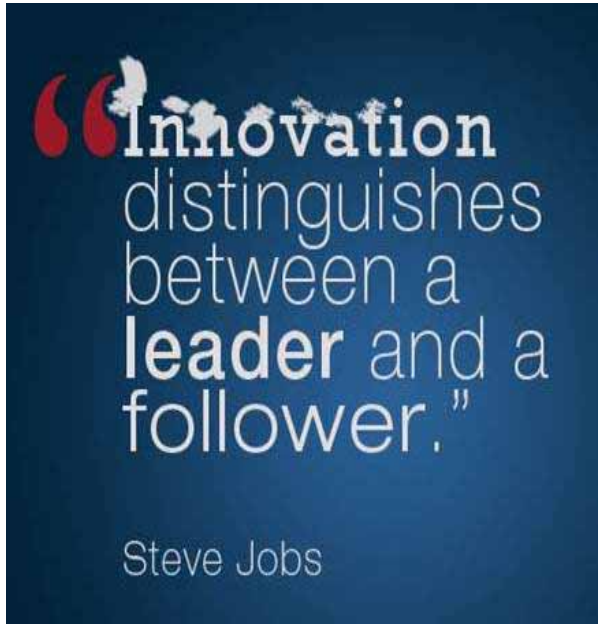
Quality and Innovation:
- Partner or Substitute ?
- QMS vs Innovation ?

Kwai-Sang Chin

PhD, AMIAQ, FASQ, FHKSQ, CEng, RPE

City University of Hong Kong

Innovation: A Global Trend



Innovation: A Global Trend

- Many people consider innovation is different from quality, ahead of quality – **“Today is Quality but Tomorrow is Innovation”**
- People argue that QMS even hinders the creativity for innovation.

What is Innovation ?

- Something new!
- If the idea seems new and different to the individual, it is an innovation
  - Roger and Shoemaker (1997) Communication of innovation, Free press, NY.
- Innovation is the constant search for a fresh or novel approach to every aspect of running the business, whether that is new or existing products; new techniques or new materials; new strategies or **new way of working**.
  - Keither Oates, Former deputy Chairman, M&S

Types of Innovation

- Technical Innovation
  Application Innovation
  Incremental Innovation
  Radical Innovation
  Open Innovation

  ……

Types of Innovation

- Organizational innovation
- Management innovation
- Product innovation
- Process innovation
- Production innovation
- Marketing innovation
- Service innovation ……

Interesting items from Quality perspective

- Relationship between quality and innovation ? Quality be replaced by or partnered with Innovation?
- Could Quality Management System benefit implementation of Innovation?

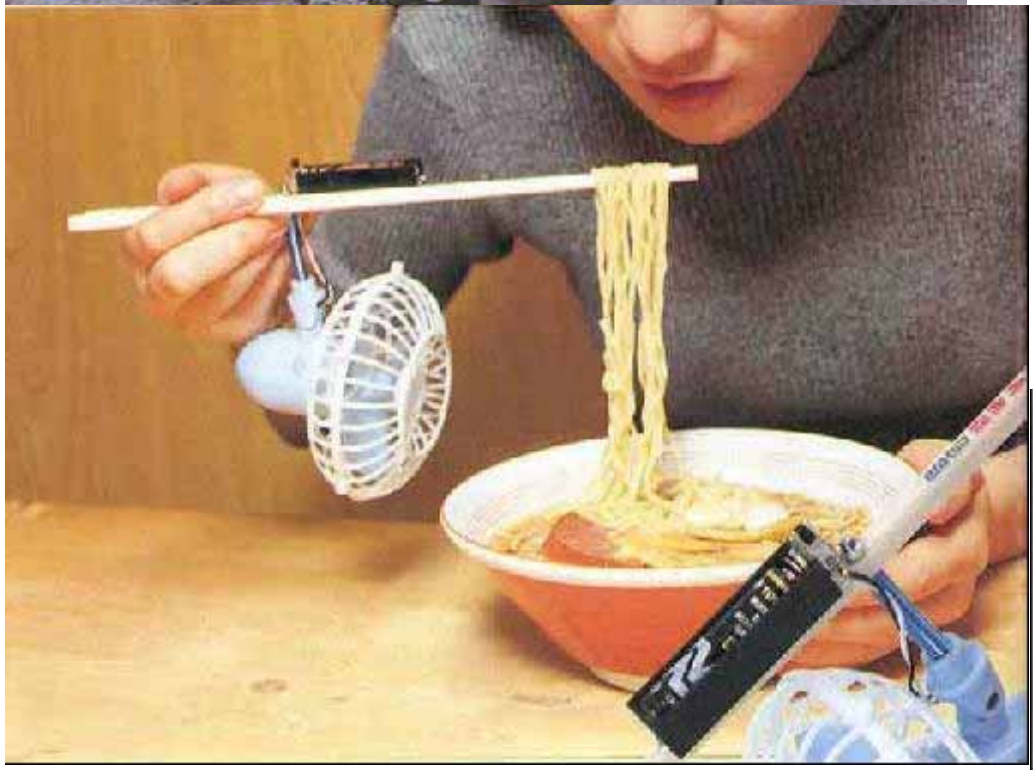
Innovation

- Innovation could be defined as a change that translates an original and new idea into goods, services or practice for added value and increased profit to the organization.

Innovation:

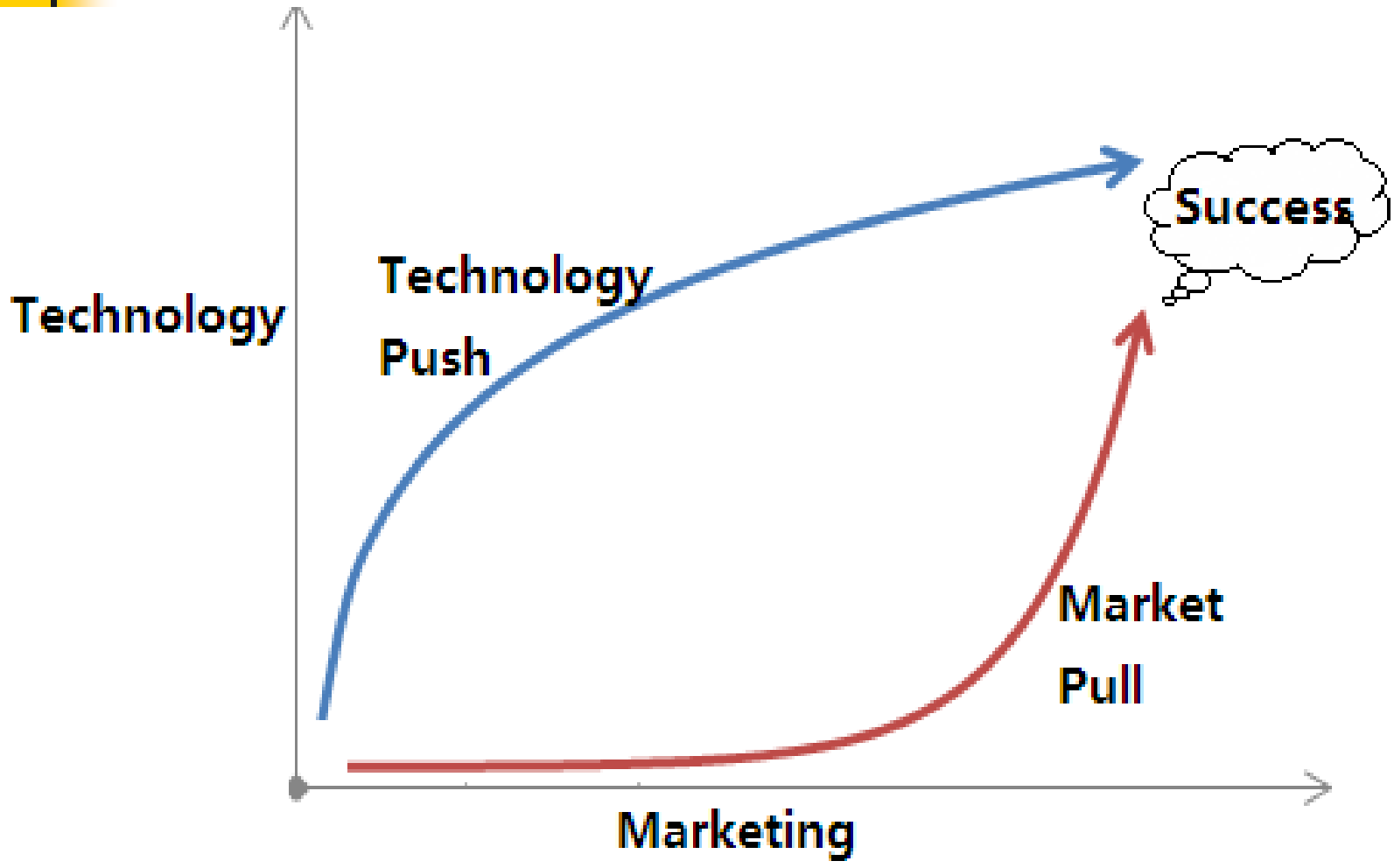
Success rate : 2% or less .....

High risk of loss ! Gambling?

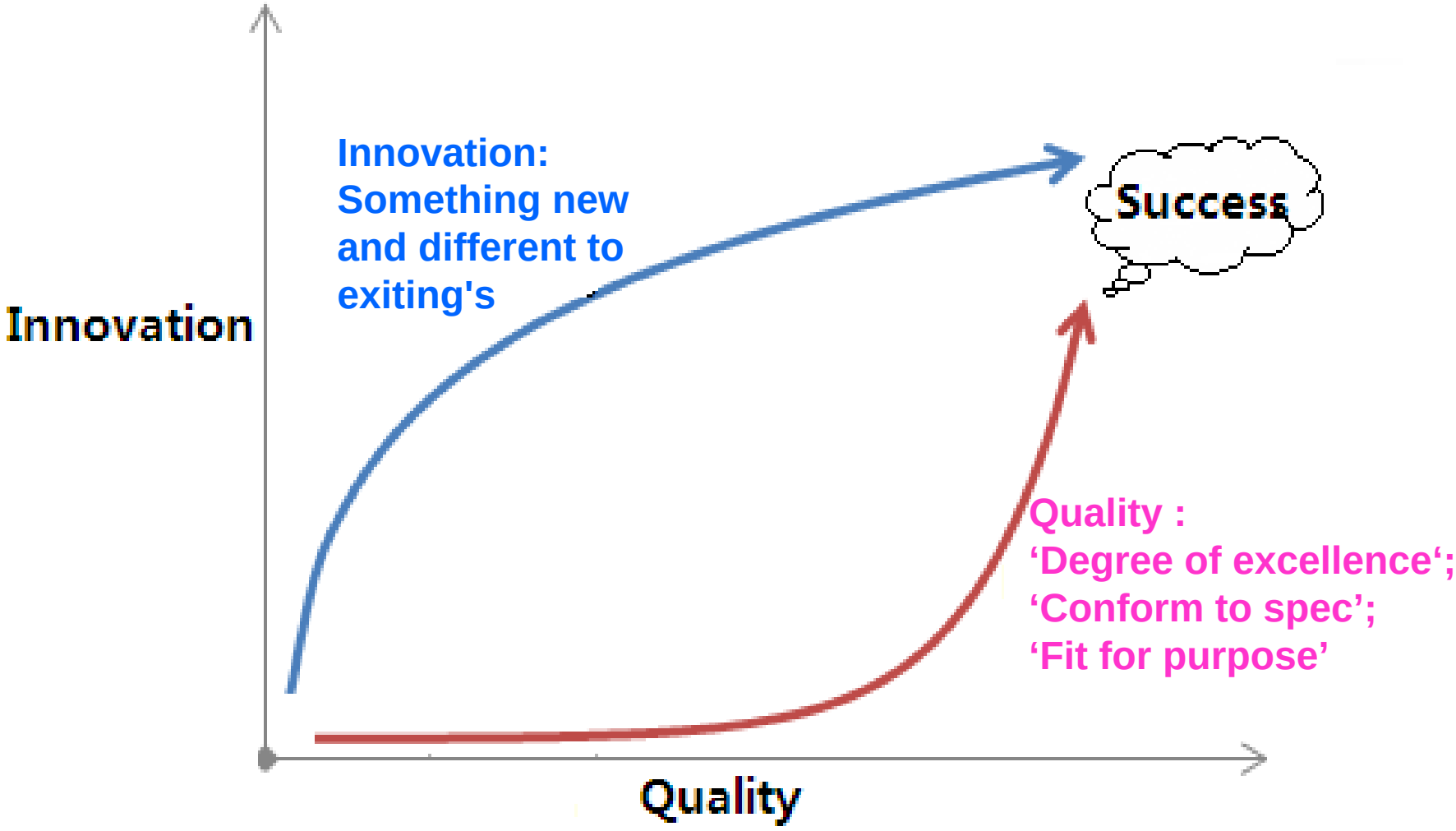



23

Quality and Innovation



Quality and Innovation

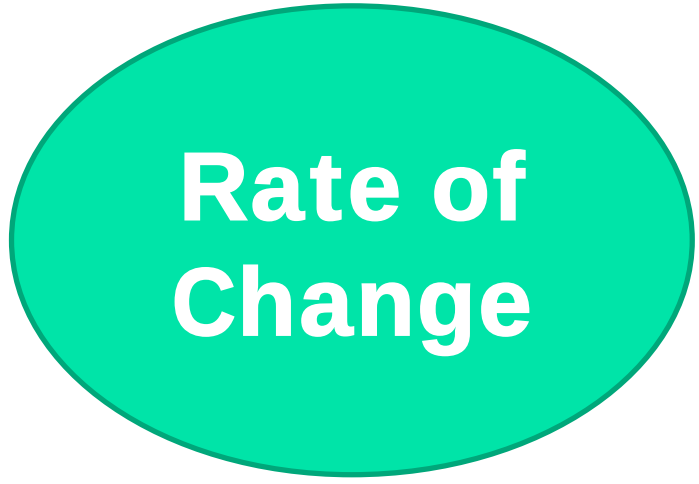


Quality partnered with Innovation ?

- Successful innovative products or services must meet the quality attributes, namely, meeting customer needs, conforming product standards, fulfilling safety and reliability requirements, etc.
- Quality is the basis of innovation and also guides for technological innovation decisions.
- **Partnering relationship does exist between quality and innovation.**

Quality partnered with Innovation

- Innovation: a change process to make new things actually happen and accepted by people,
- Contemporary quality management embraces the “change” and “breakthrough” in its continuous improvement process.



How to achieve Innovation ?

QMS benefits Innovation ?

An Argument :

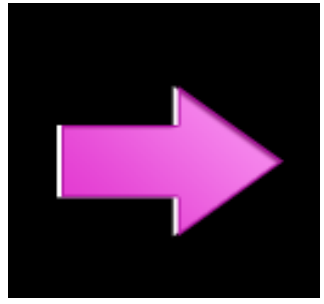
Quality Management System

vs

Innovation

QMS vs Innovation

- Innovation lies in the use of new knowledge to create new products and services. The discovery of new knowledge requires **a successful organization of efforts**, **an effective process** and **a perfect management system.**



QMS vs Innovation

Case 1 : Organizational Innovation Management Model in HK/China

- Lack of comprehensive reference model for organization innovation management (OIM)
- Demand for self-assessment/continuous improvement in OIM
- Deficiencies in Organization Innovation Management
  - Unaware and lack of understanding of critical factors of OIM
  - Lack of reference (like ISO9000, MBNQA for quality management) to assess and implement OIM
  - Difficult to self-assess and identify the OIM improvement areas

Beijing &Bohai

Shanghai & YRD

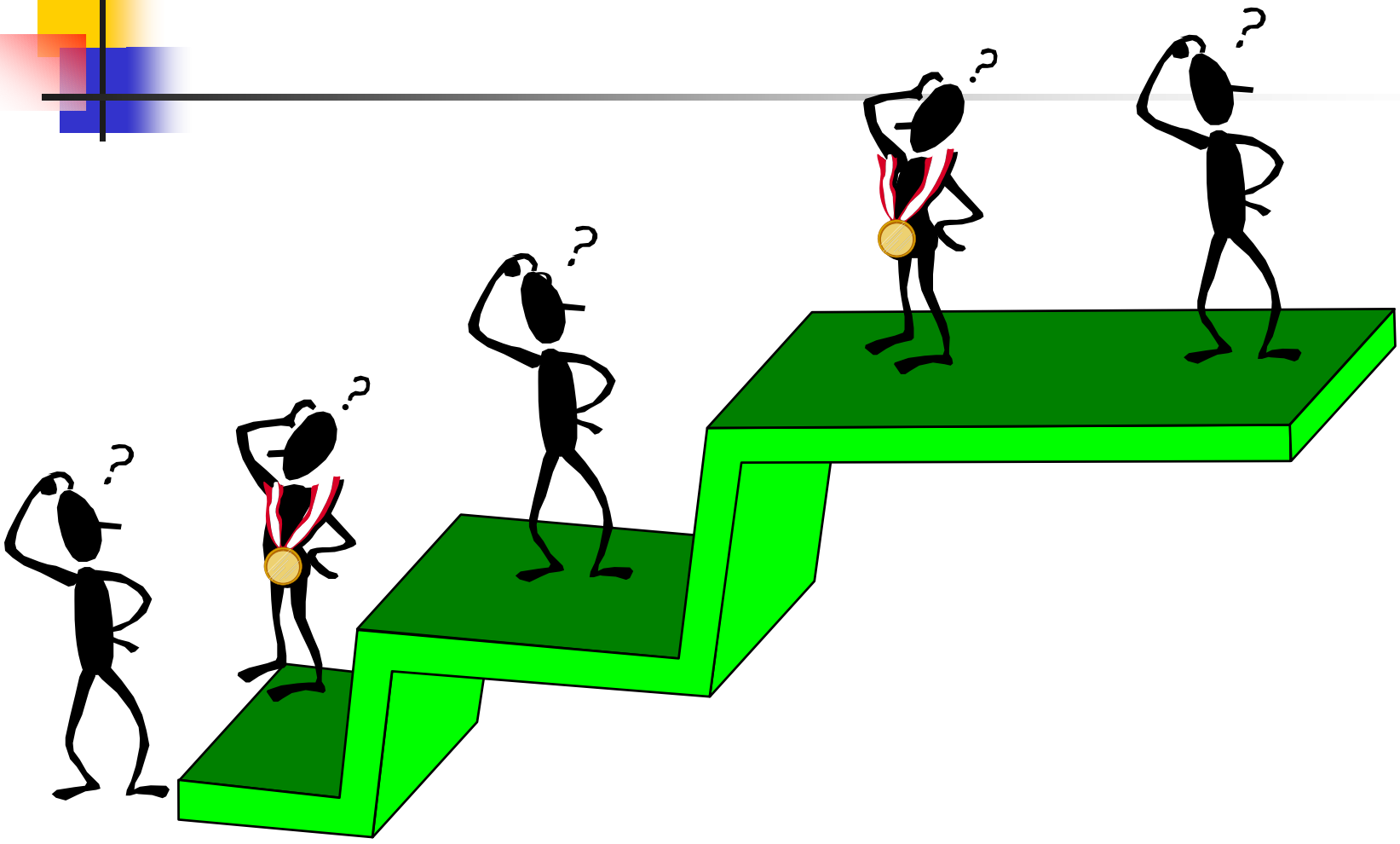
Hong Kong & PRD

Importance of Innovation in China

FROM "Made in China"

TO "Created in China"

How to achieve Innovation ?

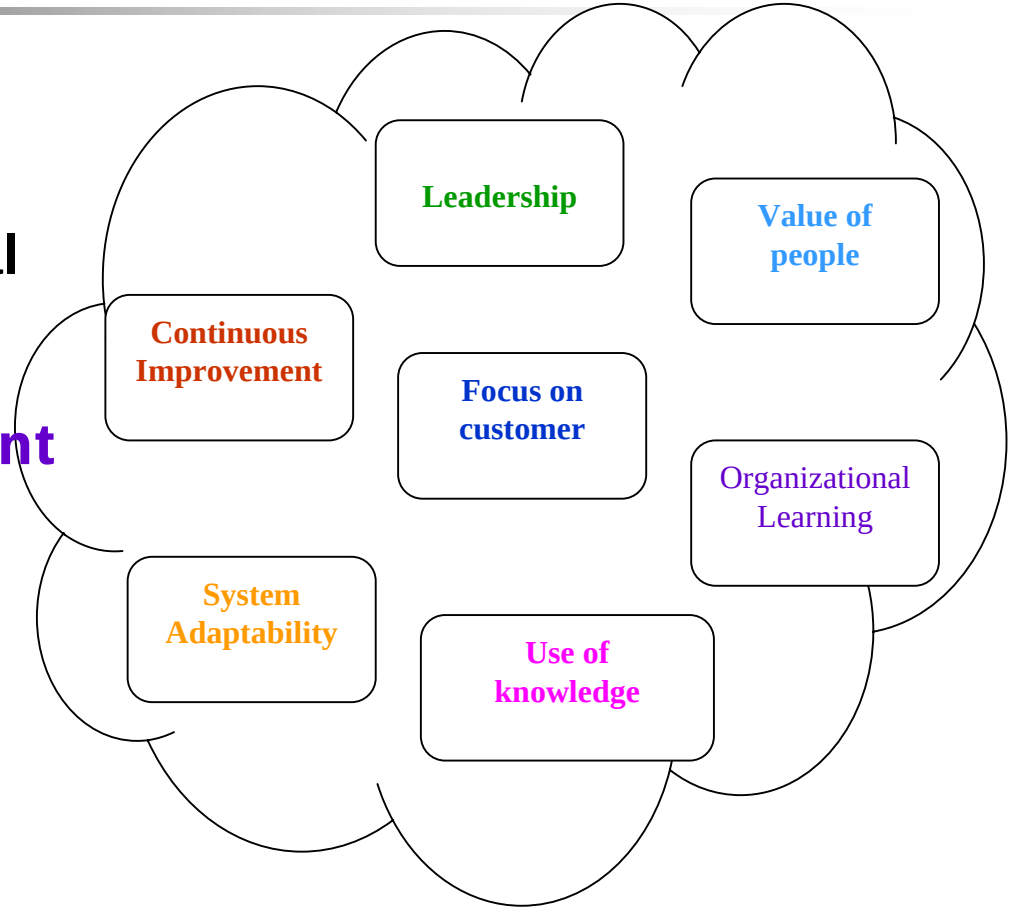


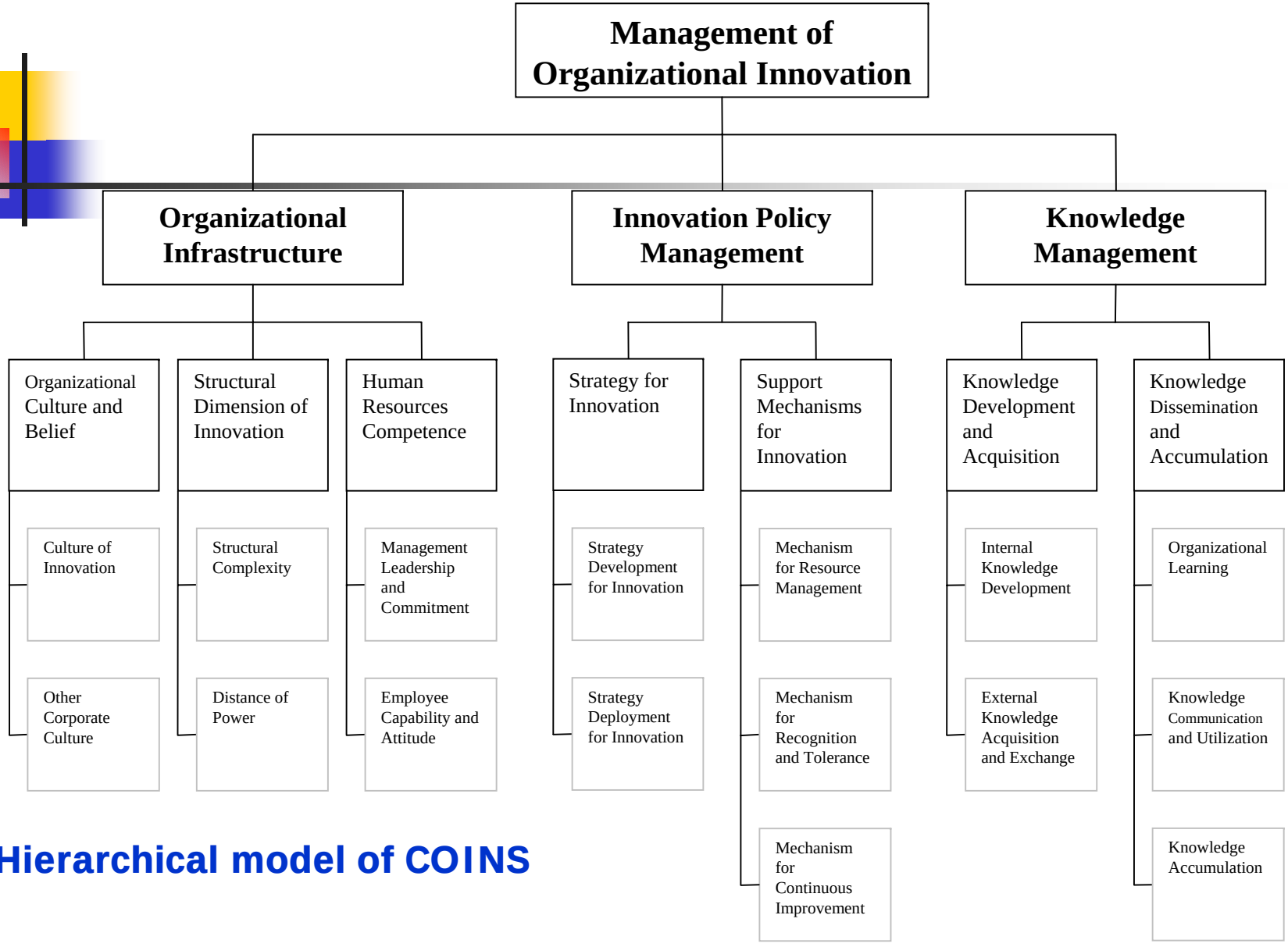
COINS: Innovation Management Model

Core values

- **the basic philosophy for successful organizational innovation management**

- **Continuous Improvement**
- **System adaptability**
- **Leadership**
- **Value of people**
- **Focus on customer**
- **Organizational learning**
- **Use of knowledge**





Hierarchical model of COINS

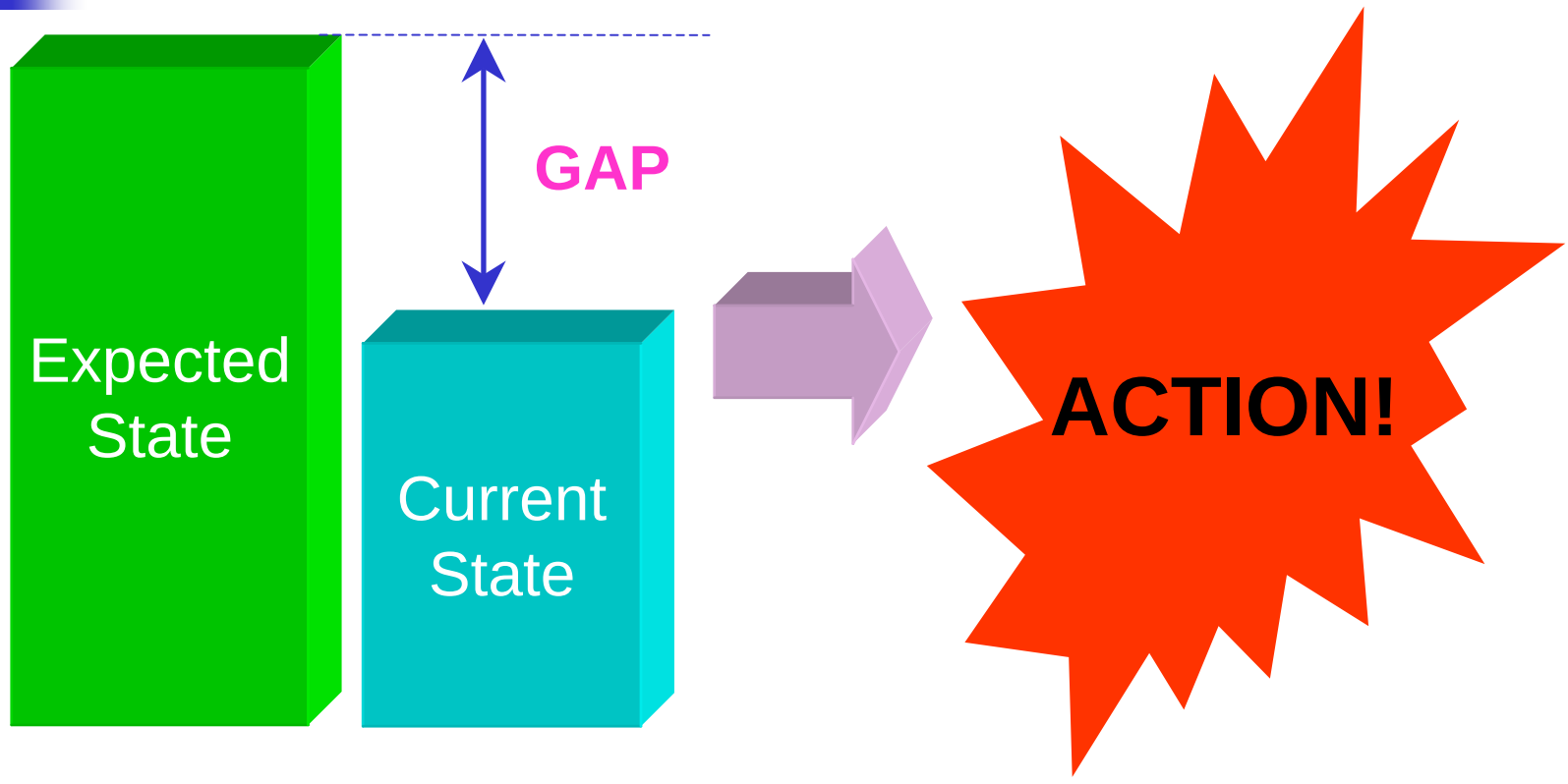
Assessment of IM performance

Framework of organizational innovation				Point values		
1	Organizational infrastructure					**400**
	1.1	Organizational culture and belief			130	
		1.1.1	Culture of innovation	100		
		1.1.2	Other corporate culture	30		
	1.2	Structural dimension of innovation			40	
		1.2.1	Structural complexity	10		
		1.2.2	Distance of power	30		
	1.3	Human resources competence			230	
		1.3.1	Management leadership and commitment	190		
		1.3.2	Employee capability and attitude	40		
2	Innovation policy management					**360**
	2.1	Strategy for innovation			180	
		2.1.1	Strategy development for innovation	50		
		2.1.2	Strategy deployment for innovation	130		
	2.2	Supporting mechanism for innovation			180	
		2.2.1	Mechanism for resource management	50		
		2.2.2	Mechanism for recognition and tolerance	70		
		2.2.3	Mechanism for continuous improvement	60		
3	Knowledge management					**240**
	3.1	Knowledge development and acquisition			160	
		3.1.1	Internal knowledge development	30		
		3.1.2	External knowledge acquisition and exchange	130		
	3.2	Knowledge dissemination and accumulation			80	
		3.2.1	Organizational learning	10		
		3.2.2	Knowledge communication and utilization	20		
		3.2.3	Knowledge accumulation	50		
Total points						**1000**

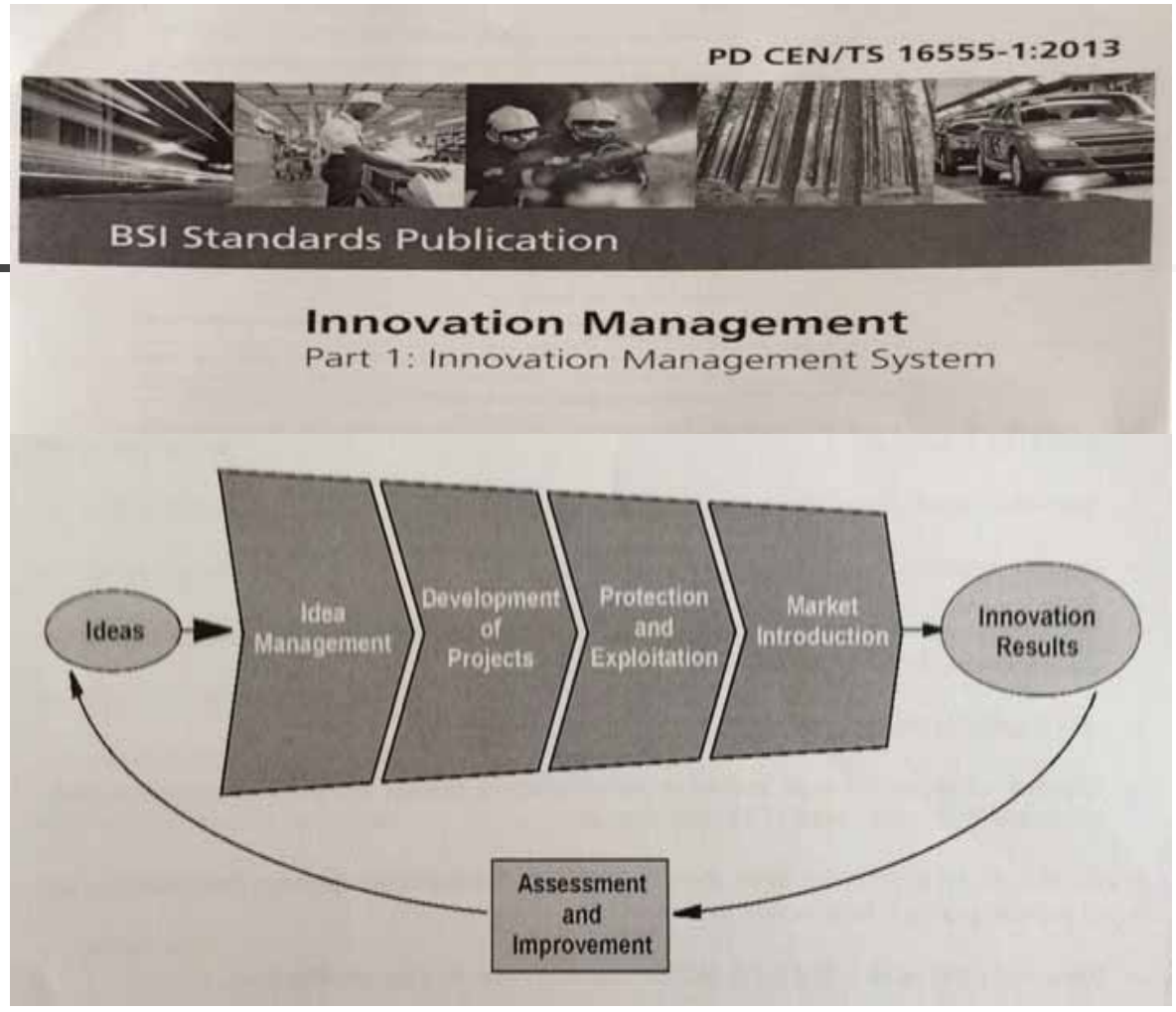
Status of Innovation Management

Status	Results
Unaware	Organizations have no or poor concepts, practices of management of organizational innovation and actual performances of organizational innovation. Substantial effort for building up the awareness and commitment towards management of organizational innovation is needed to be carried out.
Beginner	Organizations aware the general concepts of management of organizational innovation. Practices of management of organizational innovation and actual performances of organizational innovation are in an initiate level. Extra effort for further understanding of the concepts and its' conversion to the practices and actual performances are needed to be carried out.
Average	Organizations understand the concepts of management of organizational innovation. Practices of management of organizational innovation and actual performances of organizational innovation are in an intermediate level. Major improvement areas exist for enhancing the practices and actual performances.
Improver	Organizations comprehend the concepts of management of organizational innovation. Practices of management of organizational innovation and actual performances of organizational innovation are in a good level. Improvement areas still exist for enhancing the practices and actual performances.
Innovator	Organizations master the concepts of management of organizational innovation. Practices of management of organizational innovation and actual performances of organizational innovation are in an excellence level. Continuous improvement and revision of company's situation is needed in order to maintain and go beyond the current status quo.

IM assessment and continuous innovation development



COINS :
An Innovation Management model



BS16555:2013 Innovation Management System, launched in 2014

Clauses of ISO 9001:2015 (DIS)	Clauses of CEN/TS 16555-1:2013(E)
1. Scope	**1. Scope**
2. Normative references	**2. Normative references**
3. Terms and definition	**3. Terms and definition**
4. Context of organization -Understanding the organization and its context -Needs and expectations of interested parties -Determining the scope -Management System	**4. Context of organization** -Understanding the organization and its context -Needs and expectations of interested parties -Determining the scope -Management System
5. Leadership -Leadership and commitment -Policy -Roles, responsibility and authority	**5. Leadership for Innovation** -Inno Vision & Strategy Development -Leadership and commitment -Innovation culture -Roles, responsibility and authority
6. Planning -Actions to address risks & opportunities -Objectives and plans to achieve them	**6. Planning for Innovation** -Actions to address risks & opportunities -Objectives and plans to achieve them
7. Support -Resources - Awareness -Competence - Communication -Documented information	**7. Innovation Enablers/Driving Factors** -Resources - Awareness - Documented Info -Competence - Communication -Strategic human resources -IP & knowledge management - Collaboration
8. Operations - Operation planning and control	**8. Innovation Management Process** - Development Inno Projects and Assessing the result
9. Performance Evaluation -Monitoring, measurement, analysis & evaluation -Internal audit -Management review	**9. Performance Assessment of the InnoMS** -Monitoring, measurement, analysis & evaluation -Internal audit -Management review
10. Improvement -Non-conformity and corrective action -Continual Improvement	**10. Improvement of the InnoMS** -Identify deviations and establish corrective action -Continual Improvement
	11. Innovation Management Techniques -Management of strategic intelligence, Inno thinking, IP, Collaboration and Creativity.

Case 2: Integration of Quality and Innovation Management System

A Case Study: Technology Support Centre of Hong Kong Science and Technology Park

HKSTP - Technology Support Centre

Electronics

- IC Design Centre
- IP Servicing Centre
- Probe & Test Development Centre
- IC Failure Analysis Lab
- Reliability Lab
- 3D SiP Lab

IT/Telecom

- Wireless Communications Test Lab
- LTE Joint Test Lab

Precision Engineering

- Materials Analysis Lab
- Rapid Prototyping Lab (To be opened in Phase 3)

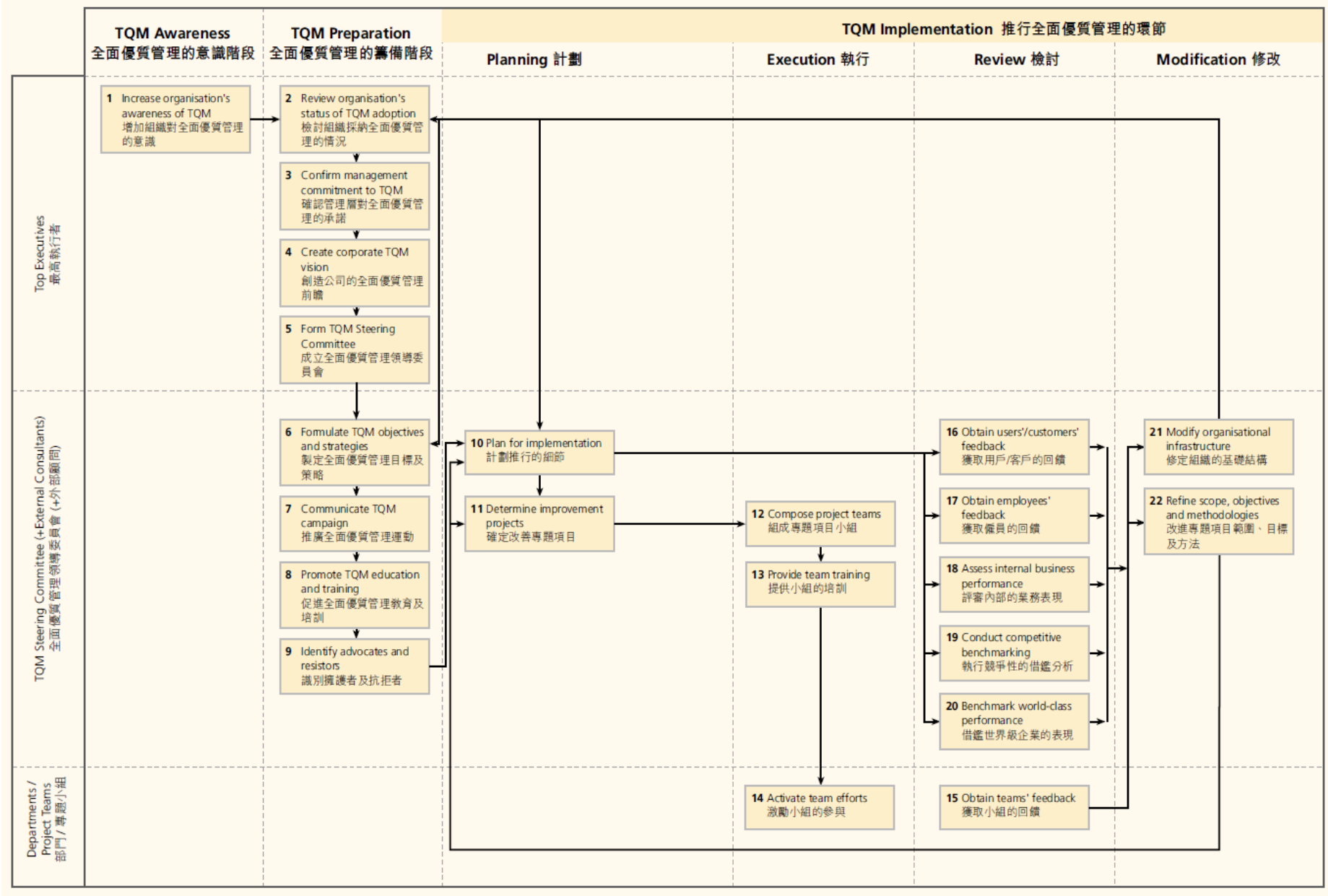
Biotech

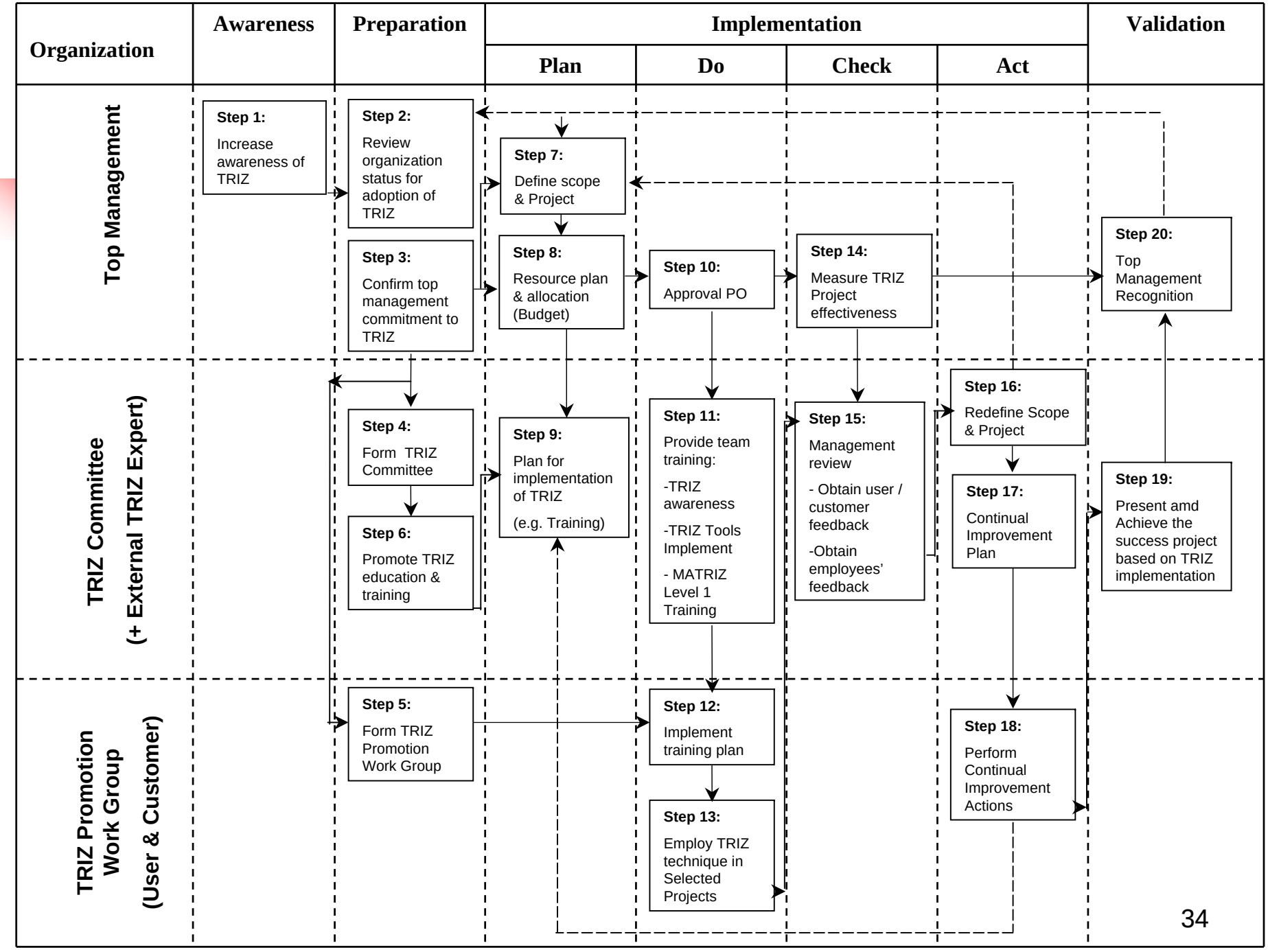
- Biotech Support Centre

Green Tech

- Solar Energy Technical Support Centre
- Solid State Lighting Lab

22-Step TQM Implementation guideline – KS Chin




Organization
Awareness
Preparation
Implementation
Plan
Do
Check
Act
Validation
Top Management
TRIZ Committee (+ External TRIZ Expert)
TRIZ Promotion Work Group (User & Customer)
Step 1: Increase awareness of TRIZ
Step 2: Review organization status for adoption of TRIZ
Step 3: Confirm top management commitment to TRIZ
Step 4: Form TRIZ Committee
Step 5: Form TRIZ Promotion Work Group
Step 6: Promote TRIZ education & training
Step 7: Define scope & Project
Step 8: Resource plan & allocation (Budget)
Step 9: Plan for implementation of TRIZ (e.g. Training)
Step 10: Approval PO
Step 11: Provide team training: -TRIZ awareness -TRIZ Tools Implement - MATRIZ Level 1 Training
Step 12: Implement training plan
Step 13: Employ TRIZ technique in Selected Projects
Step 14: Measure TRIZ Project effectiveness
Step 15: Management review - Obtain user / customer feedback -Obtain employees' feedback
Step 16: Redefine Scope & Project
Step 17: Continual Improvement Plan
Step 18: Perform Continual Improvement Actions
Step 19: Present amd Achieve the success project based on TRIZ implementation
Step 20: Top Management Recognition

Improvement Summary - Dr. Lotto Lai

Items	Original Metal Tray (Parameters)	New Metal Tray (Parameters)
Dimension of original holder and new holder (Length, Width and Height)	15cm*18.5cm*0.5cm	5cm*7cm*0.25cm
Weight of original holder and new holder	390g	52g
Number of sample held	270pcs	150pcs
How much of total sample could be handled per time in the oven?	270pcs*2 tray(per basket)*2 basket(per oven)= **1080pcs**(of samples)	150pcs*12 tray(per basket)*2 basket(per oven)= **3600pcs**(of samples)

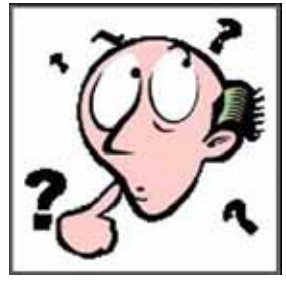
Improvement Summary - Dr. Lotto Lai

- Innovation and Quality could integrate into one System
- A 20-steps Implementation Framework for Organizational Innovation is proposed.
- Top Management Support, Adequate Training and Knowledge, as well as Resources are well recognized as key sources of Innovation project success.

Conclusion – Quality and Innovation

- Quality is partnered with Innovation for **SUCCESS**
- Quality Management System could benefit for implementing Innovation: **Organization-wide implementation and sustainability**

+



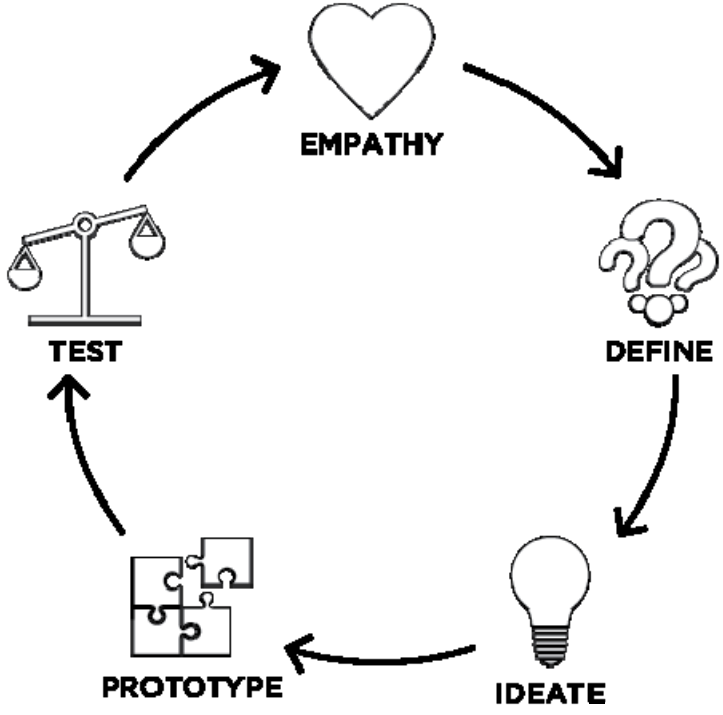
Intellect

=

The End

Q & A

Quality is partnered with Innovation



igniting innovation