

# IIoT & Digital Transformation

Payback? Where we are going, we don't need payback

Presented by:

William Leet

Sr. Offering Management Specialist, Connected DC

Honeywell Intelligrated



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# Presenter



## William Leet

Sr. Offering Management Specialist, The Connected Distribution Center

**Responsibilities:** support customers with leveraging IIoT technologies for digital transformation for distribution center, material handling and warehouse industries

**Experience:** six years in the building automation and energy management industry working with smart buildings, and two years in the industrial automation industry helping design industry 4.0-enabled machines

**Education:** mechanical engineering,  THE OHIO STATE UNIVERSITY



### When I'm not working:

road cycling/racing, backpacking,  
mountain biking, motorcycling

# Objectives

- Review barriers to adoption
- Understand and set financial criteria for evaluating IIoT
- Risk and sensitivities for IIoT adoption
- How to quantify benefits and recognize intangible benefits
- Prove it – how to validate financial performance before scaling

# IIOT TECHNOLOGY ADOPTION

## DIGITAL TRANSFORMATION EXAMPLE

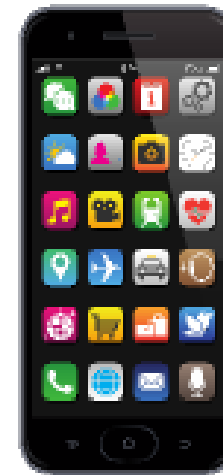
Physical



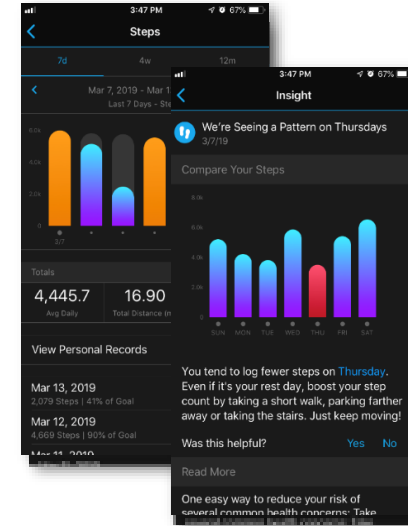
Analog to digital



New operation, roles, process



New business and customer focus



### DIGITIZATION

We digitize information.

### DIGITALIZATION

We digitalize processes and roles.

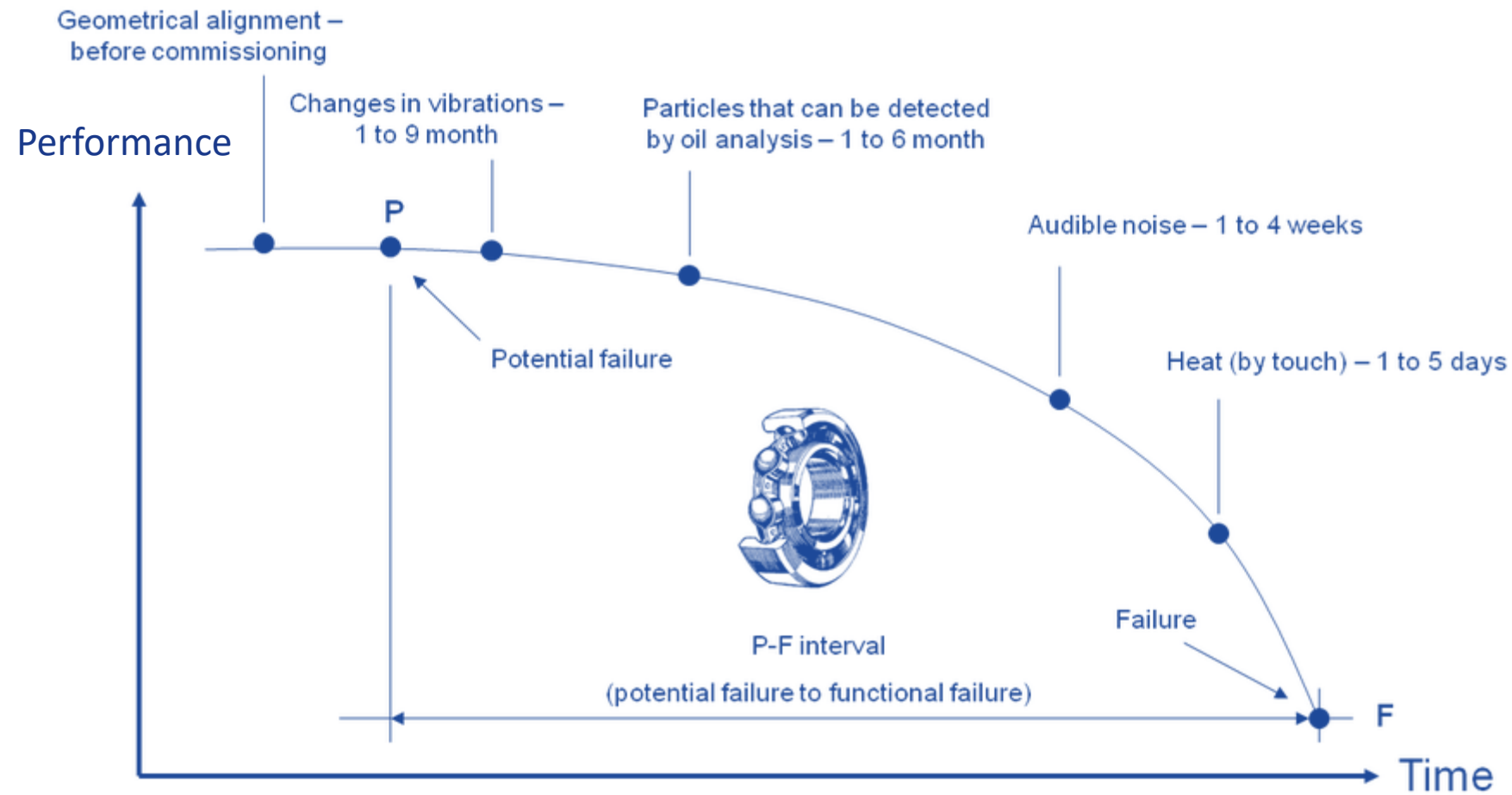
### DIGITAL TRANSFORMATION

We transform the business.

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# Asset Health & Predictive Maintenance



# Vibration Analysis Use Case

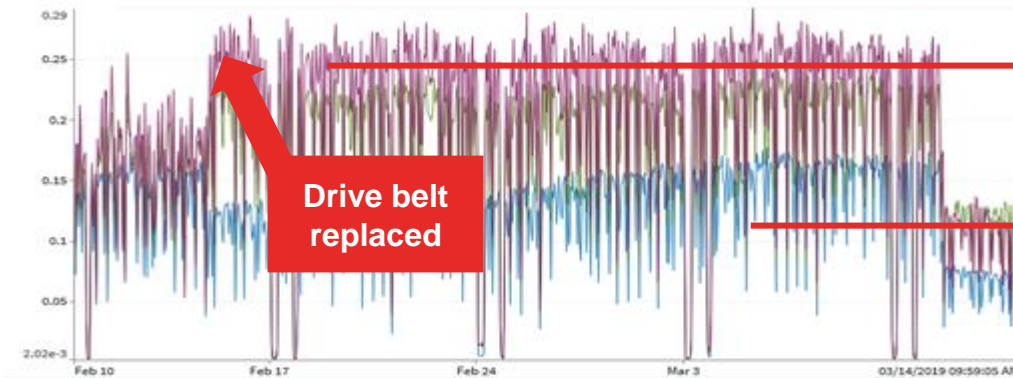
- ✓ Increase in vibration detected
- ✓ Inspection requested
- ✓ Inspection uncovered a misaligned gearbox
- ✓ Issue corrected with no long-term damage



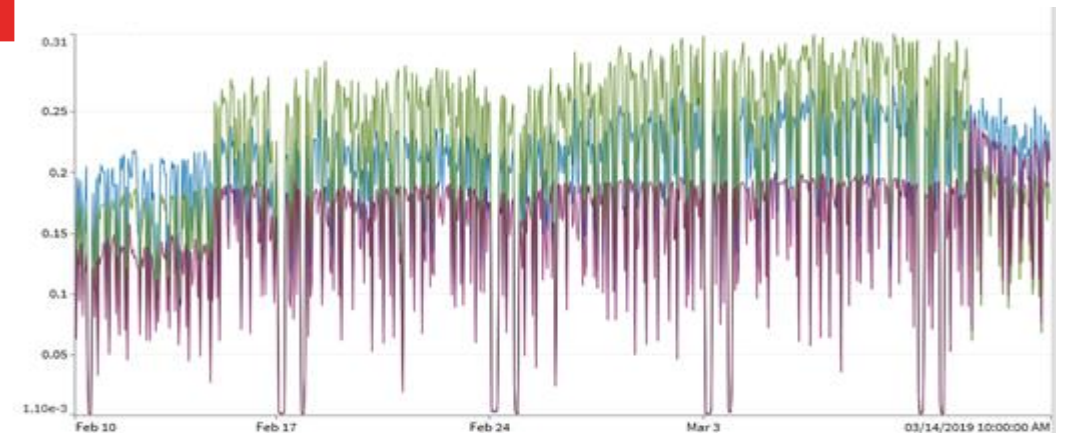
Change detected

Gearbox realignment

Drive belt replaced



VELOCITY



ACCELERATION

# What Are CEOs Saying About Digital Transformation?

Business senior leadership's adoption of IIoT

**STRATEGY** – Digital is a leadership priority.

53

% of respondents who “agreed” or “strongly agreed”

We have a strategy for how digital will enable competition.

29

% of respondents who “agreed” or “strongly agreed”

**EXECUTION** – Digital strategy is translated to specific initiatives.

20

% of respondents who “agreed” or “strongly agreed”

**RESOURCES** – We have sufficiently skilled resources.

30

% of respondents who “agreed” or “strongly agreed”

A majority of business leaders say digital transformation is a priority, but few define any strategic vision or actionable goals.

Source: McKinsey analysis 2016

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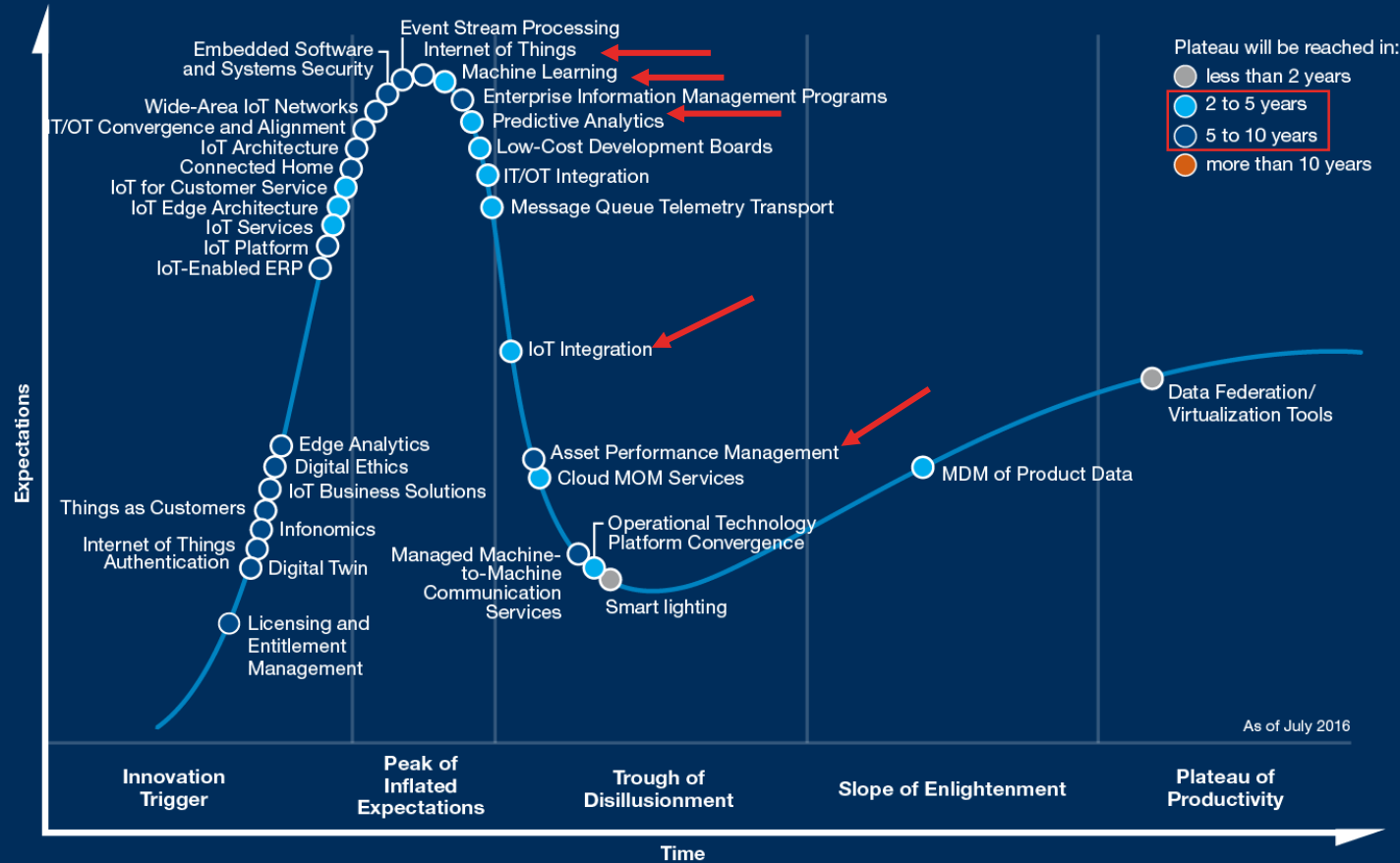
# Honeywell Webinar Survey Results

This statement best describes my level of IIoT adoption:





# Gartner Hype Cycle for the Internet of Things, 2016



[gartner.com/SmarterWithGartner](http://gartner.com/SmarterWithGartner)

Source: Gartner  
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**Gartner**



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# So why are 75% of IIoT projects are failing?

- ✓ We understand the technology
- ✓ We think it is important
- ✓ We know there are benefits
- ✓ Everyone is talking about IIoT



# Customer Barriers, per MHI 2019 Study

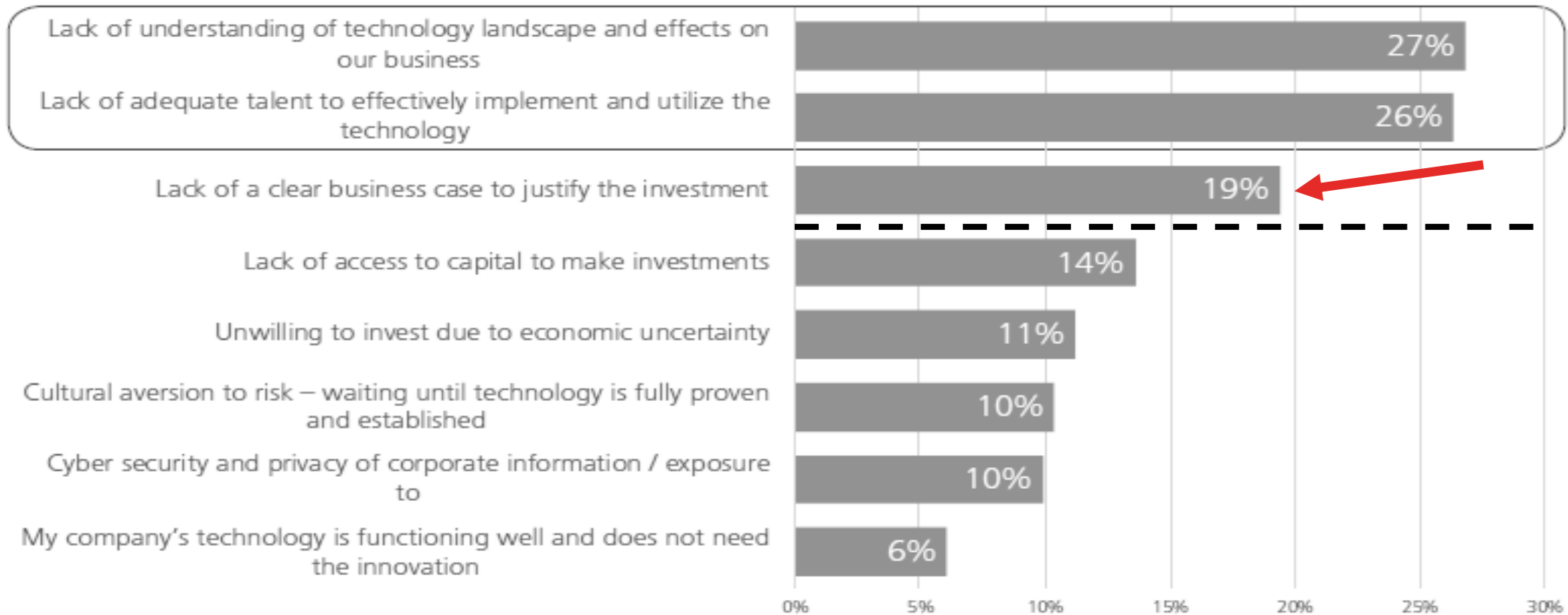
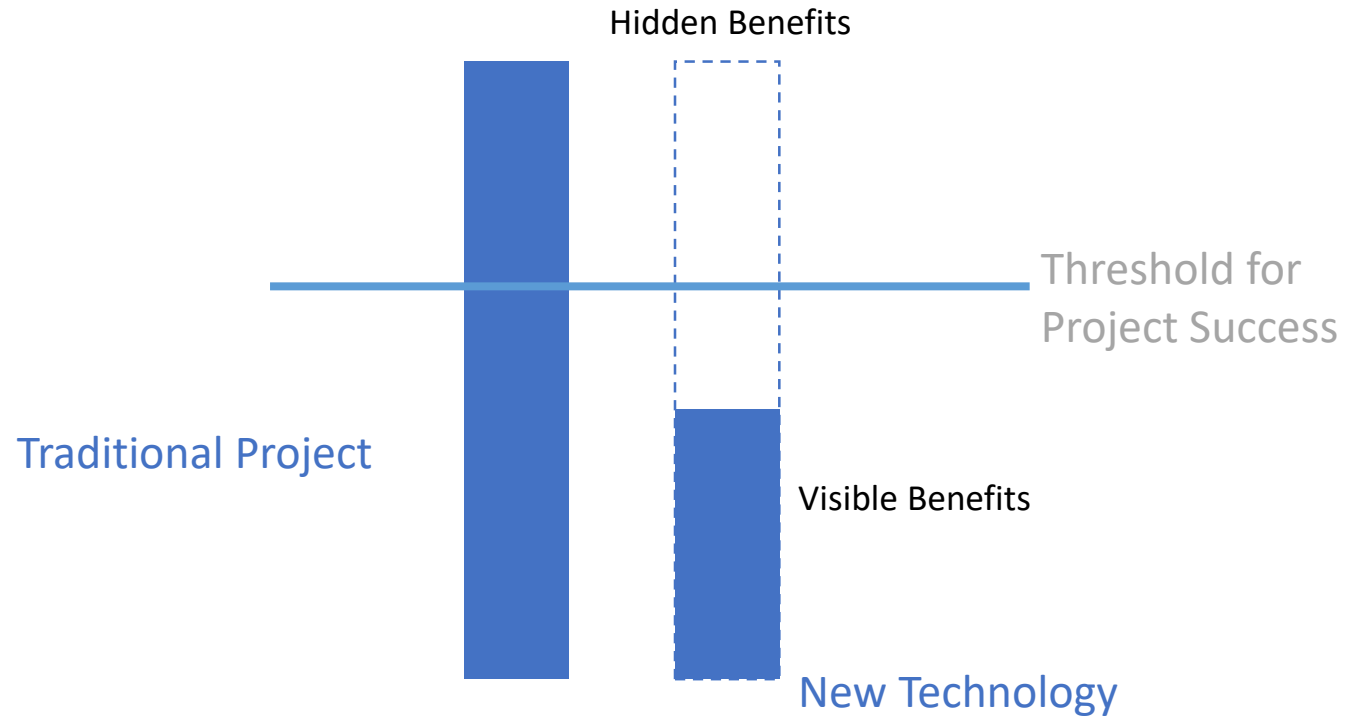


Figure 14: Barriers to Adoption of Predictive/Prescriptive Analytics Innovations



# What's the payback?



Payback?



Where we're going we don't need payback!

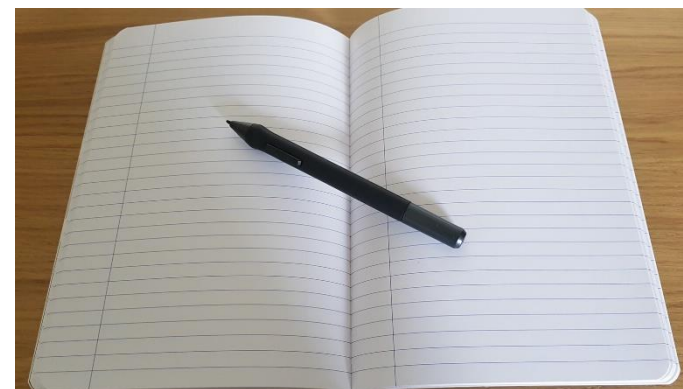
leaders in IOT adoption were **75 percent more likely** to cite the preparation of a **strong business case** as a key success factor for their IoT programs.

Without such a vision or value metrics, companies will find it difficult to tie their IoT programs to their business strategies, **disrupt obsolete processes**, and **measure progress** toward implementation.

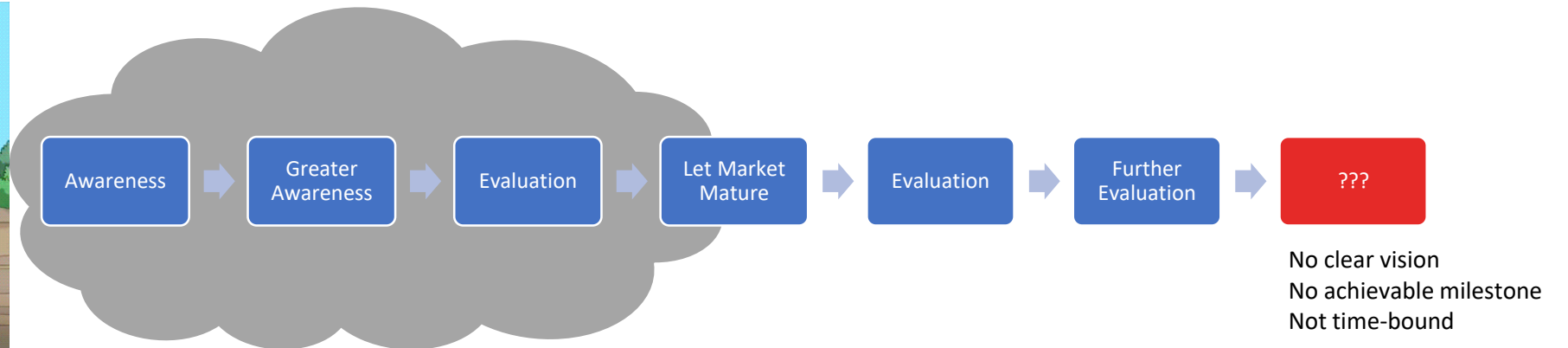
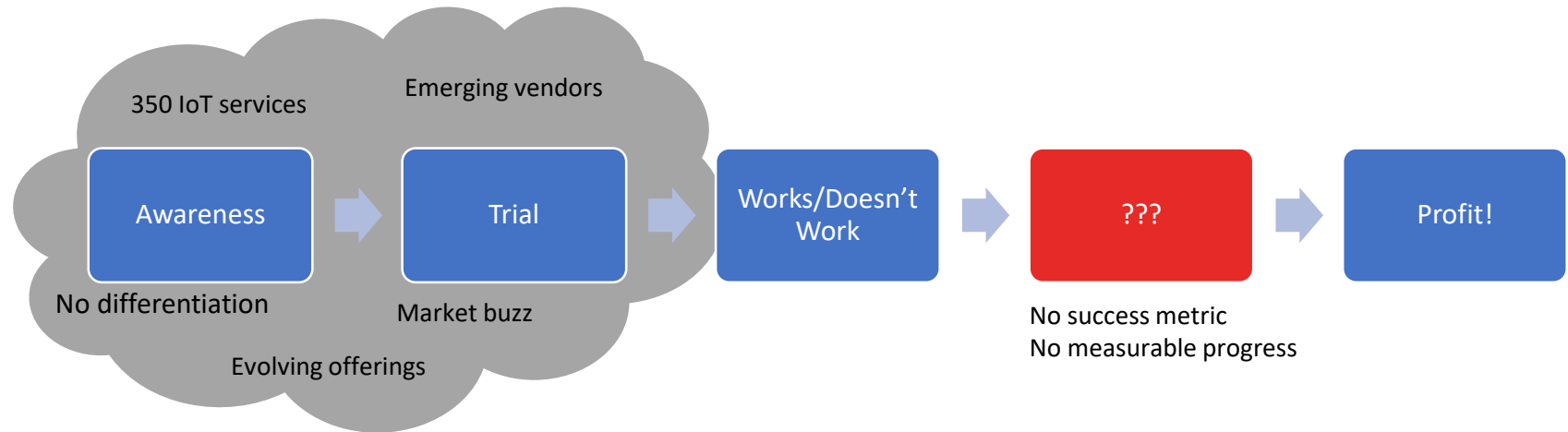
-McKinsey survey of IoT practitioners 2018

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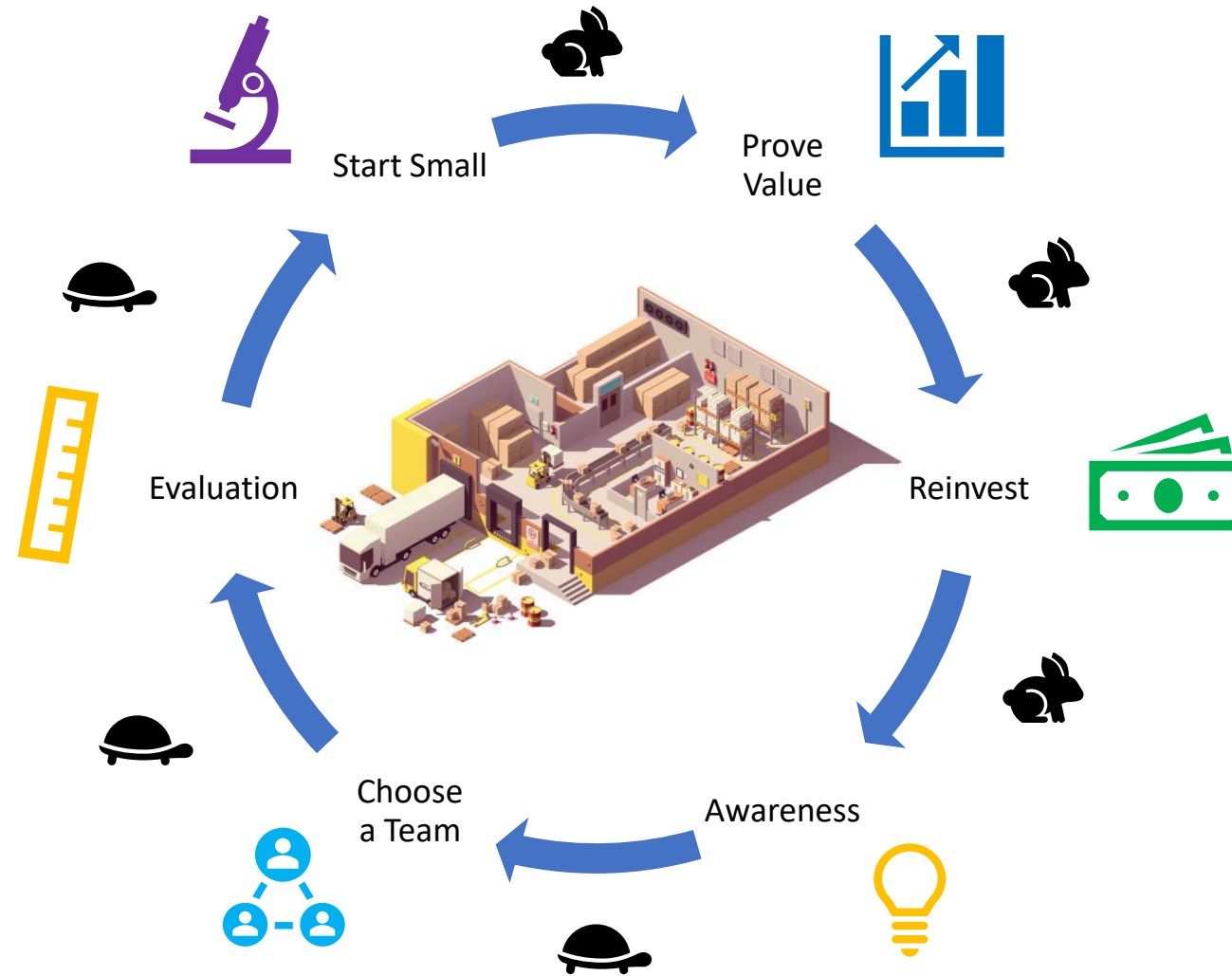




# Innovation Process



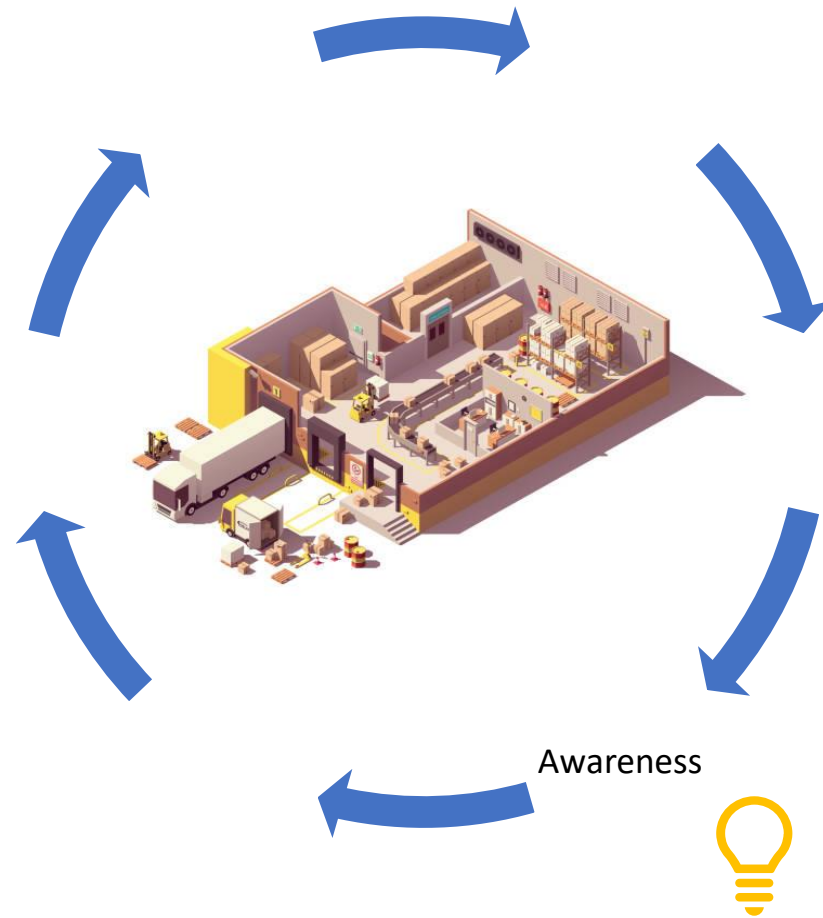
# Innovation Process



“Hortise”  
Approach

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# IIoT Market Awareness



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# Customer Barriers, per MHI 2019 Study

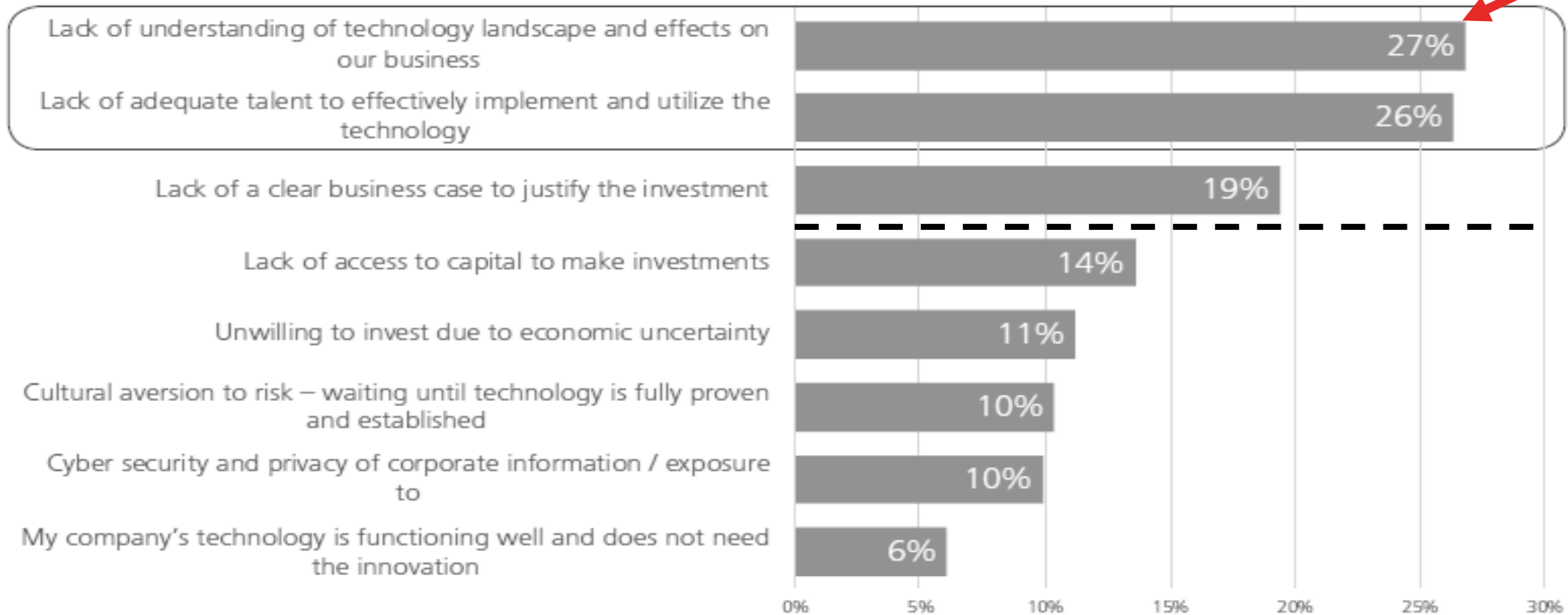


Figure 14: Barriers to Adoption of Predictive/Prescriptive Analytics Innovations



# Try Premium. For 30 days.

- ✓ Spotify on your mobile
- ✓ Enhanced sound quality
- ✓ No advertisements
- ✓ Offline mode for your playlists
- ✓ Take your music abroad
- ✓ Unlimited music.



YouTube and YouTube Music ad-free.  
Plus access to all YouTube Originals.

TRY IT FREE

3-month free trial • \$11.99/month



# ENJOY

3 MONTHS FREE

## pandora

PREMIUM

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Music  
Unlimited

Any song,  
anywhere

Start your 30-day free trial



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# Choosing your IIoT Success Team



# Customer Barriers, per MHI 2019 Study

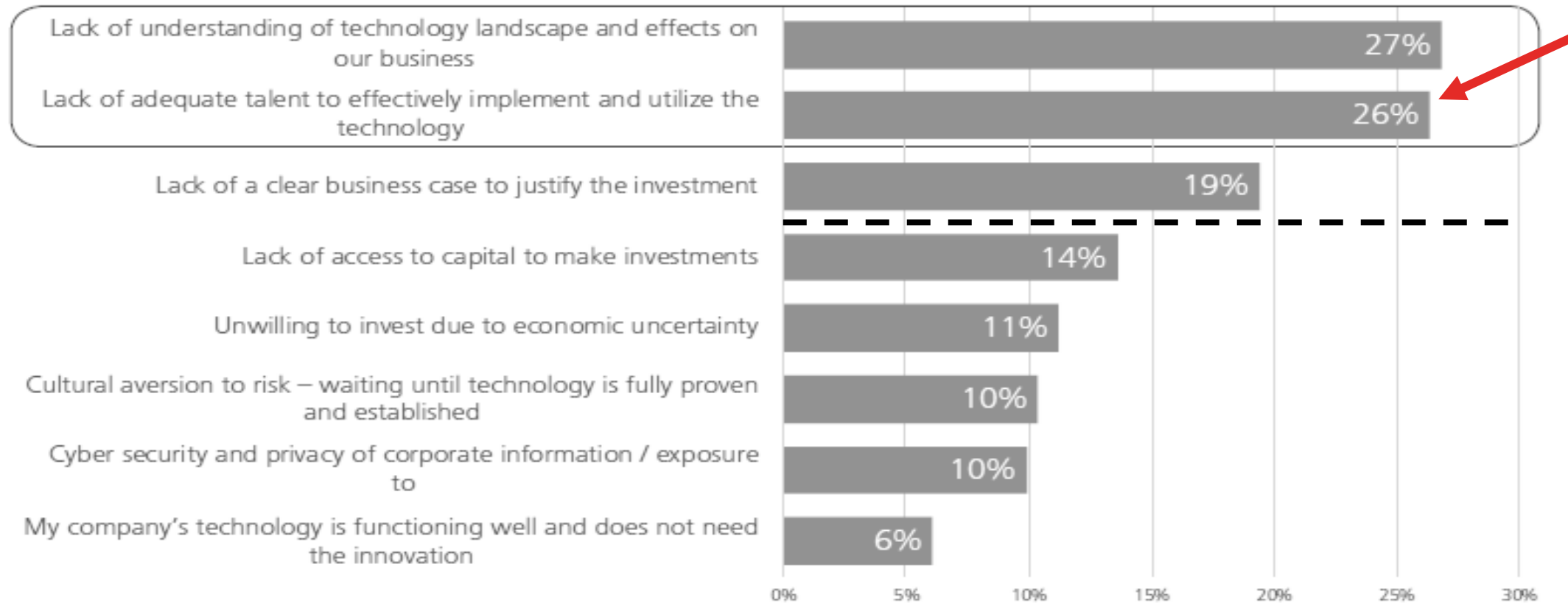


Figure 14: Barriers to Adoption of Predictive/Prescriptive Analytics Innovations



# Choose A team

Members of an innovation team:



**Visionary:** someone with clear direction on how and where to innovate



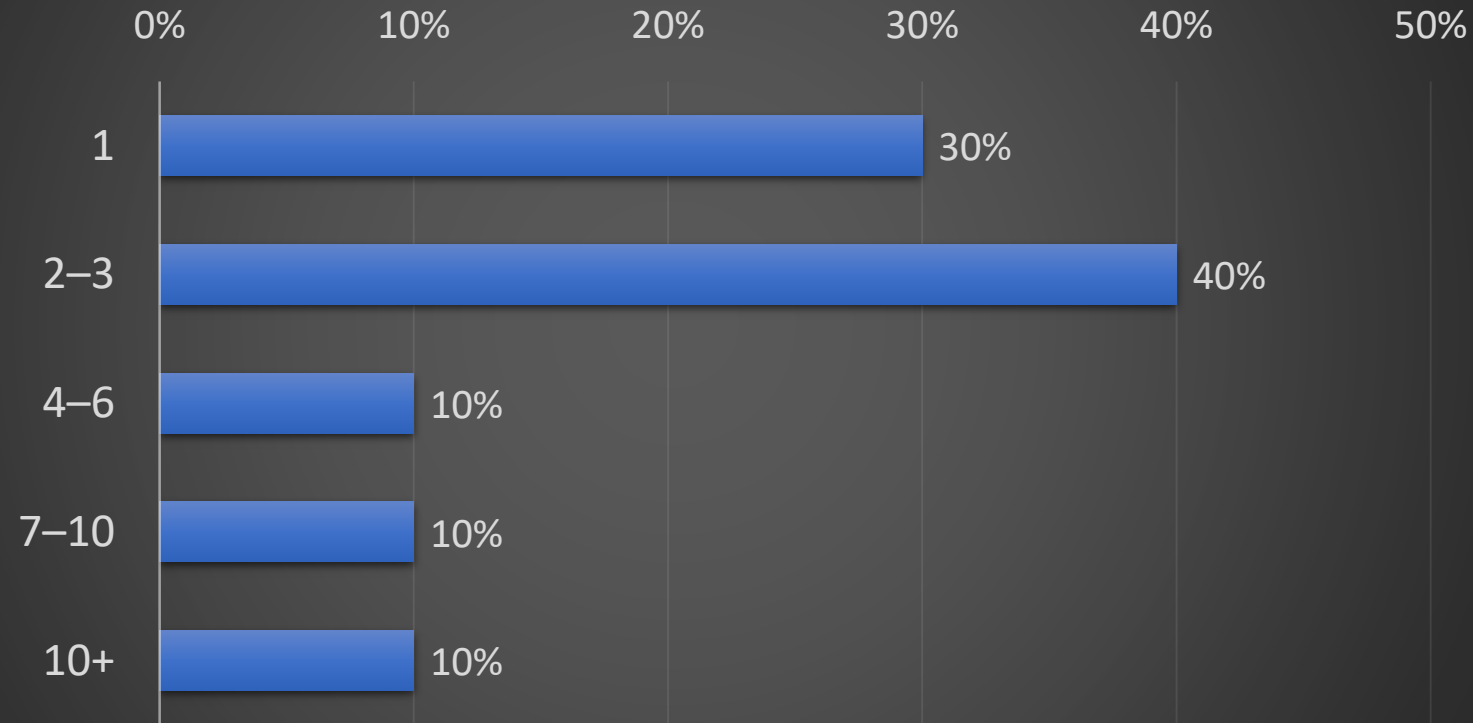
**Motivator/Coach:** someone with the capacity to engage others



**Executor:** someone with ability and resources to affect change

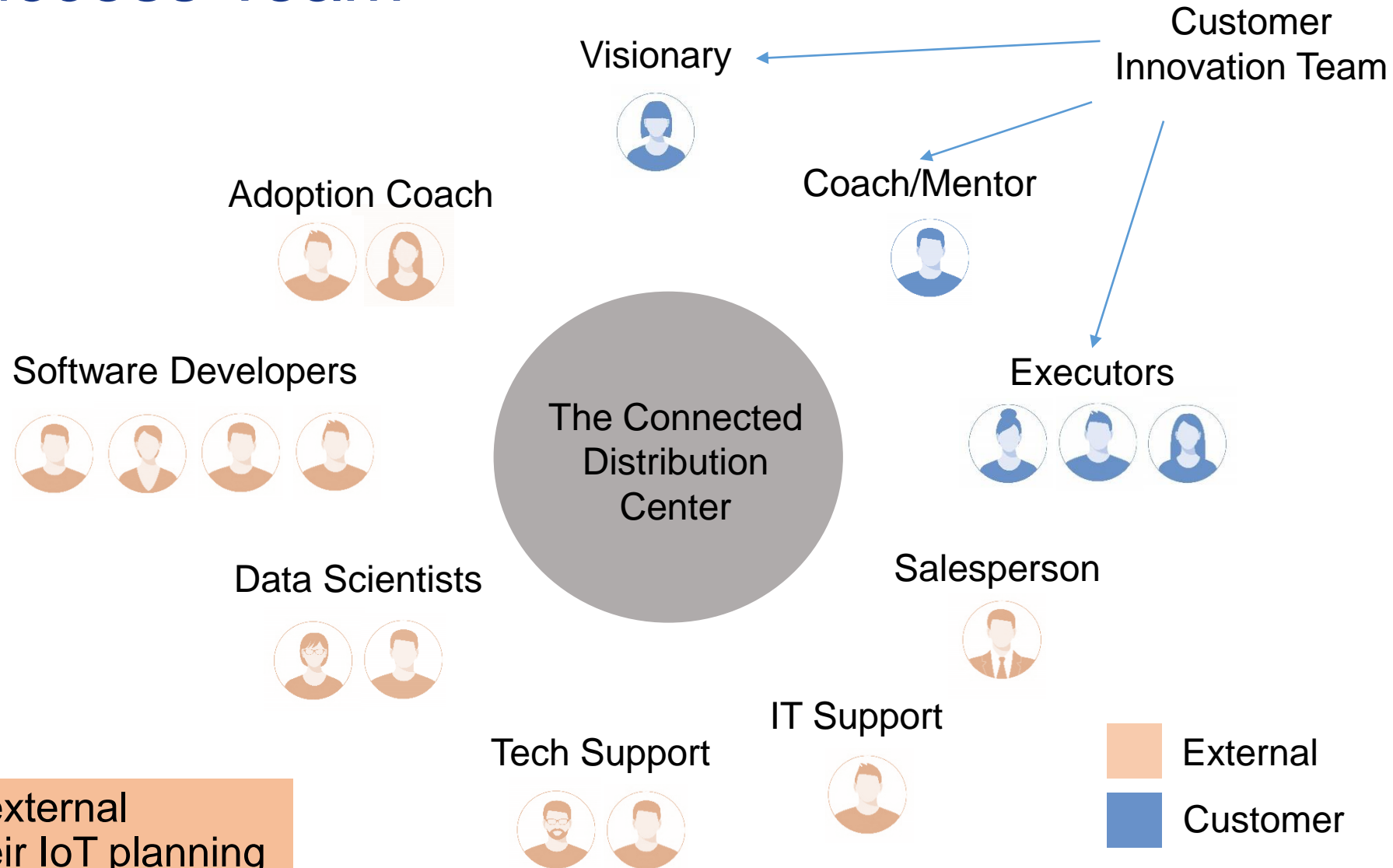
# Honeywell Webinar Survey Results

How many people are included in my IIoT team initiative?



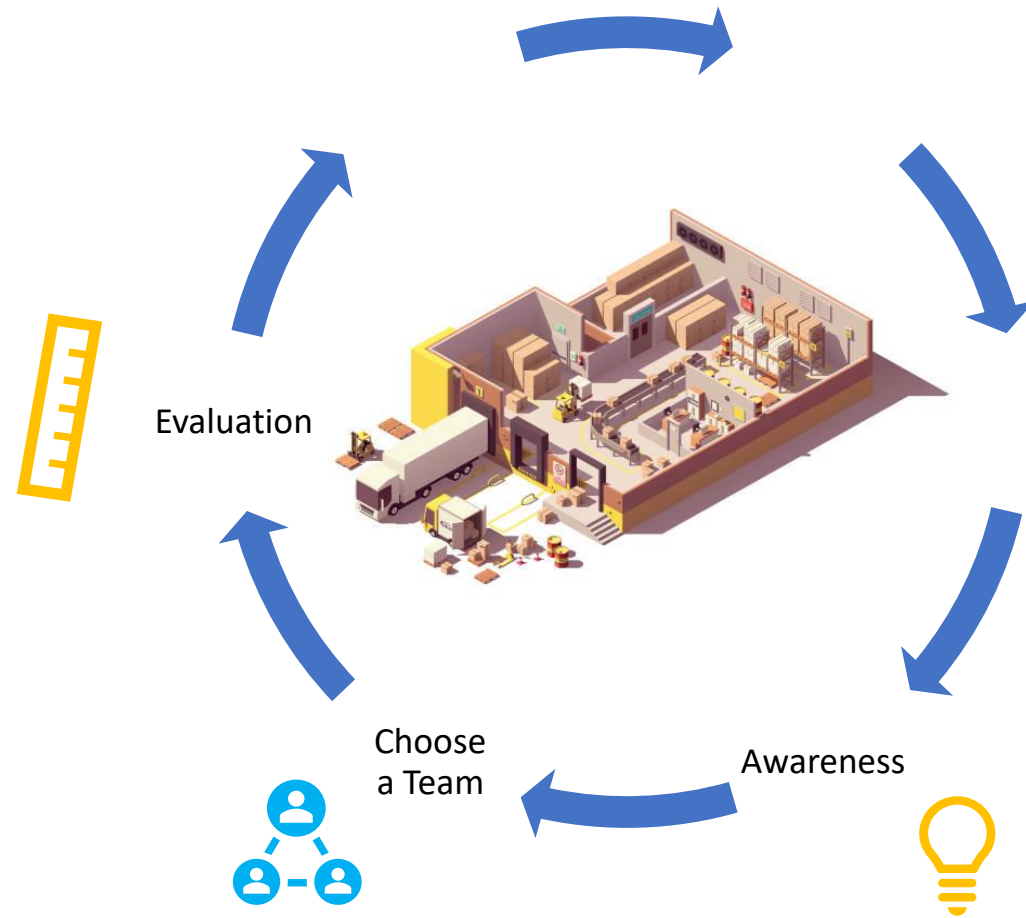
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# IIoT Success Team



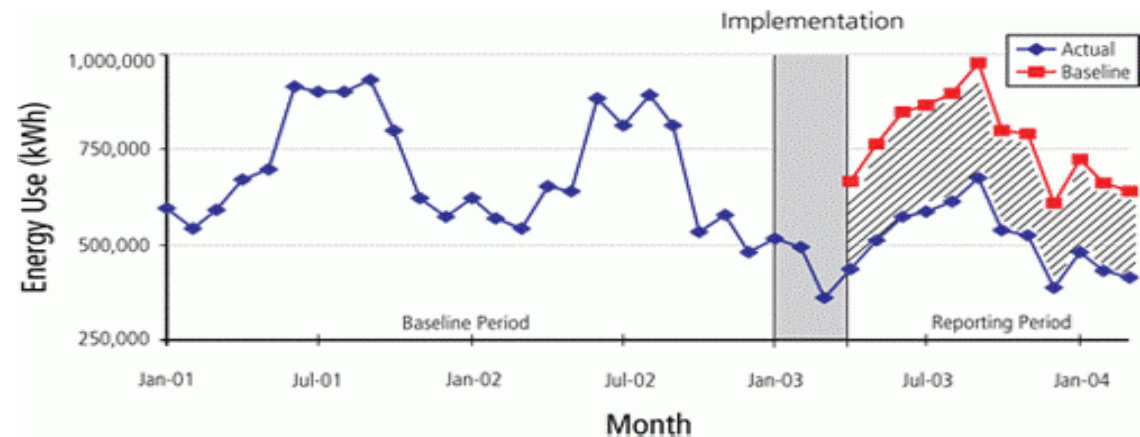
“66% include external vendors on their IIoT planning team” — *Forbes Insights*

# Evaluating Outcomes





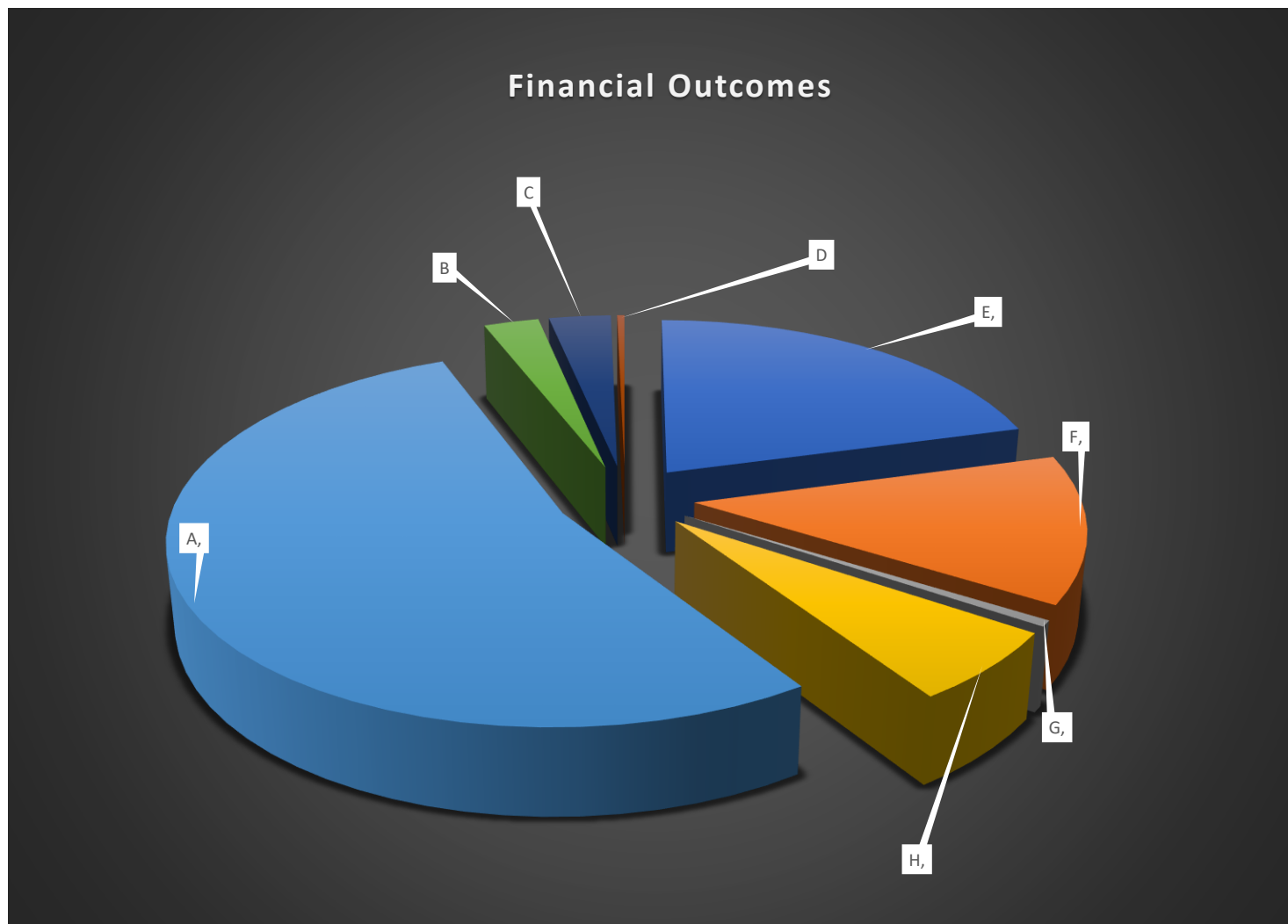
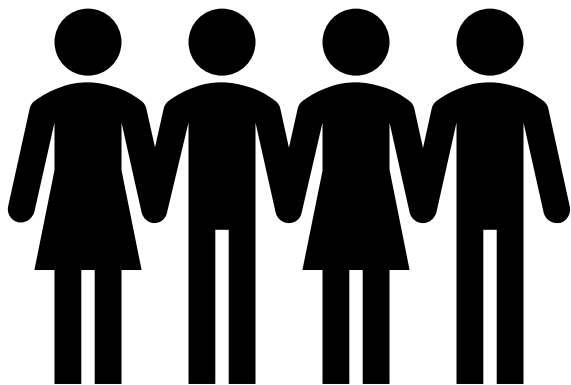
# Lessons from Building Energy



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# Evaluation

Align benefits with key stakeholders



# What Business results can we expect?

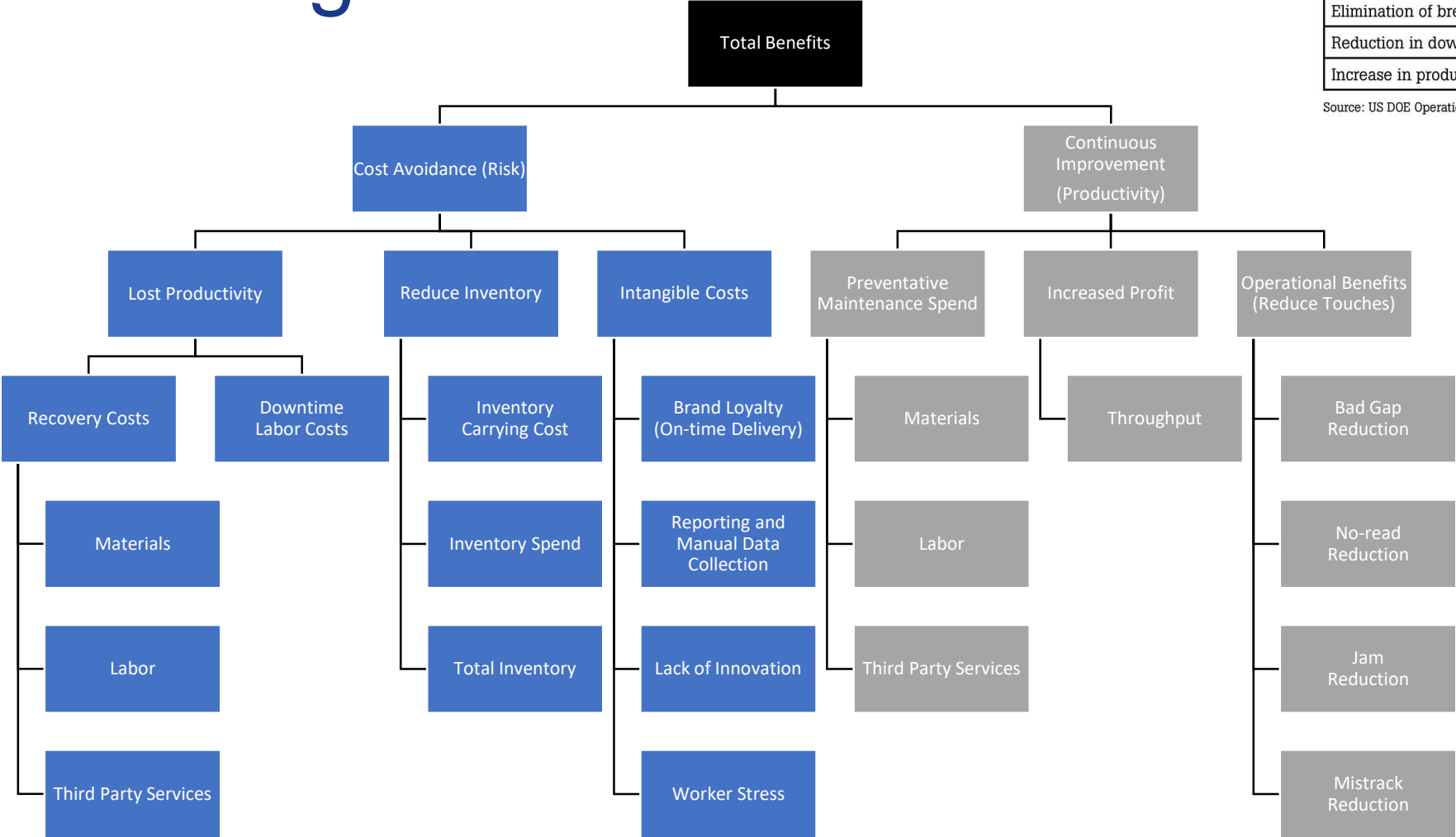
| Average savings from a functional predictive maintenance program |            |
|--|------------|
| Return on investment   | 10 times   |
| Reduction in maintenance costs                                   | 25% to 30% |
| Elimination of breakdowns  | 70% to 75% |
| Reduction in downtime  | 35% to 45% |
| Increase in production   | 20% to 25% |

*Source: US DOE - Operations & Maintenance Best Practices 2010*

A properly functioning predictive maintenance program can provide a savings of **8% to 12%** over a program utilizing preventive maintenance alone.

Depending on a facility's reliance on reactive maintenance and material condition, it could easily recognize savings opportunities exceeding **30% to 40%**.

# Benefit Modeling



Standard returns on CBM

|                                |            |
|--------------------------------|------------|
| Return on investment           | 10%        |
| Reduction in maintenance costs | 25% to 30% |
| Elimination of breakdowns      | 70% to 75% |
| Reduction in downtime          | 35% to 45% |
| Increase in production         | 20% to 25% |

Source: US DOE Operations & Maintenance Best Practices guide, 2010



# Example: 3M's IIoT Project

Minnesota Public Radio reports that 3M staff earlier this year removed over 1,000 clocks from its 400-acre campus, leaving up only a handful in places like laboratories and fitness centers.

The shift recognized that few people need wall clocks any longer, not when the correct time is always available with a glance at their phones – which are generally more accurate than modern mechanical clocks anyway.

The mass removal eliminates the need for 3M to staff a crew of nearly two dozen people, two weekends a year, to reset clocks and replace batteries during 12-hour shifts. It also saves roughly \$35,000 a year in the cost of batteries, MPR reports.

3M also noted that the change could reduce potential fall injuries caused by workers climbing up and down ladders a few thousand times a year.

And there are other potential benefits: Researchers at Yeshiva University's Sy Syms School of Business in New York conducted a study in 2014 that found employees were happier and more productive if they weren't beholden to a clock-based schedule. Even the presence of a clock was enough to hurt employee creativity in their study, *The Wall Street Journal* reported.

You could give 160 employees iPhones, or 1,900 Fitbits

Annual Net Benefit:  
>\$120,000

Productivity

Time Accuracy:  
\$6,400

Labor: \$38,707

Batteries: \$35,000

Additional  
Functionality: \$1

Creativity: \$1

Happiness: \$1

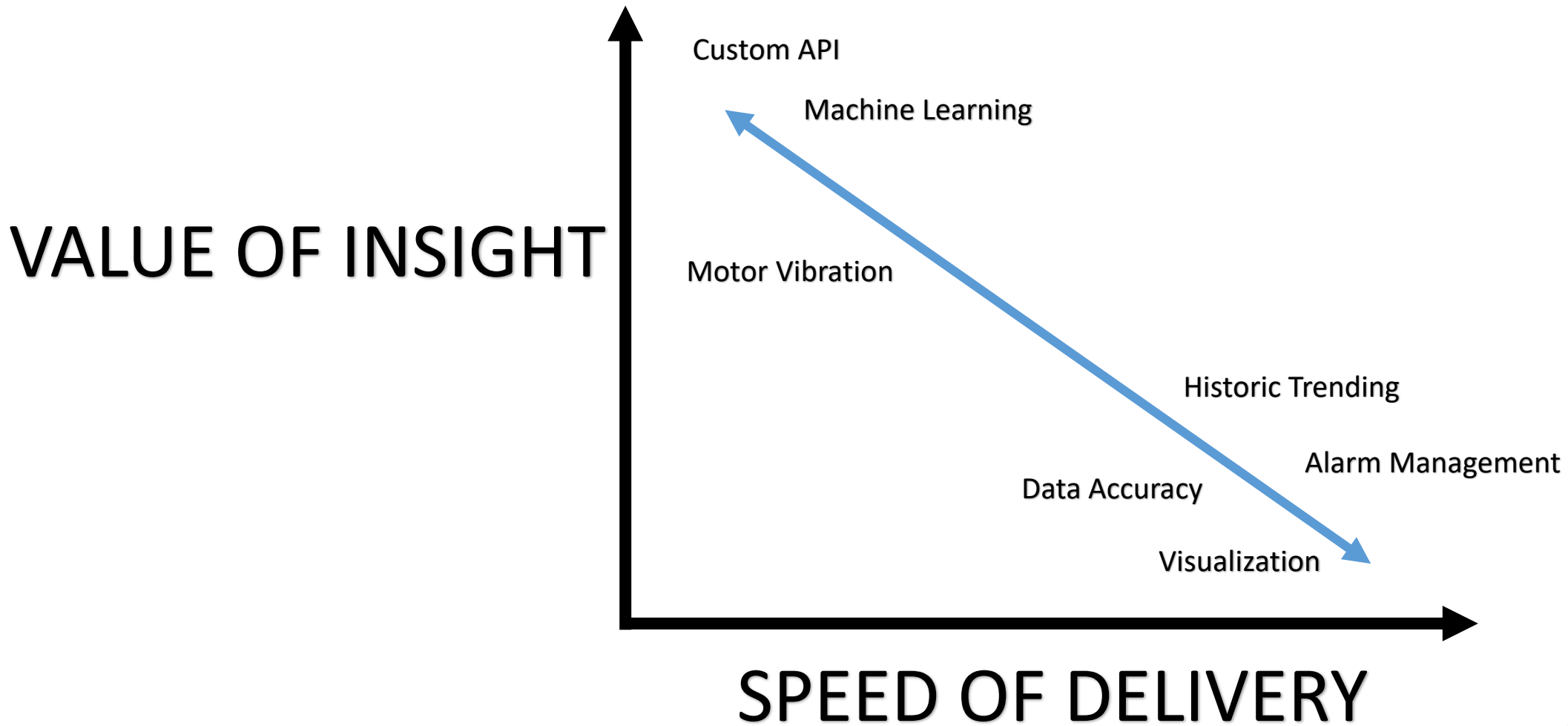
Risk

Medical: \$34,294

Lost Labor: \$5,000

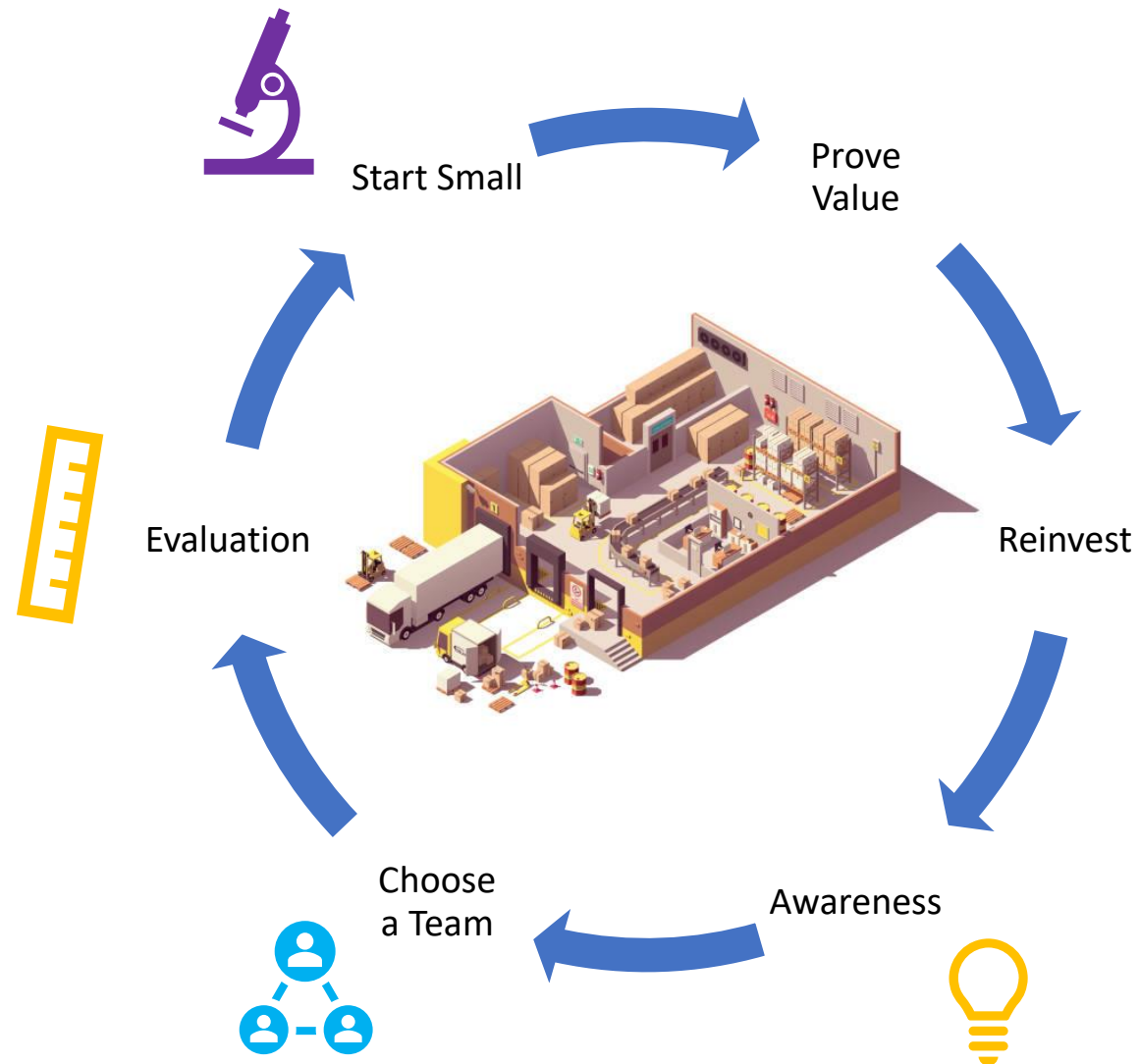
Company EMR:  
???

# Speed to value



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# Start Small to Prove Value



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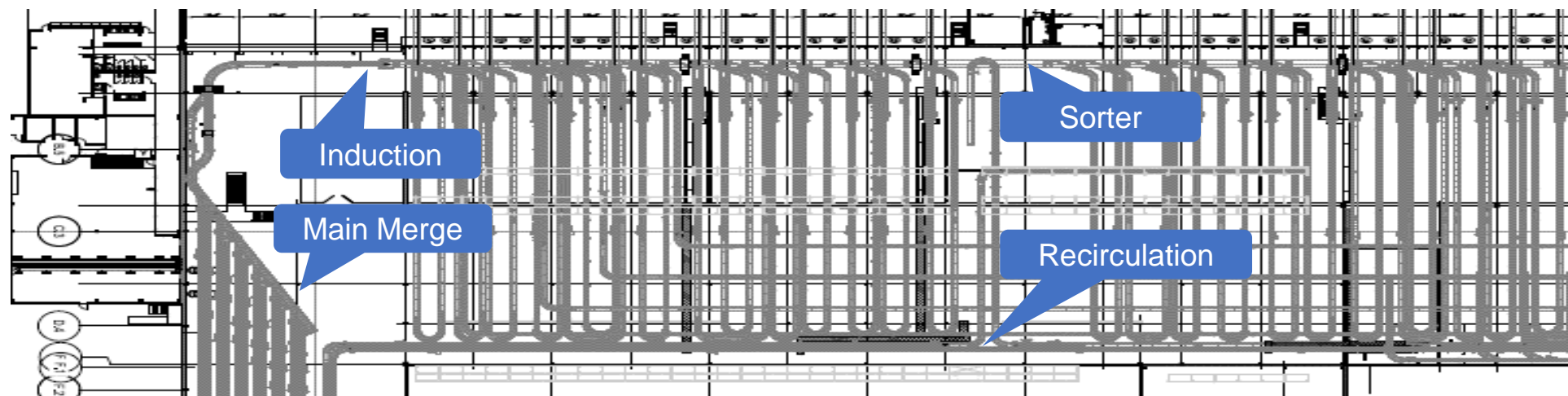


# Pick a “start small” that is BIG enough to succeed





# Scope: Sortation — Critical Path



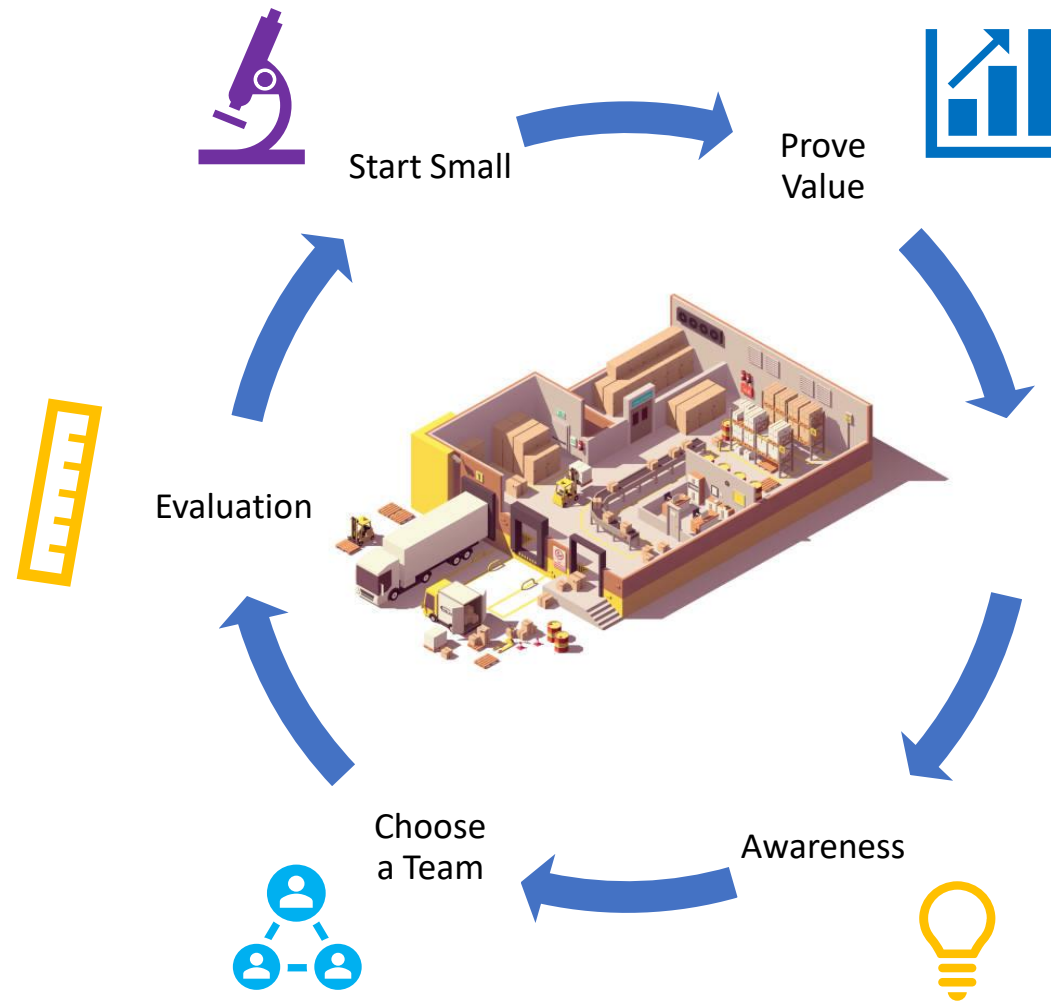
| Critical Path Equipment  |   |  |
|--|---|--|
| Merge motors   | Scanners/scales   | Ambient conditions   |
| <i>Includes any motors for the recirculation lane (attached with the monitored sortation system) and associated power transfer components such as: meter belts, staging belts, vertical transfer belts, spurs and merge main beds. Takeaway belts for the recirculation lane are attached with the monitored sortation system.</i> | <i>Includes any scanners, dimensioners and scales attached to the monitored sortation system.</i>   | <i>Includes sensors on all monitored control panels described above and a single sensor to monitor conditions of the occupied space inside the building.</i> |
| <i>Monitoring: vibration, temperature, run status, product counts and I/O cycle counts</i>   | <i>Monitoring: read and error rates</i>   | <i>Monitoring: temperature/humidity</i>  |
| Induction motors   | Sorters   |  |
| <i>Includes any motors from the exit of monitored sortation system merge to the start of the monitored sortation system.</i>   | <i>Includes any sorter motors. If the system has subsequent sorter systems, it will also include any motors interconnecting the sorters.</i>      |  |
| <i>Monitoring: vibration, temperature, run status, product counts and I/O cycle counts</i>   | <i>Monitoring: vibration, temperature, run status, product counts, I/O cycles, key performance indicators and power consumption</i>               |  |
| Recirculation motors   | Control panels  |  |
| <i>Includes any conveyor motors along the recirculation loop from the exit of the sortation system along the path to the entrance of the same sortation system. Not all systems will have a recirculation loop.</i>  | <i>Includes control panels but limited to any control panel associated with the sortation system control and the main sortation system merge.</i> |  |
| <i>Monitoring: vibration, temperature, run status</i>  | <i>Monitoring: power consumption</i>  |  |

# Start Small and Prove Value

- Start with an achievable project
- Organize and build out your team
- Define return
- Test technology



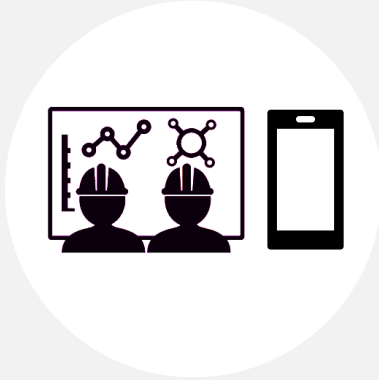
# Prove it!



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# IIoT Deployment Stages

## STAGE 1 VISUALIZATION



- Graphical UI
- Historical data capture

**\$31,746**

## STAGE 2 INSIGHTS



- Trend analysis
- Mobile alerts
- Predictive maintenance
- Optimization

## STAGE 3 AUTOMATION



- Work orders and reporting
- Inventory optimization
- Labor optimization



# Benchmark Performance

DC4 Carton Flow 1 Jams

DC4 Carton Flow 1 Xfer Total Jams - 30 Day

| Item                     | Units | 10/05/2019<br>08:09:38 AM | 11/20/2019<br>11:17:14 AM |
|--------------------------|-------|---------------------------|---------------------------|
| DC4MOD1L1XFER1JAMTOTAL30 |       | 54                        | 48                        |
| DC4MOD1L1XFER2JAMTOTAL30 |       | 375                       | 340                       |
| DC4MOD1L1XFER3JAMTOTAL30 |       | 456                       | 326                       |
| DC4MOD1L1XFER4JAMTOTAL30 |       | 814                       | 439                       |
| DC4MOD1L1XFER5JAMTOTAL30 |       | 1490                      | 735                       |
| DC4MOD1L1XFER6JAMTOTAL30 |       | 584                       | 402                       |
| DC4MOD1L2XFER1JAMTOTAL30 |       | 674                       | 281                       |
| DC4MOD1L2XFER2JAMTOTAL30 |       | 893                       | 569                       |
| DC4MOD1L2XFER3JAMTOTAL30 |       | 644                       | 463                       |
| DC4MOD1L2XFER4JAMTOTAL30 |       | 1178                      | 822                       |
| DC4MOD1L2XFER5JAMTOTAL30 |       | 955                       | 558                       |
| DC4MOD1L2XFER6JAMTOTAL30 |       | 1229                      | 628                       |
| DC4MOD1L3XFER1JAMTOTAL30 |       | 711                       | 561                       |
| DC4MOD1L3XFER2JAMTOTAL30 |       | 409                       | 591                       |
| DC4MOD1L3XFER3JAMTOTAL30 |       | 781                       | 839                       |
| DC4MOD1L3XFER4JAMTOTAL30 |       | 825                       | 730                       |
| DC4MOD1L3XFER5JAMTOTAL30 |       | 540                       | 546                       |
| DC4MOD1L3XFER6JAMTOTAL30 |       | 1340                      | 775                       |
| Add Item...              |       |                           |                           |



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# Vibration Analysis Use Case

\$35,000

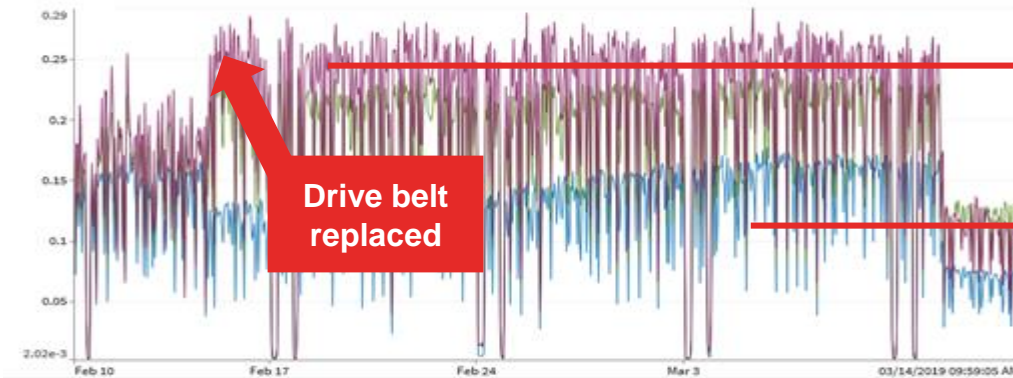
- ✓ Increase in vibration detected
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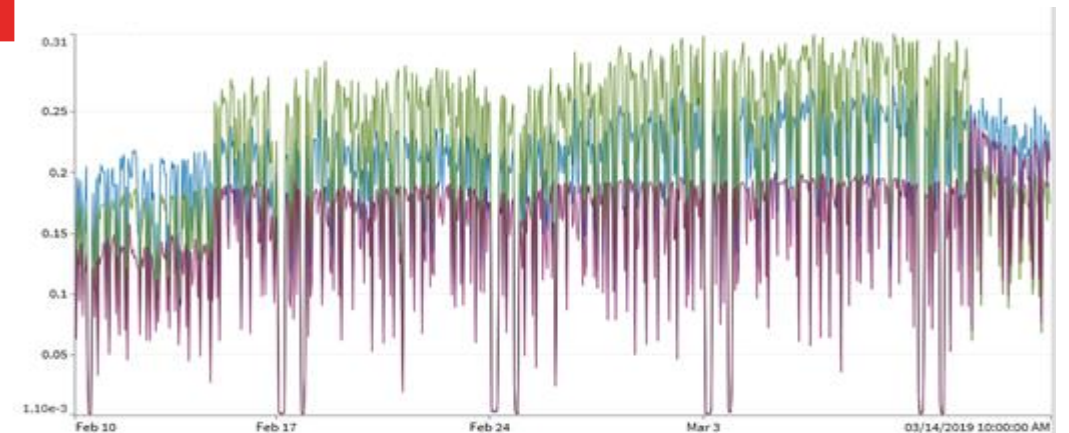
Change detected

Gearbox realignment

Drive belt replaced

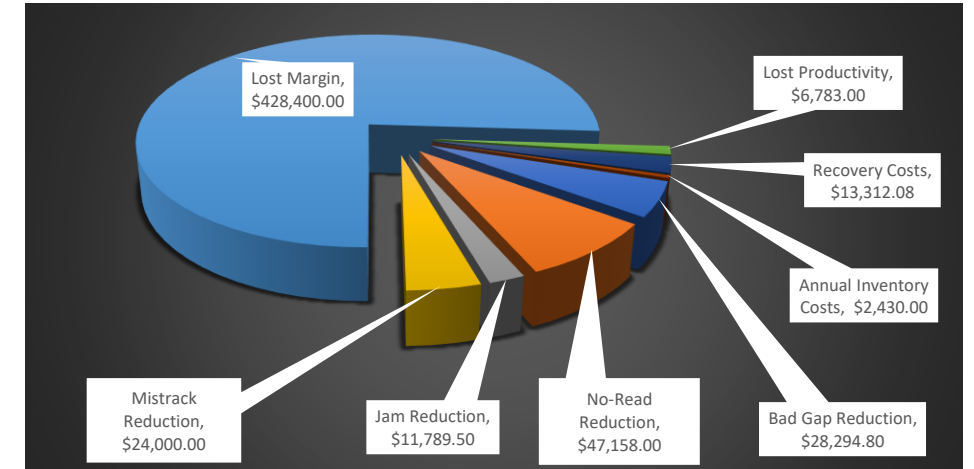
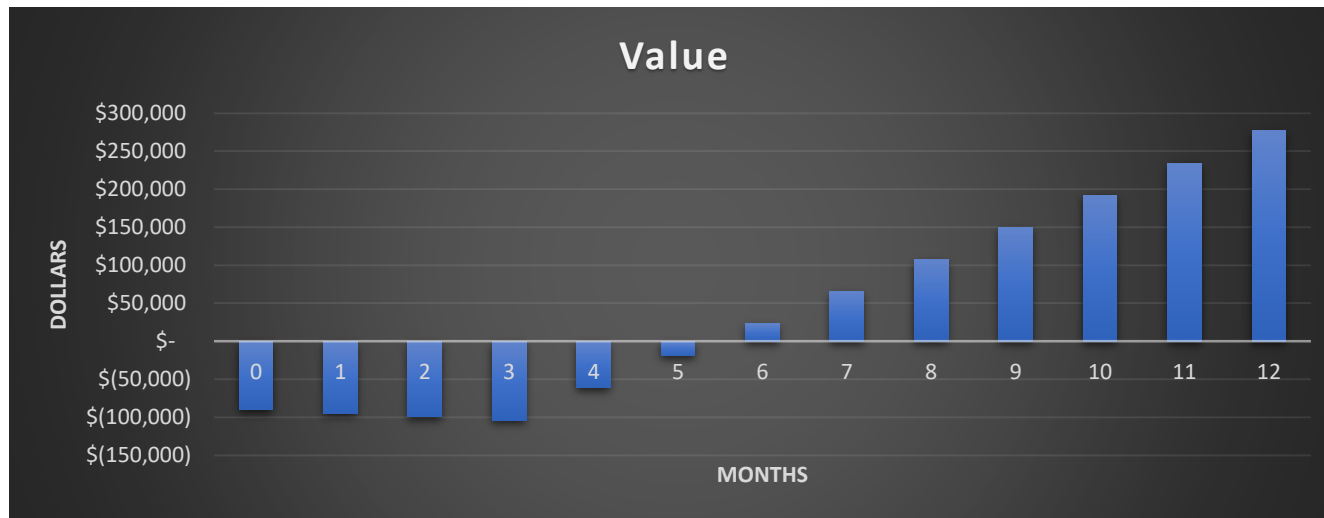
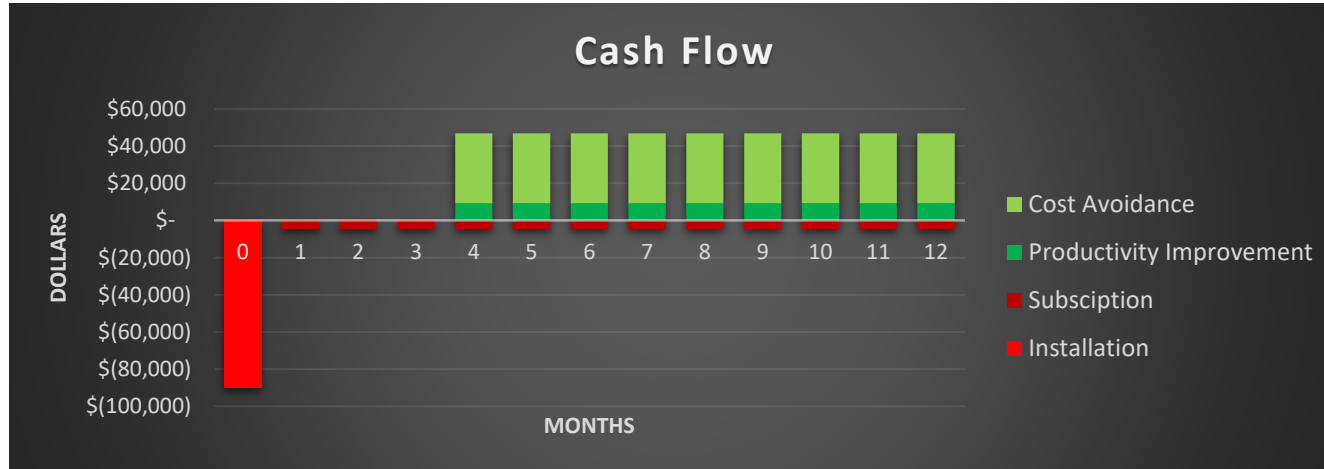


VELOCITY



ACCELERATION

# MEASURE FINANCIAL OUTCOMES

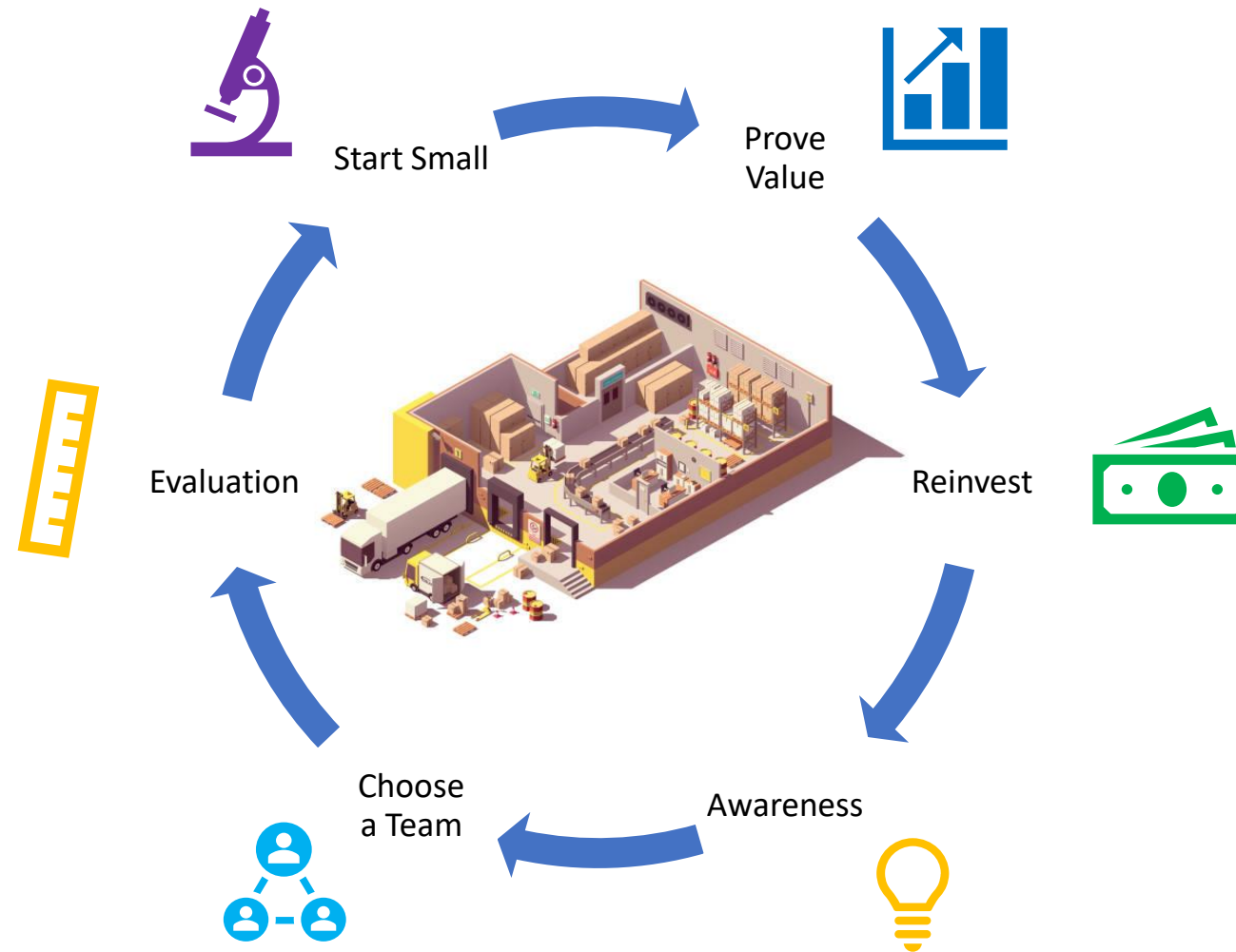


| Results 1-year |            |
|----------------|------------|
| Investment     | 145,000.00 |
| Net Benefit    | 421,625.53 |
| IRR            | 20%        |
| NPV            | 276,625.53 |

| Results 3-year |              |
|----------------|--------------|
| Investment     | 255,000.00   |
| Net Benefit    | 1,545,960.28 |
| IRR            | 23%          |
| NPV            | 1,290,960.28 |



# Reinvest or Scale Success

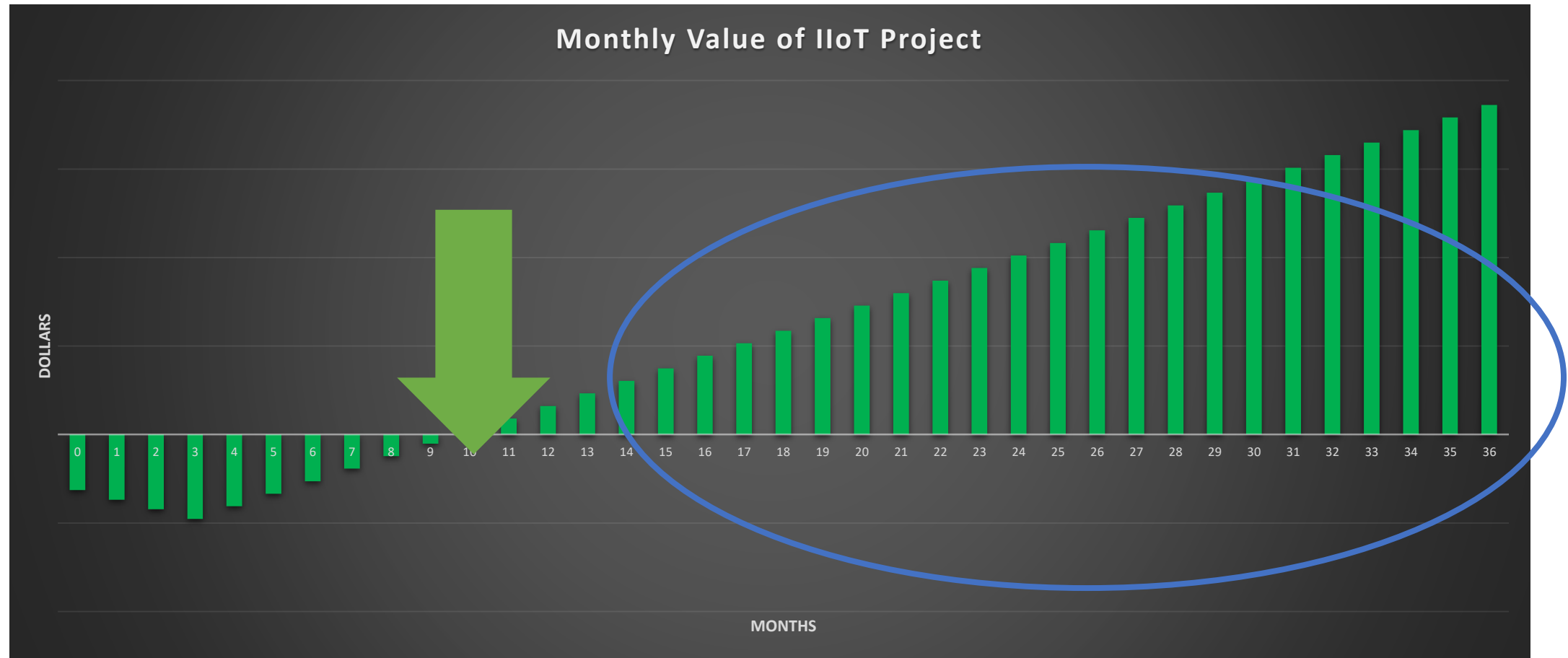


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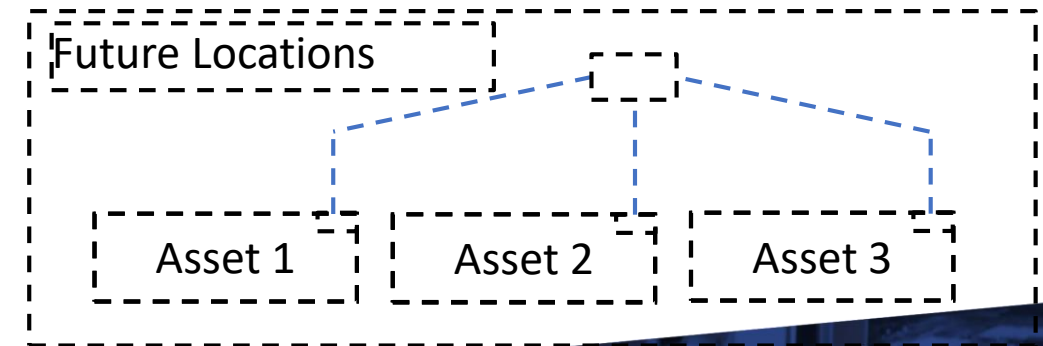
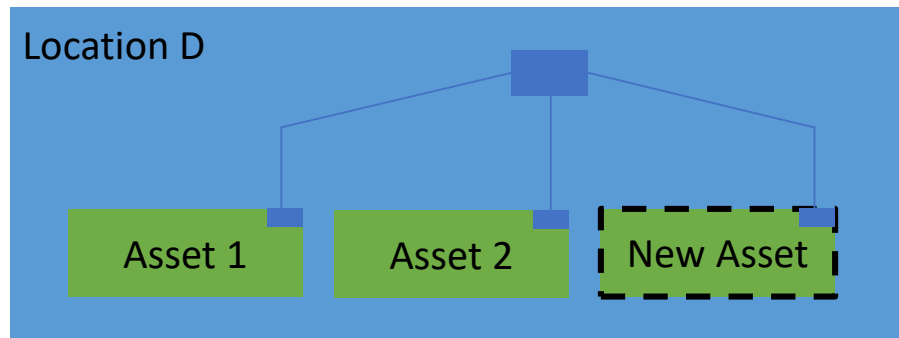
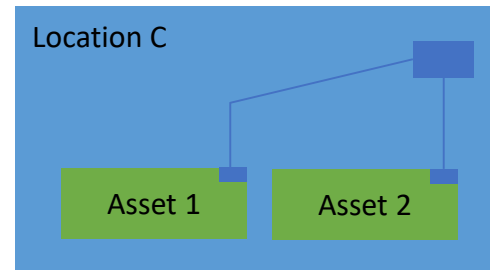
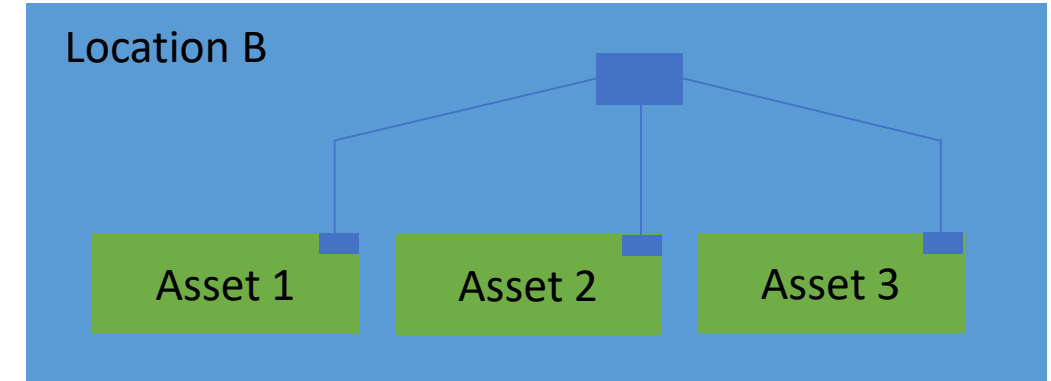
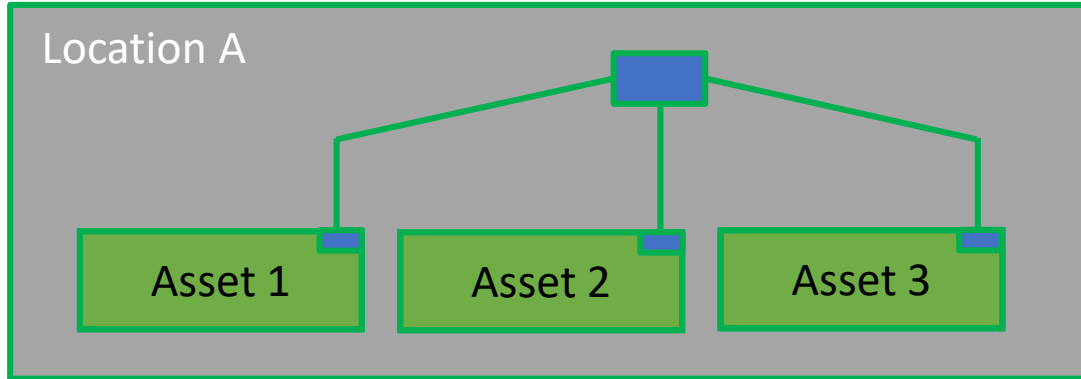
# Reinvest

Once value is proven, the process can be iterated to scale the benefits or expand to additional features.



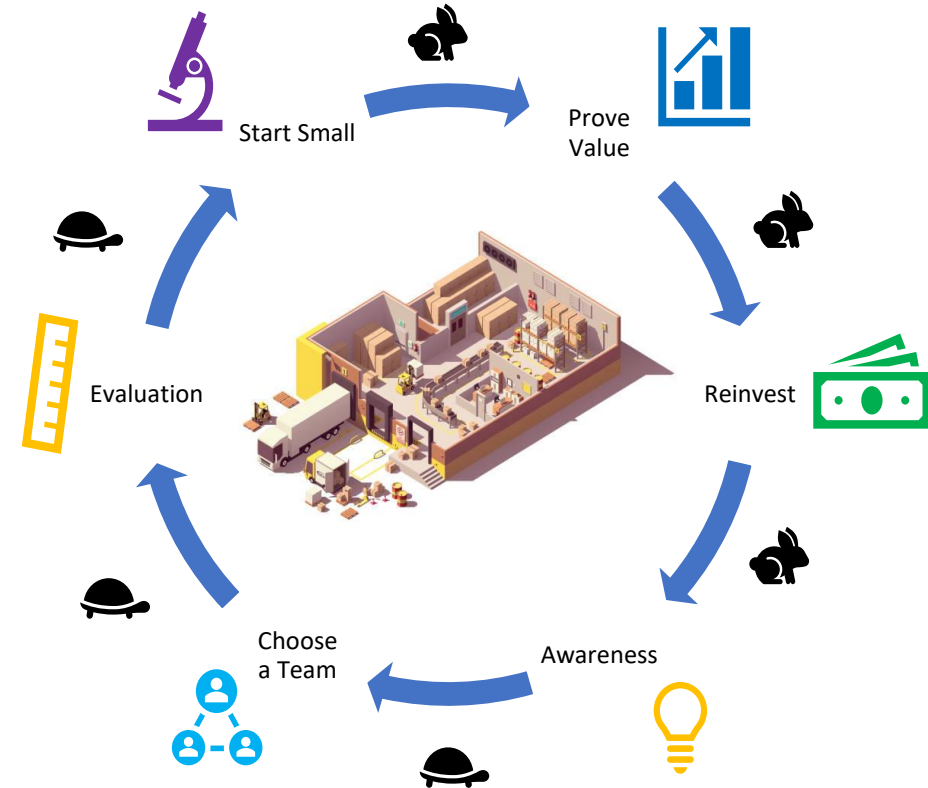
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# Repeat Process to Scale Benefits



# Key Takeaways

- Choose a partner
- Select a diverse team for success
- Model financial feasibility early
- Align outcomes to team members
- Choose a limited scope that will be large enough to prove value
- Validate findings against financial goals and trial exit criteria
- Repeat process at scale or larger scope



*For more information:*

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Website: [www.intelligrated.com/en/solutions/technology/connected-distribution-center](http://www.intelligrated.com/en/solutions/technology/connected-distribution-center)

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