# 数字化转型下的精益升级 Lean Upgrading in Digital Era

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VP of Asia Supply Chain Management

Performance Materials and Technology

**QR** Code





# 宏观环境在飞快地发生剧烈变化 Drastic Disruptions At A Rapid Pace

### 政治挑战 Political Challenges







### 环境保护 Environment







### 人才战略 Talent







### 金融变革 Financial









# 商业大环境的大趋势: 中国企业的变化 Chinese Corporate Is Changing

### 老模式 Conventional Model





合规压力和成本较小:环保等 Less compliance pressure and cost: env. protection, etc.

市场竞争相对宽松 Relatively loose mkt competition

# 商业环境变化 Biz Env. changing

- · 严厉的环保政策 Env.
- 市场开放程度增加 Open mkt
- 融资难度增加Financing
- 人口红利变弱Labor population
- · 税收制度更加完善 Taxation

### 新模式 New Model

- 削减过剩产能,收紧投资
   Cut excess capacity and tighten investment
- 开始重视创新和企业盈利能力建设 Focus on Innovation & profitability building
- 合规成本增加:环保投资、税收等 Increased compliance costs: environmental investment, taxation, etc.
- 市场竞争激烈: 本土和跨国公司 Intense mkt competition: local & MNC



# 宏观市场 vs. 中国企业希望达成的目标 Macro Mkt vs. The Target of Chinese Company

### 企业希望达成的目标 Target of Chinese Corporate

- 如何达成利润良好的增长
   Achieve profitable growth
- 如何实现数字化转型Digital Transformation
- 如何成功实施全球化战略Global Strategy
- 企业需要怎样的核心能力 Core Competitiveness

The Challenge of Chinese Corporate

### 市场大环境的现实情况 The Reality of Mkt Env.

- 市场竞争加剧对企业盈利能力要求提升 Request of profitability increase
- 数字化技术引领新一代革命 Digital revolution
- 全球化程度的加深带来更多机遇和挑战 Globalization brings challenges & oppty.
- 市场经济使得企业优胜劣汰更加残酷 Market-oriented economy



# 精益理念已经超越了生产制造的范畴 Lean concept has expanded beyond production

精益理念超越了生产制造的范畴,逐渐在多样化的领域被应用, 如:创新、创业、客户体验、智能制造等

精益思想专注于生产方面的应用和 研究

1996

2000

2004

创业 Start-up

2011

供应链 Supply

2012

管理创新 Mgmt & Innovation

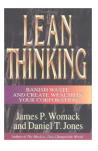
2015

客户体验 User Experience

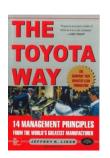
2016

智能制造 Smart Mfg.

2018

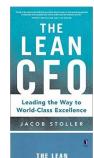




















# 精益无处不在 Lean Is Everywhere

























财务 Finance









# 工业物联网时代为精益生产注入新的活力,互补提升 IloT Gives Lean Production Vitality, They Are Complementary

### 精益生产

- ✓ 消除浪费、快速交付
- ✓ 识别&消除非增值环节
- ✓ 多品种、小批量
- X 缺乏 "信息化" 、 "网络化" 和 "自动化"
- X 生产环节连接不畅,数据采集 不全,流转不透明

Lean mgmt. provides operational base for mfg. digital transformation

lloT tech helps lean mgmt. land in company

# 工业物联网IIoT技术

- ✓ 精益思想与lloT不存在矛盾
- ✓ 价值流数据化,智能算法,智 慧解决方案
- ✓ 以数据为核心,串联所有生产 环节和流程
- X 一味增加智能硬件设备,忽略了内部增效和精益管理
- X 没有精益基础的智能化容易造成"信息孤岛"和无效投资



# 数字化升级后的精益管理为企业生产带来更大效益 Digital Lean Achieves More Benefits For Mfg. Corporate



### INITIAL STATE · Multiple process flows

- · Different layouts and
- · High level of manual labor

processes

· Poor quality that forces frequent rework



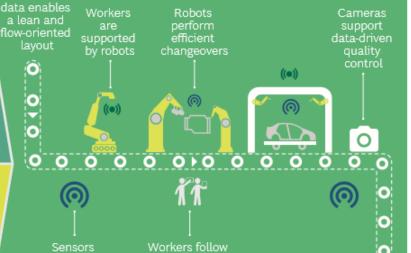
- There is a single lean and flow-oriented lavout
- Workers follow SOPs to improve efficiency
- Ergonomic work stations promote safety

15%-20% cost reduction 降低15%-20%成本



- Workers follow digital SOPs
- Robots support workers
- · Cameras support data-driven quality
- · Robots perform efficient changeovers
- · Robots automate material handling
- Predictive algorithms improve autonomous maintenance
- · But process inefficiencies and quality

降低10%-15%成本 10%-15% cost reduction LEAN INDUSTRY 4.0 GENERATES BENEFITS BEYOND THOSE THAT EITHER APPROACH ACHIEVES SEPARATELY Up to 40% cost reduction Real-time



enhance safety digital SOPs Predictive

0 0 0 0 10

- Robots
  - material handling

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Worker O Sensor

- 智能制造与精益优化融合后能产生 更大的效益: 20%(单独应用) →40% (融合应用)
- 大数据与先进分析技术为精益工具 提供了更准确透明的数据 Big data & adv. Analysis provide accurate & transparent data
- 精益管理与数字化技术结合的使用 场景 Using Scenarios
  - 生产转换 Mfg. switch
  - 停工预测 Shut-down prediction
  - 实时数据 Real-time data
  - 质量监测 Quality monitoring
  - 安全改善 Safety improvement

来源: BCG Analysis

Production flow



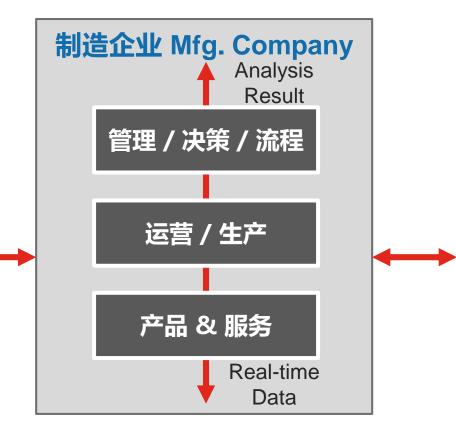
# 数字化精益还可以串联产业链,提升上下游整体表现 Digital Lean Integrates Industrial Chain, Improve Performance

### 供应链 Supply Chain

精益供应链模式借助数字 化系统实现在制品积压的 大量减少和快速补货

Reduction in the backlog of products & rapid replenishment

• 磨合优化流程,减少浪费, 提高准确度 Improve process, reduce waste



### 下游客户 Customer

- 更加透彻及时地了解客户的真实需求,减少浪费 The real needs of
  - The real needs of customers
- 通过流程优化来为客户提供更快捷准确的服务
  - 物流送货 Logistic
  - 产品 Offering
  - 售后服务 Service

Quality Performance

High Level Performance

Business Performance



# 中国正在自动化程度上快速追赶发达国家 China is catching up in automation

中国的自动化程度仍然大幅度落后于发达工业国家 China's automation is far behind industrialized countries...

# China Robot Density Lags Automation level remains low relative to other major economies on a per-worker basis South Korea Singapore Japan Germany U.S. Global Average China

Number of multipurpose industrial robots per 10,000 persons employed in manufacturing

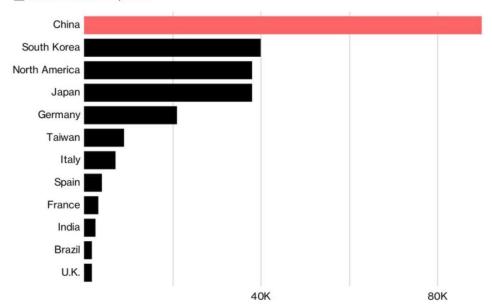
Source: International Federation of Robotics

# 但中国正在快速追赶 ...but is catching up rapidly

### **Robot Rise**

Installations in China are growing fast, and make up about a third of the global total

■ Estimated 2016 shipments



Source: Int'l Federation of Robotics, National robot associations, Bloomberg Intelligence Bloomberg



Bloomberg

# 日本企业具有深厚的精益管理基础,以"人"代代相传 Passing To Next Generation By Employees: Lean Mgmt In JP



### Mr. Yamada

Group Manager 18yr Working experience

### **Professional Experience**

**TOYOTA** 

**Toyota Motor Corporation** 

4 years

Group Manager
2016-Present, 3 years

Project Manager 2015-2016, 1 year

**TOYOTA** 

**Senior Executive Coordinator** 

Toyota Motor Corporation Australis

2012-2016, 4 years

**TOYOTA** 

**Plant Assistant Manager** 

Toyota

2008-2011, 3 years

**TOYOTA** 

Toyota

7 years

R&D Assistant Manager 2003-2006, 3 years

Production Engineering Specialist 1998-2002, 4 year

人才从生产线输送到各 个职能部门,精益思想 也随之在企业内传播、 积累、进化







# 然而中国企业的管理文化非常不同 Looking at management culture in China

### 中国企业扩张快速,但管理基础薄弱 Expand rapidly, weak mgmt. base

- 经济高速发展,爆发性的增长机会 High growth economy
- 注重扩张, 牺牲盈利, 负债率较高 Focus on scale expanding, weak margin
- 工人的教育程度较低,技能培训欠佳 Lack of well-educated & skilled workers
- 人员流动率较高High turnover rate
- 精益理论基础薄弱,缺乏精益管理实践体系
   Weak lean mgmt. base and practical system
- 人员没有形成良好的精益行为习惯 Lack of lean behavior

### 如何解决 How to solve

- 在公司内树立精益文化,鼓励全员参与, 渗透到各个职能
  - Build up **lean culture**, encourage all employees join in
- 数字化系统辅助精益落地和持续使用
   Digital system help lean mgmt. land and be sustainably used
- 智能制造设备升级,完善各级数据,支持精益应用
  - Smart mfg. **equipment upgrade**, improve **data quality**



# 霍尼韦尔的经验 Honeywell's Experience

# THE FUTURE IS WHAT WE MAKE IT













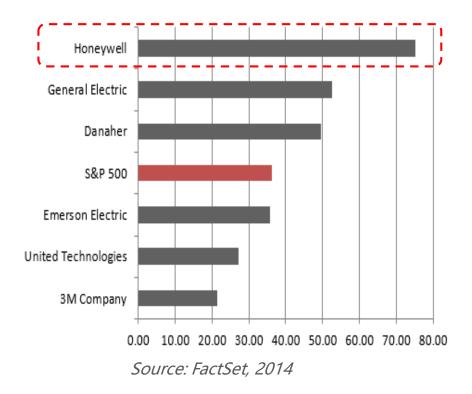
# 2000年以来霍尼韦尔经历了巨大的转变 Huge Turnaround and Transformation Since 2000

### 销售收入与公司市值 Revenue & Market Cap

销售收入 (\$Bn)	2001	2018
Honeywell	23.7	42.3
	125.9	124.0
SIEMENS	77.4	95.3
市值 (\$Bn)	2001	<b>2019</b> 年4月
<del></del>	<b>2001</b> 50.0	
(\$Bn)		年4月

### 从2008经济危机中恢复 Recovering From 2008 Crisis

3yr Stock Returns, ending Dec 31, 2012



### 霍尼韦尔的今天 Today

### STILL GROWING STRONG

- \$14B cash
- Strong market cap
- Pension funded
- Sustainability & environmental obligations



# 关键的转变 Key Transformations

### **KEY TRANSFORMATIONS**

### **KEY FOCUS**



改善运营 Fixing Operations

- Six Sigma, Honeywell Operating System (HOS)
- R&D process



**Strategy & Marketing** 

- Hire "real" strategists and marketers
- From "technology forward" to "market back"



**Portfolio Management** 

- "Great Positions in Good Industries"
- 80+ acquisitions. 40+ divestitures



**High Growth Regions** (HGR)

- >50% of global revenue growth
- China as the centerpiece



# 精益在霍尼韦尔 - HOS金牌运营 **Lean Mgmt. in Honeywell – Honeywell Operation System**

### 增长 Growth

Common Set of Tools / Metrics to Drive and Manage Sales

Value Proposition Development Rigor

Breakthroughs – New Adjacencies to Enhance **Growth Rate** BUSINESS PLANNING

**Channel Program Design** 

### 手段 Leverage

- Cross-Business Technology Development
- Cross-Business Selling

### 创新 Innovation

~11K Employees Developing Software; World-Class **Technologists Driving Innovation** 

Rigor and Metrics for New Product Development

Honeywell User Experience Incorporated Into Everything We Do

### 生产力 Productivity

- HOS Drove >200 bps Margin Expansion Over Last 3 Years
- OEF Management Drove ~80 bps Fixed-Cost Improvement Over the Last 5 Years



ORDER TO CASH

HOS-OTC

TOTAL CUSTOMER EXPERIENCE

X-MATRIX

Commercial Excellence

HOS

**GOLD** 

Lean / Six

Sigma

HUE

Working Capital

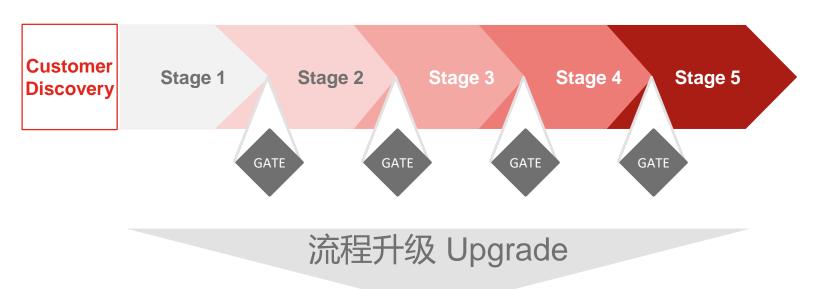
MANAGEMENTON

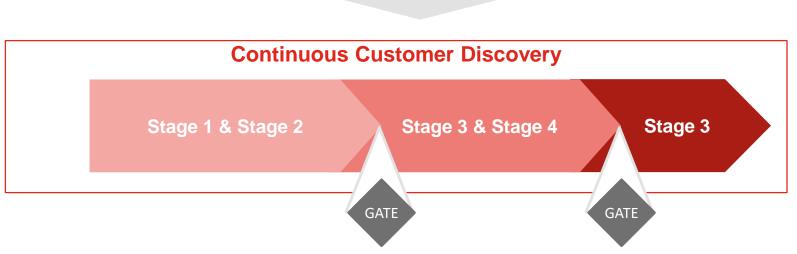
INTEGRATEDE

Agile

CMMI

# 精益在霍尼韦尔 – 敏捷开发 Lean Mgmt. in Honeywell – Agile Development







**50%** 缩短开发时间 Reduce Cycle time



持续发现客户需求 Continuous customer discovery



提早接触客户 Early customer validation



简化决策流程 Simplified decision process



# 霍尼韦尔金牌运营数字化 Digital HOS

### 数字化金牌运营的优点 Benefits

- 将流程和方法论**软件化**Software
- 增加用户的粘性Retention
- 推动持续追踪和改进
   Continuous track & improve
- 搜集并整合运营数据, 为智能分析提供基础

Data and smart analysis

### 霍尼韦尔RPS系统



### 霍尼韦尔CKS互联改善系统



### 霍尼韦尔CTM互联层级会议



### 霍尼韦尔EAGLE安环管理系统



# 数字化转型是精益管理在中国企业落地的关键机遇 Digital transformation breathes new life into lean for Chinese enterprises



