

Sustainability Perspectives: A Research on Leadership, Innovation, Performance and Competitive Advantage

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Abstract

This paper elaborates Sustainability Perspectives as A Research on Leadership, Innovation, Performance and Competitive Advantage (LIPCA), including Urban Search and Rescue (USAR) through Human Factors and Systems Engineering Approach of Badiru and Racz (2013), other than Serpentine Robot in confined space rescue, that eventually focuses on Sustainable Competitive Advantage (SCA). This paper provide balance discussion of Pros and Cons of SCA, as its references refer to mainly to Cons of McGrath (2013) versus mainstream of Cons of SCA. The Cons of SCA include the contributors to SCA, starting from Bennett (2013), Hani and Al-Hawary (2009), until Barney (1991), Prahalad and Hamel (1990), Coyne (1986) and Porter (1985). The mention balance discussion relates concept, theoretical aspects and managerial implications (CTM) of LIPCA and its SCA within unit analysis of individual, company and nation toward global benefit. This paper elaborates scope of problem within scope of a nation, Indonesia, that integrate CTM and its empirical studies (ES) in unit of analysis of company that can be integrated in unit individual and nation's unit analysis. As scope of objectives, Methodology and Discussion in this paper emphasize on generalized concept of LIPCA and its SCA based upon the Neuman (2013 and 2011), Kumar (2011), Jonker, Pennink, Wahyuni (2011), Creswell (2009). With the balance of CTM and ES, this paper provide benefits for Indonesia, and simultaneously beneficial for global settings.

Keywords

Urban Search and Rescue (USAR), Sustainability, Leadership, Innovation, Performance

Introduction

This paper elaborates Sustainability Perspectives as A Research on Leadership, Innovation, Performance and Competitive Advantage (LIPCA), Urban Search and Rescue (USAR) through Human Factors and Systems Engineering Approach, other than Serpentine Robot in confined space rescue, that eventually focuses on Sustainable Competitive Advantage (SCA). It is emphasized that the challenge is toward maintaining the SCA in this paper.

In term of Urban Search and Rescue (USAR) using Serpentine Robot, Human Factors are involved, in wider scope of Industrial and Systems Engineering. Badiru and Racz (2013) emphasize this USAR in its Handbook of Emergency Response, A Human Factors and Systems Engineering Approach. In this paper, The mentioned approaches, in that Handbook, are combined with the research of USAR using Serpentine Robot within confined space rescue, as building blocks of previous research by Soebandrija, Wajong, Sofyan and Meilani (2013). Yet, to segregate the scope, this paper emphasizes more into the Human Factors and Systems Engineering Approach, *in lieu* of specific discussion on the Confined Space Rescue. Furthermore, the mentioned Handbook is organized into three parts, which are Technical Challenges, Human Factors Issues and Managerial Models.

Subsequently, the aspects of USAR are elaborated using the perspectives of Sustainability, in term of Leadership, Innovation, Performance and Competitive Advantage. The mention balance discussion relates concept, theoretical aspects and managerial implications (CTM) of LIPCA and its SCA within unit analysis of individual, company and nation toward global benefit.

Literature Review

This paper provide balance discussion of Pros and Cons of SCA, as its references refer to mainly to Cons of McGrath (2013) versus mainstream of Cons of SCA. The Cons of SCA include the contributors to SCA, starting from Bennett (2013), Hani and Al-Hawary (2009), until Barney (1991), Prahalad and Hamel (1990), Coyne (1986) and Porter (1985). This SCA is elaborated furthermore, in the sub session of Textbooks and Referred Journals in Sustainable Competitive Advantage

Literature Review in Human Factors and Systems Engineering Approach

In term of Urban Search and Rescue (USAR), this paper elaborates discussion through Human Factors and Systems Engineering Approach, other than Serpentine Robot in confined space rescue.

Prior to discuss the USAR through Human Factors and Systems Engineering Approach, it is indispensable to briefly discuss the USAR using Serpentine Robot in Confined Space Rescue, as already elaborated by Soebandrija, Wajong, Sofyan and Meilani (2013); precisely, in prior literature review i. Emergency Response Systems and Emergency Management, which are authored by Subramaniam *et al* (2010) on Emergency Response Performance, Pourezzat *et al* (2010) on Data Flow Diagram (DFD), Local Government Resource Capability (LGRC) and Civil-Military Relations (CMR) in Emergency Management, ii. Robot and Its Types, which are authored by Hopskins (2009), Borenstein (2007), Kinugasa(2010), Murphy(2004), Dowling(1997), Ohno(2001) and others, iii. Forensic and Forensic Structural Engineering, which are authored by Ratay (2010), Carper (2001) and others. Those prior literatures reviews are mentioned and discussed by Soebandrija, Wajong, Sofyan and Meilani (2013).

Literature Review in Sustainable Competitive Advantage

This paper emphasizes research of McGrath (2013), in her research on The End of Competitive Advantage: How to Keep your strategy moving as fast as your business, that elaborated the discussion on Sustainable Competitive Advantage (SCA) , other than other references. McGrath (2013) deemed that Executives need to stop basing their strategies on SCA, in any setting and speed of competitive environment. Precisely, there are Pro and Cons toward SCA.

Literature Review in Leadership

This paper emphasizes research of Dubrin (2013), in the reference about Research Findings, Practice and Skills, elaborated the discussion on Leadership, other than other references. Dubrin (2013) provided the understanding on Leadership principles and skills through a balance between essential theory and real-world applications.

Literature Review in Innovation

This paper emphasizes research of Anthony (2012), in his reference about The Little Black Book of Innovation, elaborated the discussion on Innovation, other than other references.

Literature Review in Performance

This paper emphasizes research of Keller and Price (2011), in their references about Beyond Performance, elaborated the discussion on Performance, other than other references.

Literature Review in Competitive Advantage

This paper emphasizes research of Porter (2004) elaborated the discussion on Competitive Advantage, other than other references.

Methodology

This paper elaborates scope of problem within scope of a nation, Indonesia, that integrate CTM and its empirical studies (ES) in unit of analysis of company that can be integrated in unit individual and nation's unit analysis. As scope of objectives, Methodology and Discussion in this paper emphasize on generalized concept of Leadership, Innovation, Performance and Competitive Advantage (LIPCA) and its Sustainable Competitive Advantage (SCA) based upon the Neuman (2013 and 2011), Kumar (2011), Jonker, Pennink, Wahyuni (2011), Creswell (2009). With the balance of concept, theoretical aspects and managerial implications (CTM) and ES, this paper provide benefits for Indonesia, and simultaneously beneficial for global settings.

Results and Discussions

This paper and its contribution through Aspects of Human Factors and Systems Engineering Approach

In term of Urban Search and Rescue (USAR), this paper elaborates discussion through Human Factors and Systems Engineering Approach, other than Serpentine Robot in confined space rescue. The mentioned Serpentine Robot in Confined space, as indicated in Table 1 below, are elaborated by Soebandrija, Wajong, Sofyan and Meilani (2013).

Table 1: USAR Program using Serpentine Robot in Confined Space Rescue

Year	Stage	Explanation	Performance Indicator
1	1	Comparison of USAR Integration Worldwide: Comparison of Data Flow Diagram, Local Government Resource Capability, Civil-Military Relations in Emergency Management, and Benchmark Emergency Response System in particular in USA and Europe.	(a) Data Flow Diagram; (b) Local Government Resource Capability; (c) Civil-Military Relations in Emergency Management; (d) Benchmark Emergency Response System
	2	Model Development for Kinematics and Dynamics Robot: Serpentine Robot with 3 degree freedom to conduct simulation pose and gait movement.	(a) Kinematics Robotic Model; (b) Dynamics Robotic Model; (c) Serpentine Robot and its movement strategy.
	3	Construction of Prototype Robot: Preliminary construction of 4 segments of serpentine robot prototype, according to Model Development in Phase 2.	4 segments of serpentine robot prototype.
2	1	USAR Integration in Indonesia: Adjustment to Condition in Indonesia: Data Flow Diagram, Local Government Resource Capability, Civil-Military Relations in Emergency Management and Benchmark Emergency Response System	(a) Data Flow Diagram; (b) Local Government Resource Capability; (c) Civil-Military Relations in Emergency Management; (d) Benchmark Emergency Response System
	2	Development of Control Algorithm System: Compliance Control Development	Algorithm Compliance Control System
	3	Construction of Prototype Robot: Construction of 4 segments with movement sensor and camera on Robot	8 segments of serpentine robot prototype with sensor
3	1	Development of Robotic Navigation System: System Development to control through remote mechanism.	(a) Serpentine Robot Algorithm Navigation System thorough remote mechanism.; (b) prototype of remote control system
	2	Construction of Prototype Robot: Construction of 2 segments with skin on serpentine robot	10 segments of serpentine robot prototype with sensor
	3	On Site Simulation toward Emergency Response System Procedure that are integrated with Serpentine Robot Prototype.	Data evaluation pertaining On Site Simulation Results

Badiru and Racz (2013) emphasize this USAR in its Handbook of Emergency Response, A Human Factors and Systems Engineering Approach. Subsequently, the mentioned Handbook is organized into three parts, which are Technical Challenges, Human Factors Issues and Managerial Models.

Furthermore, Badiru (2006) in his previous research through Handbook, has elaborated the concept of Industrial and Systems Engineering. Thus, it not merely the Systems Engineering. Precisely, Badiru (2006) has elaborated research in his Handbook of Industrial and Systems Engineering. Subsequently, the mentioned Handbook is organized into six parts, which are General Introductions, Fundamentals of Industrial Engineering, Fundamentals of Systems Engineering, Manufacturing and Production Systems, New Technologies, and General Applications.

Emergency Response and Technical Challenges

In term of Urban Search and Rescue, in particular about Emergency Response and Technical Challenge; Badiru and Racz (2013) elaborated its synopses pertaining the Technical Challenge. Precisely, the Technology that ease the Emergency Response Systems, as discussed in Badiru and Racz (2013) in the following respective summarized Chapter's Titles:

1. Chapter One : Robotic Technologies for first response
2. Chapter Two : Chemical Agent Sensor Placement Methodology
3. Chapter Three : Disruptive Technologies and its Quick Systems Engineering
4. Chapter Four : Unmanned Aircraft Systems in the National Airspace systems
5. Chapter Five : Optimization in Evacuation Route Planning
6. Chapter Six : Evacuation Planning, Analysis and Management
7. Chapter Seven : Optimization for Helicopter Mission Planning
8. Chapter Eight : Transportation Systems for Evacuation
9. Chapter Nine : River flow Prediction for Emergency Response and Military Applications

Thus, in term of the relevancy of those Technical Challenges toward this paper on Sustainability Perspectives as A Research on Leadership, Innovation, Performance and Competitive Advantage (SLIPCA), it can be elaborated that: Serpentine Robot is not the only Technology Challenges that Emergency Response Systems face. Even in term of the Robot, there are multi options that USAR Team can optimize those technologies. Yet, indeed since the USAR using Serpentine Robot is within the Confined Space Rescue, characteristics of Serpentine Robot has its advantage and disadvantages.

Emergency Response and Human Factors

In term of Urban Search and Rescue, in particular about Emergency Response and Human Factors; Badiru and Racz (2013) elaborated its synopses pertaining the Human Factors. Precisely, the Human Factors that constitutes the key factor for the overall Emergency Response Systems, as discussed in Badiru and Racz (2013) in the following respective summarized Chapter's Titles:

10. Chapter Ten : Cry Wolf Hypothesis and False Alarm Effect
11. Chapter Eleven : Accessible Emergency Management
12. Chapter Twelve : Preparing the Unprepared
13. Chapter Thirteen : Bioterrorist incident
14. Chapter Fourteen : Weapon of Mass Destruction (WMD)
15. Chapter Fifteen : Biomechanical Evaluation of Supply Distribution
16. Chapter Sixteen : Organophosphate Poisoning

Thus, in term of the relevancy of those Human Factors toward this paper on Sustainability Perspectives as A Research on Leadership, Innovation, Performance and Competitive Advantage (SLIPCA), it can be elaborated that: Human Factors are deemed in any situations are the key factors in Emergency Response Systems.

Emergency Response and Managerial Models

In term of Urban Search and Rescue, in particular about Emergency Response and Managerial Models; Badiru and Racz (2013) elaborated its synopses pertaining the Managerial Models. Precisely, the Managerial Models that facilitate the strategy for the Emergency Response Systems, as discussed in Badiru and Racz (2013) in the following respective summarized Chapter's Titles:

17. Chapter Seventeen : Coordinated Project Systems
18. Chapter Eighteen : Integrated Response Among Incongruent Organizations
19. Chapter Nineteen : Decisions in Disaster Recovery Operations
20. Chapter Twenty : Integrations of Department of Defense with NonGovernmental Organizations
21. Chapter Twenty One : Critical Path Drag
22. Chapter Twenty Two : Coordination and Control
23. Chapter Twenty Three : Complexities of Incident Command
24. Chapter Twenty Four : Waste Management Planning for Homeland Security Incidents
25. Chapter Twenty Five : Effective Response Communications
26. Chapter Twenty Six : Emergency Response Systems in Other Countries
27. Chapter Twenty Seven : Real Time, All Hazards Global Situations Awareness

- 28. Chapter Twenty Eight : All Hazards Response Team Preparation
- 29. Chapter Twenty Nine : Medical Supply Chain Resiliency
- 30. Chapter Thirty : Inland Waterways Emergency Response

Thus, in term of the relevancy of those Managerial Models toward this paper on Sustainability Perspectives as A Research on Leadership, Innovation, Performance and Competitive Advantage (SLIPCA), it can be elaborated that: Managerial Models, the Human Factors can further be the ground and the most important aspects, especially if there are solid Managerial Models in the Emergency Response Systems.

This paper and its contribution through Aspects of Sustainable Competitive Advantage (SCA)

Aspects of SCA in this paper provide its own contribution. As indicated in the Literature review in this paper on the mentioned aspects, the contribution is originated from the research of McGrath (2013). In this paper, the mentioned contributions refer to the Pros and Cons of SCA. SCA has its Pros and Cons in term of the playbook that becomes the guidance pertaining the Competitive Advantage and its Sustainability. This paper deemed that the contribution of McGrath (2013) is relevant if the following rule is obeyed: In the situation of USAR, it is important to comply with that historical situation in strategy of similar situation, especially if the required Emergency Response Systems are different.

This paper and its contribution through Aspects of Leadership

Aspects of Leadership in this paper provide its own contribution. As indicated in the Literature review in this paper on the mentioned aspects, the contribution is originated from the research of Dubrin (2013). In this paper, the mentioned contributions refer to the fact that Badiru and Racz (2013) refer to the Human Factors and Managerial Models. Thus, both mentioned aspects would not be smooth if the Leadership is not strong.

This paper and its contribution through Aspects of Innovation

Aspects of Innovation in this paper provide its own contribution. As indicated in the Literature review in this paper on the mentioned aspects, the contribution is originated from the research of Anthony (2012). In this paper, the mentioned contributions refer to the fact that Innovation is needed in USAR and Emergency Response Systems, not only in Technical aspects, but also the coordination of Human Factors and Management of Management Models.

This paper and its contribution through Aspects of Performance

Aspects of Performance in this paper provide its own contribution. As indicated in the Literature review in this paper on the mentioned aspects, the contribution is originated from the research of Keller and Price (2011). In this paper, the mentioned contributions refer to Speed and Safety as the main Key Performance Indicators. Especially, in research of Soebandrija, Wajong, Sofyan and Meilani (2013) it is mentioned that Speed of Emergency Response Systems and Safety of the Rescue Team and the Victims, are deemed indispensable in the Emergency Response Systems. Both mentioned Speed and Safety are not only in the USAR using Serpentine Robot within Confined Space; but also for any Situation requiring Emergency Response Systems.

This paper and its contribution through Aspects of Competitive Advantage

Aspects of Competitive Advantage in this paper provide its own contribution. As indicated in the Literature review in this paper on the mentioned aspects, the contribution is originated from the research of Porter (2004). In this paper, the mentioned contributions refer to Competitive Advantage among the rescuers and victims' speed and safety, but also the technology challenges that are strengthened by Human Factors and Managerial Models.

Conclusions

This paper elaborates Sustainability Perspectives as A Research on Leadership, Innovation, Performance and Competitive Advantage (LIPCA) of Urban Search and Rescue (USAR) through Human Factors and Systems Engineering Approach, other than Serpentine Robot in confined space rescue, that eventually focuses on Sustainable Competitive Advantage (SCA). It is emphasized that the challenge is toward maintaining the SCA in this paper. Precisely, if this paper refer to the Table 1, the Year 1 constitutes the 2013 as the first year, and subsequently followed by Year 2 and Year 3, that require not merely the Competitive Advantage in term of the benchmark between USAR in Indonesia, and also toward the global setting; not to mention the Sustainability itself, and the aspects that Badiru and Racz (2013) mentioned in terms of Technical Challenges, Human Factors Issues and

Managerial Models. Those three terms involve the coordination of Leadership, Innovation, Performance and Competitive Advantage (LIPCA).

From view point of Technical Challenges, it is obvious that Serpentine Robot is not the only Technology Challenges that Emergency Response Systems face. Thus, for future research those other technologies can be considered. From view point of Human Factors are deemed in any situations are the key factors in Emergency Response Systems. Similarly, from view point of Managerial Models, the Human Factors can further be the ground and the most important aspects, especially if there are solid Managerial Models in the Emergency Response Systems. Especially, in research of Soebandrija, Wajong, Sofyan and Meilani (2013) it is mentioned that Speed of Emergency Response Systems and Safety of the Rescue Team and the Victims, are deemed indispensable in the Emergency Response Systems. Both mentioned Speed and Safety are not only in the USAR using Serpentine Robot within Confined Space; but also for any Situation requiring Emergency Response Systems.

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Biography

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