



Welcome!

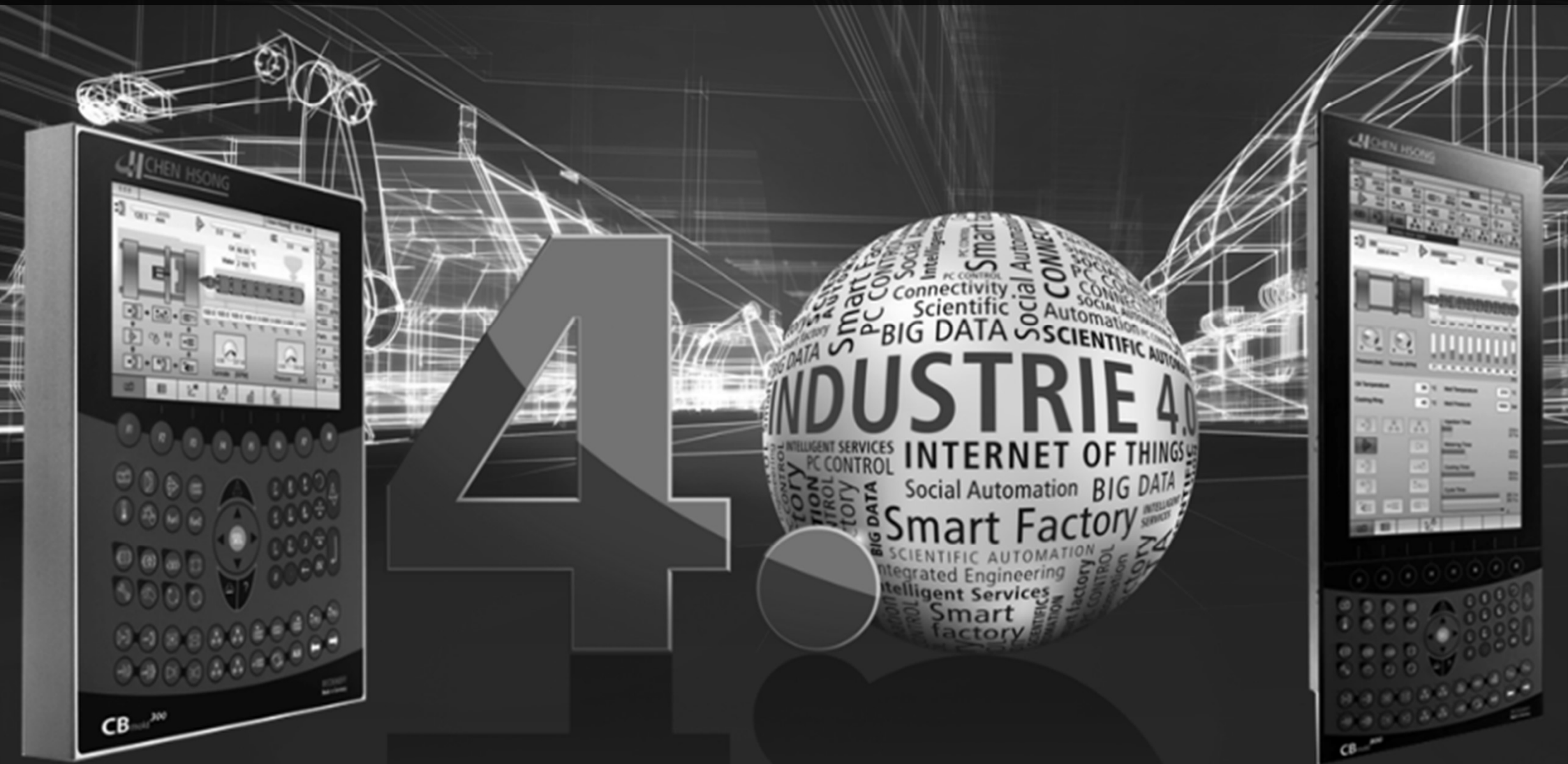
Chen Hsong – Who Are We?



One of the largest producers of injection moulding machines in the world

Annual production exceeds 15,000 machines

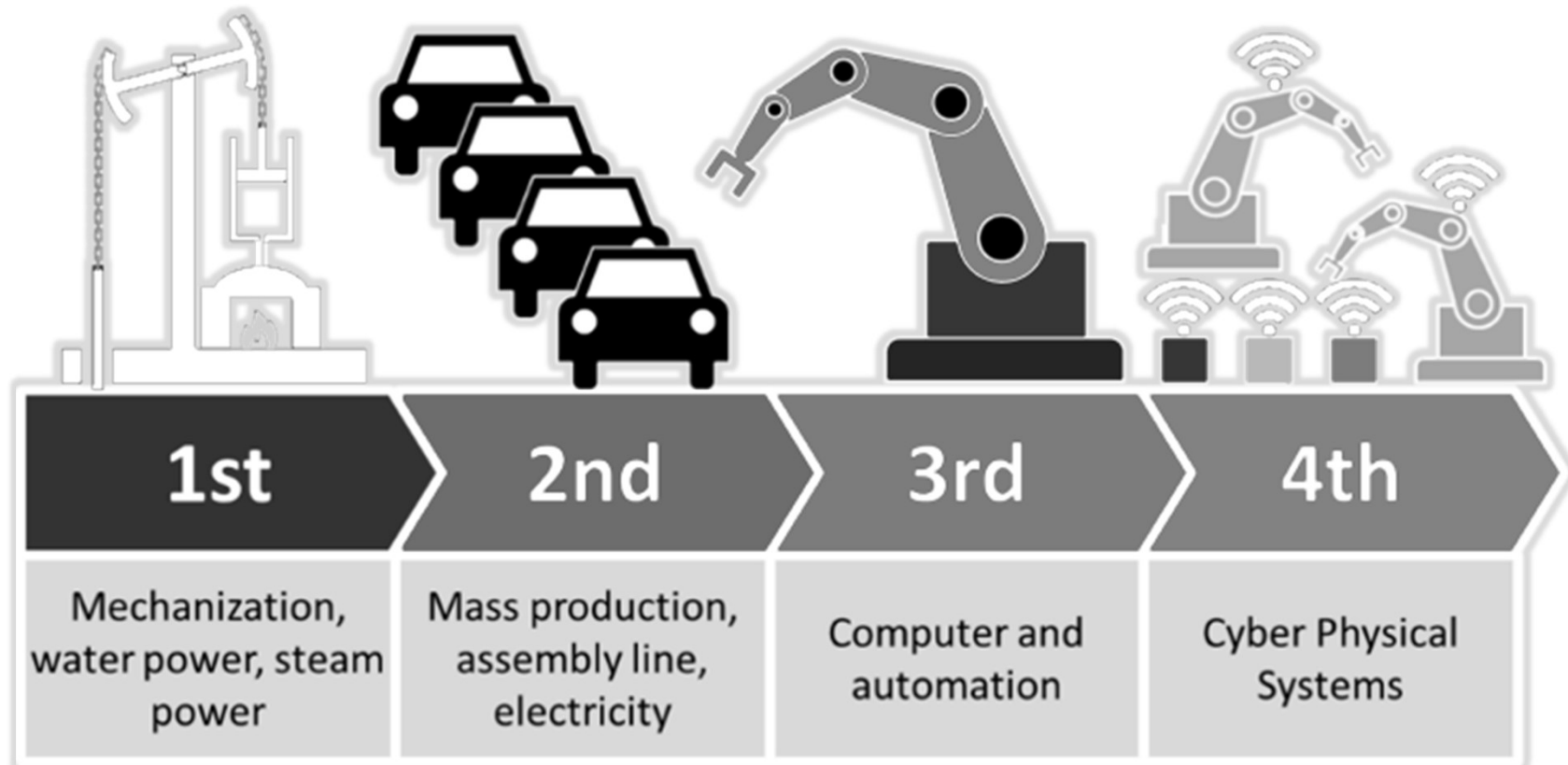
Industrie 4.0 And The Modern Work-Flow



Define

What is
Industrie 4.0?

The Four Stages of Industrial Revolution



What is Industrie 4.0?

- Originated in Germany in the 2000's
- Termed “Cyber-Physical Systems” (CPS) in the USA
- Driven by needs of an aging population and rigorous demands of modern life-styles
- It is a *research goal* – there is *no* Industrie 4.0 factory yet

Defining Characteristics of Industrie 4.0

- Interoperability
- Virtualization
- Decentralization
- Real-Time
- Service Orientation
- Modularity

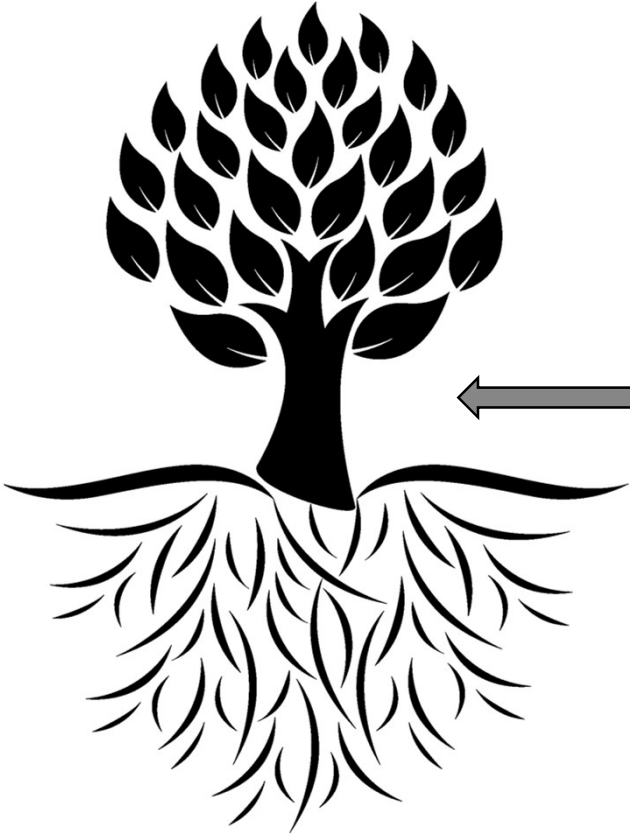


Industrie 4.0 – Simplified View

Branches

Trunk

Root



Communi-
cations

AI

BIG DATA

The Goals of Industrie 4.0

- Cyber-Physical Systems =
Bridge Cyber (Computers) and Physical (Machines)
- Let the Machine Think (so you don't have to)
 - compare with 3.0 – Let the Machine Work
- Mass Customization = Mass Personalization
 - the coming of penultimate individualism
 - 3D printing technology likely to accelerate trend
- Individualized Service a Possibility (or the norm)

What does it *mean*, really?

- At Hannover Messe 2016, then President Obama of the USA visited the Siemens booth, asking the same question
- Siemens CEO Joe Kaeser gave him a golf club which was custom-designed and custom-manufactured to perfectly fit Obama's size and swing style
- Such a personalized golf club cost no more to make than a regular, mass-produced model





#1

BIG DATA

The Basis of
Everything

First You Must be Able to Collect All That Data...

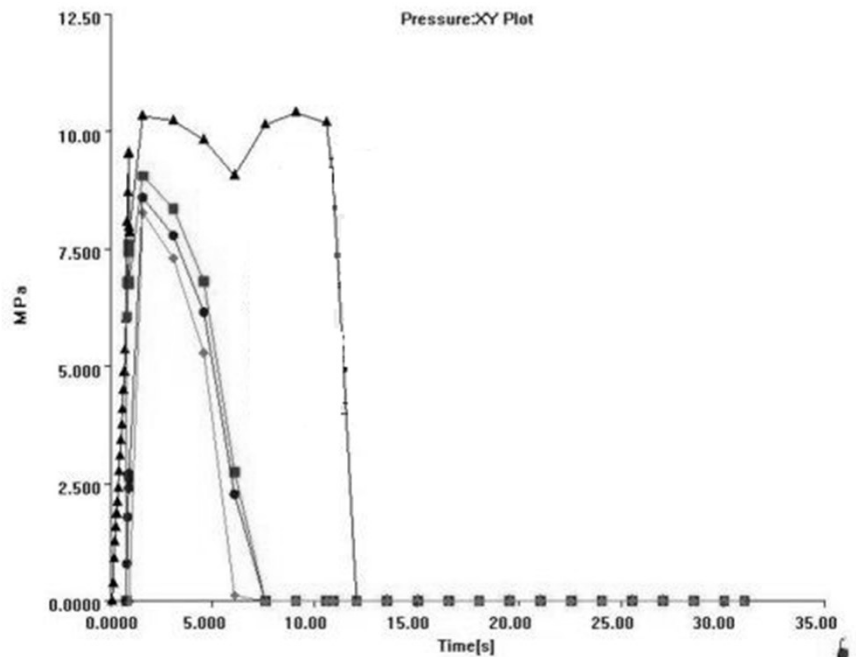


Entering the era of **BIG DATA**

Basic	1GB flash storage
Advanced	8GB flash storage
Enterprise	16GB flash storage
Ultimate	32GB flash storage

is your equipment **BIG DATA**-ready?

Then What Can You Do With It?



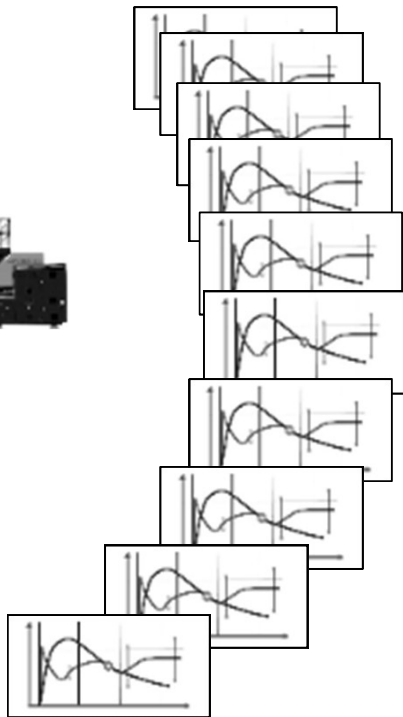
EXAMPLE:

Stores the injection speed and pressure curves of EVERY cycle within the past month.

Store All That Data into The Cloud



Injection moulding machine



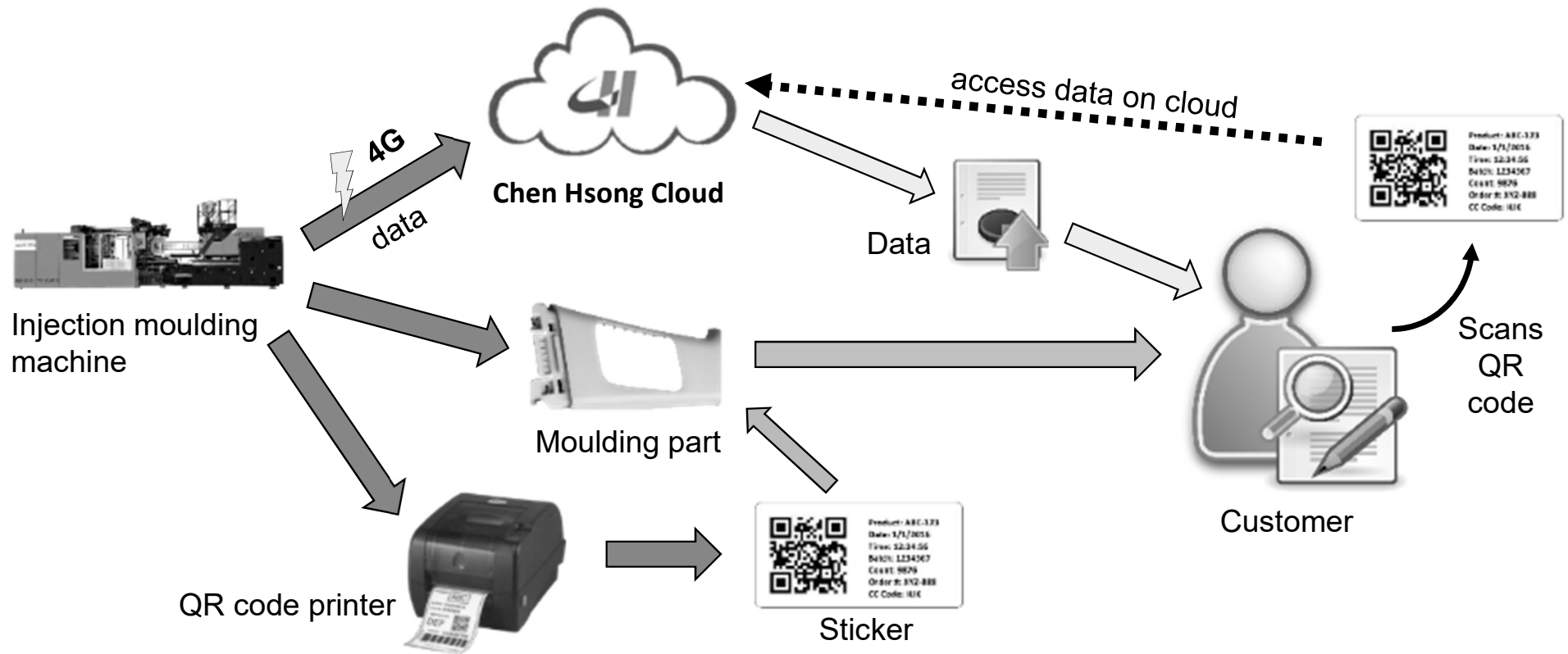
Injection curve for each cycle



Chen Hsong
Cloud Database

But Then What?

Cloud-Based Data Management





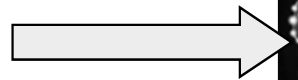
What's Good About This?

- Easy
- Secured
- Zero Maintenance
 - Zero Labour
 - No Fuss

iChen™ 4.0 Cloud Intelligence



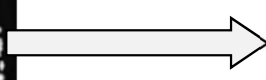
**Chen Hsong
Cloud Database**



Big Data Map-Reduce (MR) processing and Machine Learning (ML) on trends prediction and pattern recognition



**Trends &
Intelligence**



**Alerts &
Alarm
Triggers**



**Advanced
Analytics**



Service Implications

How can BIG DATA help improve service levels?



Chen Hsong Cloud Preventive Maintenance

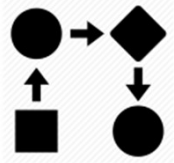


Injection moulding machine



Chen Hsong technicians
show up **before**
problem occurs

- Cloud-based, with BIG DATA calculations, continuously monitors sub-systems performance
- Monitors parts wear and tear
- **Discovers potential failures *before* they happen**



Work Flow Implications

How can BIG DATA help
stream-line work flows



EXAMPLE:

Time Machine

Restore machine to the *exact state* of any time within the past month

Time Machine – In Action



时光机器

关 开

选择时间...

保存选项..

选择模数...

恢复选项..

28GB 可用 (共 32GB)

最早的备份: 2016 年 7 月 18 日

最新的备份: 2016 年 7 月 18 日

下次备份: 今天 下午 12:30

选择磁盘..



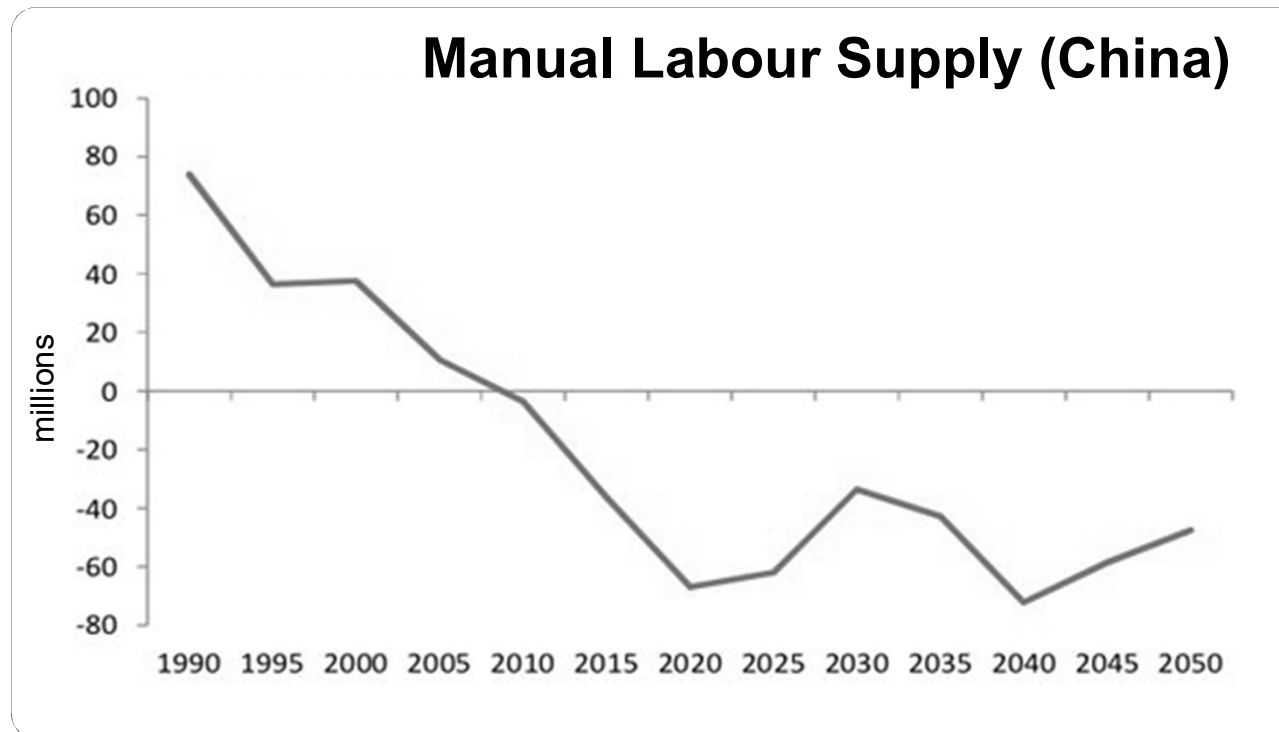
#2

AI

Making Sense
Out of All Those
DATA

(so you don't have to)

China's Big Problem: Fewer and Fewer Workers



* Population aged 15-19 minus 50-54 and new university students

Source: CEIC, UN, CS

Artificial Intelligence to the Rescue



CBmold AI Auto-Tune

Through *machine learning* processes, the controller automatically sets and fine tunes moulding parameters without human interference. Now **That's** smart.

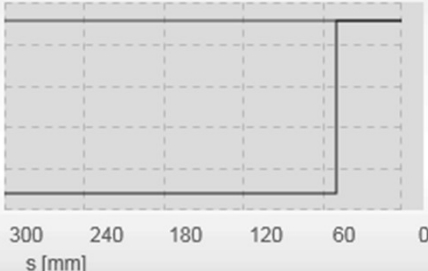


*** Click-Once ***

Traditional Machine Controller Setup Screen

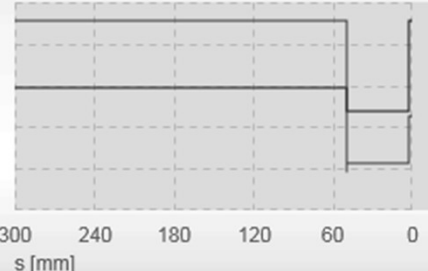
211 開合模設定 震雄 2016/05/15

開模



s [mm]

合模



s [mm]

	末段 ◀ 4# ◀ 3# ◀ 2# ◀ 1#				1# ▶ 2# ▶ 3# ▶				模保	鎖模		
位置	300.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	3.00	0.0	mm	
速度	20.0	20.0	20.0	20.0	20.0	100.0	20.0	20.0	25.0	50.0	%	
壓力	5.0	15.0	35.0	35.0	55.0	65.0	65.0	65.0	52.5	100.0	bar	
									模保超時	3.0	0.0	s

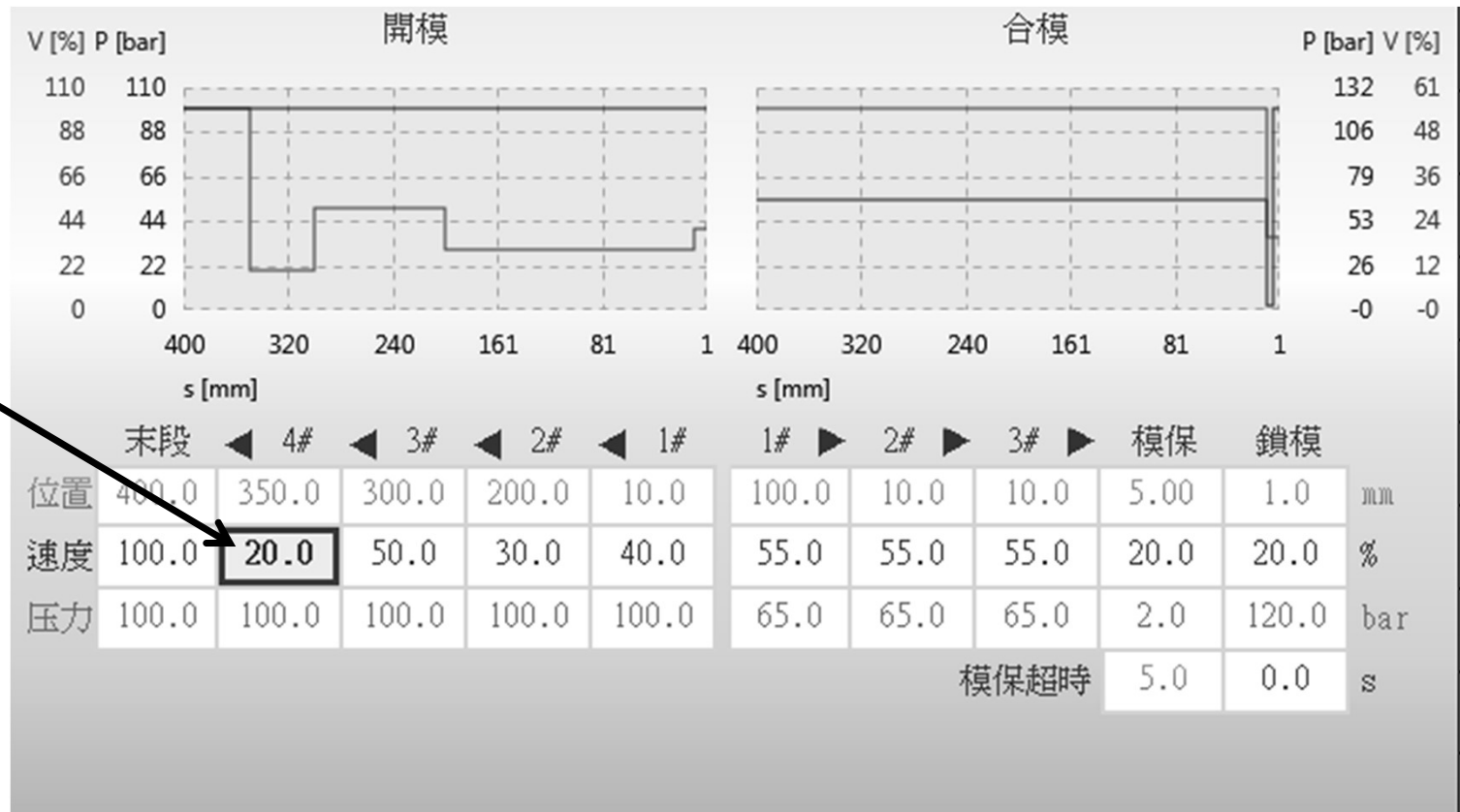
人工智能調機開關

開合模
調模
潤滑
機械手
高級

模板	0.0 mm
頂針	0.0 mm
射膠	-4.5 mm
射臺	0.0 s
轉速	0.0 rpm
背壓	0.0 bar
壓力	0.0 bar
流量	0.0 %
實際	0.0 bar
模數	49

Mistakes are Just Too Easy...

Oops!



AI Auto Setup – No Trained Technicians Needed

211 開合模設定		4	震雄	2016/05/16
<h2>人工智能调机模式</h2>				
 <p>开模终止位置</p> <p>300.0 mm</p>		 <p>开模速度</p> <p>20.0 %</p>		 <p>锁模速度</p> <p>100.0 %</p>
<input checked="" type="checkbox"/> 人工智能调机开关				
 開合模	 調模	 潤滑	 機械手	 高級
				模板 0.0 mm 頂針 0.0 mm 射膠 -4.5 mm 射臺 0.0 s 轉速 0.0 rpm 背壓 0.0 bar 壓力 0.0 bar 流量 0.0 % 實際 0.0 bar 模數 170

How AI Alleviates Labour Shortages?

- Knowledge-base
- Auto check-up's and diagnostics
- Auto monitoring
- Worldwide data mining of stored data
- Patterns recognition and proactive actions
- Reminders and alerts

Leaving humans to what they are best at: Solve Problems and Make Decisions

The background of the slide is a repeating pattern of stylized speech bubbles in various shapes and sizes, rendered in shades of gray. A white rectangular box with a thin black border is centered on the left side of the slide. At the top of this box is a white shield-shaped icon containing the number '#3'.

#3

Communications

The Way We Talk to
Machines

or How They Talk to US

Common Myth: Industrie 4.0 is Complicated

MYTH BUSTER

NO.

If it is complicated, it is *not* Industrie 4.0.

What Do Humans Use to Communicate?

- WhatsApp
- WeChat
- Facebook Messenger
- iMessage
- LINE
- Skype
- Email
- SMS
- Good Old Phone Call

Machines Learning to Talk to US



CBmold + WeChat®

Equipment = Friend

Management = Chat Group



Conclusion

Remember This Tree



BIG DATA

Data underlies **EVERYTHING**

AI

Think for us

Communications

Talk to us



Chen Hsong

Thank You!