Structural Model of System Information for Management Innovation Ruminant-Slaughterhouse

1st Muhammad Syarif Hartawan
Faculty of Technology
University of Krisnadwipayana
Jakarta, Indonesia
ICT Departement Asia e University
Kuala Lumpur, Malaysia
muhammadsyarif@unkris.ac.id

2nd Maya Dewi Dyah Maharani
Environmental Engineering
Sahid University
Jakarta, Indonesia
maya@usahid.ac.id

3rd Erly Krisnanik Information System,
Faculty of Computer Science
Universitas Pembangunan Nasional
Veteran Jakarta
Jakarta, Indonesia
erlykrisnanik@upnvj.ac.id

Abstract— In the digital age, data and information such as performance of Ruminant-Slaughterhouse, both true and false, could spreads faster than ever. The same information technology that provides access to data across the globe very possible can abet the warping of truth and normalization of lies. The truth, untruth and information technology, including how social media manipulates behavior, technologies such as deep fakes spread misinformation, including the bias inherent in algorithms. The aim of the study is formulating a structural model for the Information System Management Innovation Ruminant-Slaughterhouse by understanding the interaction and contextual 3 elements (objectives, constraints, and benchmarks). This model is needed as the basis for the operational policy of the 2020-2024 technology research and innovation program, specially for sustainability of management Ruminant-Slaughterhouse. The research methodology includes secondary data collection based on literature study and expert consultation, and analysis using ISM. The results show that the key goal is to increase the true digital leadership of Manager Ruminant-Slaughterhouse; Provide Vision and Empower Ruminant-Slaughterhouse Users and Workers, and Give up control and Empower Ruminant-Slaughterhouse Users & Workers. The key constraint are: Online Deception of slaughtered diseased animal, Online deception of processed meat, conflict between Users. The benchmarks for the success of the objectives are: fake news goes viral decreasing, and social media manipulates human behavior decreasing.

Keywords: System-Information, System Innovation, Ruminant-Slaughterhouse, ISM

I. INTRODUCTION

In the digital new age of digital transformation, data and information such as performance of Ruminant-Slaughterhouse, both true and false, could spreads faster than ever. The same information technology that provides access to data across the globe very possible can abet the warping of truth and normalization of lies. The information cycle consisting of data-information-alternative decision-decision-action-back to data is no longer a consideration in disseminating information. Data is key when decision-making. Often data has a historical character, and may not always have the function of predicting the value of data accurately in the future, especially if in an environment that is always changing rapidly. Intuition or institutions play a major role in predicting the future, and can assist leaders in formulating hypotheses and making assumptions in order to decide what types of data and resources to focus on, prioritize, and how to combine, analyze, interpret, in a sea of missing information. end at this point.

The truth, untruth and information technology, including how social media manipulates behavior, technologies such as deep fakes that spread misinformation, the bias inherent in algorithms. Considering "Systems Information (SI)" not only being a synonym for "Information Technology," one has to learn a lot about the technologies involved and not only those involved, but also in the organizational processes in which technology is activated or changed [1,2].

The majority of Ruminant-Slaughterhouse Workers both managed by state and private in Indonesia are not permanent or outsourced. The outsourcing gives the firms the possibility of enhancing their SI services [3]

II. INFORMATION SYSTEM INNOVATION

Information Systems Innovation can be defined as the newest application in digital computer organization and communication technology (ICT) [4, 11]. IS on Innovation is very much related to the role of the transformation industry. Digital transformation is an application of digital-based methods, where the working model has implemented a digital system.

With digital-based technology, it is possible that IS on Innovation scheduling slaughter of animals, the arrival of animals predicted, even in the future can be estimated by Ruminant-Slaughterhouse service managers and users will arrive at the location within a certain time. Management Ruminant-Slaughterhouse in the future requires IS Innovation to communicate to the public that the meat produced has been already has Safe-Healthy-Whole and Halal criteria for Muslims. Likewise, animal welfare should be prioritised to be communicated to the public and the world through IS Innovation.

III. RUMINANT-SLAUGHTERHOUSE

The modern Ruminant Slaughterhouse is a very different place from what Upton Sinclair describes in his early 20th century novel, "The Jungle." The Ruminant Slaughterhouse is the largest, has a sleek refrigerated assembly line, staffed by mostly unionized workers, under the direct supervision of local governments. This industry has the cleanest work or hygienic space of any industry.

Meat companies, companies managed for decades for maximum profit and efficiency of performance, these businesses are becoming the focal point for the coronavirus pandemic, with widespread reporting of disease among workers and users The health crisis has exposed how this company has become the weakest link in the supply chain for national food supplies, creating new and very serious challenges for meat producers. After decades of consolidation, around 800 slaughterhouses are inspected by local authorities for hygienic hygiene, processing billions of pounds of meat to meet grocery stores needs each year. But a small number of slaughterhouses are responsible for a large proportion of national meat production. In the livestock industry, a little more than 50 slaughter animals are responsible for 98 percent of the slaughter and processing of meat [5].

IV. INTERPRETIVE STRUCTURAL MODELING (ISM)

ISM (Interpretive Structural Modeling) is a strategic policy planning modeling technique [6,7,8]. ISM as a descriptive modeling technique, ISM is a direct linking structural tool. ISM is a sophisticated planning methodology or technology that is often used in identifying and inferring various interface relationships of a particular problem or problem. The basic foundation in making decisions using the ISM technique is a group. The resulting structural model is for photographing complex systems through meticulous design patterns using graphics and sentences. The ISM technique is capable of turning an illegible or unclear mental system model into a more visible system model. The Interpretative Structural Model (ISM) provides a description of the model through elements that have been classified using the Multiplication Impact Matrix from Applique'e a UN Classement (MICMAC) [8,9,10].

ISM can assist in the management of the maintenance of interaction elements that affect the probability of human failure in using nuclear technology, and help management design policies and guidelines for Management Innovation Ruminant-Slaughterhouse.

Saxena states that the ISM technique provides a basis in program analysis where the processing of information to be generated is very useful for policy formulation and strategic planning [9]. ISM according to Saxena that there are nine program elements which are grouped into the following elements, namely: (i) the affected community sector, (ii) program needs, (iii) the purpose of the program, (iv) possible changes, (v) the main constraints, (vi) benchmarks for assessing each objective, (vii) the activities required for action planning, (viii) the size of the activity to evaluate the results achieved by each activity, and (ix) the institutions involved in the implementation of the program. Through this concept, the formulation of a structural model for the Innovation Information System for Ruminant Slaughterhouse Management through effective policies and supporting programs in "Sustainable Slaughterhouse Management" where this research prioritizes three elements, namely (i) program objectives, (ii) constraints, and (iii) benchmarks in the program.

The three things that the ISM method produces include: (i) key elements, (ii) element hierarchy structures, and (iii) a grouping of elements with four sector classifications. The four sectors of the classification are:

1. The independent sector or sector I (First),

2. Linkage Sector or Sector II (Second),

3. Dependent Sector or Sector III (Third), and

4. Autonomous Sector or Sector IV (Fourth).

Independent sector classification is a driving element of high and low dependency. The related sector classification is a sector that has an unstable relationship between variables and any change in the action of the modifier will have an impact on other sub-elements. Feedback from their influence can amplify impact so this sub-element should be carefully reviewed. The sector classification depends on the sub-elements. Autonomous sector classification is a sub element that has little relationship but can affect the achievement of goals.

V. METHODOLOGY

The study was conducted in November 2018 - April 2019. Data and information collection were obtained from literature studies, and expert opinions in the SI on Innovation, Manager of Ruminant-Slaughterhouse, social and systems fields. The data processing method uses Interpretive Structural Modeling (ISM) through expert survey in-depth interviews from various experts across disciplines to obtain elements and sub-elements or Brainwriting or Clinical Interview in [10, 11]. There are 7 experts consisting of elements from academia (2 people), bureaucrats (3 people) and others from the private sector.

VI. RESULTS AND DISCUSSION

Based on literature review, consultation with experts and practitioners, identification of sub-elements of the five elements obtained data as in Table 1 below:

TABLE I. CONTEXTUAL RELATIONSHIPS BETWEEN ELEMENTS OF STRUCTURAL MODEL

No	Elements	Contextual Relationships
1.	Goals	Gi's role is to support Gj
2.	Constraint	Ci's role is to support Cj
3.	Benchmark	Assesses the goals of B_j

A. Sub-Elements of the Goal Programs

The goal elements consists of 10 (ten) sub-elements, i.e.: (i) to increase the true digital leadership of Ruminant-Slaughterhouse Manager, (ii) Digital mindset (E_2), (iii) Provide Vision and Empower Ruminant-Slaughterhouse Users & Workers (E_3), (iv) Give up control and Empower Ruminant-Slaughterhouse Users & Workers (E_4), (v) to mitigate conflicts (between Users and others Users, etc) and serve as a bridge between the old technologies and the new innovation (E_5), (vi) to rely on data & information, and trust the intuition (E_6), (vii) socialize Users & Workers have skeptical digital-mindset and open-minded (E_7), (viii) encouraging experimentation throughout the organization Ruminant-Slaughterhouse (E_8), (ix) embrace with the try-it-and-see approach in Users & Workers personal lives (E_9), (x) Socialize to Users & Workers step out of comfort zones to digital age (E_{10}). This goal is achieved by using a variety of tools that are part of different systems that each perform a specific function.

Expert assessments of contextual relationships between goal sub-elements produce a respondent perception matrix called the Structural Self Interaction Matrix (SSIM). Furthermore, the SSIM is revised with the transitivity principle to produce a final reachability matrix, and the dependency level and the driver power element can be determined.

TABLE II. STRUCTURAL SELF INTERACTION MATRIX (SSIM) OF GOALS

No.	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10
E1		V	V	X	V	V	V	V	V	V
E2			A	A	A	A	A	A	A	A
E3				V	V	V	V	V	V	V
E4					V	V	V	V	V	V
E5						V	V	V	V	X
E6							V	V	V	V
E7								V	V	V
E8									A	A
E9										A
E10										

The result of consistency of expert opinion is 93 percent, meaning that the perception of expert opinion is considered good so it can be accepted.

TABLE III. FINAL REACHABILITY MATRIX OF GOALS,

No.	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	Drv
E1	1	1	1	1	1	1	1	1	1	1	10
E2	0	1	0	0	0	0	0	0	0	0	1
E3	1	1	1	1	1	1	1	1	1	1	10
E4	1	1	1	1	1	1	1	1	1	1	10
E5	0	1	0	0	1	1	1	1	1	1	7
E6	0	1	0	0	1	1	1	1	1	1	7
E7	0	1	0	0	1	1	1	1	1	1	7
E8	0	1	0	0	0	0	0	1	0	0	2
E9	0	1	0	0	0	0	0	1	1	0	3
E10	0	1	0	0	1	1	1	1	1	1	7
Dep	3	10	3	3	7	7	7	9	8	7	

The contextual relationship between the goal sub-elements shows their role in supporting the program. The results of ISM processing show that to increase the true digital leadership of Ruminant-Slaughterhouse Manager (E_1), Provide Vision and Empower Ruminant-Slaughterhouse Users & Workers (E_3), and Give up control and Empower Ruminant-Slaughterhouse Users & Workers (E_4) have the highest driver power of 10 and the lowest dependence of 2. They are called the key goals, so that program failure does not have an immediate impact (Figure 1).
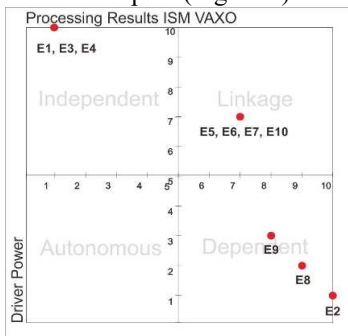

Fig. 1. Relationship Driver Power-Dependency on Goal elements

In Figure 1, The classification of 3 (three) sub-elements are called the independent sector. Analysis also shows that sub-elements are included in the linkage sector are: to mitigate conflicts (between Users and others Users, etc) and

serve as a bridge between the old technologies and the new innovation (E5), to rely on data & information, and trust the intuition (E6), socialize Users & Workers have skeptical digital-mindset and open-minded (E7), and Socialize to Users & Workers step out of comfort zones to digital age (E10) have Driver Power of 7 and Dependence of 7.

The classification analysis also shows that sub-elements are included in the dependent sector are: embrace with the try-it-and-see approach in Users & Workers personal lives (E9), has Driver Power of 3 and Dependence of 8, encouraging experimentation throughout the organization Ruminant-Slaughterhouse (E8), has Driver Power of 2 and Dependence of 9 and applying Digital mindset to innovation of Ruminant-Slaughterhouse activities (E2), has Driver Power of 1 and Dependence of 10.

B. Sub-Element Constraints

The constraint elements consist of ten sub-elements, namely: (i) online deception of slaughtered diseased animal (E1), (ii) online deception of processed diseased animal (E2); (iii) local competition (E3), (iv) labor shortage (E4); (v) conflict between Users (E5); (vi) rising cost (E6); (vii) online deception of personally (Users) identifiable information (E7), (viii) money laundry (E8), (ix) online deception of internet fraud (E9), (x) online deception of cybercrime fraud (E10). The relationships between constraint sub-elements produce a respondent perception matrix called the SSIM (table 4). Furthermore, the SSIM is revised with the transitivity principle to produce a final reachability matrix (table 5), and the dependency level and the driver power element can be determined.

TABLE IV. STRUCTURAL SELF INTERACTION MATRIX (SSIM) OF CONSTRAINT.

No.	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10
E1		X	V	V	X	V	V	V	V	V
E2			A	A	A	A	A	A	A	A
E3				A	A	A	A	A	A	A
E4					V	V	V	V	V	V
E5						V	V	V	V	V
E6							V	V	V	V
E7								V	V	V
E8									V	V
E9										X
E10										

TABLE V. FINAL REACHABILITY MATRIX OF CONSTRAINT

No.	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	Drv
E1	1	1	1	1	1	1	1	1	1	1	10
E2	1	1	1	1	1	1	1	1	1	1	10
E3	0	0	1	0	0	0	0	0	0	0	1
E4	0	0	1	1	0	0	0	0	0	0	2
E5	1	1	1	1	1	1	1	1	1	1	10
E6	0	0	1	1	1	1	1	1	1	1	7
E7	0	0	1	1	1	0	1	1	1	1	6
E8	0	0	1	1	1	0	0	1	1	1	5
E9	0	0	1	1	1	0	0	0	1	1	4
E10	0	0	1	1	1	0	0	0	1	1	4
Dep	3	3	10	9	3	4	5	6	8	8	1

The relationship between drive power and dependency on the constraint sub-element is shown in Figure 2. The assessment of expert opinion on the contextual relationship between the constraint sub-elements has formed a respondent percepion matrix called the structural self-interaction matrix (SSIM). Furthermore, the SSIM was revised with the transitivity principle so that a final reachability matrix was

produced, and the dependency level and driver power of the constraint elements could be determined. The result of consistency of expert opinion is 99 percent, meaning that the perception of expert opinion can be considered good.
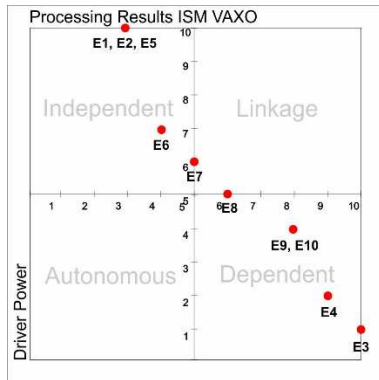

Figure 2. Relationship Driver Power-Dependence on Constraints Elements.

In accordance with the contextual relationship to this element, the results of ISM processing show that there are online deception of slaughtered diseased animal (E_1), online deception of processed diseased animal (E_2), and conflict between Users (E_5) have a Driver Power of 10 and Dependence of 3 (key constraints). While rising cost (E_6) has a Driver Power of 7 and Dependence of 4, and online deception of personally (Users) identifiable information (E_7) has a Driver Power of 6 and Dependence of 5. The fifth sub-elements are classified as independent (Figure 2).

Money laundry (E_8) has a Driver Power of 5 and Dependence of 6, online deception of internet fraud (E_9) and on line deception of cybercrime fraud (E_{10}) have a Driver Power of 4 and a Dependence of 8. The labor shortage (E_4) has a Driver Power of 2 and a Dependence of 9, and labor shortage (E_3) has a Driver Power of 1 and Dependence of 10. The 5 (fifth) constraints does not have high Driver Power, but high dependence, so it is included in the dependent classification (Figure 2). The result of consistency of expert opinion is 99 percent, meaning that the perception of expert opinion can be considered good so that it can be accepted.

C. Benchmarking Sub-Element

The benchmark element consists of ten sub-elements, namely: (i) fake news goes viral decreasing (E_1), (ii) New world disorder (E_2), (iii) social media manipulates human behavior decreasing (E_3), (iv) when like is weapon (E_4), (v) amount case of lies in videotape (E_5), (vi) amount challenge of detection (E_6), (vii) Artificial Intelligence (AI) be the future of fake news (E_7), (viii) AI be the product (services) review (E_8), (ix) AI be the product (services) in the future (E_9), and (x) Fakes New web sites (E_{10}).

The results of the analysis show that there are two benchmarks or program successes, including: fake news goes viral decreasing (E_1), and social media manipulates human behavior decreasing (E_3) have the highest Driver Power of 10 and the lowest dependence of 2 (The two elements are called key benchmarks). Meanwhile, amount case of lies in videotape (E_5) and amount challenge of detection (E_6) have Driver Power of 8 and Dependence of 4. Artificial Intelligence (AI) be the product (services) review (E_8) has a driver Power of 6 and Dependence of 5. The 5 (fifth) sub-element are classified as independent.
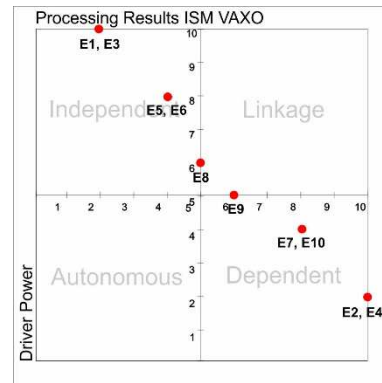

Figure 3. Relationship Driver Power-Dependency on Benchmark Elements

AI be the services innovation in the future (E_9) has a Driver Power of 5 and a Dependence of 6, AI be the future of the fake news (E_7,) and fakes news web sites (E_{10}) have Driver Power of 4 and Dependence of 8. New world disorder (E_2) and when like is a weapon (E_4) have Driver Power of 2 and Dependence of 10. The 5 (fifth) benchmark do not have a high driving force, but their dependence is called dependent classification (Figure 3).

The relationships between benchmark sub-elements produce a respondent perception matrix called the SSIM (Table 6). Furthermore, the SSIM is revised with the transitivity principle to produce a final reachability matrix (Table 7), and the dependency level and the driver power element can be determined.

TABLE VI. STRUCTURAL SELF INTERACTION MATRIX (SSIM) OF BENCHMARK

No.	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10
E1		V	X	V	V	V	V	V	V	V
E2			A	X	A	A	A	A	A	A
E3				V	V	V	V	V	V	V
E4					A	A	A	A	A	A
E5						X	V	V	V	V
E6							V	V	V	V
E7								A	A	X
E8									V	V
E9										V
E10										

TABLE VII. FINAL REACHABILITY MATRIX OF BENCHMARK

No.	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	Drv
E1	1	1	1	1	1	1	1	1	1	1	10
E2	0	1	0	1	0	0	0	0	0	0	2
E3	1	1	1	1	1	1	1	1	1	1	10
E4	0	1	0	1	0	0	0	0	0	0	2
E5	0	1	0	1	1	1	1	1	1	1	8
E6	0	1	0	1	1	1	1	1	1	1	8
E7	0	1	0	1	0	0	1	0	0	1	4
E8	0	1	0	1	0	0	1	1	1	1	6
E9	0	1	0	1	0	0	1	0	1	1	5
E10	0	1	0	1	0	0	1	0	0	1	4
Dep	2	10	2	10	4	4	8	5	6	8	1

The result of consistency of expert opinion is 99 percent, meaning that the perception of expert opinion can be considered good so that it can be accepted.

VII. CONCLUSION

The formulation of a structural model for the Information System Management Innovation Ruminant-Slaughterhouse produces three key goals: (1) to increase the true digital

leadership of Ruminant-Slaughterhouse Manager, (2) Provide Vision and Empower Ruminant-Slaughterhouse Users & Workers, and Give up control and Empower Ruminant-Slaughterhouse Users & Workers (E4). However as a key constraints that are online deception of slaughtered diseased animal, online deception of processed diseased animal, and conflict between Users, this has resulted in the achievement of goals that have not been optimal. The benchmarks for the success of the objectives are: fake news goes viral decreasing, and social media manipulates human behavior decreasing

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