Research topics in industrial engineering and operations research

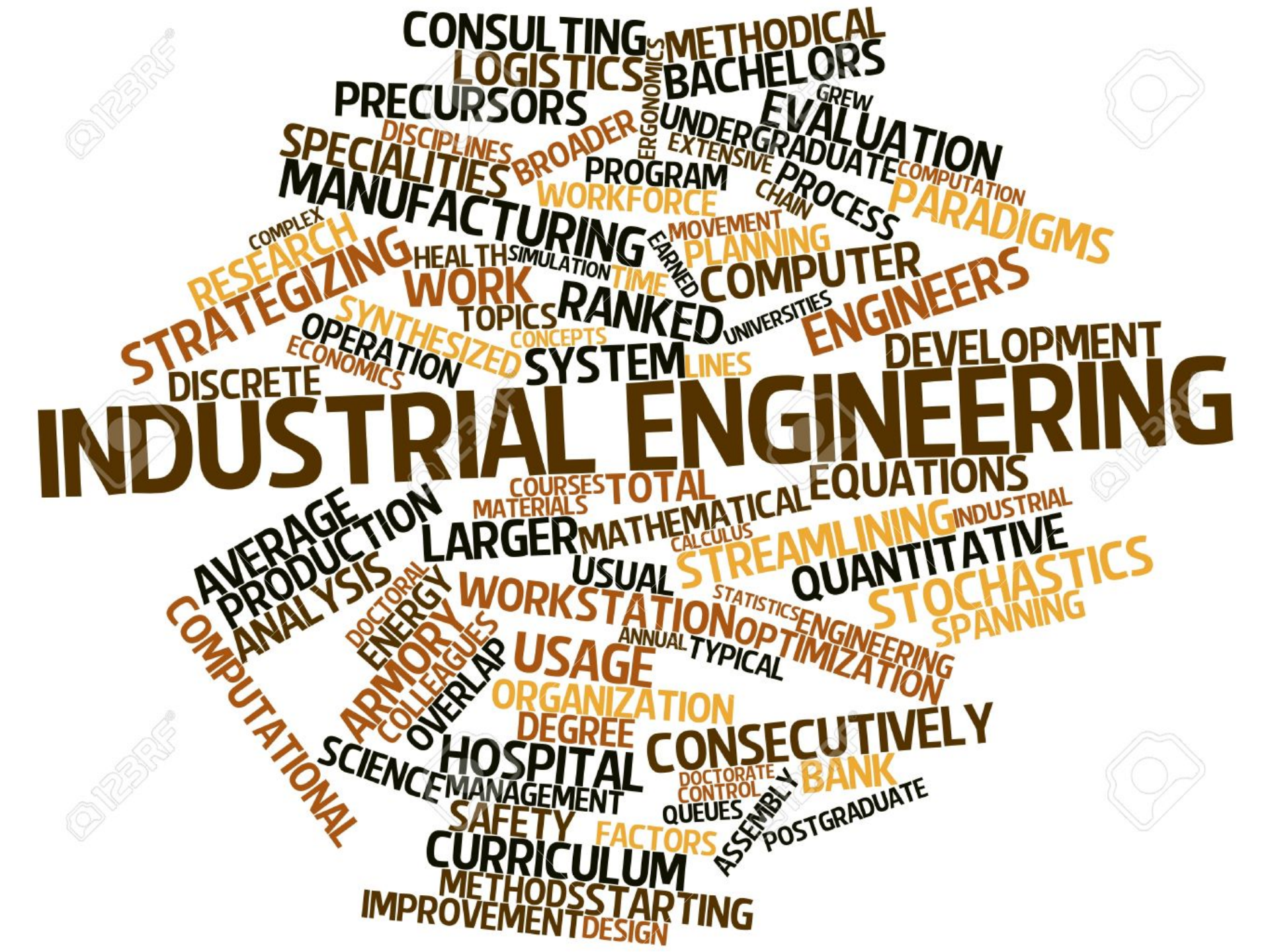
Andy Johnson

Presentation Structure

- Industrial and Systems Engineering and Operations Research
  - Examples
  - Definitions
  - History
  - Industries
- Industrial and Systems Engineering at Texas A&M
  - International Students
  - Johnson Laboratory

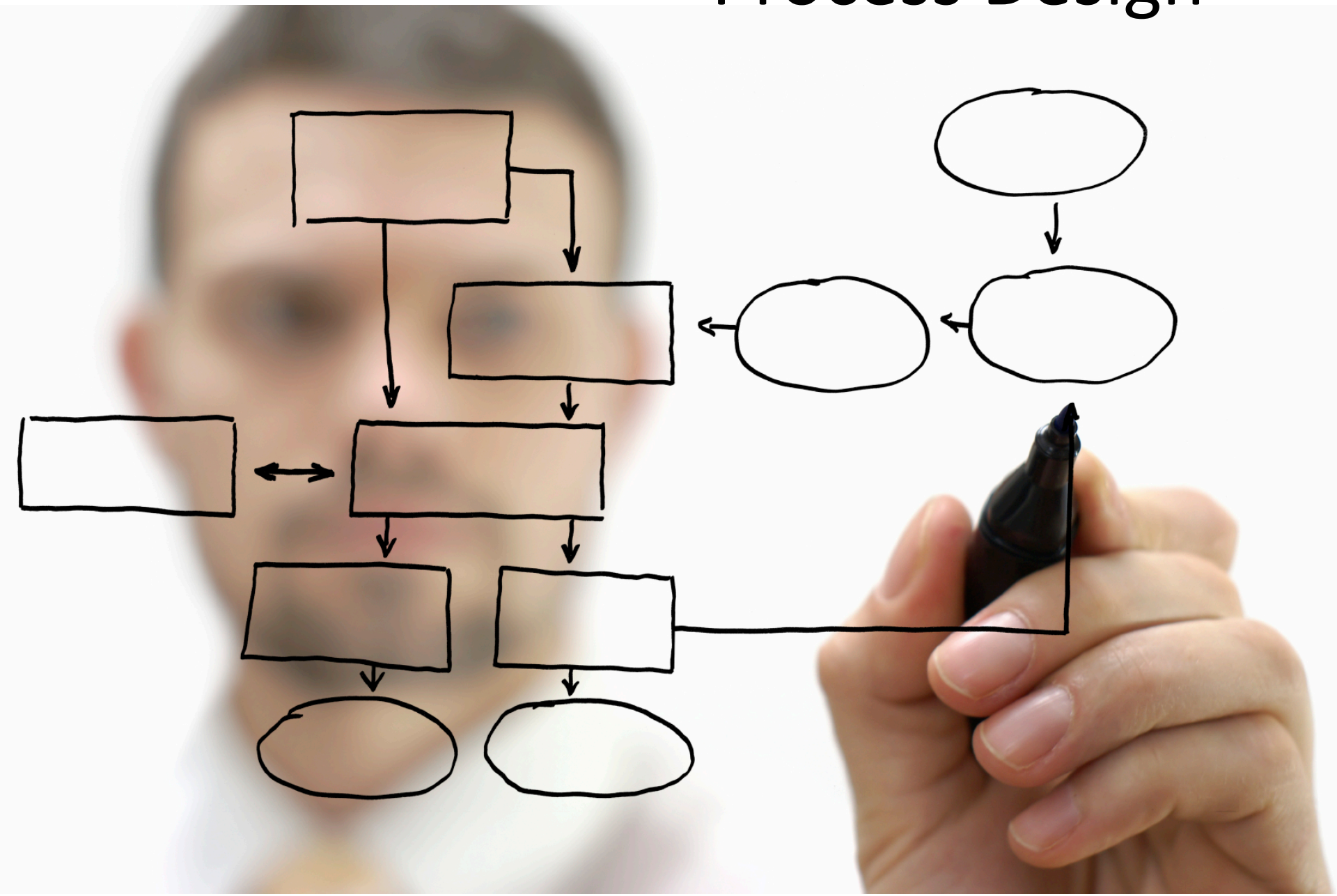

informs
prize
ups
Worldwide Services
Synchronizing the world of commerce
131073

informs prize

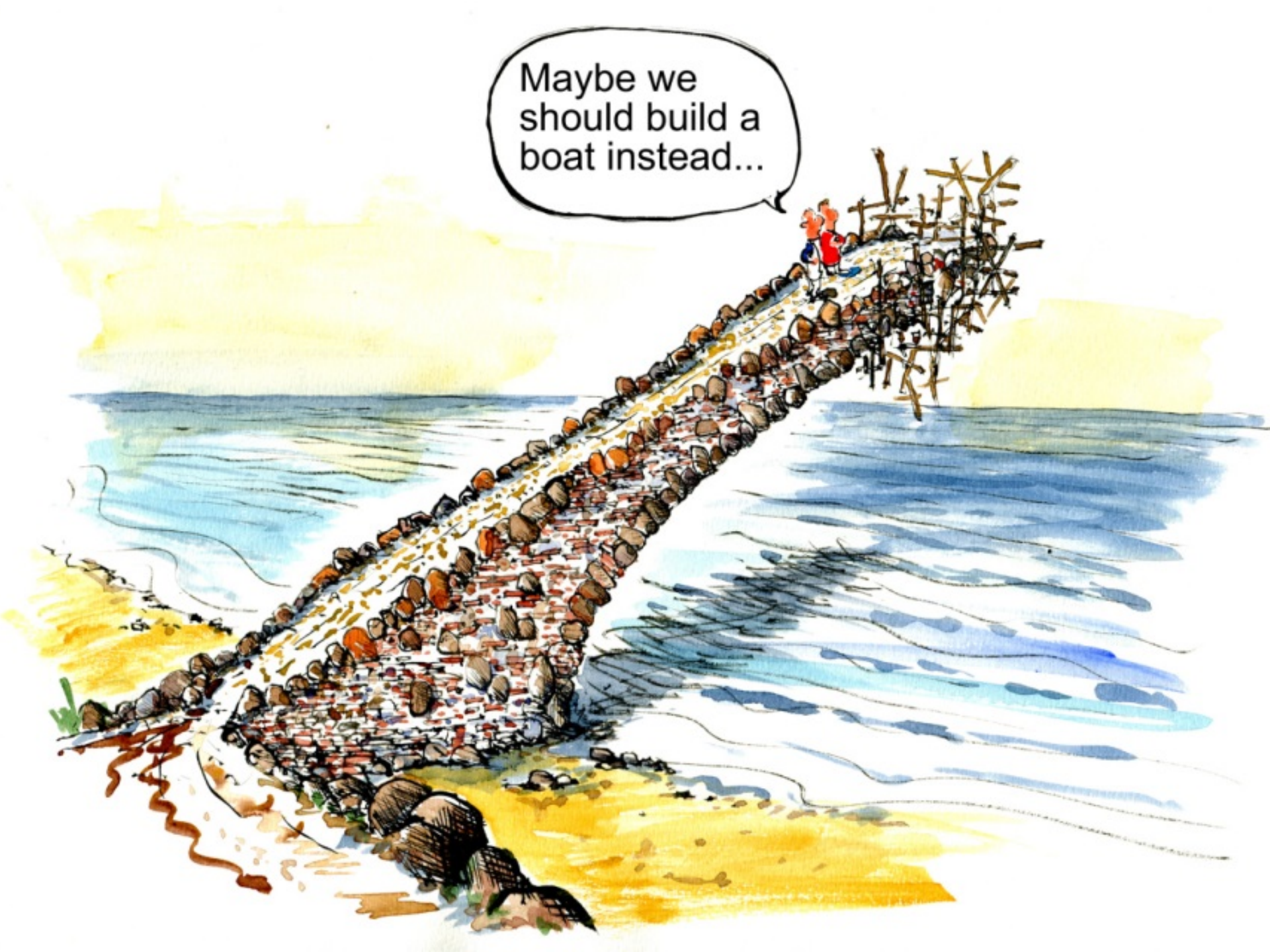

CONSULTING
METHODICAL
LOGISTICS
BACHELORS
ERGONOMICS
PRECURSORS
GREW
EVALUATION
UNDERGRADUATE
DISCIPLINES
BROADER
EXTENSIVE
SPECIALITIES
PROGRAM
PROCESS
COMPUTATION
PARADIGMS
CHAIN
WORKFORCE
MANUFACTURING
COMPLEX
MOVEMENT
RESEARCH
PLANNING
EARNED
HEALTH
SIMULATION
COMPUTER
STRATEGIZING
WORK
TIME
ENGINEERS
SYNTHESIZED
TOPICS
RANKED
UNIVERSITIES
OPERATION
CONCEPTS
ECONOMICS
SYSTEM
DEVELOPMENT
DISCRETE
LINES
INDUSTRIAL ENGINEERING
COURSES
TOTAL
EQUATIONS
MATERIALS
AVERAGE
PRODUCTION
LARGER
MATHEMATICAL
INDUSTRIAL
CALCULUS
STREAMLINING
QUANTITATIVE
ANALYSIS
USUAL
STOCHASTICS
STATISTICS
ENGINEERING
SPANNING
DOCTORAL
ENERGY
WORKSTATION
OPTIMIZATION
COMPUTATIONAL
ARMORY
ANNUAL
TYPICAL
USAGE
COLLEAGUES
OVERLAP
ORGANIZATION
DEGREE
CONSECUTIVELY
HOSPITAL
SCIENCE
MANAGEMENT
DOCTORATE
CONTROL
BANK
SAFETY
QUEUES
ASSEMBLY
POSTGRADUATE
FACTORS
CURRICULUM
METHODS
STARTING
IMPROVEMENT
DESIGN

Industrial engineering is the engineering discipline that concerns the design, development, implementation, and evaluation of integrated systems of people, knowledge, equipment, energy, and material. Industrial engineering draws upon the principles and methods of engineering analysis and synthesis, as well as mathematics, physical, and social sciences. Industrial engineers work to eliminate wastes of time, money, materials, energy, and other resources.
en.wikipedia.org/wiki/Industrial_engineering

Process Design



Systems Engineering


Maybe we should build a boat instead...

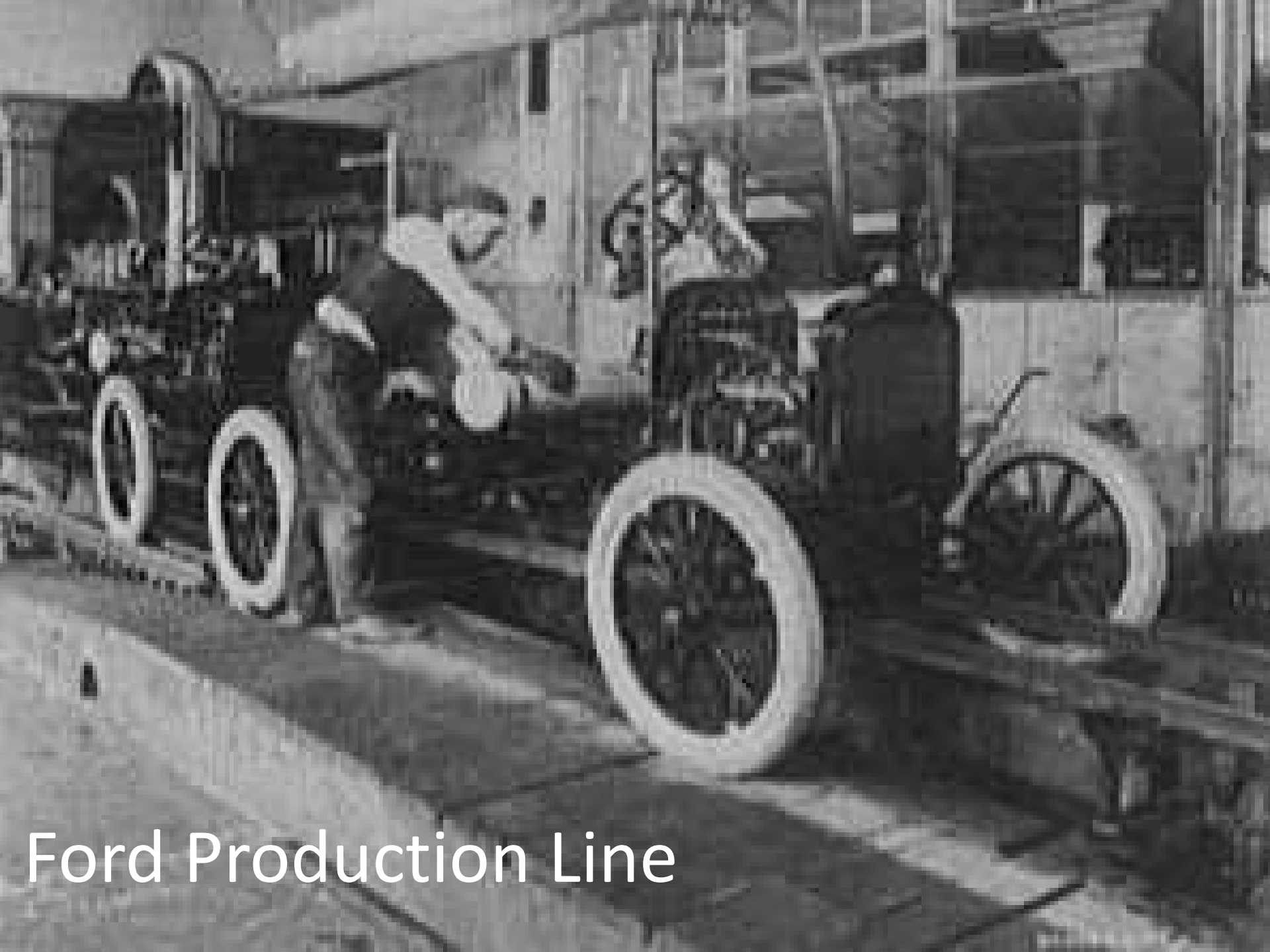
Lillian Gilbreth

Fredrick Taylor

Shigeo Shingo

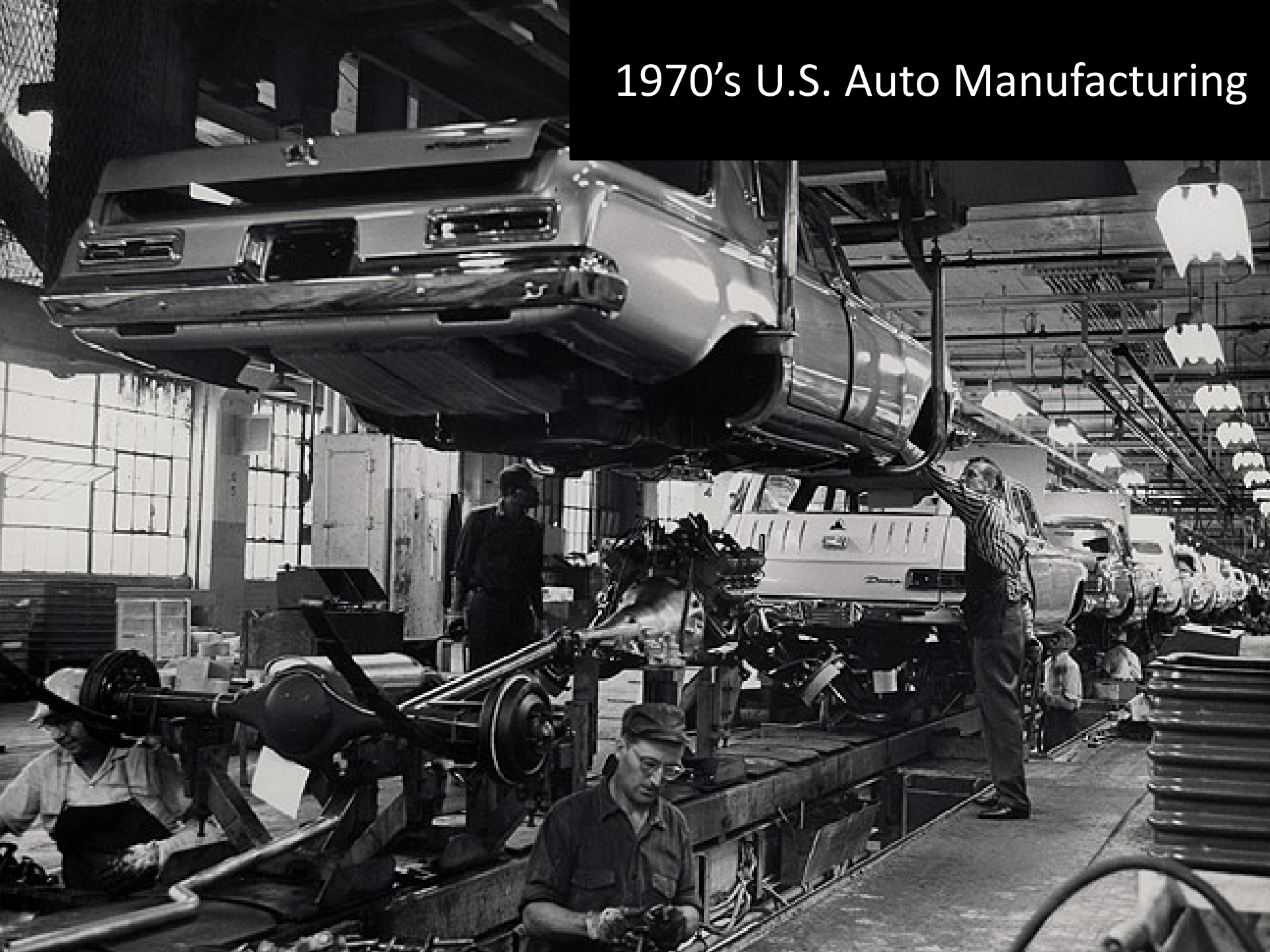
"Rational behavior requires theory. Reactive behavior requires only reflex action."

W. Edwards Deming

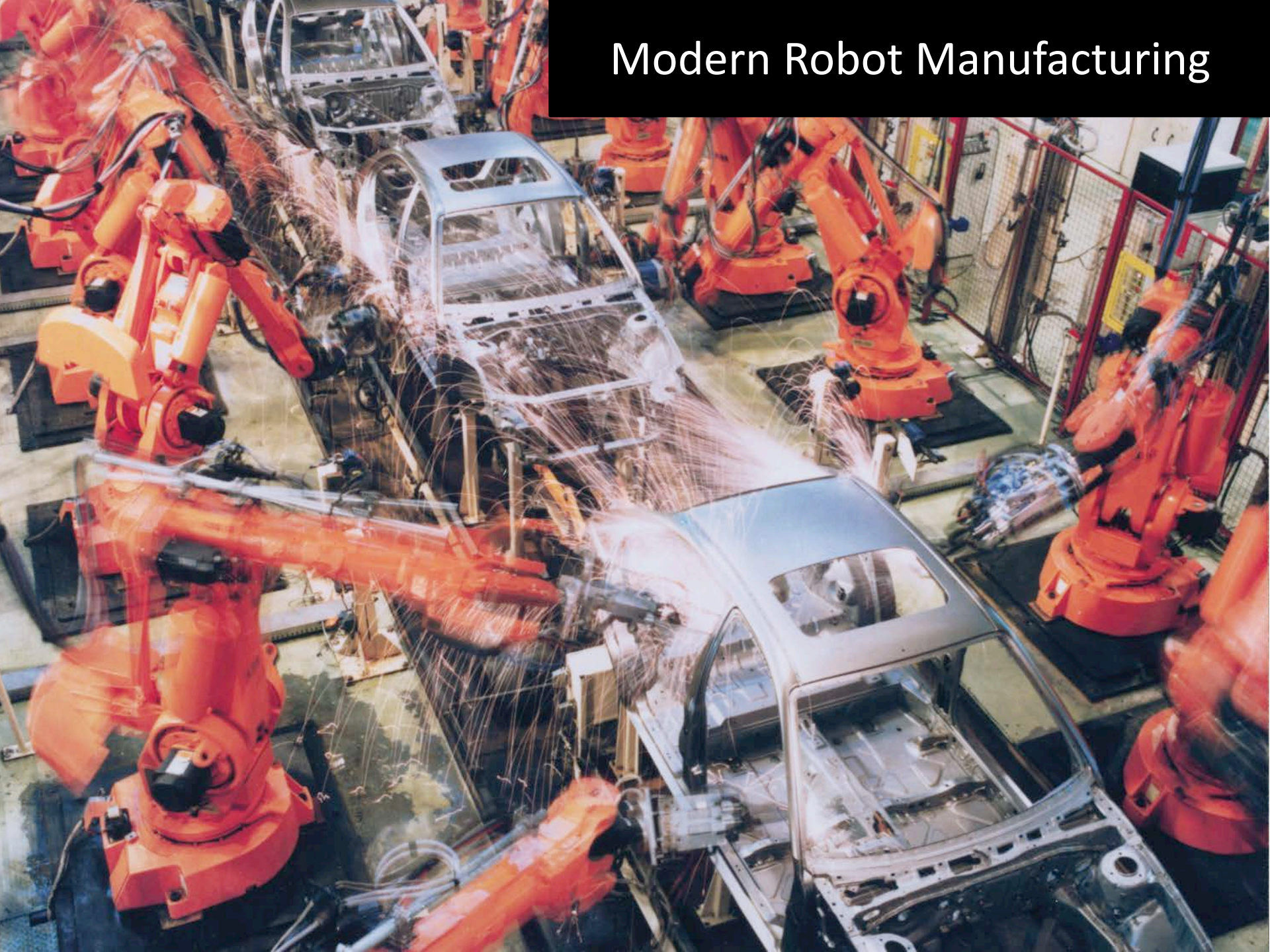


Ford Production Line

1970's U.S. Auto Manufacturing



Modern Robot Manufacturing

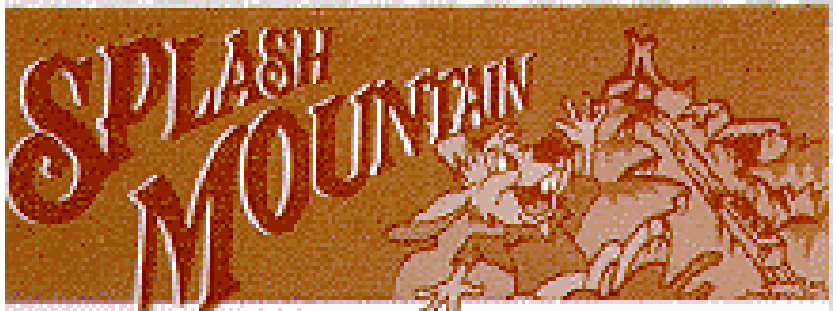



Modern Manufacturin

Tokyo Disneyland


KETING
券所
STANDBY
WAIT TIME
ただいま
4:00
MINUTES
分待ち
スタンバイの待ち時間


SPLASH MOUNTAIN
FASTPASS
RETURN BETWEEN
12:15
1:15
Mouse Planet



FASTPASS

Please Return Anytime Between

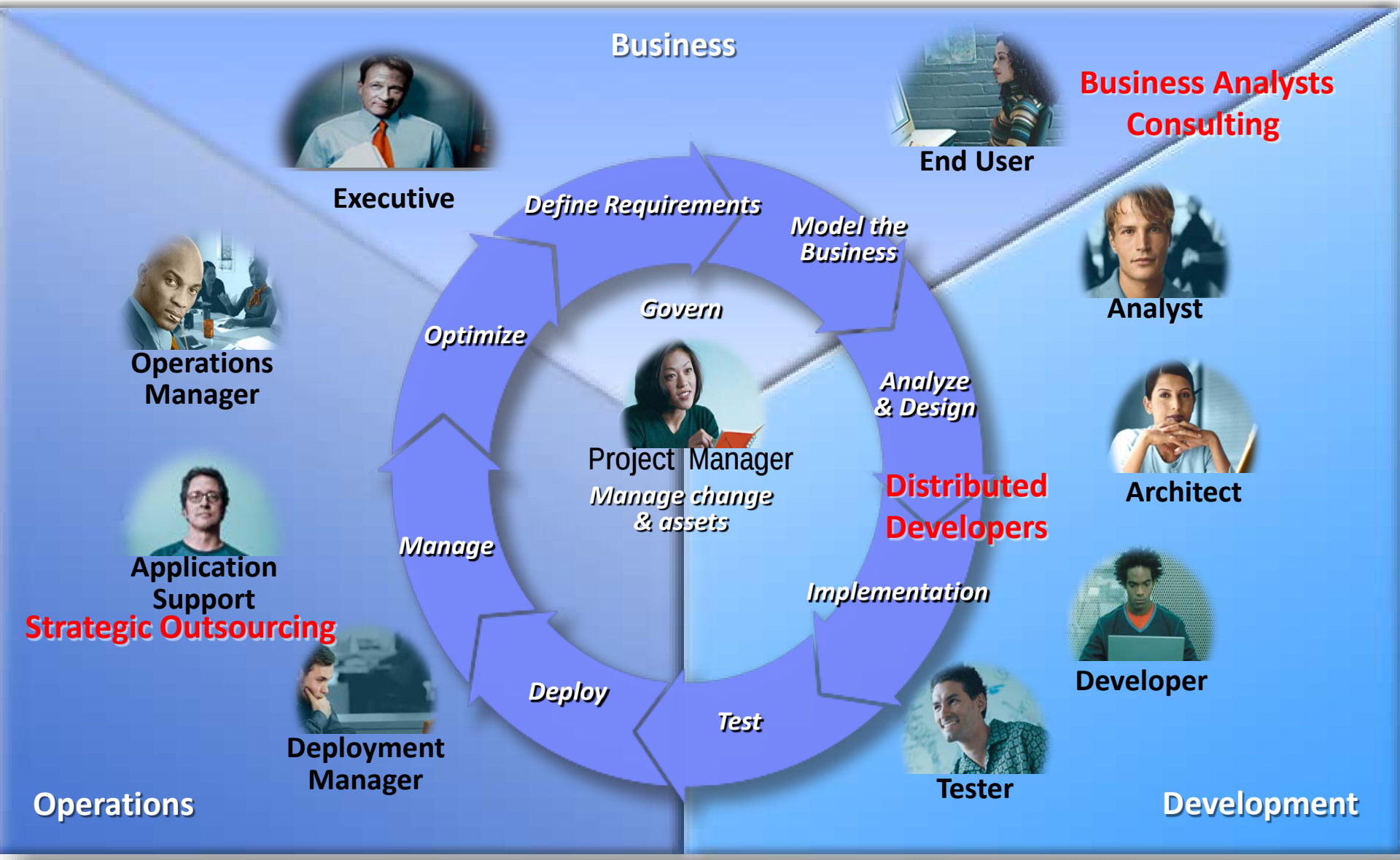
12:15PM

AND

1:15PM

Another FASTPASS ticket
will be available
after 12:15pm

SUN OCT 29


Business
Executive
End User
Business Analysts
Consulting
Define Requirements
Model the Business
Govern
Optimize
Analyze & Design
Project Manager
Manage change & assets
Manage
Implementation
Deploy
Test
Operations Manager
Analyst
Application Support
Strategic Outsourcing
Distributed Developers
Architect
Deployment Manager
Developer
Tester
Operations
Development

IBM

ng
ion.


Change Tire
Close door
Get Jack
Install Spare
Oh Change
Set Jack
Install Nuts
Jack up Car
Tighten Nuts
Impact Wrench
Lower Jack
Delay
Remove Nuts
Set Jack aside
Remove Tire
Park Car
Obtain Spare

Aerospace & Defense

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We never forget who we're working for®

NASA

Energy

Health Care

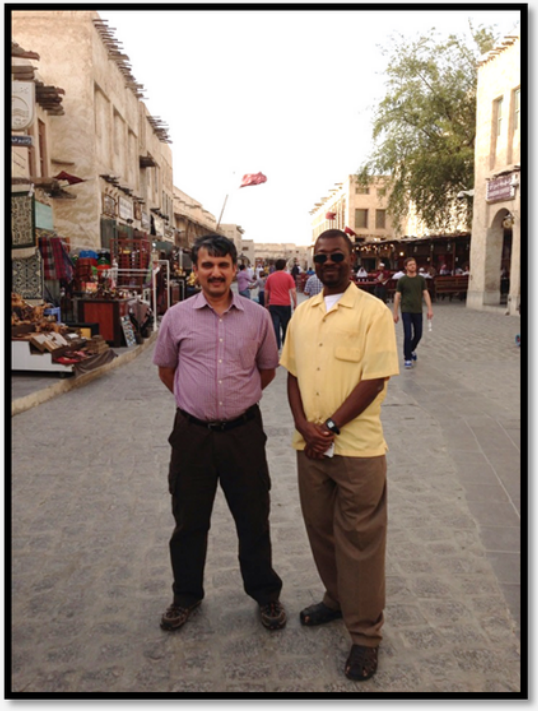
Transportation Systems

INDUSTRIAL & SYSTEMS ENGINEERING

TEXAS A&M UNIVERSITY

Research

ISEN organizes its faculty in the following four major research areas with applications in energy, healthcare, homeland security, big data and informatics, infrastructure & transportation, and systems engineering.



Advanced Manufacturing

- Faculty: Banerjee, Bukkapatnam, Curry, Ding, Elwany, Johnson, Klutke, Malave, Lawley, Leon;
- Focus: manufacturing processes and systems, additive manufacturing, logistics and supply chain, quality, reliability and maintenance.

Human and Organizational Systems

- Faculty: Avnet, Banerjee, Ferris, Lawley, Ntaimo;
- Focus: cognitive engineering, healthcare delivery, human information processing, system engineering, engineering management.

Operations Research

- Faculty: Butenko, Elwany, Gautam, Kianfar, Klutke, Kumar, Leon, Moreno-Centeno, Ntaimo, Smith, Wortman, Yates;
- Focus: optimization, stochastic processes, applied probability, risk analysis.

System Informatics

- Faculty: Banerjee, Bukkapatnam, Ding, Gautam, Johnson, Kianfar, Kumar, Moreno-Centeno, Yates;
- Focus: data analytics, production economics, simulation, spatial optimization, stochastic optimal control

RESEARCH

Faculty

Labs and Facilities

News

RESOURCES

Senvol 3D Printing Database

RELATED LINKS

Overview of the One Health Plus Biocorridor

2009 Annual Report

2010 Annual Report

2011 Annual Report

Why go to graduate school?

International Experience

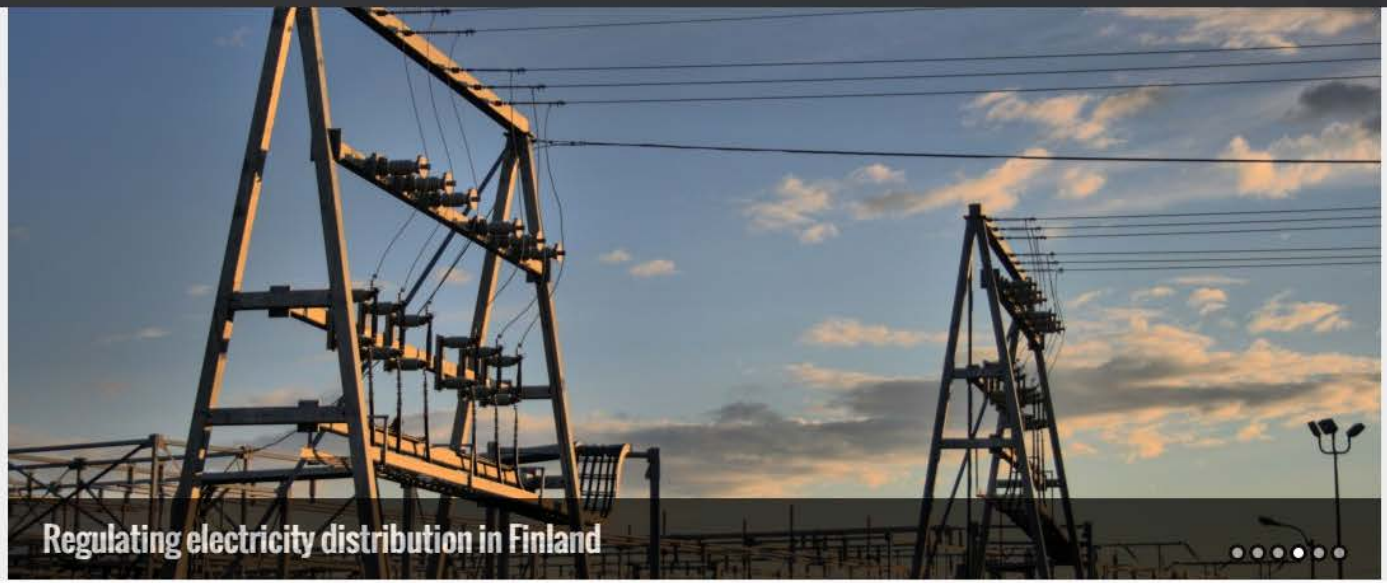
Work in diverse teams

Admissions Funding

Improved Job Potential

Andrew (Andy) L. Johnson, Ph.D.

Texas A&M University



News

Plenary Talk at European Workshop on Efficiency and Productivity Analysis (EWEPA) XIV

June 26th, 2015

The largest conference in the field of efficiency and productivity analysis is the European Workshop on Efficiency and Productivity Analysis (EWEPA) [...]

Informs Annual Conference - Nov 1-4 Philadelphia PA - DEA Cluster

June 25th, 2015

Seminars/presentation

- November 9th – Informs Annual Conference: A Multivariate Seminonparametric Bayesian Concave Regression Method to Estimate Stochastic Frontiers

  This presentation discusses a method that incorporates the latest advances in the Bayesian constrained regression literature offering an alternative to the current Least Squares-based and Kernel Regression-based Stochastic frontier constrained estimation methods, both in terms of runtime and of data capacity.

- October 4 and 5: College Industry Council on

Ongoing work

- Multi-variate Bayesian Convex Regression with Inefficiency

  This research builds in Hannah and Dunson's Multi-variate Bayesian Convex Regression to develop a method to estimate a shape constrained production functions and potential deviations from the function representing inefficiency.

- Shape Restricted Estimation of the Power Curve for a Wind Turbine

  The estimation of the power curve provides an application for methods to estimate production

Johnson Laboratory Members

Daisuke Yagi

Research Assistant

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Email: d.yagi@tamu.edu

Education

April 2009 - May 2013, **B.S.**, Department of Information and Communication Sciences, Sophia University, Tokyo, Japan.

September 2013 - Present, **Ph.D.**, Department of Industrial and Systems Engineering, Texas A&M University.

Research interest

Productivity and Efficiency analysis
Nonparametric estimation method

Publications

Daisuke Yagi, Keisuke Nagasawa, Takashi Irohara, Hans Ehm, Geraldine Yachi, Semiconductor supply planning by considering transit options to take advantage of pre-productions and order cancellations, *Simulation Modelling Practice and Theory, Vol.41, pp.46-58, (2014)*

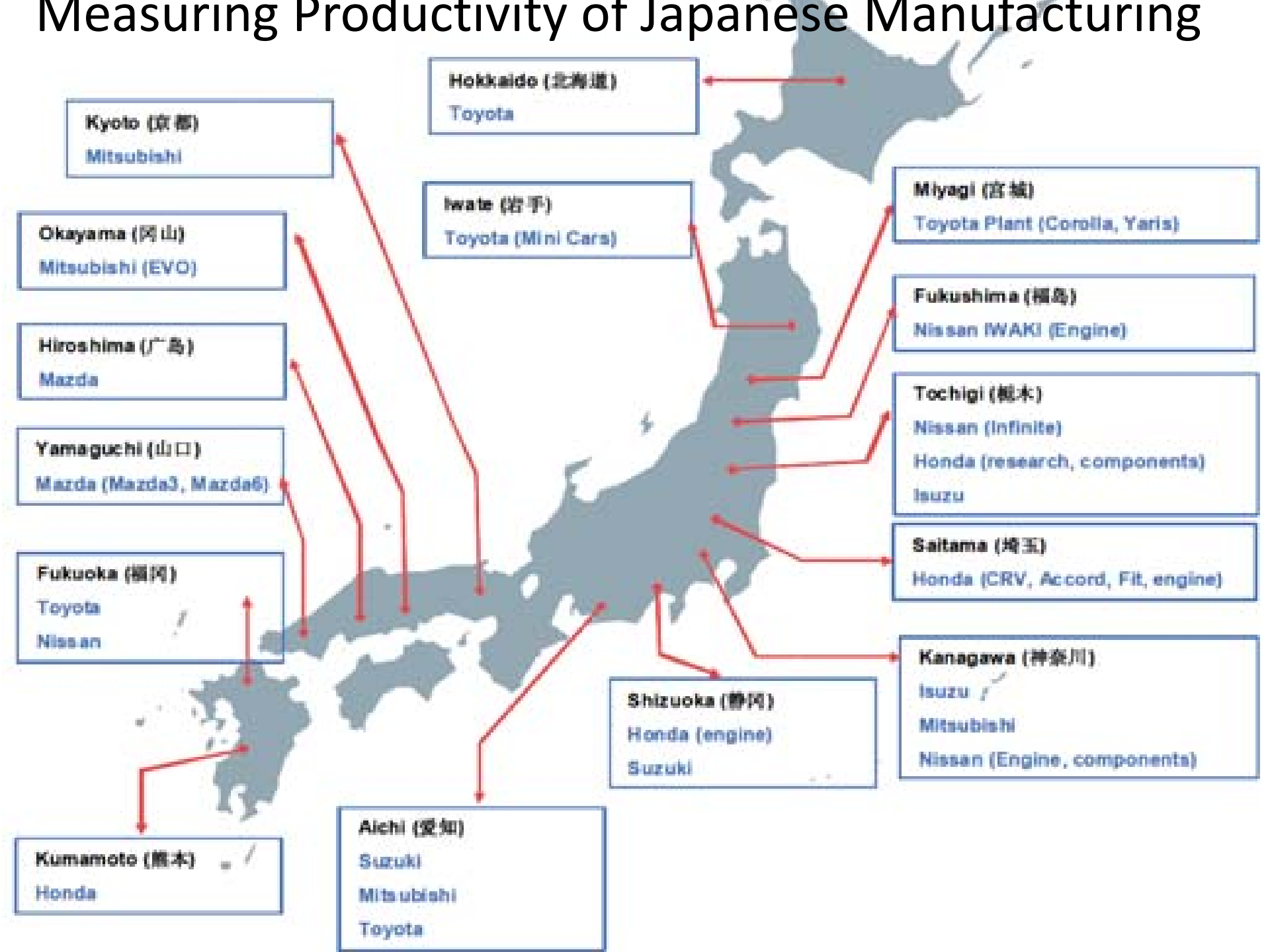
National Oilwell Varco

Hospital Productivity

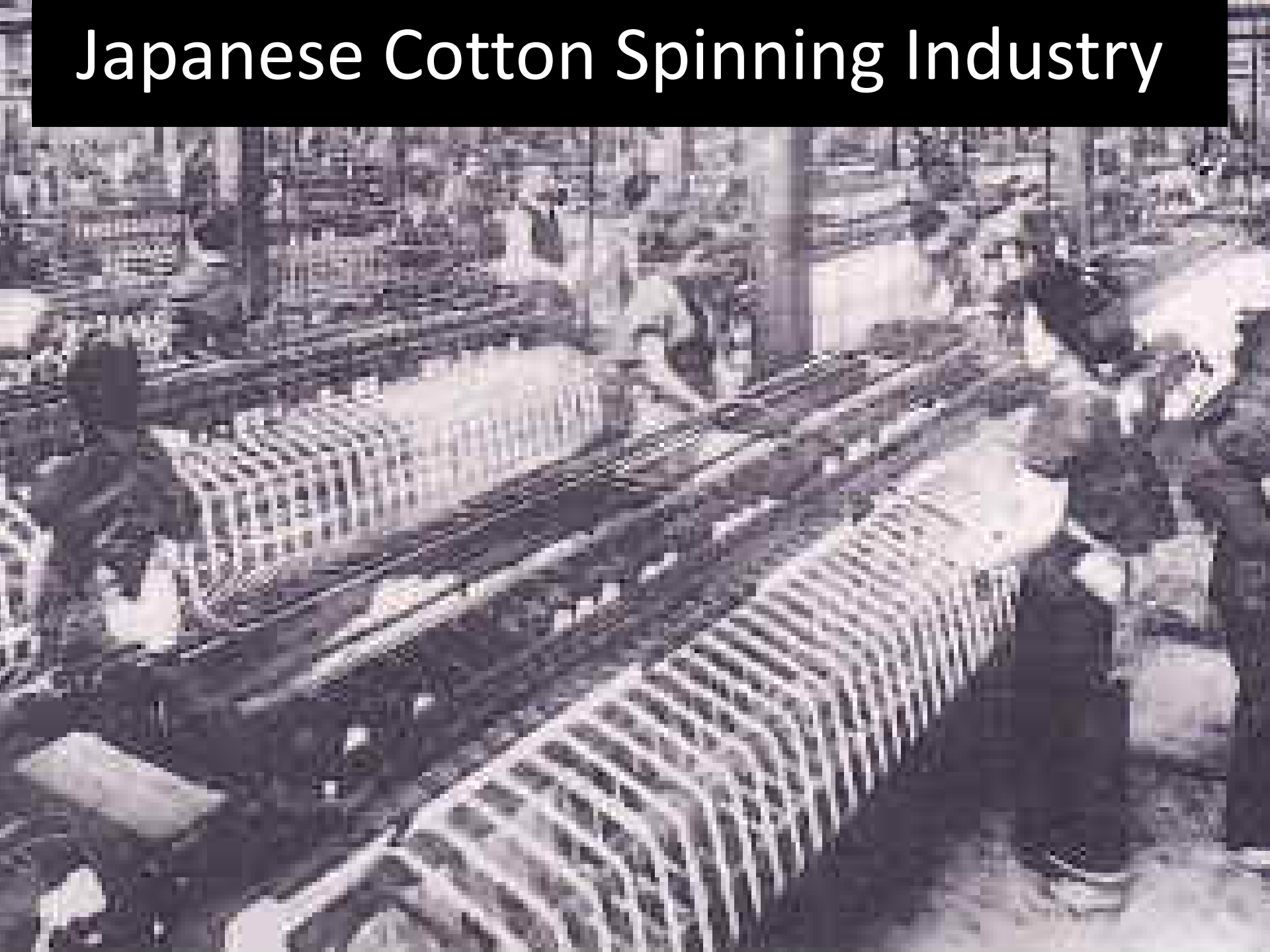
Effectiveness of Performance Measurement Systems in Italian Manufacturing

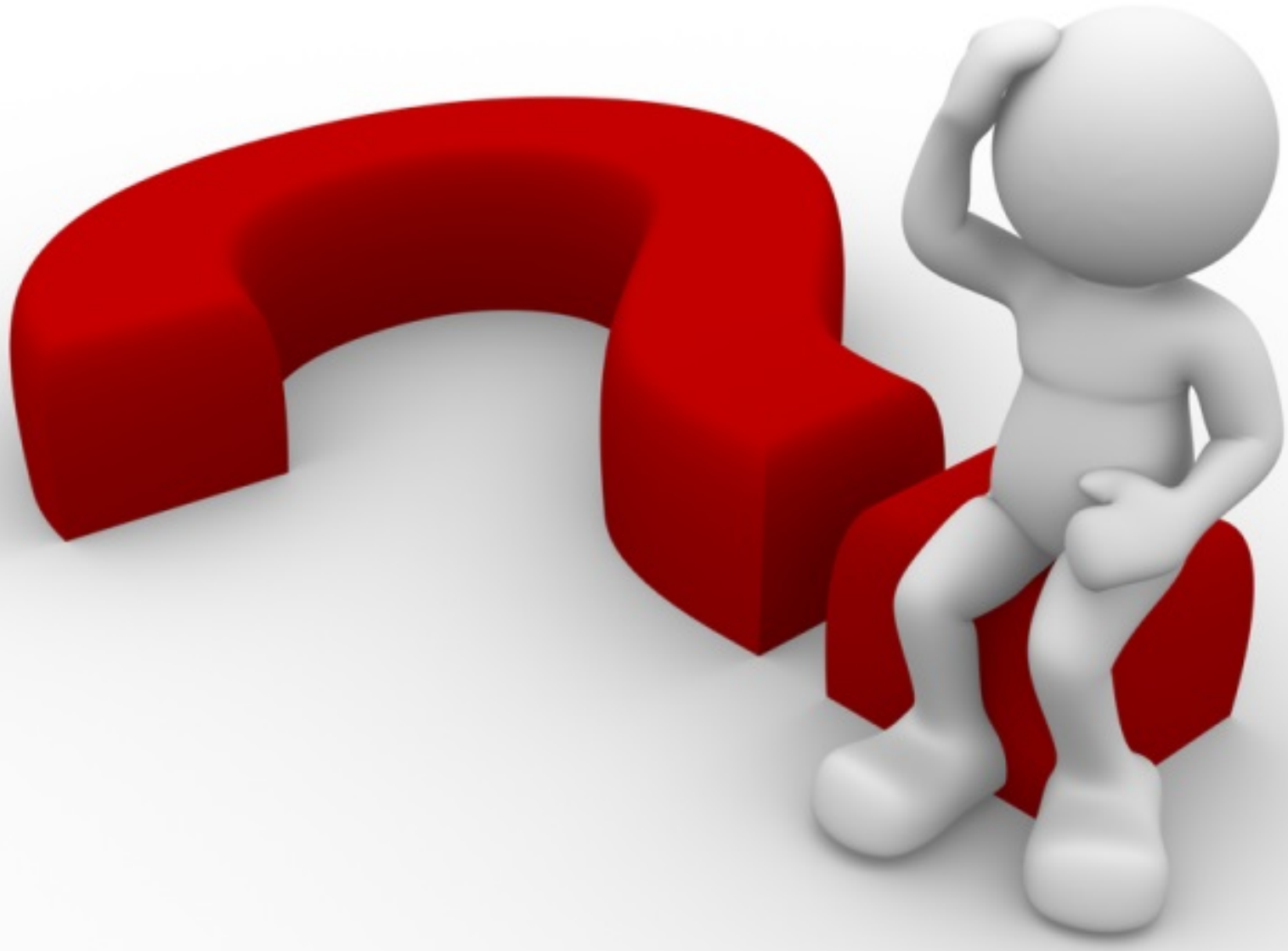
Measuring Productivity of Mexican Manufacturing

Measuring Productivity of Japanese Manufacturing



Japanese Cotton Spinning Industry





What will I learn in graduate school?


Data

Analytical and Creative Abilities


Let's
Discuss...