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McCormick Place | Chicago  
April 8-11, 2019  
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# *Building a Business Case for Automation The Financial Considerations*

Presented by:  
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# Presenter



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# Why invest in automation?

- **Reduce dependence on labor**
  - Wage rates are increasing
  - Competition for labor is fierce
  - Hidden costs of labor – retention, training, absence, FMLA, worker’s comp risk
- **Better utilize space**
  - Optimize clear height
  - More inventory in “pick” (reduce replenishment delays)
  - Extend life of facilities
- **Increase throughput**

Benefit	Semi-Automated	Automated
DC size (sq. ft.)	400,000	200,000
Throughput Capacity	20,000 orders per day	35,000 orders per day
Labor Cost per Unit shipped	\$0.40 per unit	\$0.15
Order processing speed	4 hours	30 minutes
Headcount	500+	150+
Shifts	2 shifts – 10 hr (7 days)	1 day – 10 hr (5 days) 1 night – replen only

# What is a business case?

According to Wikipedia...

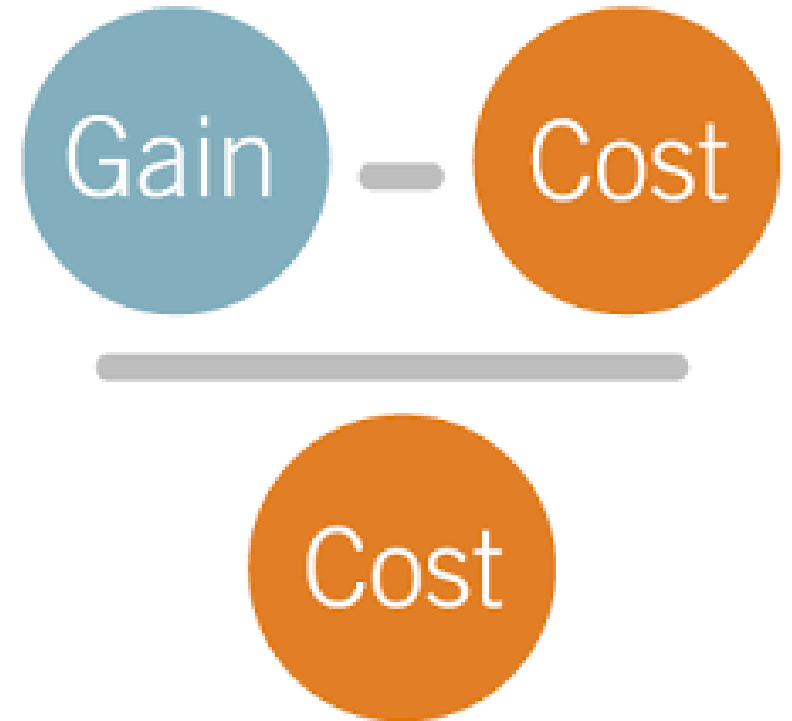
“A **business case** captures the reasoning for initiating a project or task”

“A compelling business case adequately captures both the ***quantifiable*** and ***non-quantifiable*** characteristics of a proposed project”

- Quantifiable = ROI
- Non-quantifiable = Practical Considerations (tomorrow at 1:15pm)

# So what's the ROI?

- It's NOT just “less than 2 years”...



# 3 Primary ROI Methods

- Payback Period
- Net Present Value (NPV)
- Internal Rate of Return

# Time Value of Money

- A dollar today is worth a whole lot more than tomorrow
- Three concepts used to analyze capital expenditures
  - **Future value** - \$ value in the future if loaned or invested
  - **Present value** – reverse of FV
  - **Required rate of return** – rate required in order to make an investment
    - Varies based on project risk
    - Depends on company’s “cost of capital”



# What is needed to do these analyses?

- Capital Expense
  - Cost of the “project” - equipment plus installation, freight, taxes and future maintenance/software license fee
- Cash flows (savings)
  - For automation, labor is the most obvious but don't forget space savings
- Cost of Capital, Rate of Return or “Hurdle Rate”
  - Rate of return a firm pays its long term investors

# Project Cash Flows (e.g. Savings)

- Labor savings
  - Wages
  - Liability costs (disability, lawsuits, etc.)
  - Reliability costs (sickness, injury, tardiness, consistency)
- Space savings
  - Rent
  - Utilities

# Potential Cash Flows

- Increased revenue due to higher service levels
  - Faster order processing
  - Better accuracy
  - Less damage (less product handling)
- Value of additional space
  - Extend life of current facility and delay capex
  - Sublease extra space and generate revenue
- Less labor “risk”
  - Comp claims
  - Absence and FMLA
  - Turnover and training costs

# Example:

- Your company is considering investing \$3,000,000 in automation, e.g. “a goods to person picking system”
- The benefits are better storage/space utilization and lower labor costs
- The system will last 3 years (ease of calculations) and the system will save the company \$1,300,000 per year
- Your company’s required rate or return – hurdle rate – is 8%
- Do you purchase this equipment or not?

# Three methods

- Payback
- Net Present Value
- Internal Rate of Return

# Payback Method

- Time required from the project to return the original investment

$$\frac{\$3,000,000}{\$1,300,000/\text{year}} = \$2.31 \text{ years}$$

- The payback period is less than the project life (3 years)
- Payback longer than project life is “no-go”

# Net Present Value (NPV)

- Takes into account the “time value of money” and “cost of capital”
- NPV is equal to “present value” minus the capital expense

Present Value =  $\frac{FV_1}{(1+i)} + \frac{FV_2}{(1+i)} + \frac{FV_3}{(1+i)}$  Where:

PV = present value  
FV = future value  
I = hurdle rate  
n = number of time periods

# Net Present Value (NPV)

- Takes into account the “time value of money” and “cost of capital”

$$\text{Present Value} = \frac{\$1,300,000}{1.08} + \frac{\$1,300,000}{1.08} + \frac{\$1,300,000}{1.08} = \$3,350,000$$

$$\text{Net Present Value} = \$3,350,000 - \$3,000,000 = \$350,000$$

- The NPV is greater than “\$0”, so it should be accepted



# Internal Rate of Return

- The interest rate where the NPV equals zero
- 14.36% rate of return vs 8% hurdle rate, so it should be accepted



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## IRR Calculator

Initial Investment

Cash Flow

Year 1 - \$	<input type="text" value="1300000"/>	
Year 2 - \$	<input type="text" value="1300000"/>	
Year 3 - \$	<input type="text" value="1300000"/>	

[Add Year](#) [Calculate](#)



**14.360%**  
Internal Rate of Return

# Taking it home...

- Don't underestimate the savings
  - Find the hidden labor costs
  - Space is **NOT** free
  - Opportunity costs only knock once
- Know your “hurdle” rate
- ROI is more than just payback
- NPV and IRR are better methods
- Investing in automation has a **VERY** strong business case

# For more information



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