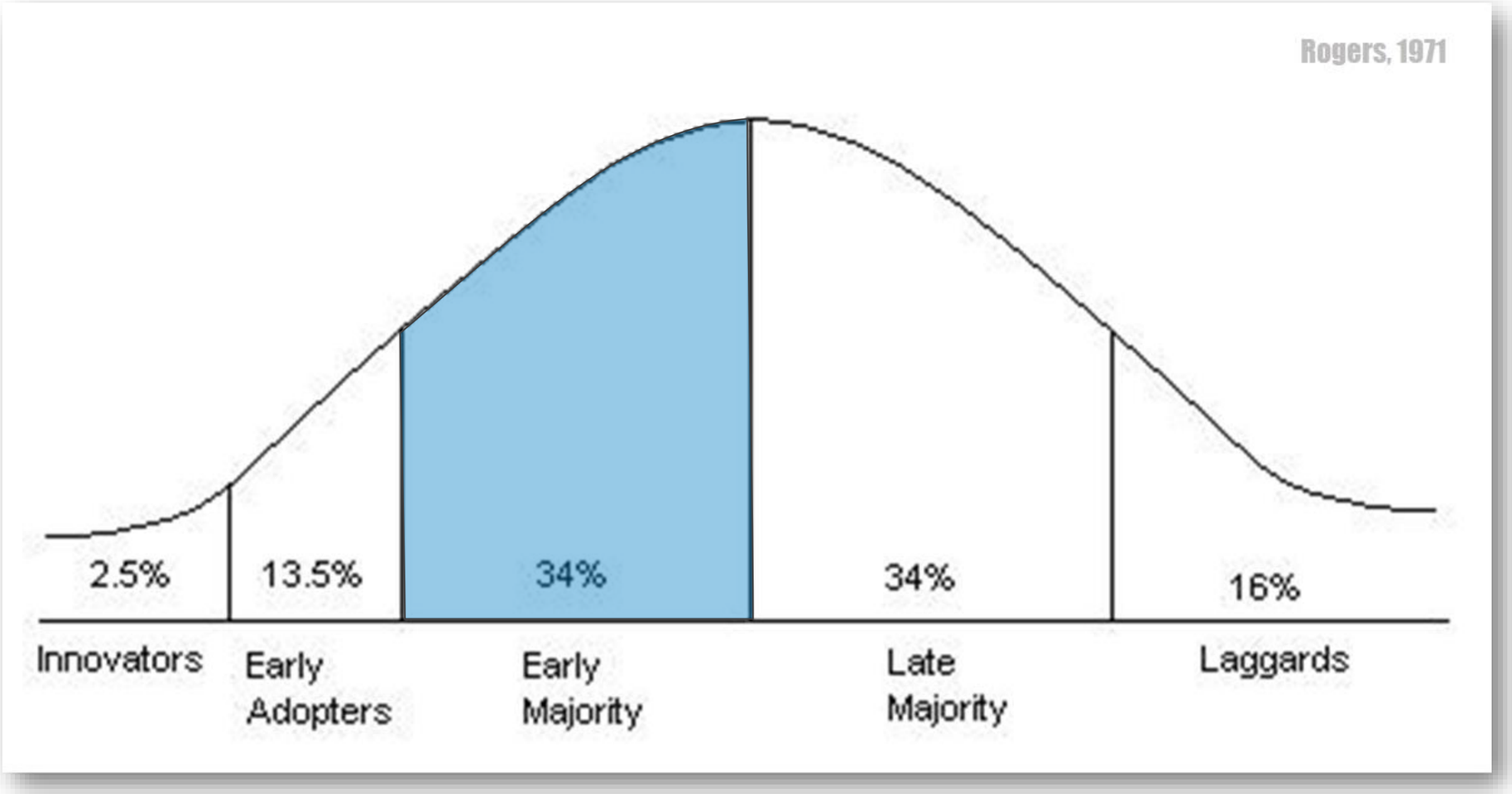
Innovators are eager to try new ideas, to the point where their venturesomeness almost becomes an obsession.

Diffusion of Innovation Theory



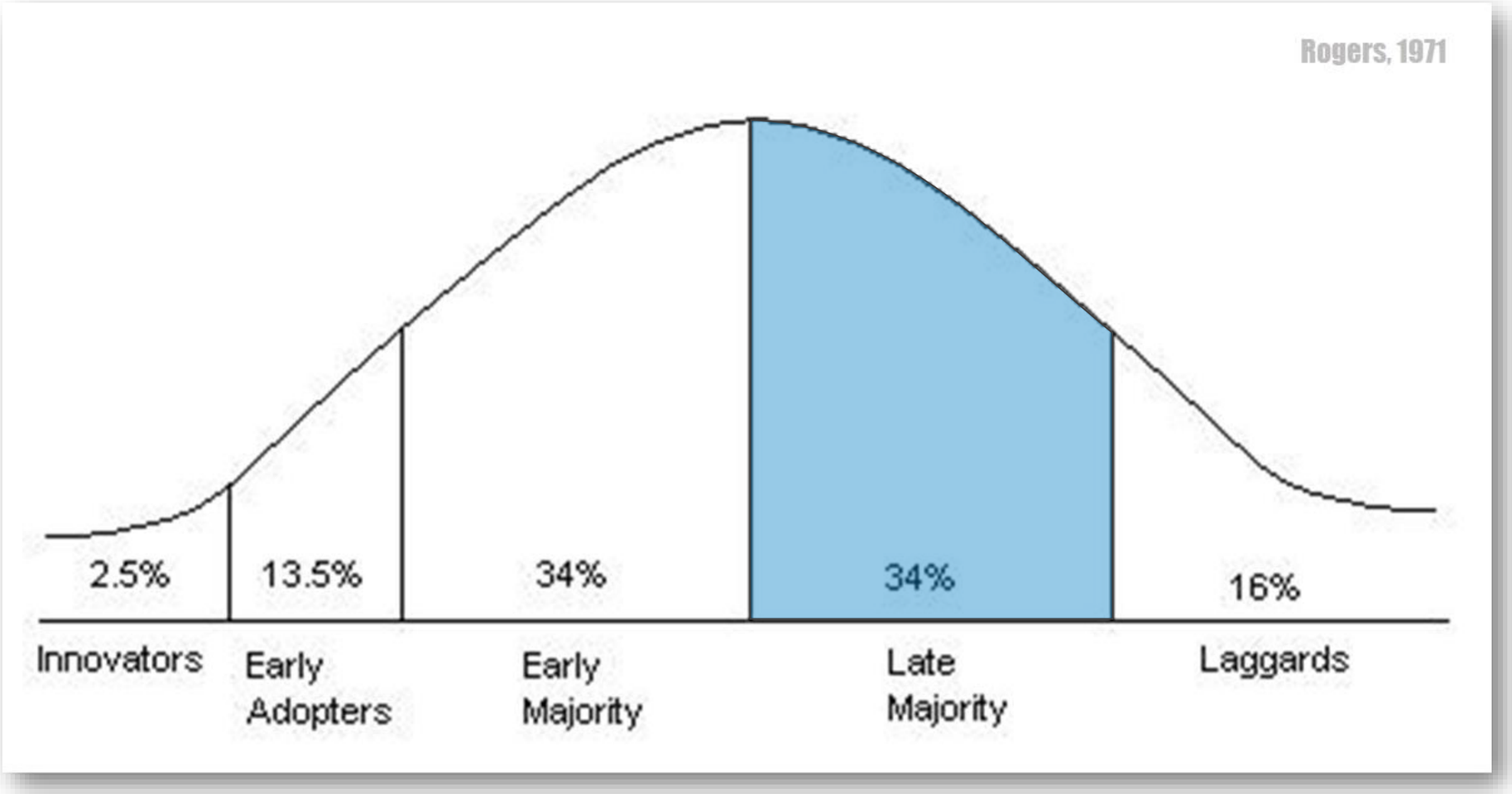
Early adopters tend to be integrated into the local social system more than innovators.

Diffusion of Innovation Theory



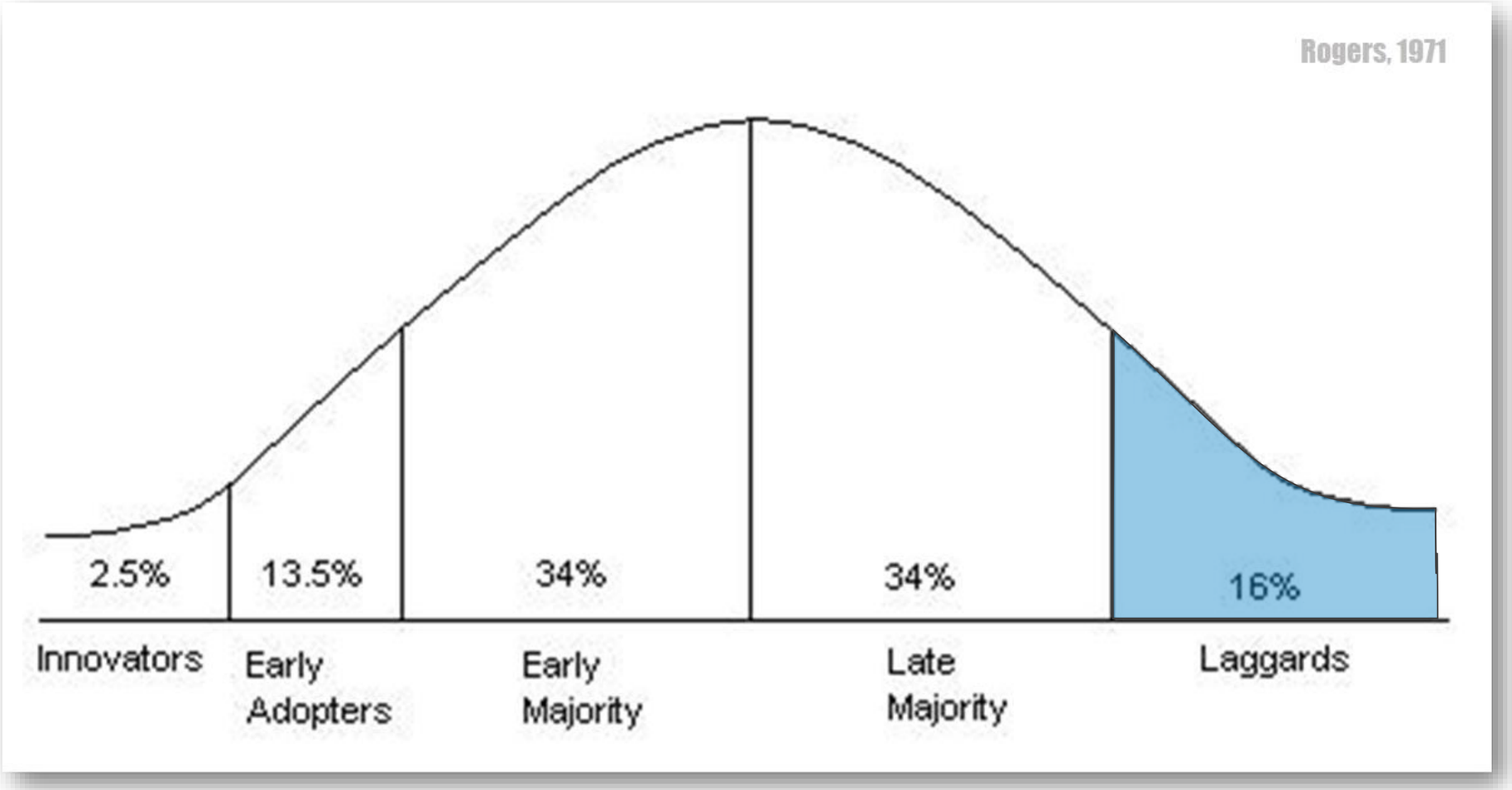
Members of the early majority category will adopt new ideas just before the average member of a social system.

Diffusion of Innovation Theory



The late majority are a skeptical group, adopting new ideas just after the average member of a social system.

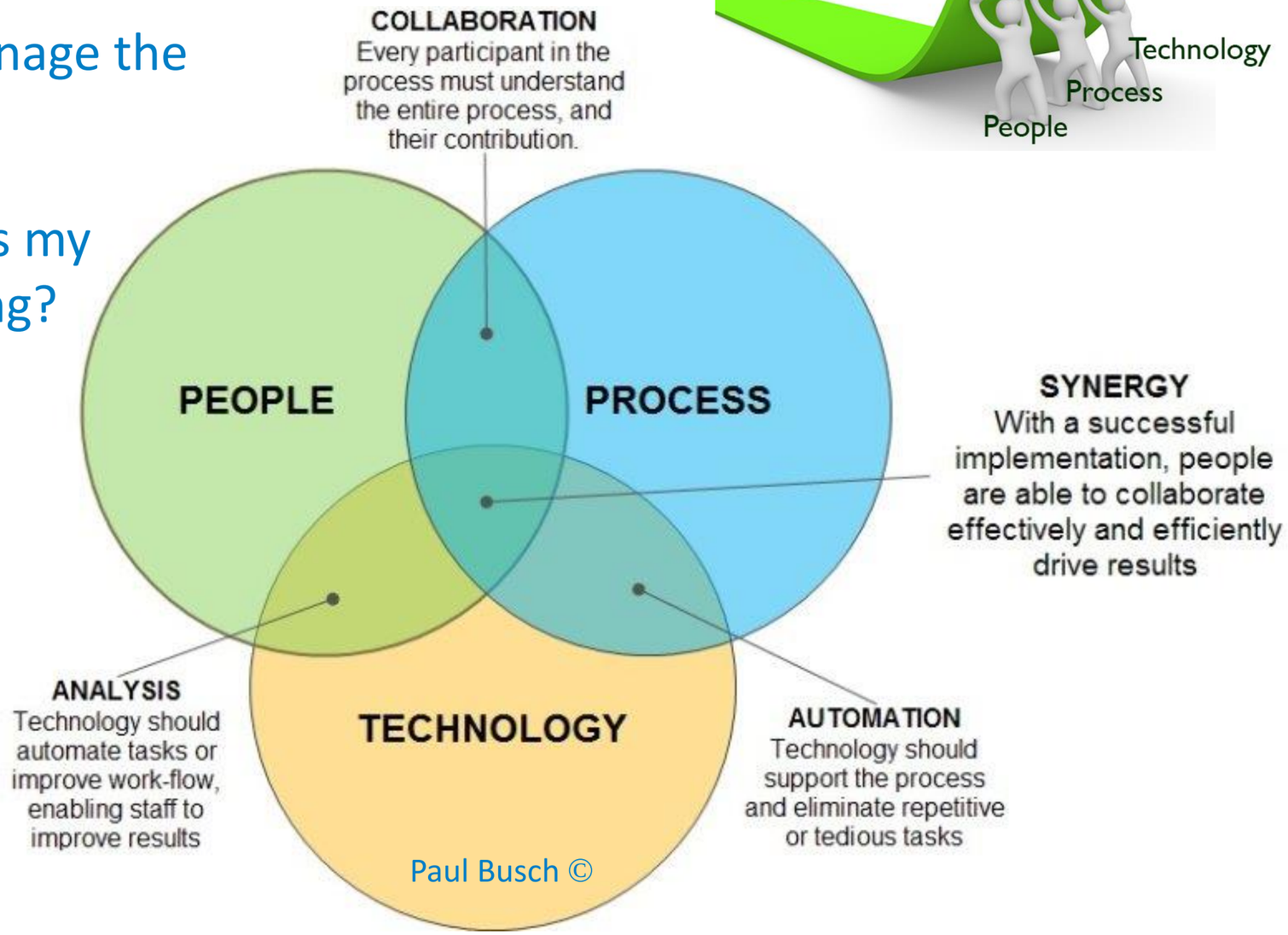
Diffusion of Innovation Theory



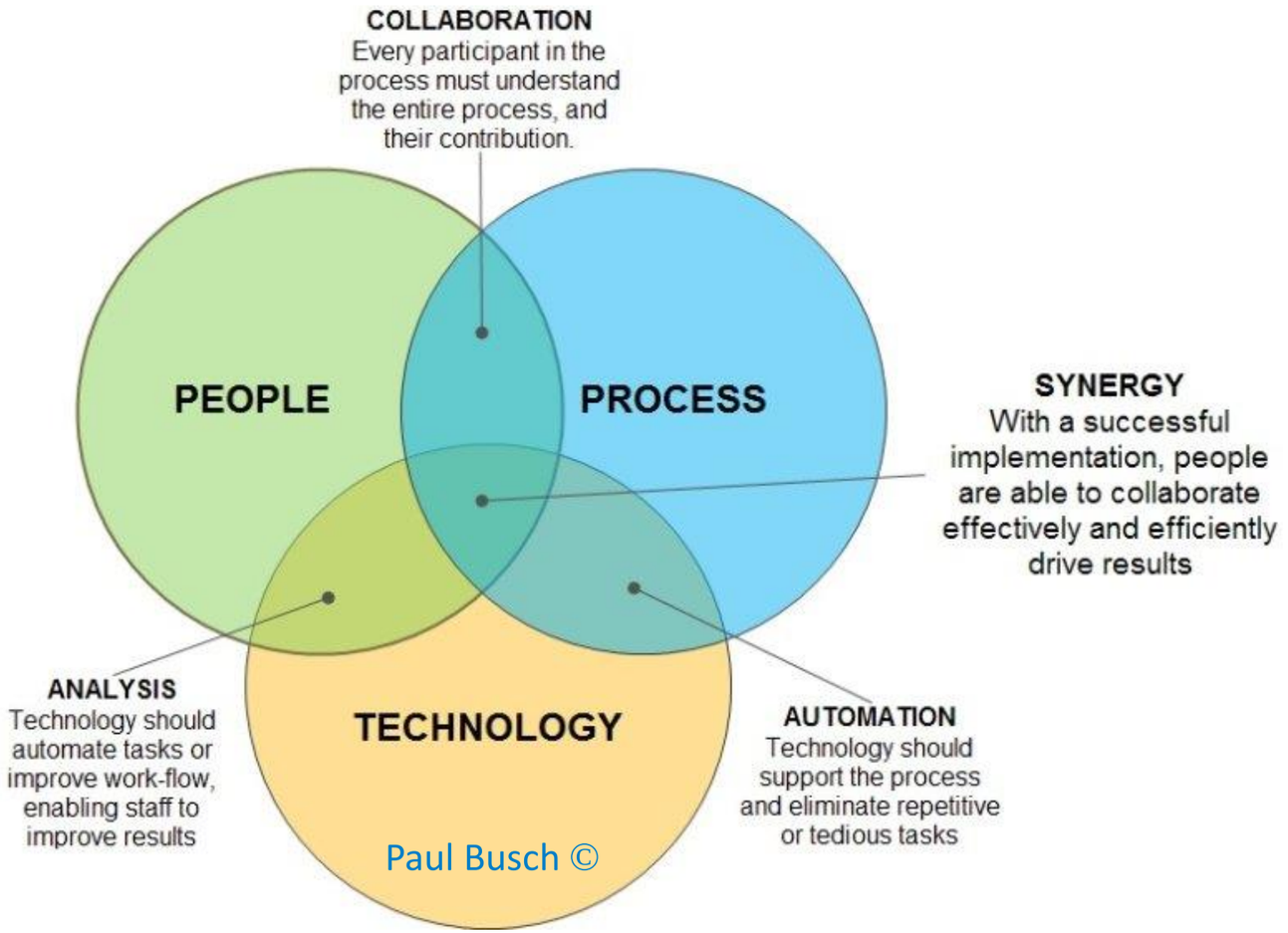
Laggards are traditionalists and the last to adopt an innovation.

People, Process, and Technology

- Do I have the right people to manage the new process?
- If the new technology automates my process, what effect is that having?
- Will I need training programs in order to properly implement the new process or technology?

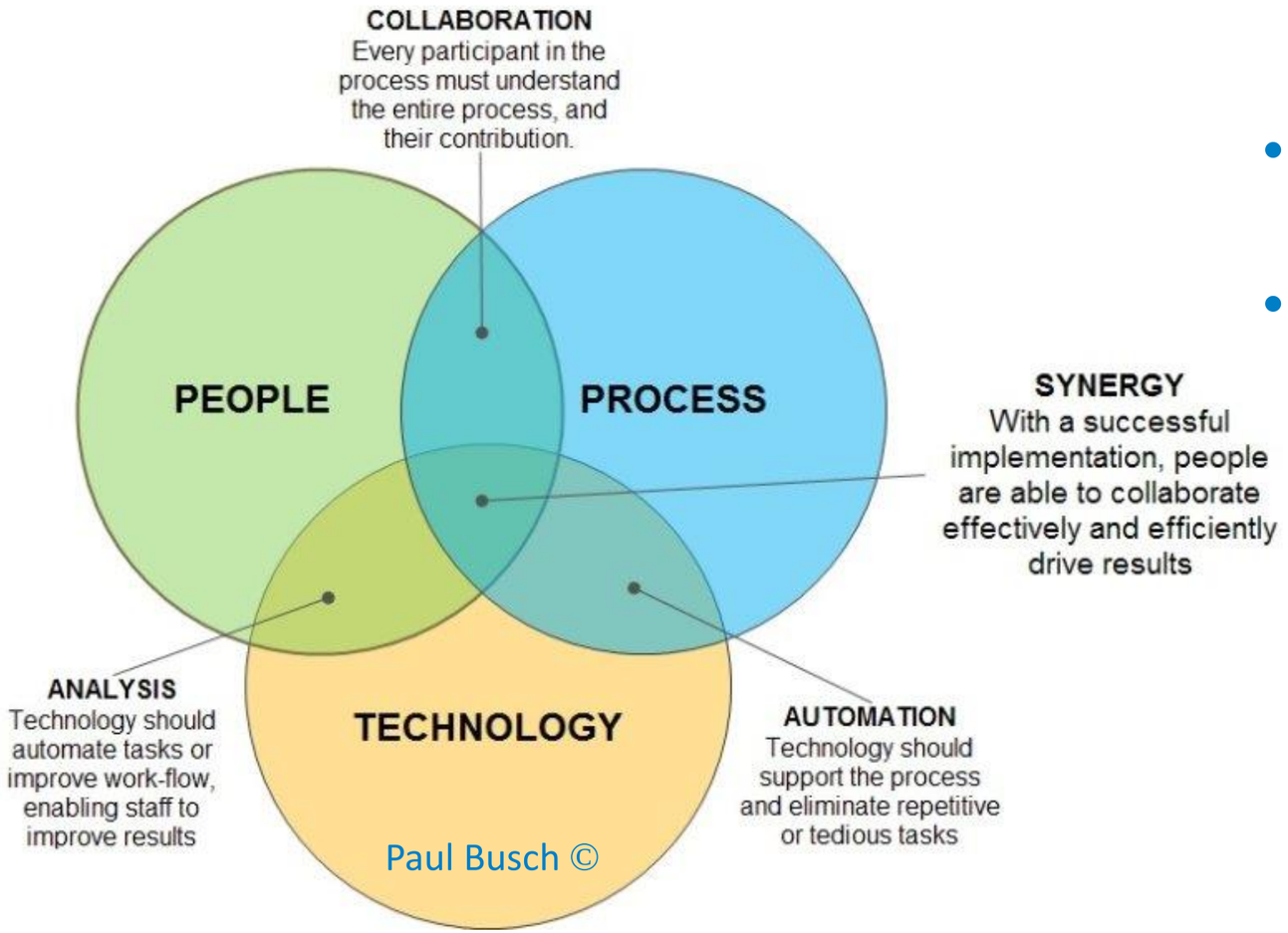


People, Process, and Technology



- Will the process require a different level of relationship between studios, departments, outside consultants, etc.?
- Can the process be managed by a single application or do we need 2 or 3 that will require integration?
- What parts of the process could potentially be eliminated or shortened by specific software or equipment?

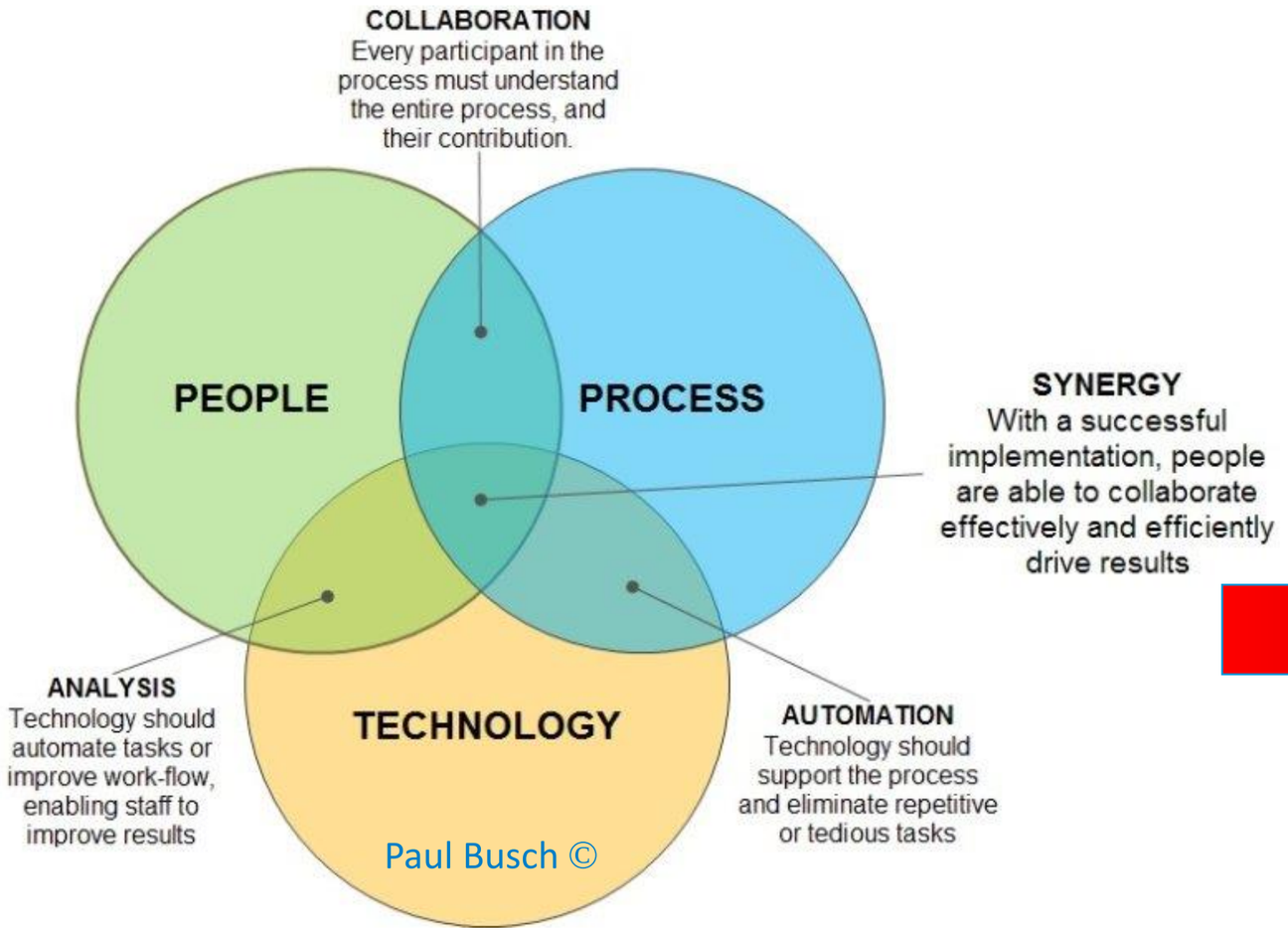
People, Process, and Technology



- Does the technology fully support the new process or will we have to consider some level of compromise to make it work?
- Can we eliminate manual entry in favor of automated data collection or process?
- Can we eliminate process steps or shorten the process by using technology?

People, Process, and Technology

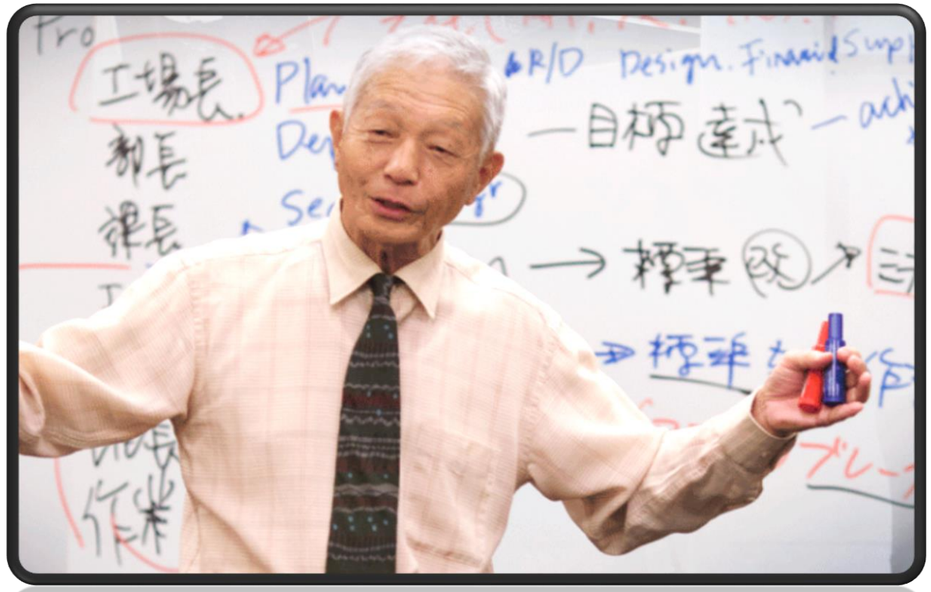
- What is the one given item in everyone's life?



Principles to putting together the strategy for an AEC firm's effective technology adoption.

1. Strategy before Technology.
2. Carefully consider both individual as well as company values.
3. Listen to your staff. That is where, "what your firm knows" resides.
4. Implement, get out of the way, and LISTEN!
5. Set the example and then live it.
6. Blend in a supportive, growth-centered, environment.
7. Plan to "measure what matters" to the planned out come – but don't try to measure everything.
8. Negotiate around obstacles as they arise while keeping the goal in sight.
9. Plan to adapt, evolve, and meet inevitable change.

Continuous Improvement - Kaizen & “Kairyo”



- The world first became aware of TPS (The Toyota Production System) when Taiichi Ohno published a book about his groundbreaking efforts at Toyota.
- Kaizen was loosely translated as “continuous improvement”. Ohno often used the Japanese word “Kairyo” to describe it.
- Kaizen is about changing one’s behaviors in order to benefit others.

Source: Jun Nakamuro

Kaizen Results = Kairyo

Source: Jun Nakamuro

Finding Waste

Architect Frank Gehry speaking with radio host and producer Frances Anderton of KCRW at the ULI Fall Meeting in Los Angeles.

Frank Gehry

Gehry said his role as an architect is to
“find technology that eliminates waste.”

Six Sigma – Lean Types of Waste

8 Wastes of Lean… But…
AEC industry uses all 8???

- **Talent**: staff that are not effectively engaged in the process.
- **Waiting**: waiting for the previous step in the process to complete.
- **Defects**: services that are out of specification that require resources to correct.
- **Overprocessing**: performing any activity that is not necessary to produce a functioning service.

Six Sigma – Talent

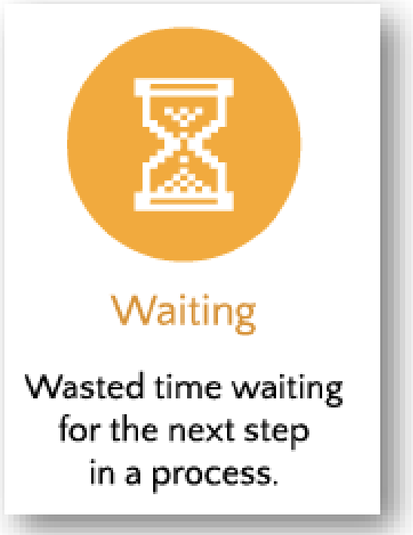
This waste is being increasingly seen within businesses today. Not or under-utilizing peoples' talents, skills, and knowledge can have a detrimental effect on an organization.

- Assigning staff to wrong tasks
- Wasteful admin tasks
- Poor communication
- Lack of teamwork
- Poor management
- Insufficient training

Sound Familiar? Many of these failings are the same ones that result in a lack of employee engagement, which hurts any firms productivity.

KEY SOLUTIONS: Empowering Staff, Stop Micromanaging, and Increase Training.

Six Sigma – Waiting



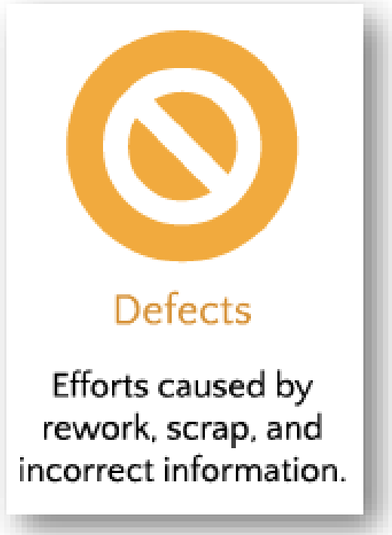
This occurs whenever work has to stop for some reason: because the next person is overwhelmed, because communication broke down, because you're waiting for approval, or because you don’t have the skillset.

- Unbalanced workloads
- Skillset not known
- Insufficient staffing
- Work absences
- Poor process or workflow
- Poor communication

Whatever the cause, staff has to wait for a bottleneck to be cleared.

KEY SOLUTIONS: Locate Communication Issues, Find Breakdown with Process/Workflow, Understand Where Staffing Issues Are, Staff Need to Learn New Skillset.

Six Sigma – Defects



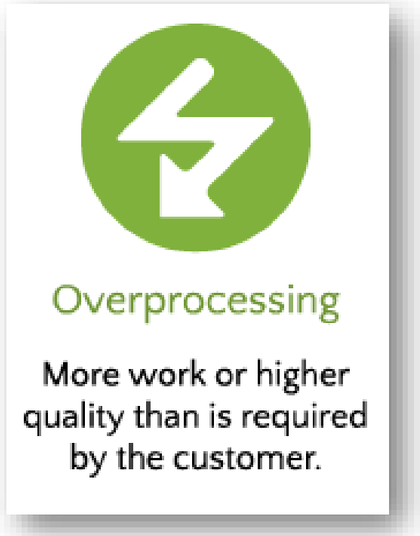
Mistakes that require additional time, resources, and money to fix. In any process, a defect might involve missed information, rework of design, owner change of mind and not communicated.

- Poor quality
- Poor documentation
- Lack of standards
- Weak or missing processes
- Misunderstanding owners needs
- Poor design and undocumented design changes

Completely eradicating any form of waste is impossible, BUT... Certainly can be limited!

KEY SOLUTIONS: Application of Standardized Work Plans, More Stringent Quality at All Levels, Full Understanding of Work Requirements and Owners Needs, Simple Process/Workflow Aids such as Checklists.

Six Sigma – Overprocessing



This often occurs due to the creation of multiple versions of the same task, process more than is required or long-winded poorly designed processes.

- Re-entering data and duplicated data
- Lack of standards
- Poor communication
- Excessive Redesign
- Misunderstanding of the owners needs
- Human error

All of these unnecessarily increase costs, time and resources.

KEY SOLUTIONS: Examine and Map your Organization to Analyze the Processes in Order to Fix Them, Standardize Processes, Empower Staff and Eliminate Unnecessary Documentation and Meetings.

Return on Investment

ROI analysis is one of many ways to evaluate a proposed investment. It compares the gains anticipated from an investment against the cost of the investment.

Here are just two simple examples in the construction industry of the adoption of better workflows that had substantial productivity benefits.

- In a tunnel project in the United States that involved almost 600 vendors, the contractor put in place a single platform solution for bidding, tendering, and contract management.
- This saved the team more than 20 hours of staff time per week.
- Cut down the time to generate reports by 75 percent.
- Sped up document transmittals by 90 percent.
- In another case, a $5 billion rail project saved more than $110 million and boosted productivity by using automated workflows for reviews and approvals.

 Source: McKinsey Global Institute

ROI 101 “Quick and Dirty Method”

ROI analysis is one of many ways to evaluate a proposed investment. It compares the gains anticipated from an investment against the cost of the investment.

Sample Scenario

- Several times each day, a staff member has to do a workflow/process that is intensive.
- This workflow/process when not done right can cause errors, communication issues, and delay other staff duties that rely on it being completed correctly.
- The staff member estimates 30 minutes per day is lost to remembering the steps in the workflow/process or asking for help from other staff.
- Person is paid $76,000 per year, but nobody in management will acknowledge that there is an issue to solve the problem because “we’ve always done it this way“.

 Source: Robert Green

ROI 101 “Quick and Dirty Method”

ROI analysis is one of many ways to evaluate a proposed investment. It compares the gains anticipated from an investment against the cost of the investment.

Raw Calculations

- New Technology Cost (workflow, training, software, consulting): $4,000
- Arch/Eng cost: $76,000/year at 200 working days per year at 8 hours per day = $47.5/hour
- Time lost: 30 minutes per day at 200 working days per year = 100 hours per year
- Money lost annually: 100 hours per year at $47.5/hour = $4,750/year
- Money lost over three years: $4,750/year x 3 years = $14,250

ROI 101 “Quick and Dirty Method”

In this case, ROI is simply the money you could save divided by the cost of the investment. By assuming a three-year life span, we obtain the following:

ROI = Savings/Cost = $14,250/$4,000 = 356%

Put it this way: If you could deposit $4,000 in the bank and in three years the bank would pay you back $14,250, would that be a good investment? Bankers and stockbrokers would kill for a 356% return over three years! Do you think upper management/owner will take notice when you present this ROI to them?

Remember, this is only one person in the firm, so start multiplying!

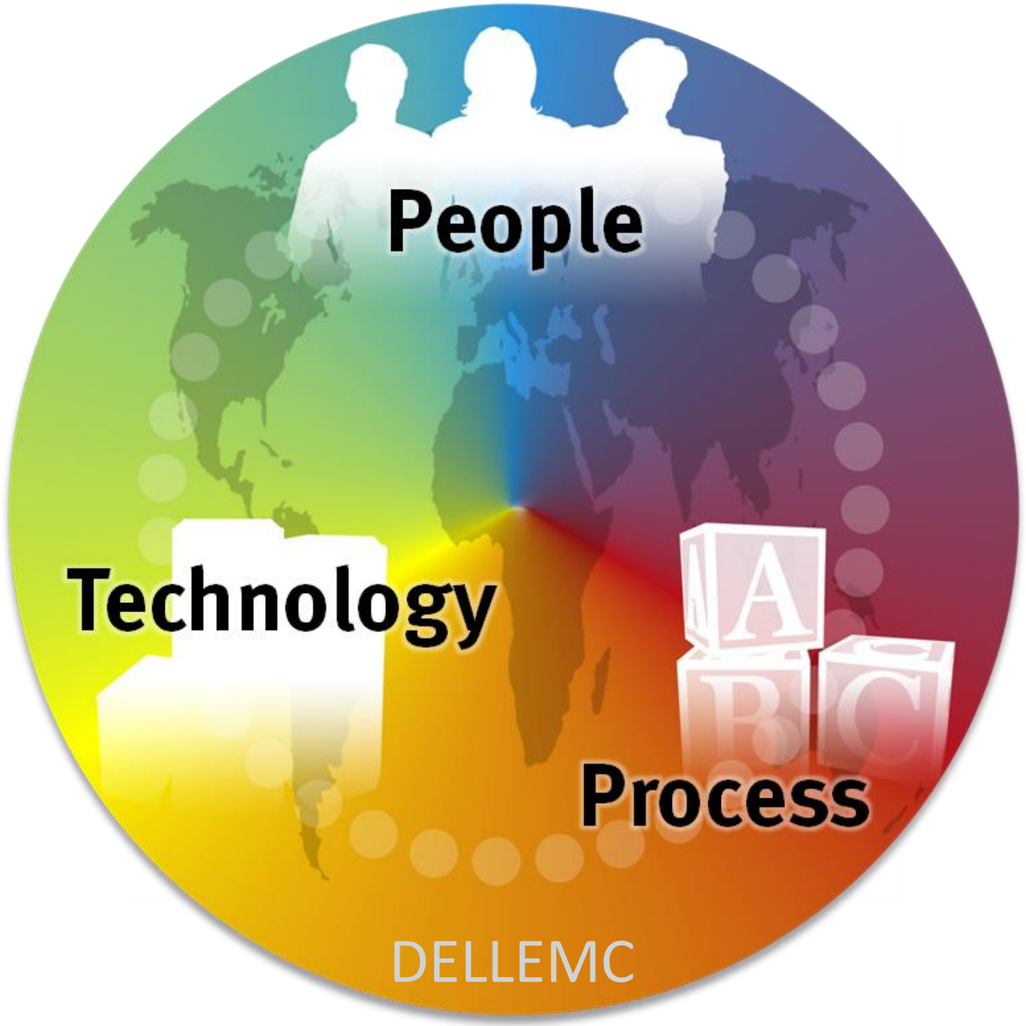
ROI 101 “Quick and Dirty Method”

Finally, If you go to management and tell them it appears we're paying an a staff member $14,250 over three years to accomplish a certain task that could be solved by new “workflow, training, software, consulting” but is too expensive.

Watch the expression on your upper management/owners face as they grasp the business case you're making — then watch your new “workflow, training, software, or consulting” show up in short order.

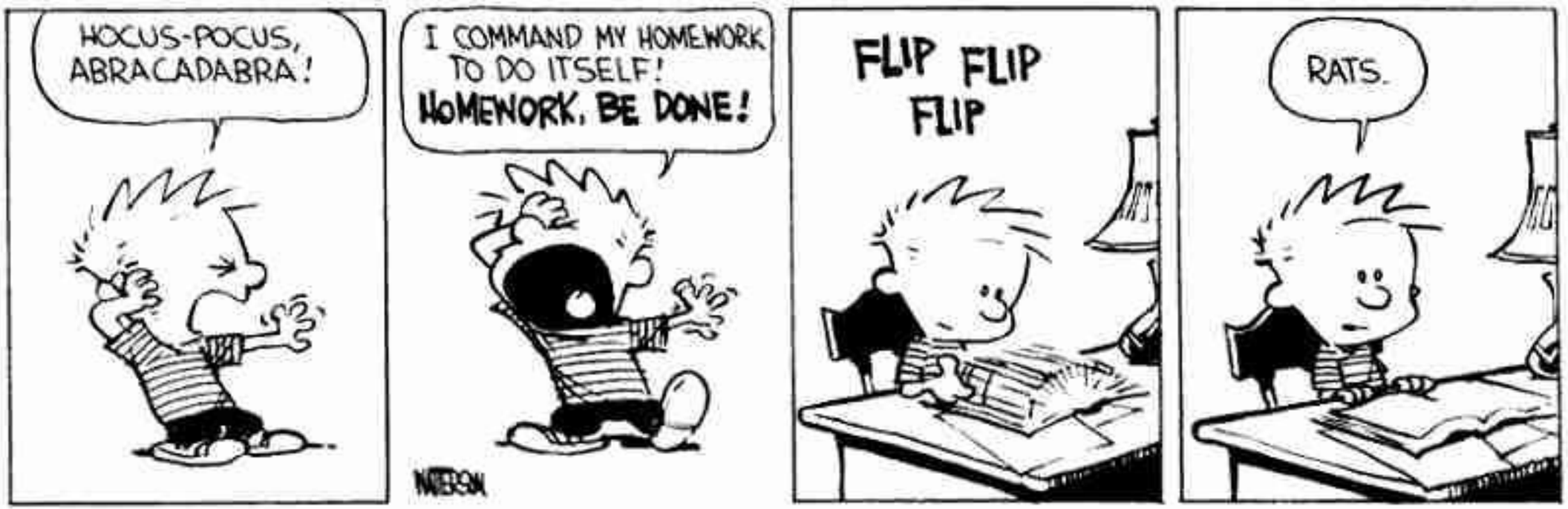
The moral of the story: Don't just ask for things. Use this quick and dirty ROI method to justify your requests, then watch your budgets get approved!

Continuous Improvement Cycle

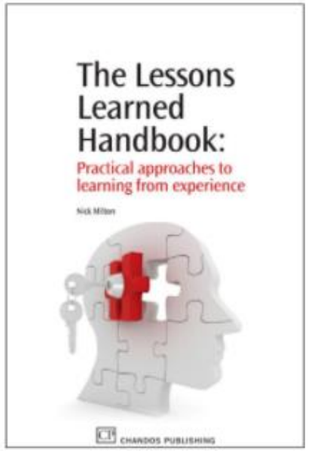


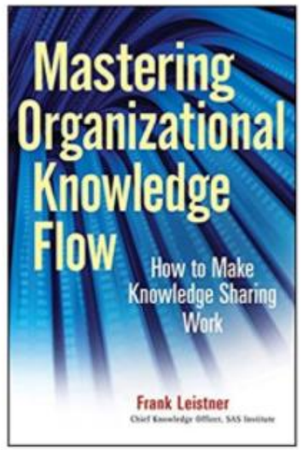
Taking each process that we looked at
you are now on your way to
“Continuous Improvement Cycle”

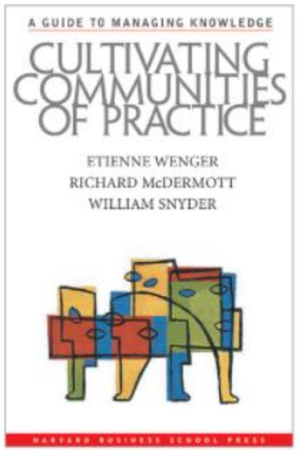
Additional Homework…



So you want to build a Learning Organization? LINK







BLOG: www.JarodSchultz.com
LinkedIn: linkedin/in/JarodSchultz
Twitter: twitter.com/JarodJSchultz

Technology Disruption, Now What?!?!

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Director of Specialized Services

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