

# **LINGUISTIC ACTION: CONTRIBUTING TO THE THEORY OF LEAN CONSTRUCTION**

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## **ABSTRACT**

Lean Construction springs from the failure of current project management and opens the door to significant reform. Lauri Koskela has identified the inadequate conceptual foundations of current practices in terms of both management and the project, and the resulting calls for reform offer new hope for a stagnant discipline. Lean Construction, inspired by the Toyota Production System, has applied principles drawn from production management to the design of project-based production systems. This paper argues that linguistic action contributes an essential addition to the theory of the project and management. The theory of linguistic action describes the very human processes, the purposeful ways people communicate, by which projects are conceived and delivered. This theory provides a coherent conceptual foundation for the design of the lean project delivery system and its management.

## **KEYWORDS**

Lean Construction, theory, linguistic action, project management, production system design.

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## INTRODUCTION

Lean Construction springs from the failure of current project management and opens the door to significant reform. Lauri Koskela has identified the inadequate conceptual foundations of current practices in terms of both management and the project, and the resulting calls for reform offer new hope for a stagnant discipline (Koskela & Howell, 2002).

Lean Construction has focused until now on the organization of production in project settings in the pursuit of task, flow, and value goals. These goals are set by people and delivered by people. Management, i.e., the design, operation, and improvement, of production systems, is carried out by people. This may sound so obvious that stating it is unnecessary. We say it, however, to remind ourselves that people are unique: never merely cogs in a machine. Projects are always human endeavors; some of those projects involve designing and making, as happens in construction. All projects involve individuals with their own interests working together to some common end(s). All project management approaches respond to the situation and create the environment, set the rules and tone, for doing that work. Projects are work. But what is the nature of work and its management?

In projects, work is usually understood as mechanical horsepower work, the application of energy to “materials” – shaping and moving them, or aligning electrons when acting on data. Activity-centered project management represents the work in projects as a series of these transformations. Project managers acting from this perspective use the Critical Path method to design a production system. The resulting schedule represents the layout in time of a network of “machines” on the “shop floor” that optimizes the time and resources needed to complete the project. Planning is separated from execution and control. The schedule determines when each activity should start and triggers action. Control tracks outcomes.

Fernando Flores proposes another definition: “the work of business is making and keeping commitments” (Flores, 1982). This definition puts people at the center as they organize themselves to deliver on the promise(s) of the project to the client. Production system design of this kind of work establishes the conversations and sets the working agreements so people can act in their own interests as they organize and assemble the wherewithal to deliver the promise of the project. Flores defines management from this perspective:

*Management is that process of openness, listening, and eliciting commitments, which includes concern for the articulation and activation of the network of commitments, primarily produced through promises and requests, allowing for the autonomy of the productive unit (Flores, 1982).*

The usual explanation (theory<sup>3</sup>) for why the Last Planner System™ (LPS) performs so well rests on Ohno’s and Shingo’s theories of value and flow (Koskela, 2001), more general theories of production management (Hopp & Spearman, 2000), and Goldratt’s insights into the combined effect of dependence and variation (Goldratt & Cox, 1986). Looking back, we can see that these theories explain much of how Lean Project Delivery and the LPS work to improve particularly the performance of the horsepower work. Looking forward, with Flores’

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<sup>3</sup> We fully adopt here the definition and roles of theory put forward by Lauri Koskela (Koskela, 2000)

definitions of work and management both grounded in the theory of linguistic action, we believe greater understanding and improvement are possible.

Early research on planning system performance shifted attention from the master schedule to the assignment level (Ballard, 1993). It seemed obvious that improving planning system performance would improve productivity. This was hardly a new idea. Many construction associations and companies offered extensive training programs to improve foremen planning. It is hard to trace how the ideas came together, how ideas connected, but the importance of reliable workflow soon became apparent. Of course, the quality of assignments affects the productivity of the immediate crew, but the predictable release of work produced by the assignment is even more important to downstream crews and total project performance. At some point, various practitioners and academics began to understand an assignment as a promise to those downstream.

This idea, “planning as promising,” connected with work at The Neenan Company led by the first author, a student of Fernando Flores. According to Macomber, the three classes of inputs shown on the Activity Definition Model<sup>4</sup> (ADM) used by the Lean Construction Institute (LCI) to illustrate the LPS, made the connection between the central concerns of a promise as understood from the linguistic action perspective and the criteria for an assignment. Linguistic action itself is described in Chapter 5 of “Computers and Cognition” (Winograd & Flores, 1986), “You are what you say” (Budd & Rothstein, 2000) and *A Case Study: George Washington University* (Denning & Medina-Mora, 1995).

The LPS is now understood as a distributed production control (work planning) system that increases workflow reliability. Every planner in the system has the responsibility to say “no” rather than to let a defective plan or assignment advance if specific criteria are not met. This policy aligns with Ohno’s rule that a defective part must not be released downstream. People new to Lean Construction often find this rule at least surprising and at the extreme objectionable. Objections to the rule fall into two broad categories: those who believe allowing people to say “no” will compromise the project schedule, and those opposed to the loss of authority it implies. The rule does shift responsibility for triggering action from the higher level plans to the person who makes the assignment and the performer. Flores’ definition of management highlights why this simple rule is more effective. Physical work happens when people commit to its completion.

We propose in this paper to explain the linguistic action perspective or theory; how it interrelates, aligns with, informs, and supports Lean Project Delivery; and how a fuller understanding of the disclosive nature of people will enhance our understanding of projects and their delivery. We argue that the theory of linguistic action provides a missing explanation by calling attention to the conversational nature of design, planning, and coordination. Managers acting in the LPS “articulate and activate” a routine of conversations that lead to commitments connecting “horsepower work” with the project’s promise to the client and coordinating the wherewithal for the fulfillment of that promise.

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<sup>4</sup> The Activity Definition Model (ADM) is described in workshops and seminars presented by the Lean Construction Institute (See also Ballard 1999 & 2000b). The ADM is routinely used to portray the LPS. Inputs to activities include criteria that describe what is to be completed and how, inputs such as materials that are consumed in the process and resources such as people, equipment or space which carry load.

## THE LINGUISTIC ACTION PERSPECTIVE

When we speak of the *linguistic action perspective* (LAP) we are calling attention to an interpretive structure for explaining and acting in a number of domains. The most basic of these domains is the everyday coordination of action. But people who work on projects do more than coordinate action. Linguistic action as a theory goes beyond coordination. In this paper we explore five issues significant to the overall functioning of projects and at the heart of making history: (1) coordination of action; (2) assessments; (3) discourse (storytelling) as the basis for making sense; (4) trust between coworkers; and (5) mood. Please consider what we are doing here as a beginning, the first attempt to redraw the map (template) for delivering projects; details come later.

### EVERYDAY COORDINATION OF ACTION

Projects are first and always human endeavors. Projects might also be engineering, research, or improvement endeavors. All projects require that people work in concert with each other. That projects are human endeavors is good news because of what each individual brings to each project. As humans we have capacities for learning, improvisation, assessment, cooperation, flexibility, and intentionality. These capacities are essential in the face of each project's ever-present uncertainty. And humans also have pasts, presents, and futures. That sense of history and temporality allows us to unite for making and keeping commitments. Flores underscores that:

*To be human is to be the kind of being that generates commitments, through speaking and listening. Without our ability to create and accept (or decline) commitments we are acting in a less than fully human way* (Winograd & Flores, 1987).

The world is created and changed by each project; it is invented through acts of language. Flores offers a grammar of action which he derived from the work of both John Austin and John Searle distinguishing the five basic acts (Davis, 2000). The essential work of projects is conducted as conversations built on this grammar, as detailed in Table 1 below.

Table 1: Linguistic Acts: Grammar of Action

Action	Example	Definition
Declaration	"We will put a man on the moon and bring him back safely in this decade."	Creating a space of action, not to be confused with a promise.
Request	"Please deliver the submittal on Thursday."	Calling for a statement of commitment.
Promise	"You can have the crane at noon."	Statement of commitment to provide something specific by a specific time.
Assessment	"We are making good progress."	Offering an opinion with or without any basis for the assessment.
Assertion	"All tasks were completed as promised."	Statement of fact. Includes an offer to provide evidence.

Someone with authority *declares* there is a project. That new project is there for one and only one purpose: to deliver on the set of *promises* to a customer. Flores calls the cycle of promising “The atomic structure of commitment” (Flores, 1982).

### COMMITMENT WORKFLOW

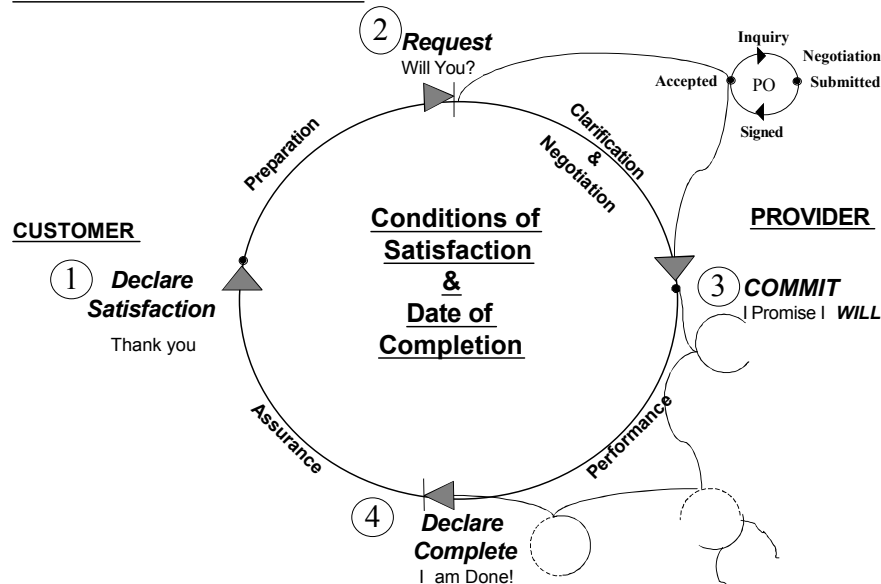


Figure 1: The Conversation for Action

In response to a concern, a Customer prepares and makes requests. S/He negotiates with a Performer, who promises to deliver on agreed Conditions-of-Satisfaction, does the work, and declares it complete. The Customer, if s/he agrees says, “Thank you” or works with the Performer to resolve and learn from the breakdown.

Projects are organized first in conversation. Those conversations often begin as speculative in nature, leading to the *declaration* of roles and the *request* for people to fill those roles. *Promising* to accept those roles, people act accordingly.

Planning is a conversation that continues over the duration of the project. The planning conversation arises out of team members’ *assessments* of risks, opportunities, and value. Eventually, assessments lead to speculation, which in turn leads to more *promising* conversations. Through time, a network of commitments builds, becoming the fabric of the project. That network must be plastic for a project to succeed in an ever-uncertain world. Flores defines “management” as the care given to the team’s effectiveness in continuing to carry out and commit anew as the future and the project unfold.

Teams are wary of promising. People will say, “I don’t want your promise. I want the result.” We have good reason to be wary. Task reliability is a flip of the coin (or worse). In the project setting we need to elicit *reliable promises*. A promise can be considered *reliable* when the person making it can say,

“I am competent to perform or I have access to competence.”

“I estimate it will take so much time (hands-on).”

“I have the capacity & I’ll allocate it.”

“I am not having a private unspoken conversation in conflict with the promise.”

“I will be responsible (willing to clean up any mess that ensues).”

We now understand that “promising”, particularly the ability to make and elicit reliable promises, is the primary skill needed for working in the LPS and is the key to coordination. (And we know that the skill of making and eliciting *reliable promises* can be taught.) Planning itself happens in conversation even if people are only talking to themselves. On projects managed under the LPS, these conversations create a coherent set of commitments connecting the “promise of the project” to the client with work, and coordinating the wherewithal necessary for its completion.

The network of commitments to deliver the project is articulated in the development of Phase Schedules to deliver milestones (Ballard, 2000, See also Ballard & Howell, 2003). These schedules, prepared by those responsible for the work, represent their best understanding as a team about how they will do the work. Working from the project milestone backwards, each “request” pulls the work needed from those upstream. The requestor and performer establish the COS at hand off points between specialists. As a result, each member of the team understands the entire effort required and their part in it. While they know even this schedule will evolve, they are confident of their ability to work together to keep their collective promise.

The promise for the work by each work group becomes sharper when activities enter the look-ahead period. The responsible individual reaffirms their promise to start and complete the work in the available period or immediately alerts the team if they have lost confidence, in effect reopening the planning conversation to establish a new promise. Then the gritty work of making work ready for assignment begins. Constraints to starting and completing the work are identified and requests made to suppliers. Planners at each level assess the reliability of the resulting promises and take action as necessary. Finally the assignment is prepared.

The word “Assignment” has a ring of top-down direction. It is better understood as the promise made by the planner in response to requests from the phase schedule, and as such is also a promise to those downstream for the release of work to them. From this perspective, projects are promises to the client and their completion is realized by action coordinated through promising at every level. By contrast, current project management attempts to coordinate action with a master schedule. Lacking a conversation-centered process to develop explicit promises for delivery, the project managers are left to remind participants about what they should do: communicating urgency to motivate them to take action.

### **Assessing Is an Untapped Capacity for Distributed Control**

People are always in a position of making assessments. We are these walking around machines for saying what is good, bad, beautiful, ugly, smart, dumb, and dangerous. In the project setting people are distributed about the physical environment. There is no one central assessing authority who has the capacity for making assessments based on seeing what is occurring as it occurs everywhere.

This distributed capacity of assessing is usually under utilized. This is particularly the case when project controls is constituted as a distinct organizational division of labor. The

project manager relies on a few, perhaps very smart and experienced people, to say how the project is doing on cost and schedule. But this after-the-fact control doesn't keep the project on track. Consider the alternative.

In the Last Planner™ approach a cadre of informed and experienced people is in the position (present to the conditions of the project work) and are responsible for making assessments for how they are collectively doing performing the project. These last planners make these assessments in real time with their (sub) team members adjusting their actions and re-planning along the way. This distributed capacity for assessing seemingly has less control. Observing last planner projects we have learned that the “head” is not smarter than the body. By tapping the distributed capacity for assessing, the project organization has a vastly superior ability to control.

### **Storytelling Is the Basis for Making Sense**

As human beings, we go about our lives trying to make sense of the world. We do this by giving explanations, finding relevance, and providing context. People even make up stories in order to explain how what they are seeing and experiencing fits with their pre-existing view of the world. Any remaining discord is unsettling.

Each of us tells our own story of what is happening, why that is important, and how we fit in. Our unique experiences in life, our education, social circumstances, existing commitments, relationships, etc., all come together, enable us to make sense of the world. If we each have only our individual story, we may find ourselves in a collision of perspectives that makes the planning, managing, committing, and carrying out of commitments impossible.

Flores says managing entails “allowing for autonomy.” Autonomy in the absence of shared contextualization can become anarchy. We produce alignment as we share stories—and not just any stories, but the story of the project, of who we are as a team on the project, and why it matters to others. We (and the project) become what we say (Budd, 2000).

### **Functioning with Our Blindness, Learning, and Innovation All Require Trust**

Individually and collectively, we need each other (whether on projects or not) for success. Each of us lives with a certain degree of blindness and though the condition may fluctuate, blindness is a permanent human condition. While today we can see something that wasn't visible yesterday, there is still plenty that will remain invisible to us. The facticity of blindness calls for help from others. Our ability to get help depends on the strength of our social network. In the project setting we don't have time for that social network to gradually develop. In large part, the availability each of us gives to others is related to the trust we have in those other individuals. Flores offers this practical, teachable, and learnable linguistic-based approach to developing trust:

*Trust is a matter of making and keeping commitments, and the problem of trust is not loss of confidence but the failure to cultivate commitment making. (Solomon & Flores, 2001)*

Learning is social. We learn in proximity to and in conversation with those who are competent. While each of us has experiences of learning alone, perhaps learning to juggle or

even learning a foreign language, the learning that is required on projects must happen as the project unfolds. Often, we know there is something to be learned. In that situation we need only reach out to our network of support (often people beyond the project team, whom we trust) for help. Perhaps just as often, we are blind to the missing competence. In that case, only those nearby are in a position to make the assessment and to offer help. Without the precondition of trust, people do not make offers of help that might be received as unwelcome.

Innovation, too, is social. Projects inevitably require gee-whiz solutions. The perception that innovation comes only from those who are innovative is a cultural myth. Even Alexander Graham Bell had help from Dr. Watson. Project team membership can be both short-lived and transitory. Solving project problems is rarely solitary work; sharing the gain and the pain requires trust. The social coupling required for innovation is nurtured before the fact in the success of the everyday conversations for coordinating one with the other.

### **Mood Shapes Possibility**

We have all had the experience of working with an individual with a bad (i.e., ineffective for the situation) mood. Perhaps the mood is cynical, or maybe only resigned. Perhaps the mood is inappropriately positive, failing to see danger or urgency. Either way, positive and negative, moods are infectious. When left unattended, the mood of the team will drift.

Our experience of moods is both physiological – oriented as a feeling in the body – and linguistic – an assessment disposed positively or negatively to the future. Moods arise out of our past experience. A mood of dread may coincide, for instance, with the recognition that it is necessary to fire an employee. That is a situational mood. Other times an individual's mood carries with him from the past. In the face of a team that sees numerous possibilities one member may see only no possibility; her mood of resignation can infect the team as it passes from one situation to the next.

One way we gain access to mood is by investigating the conversation that constitutes the mood. That conversation is often unarticulated, living only as a private thought, or less than that. A conversation of resignation is “Nothing is possible here. There is nothing I can do that will matter.” Of course, this is not a statement of fact. The individual is living in an assessment. By characterizing the situation as one of no possibility the individual left to operate with that mood shapes a space of no possibility. The action required is to reshape the assessment to one that is appropriate for the situation. The reshaping occurs in revealing the often-unexamined background and history of the mood.

### **THE LAST PLANNER SYSTEM™ AND THE LINGUISTIC ACTION PERSPECTIVE**

Work in project settings has always been conversational and aimed at commitments. These conversations are shaped by the management system in place and by the intentions and perspective of those in authority. Current practice rests on a faulty conception of that work. Managers who hold the activity view of work in projects manage as if the work could be accomplished by a series of machines. Of course, horsepower work is done in projects. But projects themselves are created when one person (or entity) makes a promise to another. Projects are promises—big, risky promises—to deliver.

We believe that this short introduction to linguistic action and Flores' definition of management opens a new way to understand project delivery: a new theory that describes



what we already see, allows us to make new and essential distinctions, gives us a new lever for action, and provides a foundation for further investigation and learning. We summarize our understanding in two sections below. We believe the first statement applies to all projects but that current project management inhibits the process. The second section describes the function of the LPS.

Delivering on the promise(s) of the project requires a network of commitments among people with limited common experience and future together. People in conversation, applying the grammar of coordination, cope with and take advantage of uncertainty as they create value for all participants. Together they deliver better answers; they reveal, deepen and resolve concerns. By their agreement, the design of the project and its delivery system emerge.

The LPS “articulates and activates” a routine of conversations that lead to commitments connecting “horse power work” with the promise(s) of the project to the client and coordinating the wherewithal for its completion. People working in the LPS coordinate action by designing their unique network of commitments and activating it in routine planning cycles. They come to rely on a distributed capacity for judgment. Project teams of last planners learn from their experience when they find their confidence misplaced. The management of the network of commitments to assure more reliable promises connects directly with the management of the physical work where waste is reduced by increasing workflow reliability. Reliable promising creates reliable workflow.

## CONCLUSIONS

The Last Planner™ is a brilliant project management innovation that produces the routines for the ongoing articulation and activation of the network of commitments among responsible agents at every level. Acting in language, these agents produce an evolving set of coherent commitments in response to an always-updated assessment of the project condition that connect the horsepower work to the promise of the project and coordinate its completion.

The five aspects of the linguistic action perspective explored in this paper—coordination, assessments, discourse (storytelling), trust, and mood—influence how people work together on projects and shape the outcome. Flores describes this as the “disclosive nature of humans or history-making” (Spinosa, Flores, & Dreyfus, 1997). Each project is a unique opportunity for a collection of people to make history together.

We anticipate that a linguistic action perspective will explicate other issues of project delivery: project leadership, quality, innovation, cost management, training, and the use of systems for managing projects.

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