



## PROJECT MANAGEMENT CENTER FOR EXCELLENCE

A.J. CLARK SCHOOL OF ENGINEERING  
Civil & Environmental Engineering Department



# INFORMATION MATTERS

Revolutionizing the Construction industry  
through the adoption of technology

Presented by:

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# Technology in the Construction Industry

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## Early 1960 to late 1970

- Mainframe computers
- CPM Scheduling (US Navy & Westinghouse)
  - Pert (IJ diagramming)
  - PDM (Node on Arrow)



## Walt Disney World Beyond the Magic Kingdom circa 1977





## Conceptual Design 1977





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Name  
UMD Project Management Symposium  
May 10-11, 2018

Slide 5



Opening  
Day  
Oct 1, 1982



## Accuracy Matters





Designed and  
constructed  
1977-1982



# Technology in the Construction Industry

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## Early 1980 to mid-1990

- Mini computers
- Applications
  - Distributed processing
  - eMail
  - Integrated construction solutions
- Personal Computers
- Local Area Networks (LAN)
- Applications
  - Spreadsheets
  - Databases
  - Point Solutions





# Canary Wharf London



Designed & constructed  
1987 - 1993



# Canary Wharf London



Communication Matters





# Technology in the Construction Industry

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## 1990 to 2000

- Personal Computers
- Applications/Point Solutions
  - Databases
  - CAD
  - Estimating
  - Cost Accounting
  - Scheduling
  - Resource Management



# Centennial Olympic Games Atlanta, Georgia



Designed & constructed  
1992-1996





# Centennial Olympic Games Atlanta, Georgia



Alignment Matters



# Centennial Olympic Games Atlanta, Georgia



Effective Communication  
Matters







# Technology in the Construction Industry

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## 2000 to 2005

- WWW/Internet
- SMART devices
- Software as a Service (SaaS)



# MGM Mirage City Center Las Vegas



Designed & Constructed  
2005-2009





# MGM Mirage City Center Las Vegas



## Information Matters

- GR's & GC's aligned/codified in SaaS technology platform
- Collaborative, single-source-of-truth
- Real-time, accurate & accessible



# City Center Case Study

- Project Organization
- Technology Platform
- Project Close-Out
- Solution to Key Challenges





# City Center Case Study

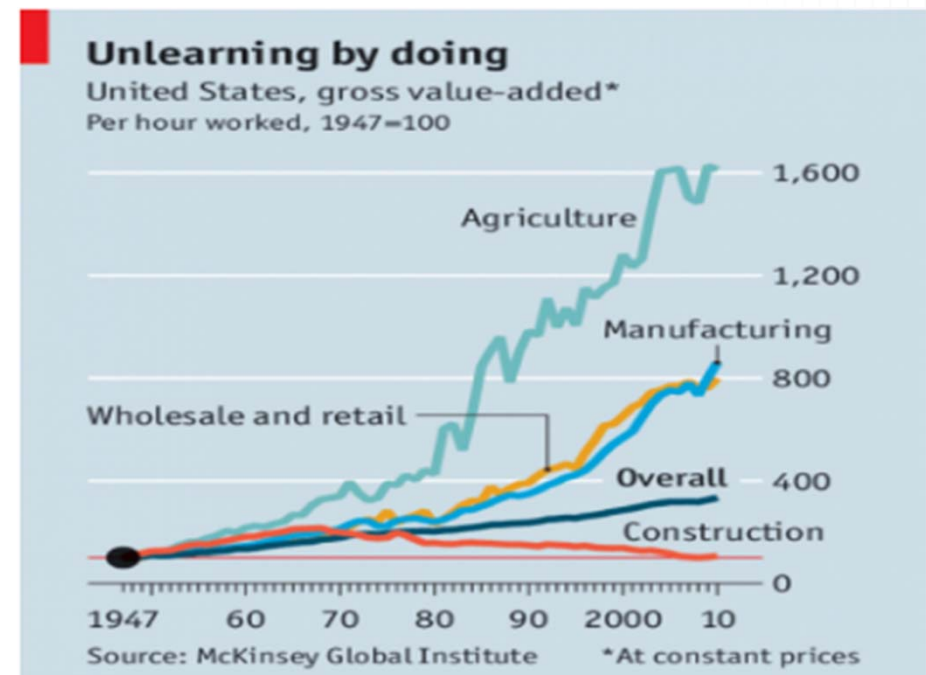
## Solutions to Key Challenges

- Payment
- Changes
- Non-Conforming Work
- Acceleration Costs
- Quality Assurance



# State of Project Management Today

Productivity in  
Construction lags  
behind every other  
sector of the US  
economy







# Construction is Perceived to be a Competitive Industry

- In all other industries competition creates efficiencies, so
- Is the construction industry really competitive,
- Or is it monopolistic?



# Asymmetry of information

A situation in which one party is better informed than the other party and exercises control over the flow of information

- Owners often do not get the information they need from Contractors (or do not have the necessary expertise to interpret the information)
- Owner's essentially lose control over their projects while the Contractors exercise a monopoly over information and the project itself.





# Technology

## The Key to avoiding the problem

The role the adoption of technology can play in revolutionizing the industry by reducing the phenomenon of asymmetric information.



# State of Technology Today

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## Proliferation of “disruptive” Cloud technologies

- Artificial Intelligence
- Robotics
- Drones
- The Internet of Things (IoT)





# Information Matters

## Revolutionizing the Construction Industry through the Adoption of Technologies



# Information Matters

## Three Key Elements

- Leadership
- Management
- Technology

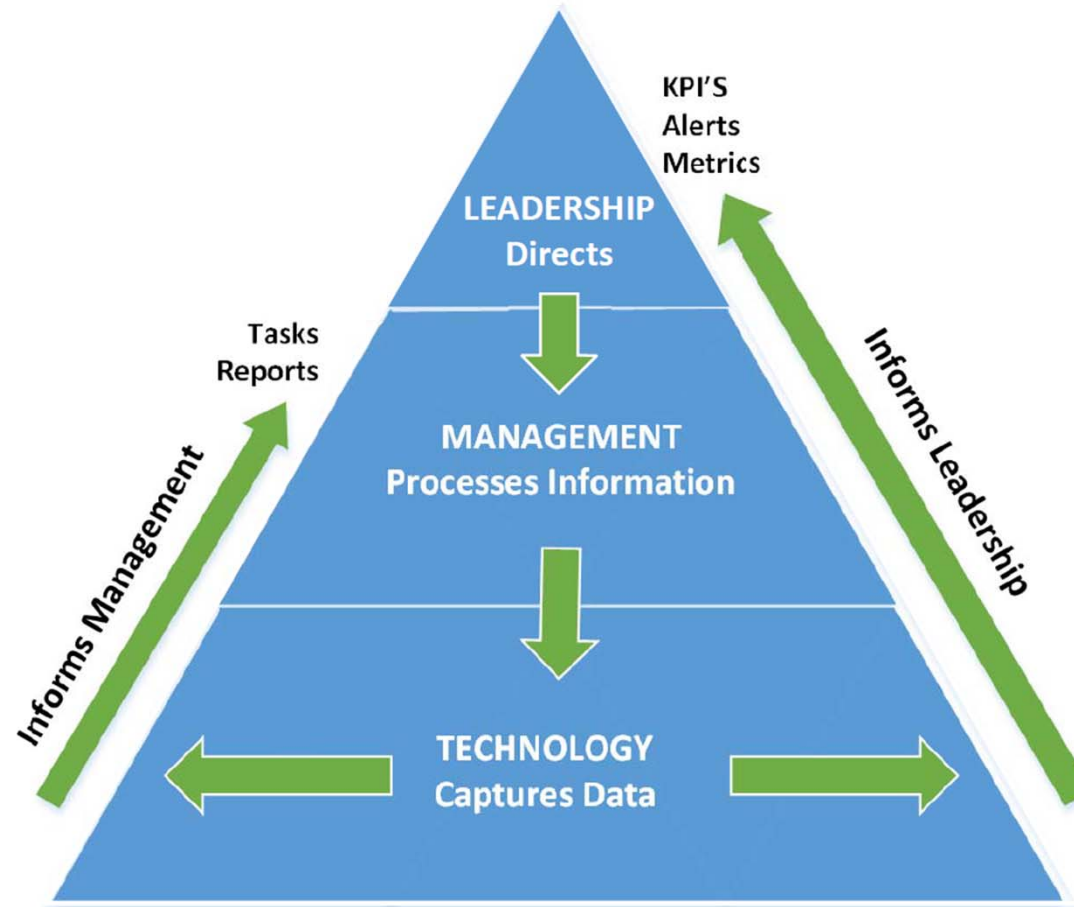
## Four Pronged Approach

- Robust Contractual Requirements
- Leveraged Technologies
- Effective Intermediaries
- Change Management

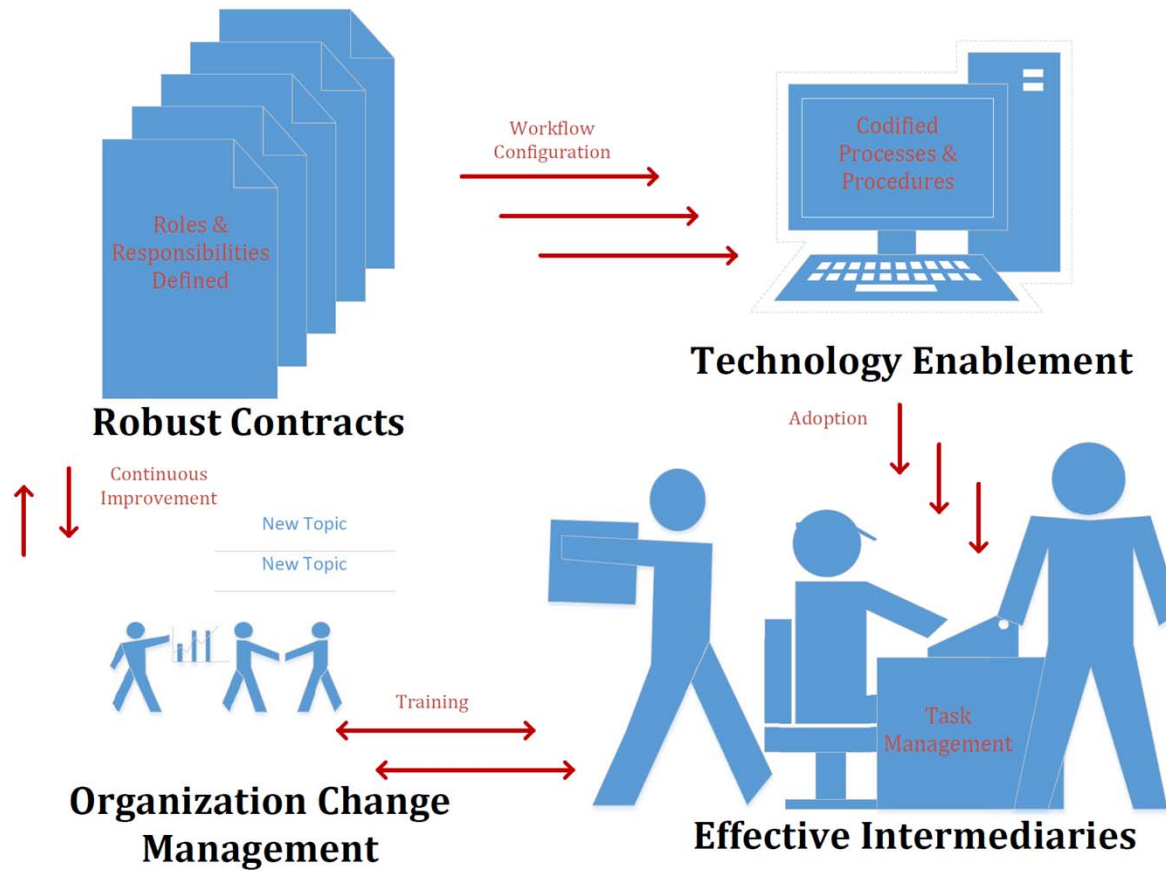




# Three Key Elements



# Four-Pronged Approach





# Benefits of Robust Contractual Requirements

1. Aligns expectations
2. Improves cost estimations
3. Minimizes disputes
4. Safeguards the project schedule





# Benefits of Leveraging Technology

1. Easy access to real-time project data
2. Single source of truth (data integrity)
3. Visibility and accountability of roles and responsibilities
4. Facilitates collaboration and easy communication
5. Ensures data is synchronized across all stakeholders
6. Saves tremendous costs by forestalling disputes



# Effective Intermediaries

## Project Organizational Alignment





# Benefits of having Effective Intermediaries

1. Equitable risk sharing
2. Gain in profitability & efficiency
3. Conflicts resolved quickly
4. Goals & Objectives aligned; easy to demand accountability

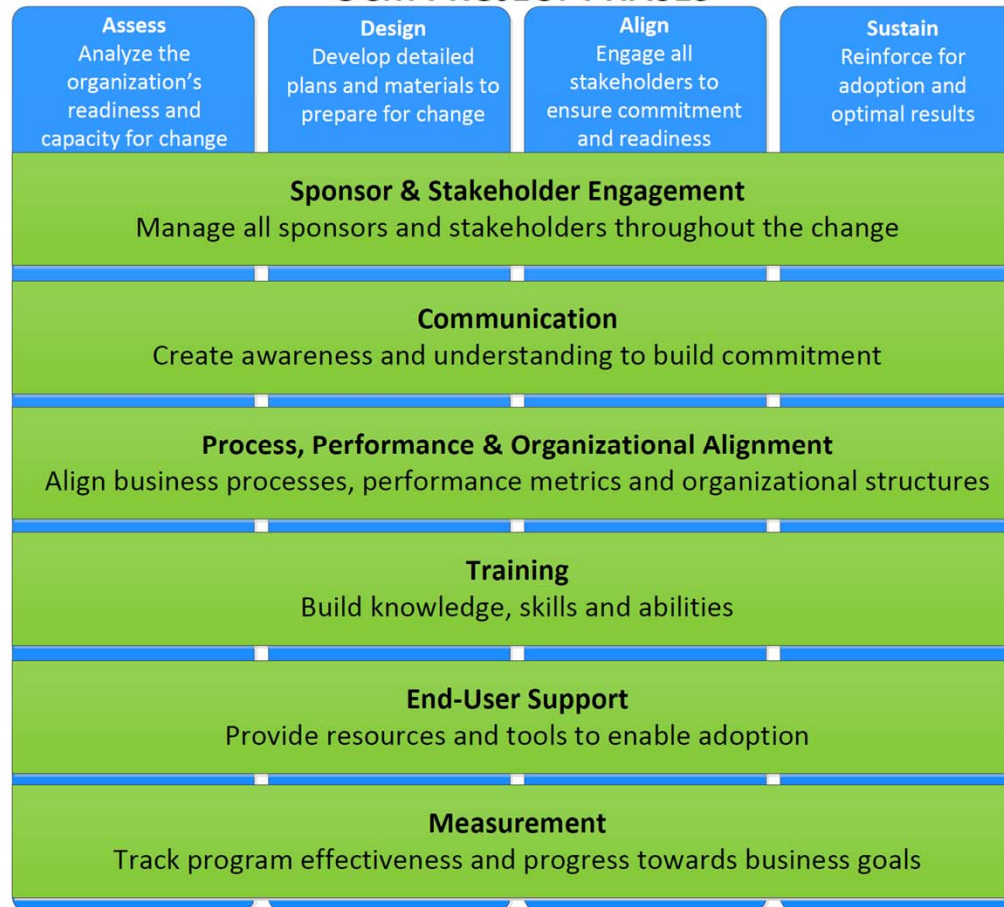




# Organizational Change Management

## OCM WORK STREAMS

### OCM PROJECT PHASES





# Benefits of Change Management

1. Speed of adoption,utilization
2. Mitigates business impacts
3. Invites engagement
4. Responsive organization
5. ROI
6. Reduced stress, greater sense of control



# Questions & Answers





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Creating Collaboration to Contain Costs

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