

SYSTEMIC LEVERAGE INDEX COMPONENT DEFINITIONS

Draft

by

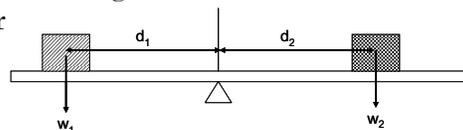
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Notes:

1. Expand development of systemic leverage formulation
2. Archimedes's Law of the Lever

$$d_1 w_1 = d_2 w_2$$



3. Copy of and ideas from SLI presentation at GAN-Net IM CoP PowerPoint
4. Cleanup use throughout of different terms for same element
5. Incorporate formulation from TELCO model that compares EBITDA and EVA. Include (1) revenue health, (2) cost health, (3) capital health, and (4) asset health.
6. Free market capitalism argues that acting in self-interest, corporations act in the best interest of society. SLI questions this. Is it possible to act completely locally and serve the global goal? The global goal, its evolution and emergence, exist within the local and are not wholly visible from the local. As an emergent property, the global goal is distinct from the local and, as a necessary condition, is defined by the local.
7. Reciprocity is about value exchange in a relationship, which is still not the global goal.
8. Emergence of the whole depends on the health of the AQUAL. Can an integral/SLI framework show how metrics (ROI, CSR) are both right (partial truth) and both partial?
9. SLI measures past and present performance. Future is a proxy of health of strategic resources we have, enabling and driving value towards our goals.

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INTRODUCTION

This work is motivated by conflicting theories of “value” creation, stockholders versus stakeholders. How do these theories inform how organizations are balanced and leveraged for sustainability?

MODEL

This research distinguishes three levels at which organizational designers affect organizational alignment and leverage. These levels include the organizational level, the functional level, and the tactical level (see Figure 1).

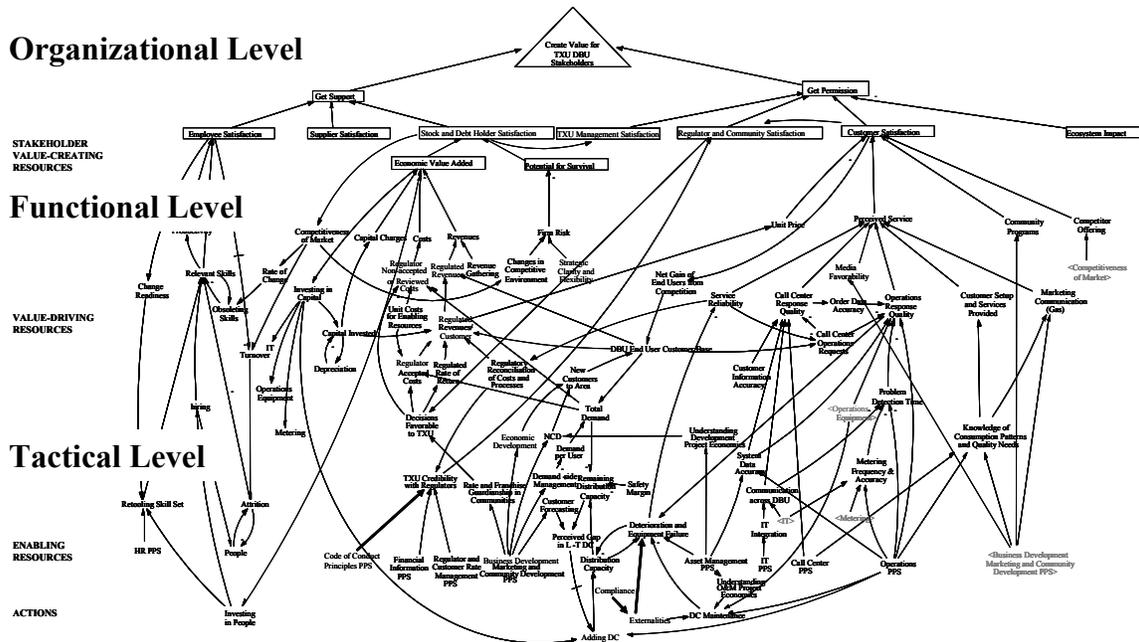


Figure 1: Three levels of organizational design for alignment and leverage.

THE ORGANIZATIONAL LEVEL

Senior management is held responsible for clarifying, communicating and achieving the organization’s global goal. Working through the logic and an example, let’s think about a strategic business unit (SBU).

The global goal $G_{G,VCR}$ is to maximize senior management's achievement of the organization's goals, effectively and efficiently. The effectiveness can be expressed in utility maximization terms, where senior management maximizes the organization's utility U_G for goal achievement, which can be expressed as the discrepancy between the desired status of its value-creating resources $D[Y_{VCR}]$ and the actual status of its value-creating resources Y_{VCR} . Senior management is also charged with utilizing its resources efficiently. Efficiency can be expressed in terms of maximizing the leveraged utilization $\lambda_{struct,VCR}$ of senior management's inputs X_{VCR} .

$$G_{G,VCR} = \max(U_G(D[Y_{VCR,t+n}] - Y_{VCR,t+n})) \Leftrightarrow \forall u_{G,i} \in U_G, \sum_{i=1}^n u_{G,i} = 1.0, u_{G,i} \in (0,1)$$

$$\& G_{G,VCR} = \max(\lambda_{struct,VCR}) \cdot X_{VCR}$$

where: $D(\cdot)$ = desired value of output measure

Exchanging terms, structural leverage $\lambda_{struct,VCR}$ measures how well senior management utilizes its inputs to achieve the organization's global goals.

$$\max(\lambda_{struct,VCR}) \cdot X_{VCR} = \max(U_G(D[Y_{VCR,t+n}] - Y_{VCR,t+n}))$$

$$\lambda_{struct,VCR} = U_G(D[Y_{VCR,t+n}] - Y_{VCR,t+n}) \cdot X_{VCR}^{-1}$$

At the senior level of the organization, the distance in time d_t and the distance in space d_s between cause, their inputs, and effect, their outputs, are long. The senior management inputs X_{VCR} are the outputs of the functional heads Y_{VDR} , and the outputs Y_{VCR} represent the organization's perceived benefits from its actions. The actions are described below.

$$d_t, d_s \gg 0$$

$$X_{VCR} = Y_{VDR}$$

$$Y_{VCR} \propto \text{Benefits}(Y_{VCR})$$

THE FUNCTIONAL LEVEL

Functional management is held responsible for clarifying, communicating and achieving how their functional-level goals will help achieve the organization's goals. We will continue to follow through the logic and example of a strategic business unit (SBU).

The local goal $G_{L,VDR}$ is to maximize functional-level management's achievement of the function's goals, effectively and efficiently. The effectiveness can be expressed in utility maximization terms, where functional management maximizes the function's utility U_L for goal achievement, which can be expressed as the discrepancy between the desired status of its value-driving resources $D[Y_{VDR}]$ and the actual status of its value-driving resources Y_{VDR} . Functional-level management is also charged with utilizing its resources efficiently. Efficiency can be expressed in terms of maximizing the leveraged utilization $\lambda_{dyn,VDR}$ of functional-level management's inputs X_{VDR} .

$$G_{L,VDR} = \max(U_L(D[Y_{VDR,t+n}] - Y_{VDR,t+n})) \Leftrightarrow \forall u_{L,i} \in U_L, \sum_{i=1}^n u_{L,i} = 1.0, u_{L,i} \in (0,1)$$

$$\& G_{L,VDR} = \max(\lambda_{dyn,VDR}) \cdot X_{VDR}$$

Exchanging terms, dynamic leverage $\lambda_{dyn,VDR}$ measures how well functional-level management utilizes its inputs to achieve the function's local goals.

$$\max(\lambda_{dyn,VDR}) \cdot X_{VDR} = \max(U_L(D[Y_{VDR,t+n}] - Y_{VDR,t+n}))$$

$$\lambda_{dyn,VDR} = U_L(D[Y_{VDR,t+n}] - Y_{VDR,t+n}) \cdot X_{VDR}^{-1}$$

At the functional level of the organization, the distance between cause and effect in time d_t is long and the distance in space d_s is short. In other words, the actions taken today affect decisions way into the future, but mostly impact decisions in the local context. The functional-level management inputs X_{VDR} are the outputs of the tactical heads Y_{ER} .

$$d_t \gg 0, d_s \approx 0$$

$$X_{VDR} = Y_{ER}$$

THE TACTICAL LEVEL

Operational management is held responsible for clarifying, communicating and achieving how their operational-level goals will help achieve the function's goals. We will continue to follow through the logic and example of a strategic business unit (SBU).

The tactical level focuses operational-level management on efficient utilization of the operation's resources. Efficiency can be expressed in terms of maximizing the leveraged utilization $\lambda_{dir,ERInputs}$ of operational-level management's inputs $X_{Actions}$.

$$Y_{ERInputs} = \lambda_{dir,Actions} \cdot X_{Actions}$$

$$\forall y_{i,ERInputs} \in Y_{ERInputs}, x_{i,Actions} \in X_{Actions}$$

Exchanging terms, direct leverage $\lambda_{dir,ERInputs}$ measures how well operational-level management utilizes its inputs to achieve the operation's local efficiency goals.

$$\lambda_{dir,Actions} = Y_{ERInputs} \cdot X_{Actions}^{-1}$$

At the operational level of the organization, the distance between cause and effect in time d_t and space d_s is short. In other words, the actions taken today affect decisions soon and in the local context. The operational management inputs $X_{ERInputs}$ are the organization's perceived costs for its actions.

$$d_t, d_s \approx 0$$

$$x_{Actions} \propto Cost(x_{Actions})$$

THE ORGANIZATIONAL DESIGN LEVEL

The organizational design team pulls together these three levels of elements, from organizational to functional to operational, to create an aligned, leveraged organization. Their goal is to maximize achievement of the organization's global goals Y_{GG} with the minimum of inputs $X_{ERInputs}$.

$$\lambda_{sys,GG} = Y_{GG} \cdot X_{ERInputs}^{-1}$$

Integrating the input and output terms in previous formulations, systemic leverage $\lambda_{sys,GG}$ is a function of the three leverage components λ_{dir} , λ_{dyn} , λ_{struct} , organizational inputs $X_{ERInputs}$, desired organizational goals $D[Y_{VCR}]$, actual organizational performance Y_{VCR} and the utility management has for achieving local U_L and global goals U_G .

$$\lambda_{sys,GG} = Y_{GG} \cdot (\lambda_{dir,ER} \cdot Y_{ER}^{-1})$$

$$\lambda_{sys,GG} = Y_{GG} \cdot \lambda_{dir,ER} \cdot (\lambda_{dyn,VDR} \cdot U_L (D[Y_{VDR,t+n}] - Y_{VDR,t+n}))$$

$$\lambda_{sys,GG} = Y_{GG} \cdot \lambda_{dir,ER} \cdot \lambda_{dyn,VDR} \cdot U_L (D[U_G (D[Y_{VCR,t+n}] - Y_{VCR,t+n}) \cdot \lambda_{struct,VCR}^{-1}] - U_G (D[Y_{VCR,t+n}] - Y_{VCR,t+n}) \cdot \lambda_{struct,VCR}^{-1})$$

or $\lambda_{sys,GG} = (D[Y_{VCR}] - \lambda_{struct} \cdot X_{VCR} \cdot U_G^{-1}) \cdot (\lambda_{dir} \cdot \lambda_{dyn} \cdot U (D[Y_{VDR}] - Y_{VDR}))$

$$\lambda_{sys,GG} = f(Y_{VCR}, D[Y_{VCR}], X_{ERInputs}, U_G, U_L, \lambda_{dir}, \lambda_{dyn}, \lambda_{struct})$$

The different components of the systemic leverage equation are linked by the organizational algorithm describing the cause-effect relationships that link the organization's inputs to its outputs, as seen in Figure 1.

IMPLICATIONS OF MODEL

This section explores the implications from the above formulation for “best practice” policies.

1. *Shared Vision.* When local goals are aligned to achieve the global goal, $U_L(\bullet) = U_G(\bullet)$, then $x_{L,n} = x_{G,n} \forall x$
 $\max(U_L(\cdot)) = \max(U_G(\cdot))$
 Local optimization equals global optimization! We generally believe this incorrect.
2. *Corporate Control Mechanisms.* The budget process aligns $X_{L,ERInputs}$ with $X_{G,ERInputs}$, so by definition $X_L = X_G$. This assumes that $U_L = U_G$, which is required for $D[Y_{t+n}]$. Since each group has its own budget for $X_{L,ERInputs}$, this assumes independence of the x_n 's. In reality,
 $y_{L1} = f(x_{L1(1)}, x_{L1(2)}, \dots, x_{L1(n)})$ and in many cases, $y_{L1} = f(x_{L2(1)})$. Others affect my resources.

3. *End Game Dynamics.* What set of policies for $X_{ERInputs}$ would maximize the output Y_{VCR} at some future time, $(t+n)$, given U_G and U_L ? This involves the enabling assets and capabilities, as well as how they are structured to create value.
4. *Therapeutic Work Environments.* Do my thing SO you can do yours, and we both win. Revisit Ackoff's paper on "purposeful systems" and three levels.
5. *Each to His Own.* From the perspectives of cognitive dissonance and bounded rationality, you can ONLY "optimize" and "identify with" the worldview of one level of the GRASP at a time.
6. *The Lone Leverager.* Aligning and leveraging resources and structures at one level or in one section will not significantly improve Systemic Leverage, and may worsen it.
7. *Global to Local Paradox.* Global level management has a high utility U_G for strong growth in $D[Y_{VCR}]$, requiring growth in Y_{VCR} . Local level management has a high utility U_L for stability in Y_{ER} , demonstrating efficient resource utilization.
 - a. *For low systemic leverage.* Must have high growth in $X_{ERInputs}$.
 - b. *For high systemic leverage.* Increase in leverage with small increase in $X_{ERInputs}$ to achieve $D[Y_{VCR}]$.

USING INDEX FOR PERFORMANCE MEASUREMENT

This section explains how the Systemic Leverage Index highlights the level of the organization where inefficiencies and ineffectiveness lie. If the Systemic Leverage Index (SyLI) is below 1.0, then one of its three components must be below 1.0. If it is the **Structural Leverage Index** (StLI), then the low leverage is at the organizational level, meaning executive management is not achieving efficient and effective integration of the functions towards the overall goal of the organization. If the **Dynamic Leverage Index** (DyLI) is low, this indicates that there are inefficiencies at the functional level. By comparing the DLIs for the different functions, it becomes clear what functions provide the lowest leverage in converting the organization's enabling resources into value-driving resources that meet their functional goals. If the **Direct Leverage Index** (DiLI) is low, this indicates that operational management is not taking efficient and effective actions on the enabling resources with which they have been entrusted. Thus, clearly, the Systemic Leverage Index provides a composite measure of the organization's ability to achieve its overall goals, while also indicating the level of the organizational design that contributes the most leverage towards achieving those goals.