Achieving success in construction project through industry revolution 4.0

Ir. Dr. Hj. Zarabizan

ACHIEVING SUCCESS IN CONSTRUCTION PROJECT THROUGH INDUSTRIAL REVOLUTION 4.0

by

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Ir. Dr. Z

1. INTRODUCTION

Project Output - Time
- Cost
- Quality

Traditional Method vs Robotic

Challenge &
Outcome Reality

2. LITERATURE REVIEW

Project Success

- Technical Validity

- Organizational Validity

- Organizational Effectiveness

Source: Pinto J.K. & Slevin, D.P. (1988). Project Success: identification and measurement tehniques. Project Management Journal, 19(1), 67-72


SUCCESS!
RESULTS
TEAMWORK
STRATEGY
PLANNING
GOAL
IDEA
CREATIVITY

Success Criteria

Criteria used for measuring Project Success in Construction

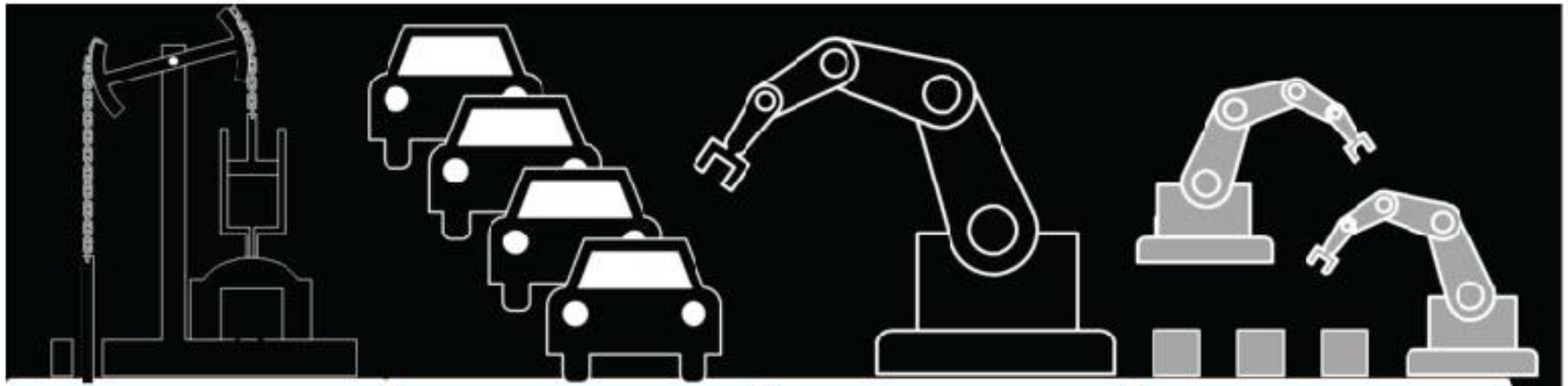
Criteria	*Rank*
Meets client's requirements	1
Completed within schedule	2
Completed within budget	3
Meets organisational objectives	4
Yields business and other benefits	5
Causes minimal business disruption	6
Meets quality and safety standards	7
Other criteria	8

Source: White and Fortune

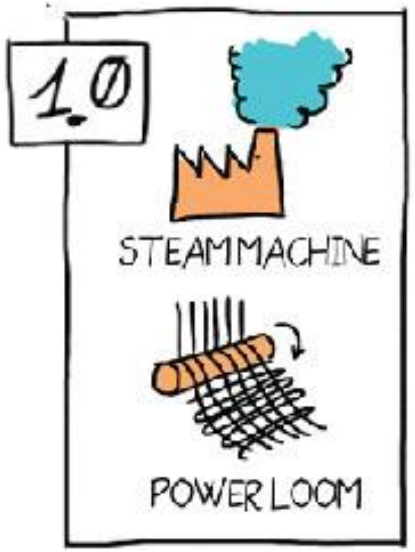
The critical success factors from the 10 top effective factors in construction project

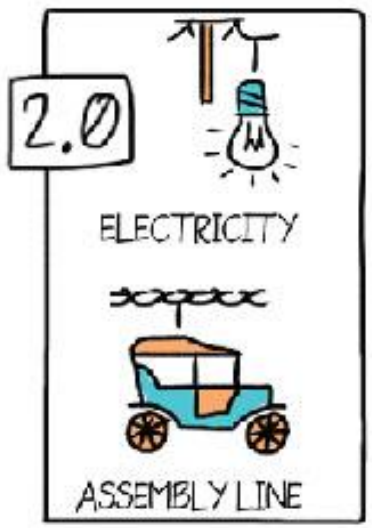
No.	Critical Factors	% Weight
1	Technical and economic assessment of the project required resources	14.5
2	Experience and executive records of the project manager	10.2
3	Project strategic planning	8.8
4	The executive experience of the contractor team about the project subject	6.5
5	Ability of on-time decision making (employer's agent in project)	6.3
6	Project control management	6.1
7	Prioritization of purchasing the needed items considering the project schedule	5.0
8	Mechanism of forming an experienced technical-legal team at the time of contract	4.6
9	Authorization in Financial decision makings and cost control considering project type and size	3.7
10	Mechanism of financial payment in relation to the project commitments and Plan	2.9

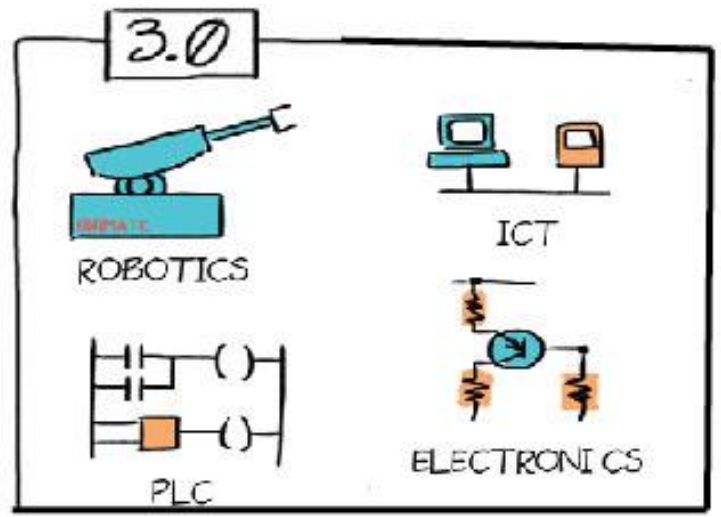
HISTORY IR 4.0

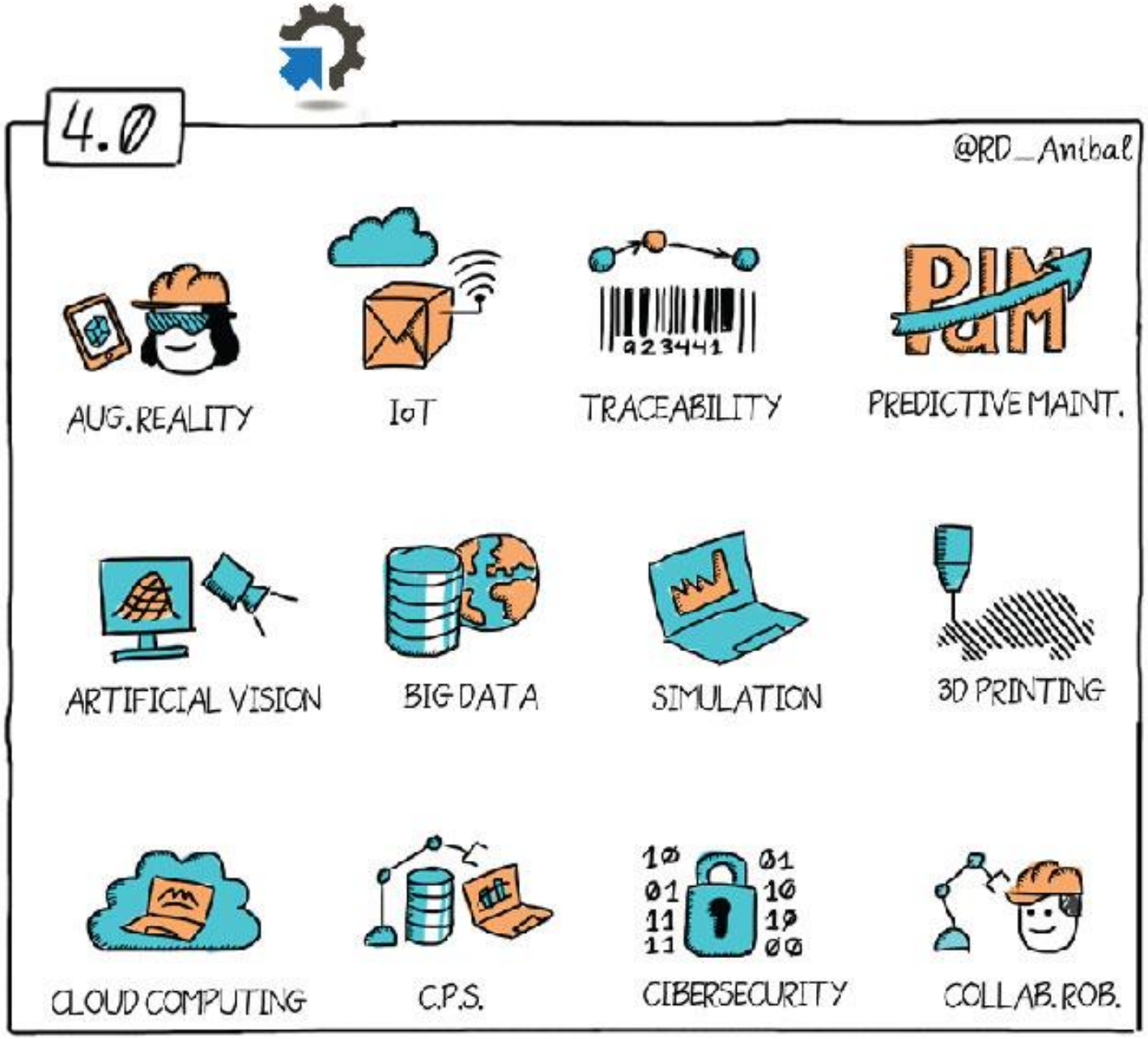


1st	2nd	3rd	4th
Mechanization, water power, steam power	Mass production, assembly line, electricity	Computer and automation	Cyber Physical Systems








4.0
@RD_Anibal
AUG. REALITY
IoT
TRACEABILITY
PREDICTIVE MAINT.
ARTIFICIAL VISION
BIG DATA
SIMULATION
3D PRINTING
CLOUD COMPUTING
C.P.S.
CIBERSECURITY
COLLAB. ROB.


INDUSTRY
4.0

3. TIPPING POINT & IMPACT IR 4.0

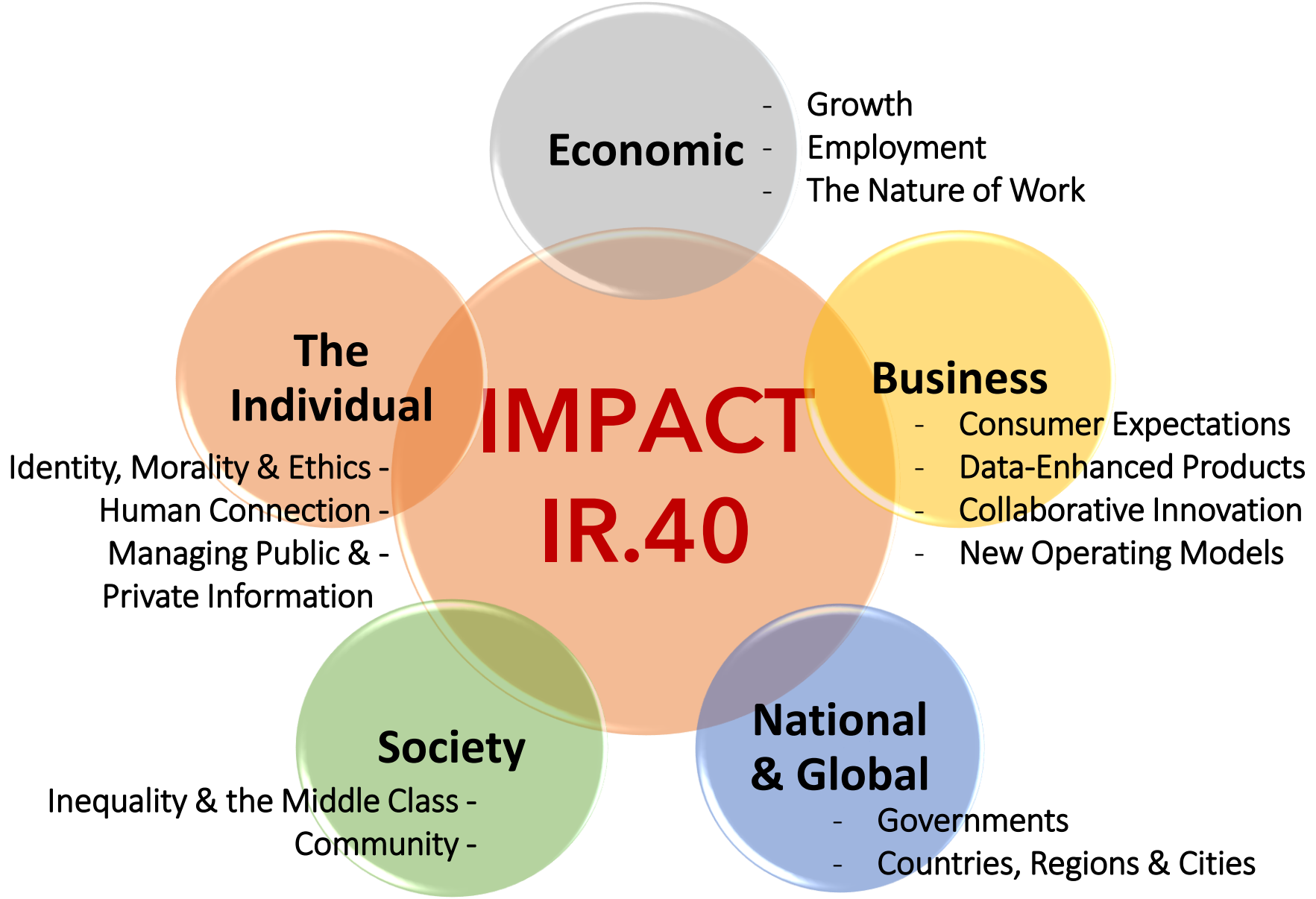
TIPPING POINT

A World Economic Forum report published in September 2015 identified 21 tipping points – moments when specific technological shifts hit mainstream society – that will shape our future digital and hyper-connected world

Source: World Economic Forum, Deep Shift – Technology Tipping Points and Societal Impact, Survey Report, Global Agenda Council on the Future of Software and Society, September 2015.

	%
10% of people wearing clothes connected to the internet	91.2
90% of people having unlimited and free (advertising-supported) storage	91.0
1 trillion sensors connected to the internet	89.2
The first robotic pharmacist in the US	86.5
10% of reading glasses connected to the internet	85.5
80% of people with a digital presence on the internet	84.4
The first 3D-printed car in production	84.1
The first government to replace its census with big-data sources	82.9
The first implantable mobile phone available commercially	81.7
5% of consumer products printed in 3D	81.1
90% of the population using smartphones	80.7
90% of the population with regular access to the internet	78.8
Driverless cars equalling 10% of all cars on US roads	78.2
The first transplant of a 3D-printed liver	76.4
30% of corporate audits performed by AI	75.4
Tax collected for the first time by a government via a blockchain	73.1
Over 50% of internet traffic to homes for appliances and devices	69.9
Globally more trips/journeys via car sharing than in private cars	67.2
The first city with more than 50,000 people and no traffic lights	63.7
10% of global gross domestic product stored on blockchain technology	57.9
The first AI machine on a corporate board of directors	45.2

Source: *Deep Shift – Technology Tipping Points and Societal Impact*, Global Agenda Council on the Future of Software and Society, World Economic Forum, September 2015.



Source: Klaus Schwab (2016). The Fourth Revolution. World Economic Forum, Switzerland

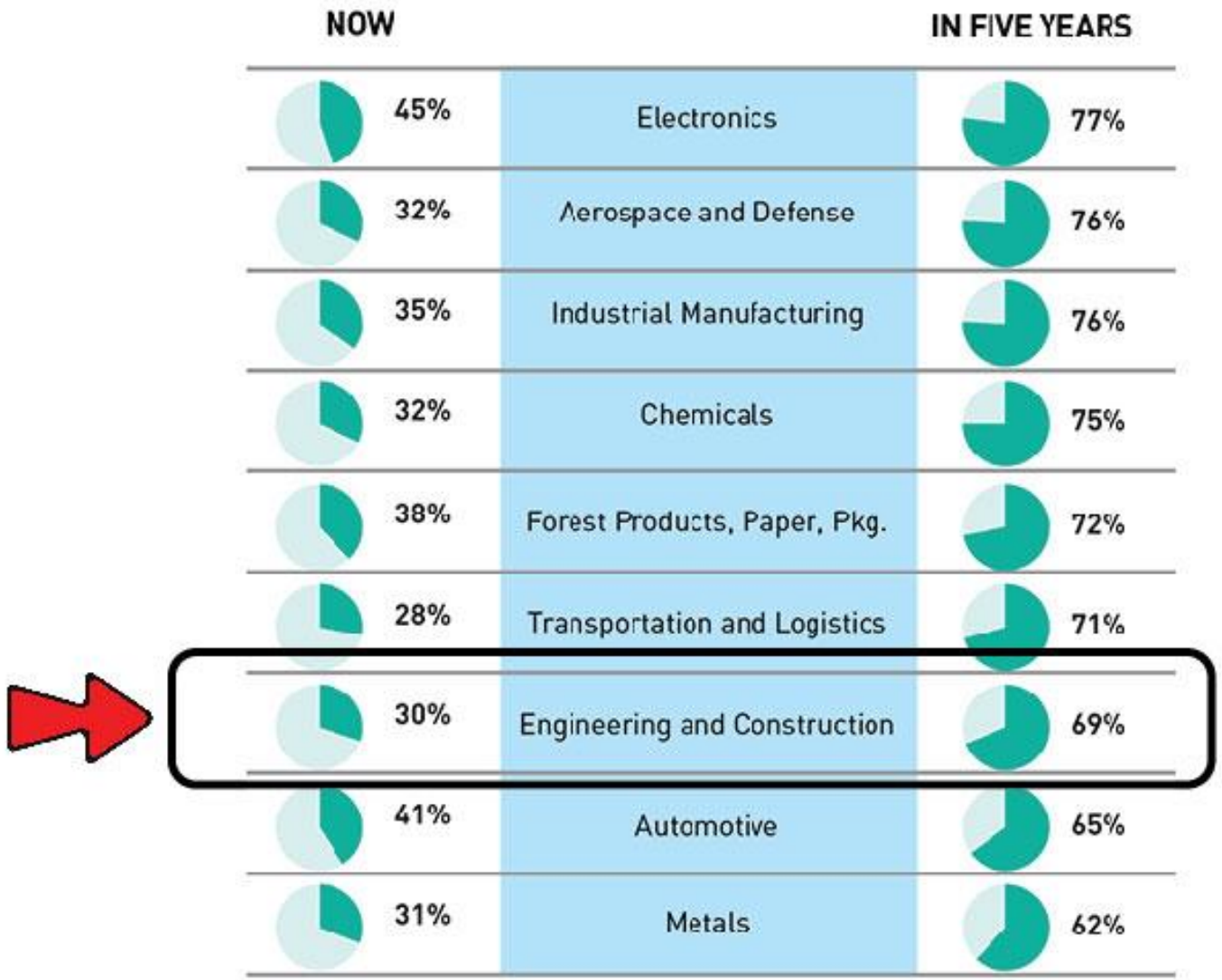
4. THE IMPORTANCE OF IR 4.0 IN CONSTRUCTION

Industry 4.0, also known as the Fourth Industrial Revolution, is based on the idea of automation and digitalisation of production processes, leading to 'smart manufacturing'.

The fourth industrial revolution, or 'Industry 4.0', will see construction coming in line with more digitally developed industries.

This will revolutionise not only how physical structures are designed, built and maintained, but also how they are subsequently used.

Exhibit 1: Adoption of Industry 4.0, by Sector



Source: "Industry 4.0: Building the Digital Enterprise," PwC

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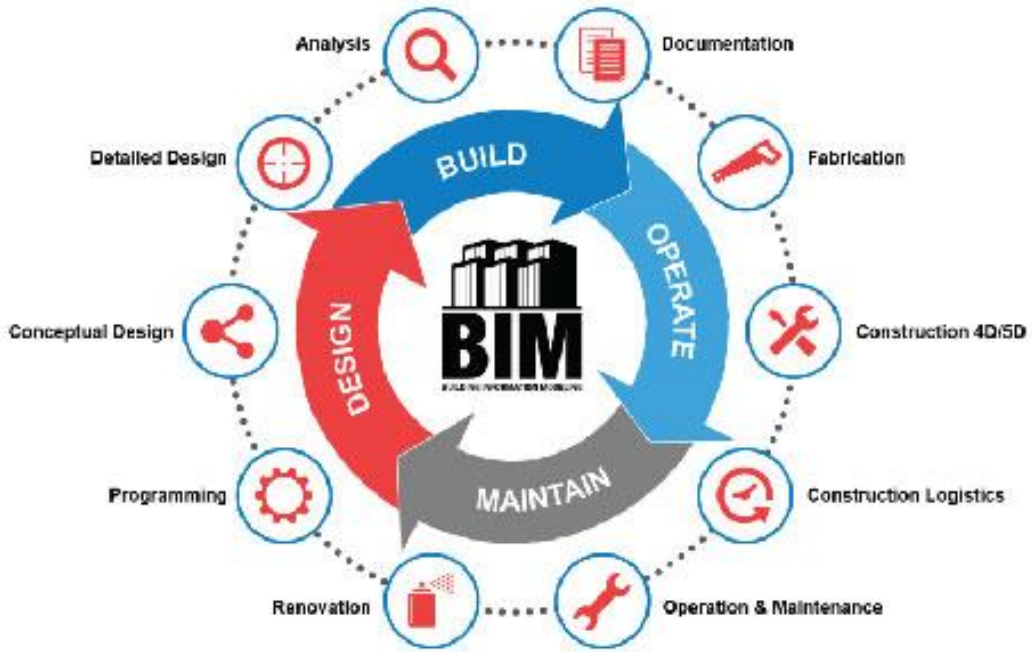
Smart Materials & Techniques

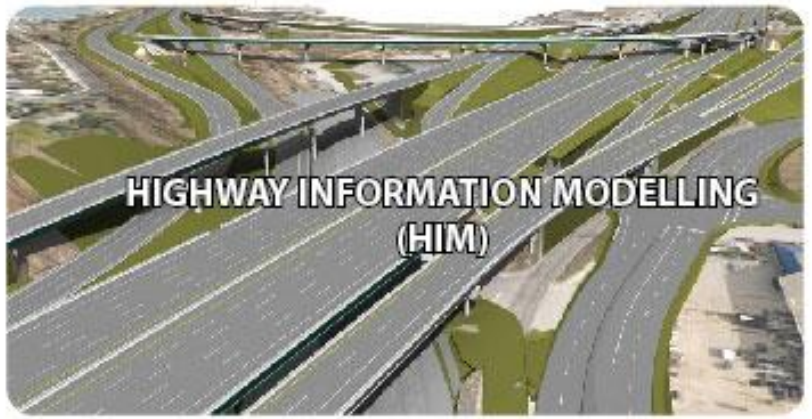
Autonomous Machinery

REVOLUTION

TRADITIONAL

At a global level, example practice that is helping to define what industry improvements are possible in the here and now through available digital tools and practices is :-





DESIGN TECHNOLOGY

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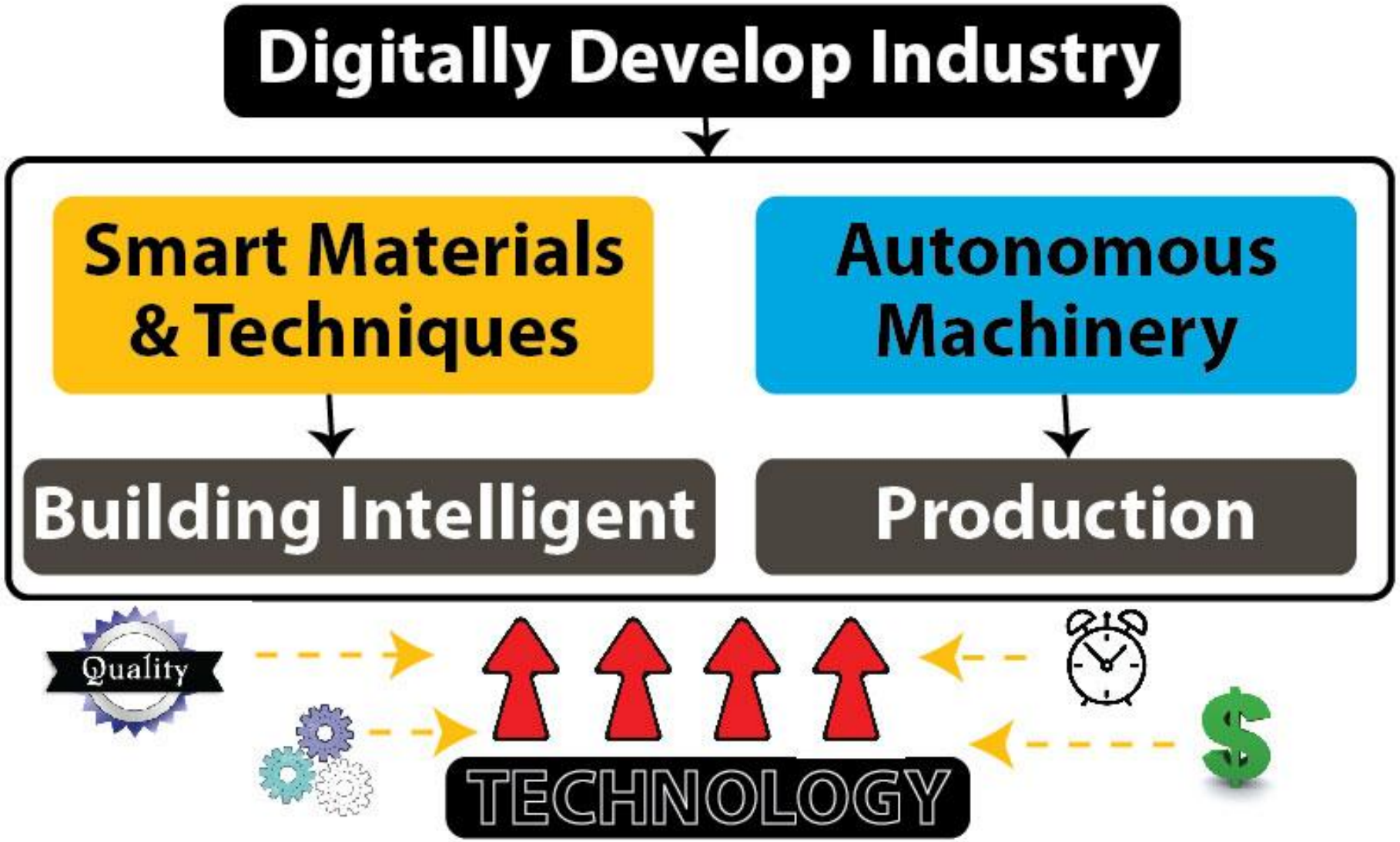
5. ACHIEVING PROJECT SUCCESS VIA IR 4.0



6. CONCLUSION

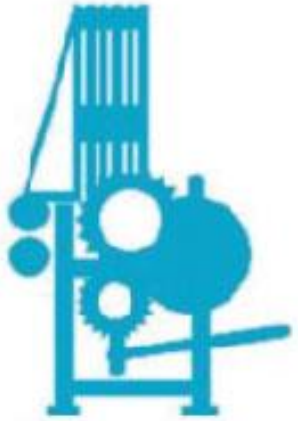
- Preparing the right ecosystem

- Education & skills required

- Interoperability & standards

- Role of technology will be at the forefront

TRANSFORMATIONAL NEEDS



TRADITIONAL

IR 4.0

Resource Focused
Labour-Intensive
Require Control
Vertical
Mass Production
Proximity is important
Rigid

VS

Knowledge-Intensive
High Skill Talent
Required Collaboration
Horizontal Trust Collaboration
Mass Collaboration
Location less significant
Flexible


ATTITUDE
GOALS
SUCCESS
MOTIVATION
?+=!
IDEA
SUPPORT
PERFORMANCE

THANK YOU

JKR
HULU LANGAT

Jasa Kepada Rakyat