



TECHNOLOGY MATURITY ASSESSMENT MODEL FOR ASSISTING PRODUCT INNOVATION AND DEVELOPMENT

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Research Methods & Professional Development

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AGENDA

INTRODUCTION

RESEARCH PROBLEM

PROJECT OUTLINE

IDEA

WHAT'S NEXT

CLOSING



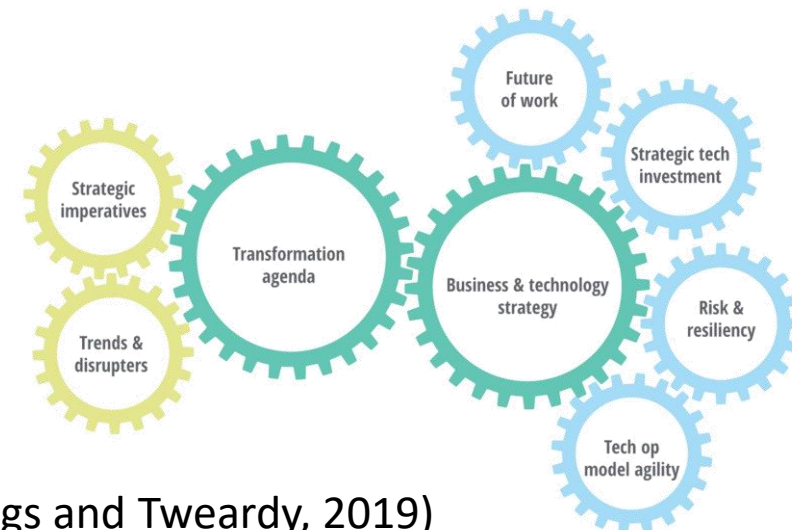
INTRODUCTION

BUILDING A STRATEGY

Technology strategies are an integral part for dynamic business and future projection.

Understanding the maturity of a technology will impact the speed of technology uptake.

TRLs is a tool to facilitate the understanding of a technologies maturity and widely used across engineering business (Clay et al, 2006).



(Kark, Briggs and Tweardy, 2019)

TECHNOLOGY READINESS LEVEL (TRL)

RESEARCH DEVELOPMENT DEPLOYMENT	9	ACTUAL SYSTEM PROVEN IN OPERATIONAL ENVIRONMENT
	8	SYSTEM COMPLETE AND QUALIFIED
	7	SYSTEM PROTOTYPE DEMONSTRATION IN OPERATIONAL ENVIRONMENT
	6	TECHNOLOGY DEMONSTRATED IN RELEVANT ENVIRONMENT
	5	TECHNOLOGY VALIDATED IN RELEVANT ENVIRONMENT
	4	TECHNOLOGY VALIDATED IN LAB
	3	EXPERIMENTAL PROOF OF CONCEPT
	2	TECHNOLOGY CONCEPT FORMULATED
	1	BASIC PRINCIPLES OBSERVED

RESEARCH PROBLEM

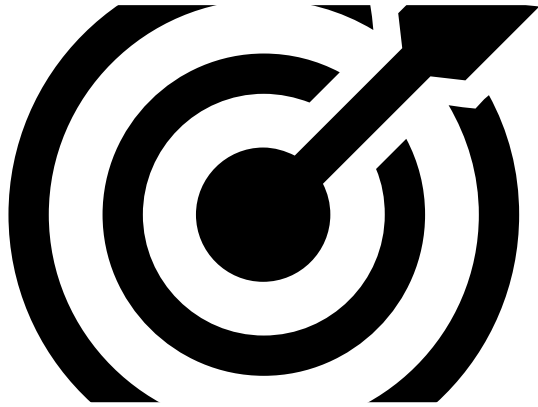
LIMITATIONS

- Readiness level does not automatically associate with the relevant or technological maturity.
- A mature technology may influence a higher or lower grade of readiness depending on the distinct system environment. However, this often isn't considered.
- Multidimensional factors must be respected for true value.
- The standard TRL model often neglects adverse and undesirability factors.

ADVANTAGES

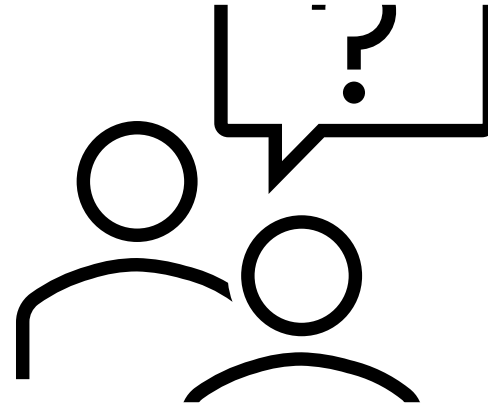
- They provide a common understanding of the technology status.
- Improve understand and develop risk management strategies.
- Assist in decision considerations for technology funding.
- Support the decision factors concerning transition of technology.

PROJECT OUTLINE



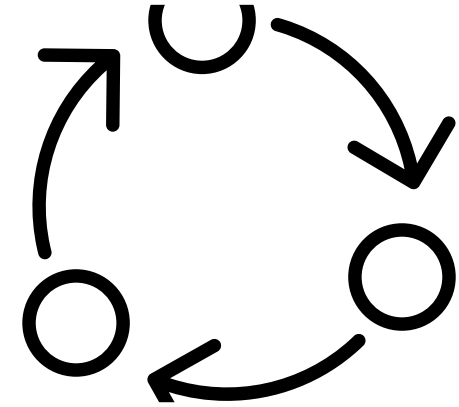
AIMS

- Series of close question.
- Propose a new and novel calculation.
- Create a GUI.
- Test the TRL calculator.
- Gather analytical data.



QUESTION

1. How does a rigorous validation model predict a technology readiness level compared to the standard TRL scale?
2. How does the model impact the drive for technology maturity?



METHODOLOGY

- Develop Multidimensional Model
- Data Collection
1. Literature
 2. First person
 3. Third person



RESEARCH MODEL IDEA

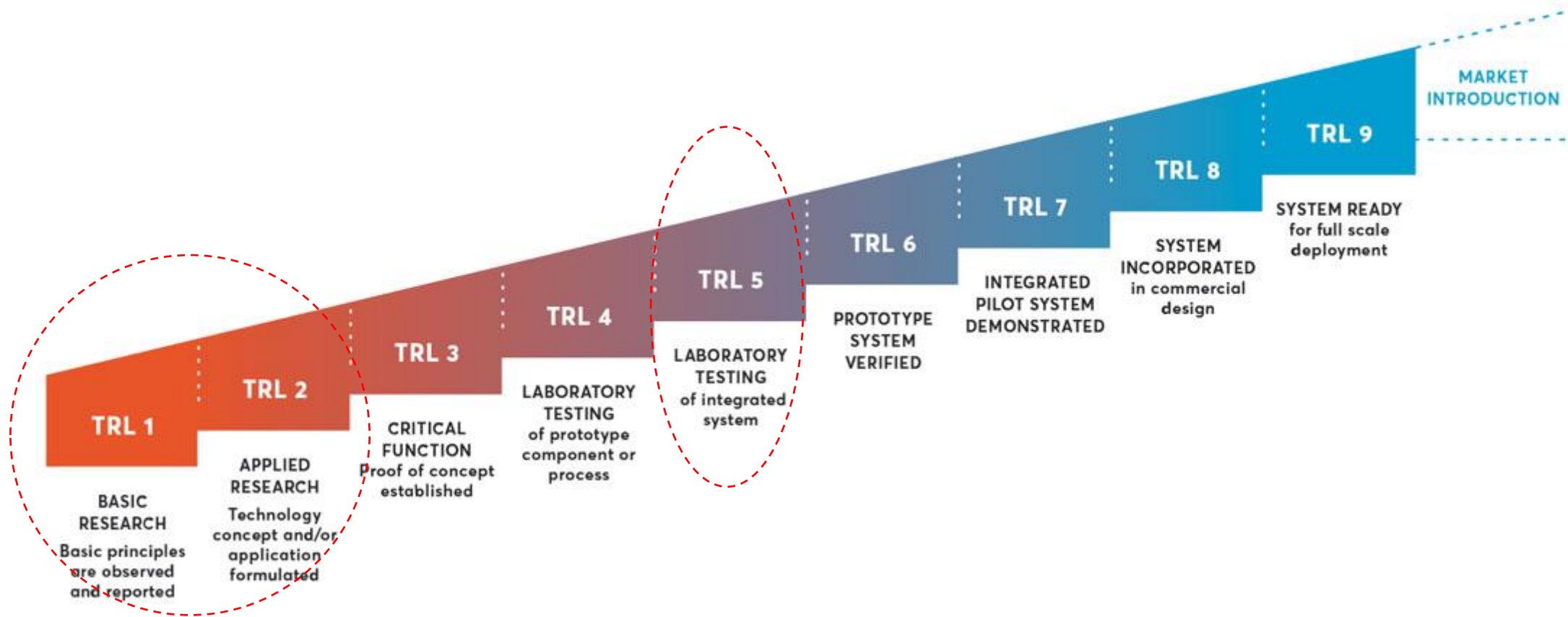
LET'S DIVE IN

PRODUCT INNOVATION & DEVELOPMENT



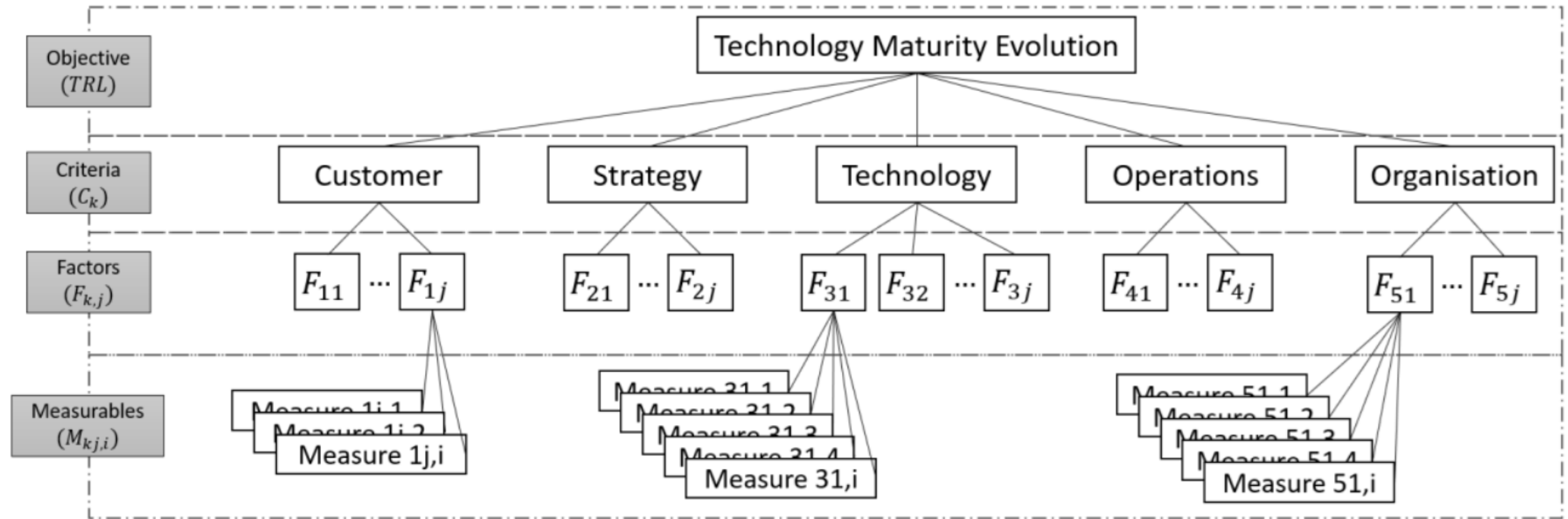
(IDF, n.d)
(Gonzalez and Palacios, 2002)

TECHNOLOGY READINESS LEVELS



(Brigaid, 2021)

GENERALISED HIERARCHICAL MODEL

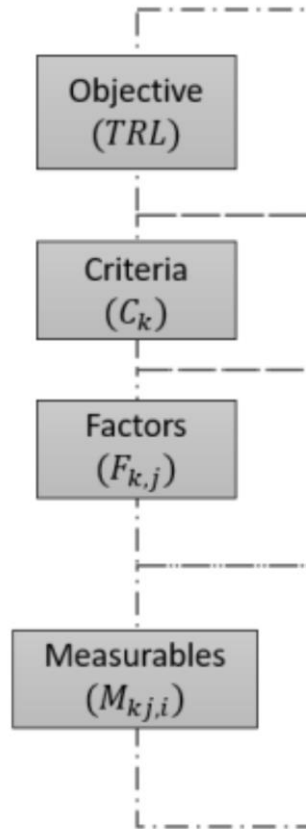


UNDERLYING EQUATION

$$TRL(n) = 9S_n$$

With:

$$S_n = \frac{\sum_{k=1}^5 \left(\frac{\sum_{j=1}^{n_j} \left(\frac{\sum_{i=1}^{n_i} M_{kj,i}}{n_i} \right)}{n_j} \right)}{5} ; \text{where } \begin{cases} S_n \leq 1.0 \\ M_{kj,i} = 0|1 \end{cases}$$



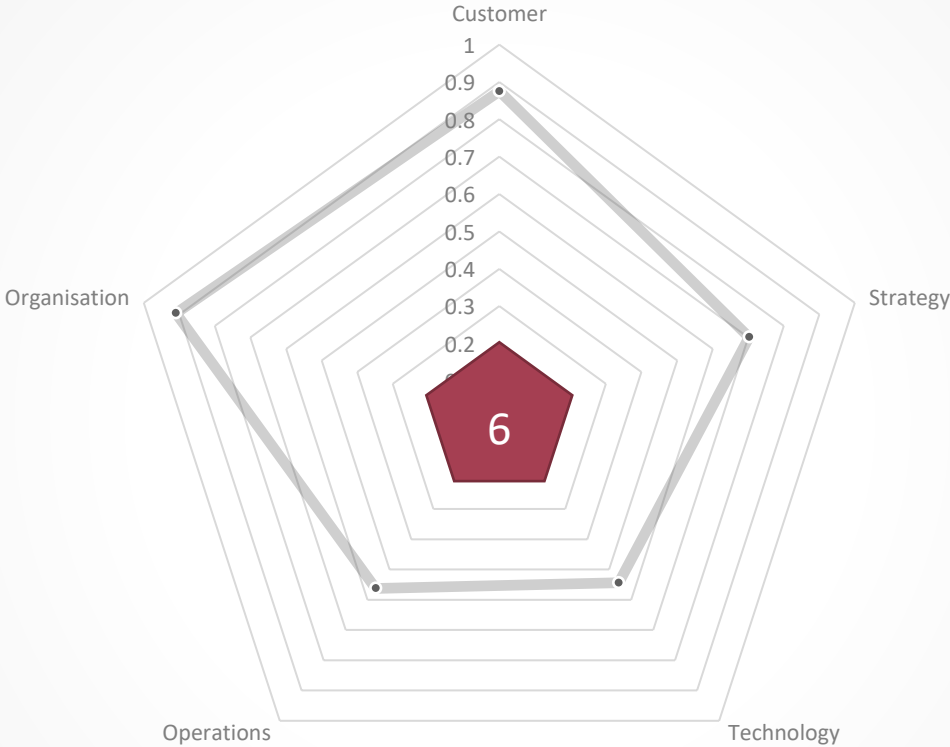
TESTING THE EQUATION

TECHNOLOGY X

Technology Maturity Evaluation									
Customer									
CRITERIA	4								
FACTORS	F1	6 F2	2 F3	4 F4	8				
MEASURABLES	M1	1 M1	0 M1	1 M1	1				
	M2	1 M2	1 M2	1 M2	1				
	M3	1	M3	1 M3	1				
	M4	1	M4	1 M4	1				
	M5	1		M5	1				
	M6	1		M6	1				
				M7	1				
				M8	1				
TOTAL	1.000	0.500	1.000	1.000					
Strategy									
CRITERIA	6								
FACTORS	F1	4 F2	4 F3	6 F4	3 F5	8 F6	5		
MEASURABLES	M1	1 M1	1 M1	1 M1	1 M1	1 M1	0		
	M2	1 M2	1 M2	1 M2	0 M2	1 M2	1		
	M3	0 M3	0 M3	1 M3	0 M3	1 M3	1		
	M4	1 M4	1 M4	0	M4	1 M4	1		
			M5	1	M5	1 M5	1		
			M6	1	M6	0			
				M7	1				
				M8	0				
TOTAL	0.750	0.750	0.833	0.333	0.750	0.800			
Technology									
CRITERIA	7								
FACTORS	F1	1 F2	8 F3	2 F4	3 F5	9 F6	5 F7		
MEASURABLES	M1	1 M1	1 M1	0 M1	0 M1	1 M1	1 M1	1	
		M2	1 M2	1 M2	0 M2	1 M2	0 M2	1	
		M3	1	M3	1 M3	1 M3	0 M3	0	
		M4	0		M4	0 M4	1 M4	1	
		M5	1		M5	0 M5	1 M5	0	
		M6	0		M6	0	M6	0	
		M7	0		M7	1	M7	0	
		M8	0		M8	0			
				M9	0				
TOTAL	1.000	0.500	0.500	0.333	0.444	0.600	0.429		
Operations									
CRITERIA	4								
FACTORS	F1	3 F2	4 F3	6 F4	2				
MEASURABLES	M1	1 M1	1 M1	1 M1	0				
	M2	1 M2	1 M2	1 M2	0				
	M3	1 M3	1 M3	1					
		M4	0 M4	0					
			M5	0					
			M6	1					
TOTAL	1.000	0.750	0.500	0.000					
Organisation									
CRITERIA	5								
FACTORS	F1	4 F2	5 F3	3 F4	2 F5	4			
MEASURABLES	M1	1 M1	1 M1	1 M1	1 M1	1			
	M2	1 M2	1 M2	1 M2	1 M2	1			
	M3	1 M3	0 M3	1		M3	0		
	M4	1 M4	1			M4	1		
		M5	1						
TOTAL	1.000	0.800	1.000	1.000	0.750				

Summary TRL6

Customer	0.875
Strategy	0.702778
Technology	0.543764
Operations	0.5625
Organisation	0.91



“Technology is important because it creates the future. We’re able to be a part of the next and create things that don’t exist.”

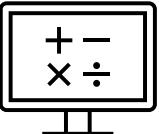
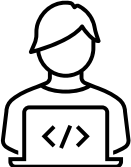
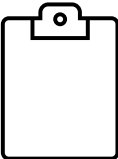
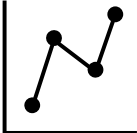
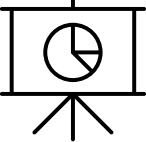
- MC HAMMER -



WHAT'S NEXT

LOOKING AHEAD

QUARTERLY TIMELINE

JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN
Lit Review Question Dev	Lit Review Verify Equation Implement Equation	Lit Review Program Script	Develop GUI	Data Collection	Data Collection	Case Study	Complete Diss
							



SUMMARY

TECHNOLOGY MATURITY ASSESSMENT

Simplistic scale currently used.

NEW AND NOVEL MODEL

Mathematical, objective approach.

Multidimensional.

GUI.

DELIVERING CASE STUDIES

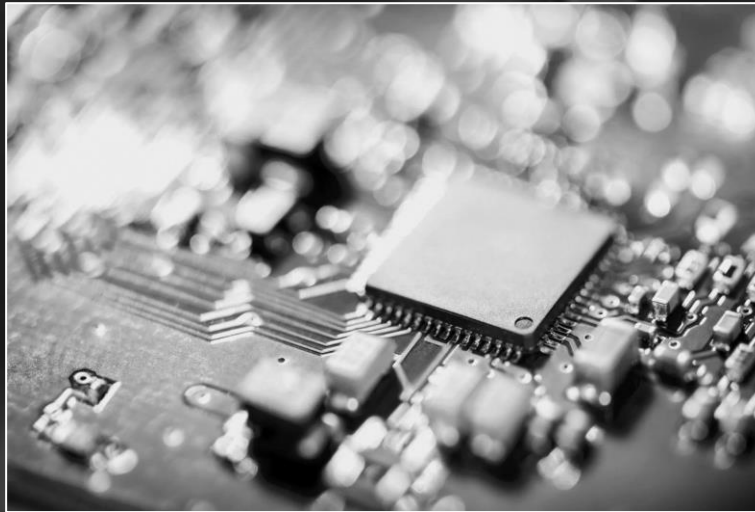
AID INNOVATION AND TECHNOLOGY UNDERSTANDING



THANK YOU



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QUESTIONS

REFERENCE

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