

## BUSINESS TRIZ ONLINE WINTER 2021

## **CONSTRUCTING AN ECOSYSTEM FOR A SUSTAINABLE INNOVATION CULTURE USING TRIZ TOOLS**

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*Rohaya Mohd Nor* Director UNIMAS Leadership Centre

Rohaya is an associate professor at the Faculty of Economics and Business, UNIMAS. Currently, she holds the position of Director of **UNIMAS Leadership Centre. Rohaya** BSc Degree obtained her in Management with MIS, from Purdue University, US. She holds a Master of Information System from Melbourne University, Australia and a PhD degree, specializing in MIS, from UK. Imperial College London, Rohaya is also a certified TRIZ Level 2 practitioner.



Prof Dr Narayanan Kulathuramaiyer Director UNIMAS Institute of Social Informatics and Technological Innovation

Narayanan is currently the Director of the Institute of Social Informatics and Technological Innovations (ISITI), Universiti Malaysia Sarawak (UNIMAS). His academic background spans over three decades in the field of Values-based Artificial Intelligence, ICT for Development and Systematic Innovation. He continues to impact changes at the national and international levels through his work with remote rural communities across the country, strategic shaping of ICT education and innovating learning technology to serve disadvantaged communities. As a certified MATRIZ Level 3TRIZ practitioner, he is currently leading the Borneo Triz initiative for Systematic Innovation promoting programs throughout the region.



Prof Datuk Dr Mohamad Kadim Suaidi Vice Chancellor Universiti Malaysia Sarawak

Kadim currently is the Vice Chancellor of Universiti Malaysia Sarawak (UNIMAS). He has been instrumental in championing strategic change in the education and life long learning scene for both UNIMAS and Sarawak

## SARAWAK Land of the Hornbills

Area: 124,450 km<sup>2</sup> Population: 2.79 million (2018)

More than 40 sub-ethnic groups, each with its own distinct language, culture and lifestyle. A magnet for researchers and nature-lovers alike, its opulent biodiversity and natural resources spell a uniqueness which cannot be found elsewhere.



Mukah Research Centre

Sibu Learning Centre

Kota Samarahan

Kuala Lumpur Learning Centre

Singapore



Penang



## Vision

LITT

A leading global university for a sustainable future

## Mission

To enhance the social and economic impacts on the global community through the pursuit of excellence in teaching, research and strategic engagement



#### *Kuching City Life* Area: 431.01 km<sup>2</sup>

Area: 431.01 km<sup>2</sup> Population: 702.7 thousand

The Cat City, as it is affectionately known, offers diversity in an unrivalled melting pot of ethnicity, languages, and culture.

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## NICHE AREAS

- Biodiversity & Environmental Conservation
- Sustainable Community Transformation
- Information, Communication and Creative Technology



















UNIMAS students are dynamic, dedicated and determined, and are ready for the world.















institute of social informatics and technological innovations

#technologytouchinglives #livestouchingtechnology

TITLE



### CONSTRUCTING AN ECOSYSTEM FOR A SUSTAINABLE INNOVATION CULTURE USING TRIZ TOOLS

#### ABSTRACT

In a previous publication, we described an innovation ecosystem designed for an institute of higher learning, Universiti Malaysia Sarawak (UNIMAS) using TRIZ ways of thinking and tools. In this presentation, we share the extensions to our proposed conceptual framework in addressing challenges faced by the innovation ecosystem of Malaysian public sectors. We draw on our experiences in working together with multiple groups of stakeholders in the unique geo-locality of Borneo. In this study, we demonstrate the application of TRIZ tools in analysing selected problems facing by our stakeholders, namely rural community, professional groups and students. Based on our research, we put forward an innovation system model for sustaining an innovation culture by emphasizing on the four roles that must co-exist in the system: innovation strategist; innovation tactician; innovation practitioner; and innovation champion. The three-pronged change management strategy adopted is showing early signs of a significant shift in organisational culture.

## **UNIMAS TRIZ JOURNEY**



## 2014

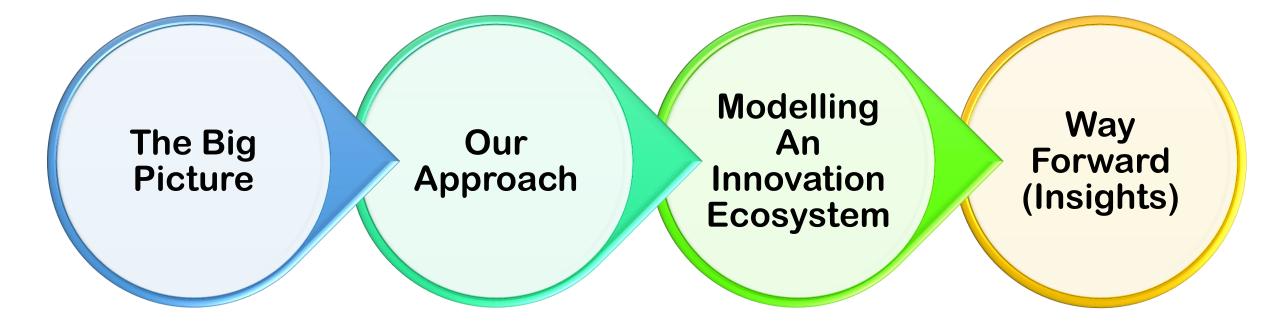
 UNIMAS team engaging with Ministry of Education Malaysia for the proposed inclusion of TRIZ into the national secondary school curriculum

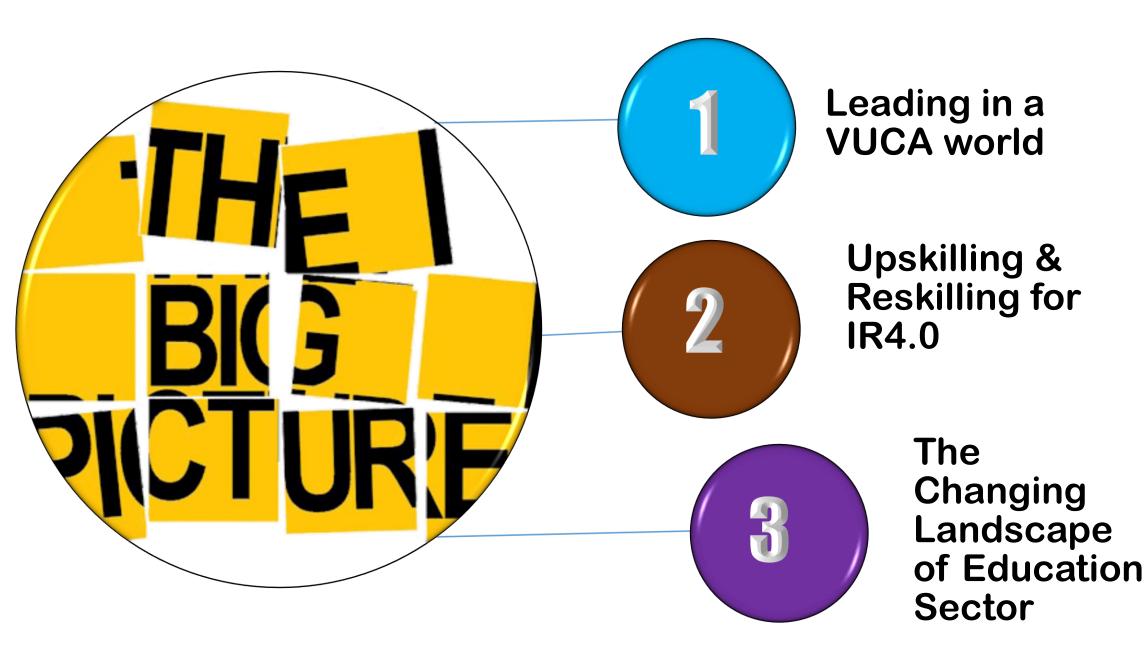
### 2020 & Onwards

- Enrolling all the managers in the program
- Staff innovation portfolio
- Research clusters
- UNIMAS Centre for Product Innovation based on TRIZ
- Annual UNIMAS TRIZ competition











## TRIZ@UNIMAS Our People

## STRATEGIC QUESTIONS

- What sorts of leaders that we want to develop and have for UNIMAS?
- How to develop and produce leadership talents to sustain UNIMAS excellence?
- How do we equip our staff with strategic leadership skills, particularly those in the first line management?

## **The Ideal Campus Dream**



**UNIMAS-wide Innovation** Campaign **Research Clusters**/ **Innovation Circles UNIMAS Innovators' Expo Certification For: Design Innovation Technology Warriors Knowledge Managers** Researchers **Graduate Student** 

#### UNIMAS as a Hub for Problem Solving

Management & ProfessionalStaff TrainingProblem Solving Laboratories

#### Research Clusters & Innovator's Circle

-TRIZ-based Research Clusters -Research Benchmarking -Inventive Knowledge Bases -Product Innovation

#### Creative TRIZ Leadership

-Innovative Leader Profiling
-Creative CVs
-Problem Solving Portfolios
-Community & Industry impact

#### UNIMAS TRIZ Academy

-Systematic Innovation Course -Train the Trainers Program -Final Year Inventive Projects -Break-through research



Self-driven, self-sustainable, organically grown, balanced, integrated as a fully dynamic system, capable of helping each one rise to challenges, allowing us move into the big league alongside the major players in the world.

## **OUR CHANGE JOURNEY WITH TRIZ**

Environment	Current Position Interactions Knowing where we are	Innovative projects One cluster one Patent Target Inventions for Awards Innovative Spaces	<u>VISION</u> 101 in World Benchmarked Research Innovation Ecosystem World Class TL Facilities	
UNIMAS Action	NTERE       Transference         NTERESTREMENT       Transference         Schrent Resources       Efforts in Mapping	Promote in all PTJs Games to stimulate interest Benchmarking Activity Improve Interaction Empowered Focus Group	Problem-> Value Knowledge-based Activities Optimised Resources= Zero Waste	
Departmenta Action	Lets do our part & Lets Work Together Define at each PTJ level!	Enterprise Account need to be dynamic Incentive for Creators	Mechanisms & Support for Value Creation System for Users to be Responsible	
	Today	Short-Term	Long Term	
Illustration of Adaptation using TRI7 Visual Way of Thinking				

**Illustration of Adaptation using TRIZ Visual Way of Thinking** 

#### **VUCA directed strategic Skills**

#### Anticipate

Explore Game Changer initiatives Go Beyond Current Boundaries Build wide networks to scan horizon

#### Challenge

Frame Problems to identify Root Causes Change Beliefs and mind-sets Uncover mis-alignments & biases

#### Interpret

Understand Data from multiple points Participatory in Gathering Insights Explore Multi-faceted constructive Decision Making

#### Decide

Carefully frame decisions and approach Balance speed, rigor, quality and agility Handle uncertainty and information challenged scenarios

#### Align

Uncover hidden parameters in effectively allign pathways to strategic visions Capacity to overcome misalignments to address though issues

#### Learn

Stay agile in steering organizational direction Celebrate success and continue learning from failures Inventive Trigger Cards S-Curve Analysis Innovation Roadmaps Directed Evolution Computer-Aided Innovation Tools

Problem Solving Laboratories Cause and Effect Chain Analytics & Charts Learning through Dialectics Problem Solving Levels

Visual Problem Solving Paradigms Multi-Screen Talented Thinking Knowledge Factory Modelling Organisational Knowledge Bases

Problem Modelling Tools 40 Principles & MATCHeMIB Case Study Collections Trends Analytics & Directed Pathways

Resource Maps Engaging Expert Networks Function Oriented Patent Search Knowledge Discovery Workshops

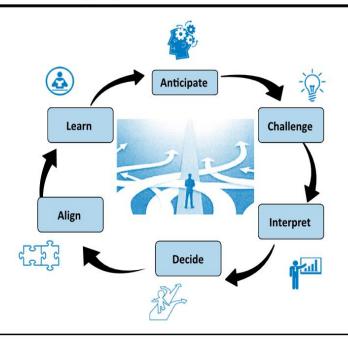
Collective Knowledge Maps Flexible Learning & Dynamic Certification Institutional Knowledge bases

Table 1: Mapping Strategic Skills to TRIZ-based Tools using VUCA Directed Strategic Skills by Shoemaker, Heaton and Teece (2018)

#### Leading & Managing in VUCA

- 1. Using TRIZ to strengthen our staff problem solving skills
- 2. Institutionalize TRIZ ways of thinking in battling inertia
- 3. Profiling staff competency in leading and managing is important

FIGURE 2. Six leadership disciplines needed for VUCA.



## **TRIZ@UNIMAS Our People**

TOTAL PERFORMANCE EXCELLENCE MODEL

Strategic Leadership



**Operational Leadership** 

PENGENALAN

Pertandingan TRIZ UNIMAS aniuran

Institut Informatik Sosial dan Inovasi

Bhg Prof Datu Mohd Fadzil Abdul

tahman, Penolong Naib Canselor

eknologi (ISITI) telah di lancarkan ol

Kepimpinan & Pembangunan) pada 2

UNIMAS, seramai 87 warga staf P&

elah mendapat pengiktirafan TRIZ Leve

ersama Pusat Kepimpinan UNIMAS d

Silverstein, D., DeCarlo, N., Slocum, M., Insourcing Innovation: How to Achieve Competitive Excellence Using TRIZ, Auerbach Publications, 2007

- Embedding of TRIZ into both aspects of strategic leadership as well as operational leadership.
- Substantiating business process management and quality assurance drives, with tool-based methodology and tools.
- Aligning TRIZ-based elements into strategic, ulletmanagerial and operational business processes.



## TRIZ@UNIMAS Our People

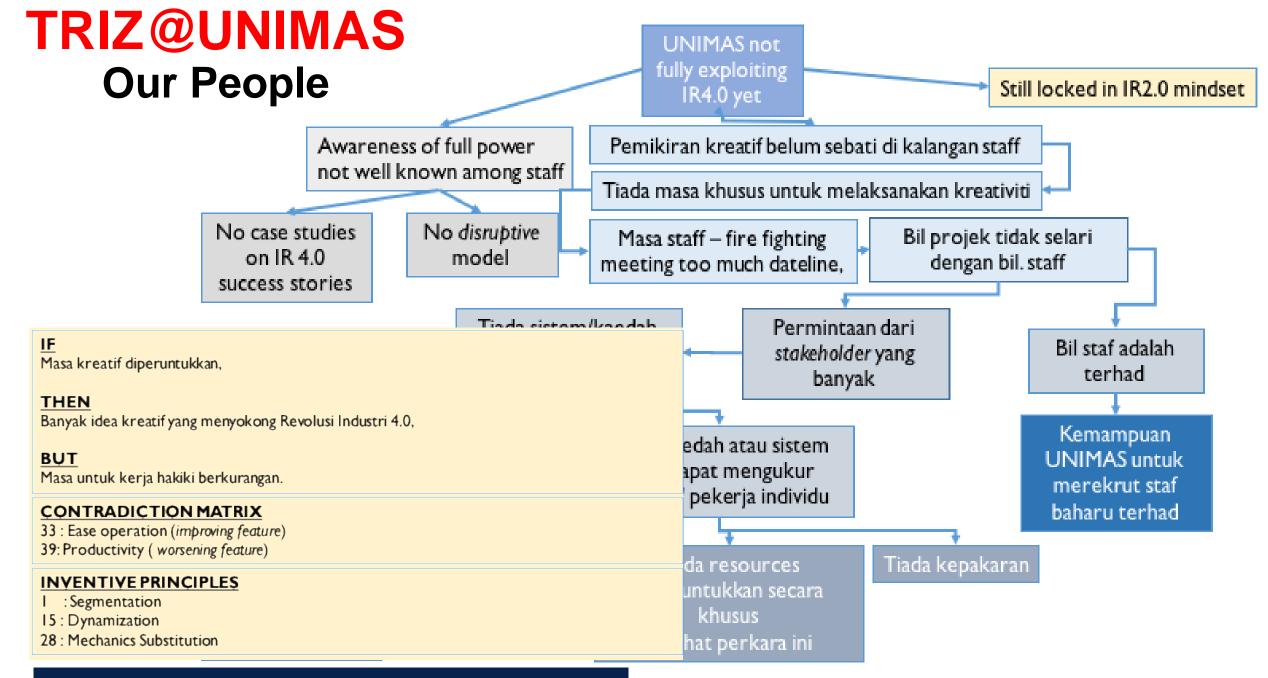
### Sample List of Projects

- Reduce Food Wastage
- Car Parking Dilemma
- Making way for IR 4.0
- Stray Dogs Problems
- Traffic Bottlenecks at Entrance
- Security IT systems
- Ambulance Response
- Pandemic Challenges and Impacts on Training



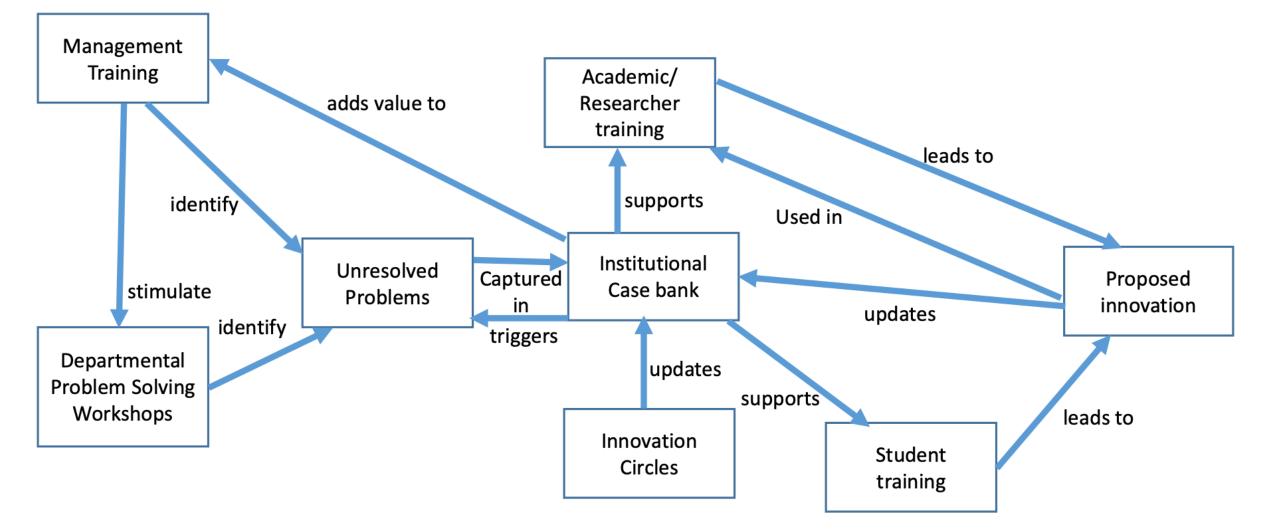




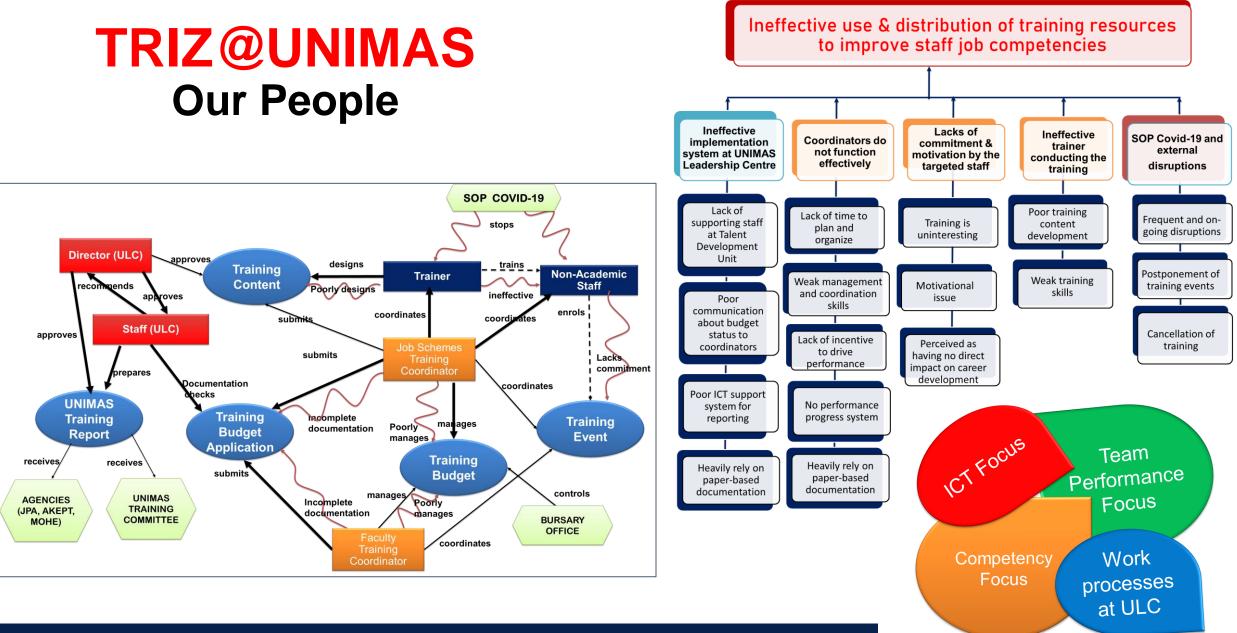


#### Institutional level – Cause & Effect Chain Analysis

## TRIZ@UNIMAS Our People



Institutional level – Function Analysis



**Departmental level – Function Analysis; Cause & Effect Chain Analysis** 

## TRIZ@ UNIMAS Our People

More than 90 administrative staff obtained TRIZ Level 1 Certification, as of 2020

Building more talent pool for TRIZ practitioners (academic and nonacademic staff)







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UNIMASfm is with Aya Taufik and Kmie Dan. October 11, 2019 - 🕅

Hello hello 😅 UNIMAS TRIZ Practitioners bersama UNIMASfm hari ini jam 2.30 petang 😫 😫 ISITI UNIMAS dan MyTRIZ Malaysia akan menganjurkan "First TRIZ Certified Practitioner Award In Borneo" di Dewan Mutiara, Banquet Hall, DeTAR Putra pada 15 Oktober 2019 > TEMPATAN

Kalau nak tahu apa itu TRIZ.....dengarkan di UNIMASfm www.endowment.unimas.my . Jom!!!



#### Unimas guna Triz selesai masalah

boleh kita jangka se riz merupakar satu teori perkara logil perkara van

Sepenyampau 205 iku pemesai deka dipatih ti nyadi sebagi ari renggat pengawa ngerembai guna Triz selampur Unimas.

KOTA SAMARAHAN: Universiti deka dinatih t

Triz: Inisiatif baru Unimas

Sarawak (Unimas) nyadi pengawa ngerembai guna yen keterubah di Asia pur Unimas. u Borneo matih staf rogram Latih Teori Mutar

- On-going coaching and mentoring efforts
- Strategic engagement and media publicity
- TRIZ related Publications

jangka secara

**TRIZ@UNIMAS Our People** 

TOWARDS A FRAMEWORK FOR MODELLING INNOVATIVE EXPRESSIONS

JANE LABADIN1\*, SOUBA RETHINASAMY2, NARAYANAN KULATHURAMAIYER3 & LIM PHEI CHIN<sup>4</sup>

> 13 Institute of Social Informatics and Technological Innovations, <sup>2</sup>Faculty of Language and Communication, \*Faculty of Computer Science and Information Technology Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia

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Abstract

Rubrics are powerful instruments to help direct students' learning towards a set of pre-defined learning outcomes. Defining a set of objectively defined rubric items that also triggers critical thinking and creative expressions remains to be a big challenge. This paper explores the knowledge gaps that hinder the formulation of such rubrics. The need for an instrument to systematically identify and chart innovation is then highlighted. A framework based on Genrich Altshuler's Theory of Inventive Problem Solving (TRIZ) is explored for formulating rubrics that correspond to and measures the learners' stage in problem solving while explicitly linking to innovative expressions. The resulting rubrics, which separate critical thinking and problem-solving forms part of its criteria and descriptors in addressing the knowledge gaps mentioned earlier. The proposed framework has enabled the benchmarking of student works with the

HARI EMPAT • 4 Julai 2019 • 1 Zulkaedah 1440H



## TRIZ@UNIMAS Our Stakeholders

## STRATEGIC QUESTION

How do we integrate our stakeholders, institutionalize innovation culture and build innovation ecosystem through shared vision and values?

#### MyTRIZ Competition 2020 Results



#### ANNOUNCEMENT MYTRIZ BORNEO Competition 2020

#### TOP WINNERS

CHAMPION: MIND BENDERS (I-SAJI)

FIRST RUNNER-UP: INNOV (E-ZY PUMP BOTTLE )

SECOND RUNNER-UP: P&P2 (SAFE GARBAGE COLLECTOR)

#### MERIT WINNERS

TEAM ALGORITHM (WASHING MACHINE WITHOUT POWER)

TEAM L.I.A.S. (THERMAL FAN)

TEAM TUAH INOVASI (SPATULA)

TEAM FHMS (SMART TOOTHBRUSH)

TEAM CC LAB (NON FOGGY GLASSES)

TEAM TEGAS (FINGER PEN)

TEAM P&P1 (FUTURE CAR PARK)

TEAM P&P3 (EZ SPREADER)

## TRIZ@UNIMAS Our Stakeholders



MPU3422 SYSTEMATIC INNOVATION AND INNOVATIVE PROBLEM SOLVING

## TRIZ EXHIBITION

Featuring the projects of First Year students from different faculties and background across UNIMAS, adopting and applying TRIZ concepts to their problem solving activities.

9 - 10 MAY 2019 9AM TO 4.30PM

FACULTY OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

#### **Undergraduate Courses**

- 1. MPU 3422 Systematic Innovation and Problem Solving
- 2. TRIZ application PBL (Project Based Learning) activity



Nur Adiba binti Mohd Saiful Azlan Nur Aina Diyanah binti Azrul Asmadi 2<sup>nd</sup> Year, Computational Science

Mentor Professor Dr Narayanan A/L Kulathu Ramaiyer Associate Professor Dr Jane Labadin

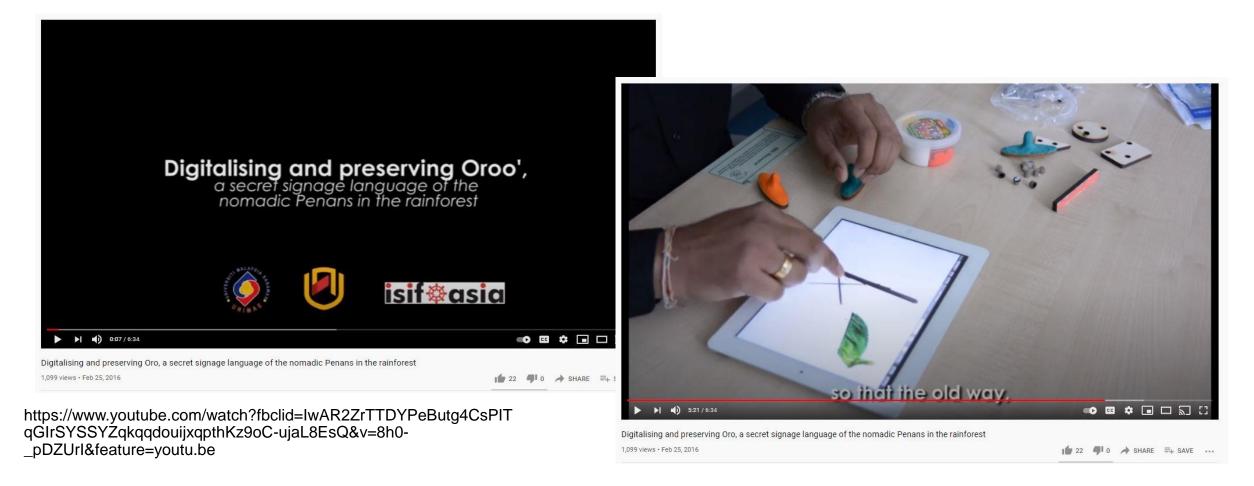
Staff and Students Faculty Of Computer Science & Information Technology

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**TEGUH O BERSAMA** 

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LIVE • FOLLOW • SHARE www.fcsit.unimas.my #UNIMASfcsitofficial

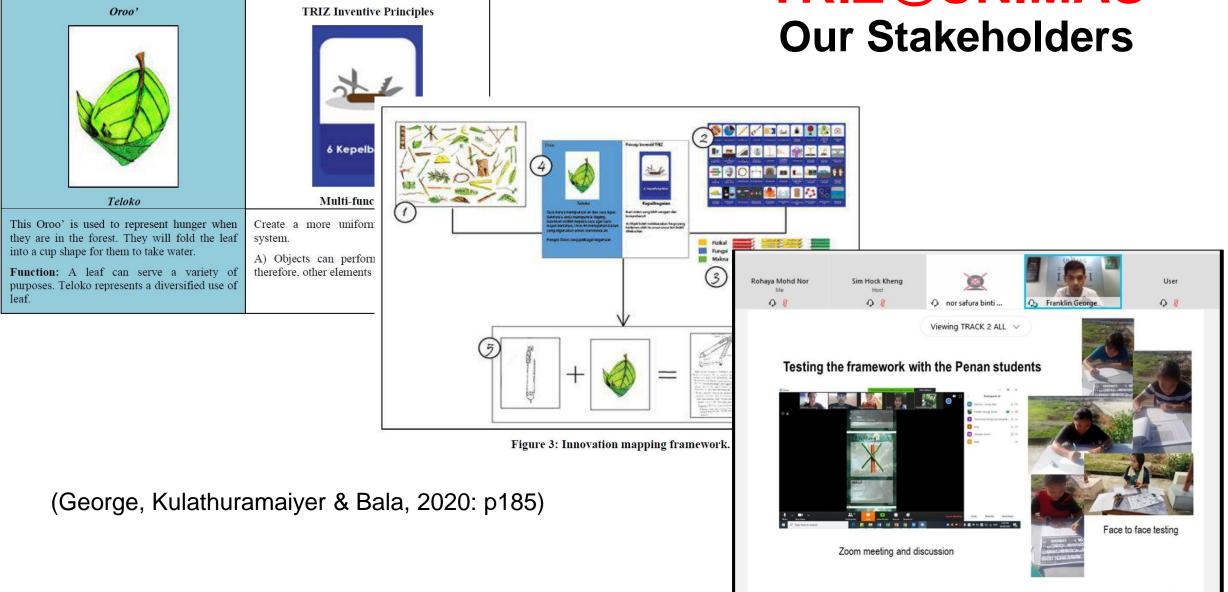


Oroo', a visual communication language, is still in use in the remote forests of Borneo. Oroo' represents signs or clues that are used to convey information about environmental conditions, activities, directions, animals, time periods, warnings and more. There is a close relationship between the Penan community and their natural surroundings which include the forest. All the materials, such as leaves, twigs, bark and roots, used to construct Oroo' symbols are obtained from forest. (George, Kulathuramaiyer & Bala, 2020: p185)

## **TRIZ@UNIMAS Our Stakeholders**

UNIMAS

TRIZ



TRIZ CONFERENCE 2020



Universiti Malaysia Sarawak (UNIMAS) October 16 2019 · 🕄

Langsung dari Sarawak N7 First TRIZ Certified Practitioner Award in Borneo



1. On-going training, coaching and mentoring efforts

2. Strategic engagement with industry and community

3. Media publicity

## **TRIZ@UNIMAS Our Stakeholders**



The TRIZ 4 Teachers & Parents is a special workshop arranged to share the method of teaching creative and innovative thinking skills. it is customized for teachers and parents who are keen to impart the thinking skills to children. It is based on the methods of solving 'open' and 'inventive' problems.

**16 · TEMPATAN** 

KOTA SAMARAHAN: Sa-

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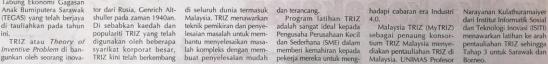
KHAMIS - 17 OKTOBER 2019 - 18 SAFAR 1441H Utusan Garawak

Venue

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#### Sarawak hasil pengamal TRIZ terbanyak





hadapi cabaran era Industri Narayanan Kulathuramaiyer dari Institut Informatik Sosial Malaysia TRIZ (MyTRIZ) dan Teknologi Inovasi (ISITI)

## INNOVATION ECOSYSTEM

An innovation ecosystem is the evolving set of actors, activities, and artifacts, and the institutions and relations, including complementary and substitute relations, that are important for the innovative performance of an actor or a population of actors. (Granstrand & Holgersson, 2020:p3)

<ul> <li>Co-evolution/ co-specialization</li> <li>Co-evolution</li> <li>Co-specialization</li> </ul>	Activities <ul> <li>Innovation processes</li> <li>Innovation activities</li> <li>R&amp;D</li> </ul>	
<ul> <li>Competition</li> <li>Coopetition</li> <li>Coordinated coherent solution</li> </ul>	Actors <ul> <li>Firms</li> <li>Organizations</li> <li>Agents</li> <li>Government</li> </ul>	Artifacts <ul> <li>Knowledge/technology</li> <li>Capital / resources</li> <li>Products / services</li> <li>Platforms</li> </ul>
Collaboration <ul> <li>Shared goal</li> <li>Collaboration</li> <li>Complements</li> <li>Co-creation</li> </ul>	<ul> <li>Institutions</li> <li>Decision principles</li> <li>Institutions</li> <li>Policies / regulations</li> </ul>	Source: Granstrand, O & Holgersson M. (2020). Innovation ecosystems: A conceptual review and a new definition. Technovation, V (90–91): 1-12.

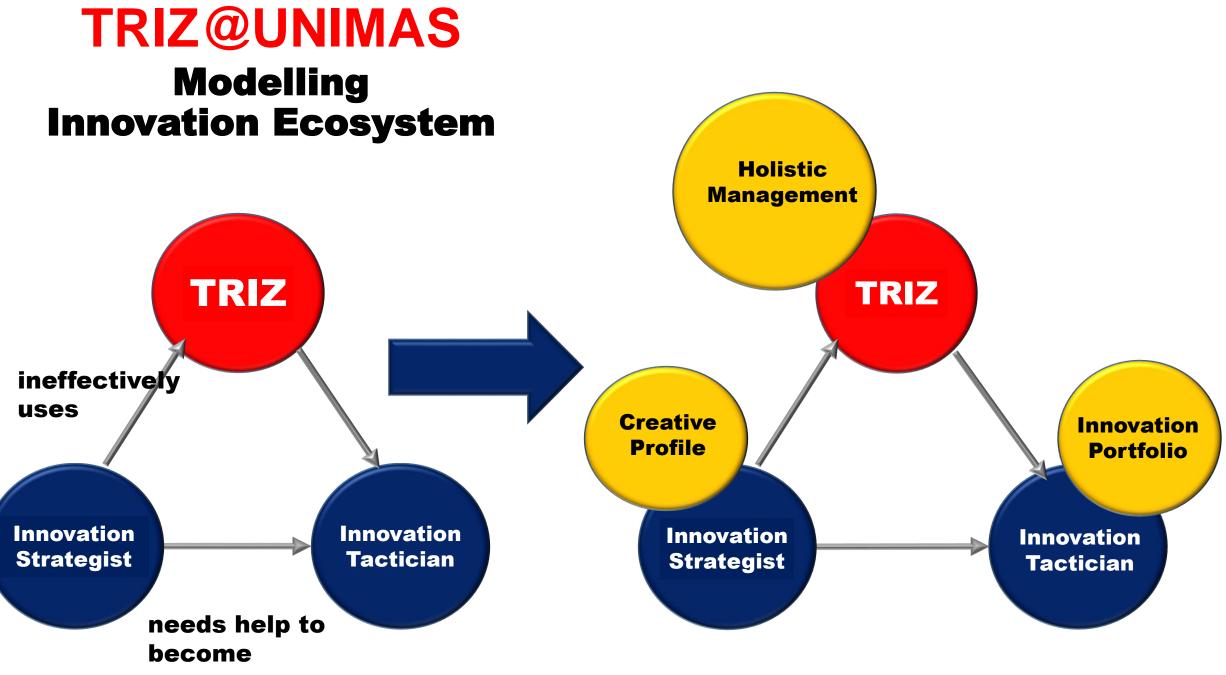
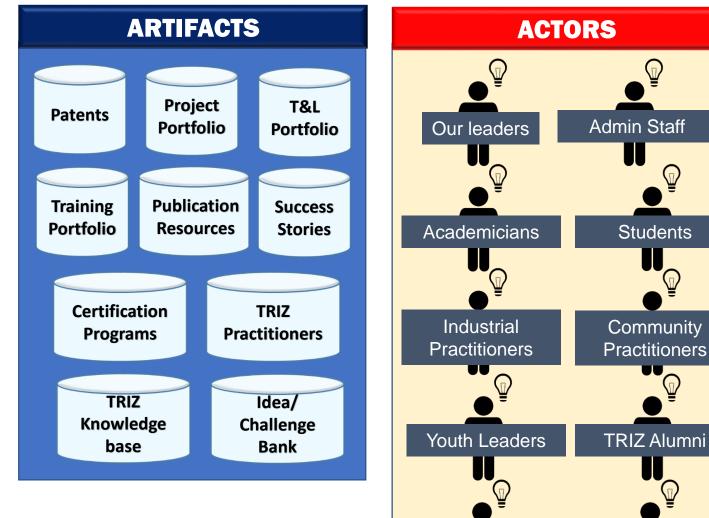


Illustration of Adaptation using TRIZ Visual Way of Thinking

## TRIZ@UNIMAS

### **Modelling Innovation Ecosystem**



Researchers Policymakers

#### Activities

- Innovation circle groups
- Innovation activities & competition
- R&D clusters
- Innovation processes related to TRIZ (T&L, R&D, management, training etc.)

#### Institutions

- Project champions from higher level management
- Certified TRIZ practitioners are decision makers (strategic and operational)
- TRIZ being integrated in the systematic management training program

#### Synergize with Stakeholders/ Sharing Vision and Values

- Co-evolution / co-specialization
- Coordinated coherent solution
- Strategic collaboration

# **TRIZ Produces Thinkers who constantly Innovate**

- Profiling staff, and pick out the champs with a simple measure:
  - Personal Capacity: Creative CV
  - Can systematize Innovation: Innovation Agenda with Evidence of operationalization
  - Recognition from internal/external partners
- We have a way of measuring problem-solving abilities based on TRIZ
- Patent databases used by everyone including students and administrative staffs to benchmark their inventions
- Multi-disciplinary Idea banks will be harnessed to stimulate collaborative projects at all levels

## **LESSONS LEARNED FROM UNIMAS**

- Shared vision and values are important
- The role of agents innovation strategists, innovation tacticians, and innovation champions
- Integrate Change Management Model (ADKAR Model) and implement effective buy-in strategies
- Recognize product/service innovations, and the business of creation
- Building an ecosystem for nurturing systemic innovation and creativity using TRIZ tools

## TRIZ@UNIMAS



Lets Discover the Mystery, Miracle and Magic of TRIZ



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Lab

borneotriz.org

Considering the challenge faced during the pandemic lock-downs and post pandemic situation, specialised problem solving labs can be tailor made to suit a wide range of needs targeted intervention programmes.

#### **Group Activities**

We provide both formal and informal training in both face-to-face and online modes. Specialised training can be customised to suit specific needs of your organization.

#### Life-long Learning

We believe that, powered by TRIZ, you will be able to start seeing problems as opportunity for knowledge discovery and innovation. Learning will become an ongoing process of unlocking potentials and talents to help you along to become accomplished in your pursuits.

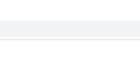
#### Certifications

Certification pathways towards recognition at both national and international levels are available through our multidisciplinary team of experts, associates and advisers.





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