SENSE-MAKING BETWEEN AND ACROSS STAKEHOLDER PERSPECTIVES

Javier Calvo-Amodio, Ph.D.
Oregon State University, Corvallis, OR; Javier.Calvo@oregonstate.edu

Shannon Flumerfelt, Ph.D.
Oakland University, Rochester, MI; flumerfe@oakland.edu

ABSTRACT

The CX Tool© provides a visual Tool© for creating congruence between what is known, thinking, and what is done, doing, within a socio-technical system. It guides the analyst by identifying six elements contained within thinking, Organizational Intelligence, and doing, Performance Management, dimensions. Three elements define Organizational Intelligence: Essential Ideas; Essential Processes/Protocols/Structures; and Essential Assessments/Audits. Three elements define Performance Management: Essential Actions; Essential Standards; and Essential Deliverables. The CX Tool© allows analysts to assign congruency scores between elements horizontally and vertically while allowing comparisons between current and desired state of the system. The CX Tool© does not distinguish between stakeholders' perspectives, a feature that, when faced with complex and/or complicated systems, may prove critical. In this research the authors propose a conceptual framework to incorporate different stakeholders' perspectives into the CX Tool©. A short case study is presented to illustrate how different stakeholders' perspectives can be incorporated and quantified.

Keywords: CX Tool©, pluralism, sense-making, system congruence

INTRODUCTION

The theoretical foundations for the CX Tool© ((Flumerfelt, Kahlen, Alves, Calvo-Amodio, & Hoyle, 2014) can be traced as far back as the work of Frederic Winslow Taylor (1911) and is heavily influenced by the system of profound knowledge developed by William Edwards Deming (1998). The work presented in this paper builds upon work presented by Flumerfelt et al. (2014) and Calvo-Amodio, Flumerfelt & Hoyle (2014) in order to expand the CX Tool©'s capabilities to solve system complexity. These proposed updates to the CX Tool© are presented.

Bringing systemic approaches closer to common use has proven elusive due to several challenges and misconceptions about the practice of systems thinking (Jackson, 2003; Trochim, Cabrera, Milstein, Gallagher, & Leischow, 2006). The CX Tool© was developed with a different perspective in mind. Instead of expecting the user to learn and become proficient in systems thinking, it is designed to augment the holistic analysis capabilities of the user, without requiring extensive systems thinking training. The acumen and analytics required for a management team or leaders to engage in is often a significant barrier to operationalization. In this state, the CX Tool© has demonstrated its power as a visual management Tool© that can expedite an individual or team's ability to "see" the current state. In this application, the CX Tool© offers a solution generated from a singular

or team-based view, which has limitations. While, it may be assumed that the tool's system analyses are vetted through the multiplicity of essential actors and properly represented by a team, that assumption lacks fidelity. Through experimentation, it has been found that a one-dimensional application of the CX Tool© may be too narrow because it may not ensure that all stakeholder perspectives are overtly under consideration for improving system key performance indicator outcomes. The CX Tool© in its current state, therefore, lacks assurance for broad range inputs with regards to compatible problem contexts held by critical stakeholders. Thus, in its current state, the CX Tool© best matches a problem context where system complexity is generated by lack of congruence between what people in a company do and what they know is the dominant problem. However, in order for the CX Tool© to be effective across different levels of system complexity within its problem context, it requires a set of tiered versions. This will allow for more accuracy in the capture of system complexity.

In this research we present the structure for a Tier 2 structure for the CX Tool©, building from the existing Tier 1 version (Calvo-Amodio et al., 2014; Flumerfelt et al., 2014).

SYSTEM COMPLEXITY AND THE CX TOOL©

For the CX Tool©, system complexity refers to a combination between complexity and complicatedness of problem contexts. Thus, complexity in a problem context refers to the existence of emergence as a result of high number of elements and/or interactions present in a system; while complicatedness refers to how hard it is to enact change in a system, given that the solution has presented itself, regardless of the system's complexity. In this vein, it is possible to picture the need for four first level tiers in CX Tool©, depending on levels of complexity and complicatedness of the problem context, to counter its narrow focus. Figure 1 presents a graphical representation of the CX Tool©'s tier structure.

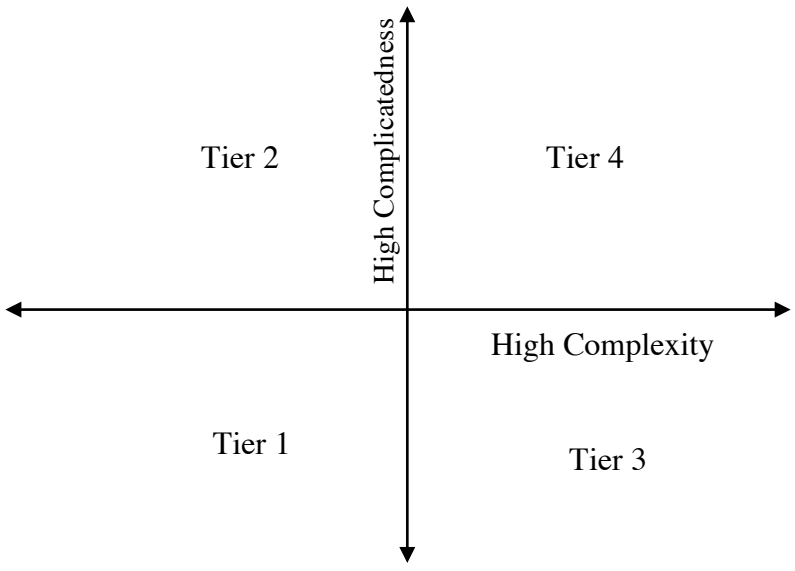

Figure 1. CX Tool© Tiers 1-4 Structure

Tier 1 Version

The Tier 1 version of the CX Tool© has been successfully utilized in different contexts through student projects at Oakland University and Oregon State University, and has been presented at 2014 ISSS (Calvo-Amodio et al., 2014), 2014 ASME IMECE (Flumerfelt et al., 2014), and during workshops at the 2014 and 2015 AIAA CASE Academic Roundtables.

The basic form presents a Tier 1 holistic visual management approach designed to solve system complexity through consensus and expert opinion where complexity is low and complicatedness is low. Table 1 presents the basic form of the CX Tool© in its Tier 1 form.

Table 1. CX Tool© Tier 1 Template adapted from (Flumerfelt et al., 2014)

Title:	Date:	**CX TOOL©**	Key: Congruence = Effectiveness + Efficiency + Relevance / 3 1(low)-3(med)-5(high)	Key: Horizontal Congruence-Current State (HCCS) Horizontal Congruence-Future State (HCFS) 1(low)- 3(med)-5(high)	Key: Vertical Congruence-Current State (VCCS) Vertical Congruence-Future State (VCFS) 1(low)- 3(med)-5(high)

ORGANIZATIONAL INTELLIGENCE	**PERFORMANCE MANAGEMENT**

	Essential Ideas			Essential Actions		
	Future State	Current State		Current State	Future State	
1 2 3 4 5 1 2 3 4 5			1 2 3 4 5 1 2 3 4 5			1 2 3 4 5 2 3 4 5 1 2 3 4 5
	Essential Processes, Protocols, Structures			Essential Standards		
	Future State	Current State		Current State	Future State	
1 2 3 4 5 1 2 3 4 5 1 2 3 4 5			1 2 3 4 5 1 2 3 4 5			1 2 3 4 5 1 2 3 4 5 1 2 3 4 5
	Essential Assessments			Essential Deliverables		
	Future State	Current State		Current State	Future State	
1 2 3 4 5 1 2 3 4 5 1 2 3 4 5			1 2 3 4 5 1 2 3 4 5			1 2 3 4 5 1 2 3 4 5 1 2 3 4 5

The template allows users to assign congruency scores between and among elements to analyse current state and to design more congruent future states. However, this version is limited if system complexity and complicatedness increases.

Tier 2 Version

The Tier 2 version of the CX Tool© must be capable of handling a higher level of complicatedness in a system. In this research, we present a Tier 2 version capable of addressing system complexity under multiple stakeholder perspectives. In Tier 2, congruency scores between and within perspective will be assigned. This is because the proposed Tier 2 template, presented in Table 2, allows for a series of stakeholders' Tier 1 templates to be input into the analysis, allowing for the capture of system complicatedness.

Table 2. CX Tool© Tier 2 Template – Congruency Between Stakeholders' Perspectives

CX TOOL© Tier 2 Version							
CURRENT STATE			**Congruency Scores**		**FUTURE STATE**		
ORGANIZATIONAL INTELLIGENCE					**ORGANIZATIONAL INTELLIGENCE**		
Essential Ideas					Essential Ideas		
Stakeholder 1	Stakeholder 2	Stakeholder 3	**C**	**F**	Stakeholder 1	Stakeholder 2	Stakeholder 3
Essential Processes, Protocols, Structures					Essential Processes, Protocols, Structures		
Stakeholder 1	Stakeholder 2	Stakeholder 3	**C**	**F**	Stakeholder 1	Stakeholder 2	Stakeholder 3
Essential Assessments					Essential Assessments		
Stakeholder 1	Stakeholder 2	Stakeholder 3	**C**	**F**	Stakeholder 1	Stakeholder 2	Stakeholder 3
PERFORMANCE MANAGEMENT			**Congruency Scores**		**PERFORMANCE MANAGEMENT**		
Essential Actions					Essential Actions		
Stakeholder 1	Stakeholder 2	Stakeholder 3	**C**	**F**	Stakeholder 1	Stakeholder 2	Stakeholder 3
Essential Standards					Essential Standards		
Stakeholder 1	Stakeholder 2	Stakeholder 3	**C**	**F**	Stakeholder 1	Stakeholder 2	Stakeholder 3
Essential Deliverables					Essential Deliverables		
Stakeholder 1	Stakeholder 2	Stakeholder 3	**C**	**F**	Stakeholder 1	Stakeholder 2	Stakeholder 3

Notice how, in the Tier 2 template, the Organizational Intelligence and Performance Management have been re-arranged vertically, while the left column now only contains current state elements and the right column contains future state elements.

The complexity of the Tier 1 and Tier 2 templates would make it difficult to use them as visual management Tools. For that, an alternative visual tool is required. Figure 2 presents a matrix structure used as a visual management for a CX Tool© application. This example contains several cells blacked out and cells not filled out at all. The blacked out cells indicate interactions not considered in the analysis, while the blank cells indicate the analysis was only focusing on one-way interactions, as complexity of the system remains relatively low.

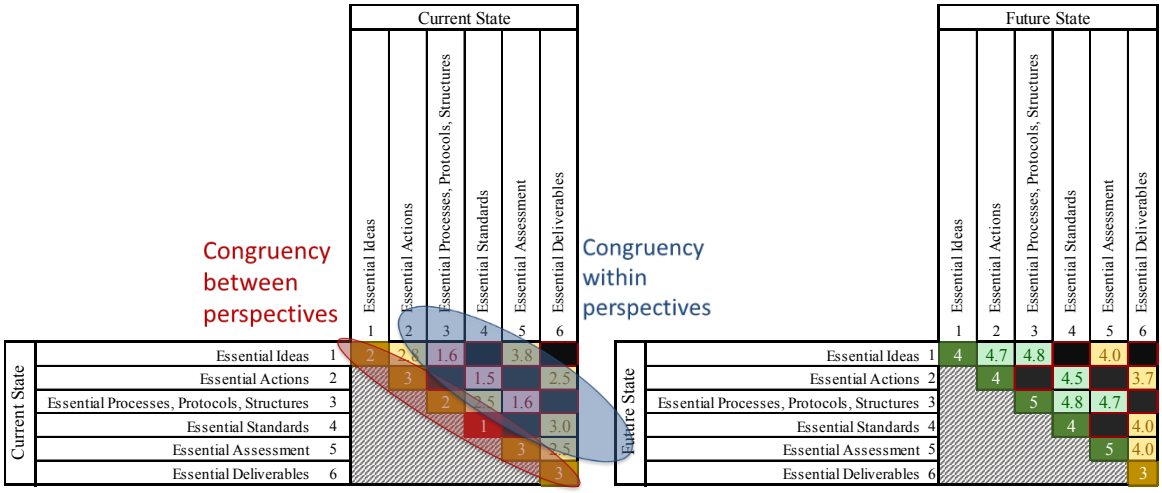

Figure 2. CX Tool© Tier 2 Visual Management Summary

The Tier 2 approach has been successfully utilized by Capstone Design students at the School of Mechanical, Industrial, and Manufacturing Engineering at Oregon State University. The project focused on a Regional Medical Center Oncology Clinic, where the non-face-to-face interaction scores with patients were substantially below expected levels. Three stakeholder perspectives –nurses, doctors, and managers– needed to be considered, and it was discovered large discrepancies existed. The application of the CX Tool©'s Tier 2 version resulted in organizational learning, through a process of sense-making as stakeholders decoded each other's perspectives. The organizational learning yielded the design of a viable future state with much improved congruency scores (as shown in Figure 2).

CONCLUSIONS AND FUTURE WORK

In this work we have presented a Tier 2 version of the CX Tool© capable of solving congruency within higher degrees of system complexities, in the form of complicatedness (see Figure 1). Future work includes the development of Tier 3 and Tier 4 versions. These advanced versions will require the incorporation of network analysis and advanced

Bayesian methods for proper evaluation and analysis of congruency deficiencies in systems with high level of complexities.

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