Industry 4.0
From Rule based to Goal based Automation
Phenomenal Growth

- 55+ Ventures built & launched with Fortune 500 partners
- 100+ Innovation Sprints
- 680+ Employees globally
- 7 Global centers
- 6 Satellites and Labs

BCGDV invents, launches and scales revolutionary new ventures with the world’s most important companies

Our Approach

We help corporations think and act like venture capitalists through a portfolio of investable business ideas and a relentless dedication to consumers.

We’ve also pioneered new ways of sharing the risks and upside of corporate venturing with our collaborative partners.

Global Thought Leadership

We speak at the world’s biggest conferences, where we seek to inspire others with our latest thinking around technology, innovation and venture development. We also contribute to the publications that help make sense of what’s happening in business, technology and design.

DVolution is our next generation global Blockchain platform

DV Spark is our internal incubator in Mountain View and Seattle

55 Degrees is our launch-pad service for new ventures
Globally, we have built >50 new businesses with corporate partners from automotive, banking, logistics, retail to industrial goods companies.
When we find an untapped source of opportunity, we **Invent** new products and businesses.

When we find an existing venture with high potential, we **Invest** in IP, talent and market opportunities.

We exist to **Invent** and **Invest**.
Disruption in Industrial Technology
The Next Leap Forward

Smart Material
Generative Design
Digital Twin/Shadow
Additive Manufacturing
Edge Computing
Collaborative Robots
AI
AR
Tesla is struggling with assembly of the Model 3 at its car plant in Fremont, California

Mr Musk has overcomplicated the already difficult task of making a mass-market car. Rather than relying on the time-tested manufacturing methods used by established rivals, who still use people to do tasks that machines are as yet unsuited for, he wants his car factory to be a hyper-automated "machine that makes machines"

Source: Economist 04/2018
The real world challenge

Example: Tesla plant in Fremont CA

Each production system consists of complicated & complex processes
You can handle complicated systems - it's just a matter of experience.
You can influence and overserve a complex systems but not predict any outcome.
In the past companies emphasized the principles of lean production ... ... than improving technical process automation

1990

Lean Production (Management)
Objective: Redesign processes / organization to reduce complexity

Real World

Complicated Processes

Complex Processes

1990

Real World

Today

Rule based Automation

Kanban Control

Real World

• Detailed process definition & interface description
• Fast reaction to failure
• Simple quality inspection
• Customer centric design

• Clear role & responsibility
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than improving technical process automation

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Objective: Redesign processes / organization to reduce complexity

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Rule based Automation

Kanban Control
TODAY
Rule based Automation

FUTURE
Goal based Automation
SENSE – INFER - ACT  

**The Edge** establishes connectivity to the physical world

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**Data Collection**

- Collect data
- Prepare data

**Sensor Fusion**

- GPS, WLAN, Gyroscope, Accelerator, Camera

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BCG Digital Ventures
The Edge works autonomously, reacts in real-time.
SENSE – INFER – ACT

Define the Goal you like to achieve

Goal Function
Find shortest path from A to B under consideration of feature ...

Data Processing Pipeline
Collect data  Prepare data  Design features/combine data

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Data Processing Pipeline

- Collect data
- Prepare data
- Design features/combine data
- Train Model

Deploy trained Model (Algo.) to the Edge

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SENSE – INFER – ACT

Apply AI to solve the Goal function

42% 92% 76% 34% 27% 42% 92% 76%
BCG Digital Ventures

SENSE – INFER - ACT

- 34%
- 27%
- 42%
- 92%
- 76%
Handle situation you did not taught before!
**TODAY**
Rule based Automation

- Input data
- Mapping
- Output

Complicated Processes

Complex Processes

Real World

**FUTURE**
Goal based Automation

- Input data
- Mapping
- Output

Level of control

+ Unlock OEE poten.

Real World

**BCG Digital Ventures**
Automotive Glazing Industry
Explore how AI & Edge Computing technology can prevent production interruptions
Major challenges in the windshield production are geometric deviations which are caused by the thermal bending process.

Manual robot programming leads to costly ramp-up.

Operators frequently re-adjust the robot programs.

The deviations lead to process disturbances which cannot be compensated by standard industrial robots.

Complex
Complicated
BCG DV & partners enabled self-optimizing robot handling by leveraging Amazon Edge Computing Technology

Digital Shadow is a physical representation of the physical workpiece.
THERE IS A PARADIGM SHIFT IN PRODUCTION TECHNOLOGY

Start transforming your business with AI and Edge computing technology. Improve quality, enhance productivity and optimise the availability of your resources or generate new opportunities of growth inside and outside the shop floor.
Keep in Touch

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