

Oleh: Prof. Dr. Vincent Gaspersz, IPU, AER

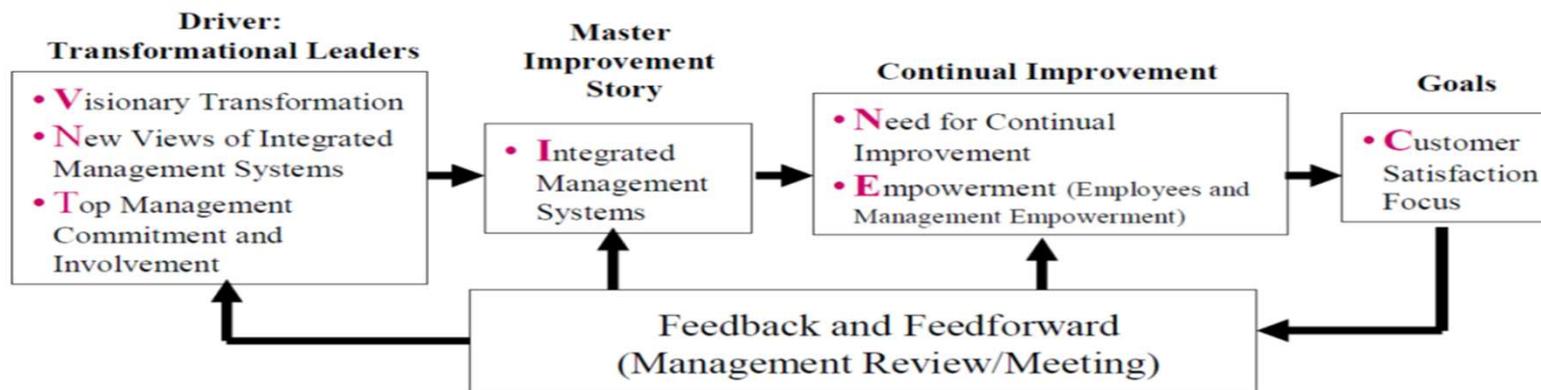
- Guru Besar (Prof) Total Quality and Operations Management
- Doktor Teknik Sistem dan Manajemen Industri, Institut Teknologi Bandung (ITB) ,
- APICS (www.apics.org) Certified in Production and Inventory Management (CPIM), Certified in Production and Inventory Management Fellow (CPIM-F), Certified Supply Chain Professional (CSCP), Certified Supply Chain Professional Fellow (CSCP-F),
- International Quality Federation (www.iqf.org) Six Sigma Master Black Belt (SSMBB),
- American Society for Quality (www.asq.org) Certified Six Sigma Black Belt (CSSBB), Certified Quality Engineer (CQE), Certified Quality Auditor (CQA), Certified Manager of Quality/Organizational Excellence (CMQ/OE), Certified Quality Improvement Associate
- Registration Accreditation Board (www.exemplarglobal.org) Certified Management Systems Lead Specialist (CMSLS),
- Insinyur Profesional Utama (IPU) – Badan Kejuruan Teknik Industri- Persatuan Insinyur Indonesia (BKTI – PII)
- Asean Engineer Register (AER No. 10084), Asean Federation of Engineering Organizations (AFEO)
- Senior Member of the American Society for Quality (Member #: 00749775), International Member of the American Production and Inventory Control Society (Member #: 1023620), and Senior Member of the Institute of Industrial and Systems Engineers (Member #: 880194630).

Aplikasi Design Thinking for Education 4.0 Untuk Menghadapi Era Revolusi Industri 4.0

Januari 2019

Topik Presentasi

1. Pengantar Memahami Revolusi Industri 4.0
2. Karakteristik Revolusi Industri 4.0
3. Kompetensi SDM dalam Revolusi Industri 4.0
4. Memahami Systems Thinking, Statistical Thinking, and Design Thinking
5. Design Thinking for Education 4.0 Untuk Menghadapi Revolusi Industri 4.0



VINCENT Concept:

Visionary Transformation (Transformasi Visi)

Integrated Management Systems (Sistem Manajemen Terintegrasi)

New Views of IMS (Pandangan Baru tentang Sistem Manajemen Terintegrasi)

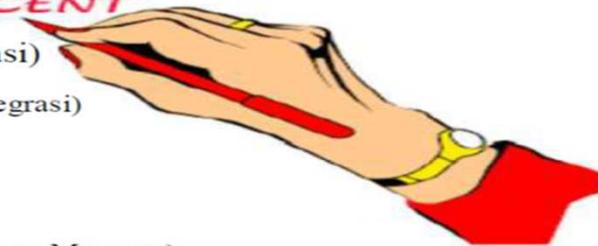
Customer Satisfaction Focus (Fokus Kepuasan Pelanggan)

Empowerment (Pemberdayaan Manajemen dan Karyawan)

Need for Continual Improvement (Kebutuhan untuk Peningkatan Terus-Menerus)

Top Management Commitment and Involvement (Komitmen dan Keterlibatan Manajemen Puncak)

VINCENT





Pengantar Memahami Revolusi Industri 4.0

Higher Education 4.0 (TANGIBLE)

IoT or IoP (Internet of Things or Internet of People), Distance Learning, Digitalization, etc

Challenged by emerging technologies in 4th IR

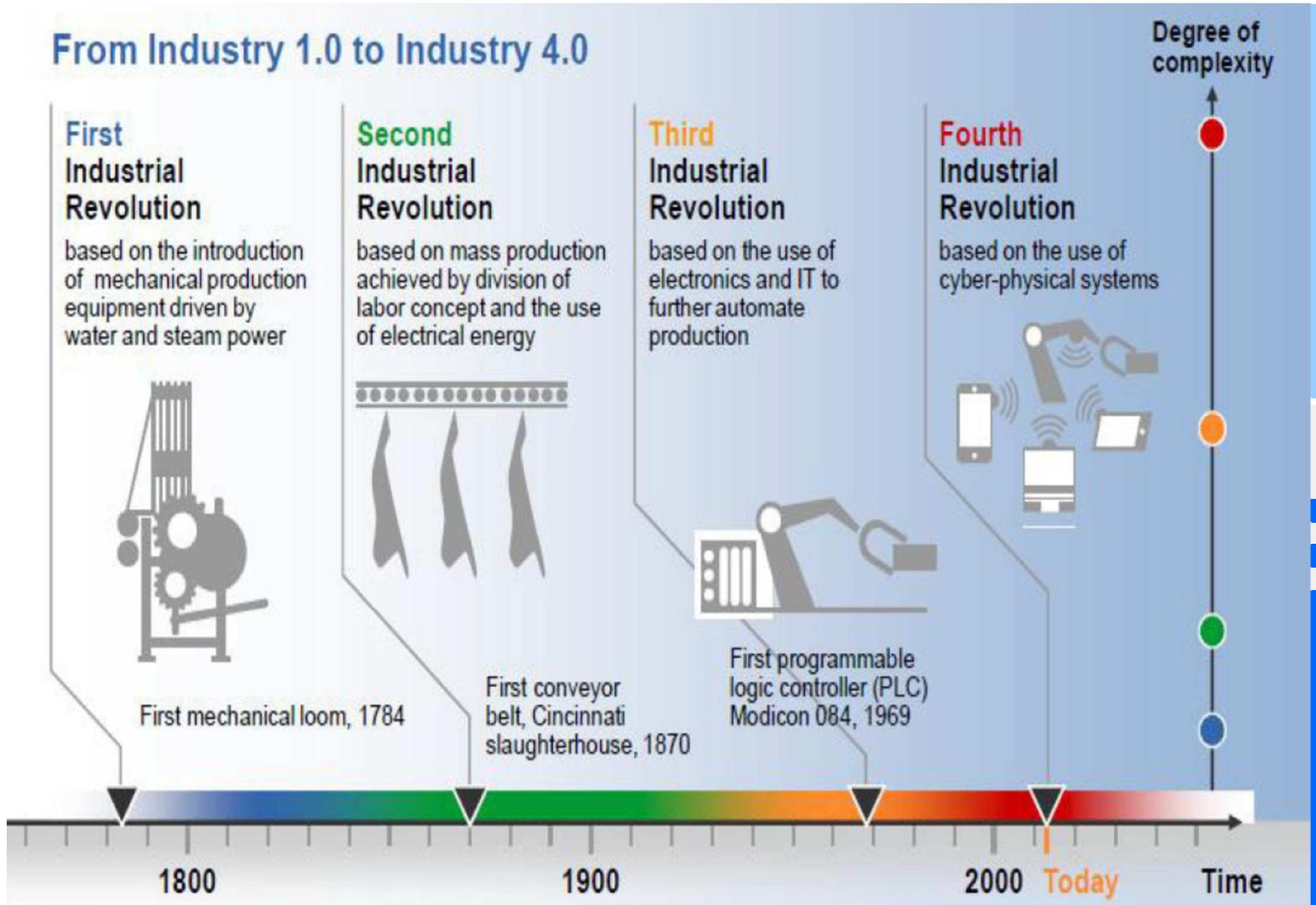
FOCUS VG

Powered by character building, higher order thinking, multiple intelligences, soft skills, lifelong learning, etc. to face the new challenges

Hidden Elements of 4thIR (INTANGIBLE)

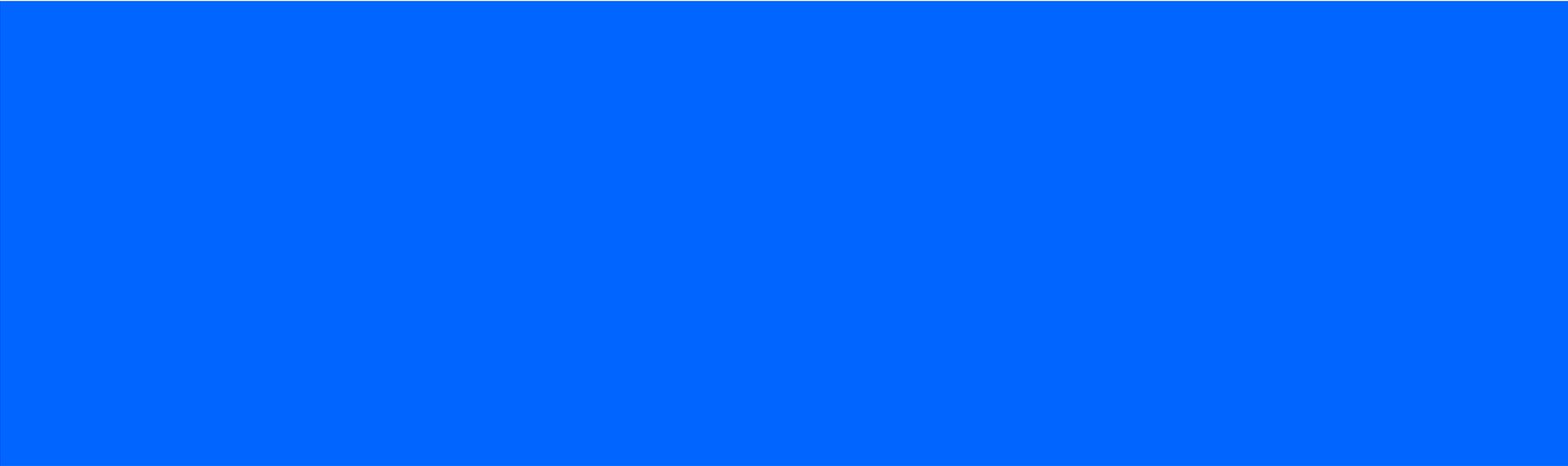
Source: Datin Paduka Ir. Dr. Siti Hamisah Tapsir Director General Department of Higher Education Ministry of Higher Education 11 September 2017, Malaysia Higher Education 4.0. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist.

From Industry 1.0 to Industry 4.0



Source: <http://newsfluss.com/index.php/2016/09/17/industry-4-0-water-4-0/>. Cited by: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist

- **Periode 1800:** Revolusi Industri 1.0 ditandai dengan mesin-mesin produksi masih menggunakan kekuatan energi dari air dan uap (water and steam).
- **Periode 1900:** Revolusi Industri 2.0 ditandai dengan penggunaan energi listrik yang memungkinkan terjadi produksi massal dan pembagian tenaga kerja berdasarkan divisi.
- **Periode 2000:** Revolusi Industri 3.0 ditandai dengan otomatisasi sistem teknologi informasi pada lini produksi.
- **Periode 2011:** Istilah Revolusi Industri 4.0 diperkenalkan pertama kali pada tahun 2011 di Hannover Fair, yang ditandai dengan Cyber Physical Systems, Internet of Things (IoT) atau Internet of People (IoP), Cloud Technology (Cloud Computing and Cognitive Computing), yang memberikan konsekuensi tugas-tugas menjadi semakin kompleks secara otomatis.



Karakteristik Revolusi Industri 4.0

Industry 4:0 =
VUCA Era

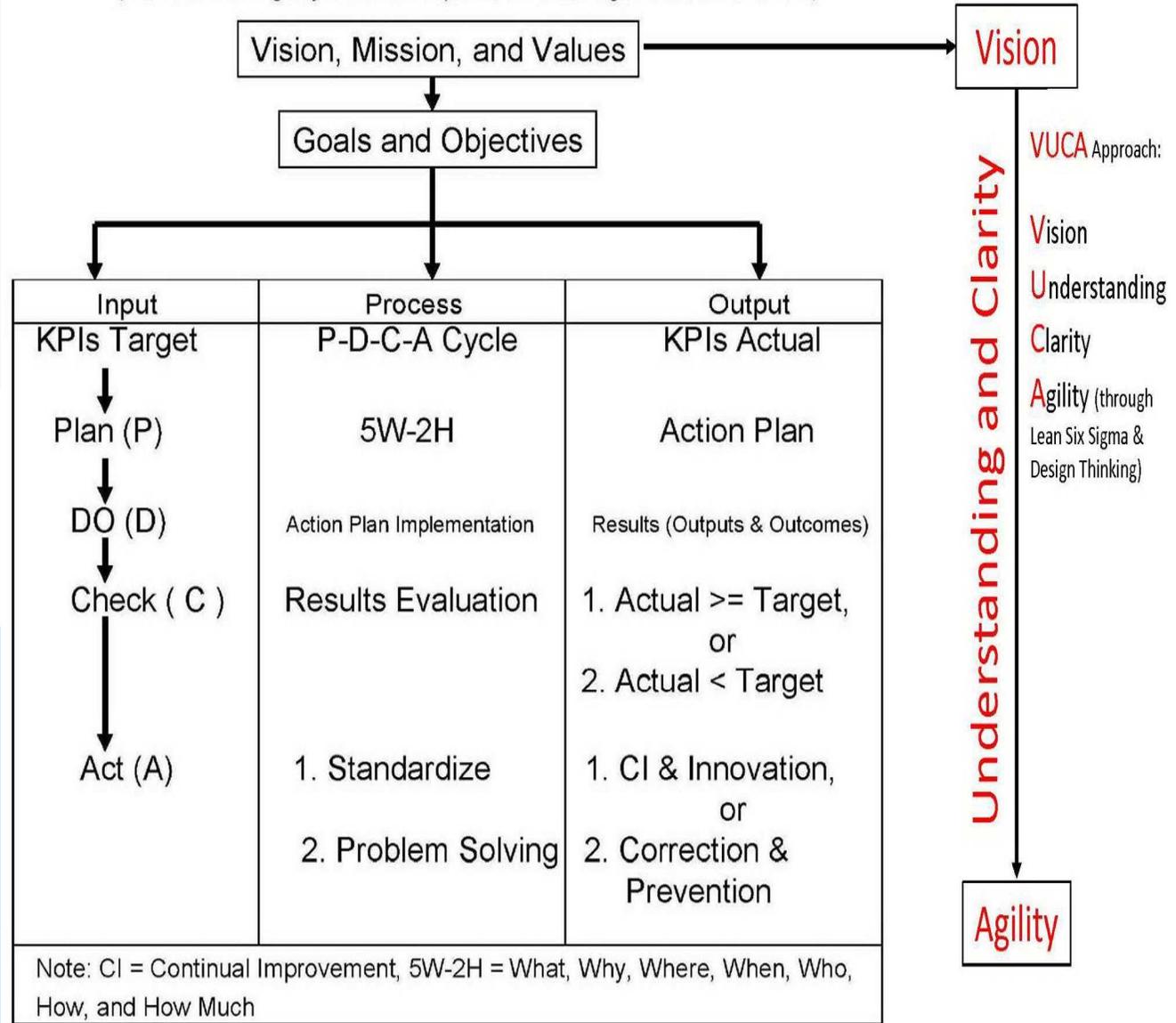
V = Volatility
 (volatilitas, berubah-ubah)

U = Uncertainty
 (ketidakpastian)

C = Complexitas
 (kompleksitas masalah)

A = Ambiguity
 (ambiguitas, kemenduaan-
 mendua)

Strategic Management in the Systems Thinking
 (Framework Design by: Vincent Gaspersz, Lean Six Sigma Master Black Belt)



1960s
Fragmentation

- Demand Forecasting
- Sourcing / Purchasing
- Requirement Planning
- Production Planning
- Manufacturing Inventory
- Warehousing
- Materials Handling
- Packaging
- Goods Inventory
- Distribution Planning
- Order Processing
- Transportation
- Customer Service

1980s
Consolidation

- Materials Management**
- Warehousing
- Materials Handling
- Packaging
- Physical Distribution**

1990s
Functional Integration

Logistics

2000s
Value Capture

Supply Chain Management

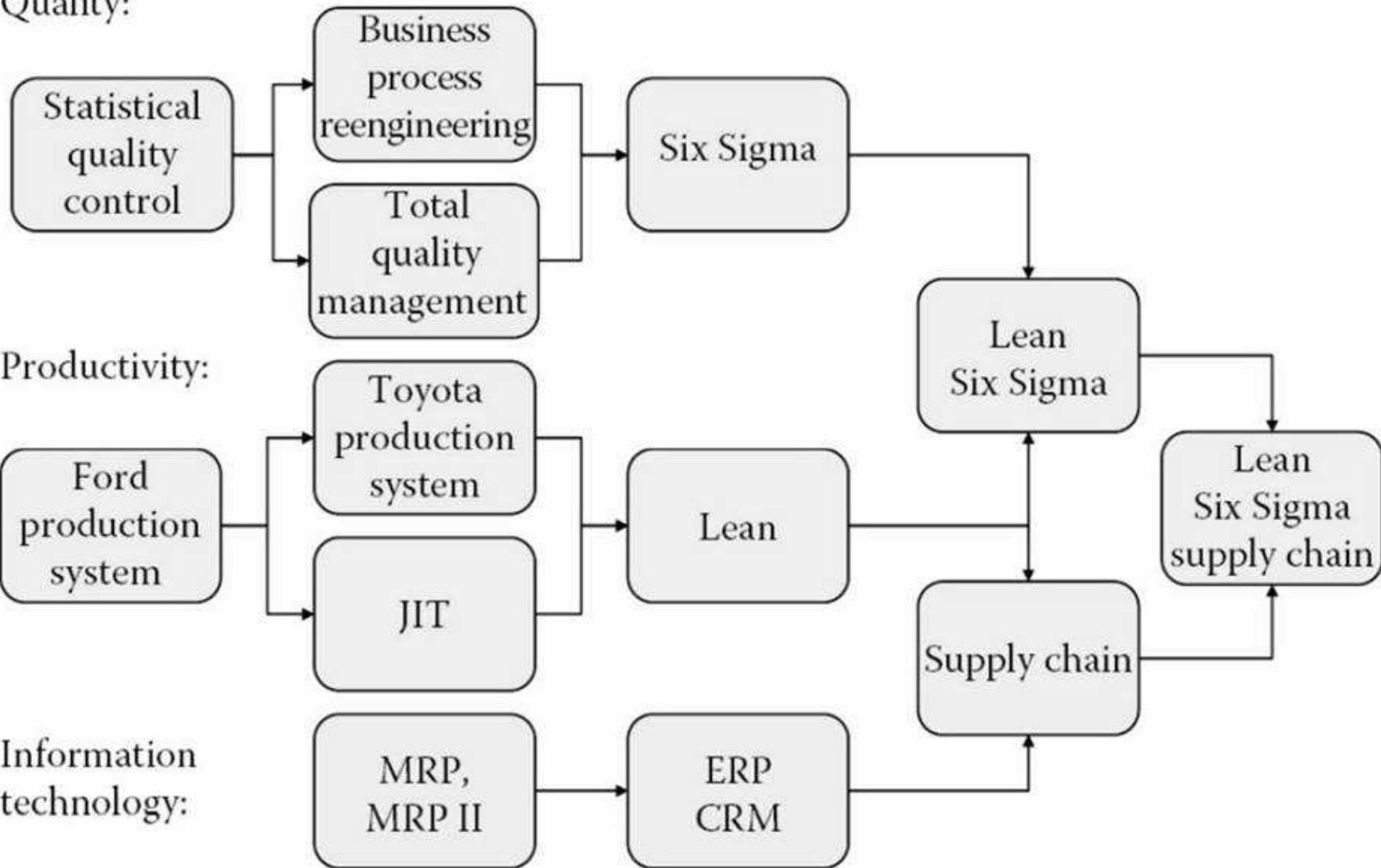
- Information Technology
- Marketing / Sales
- Strategic Planning
- Finance

2010s
Automation



Evolution of quality

Quality:



Productivity:

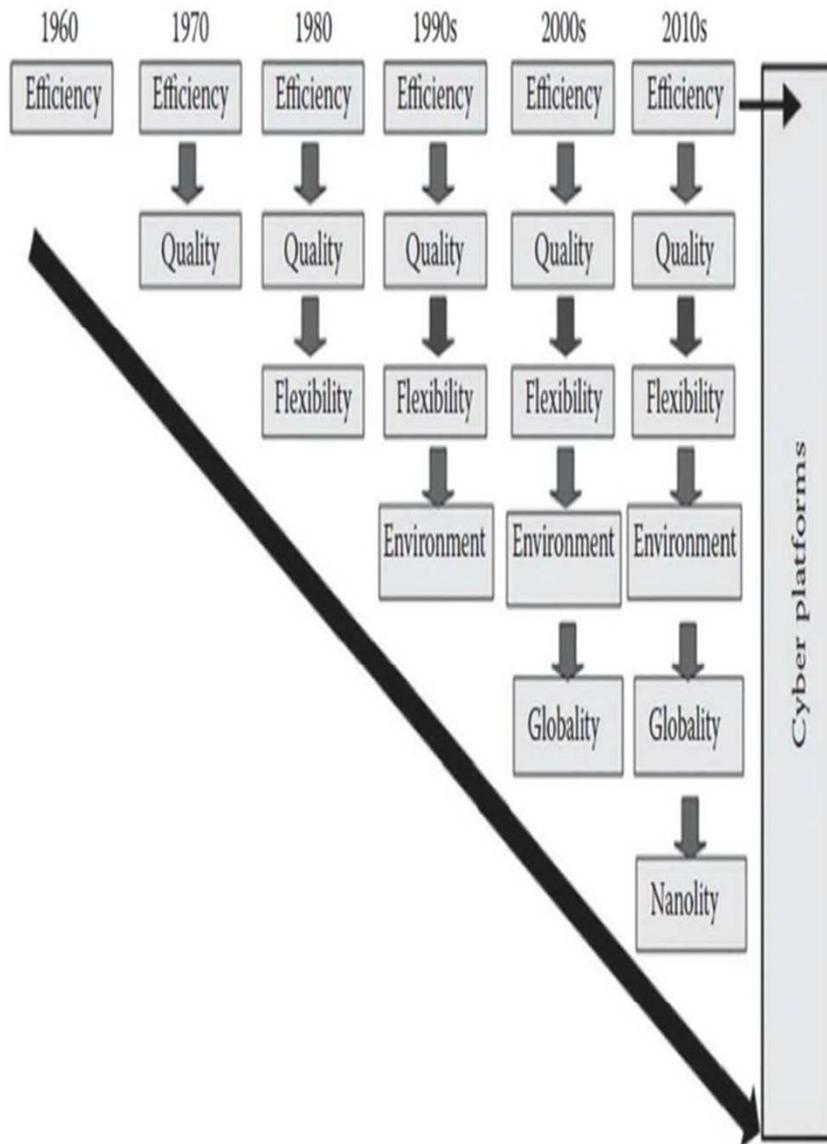
Information technology:

Evolution of quality to 2008.

Source: Sandra L. Futerer (Editor), *Lean Six Sigma in Service: Applications and Case Studies*, CRC Press, New York, 2009



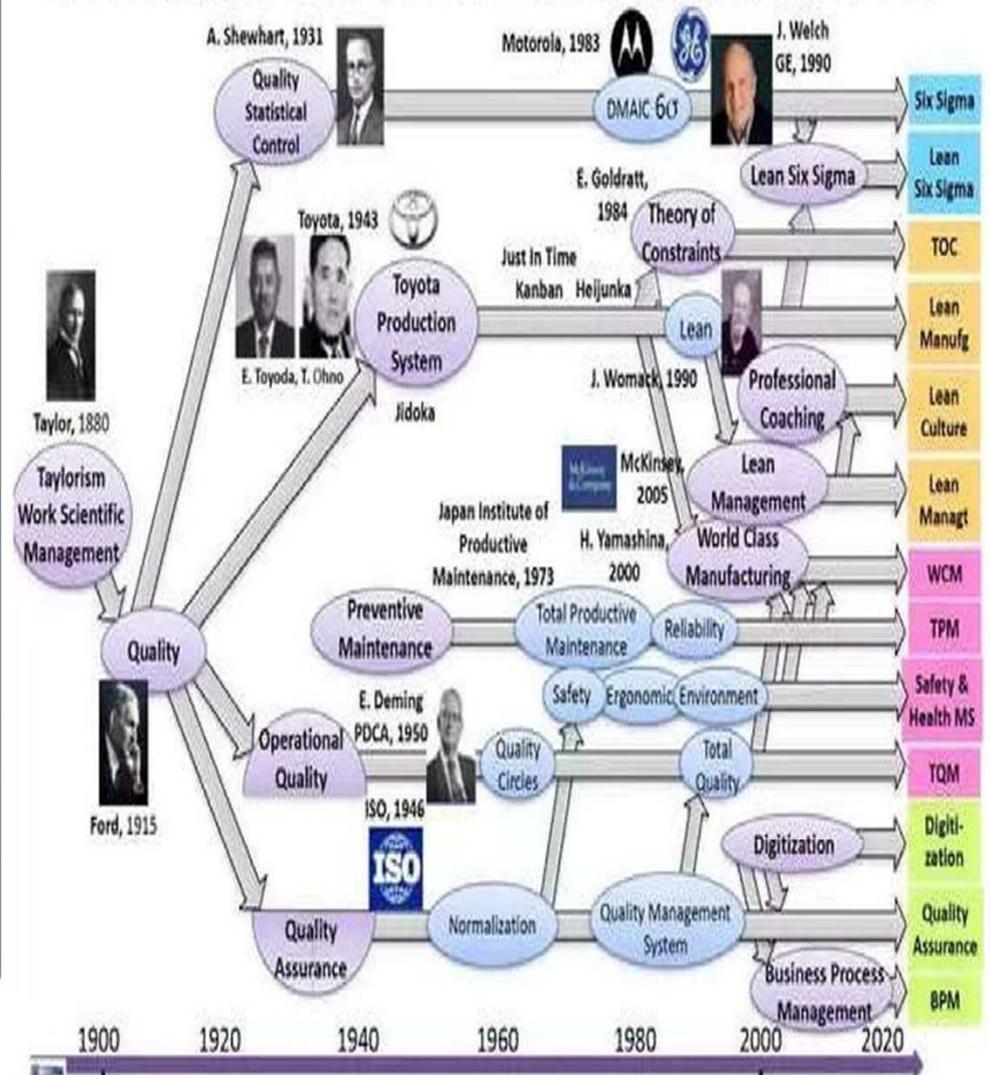
Evolution of quality



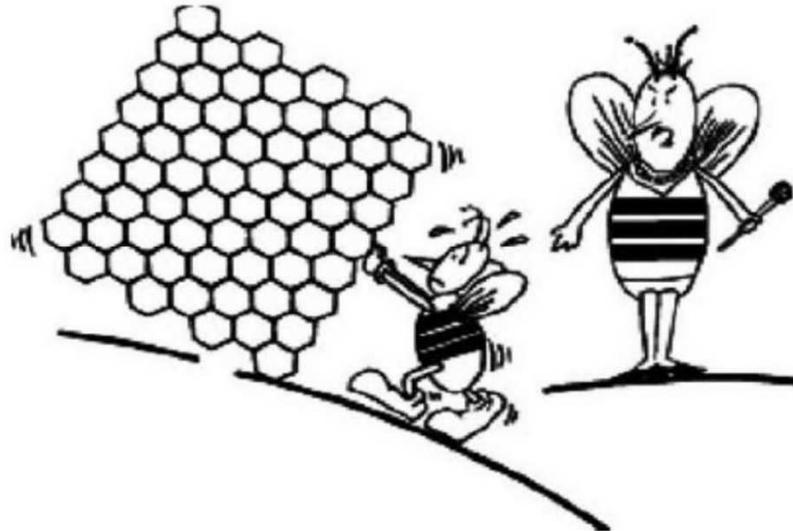
Industry progress from classical efficiency to cyber operations.

A BRIEF -HOWEVER COMPLEX- HISTORY OF LEAN

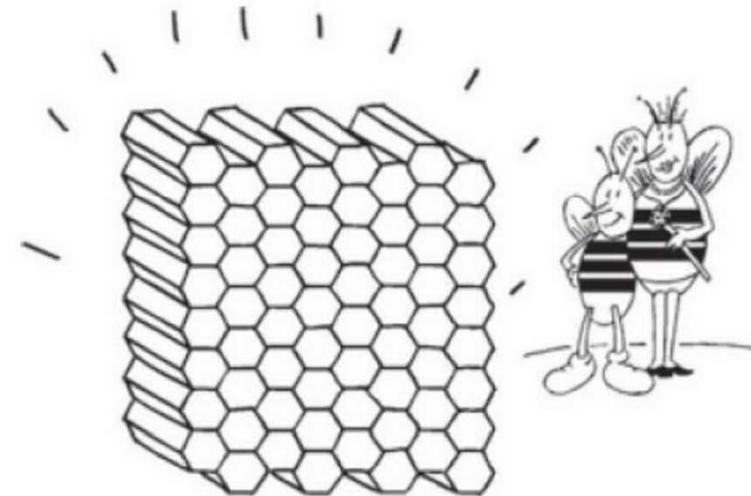
Several branches & trends influence its evolution



Traditional View of Work



Lean Six Sigma View of Work



Prinsip-prinsip Pola Pikir Lean Six Sigma (Lean Six Sigma Thinking):

Prinsip 1: Kehidupan dan pekerjaan adalah proses-proses dalam sistem.

Prinsip 2: Semua proses menunjukkan variasi.

Prinsip 3: Dua penyebab variasi, yaitu variasi penyebab umum dan variasi penyebab khusus ada dalam banyak proses.

Prinsip 4: Kehidupan dan pekerjaan dalam proses yang stabil dan tidak stabil berbeda.

Prinsip 5: Perbaikan terus-menerus adalah ekonomis, tidak membutuhkan investasi modal.

Prinsip 6: Banyak proses memunculkan waste (pemborosan/inefisiensi).

Prinsip 7: Komunikasi yang efektif membutuhkan definisi operasional.

Prinsip 8: Pengembangan pengetahuan membutuhkan teori.

Prinsip 9: Perencanaan membutuhkan stabilitas.

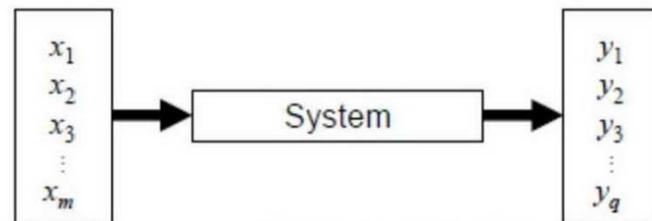
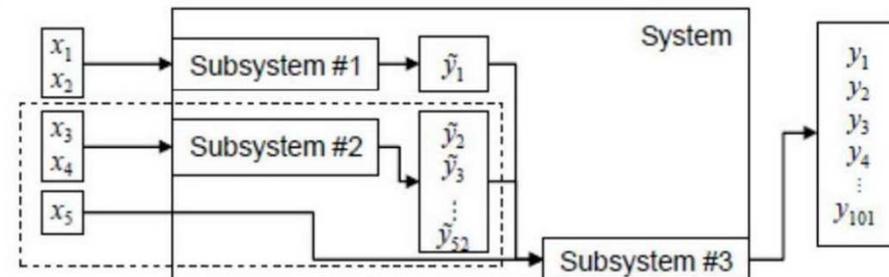


Diagram of a generic system



Example of subsystems inside a system

Source: Gitlow, H. S. 2009. A Guide to Lean Six Sigma Management Skills. CRC Press, Florida. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management System Lead Specialist

LEAN TEACHING

A Guide to Becoming a Better Teacher

Bob Emiliani, Ph.D.

For College and University Professors



LEAN UNIVERSITY

A Guide to Renewal and Prosperity

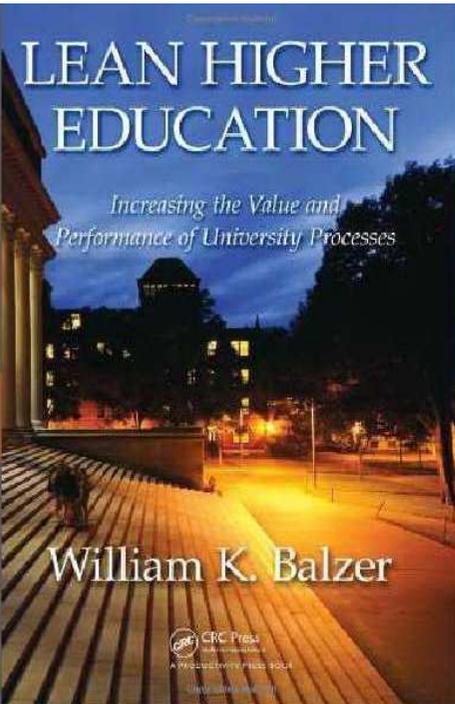
Bob Emiliani, Ph.D.

For College and University Administrators



LEAN HIGHER EDUCATION

Increasing the Value and Performance of University Processes



William K. Balzer

CRC Press
A PRODUCTIVITY PRESS BOOK

2011

Educational Lean

for Higher Education: Theory and Practice

An educator provides insights into Lean implementation for colleges and universities.

Theresa Waterbury, Ph.D., Winona State University
Introduction by Maudie Holm, Ph.D., Capella University

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Lean for the Public Sector

The Pursuit of Perfection in Government Services



BERT TEEUWEN

CRC Press
A PRODUCTIVITY PRESS BOOK

LEAN Six Sigma

for the Public Sector

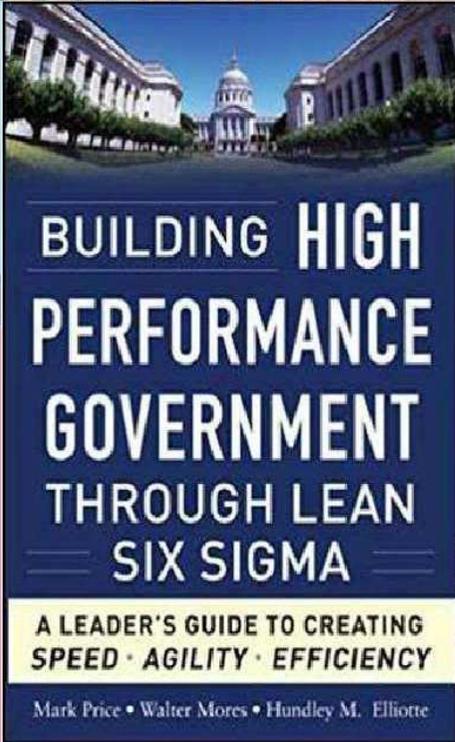


BRANDON COLE

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BUILDING HIGH PERFORMANCE GOVERNMENT THROUGH LEAN SIX SIGMA

A LEADER'S GUIDE TO CREATING SPEED · AGILITY · EFFICIENCY

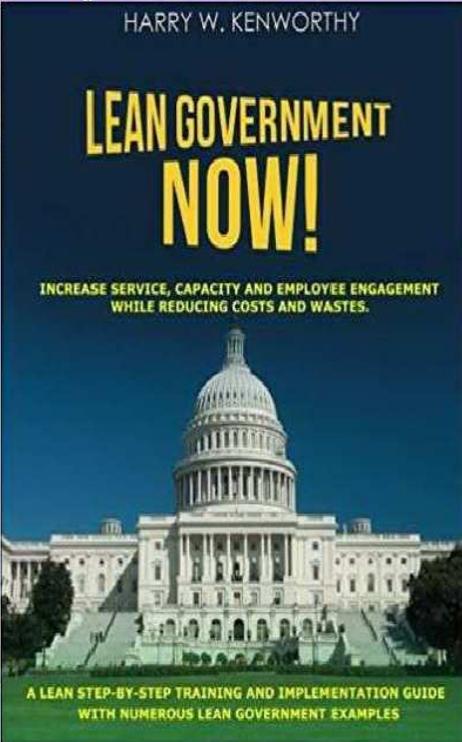


Mark Price · Walter Mores · Hundley M. Elliott

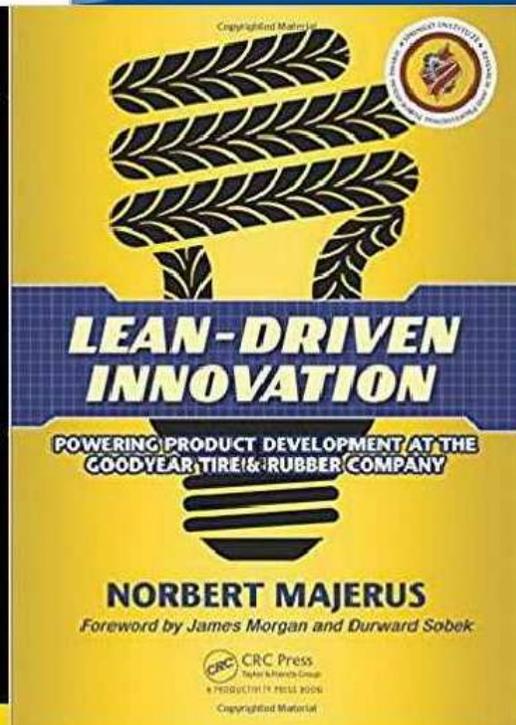
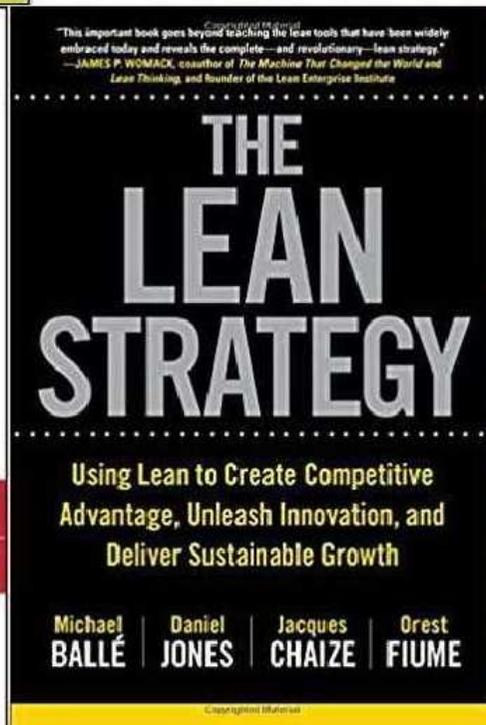
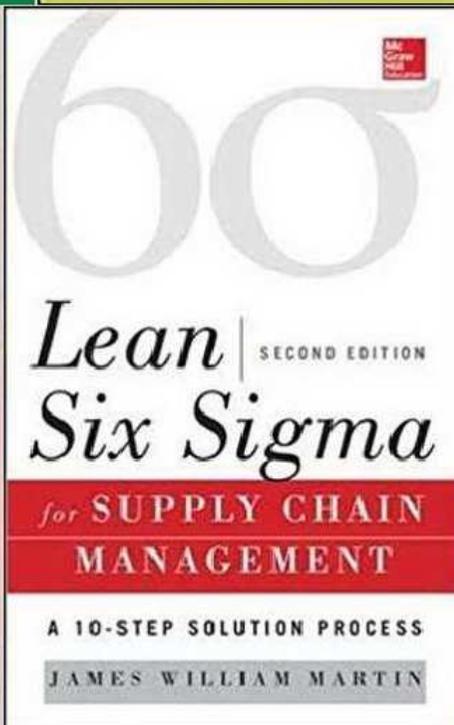
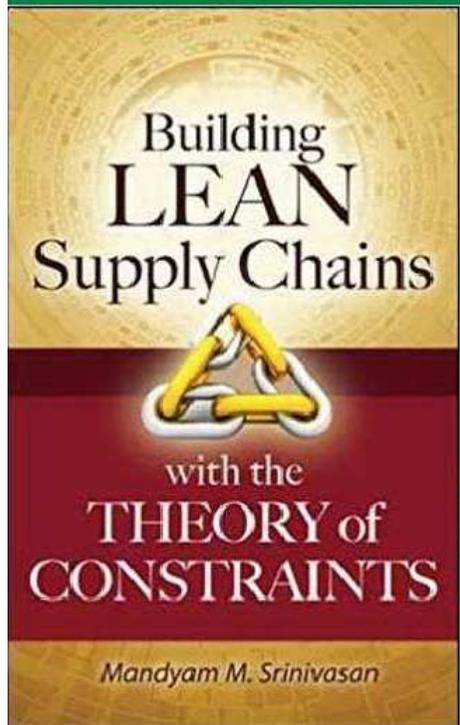
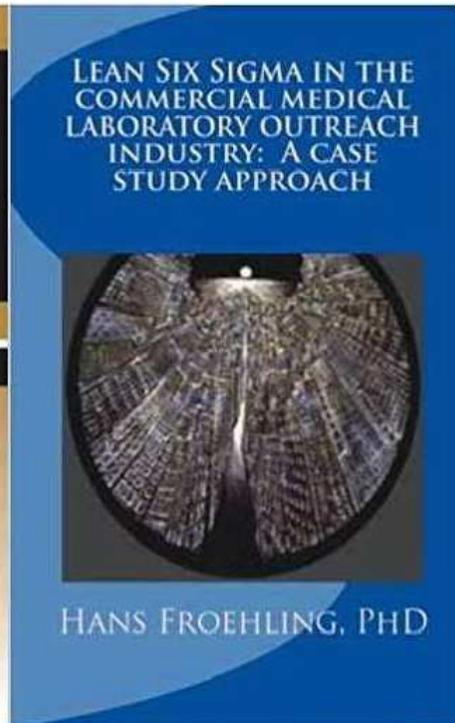
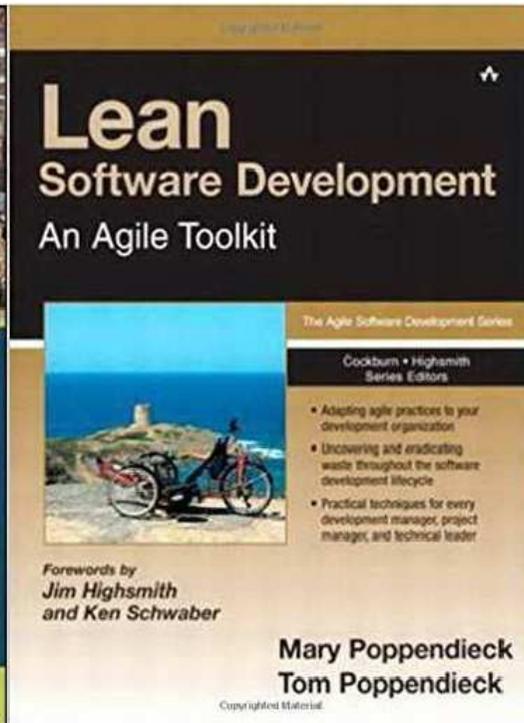
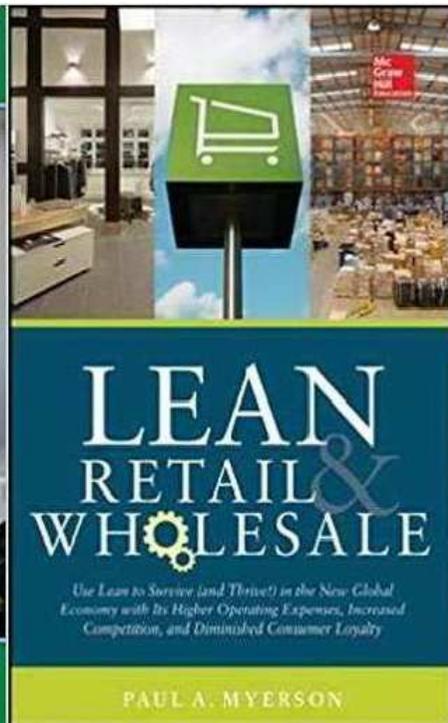
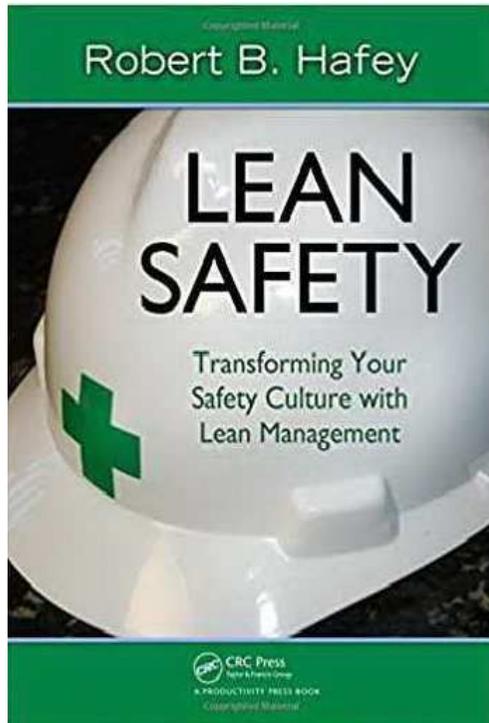
HARRY W. KENWORTHY

LEAN GOVERNMENT NOW!

INCREASE SERVICE, CAPACITY AND EMPLOYEE ENGAGEMENT WHILE REDUCING COSTS AND WASTES.



A LEAN STEP-BY-STEP TRAINING AND IMPLEMENTATION GUIDE WITH NUMEROUS LEAN GOVERNMENT EXAMPLES



Dampak Positif Reduksi Biaya Secara Signifikan

Cost type	Effects	Potentials
Inventory	<ul style="list-style-type: none"> • Reduction of safety stocks • Avoidance of Bullwhip and Burbridge effects 	-30 to -40%
Production	<ul style="list-style-type: none"> • Increase in Overall Equipment Effectiveness (OEE) • Process control loops • Improvement in vertical and horizontal labor flexibility 	-10 to -20%
Logistics	<ul style="list-style-type: none"> • Higher degree of automation (milk run, picking, ...) 	-10 to -20%
Complexity	<ul style="list-style-type: none"> • Enhanced span of control • Reduced trouble shooting 	-60 to -70%
Quality	<ul style="list-style-type: none"> • Real-time quality control loops 	-10 to -20%
Maintenance	<ul style="list-style-type: none"> • Optimization of spare part inventories • Condition-based maintenance (process data, measurement data) • Dynamic prioritization 	-20 to -30%

Source: Bauernhansl, 2014 in Hammer, Markus. 2019. Management Approach for Resource-Productive Operations: Design of a Time-Based and Analytics-Supported Methodology Grounded in Six Sigma. Springer Gambler, Austria. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist

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The 10 skills you need to thrive in the Fourth Industrial Revolution



COMMITTED TO IMPROVING THE STATE OF THE WORLD



COMMITTED TO IMPROVING THE STATE OF THE WORLD

Global Challenge Insight Report

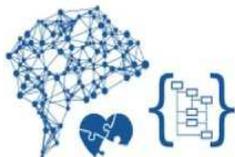
Top 10 skills

in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity



Source: Future of Jobs Report, World Economic Forum

Cited by: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management System Lead Specialist

The Future of Jobs

Employment, Skills and
Workforce Strategy for the
Fourth Industrial Revolution

January 2016



TADeRA CONCEPT

Designed and Implemented by Vincent Gaspersz, Lean Six Sigma Master Black Belt
& Certified Management Systems Lead Specialist

T = Target (SMARTERS Target)

A = Actual

De = Dent or Defect (Gap between Actual and Target)

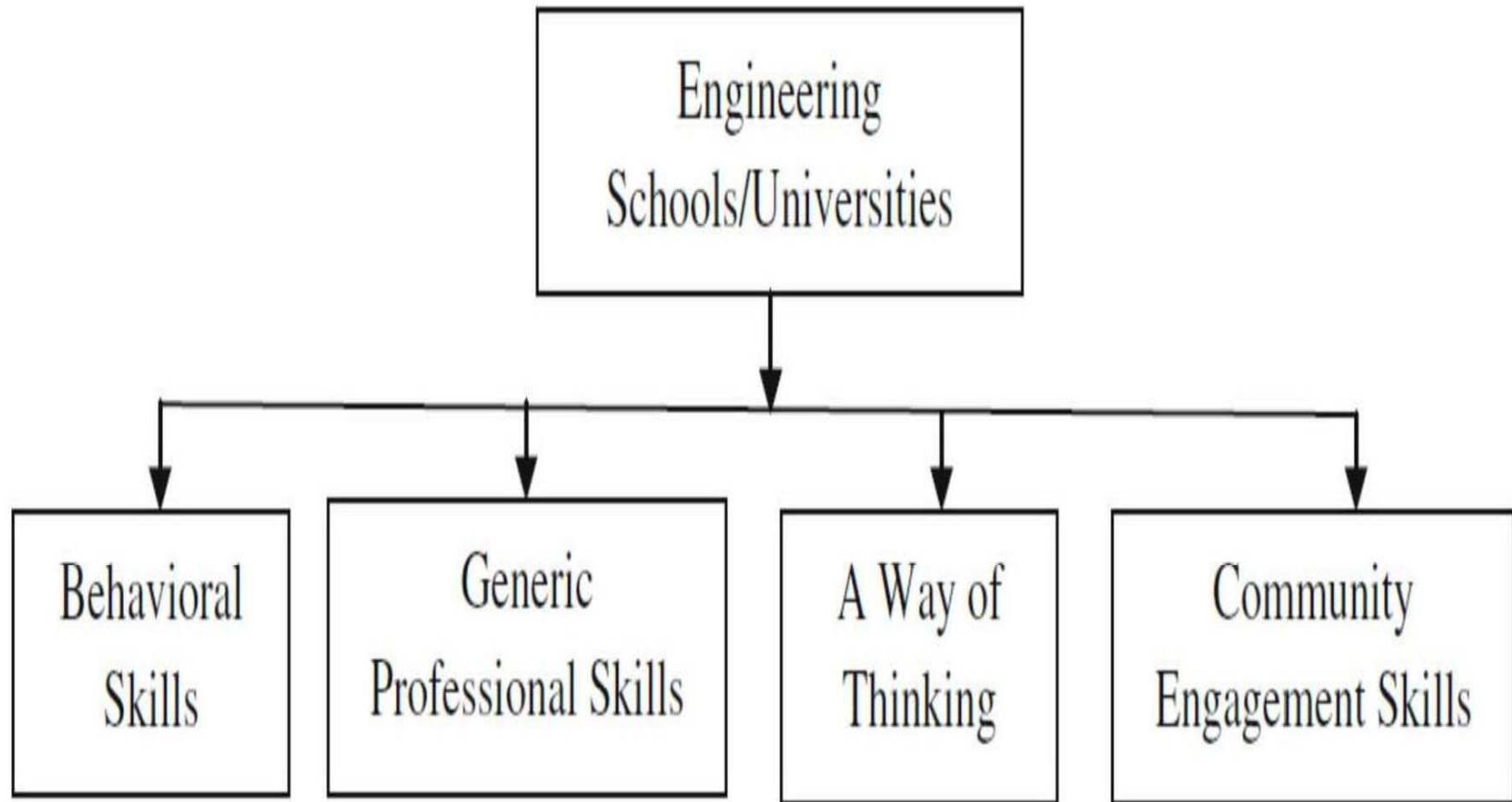
R = Root causes analysis

A = Action to reduce dent or defect (Action plan for improvement)

SMARTERS = Specific, Measurable, Achievable through action, Result-oriented, Timely/time-bound, Evaluation through empowerment, Review, reward & recognition, Spirituality

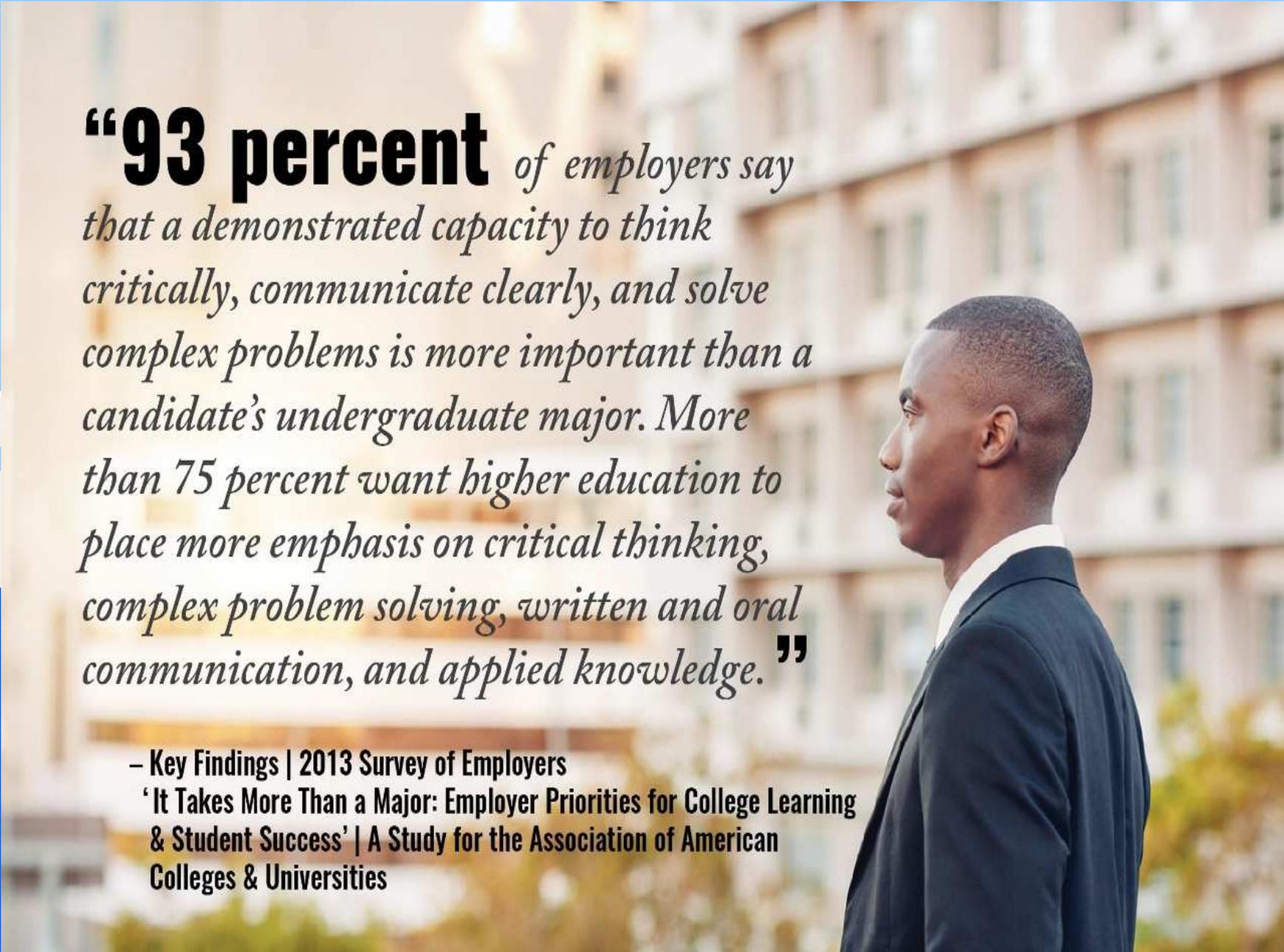


Note: Sales are just an example.



Aspects of engineering schools/universities

Source: Haase (2014) in Garbie (2016): Sustainability In Manufacturing Enterprises Concepts, Analyses and Assessments for Industry 4.0, pp.244-245, Springer International Publishing, Switzerland. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist.



“93 percent *of employers say that a demonstrated capacity to think critically, communicate clearly, and solve complex problems is more important than a candidate’s undergraduate major. More than 75 percent want higher education to place more emphasis on critical thinking, complex problem solving, written and oral communication, and applied knowledge.*”

– Key Findings | 2013 Survey of Employers
‘It Takes More Than a Major: Employer Priorities for College Learning & Student Success’ | A Study for the Association of American Colleges & Universities



Knowledge	X	Skill	=	Ability
Attitude	X	Situation	=	Motivation
Ability	X	Motivation	=	Human performance
Human performance	X	Resources	=	Organizational productivity

Organizational performance equation.

Source: Collin McLoughlin and Toshihiko Miura, 2018. True Kaizen: Management's Role in Improving Work Climate and Culture. CRC Press, Taylor & Francis Group, A Productivity Press Book., New York, 224 pages. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist

Monozukuri merupakan konsep kreativitas dan keterlibatan semua karyawan dan manajemen di Jepang. Monozukuri adalah istilah Jepang tentang "membuat sesuatu" (mono: bagian, benda; zukuri: pembuatan). Semangat Monozukuri ini mencakup semua keterampilan yang diperlukan untuk mempertahankan diri sendiri, serta kemampuan untuk menciptakan sesuatu dari nol, agar memberikan manfaat kepada pelanggan (customers).

Ide Monozukuri adalah berusaha terus-menerus untuk meningkatkan kemampuan agar memiliki keahlian sebagai seorang profesional dan terus-menerus berubah seiring perkembangan zaman, peningkatan/perbaikan, dan berinovasi, bukan hanya untuk diri sendiri tetapi untuk memberikan nilai kepada pelanggan (customer value).

Agar Monozukuri dapat diterapkan dengan benar dan efektif, maka kita harus memahami beberapa persamaan kinerja organisasi berikut:

1. Ability = f (Knowledge, Skill) = Knowledge x Skill
2. Motivation = f (Attitude, Situation) = Attitude x Situation
3. Human Performance = f (Ability, Motivation) = Ability x Motivation
4. Organizational Productivity = f (Human Performance, Resources) = Human Performance x Resources

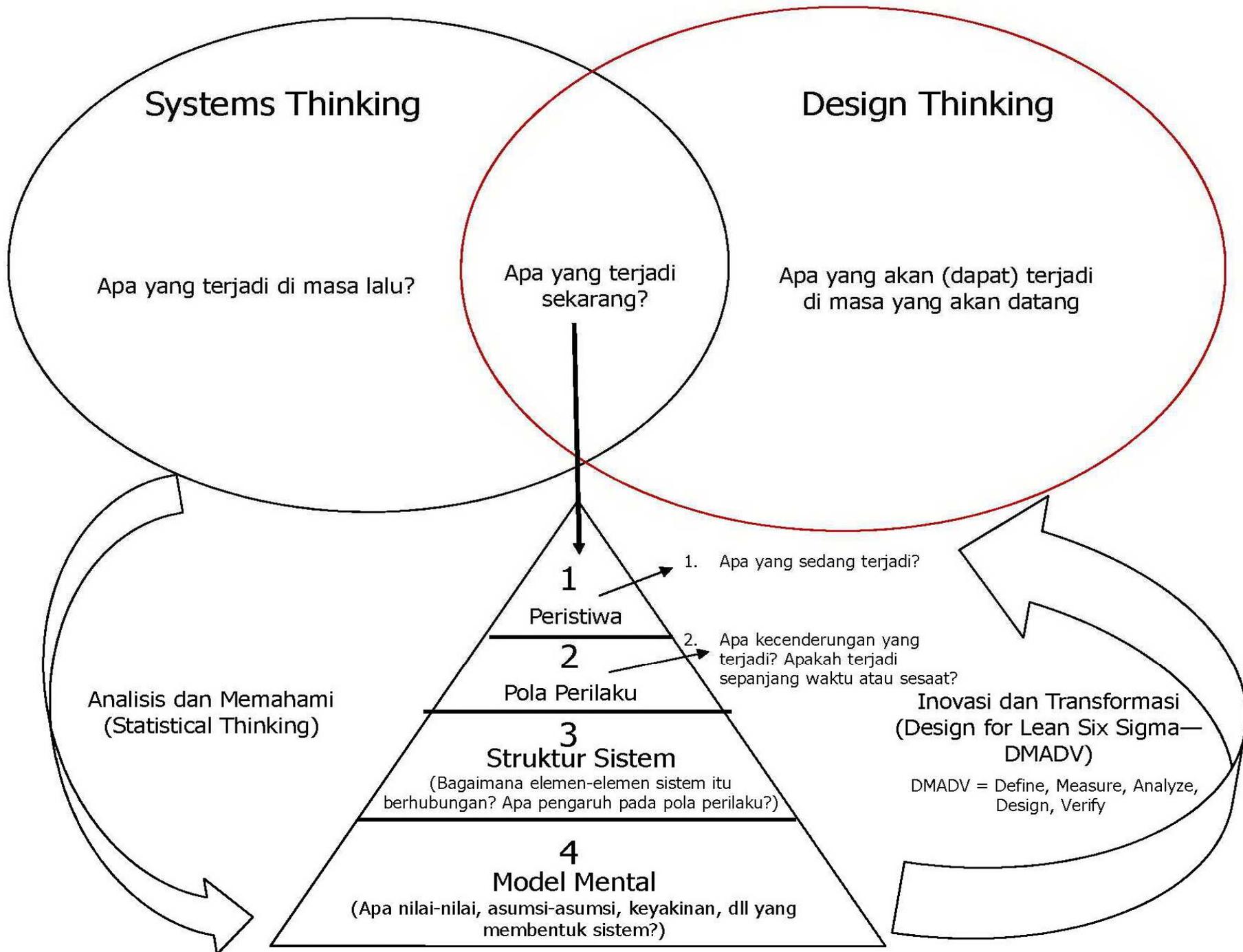
Apabila Monozukuri diterapkan pada perbaikan atau pengembangan diri (self development or self improvement), maka kita HARUS meningkatkan kinerja melalui memahami persamaan kinerja diri sendiri, yaitu: Human Performance = f (Ability, Motivation) = Knowledge x Skill x Attitude x Situation.

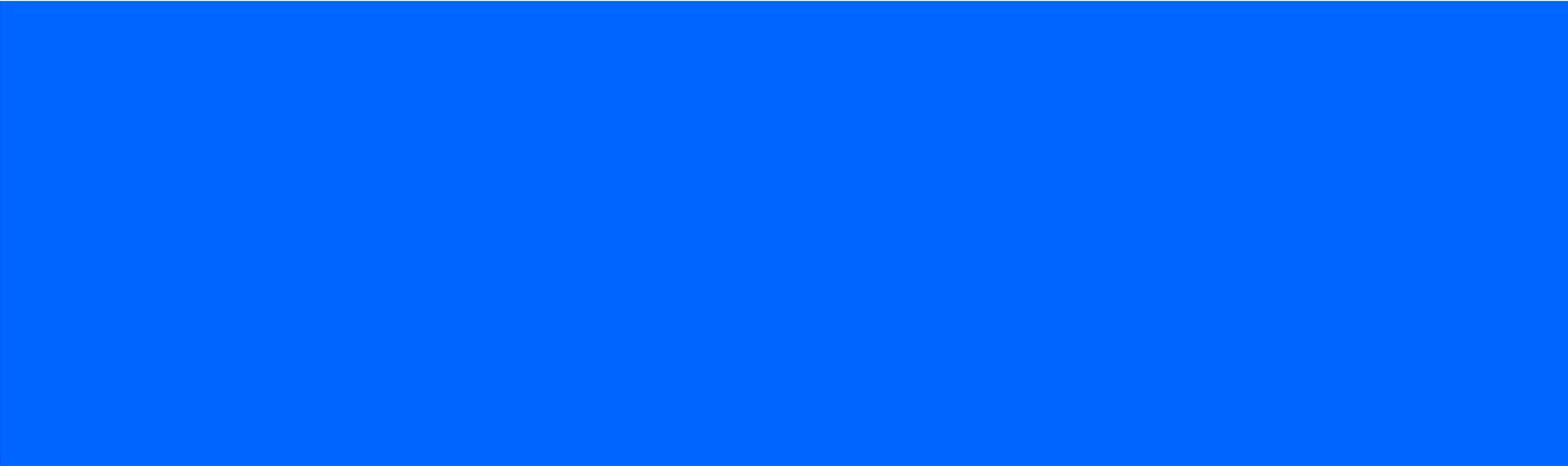
Ingat juga konsep Profitability = Productivity x Quality dalam semua bidang kehidupan.



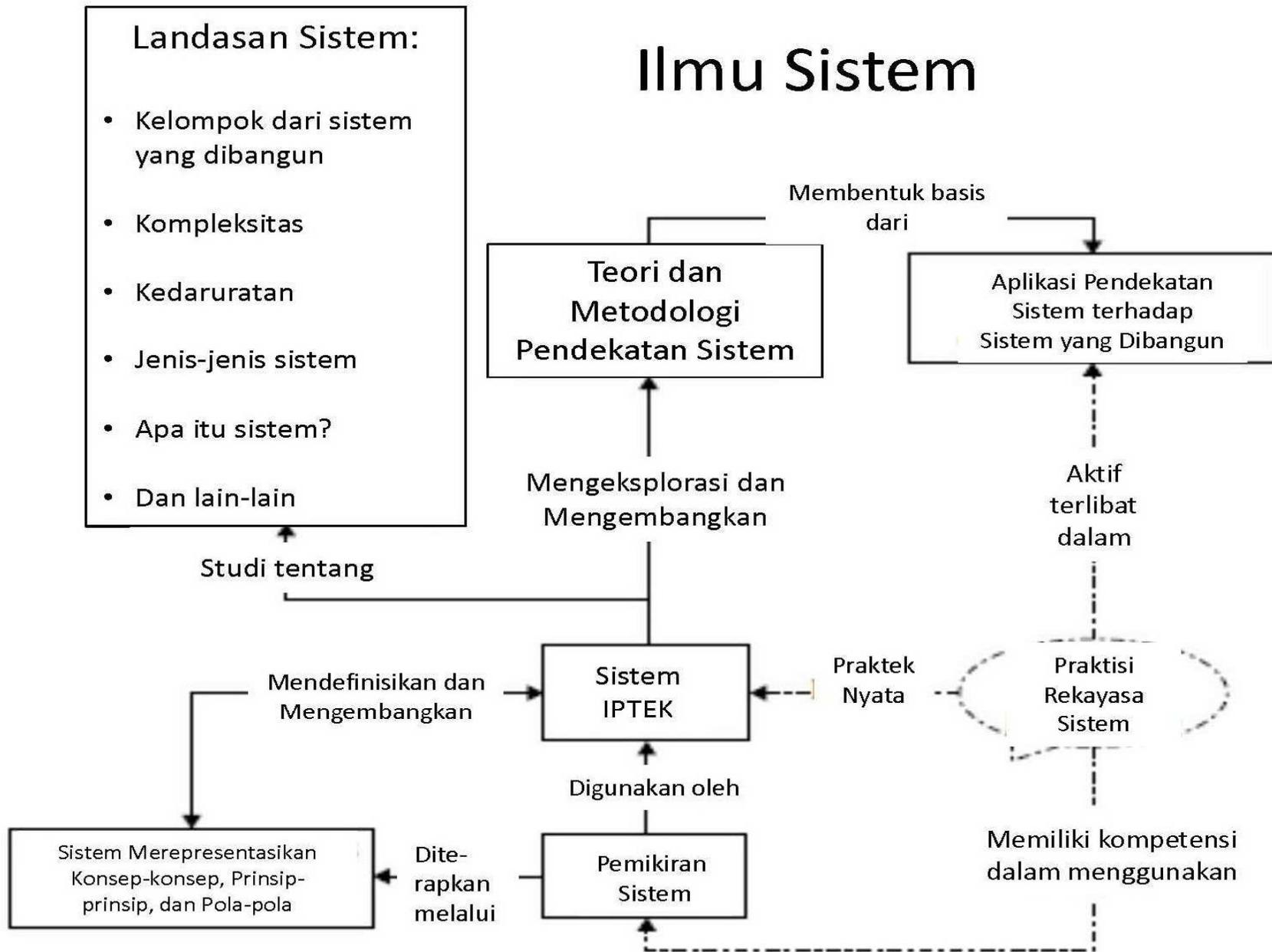
Memahami Systems Thinking, Statistical Thinking, and
Design Thinking



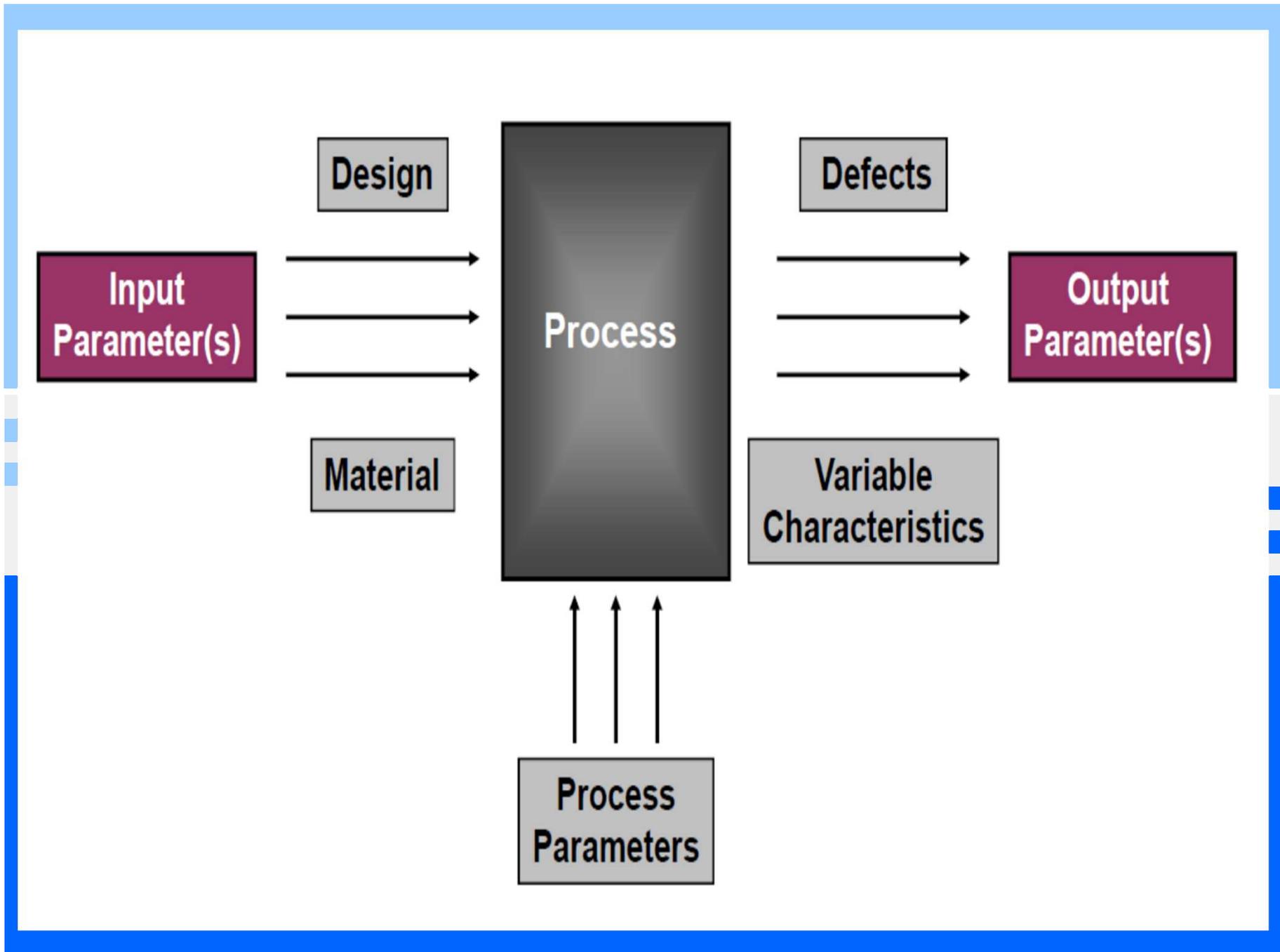


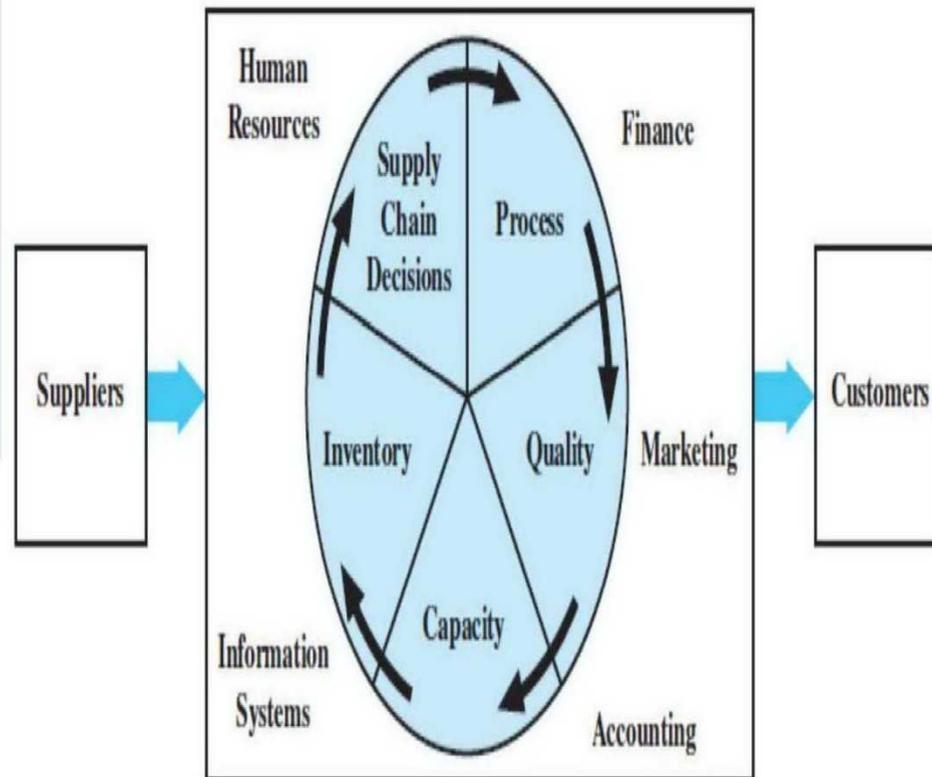


Memahami Systems Thinking



Source: International Council on Systems Engineering (INCOSE). 2015. Systems Engineering Handbook: A Guide for Systems Life Cycle Processes and Activities., 4th edition, John Wiley & Sons, New Jersey, xii+290 pages. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management System Lead Specialist





Decision-making framework for operations in the supply chain

Q-PICS = Quality—Process, Inventory, Capacity, Supply chain decisions

Source: Roger G. Schroeder and Susan Meyer Goldstein. 2018. *Operations Management in the Supply Chain, Decisions and Cases*, Seventh Edition. McGraw-Hill Education, New York, 501 pages. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist

Operations Leader Professional Societies Affiliated with Operations and Supply Chain Management

ASSOCIATION FOR OPERATIONS MANAGEMENT



The global leader and premier source of the body of knowledge in operations management, including production, inventory, the supply chain, materials management, sourcing and logistics (see www.apics.org for more information).

INSTITUTE FOR SUPPLY MANAGEMENT



The largest and one of the most respected supply management associations in the world, whose mission is to lead the supply management and sourcing profession through its standards of excellence, research, promotional activities, and education (see www.ism.ws for more information).

AMERICAN SOCIETY FOR QUALITY

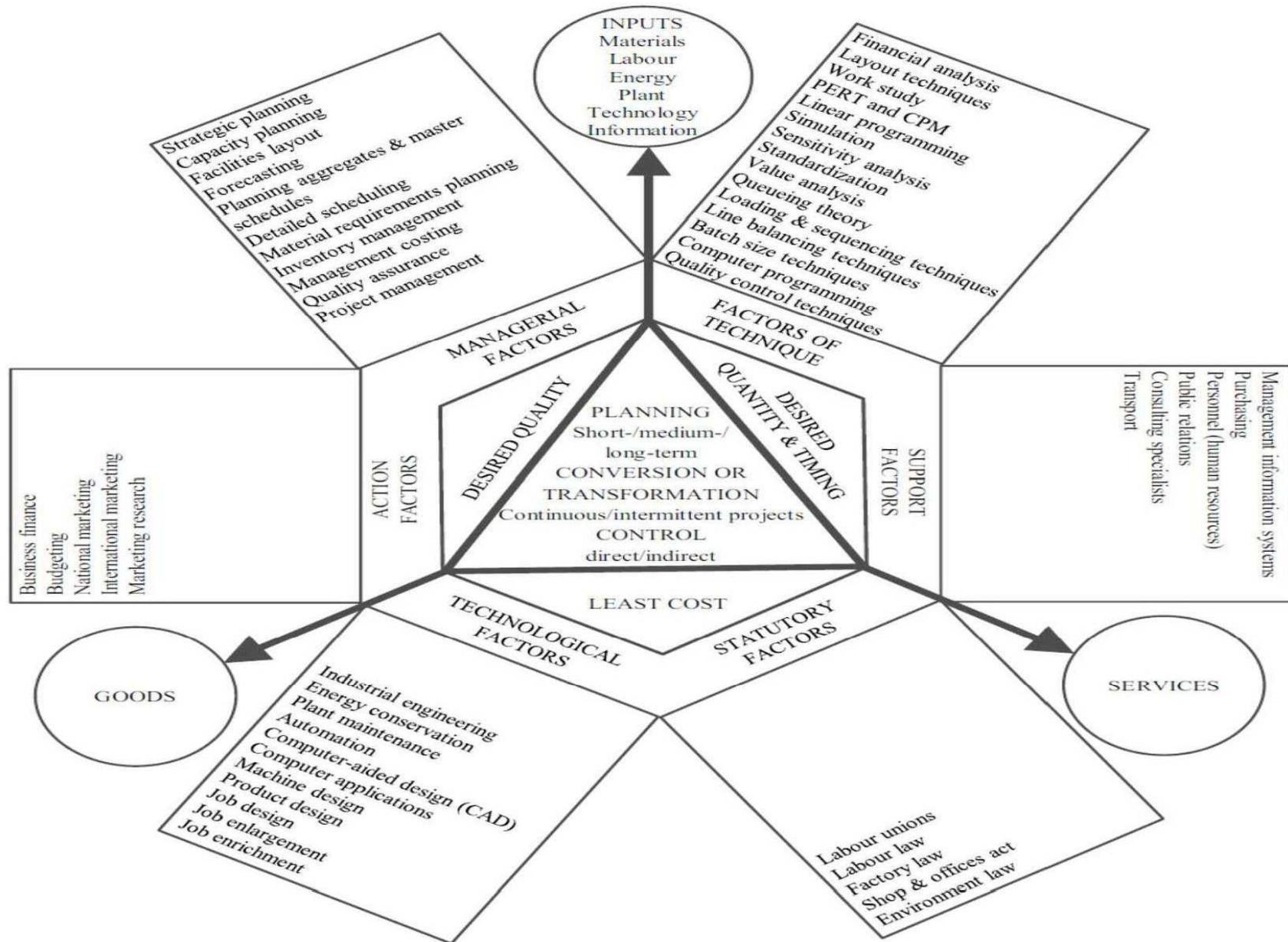


The world's leading organization devoted to advancing learning, quality improvement, and knowledge exchange to improve business results and create better workplaces and communities worldwide (see www.asq.org for more information).

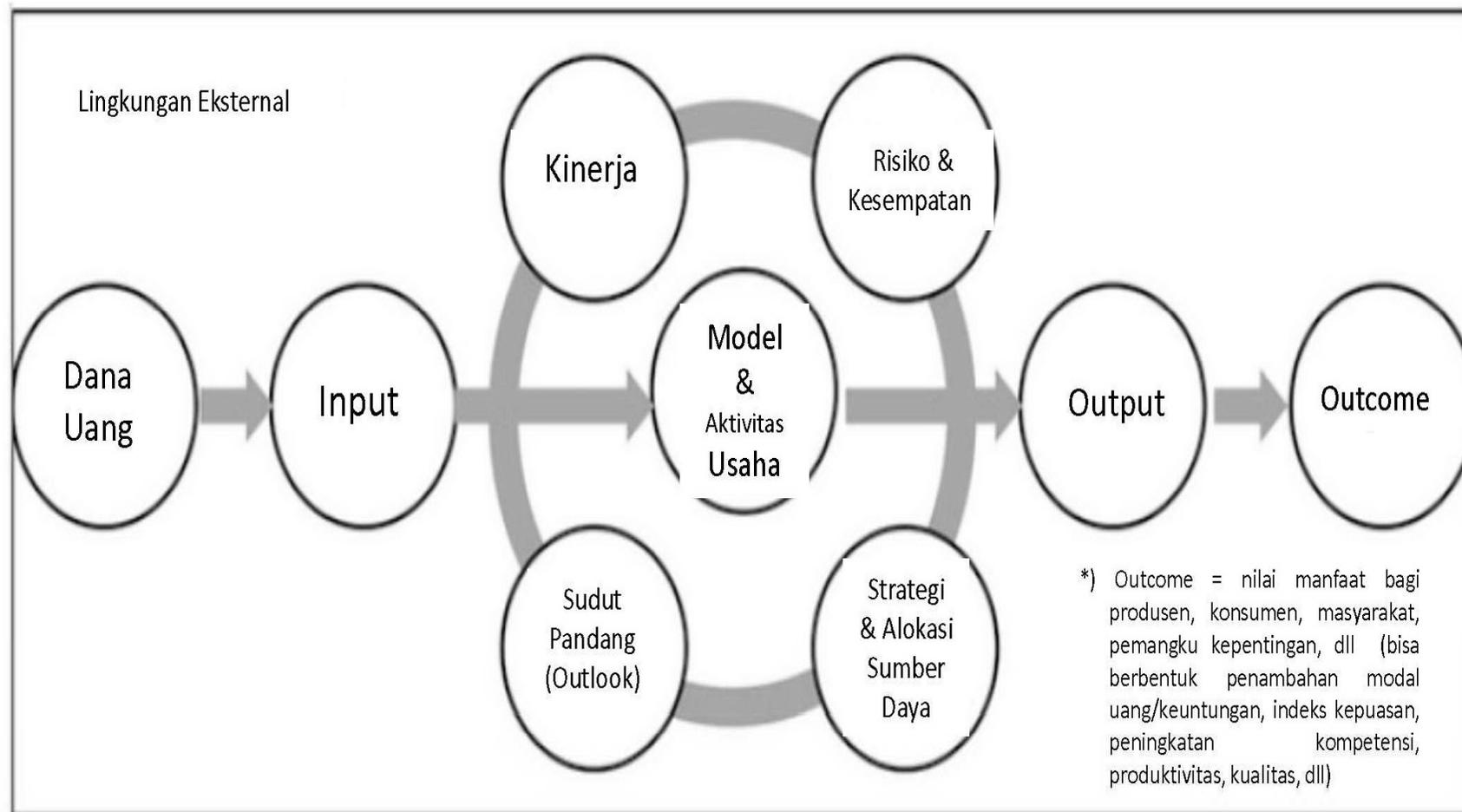
COUNCIL OF SUPPLY CHAIN MANAGEMENT PROFESSIONALS



The preeminent worldwide professional association for supply chain management professionals, whose vision is to lead the evolving supply chain management profession by developing, advancing, and disseminating supply chain knowledge and research (see <http://cscmp.org> for more information).



Source: Steyn, 1989 in Hammer, Markus. 2019. Management Approach for Resource-Productive Operations: Design of a Time-Based and Analytics-Support Methodology Grounded in Six Sigma. Springer Gambler, Austria. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist

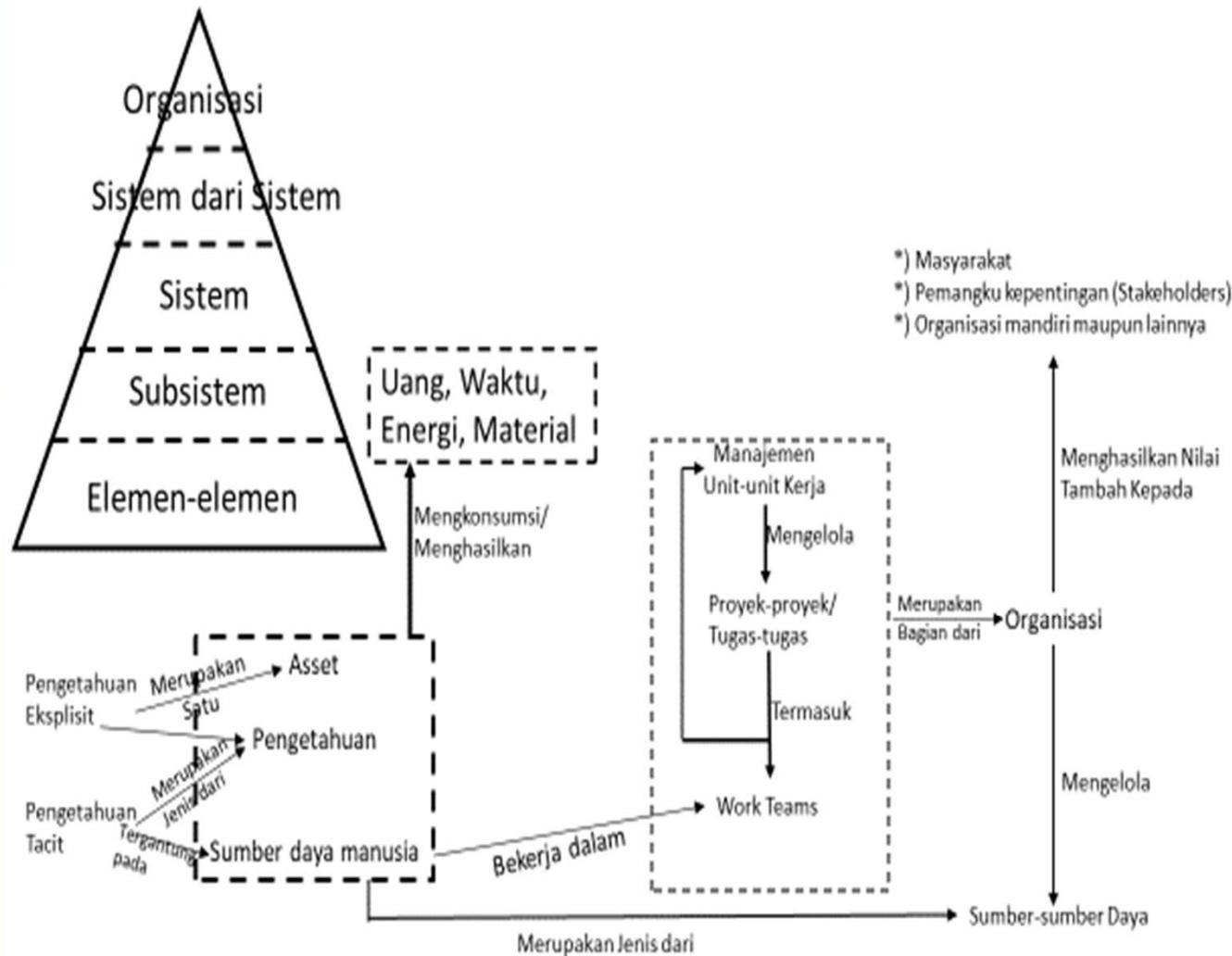


Bagan Proses Penciptaan Nilai Tambah

Source: Blankenburg, K. 2018., Intellectual Capital in German Non-profit Organisations: An Empirical Study, Springer Internasional Publishing, 2018, 233 pages. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt and Certified Management System Lead Specialist

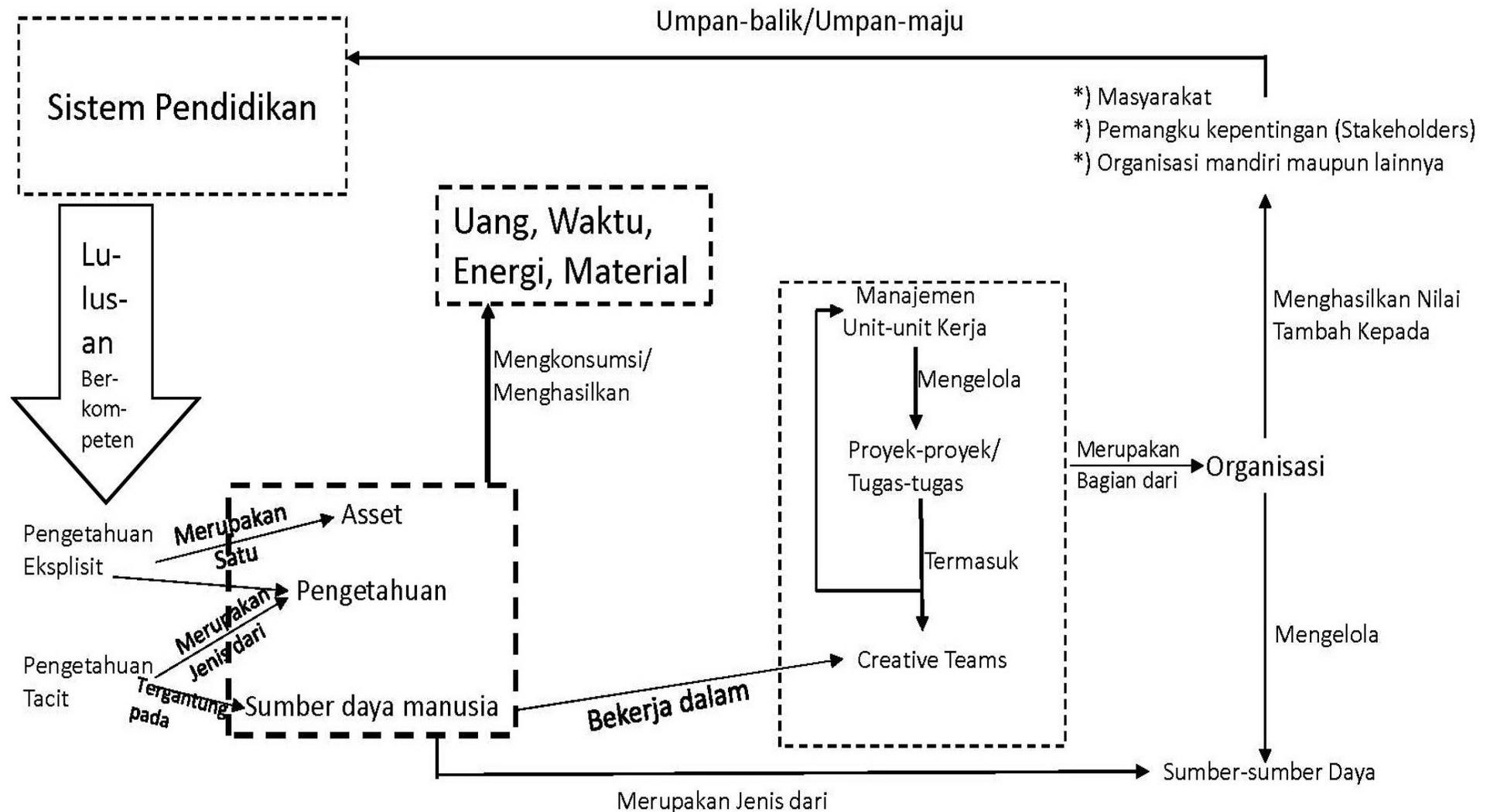
Organisasi Sebagai Sistem

Oleh: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management System Lead Specialist

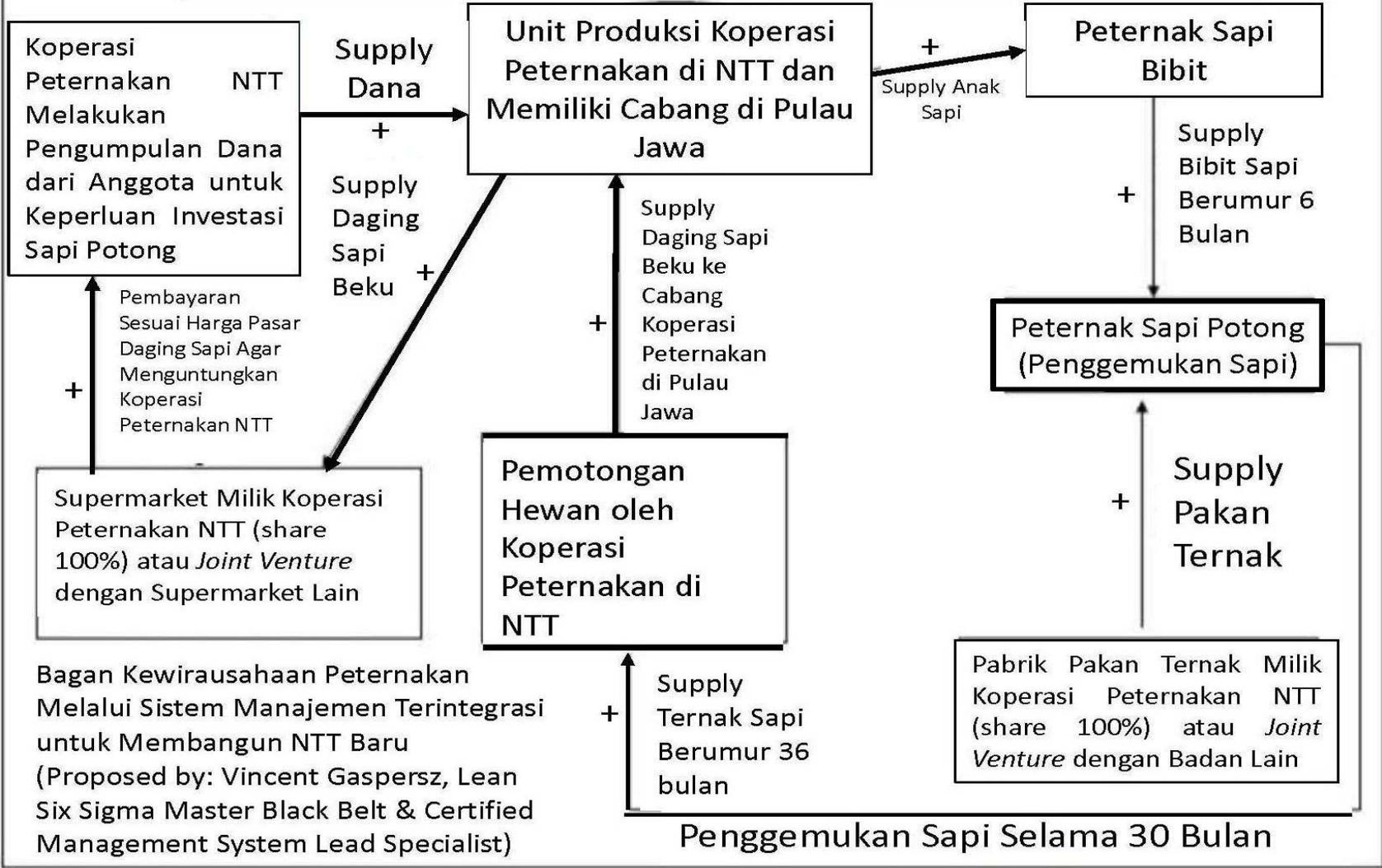


Keterkaitan Sistem Pendidikan dengan Organisasi

Oleh: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management System Lead Specialist



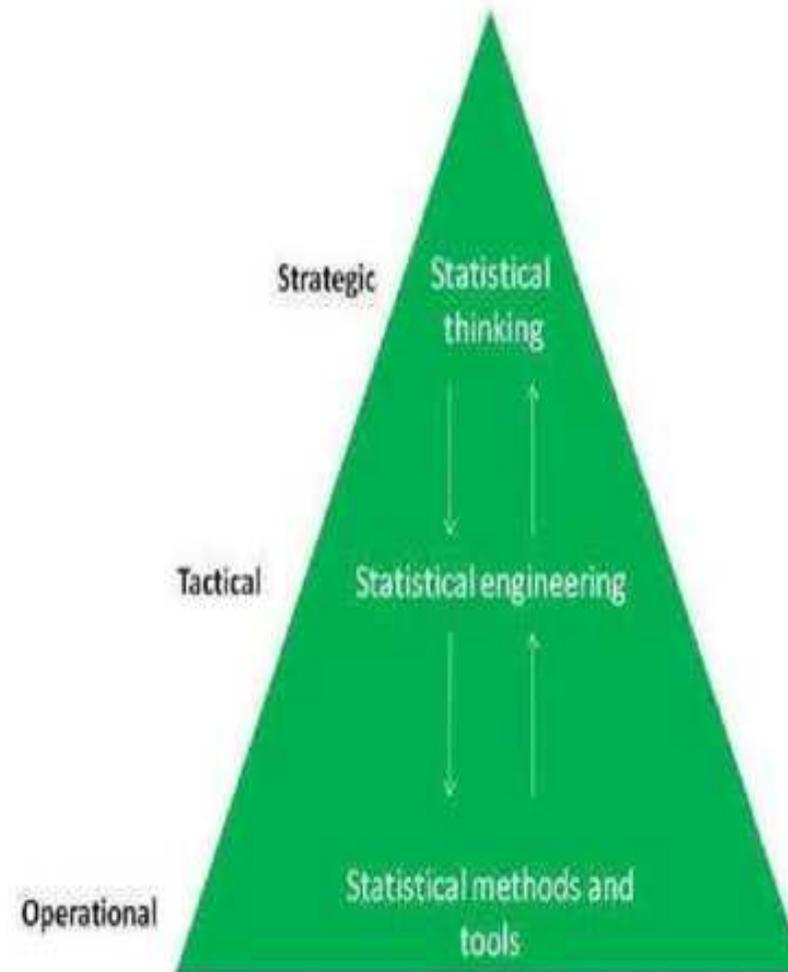
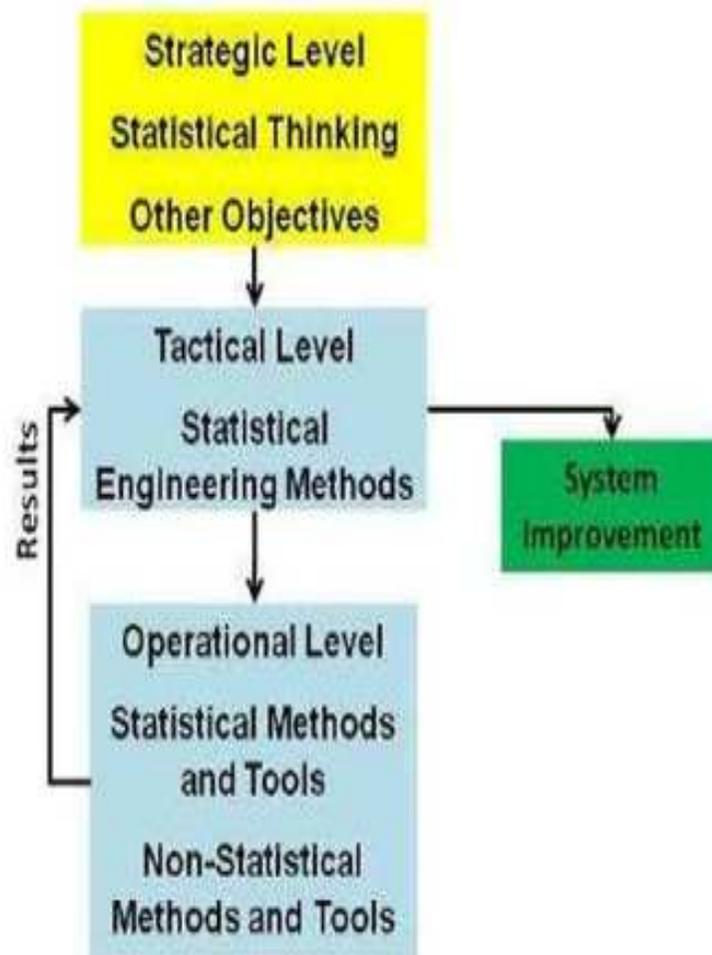
Koperasi Peternakan Beserta Seluruh Anggota Koperasi di NTT Secara Mandiri Melakukan: Penyuluhan dan Pelatihan, Pengendalian Penyakit, Promosi Pasar, Asuransi Peternakan, dll Kemudian Mempublikasi Laporan Secara Berkala Sehingga Memperoleh Kepercayaan Publik Bahwa Koperasi Peternakan itu Sedang Dikelola Menggunakan Manajemen Modern yang Transparan dan Berstandar Internasional Mengikuti Kewirausahaan Peternakan





Memahami Statistical Thinking





Rekayasa Statistikal (Statistical Engineering) adalah kolaborasi studi dan aplikasi dari keterkaitan taktikal antara Pemikiran Statistikal (Statistical Thinking) dan Metode/Alat-alat Statistikal (Statistical Methods/Tools) dengan tujuan memberikan pemahaman yang lebih baik tentang ketidakpastian dalam pengetahuan dan pembuatan keputusan untuk meningkatkan hasil-hasil yang bermanfaat bagi organisasi dan/atau masyarakat (American Society for Quality).

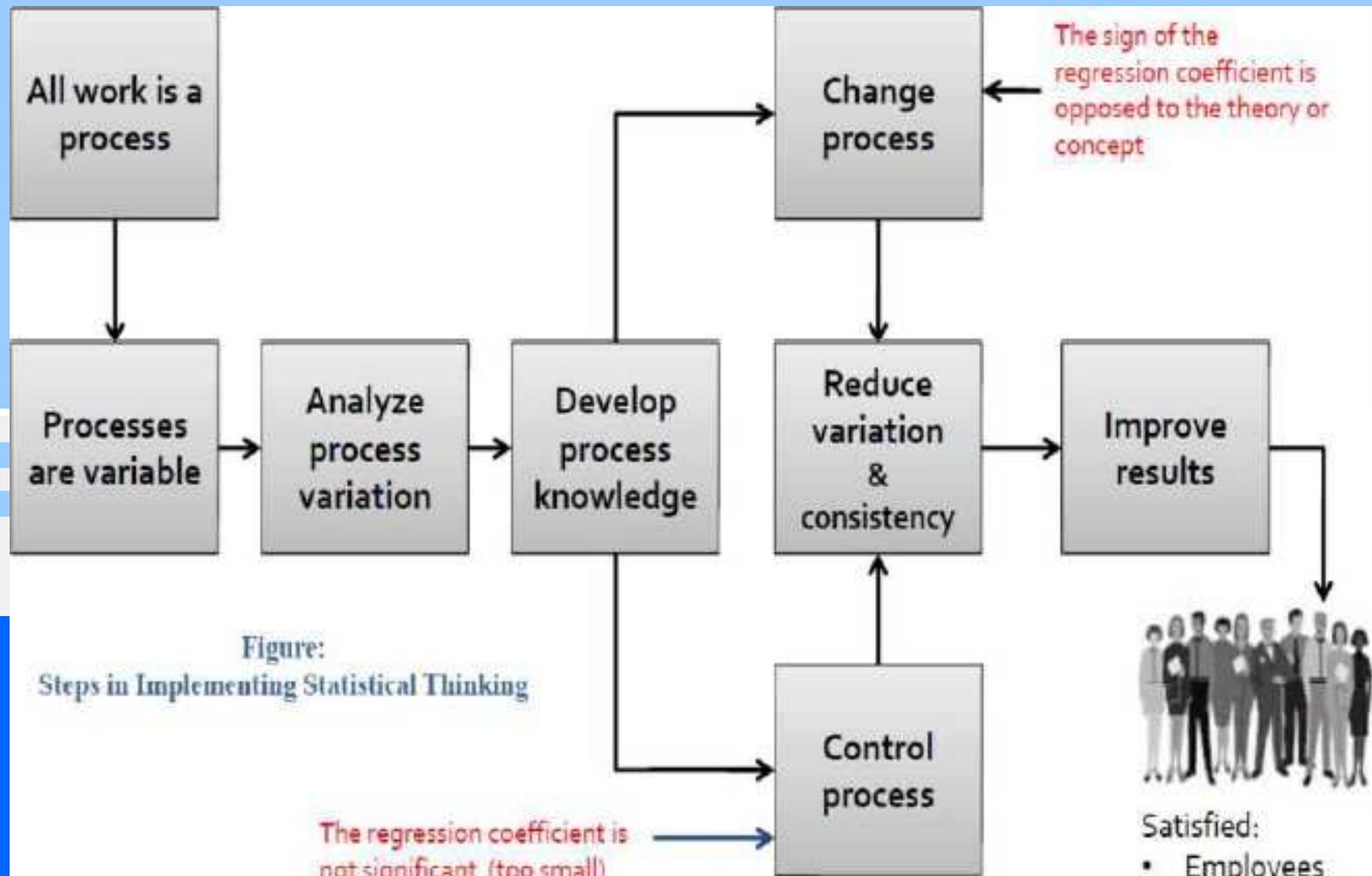


Figure:
Steps in Implementing Statistical Thinking

Source: Roger Hoerl and Ron Snee, 2012., *Statistical Thinking: Improving Business Performance*, p.13, John Wiley & Sons, New Jersey. Cited by: Vincent Gasparsz, Lean Six Sigma Master Black Belt & Certified Management System Lead Specialist

- Satisfied:
- Employees
 - Customers
 - Shareholders
 - Community



Memahami Design Thinking

Apa itu Design Thinking (Berpikir Desain)?

Berpikir Desain (Design Thinking) adalah metode untuk solusi masalah kreatif menggunakan strategi yang digunakan desainer selama proses perancangan (desain). Pemikiran desain juga telah dikembangkan sebagai pendekatan untuk menyelesaikan masalah di luar praktik desain profesional, seperti dalam konteks bisnis, ekonomi, politik, dan sosial yang kompleks.

Berpikir Desain (Design Thinking) bukanlah milik eksklusif desainer — semua inovator hebat dalam sastra, seni, musik, sains, teknik, dan bisnis telah mempraktekannya. Design Thinking adalah proses kerja para desainer yang dapat membantu kita secara sistematis mengekstrak, mengajar, belajar dan menerapkan teknik-teknik yang berpusat pada manusia ini untuk menyelesaikan masalah dengan cara yang kreatif dan inovatif - dalam desain, dalam bisnis, pendidikan, dan bidang lain, termasuk dalam kehidupan kita (mendesain kehidupan kita agar mencapai SUCCESS).

Setiap Orang Adalah DESAINER! (Design Thinking Approach)

Sumber:

<http://thinkspace.csu.edu.au/inf536reflections/2015/08/16/core-capacities-of-design-thinkers/>

BEREMPATI

PELAJARI
tentang audiens untuk siapa Anda mendesain, melalui observasi dan wawancara.
Siapa pengguna (user) saya? Apa yang penting untuk orang ini?

DEFINISI

CIPTAKAN sebuah sudut pandang berdasarkan kebutuhan & pandangan pengguna (user). *Apa kebutuhan mereka?*

IDE-IDE

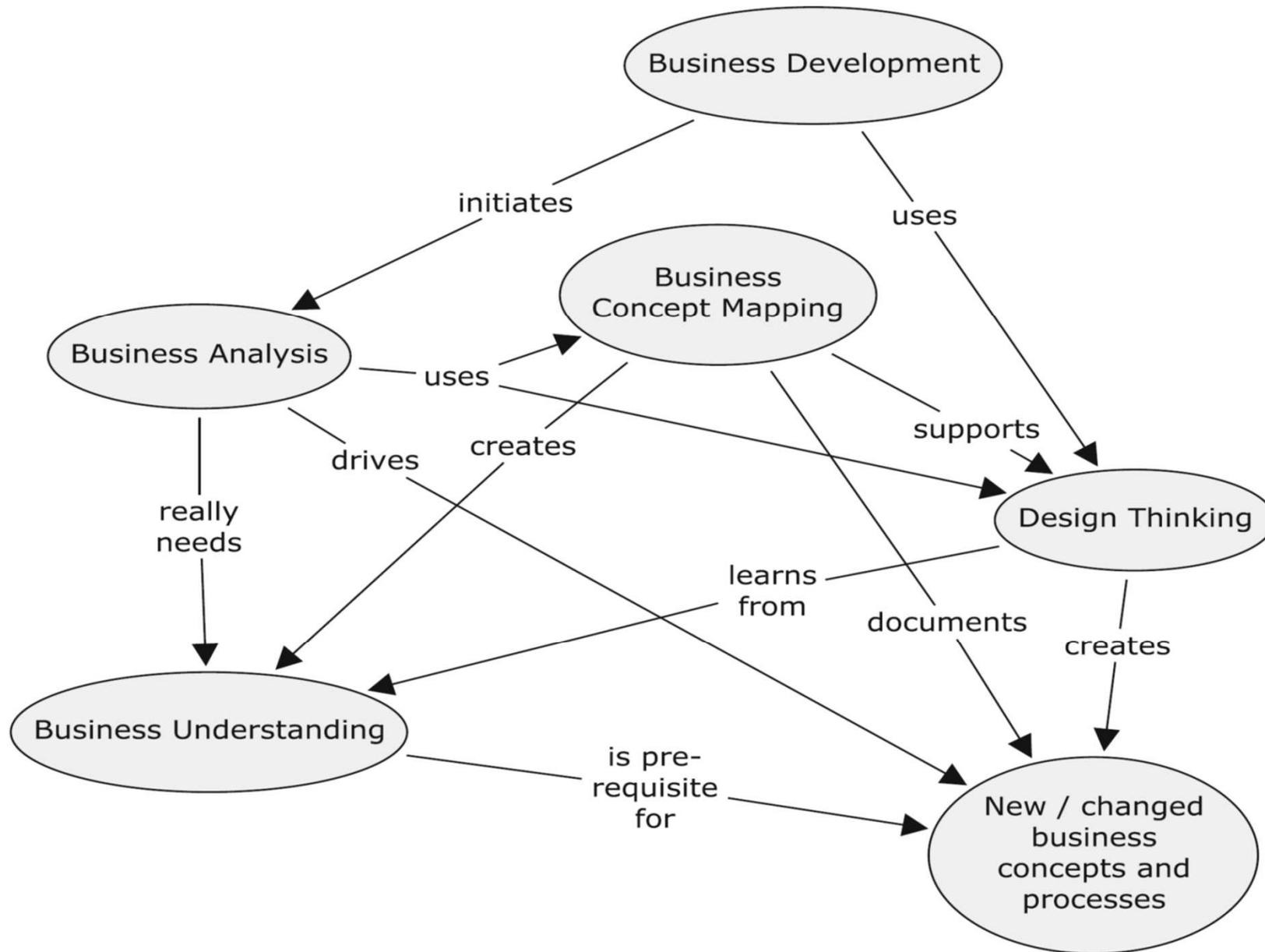
BERTUKAR PIKIRAN dan keluarkan sebanyak mungkin ide-ide untuk solusi kreatif yang mungkin. Mengemukakan ide-ide kreatif meskipun berbeda sangat dianjurkan

PROTOTYPE

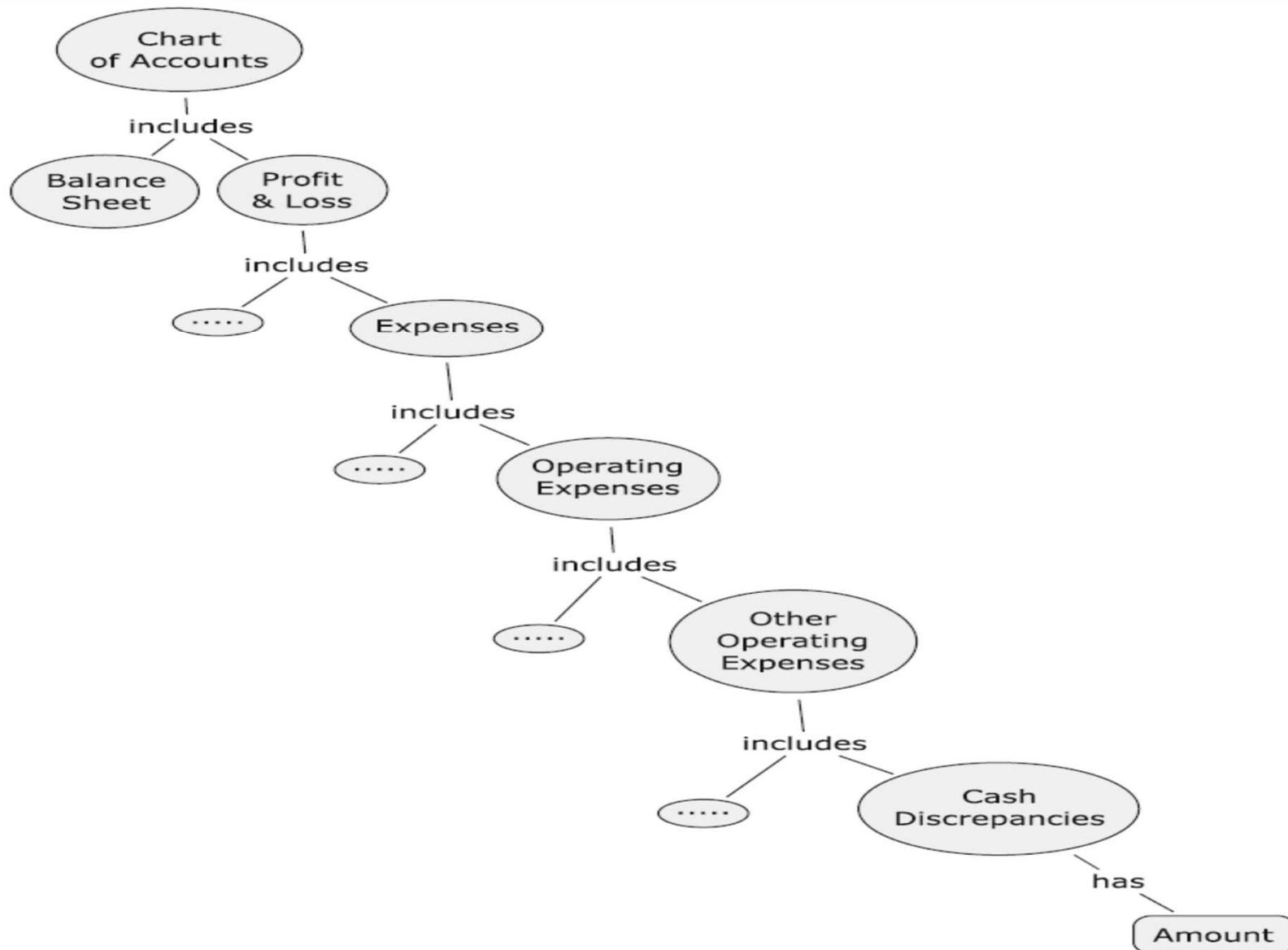
BANGUN representasi dari satu/lebih dari ide Anda untuk ditunjukkan kepada orang lain. *Bagaimana saya dapat menunjukkan ide saya? Ingat: Sebuah prototype hanyalah sebuah draft kasar.*

UJI COBA

BAGILAH ide prototype dengan pengguna (user) Anda untuk memperoleh umpan-balik. *Lihat bagian mana yang bisa bekerja? Bagian mana yang tidak efektif?*

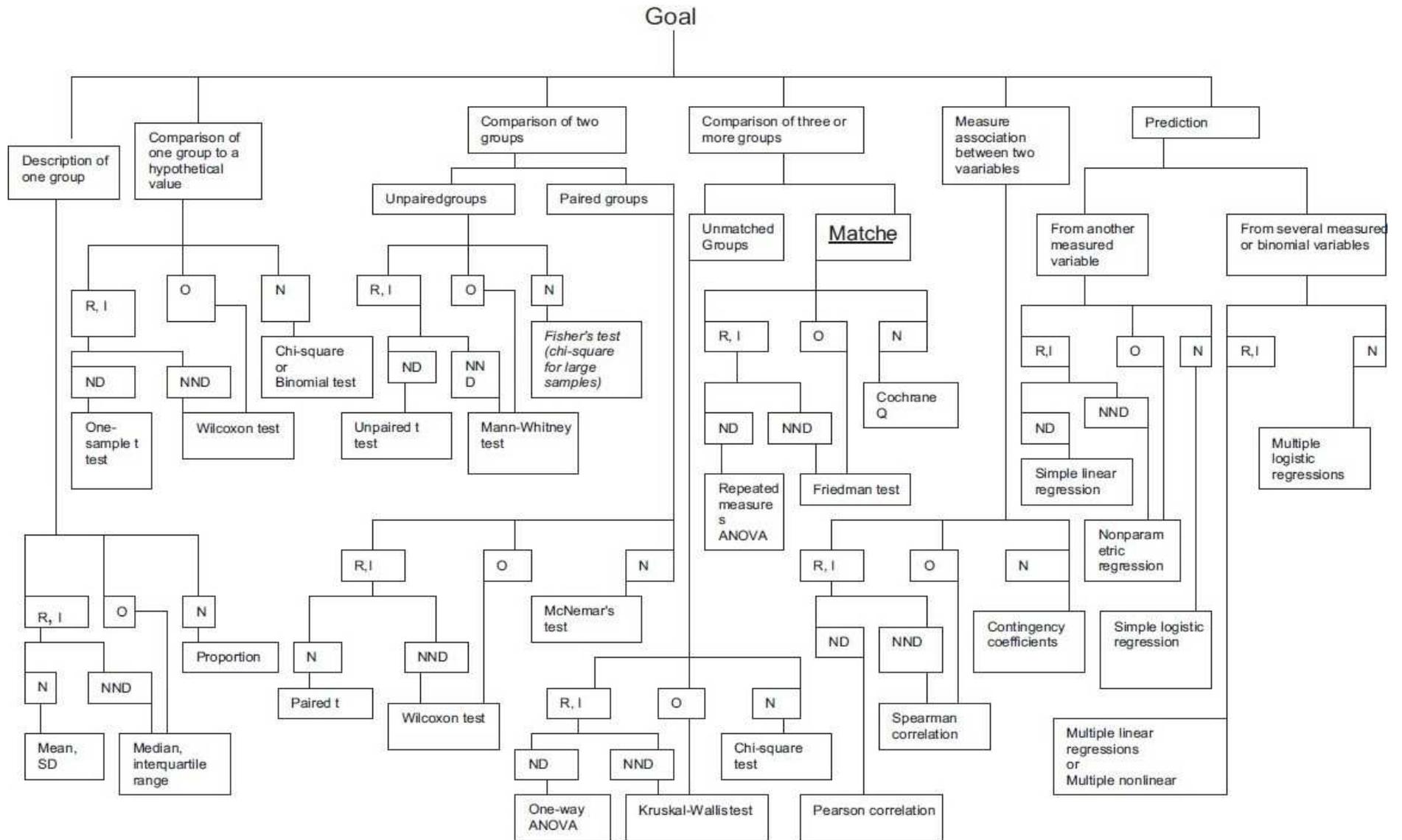


Source: Thomas Frisendal, 2012. Design Thinking Business Analysis: Business Concept Mapping Applied., Springer, Berlin. Cited by: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist.

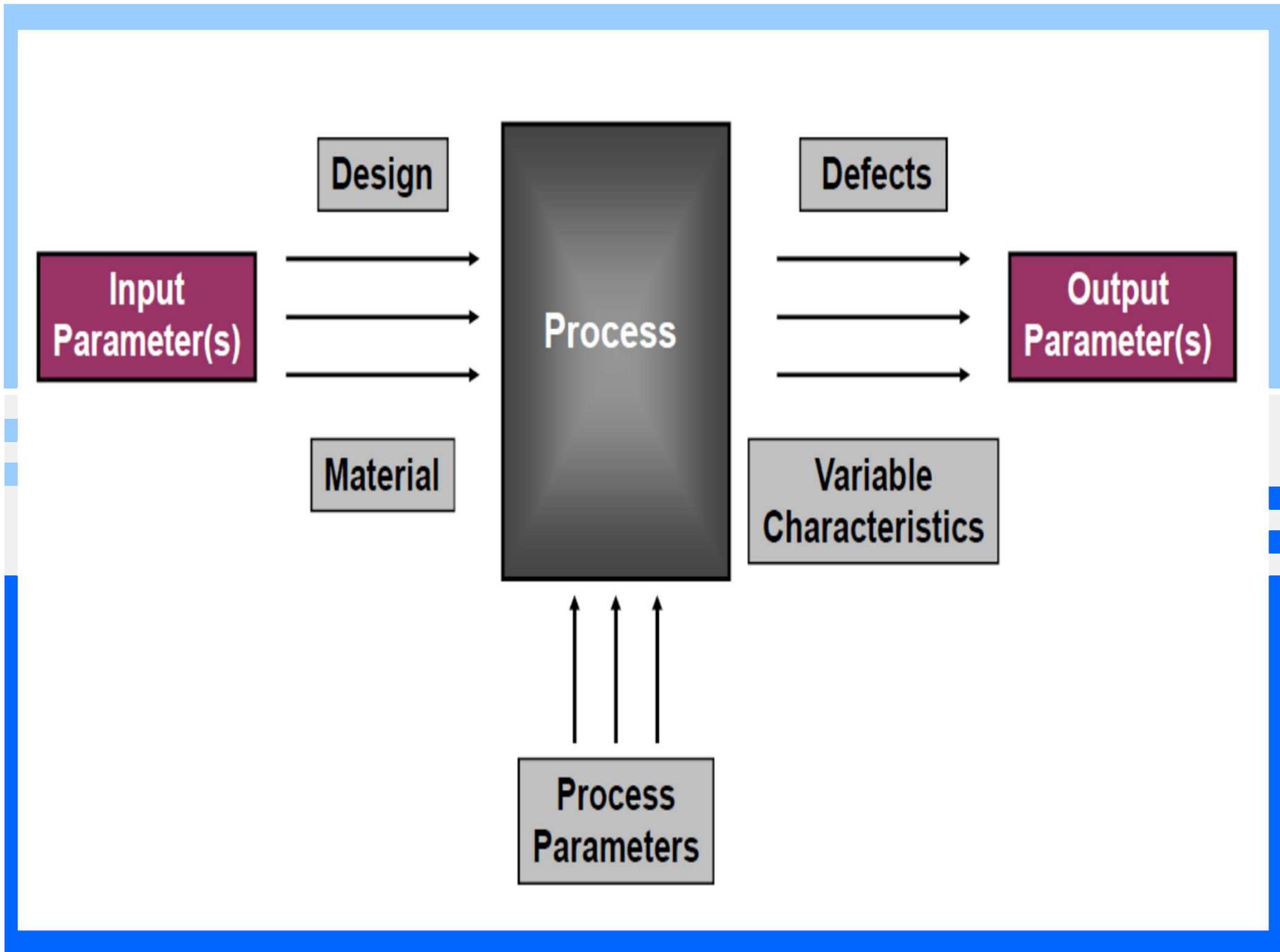


The cash discrepancies path of the chart of accounts expressed as a concept map

Source: Thomas Frisendal, 2012. Design Thinking Business Analysis: Business Concept Mapping Applied., Springer, Berlin. Cited by: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist.



R, I = Ratio and Interval data O = Ordinal data N = Nominal data
 N = Normal distribution NND = Non normal distribution





Design Thinking for Education 4.0

ASIA-PACIFIC
DECENT WORK
DECADE 2006
2015



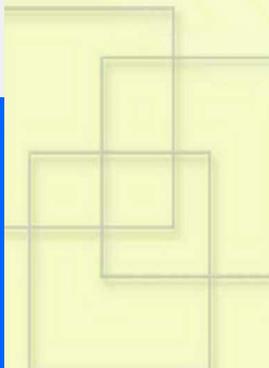
International
Labour
Organization



ILO Asia-Pacific Working Paper Series

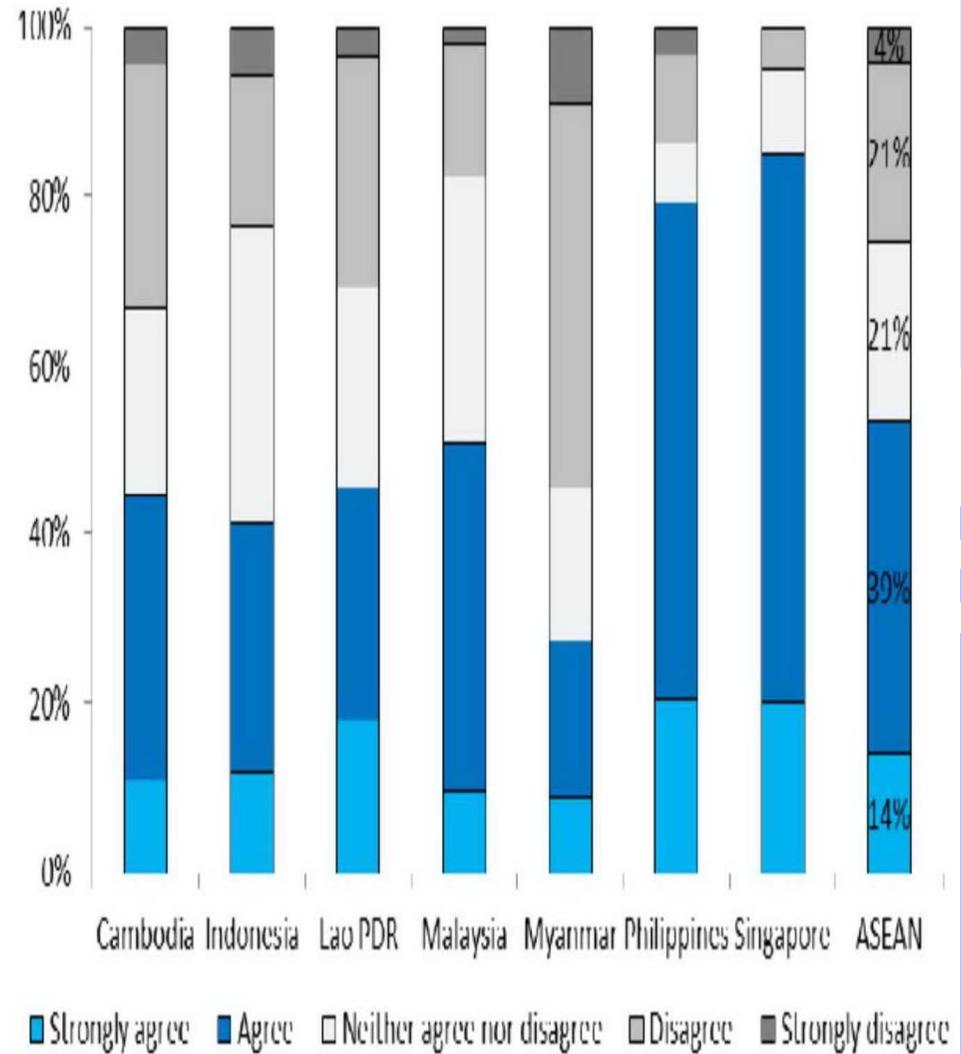
Survey of ASEAN employers on
skills and competitiveness

Emerging Markets Consulting
May 2014

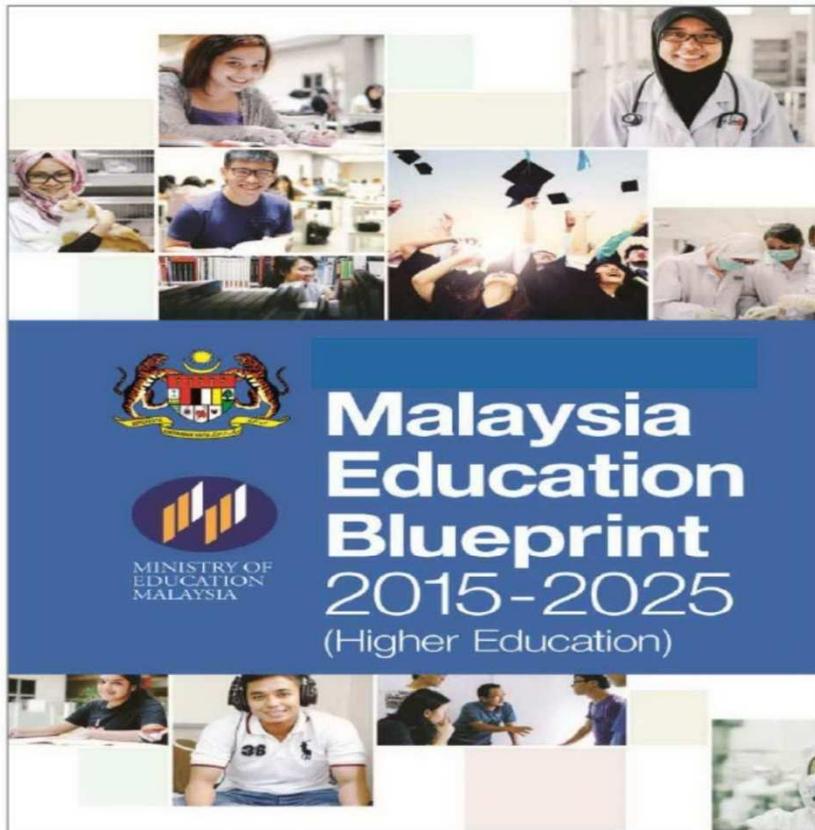


Regional Office for Asia and the Pacific and
Bureau for Employers' Activities

Skills of university graduates match enterprise needs



Source: ILO (International Labour Organization). 2014. Survey of ASEAN Employers on Skills and Competitiveness. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt, Certified Management Systems Lead Specialist, and ASEAN Engineer Register (AER, Number: 10084).



Source: Tapsir, Siti Hamisah. 2017. Malaysia Higher Education 4.0., Directorate General Department of Higher Education, Ministry of Higher Education. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt and Certified Management System Lead Specialist.

Outcome (Hasil):

1. Lulusan Holistik, Bermental Kewirausahaan, dan Seimbang antara Kecerdasan Intelektual, Emosional dan Spiritual
2. Keunggulan bakat
3. Bangsa pembelajar seumur hidup
4. Lulusan TVET (Technical and Vocational Education and Training) berkualitas

Enablers (Membuat Sesuatu Terjadi):

5. Keberlanjutan keuangan
6. Pemerintahan yang diberdayakan
7. Ekosistem inovasi
8. Ketenaran global (Global Prominence)
9. Pembelajaran online global
10. Mentransformasi penyerahan pendidikan tinggi

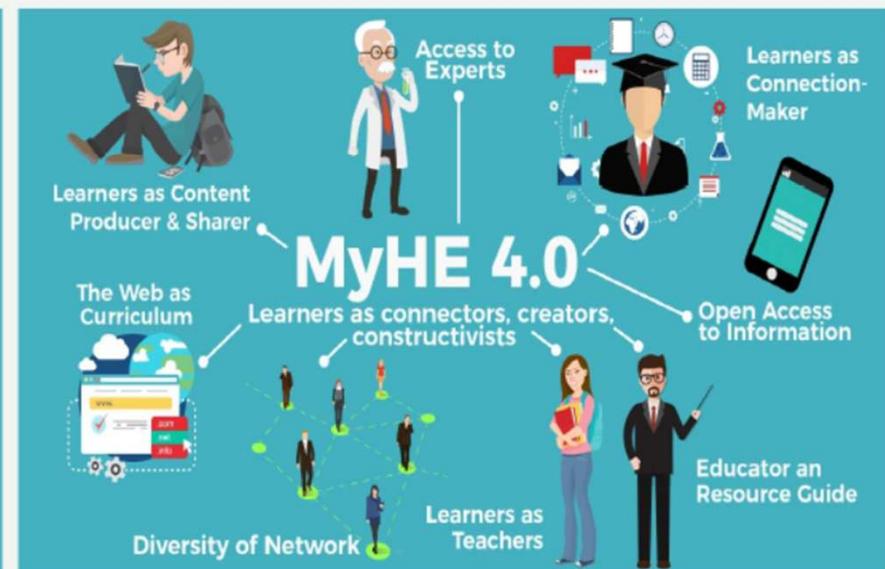
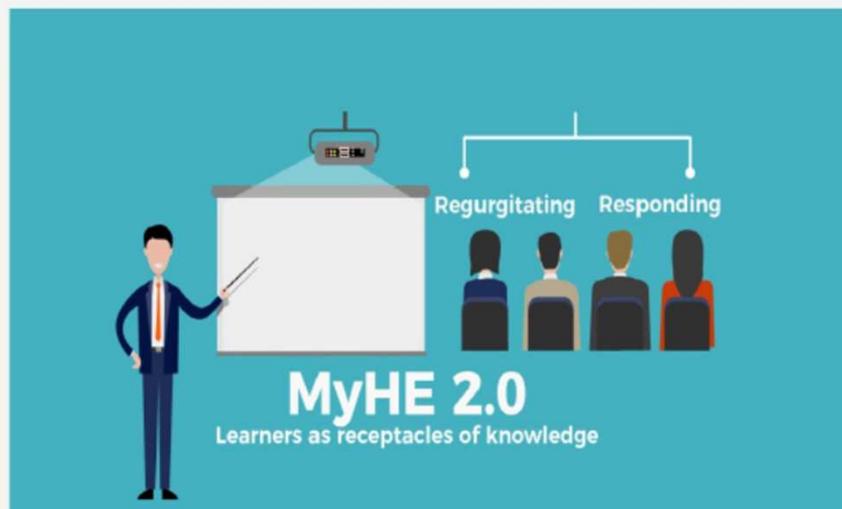
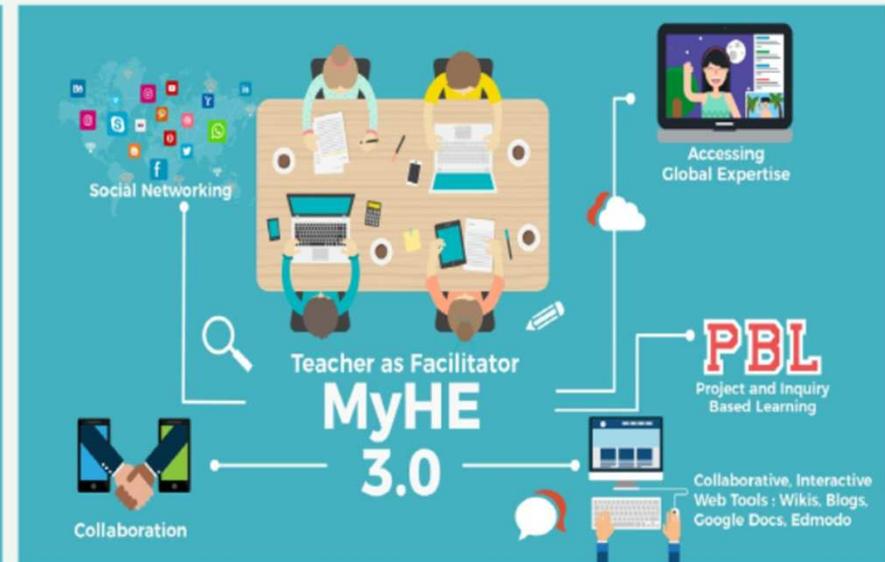
Foundation for Individual Student Aspirations in the Blueprint

Malaysia Higher Education 4.0



Source: Datin Paduka Ir. Dr. Siti Hamisah Tapsir Director General Department of Higher Education Ministry of Higher Education 11 September 2017, Malaysia Higher Education 4.0. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist.

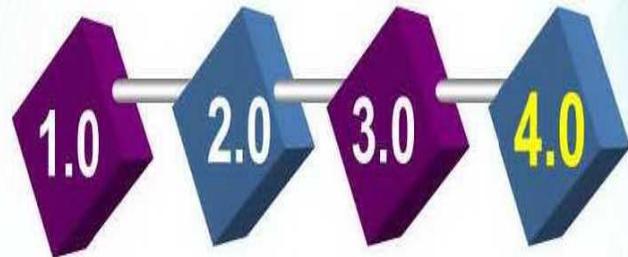
Delivery of Higher Education



MyHE = Malaysia Higher Education



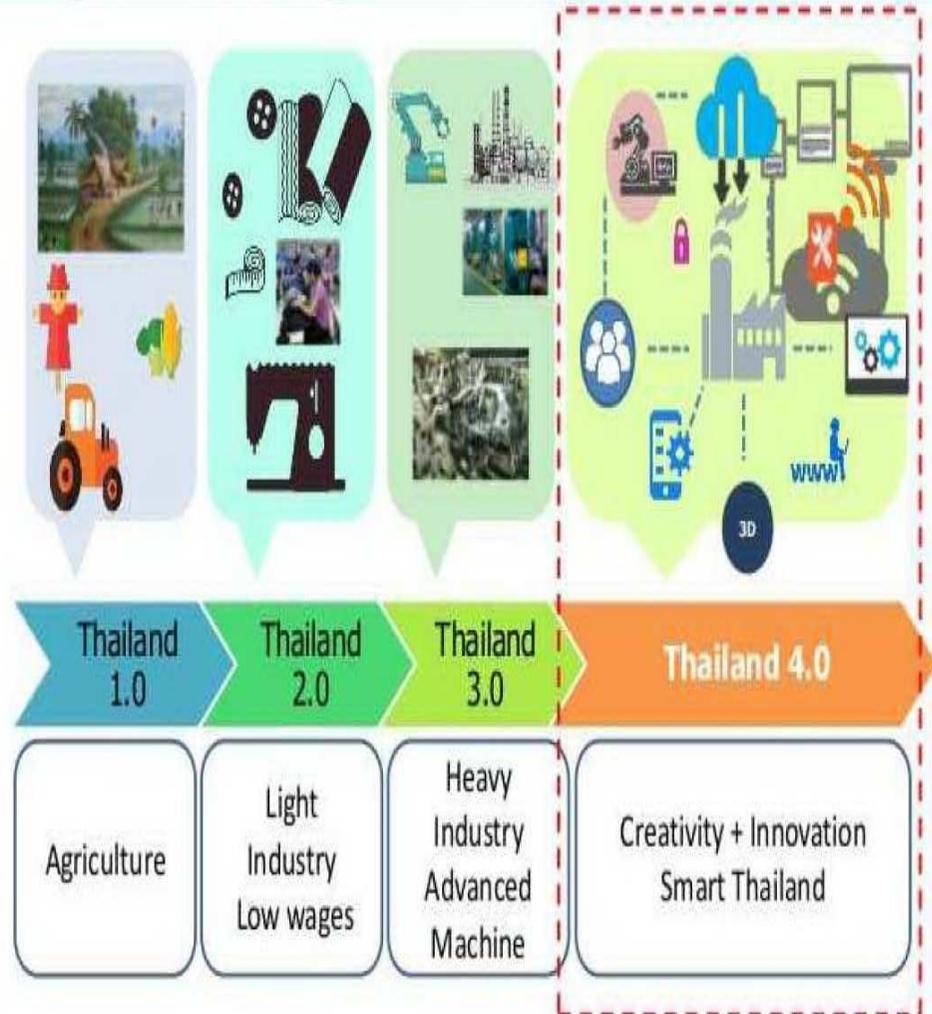
Education 4.0



Lectures and memorization	Internet-enabled learning	Knowledge-producing education	Innovative-producing education
---------------------------	---------------------------	-------------------------------	--------------------------------

Thailand 4.0

(Smart Industry + Smart City + Smart People)



Source: Languelin, O. 2017. Thailand 4.0, what do you need to know?, Thailand Business News, Nov 27, 2017. www.thailand-business-news.com. Accessed on February 2018 by Vincent Gaspersz, Lean Six Sigma Master Black Belt and Certified Management System Lead Specialist.

WHAT UNIVERSITIES NEED TO DO

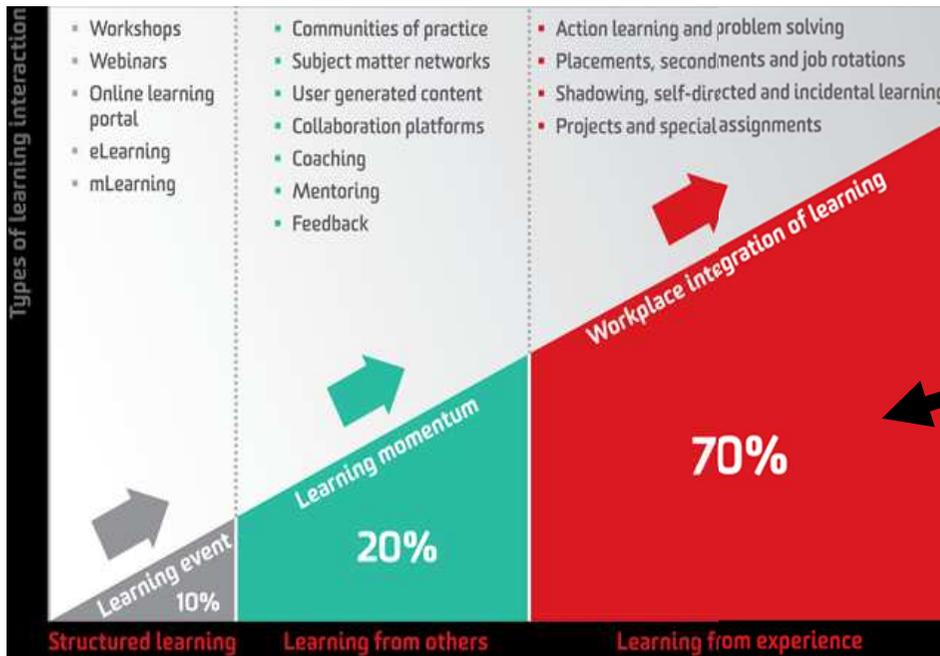
1. Instil 4Cs into students — Communication, Collaboration, Critical Thinking, Creativity
2. Make programming and ICT education a compulsory subject
3. Develop educational content in collaboration with industry
4. Reform content and the methodology of education via digital
5. Have top people resources to lead global industry engagement
6. Create new business trends through reform of higher education
7. Industry 4.0 government, industry, university research



INFOGRAPHICS NST

1. Menanamkan 4C kepada mahasiswa (Communication, Collaboration, Critical Thinking, Creativity)
2. Menawarkan mata kuliah wajib berkaitan dengan pemrograman dan pendidikan ICT (Information and Communication Technology)
3. Mengembangkan kurikulum bekerja sama dengan industri
4. Reformasi isi dan metodologi pembelajaran melalui digital (internet)
5. Memiliki sumber daya manusia berkualitas untuk memimpin keterlibatan industri global
6. Menciptakan trend bisnis baru melalui reformasi pendidikan tinggi
7. Industri 4.0 yang berkaitan dengan pemerintah, dunia industri, dan penelitian universitas

Design Thinking of Learning

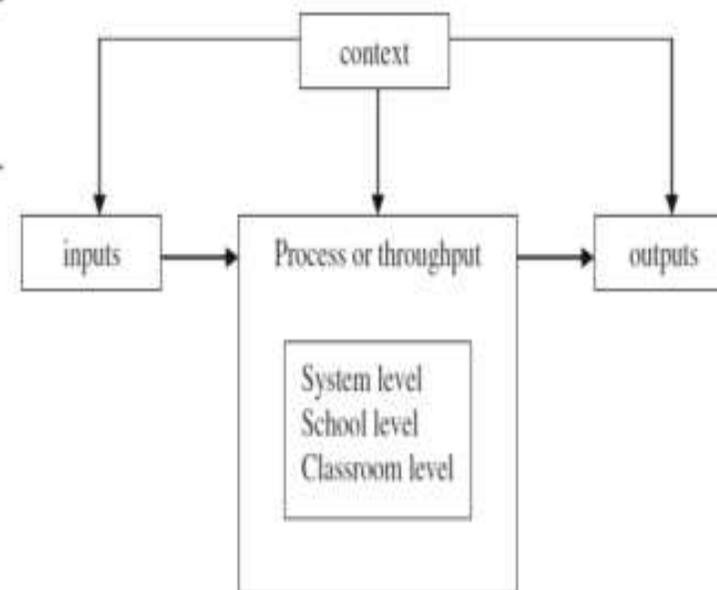


Cone of Learning		
After 2 weeks we tend to remember		Nature of Involvement
90% of what we say and do	Doing the Real Thing	Active
	Simulating the Real Experience	
	Doing a Dramatic Presentation	
70% of what we say	Giving a Talk	Passive
	Participating in a Discussion	
50% of what we hear and see	Seeing it Done on Location	Passive
	Watching a Demonstration	
	Looking at an Exhibit Watching a Demonstration	
	Watching a Movie	
30% of what we see	Looking at Pictures	
20% of what we hear	Hearing Words	
10% of what we read	Reading	



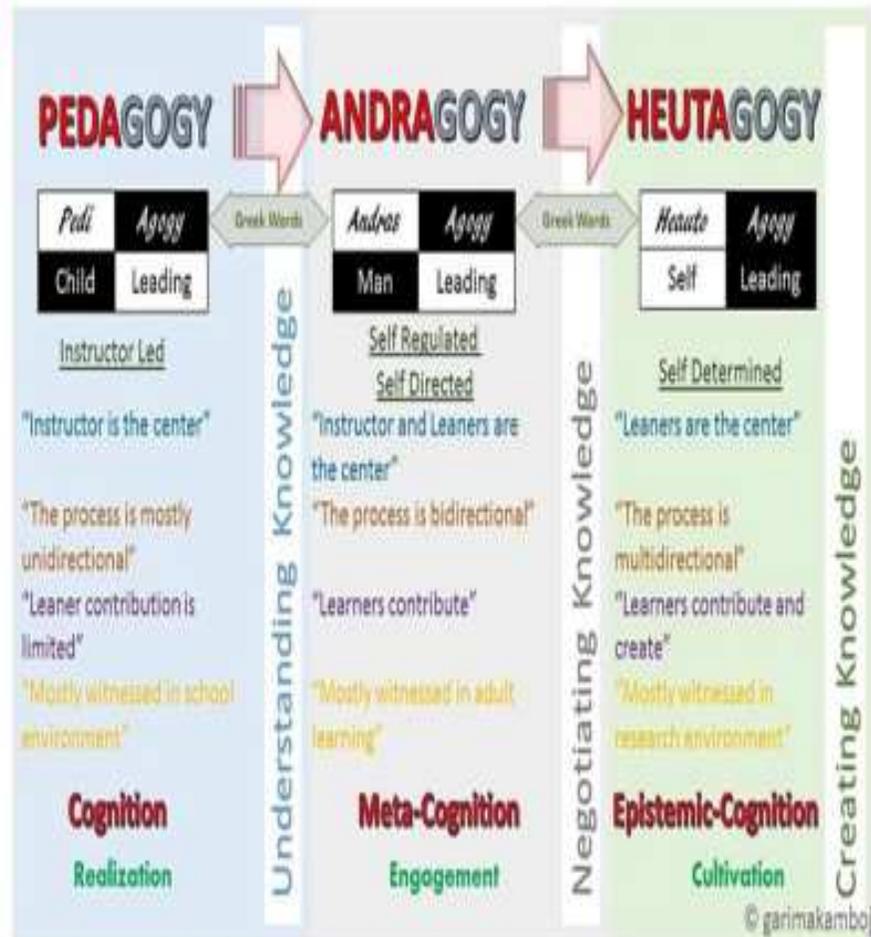
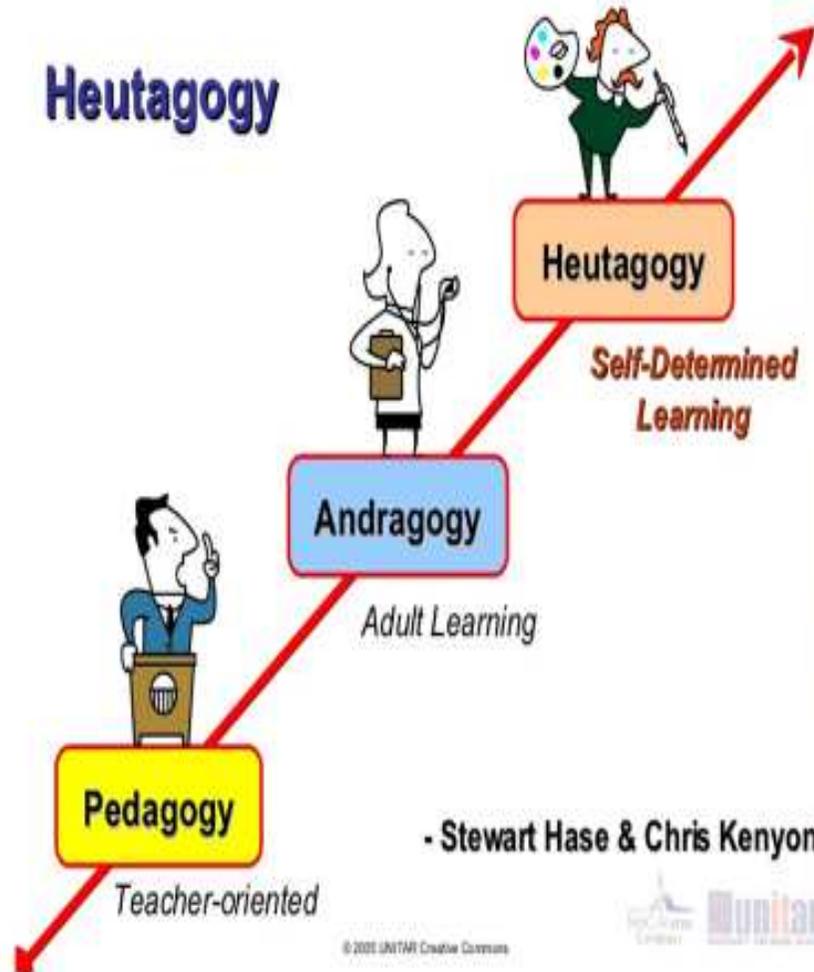
© 70:20:10 Forum

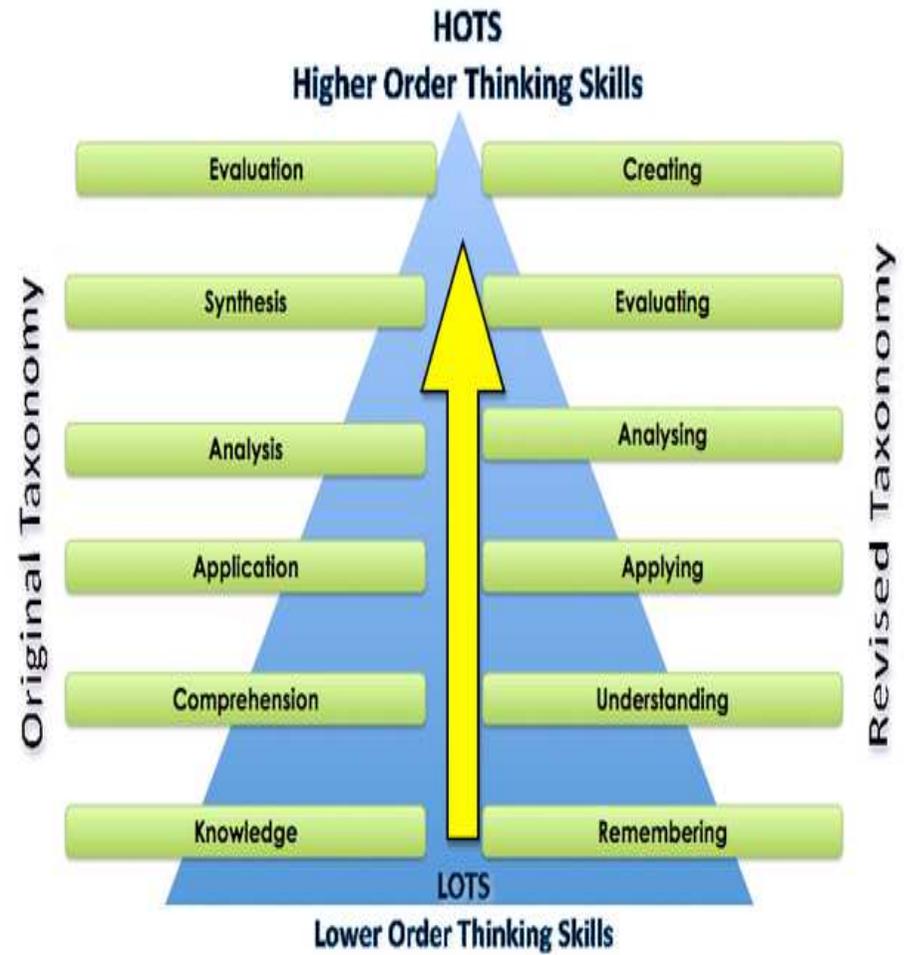
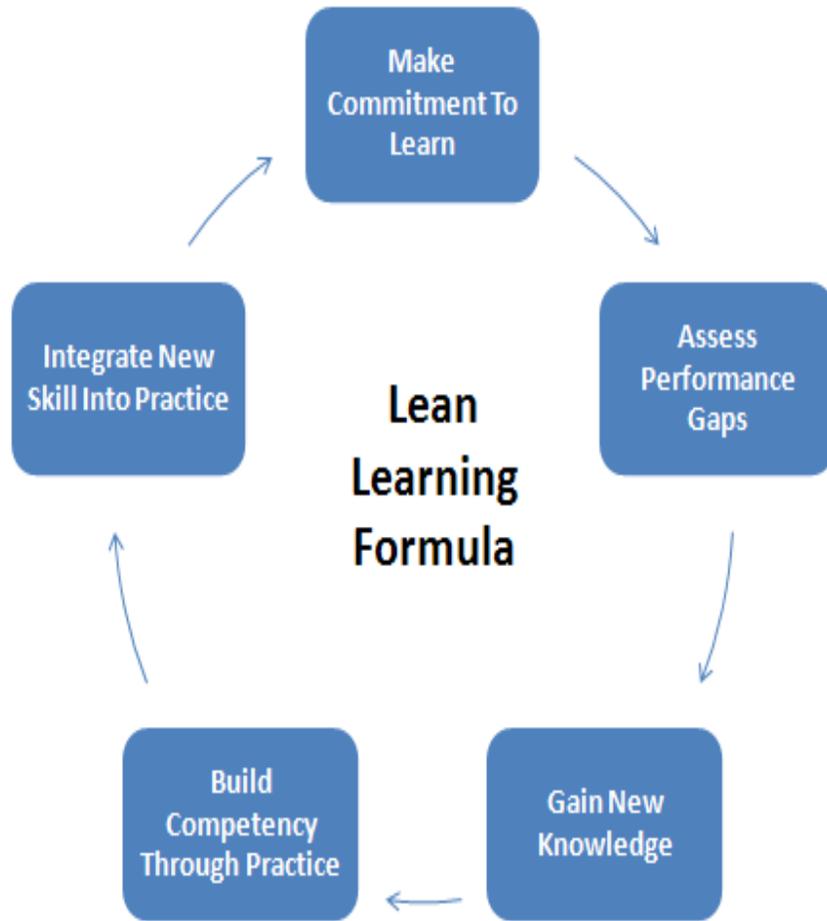
Input "given" entrance conditions	Technology				Aims (type of outcomes)
	Throughput				
	<i>Instruction</i>	<i>learning</i>	<i>classroom organization</i>	<i>Tasks</i>	
low aptitudes	direct	reactive receptive	whole class individual	highly structured	basic skills academic
high aptitudes	open	active productive discovery learning	groups	real life problems	higher order processes "real life" knowledge social skills



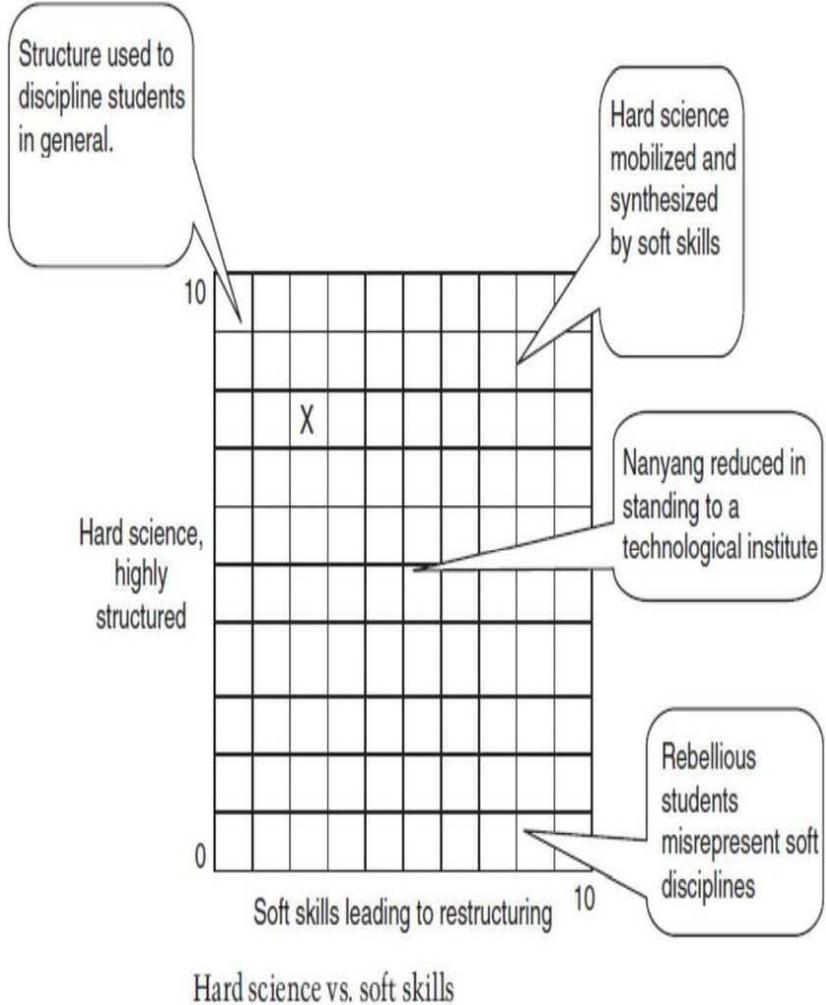
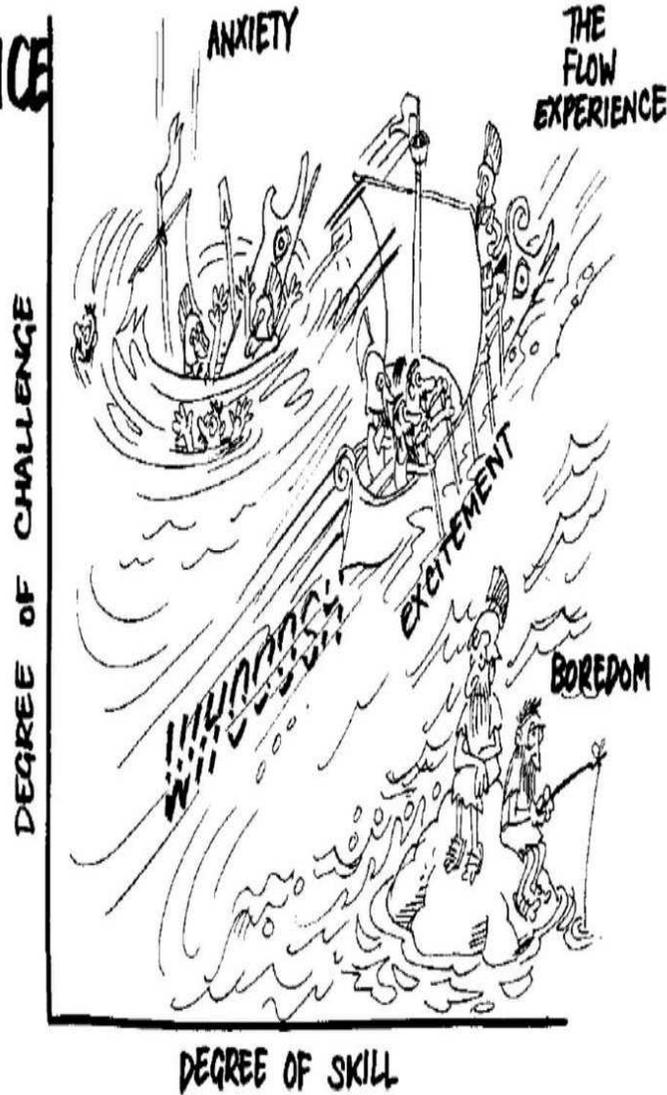
Source: Scheerens, Jaap. 2016. Educational Effectiveness and Ineffectiveness: A Critical Review of the Knowledge Base., Springer Science + Business Media, Heidelberg., 389 pages. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt and Certified Management Systems Lead Specialist.

Heutagogy



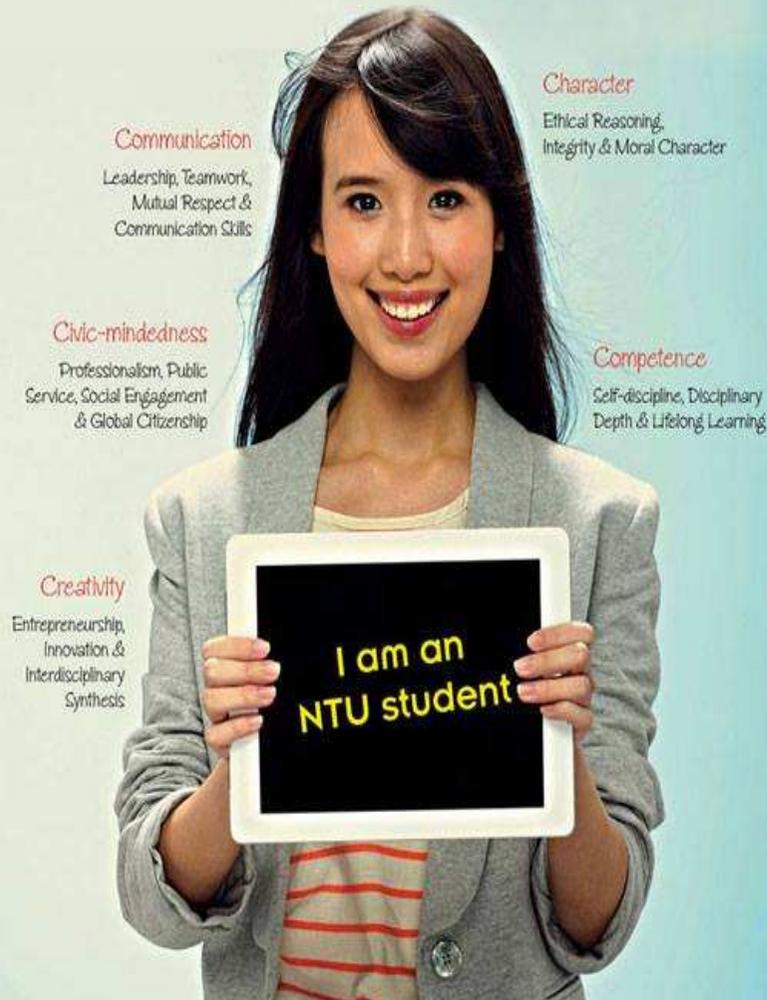


OPTIMAL EXPERIENCE



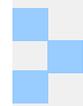
Source: Turner, Charles Hampden. Teaching Innovation and Entrepreneurship: Building on the Singapore Experiment. Cambridge University Press. Cambridge. 231 pages. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist

Character. Creativity. Competence. Communication. Civic-mindedness



NTU (Nanyang Technological University) Soft Skills

1. Character:
Ethical Reasoning, Integrity and Moral Character.
2. Creativity:
Entrepreneurship, Innovation and Interdisciplinary Synthesis.
3. Competence:
Self-discipline, Disciplinary Depth & Lifelong Learning
4. Communication:
Leadership, Teamwork, Mutual Respect & Communication Skills
5. Civic-mindedness:
Professionalism, Public Service, Social Engagement & Global Citizenship



Model Pembelajaran Determinasi Mandiri (Ciptaan Vincent Gaspersz)



“The value of an education in a college or university is not the learning of many facts, but the training of the mind to think something that cannot be learned from textbooks.”

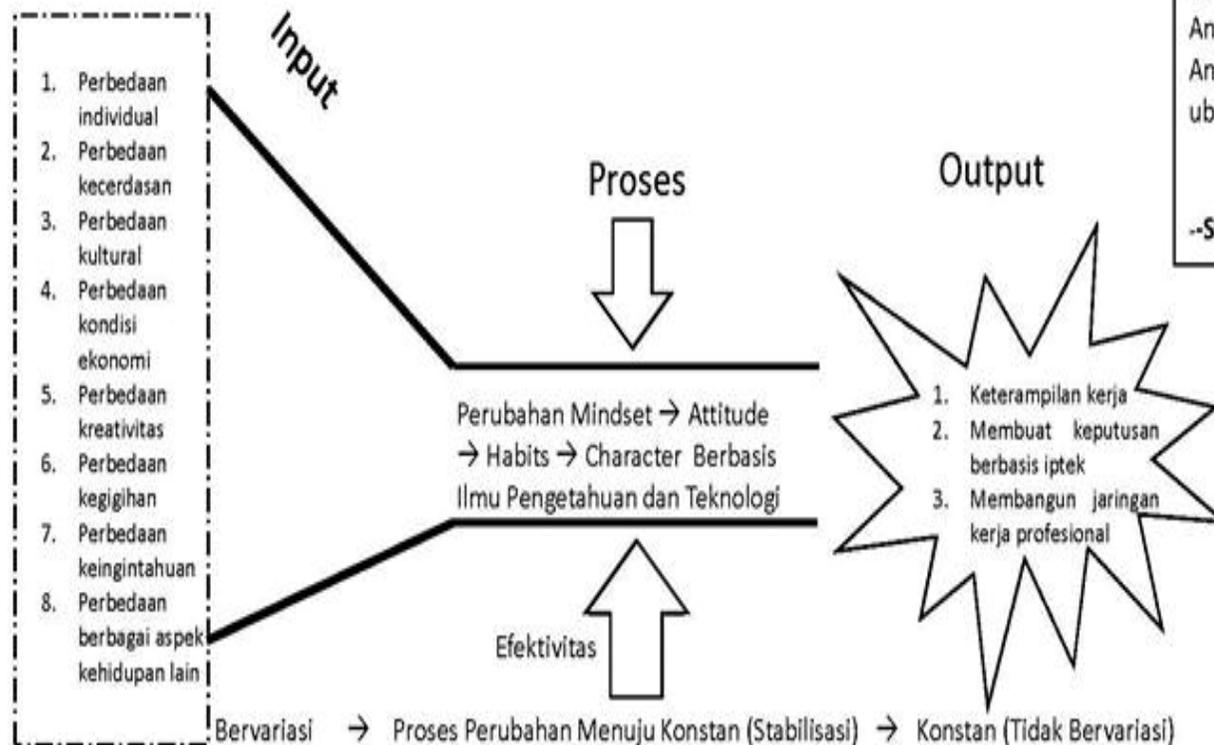
“Nilai dari pendidikan di sekolah atau perguruan tinggi adalah BUKAN mempelajari banyak fakta, tetapi melatih pikiran untuk memikirkan sesuatu yang TIDAK dapat dipelajari dari buku-buku teks”

— Albert Einstein

“Effective people are not problem-minded; they are opportunity minded. If you want small changes, work on your behavior; if you want quantum-leap changes, work on your paradigm”

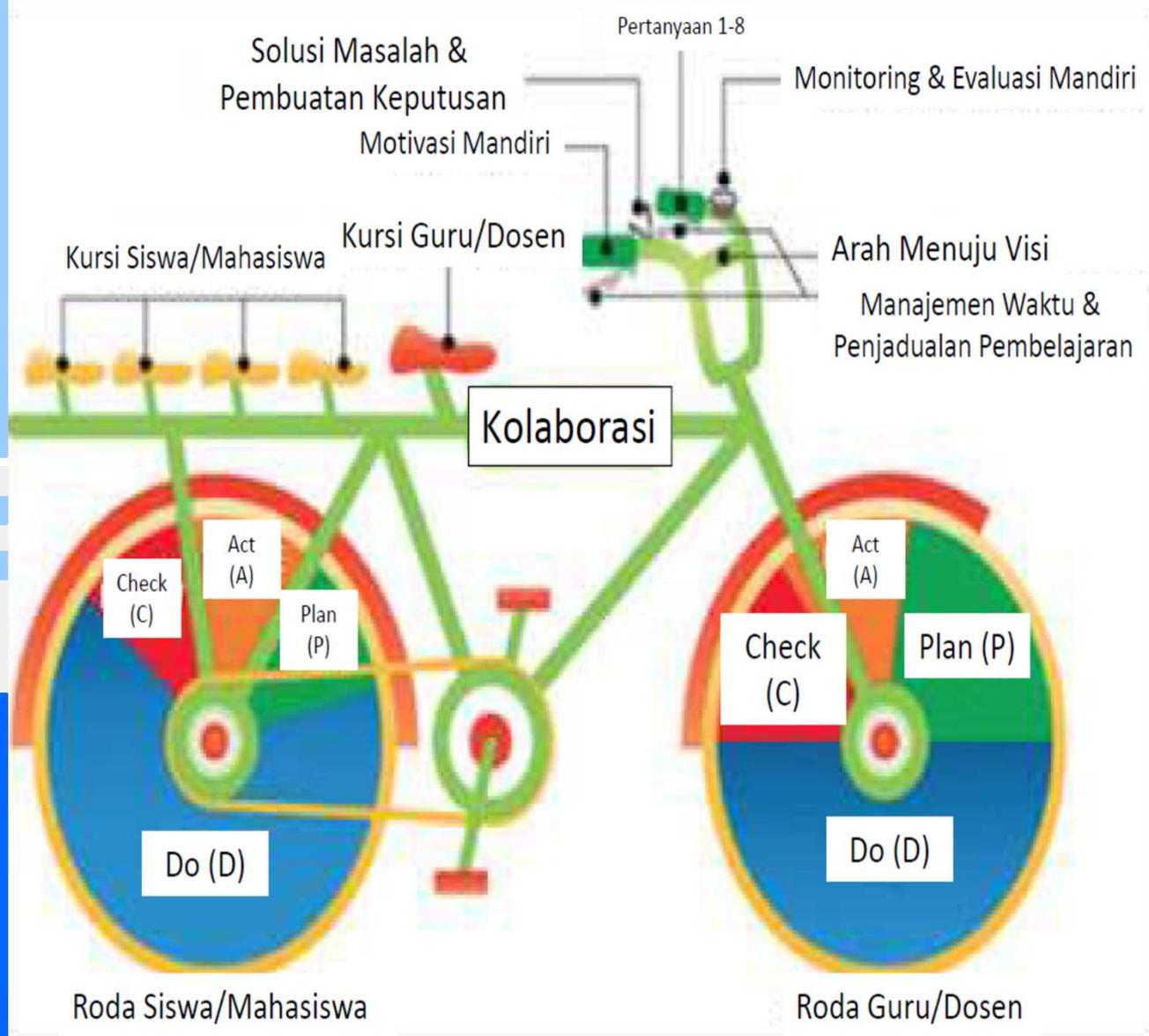
“Orang yang efektif tidak berpikir tentang masalah; mereka berpikir tentang kesempatan (opportunity minded). Jika Anda ingin perubahan kecil, ubahlah perilaku Anda; jika Anda ingin perubahan besar (lompatan jauh ke depan), ubahlah paradigma Anda”

--Stephen R. Covey



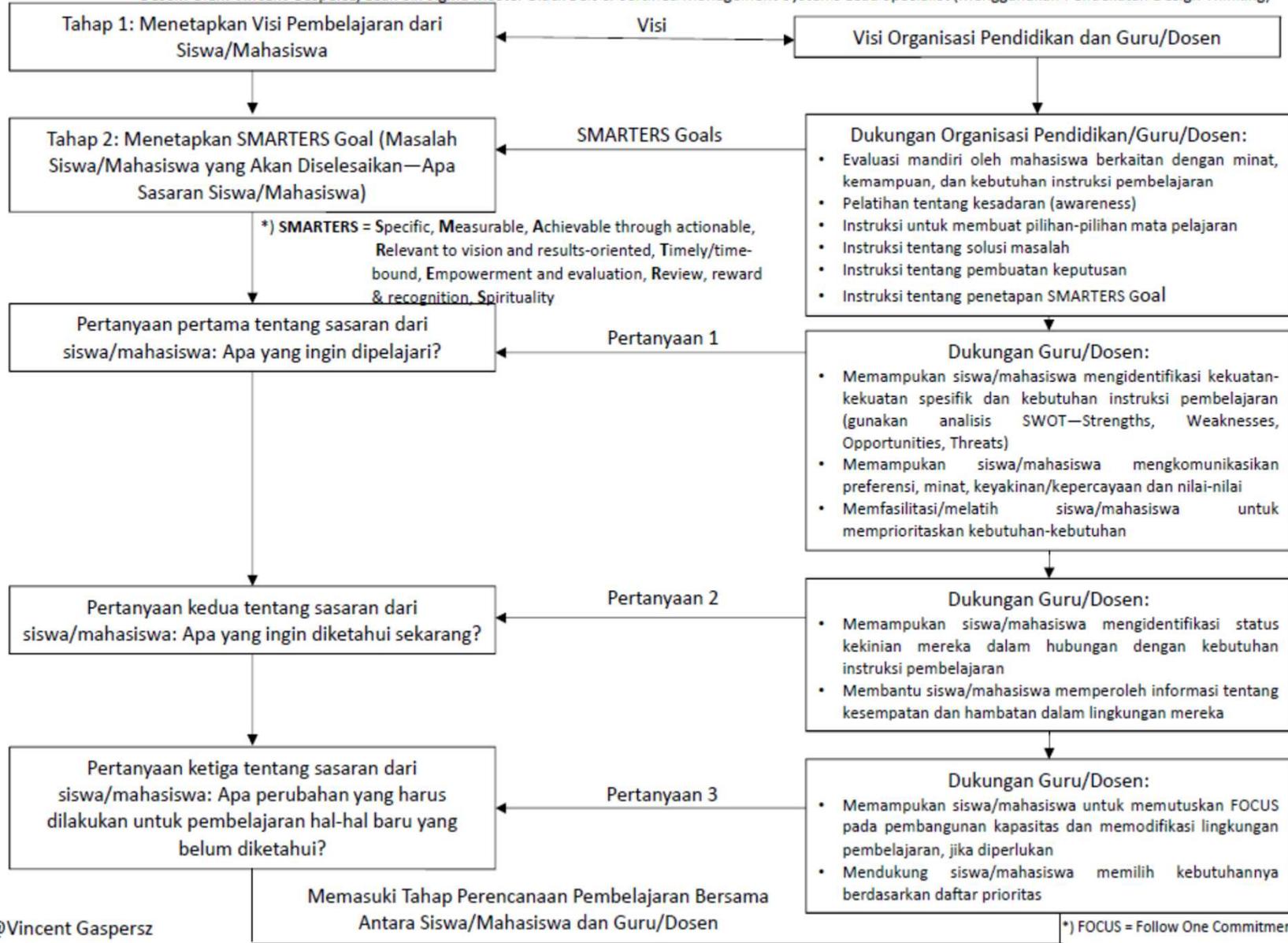
Membangun SUCCESS Sekolah/Kuliah Berbasis Pendekatan Sistem

Designed and Implemented Using Design Thinking for Education, by Vincent Gaspersz, Lean Six Sigma
Master Black Belt and Certified Management Systems Lead Specialist

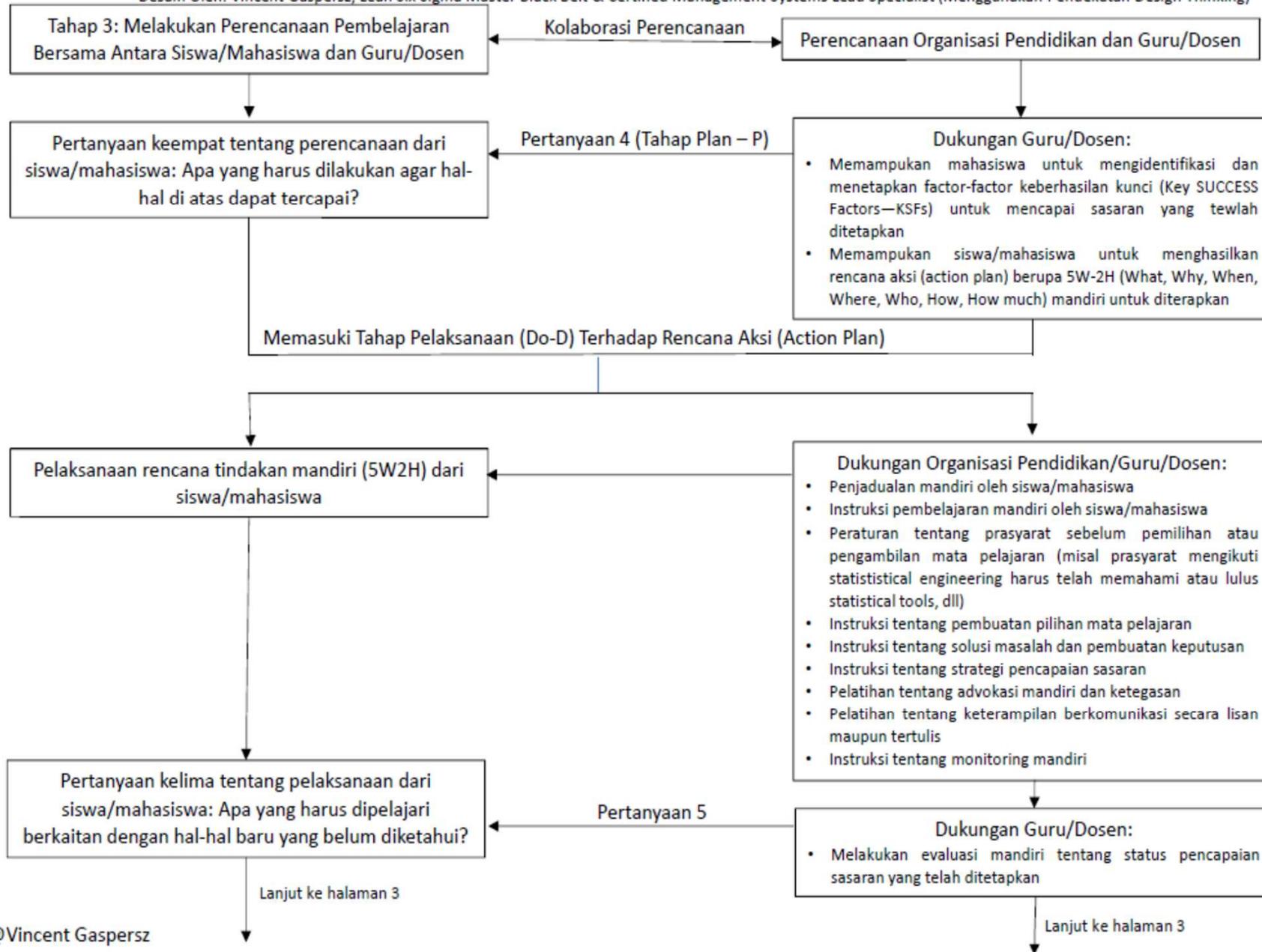


Catatan: Gambar Sepeda Tandem dan Vision diambil dari internet. Sedangkan penempatan tulisan berdasarkan desain asli Vincent Gaspersz untuk aplikasi metode pembelajaran determinasi mandiri dalam pendidikan 4.0. Design Thinking for Education 4.0 by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist.

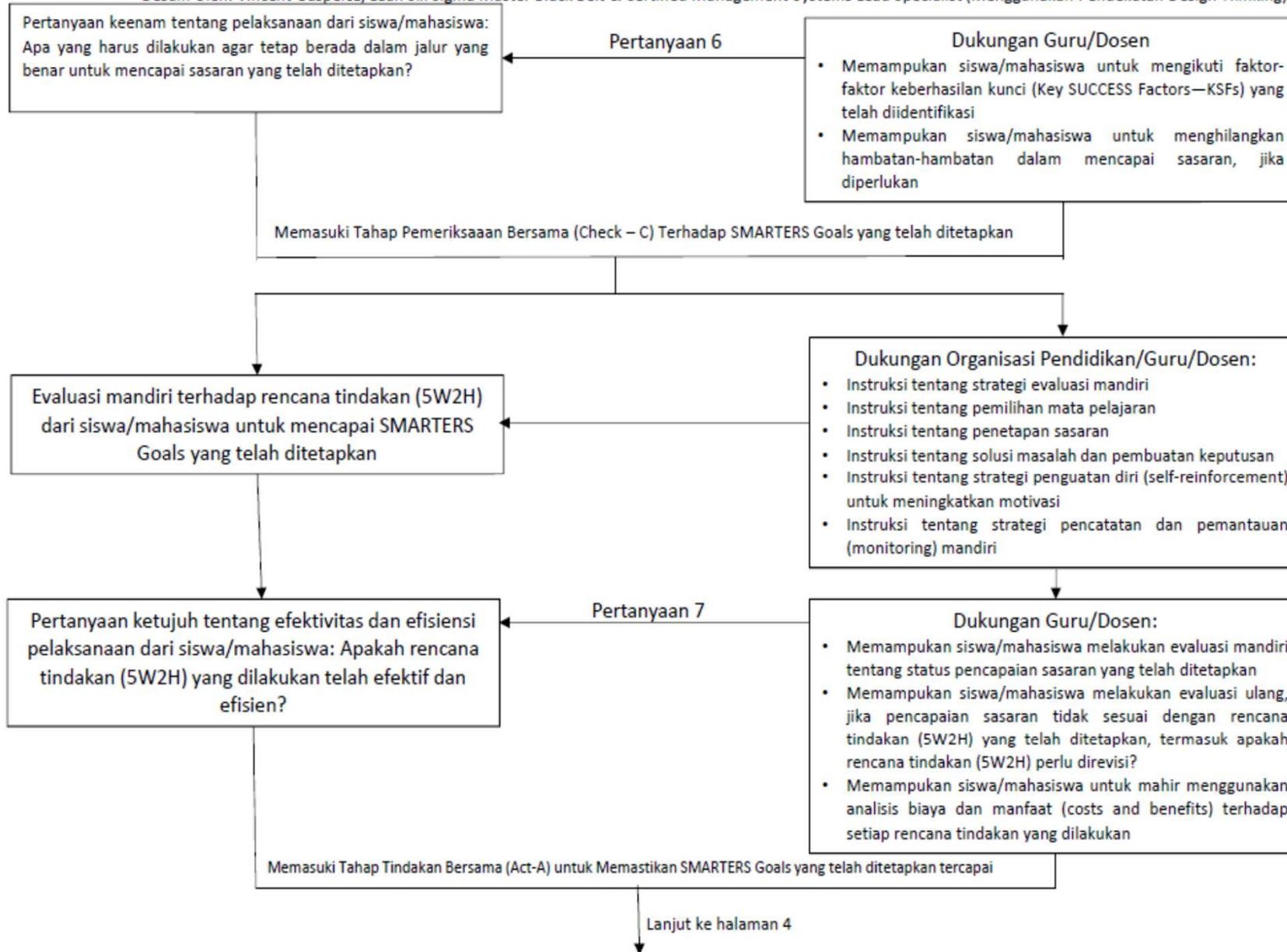
Desain Oleh: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist (Menggunakan Pendekatan Design Thinking)



Desain Oleh: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist (Menggunakan Pendekatan Design Thinking)



Desain Oleh: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist (Menggunakan Pendekatan Design Thinking)



Desain Oleh: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist (Menggunakan Pendekatan Design Thinking)

Pertanyaan kedelapan tentang tindakan dari siswa/mahasiswa: Apakah telah terjadi peningkatan pemahaman dari ilmu pengetahuan dan teknologi yang dipelajari sehingga mampu bekerja secara mandiri dalam profesi apapun untuk mencapai visi pembelajaran?

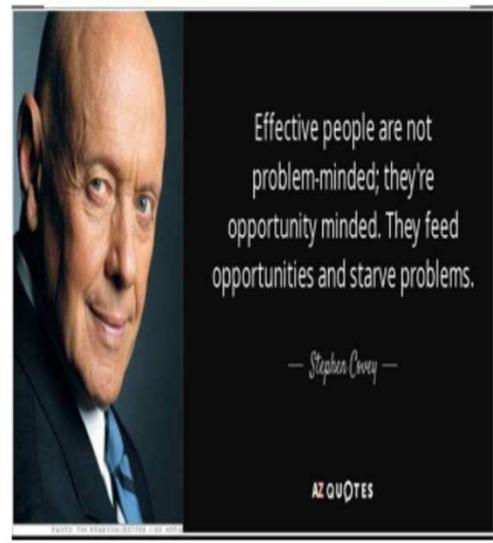
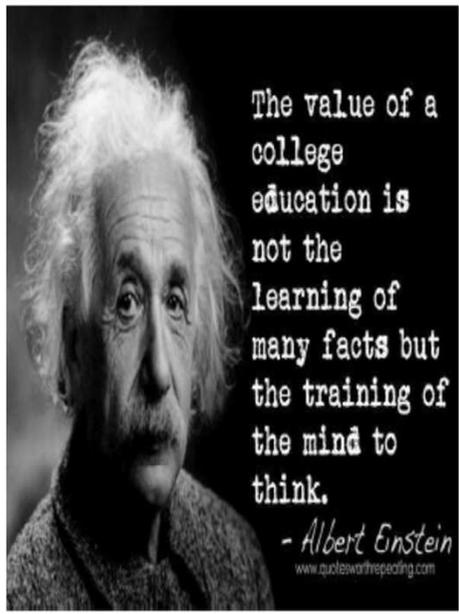
Pertanyaan 8

- Dukungan Guru/Dosen
- Memampukan siswa/mahasiswa untuk menentukan dan menjamin bahwa rencana tindakan mandiri (5W@H) telah mencapai SMARTERS Goals yang ditetapkan
 - Memampukan siswa/mahasiswa untuk melakukan manajemen perubahan diri untuk menjadi seorang professional mandiri yang mampu bekerjasama dalam TEAM (Together Everyone Achieves More) agar terjadi sinergitas dalam mencapai SMARTERS Goals

Reward and Recognition



Merayakan Keberhasilan Aplikasi Metode Pembelajaran Heutagogy dalam Education 4.0 untuk SUCCESS dalam Industry 4.0 (VUCA World)

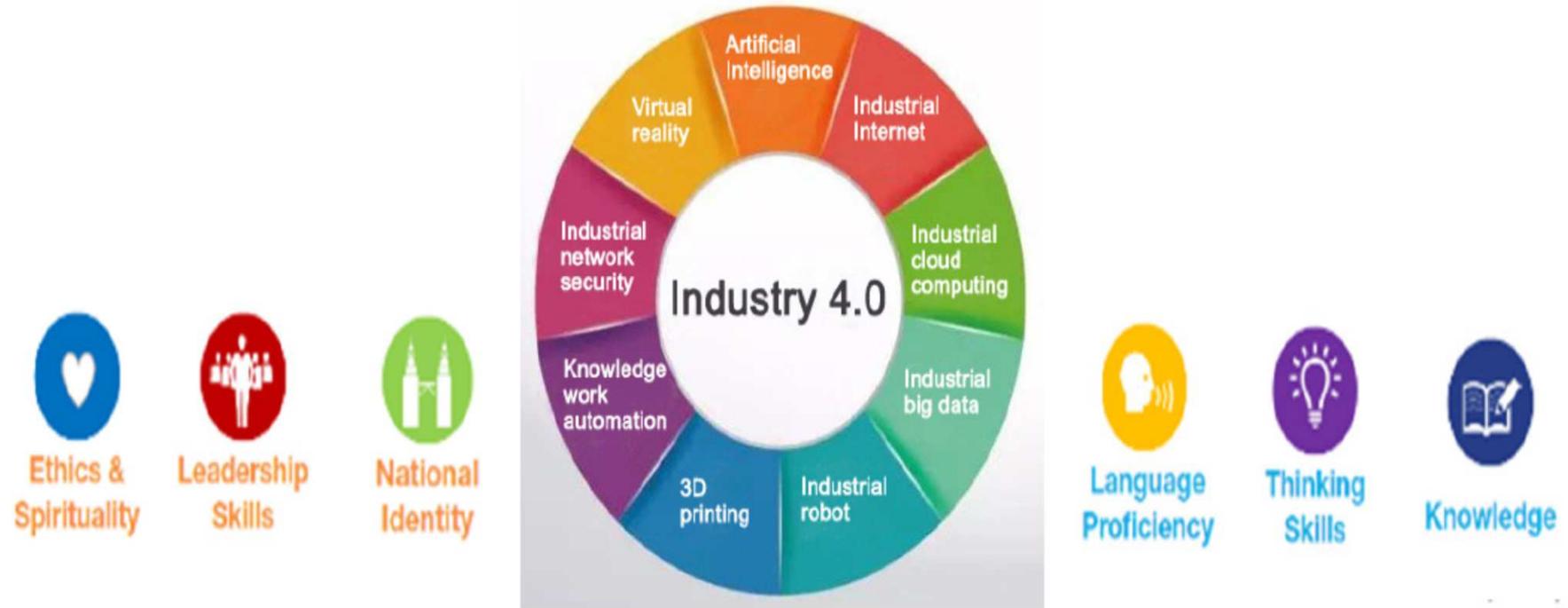


*) VUCA World = Volatility, Uncertainty, Complexity, Ambiguity
 **) VUCA Approach = Vision, Understanding, Clarity, Agility (Through Heutagogy Learning Method)

Proses Pengembangan Kurikulum Menggunakan Design Thinking

Berempati	Membentuk Ide-ide	Memilih Ide	Prototype	Coba & Renungkan
<ul style="list-style-type: none"> • Memahami kebutuhan mahasiswa • Meninjau-ulang kurikulum dan pembelajaran masa lalu • Mengumpulkan inspirasi 	<ul style="list-style-type: none"> • Memetakan pikiran (mind map) • Memperoleh sumber-sumber daya • Mengeksplorasi cara baru untuk mengajar • Menyempurnakan/menyaring ide-ide 	<ul style="list-style-type: none"> • Menerjemahkan <i>brainstorming</i> ke dalam tiga kategori utama: (1) Tujuan, (2) Pengukuran, dan (3) Instruksi • Berpikir luas yang diikuti secara terperinci (detail) 	<ul style="list-style-type: none"> • Menambahkan hal-hal terperinci—menciptakan unit instruksi dan aktivitas pembelajaran • Memperoleh umpan-balik dari kolega 	<ul style="list-style-type: none"> • Mengajarkan kepada mahasiswa • Meninjau-ulang dan merefleksikan pembelajaran • Melakukan perbaikan terus-menerus

Source: Kelby Zenor, Rubicon International, 2018. Cited and added continual improvement by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialists.



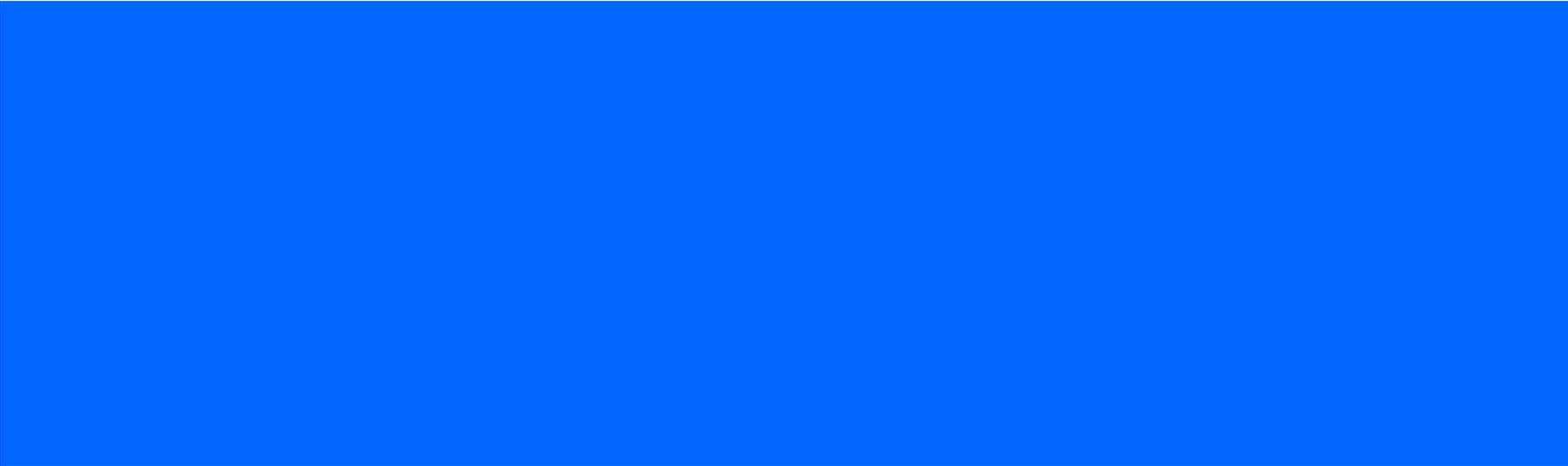
AKHLAK (Ethics and Morality)

ILMU (Knowledge and Skills)

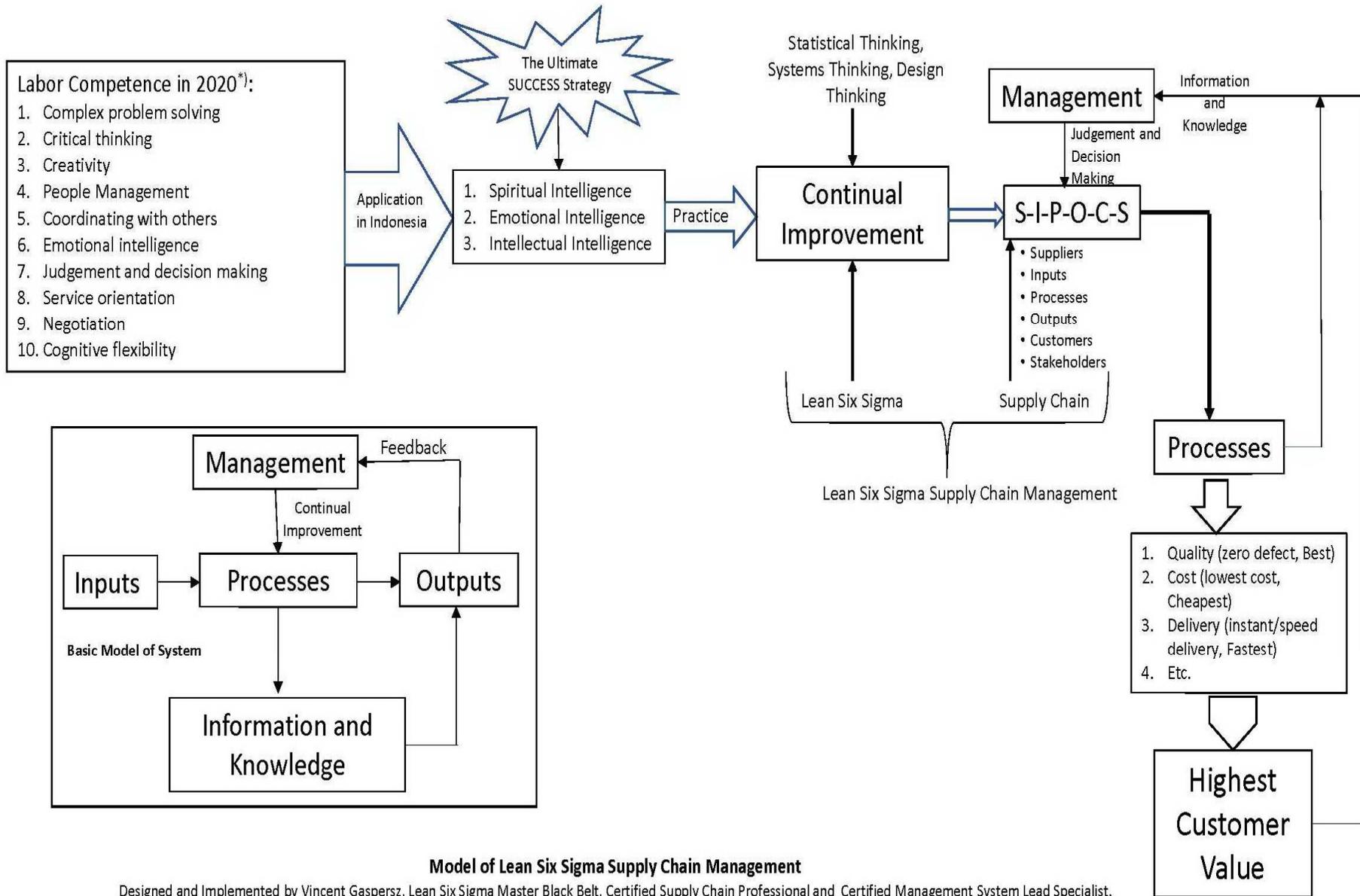
BALANCE

21st Century Curriculum for MyHE 4.0

Source: Datin Paduka Ir. Dr. Siti Hamisah Tapsir Director General Department of Higher Education Ministry of Higher Education 11 September 2017, Malaysia Higher Education 4.0. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist.



Ringkasan Implementasi

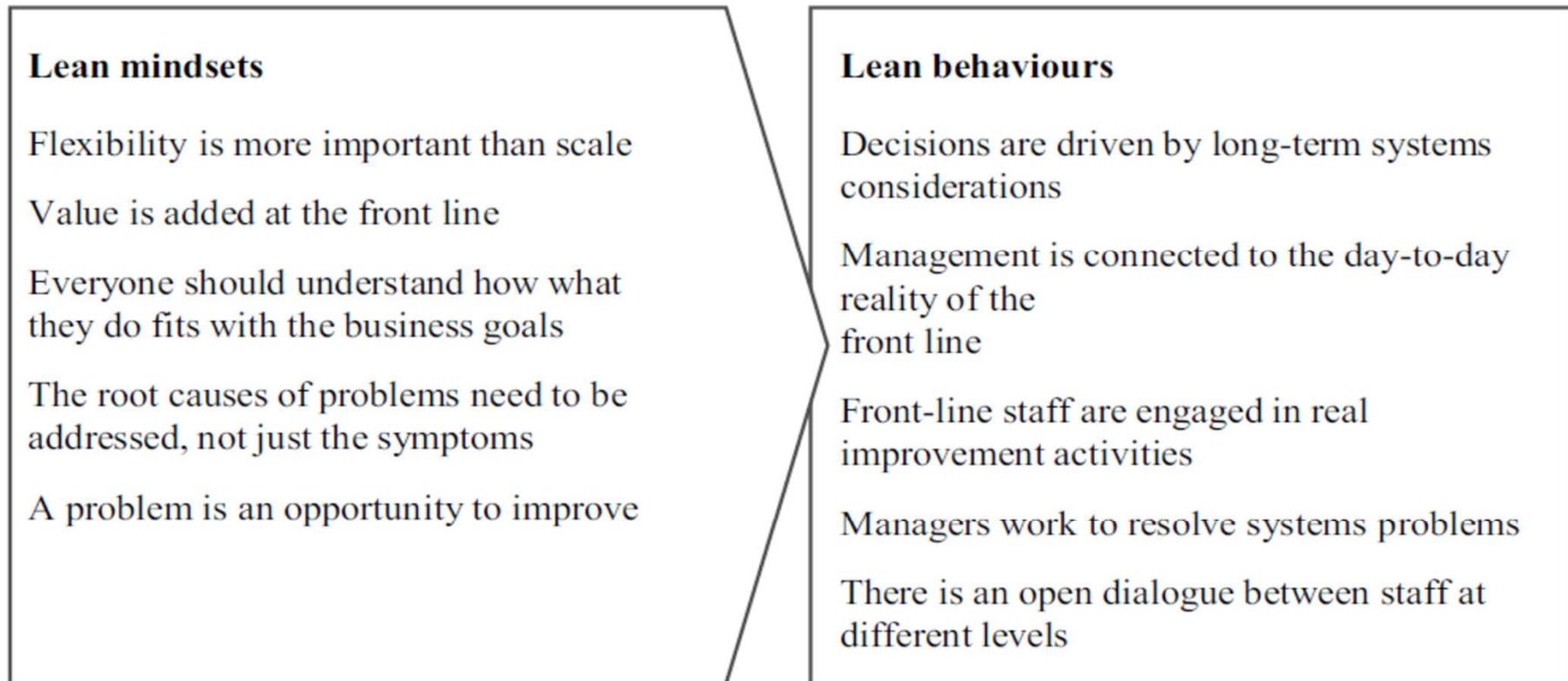


Model of Lean Six Sigma Supply Chain Management

Designed and Implemented by Vincent Gaspersz, Lean Six Sigma Master Black Belt, Certified Supply Chain Professional and Certified Management System Lead Specialist.

*) Labor Competence in 2020 based on the World Economic Forum, 2016 Report. The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution—Top 10 Skills Important in the Workforce

Lean Mindset (Pola Pikir Lean)	Lean Behaviours (Perilaku Lean)
<p>Fleksibilitas lebih penting daripada skala</p> <p>Nilai ditambahkan pada garis depan (front line)</p> <p>Setiap orang harus memahami tentang bagaimana sesuatu aktivitas yang dilakukan sesuai dengan sasaran bisnis</p> <p>Akar-akar penyebab masalah perlu diidentifikasi dan diselesaikan, bukan hanya gejala-gejala saja</p> <p>Suatu masalah adalah kesempatan untuk perbaikan/peningkatan</p>	<p>Keputusan dikendalikan oleh pertimbangan sistem jangka panjang</p> <p>Manajemen dikaitkan terhadap realitas dari garis depan setiap hari</p> <p>Staf garis depan (Front-line staff) terlibat dalam aktivitas perbaikan atau peningkatan secara nyata (real improvement)</p> <p>Manajer-manajer bekerja untuk menyelesaikan masalah-masalah sistem</p> <p>Terdapat dialog terbuka antara staf (karyawan) berbagai level</p>



Lean mindsets and behaviors (Drew et al. 2004, p. 69)

Source: Drew, et al. 2004 in Hammer, Markus. 2019. Management Approach for Resource-Productive Operations: Design of a Time-Based and Analytics-Supported Methodology Grounded in Six Sigma. Springer Gambler, Austria. Cited by Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist

The Ultimate SUCCESS Strategy of SUCCESS Management System

By: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management Systems Lead Specialist

7 Elements of the Ultimate SUCCESS Strategy (VG Approach)	3 Types of Intelligence	PDCA for SUCCESS (VG Approach)				
		Plan (P)		Do (D)	Check (C)	Act (A)
		A. SMARTERS Goals	B. Key SUCCESS Factors	C. Standardization	D. Implementing 5W2H or To Do List	E. KPIs & KBIs Evaluation
1. Spirituality	Spiritual	<p style="text-align: center;">Management Systems (All Management Systems):</p> <p style="text-align: center;">Lean Six Sigma Supply Chain, ISO (World Class Management), Malcolm Baldrige Criteria for Performance Excellence (MBCfPE), Total Productive Management, etc Industrial, Business, Manufacturing, Service, Education, Learning, Banking, Health Care, Government, Agricultural Farming, etc Organization, Team, Family, Individual, etc</p>				
2. Mentality	Emotional					
3. Vision	Intellectual					
4. Opportunity						
5. Multi Objectives						
6. Acceleration						
7. Reward & Recognition						

Note: SMARTERS = Specific, Measurable, Achievable through action, Result-oriented, Time-bound/timely, Empowerment/Evaluation, Reward&Recognition/Review, Spirituality. 5W2H = What, Why, When, Where, Who, How and How Much.

KPIs = Key Performance Indicators. KBIs = Key Behavior Indicators.

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Education Performance Excellence (EdPEX)



- Eksploitasi iptek (ilmu pengetahuan dan teknologi)
- Kesejahteraan masyarakat

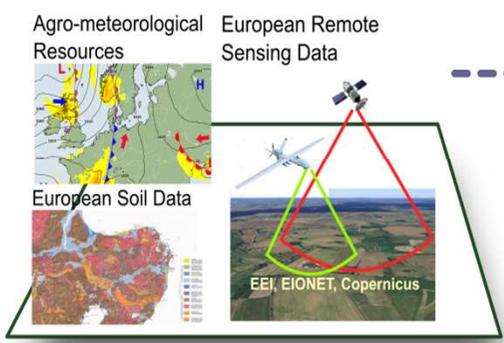


Model Kewirausahaan Universitas Standford, USA

Sumber: Laurs, Ilja. 2017., Nextury Ventures: Entrepreneurship and Innovation in European Union. Dikutip oleh: Vincent Gaspersz, Lean Six Sigma Master Black Belt & Certified Management System Lead Specialist.

CLAFIS Integration Platform

Data Sources



External Cyber Geospatial Resources

Process Automation Middleware (OPC UA, Modbus, etc.)

CLAFIS IoT-M2M Integration Platform

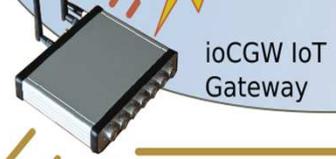
Information Processing & Knowledge Management (IPKM) Module

Data Analytics and Visualisation Modules

External Systems

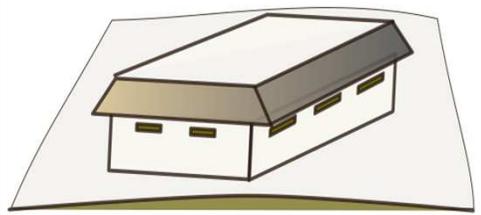
FMIS, ERP, other

HMI & GUI Platforms



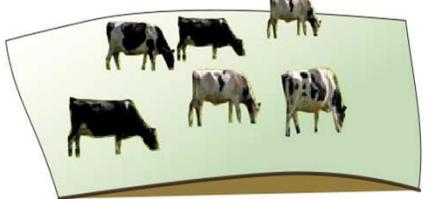
ioCGW IoT Gateway

Automation and Monitoring



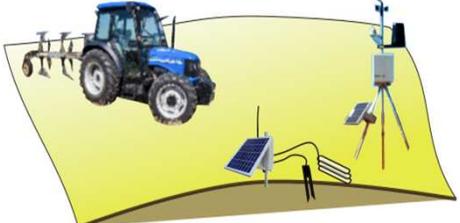
Farms & Stables

Animal Sensors



LIVESTOCK

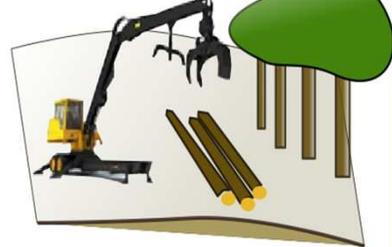
Machinery Equipment



CROP

Field Sensors Weather/ Soil, etc.

Forestry Machinery



FORESTRY

CLAFIS = Crop, Livestock and Forests Integrated System (for Intelligent Automation)

