

# Information Flow to Front-Line Employees: Leader-Member Exchange Theory and Internal Communication



A Capstone Project

by

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## ABSTRACT

This research is a case study within a large bureaucracy: the physical plant operations of a Tier-One university in the United States. The organization of study at this university received low scores for *internal communication* in their all-employee surveys in 2012 and 2014 and was cited for “lack of information flow to front-line employees” in a peer audit conducted in 2011. Root causes for these deficiencies are investigated through Activity Theory analysis along with Leader-Member Exchange Theory (LMX) within the organization. No formal initiatives addressing internal communications had been initiated when this study was launched so it is hoped that research results can have bearing on future plans for the organization.

Front-line, administrative, and supervisory personnel were employed in this study to garner a full spectrum of viewpoints regarding the efficacy of internal communication in the organization. Research observations, along with results from a study-specific survey were triangulated with scores from an all-employee survey to validate the findings and the recommendations from the study.

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## INTRODUCTION

For all of recorded history, people have studied and discussed communication processes within their dominant organizations, but in many respects these discussions differ little from those present during the past three decades of institutional organizational communication study<sup>1</sup>. Organizational communication research is a robust field and the study of communication practices helps characterize coordination and control within organizations. This study seeks to examine that coordination and control, within a particular organization, and determine if there is a positive effect between Leader-Member Exchange Theory (LMX) and effectual internal communications, observing how LMX might shape the environment for it. In the context of this study the examination of internal communication will be primarily focused on activities among *front-line* employees.

Communication competence has been conceptualized in a variety of ways. In fact, there are almost as many definitions of communication competence as there are researchers interested in the construct. One of the most popular conceptualizations of competence is that of Spitzberg and Cupach (1984), who state that “Communication competence refers to the ability to demonstrate appropriate communication in a given *context*. This requires at least an elemental analysis of how tasks, situations, and person(s) interact to affect what is considered to be appropriate communication behavior.”<sup>2</sup> As part of the examination of how LMX may shape an environment conducive to effective internal communication this study will also evaluate that “context” for communications and then annotate any effective or sub-optimal functions that are employed on a recurring basis. Activity Theory, which seeks to understand the unity of consciousness and activity as a product of interactions with people and artifacts<sup>3</sup>, will be one of the frameworks used in the analysis. Leader-Member Exchange, which posits that effective leaders form dyadic relationships with followers that differ in quality and ultimately affects team performance, will also be used.

## PROBLEM

Internal communication is vital for every organization; maintaining effective internal communication is also problematic within large bureaucracies. For the organization of this study, employee surveys in 2012 and 2014 indicated that employees feel information does not arrive in a timely fashion and it is often difficult to find needed facts. In regard to information flow in large organizations it can be noted that the scores (from benchmark data included with

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<sup>1</sup> Jablin, F. M., & Putnam, L. L. (Eds.). (2001). *The New Handbook of Organizational Communication*. Thousand Oaks, CA: SAGE Publications, Inc. doi: <http://dx.doi.org.ezproxy.lib.utexas.edu/10.4135/9781412986243>. p. 3

<sup>2</sup> Shockley-Zalabak, Pamela. 2006. *Fundamentals of Organizational Communication: Knowledge, Sensitivity, Skills, Values*, Sixth Edition, by. p. 5

Pearson Education, Inc. Published by Allyn and Bacon.

<sup>3</sup> Kaptelinin, V., & Nardi, B. A. (2006). *Acting with technology: Activity theory and interaction design*. Cambridge, MA: MIT Press. p. 18

employee survey results) for the statement “The right information gets to the right people at the right time” drop as the size of the reporting organization increases.

There was also an audit of this organization done by peer institutions and that audit recommended “improving information flow to front-line employees.”

Preliminary investigation on these shortcomings noted in the surveys and the peer audit revealed some factors likely contributing to the situation: (1) extremely disparate work groups having unique demands and (2) a considerable aversion by many individuals in using e-mail for communication.

Work groups within this study had a large variation in their needs for detailed, technical information in addition to information associated with routine, generic functions common to each group. For example, a technician might be frustrated in not having immediate access to the temperature differential of chilled water supply and return lines, and at the same time be frustrated not knowing how to categorize a new work order needed to correct the problem at hand. A single source for the information in both scenarios above does not exist; there is a natural segregation for technical data and administrative functions. Employees seem to lose sight of that distinction and just complain about “the whole system.” Such attitudes do little for continual improvement and typically just lower morale.

The technology for e-mail has become a mainstay for organizations to communicate with employees; studies have shown that older adults are less likely to use such technology. To date, evidence shows that the potential benefits of technology for older adults have not been realized.<sup>4</sup> Only 9% of the study group population is under the age of 40; 66% is over the age of 50 and 23% is over the age of 60. Survey data collected no information relating to the use of electronic communications but the researcher did confirm that “submitting their time card” was the only electronic usage for some employees in the study group. The reticence of some study users to embrace e-mail and on-line activities helps explain some gaps in the organization’s management of internal communication.

### ***Activity Theory***

To understand all of the factors affecting the level of communication with front-line employees, a reliable system for examination is needed; one such system is Activity Theory. Activity Theory is a theoretical framework for the analysis and understanding of human interaction through their use of tools and artifacts. Activity Theory helps to examine *all* activities that take place in a work center, often subconsciously, in order to obtain some object that is necessary to achieve an outcome an organization is in pursuit of. A graphical representation of an activity system is in Fig. 1. A simple example of this for a front-line employee in this study might be the task of calibrating air flow in a fume hood. Calibrating the air flow is an *object* that is needed to achieve the *outcome* of compliance with National Fire Protection Association (NFPA) annual testing requirements. Conducting an air flow test, however, is not always a straight-forward endeavor; the technician must first investigate when the laboratory will be vacant to allow for

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<sup>4</sup> Pavel, Misha; Jimison, Holly; Hayes, Tamara; Kaye, Jeffrey. Technologies for an Aging Population Release date: Spring 2009. Volume: 39, Number: 1. p. 36

testing (community). The technician must then find someone that can grant him/her access into the laboratory (community, rules). The technician must also confirm which criteria should be used for this particular test—the fume hood manufacturer’s spec, the design engineer’s spec, or the in-house environmental safety group’s spec (rules). While the tech is conducting the air flow test he/she must also know how to launch an additional work request to address any deficiencies that might be discovered (division of labor). In essence, Activity Theory basically helps to explain “how we do things here.” In this simple example an actor (the technician) uses tools (an air flow meter) within a community (laboratory research facility) using established rules (NFPA) while knowing divisions of labor (which crafts are needed to address various deficiencies) to obtain an object (completed test procedure) so an outcome is reached (NFPA compliance).

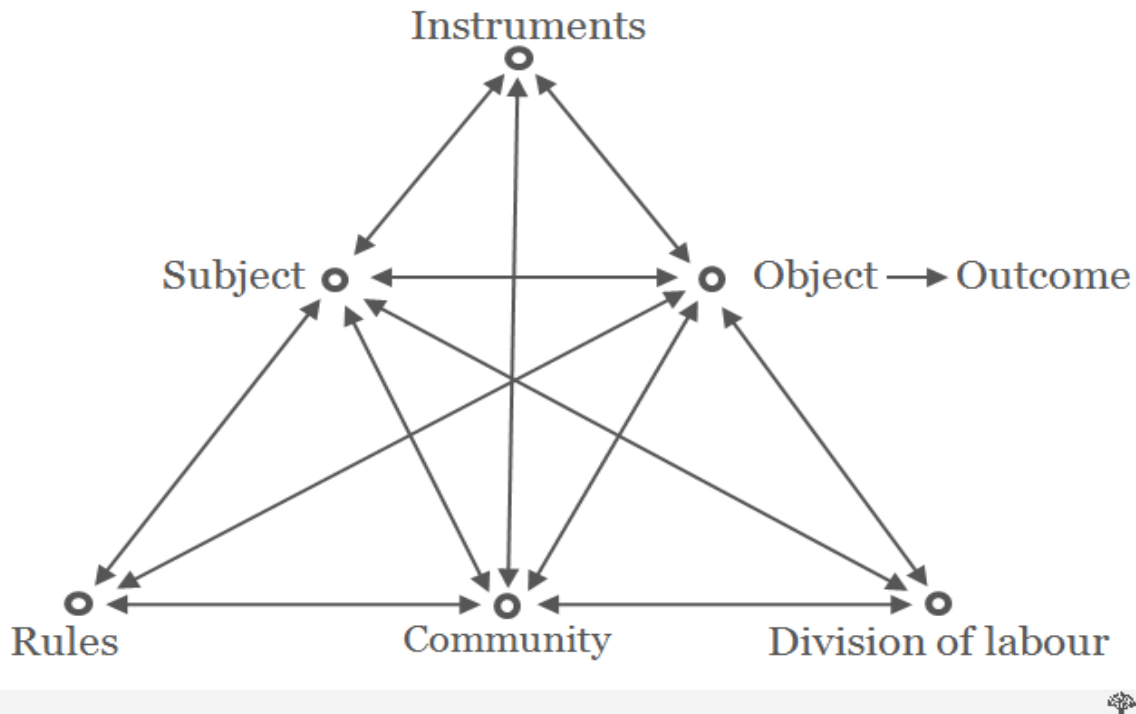


Fig. 1. An activity system.

Note how the arrows connecting all of the components are bi-directional. Each component exerts impact in relation to the intensity of *other* factors—which are all dynamic in nature. If information flow relating to a given component in the triangle is sub-optimal that will cause an effect on one of the other components. All of the simultaneous reactions in play impact the achievement of objects, and ultimately the outcome being sought by the organization.

Communication in regard to any single factor is important, but the collective communication for the entire system is *imperative* for a successful outcome. It is also critical to note each component in the triangle representation has *multiple* inputs. In the air-flow test example given above, for example, rules are quite pertinent to his object: the technician is driven by (1) the expected time limit given to him to complete the air flow test, (2) reporting his presence to work on the project to the building manager, (3) reporting labor hours spent on the task to his

work planner, and (4) getting authorization to obtain the specialized calibration tool needed to conduct testing. Lack of information (e.g., who has a key to the lab?) or misinformation (e.g., when will the lab actually be unoccupied?) in this example show how poor internal communication can have a detrimental impact in obtaining both an object *and* an outcome the organization needs. Often, a task requiring only a few hours of touch labor might take two calendar weeks to complete after the work assignment is received. When such a scenario repeats, it aggravates the front-line technician, frustrates clients that expect work to be done in a timely fashion, and then fuels negative sentiment within the organization.

Activity Theory helps to illustrate *what* happens within an organization, but it is also important to note *how* those things happen. One such measure for this is Organizational Citizenship Behavior (OCB). OCB is individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and in the aggregate promotes the efficient and effective functioning of the organization<sup>5</sup> (not to be confused with “grudging compliance”<sup>6</sup>). It is effectively a measure on the reciprocity within a group (whether between individuals or between an individual and the organization).

### ***Leader-Member Exchange Theory***

In an organization’s activity, actors who are pursuing an endeavor will often encounter some type of disruption to a procedure they are using. An actor will then, often subconsciously, change their plan and seek: (1) a different tool to do the work, (2) a different interpretation of rules governing the work being done, or (3) a change in the relationship with the community or in the division of labor typically used to complete the task.

In the activity system, one or more subjects labor to cyclically transform an object in order to achieve an outcome. To transform the object, they use mediating instruments (physical and psychological tools). This activity takes place within a community that makes the activity meaningful and is conducted with rules and a division of labor related to that community<sup>7</sup>.

In effect, whenever an actor experiences a disruption, they will then need help from someone else who is likely outside their span of control. Thus OCB can help front-line employees get information they need to complete their tasks. The roots of contemporary OCB date back to 1938 with Chester Barnard’s *The Functions of the Executive*:

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<sup>5</sup> Organ, Dennis W.; Podsakoff, Philip M.; MacKenzie, Scott Bradley. Organizational Citizenship Behavior: Its Nature, Antecedents, and Consequences. Thousand Oaks: SAGE Publications, 2005.

<sup>6</sup> Kramer, Roderick M. 1950- (Roderick Moreland), and Todd L. Investigator Pittinsky. 2012. *Restoring trust in organizations: Enduring challenges and emerging answers*. New York: Oxford University Press. P. 132

<sup>7</sup> Spinuzzi, C. (2011). Losing by Expanding: Corraling the Runaway Object. *Journal of Business and Technical Communication*, 25(4), 449 – 486.

The book is notable for its focus on how organizations actually operate, instead of previous approaches to organizations that emphasized "prescriptive principles. It has been praised for being one of the first books to consider leadership from a social and psychological viewpoint."<sup>8,9</sup>

Barnard noted that while formal structure and controls have their place, they do not define the *essential* nature of cooperative systems. Those social, psychological, and cultural aspects are at the heart of OCB as it relies on some individual's *personal choice* rather than some formal rule or directive. Again, themes of OCB are (1) it focuses on something other than routine functions with hard measures of productivity and (2) it contributes, directly or indirectly, to more effective organizational functioning. Clearly then, there is a need to foster a climate that promotes the subtleties of OCB. One such measure to encourage that environment is LMX.

As OCB has been related to reciprocity, LMX has been positively related to *altruism*, which is desirable for front-line employees needing help from others to get information needed to solve a problem. LMX basically refers to the unique relationship quality that a leader develops with a subordinate. As noted by Wayne, Shore, Bommer, and Tetrick,<sup>7</sup> as the quality of the LMX relationship increases, OCB also increases. Numerous studies have shown that high LMX will yield followers' engagement in altruistic behaviors.<sup>10,11</sup> LMX does not focus on the specific characteristics of an effective organizational leader or a follower; it focuses on the nature and quality of the relationships *between* a leader and his or her individual subordinates. The quality of those relationships can either aid or hinder information flow to front-line employees.

One particular facet that is recognized by LMX is the existence of "in-groups" and "out-groups." The emergence of LMX (see Fig. 2) grew from the study of Vertical Dyad Linkage, which identified links between a leader and a group on the basis of (1) trust in the relations within the group, (2) competencies of the group, and (3) loyalty between the leader and group. Those studies revealed there were varied degrees of latitude granted by a supervisor to his staff member, which affected subsequent behavior of both the supervisor and the staff member. Specifically, the studies documented that for some members a boss might employ leadership *and* supervision, while for other groups the superior would only supervise. Recognizing those two distinct groups, the terms "in-group" and "out-group" were coined to help describe dynamics within an organization. It should be noted that LMX relationships develop over an extended period of time; as such, those relationships become well established and then have ongoing influence for how an employee provides feedback to their leader and how a leader makes decisions. Those interactions between the leader and any established "in-groups" and "out-groups" in turn affect internal communications within the entire organization.

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<sup>8</sup> Rainey, Hal G. *Understanding and Managing Public Organizations*. Hoboken: Wiley, 2009.

<sup>9</sup> Gabor, Andrea. (2000) *The Capitalist Philosophers: The Geniuses of Modern Business--Their Lives, Times, and Ideas*. 1st Ed. New York : Times Business

<sup>10</sup> Organ, Dennis W.; Podsakoff, Philip M.; MacKenzie, Scott Bradley. *Organizational Citizenship Behavior: Its Nature, Antecedents, and Consequences*. Thousand Oaks: SAGE Publications, 2005. p. 104

<sup>11</sup> Stewart Wherry, Heather M. 2012. "Authentic Leadership, Leader-Member Exchange, and Organizational Citizenship Behavior: A Multilevel Analysis." Order No. 3521967, The University of Nebraska - Lincoln. p. 131



“Out-groups” typically get less information while “in-groups” will likely be favored in daily communications, so the quality of LMX relationships—with all staff members—is important for creating an environment favorable to internal communication.

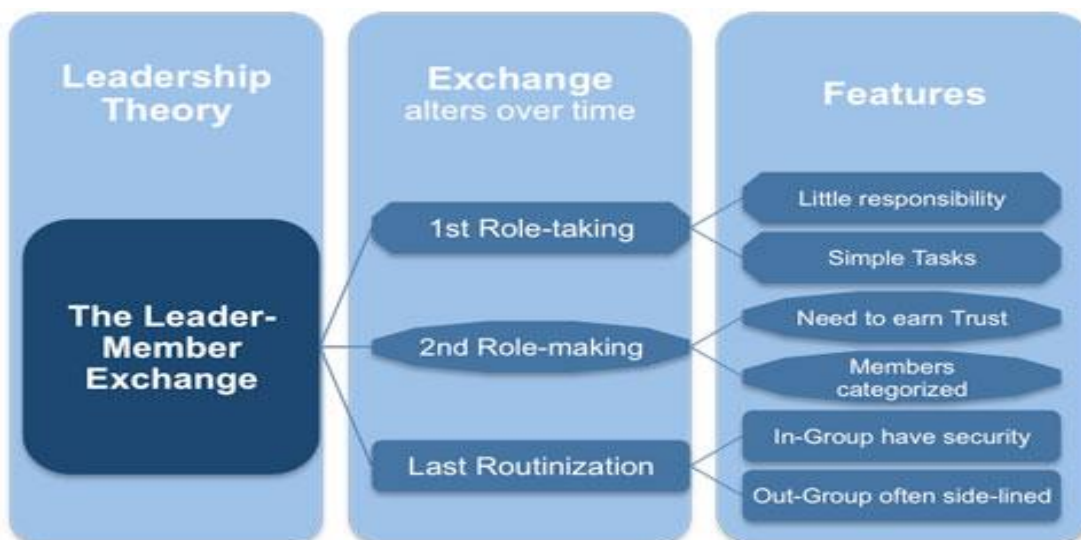


Fig. 2. LMX leader-member associations.

## BACKGROUND

### *Study Group Demographics*

The study group is comprised of the front-line technicians providing maintenance services to a large, public university. The group maintains 400+ buildings across 900+ acres, totaling 20M+ square feet of space. Demands on this group are very high as the university is heavily involved in research and must demonstrate competence in their research to maintain grant funding (received \$500M+ in 2014). A typical frustration for this group in their mission to support campus researchers is being able to interrupt utility service (electric, water, steam, etc.) to perform critical maintenance. Mechanical, electrical, and plumbing upgrades are often needed during times that experiments cannot be interrupted without invalidating months or even years of data collection. The study group is thus often ignored in their pleas to shut down mechanical systems to preform preventative maintenance on equipment though they are maligned should any of that equipment not perform perfectly.

Recruiting for this group is challenging in that the wages for this institutional environment are 20 – 25% lower than the private sector market; this is acknowledged by all (executives and management). A lack of pay raises for 5 consecutive years, however, has decreased employee satisfaction and caused an increase in turnover from historical levels. The turnover rate for this group is currently averaging 30%.

### ***All-Employee Surveys***

The study group participated in all-employee surveys in 2012 and 2014; there were low scores from each of those surveys for *internal communication*. The surveys administered were robust, recognizing 125 different types of organizations with hundreds of thousands of employees [source not cited for anonymity of the university].

### ***3<sup>rd</sup>-Party Auditors***

The group was also audited by peer institutions in a formal review process in 2011; that audit was sponsored by a group comprised of higher education universities across North America. A prime recommendation from that audit was to improve information flow to front-line employees.

### ***Study Group Morale***

Morale affects the perception of all operational components in an organization, internal communication notwithstanding. Given the high demands placed on the front-line employees of this group coupled with their low salaries and lack of pay raises it is understandable there was displeasure with internal communications at the time of this study. Additionally, no formal initiatives have been launched to address the low survey results or to enact recommendations given by the 3<sup>rd</sup>-party audit (that was the impetus for this project).

A major frustration for the majority of this study group (86%) is the mandated use of a sub-optimal work order management system. That software tool's interface is not user friendly and using the tool is labor intensive; it has no useful reporting function so there are dedicated employees that query the system's server with SQL programming. Executives understand this dilemma and are planning to replace it by 2017. Some users spend 80% of their workday with the current tool so a more efficient solution could help improve morale.

## **APPROACH**

### ***General Methodology***

This case study seeks to identify work practices in the organization of study that are either (1) effective for internal communication or (2) sub-optimal for it. Effective practices can then be shared throughout the organization as "best known methods" (BKMs) and sub-optimal processes can be highlighted for further research to determine possible corrective actions.

The researcher for this project currently manages 50 front-line technicians, across multiple trade shops, in an environment similar to the study group. The researcher also has 7 years' experience as a front-line technician (electrician) in such an environment. The researcher's education and certifications are listed below:

- BBA, Engineering Route to Business, The University of Texas at Austin
- Certified Facilities Manager, International Facilities Management Association
- Master Electrician, Texas Department of Licensing and Regulation

This background is advantageous for gaining trust from front-line employees participating in the study in order to gather meaningful and accurate information

Methodology for the study began with gaining permission from the Vice President over two business units (predominantly comprised of front-line technicians) to conduct research with the staff. Subsequent meetings were then held with each director of the respective functional units within those two business units; the purpose of those meetings was to ensure each respective director understood the intent of the study and was aware of time commitments for an employee to participate. Table 1 shows the organizational reporting structure for the area of study in this research; all listed groups are pseudonyms to protect anonymity of the organizations:

<u>Organization</u>	<u># of Employees</u>
<b>ORGANIZATION #1</b>	<b>639</b>
Sub-group 1A	192
Sub-group 2A	319
Sub-group 3A	128
<b>ORGANIZATION #2</b>	<b>87</b>
Sub-group 1B	30
Sub-group 2B	18
Sub-group 3B	36
Sub-group 4B	3

Table 1. How the organization of study is comprised.

### ***Participants***

**Population.** The study population was 726 people (see Table 1). The group was comprised of:

- front-line technicians
- supervisors
- managers
- administrative personnel.

**Survey participants.** Out of the study population, 12.1% (88 people) participated in the survey.

**Fieldwork participants.** Out of the survey participants, 100% (15 people) were interviewed and observed over a 3-week period. Table 2 lists information on the fieldwork participants; all job titles listed are pseudonyms to maintain the anonymity of participants.

Note that all 15 participants that were interviewed were from Organization #1; no interviews or observations were conducted with Organization #2. The same methods of participant recruiting were used for both organizations, though Organization #2 was actually recruited for one week longer than Organization #1. Organization #2 comprised only 12% of the entire study group so their lower participation rate is to be expected.

<u>Job Title</u>	<u># of participants</u>
Front-line craft 1	2
Front-line craft 2	2
Front-line craft 3	2
Front-line craft 4	1
Front-line craft 5	3
Supervisory 1	1
Supervisory 2	1
Supervisory 3	2
Supervisory 4	1

Table 2. Study participant job functions.

### ***Data Collection***

#### ***Surveys***

Evaluation for LMX relationships was done by administering a 5-point Likert scale questionnaire (LMX-7, currently the consensus choice among academicians for LMX measurement) to all 726 members in the study group; response rate to that survey was 12.1% (88 people). The survey was administered through Qualtrics and hard copy questionnaires were also made available. Eight percent (7 people) of the survey responses were done by hard copy submittal. Participation in the survey was completely voluntary and participants were not prompted to participate. The LMX-7 survey is listed in Table 3.

<b>1. Do you know where you stand with your leader (follower) and do you usually know how satisfied your leader (follower) is with what you do?</b>					
Rarely	Occasionally	Sometimes	Fairly often	Very often	
1	2	3	4	5	
<b>2. How well does your leader (follower) understand your job problems and needs?</b>					
Not a bit	A little	A fair amount	Quite a bit	A great deal	
1	2	3	4	5	
<b>3. How well does your leader (follower) recognize your potential?</b>					
Not at all	A little	Moderately	Mostly	Fully	
1	2	3	4	5	
<b>4. Regardless of how much formal authority your leader (follower) has built into his or her position, what are the chances that your leader (follower) would use his or her power to help you solve problems in your work?</b>					
None	Small	Moderate	High	Very high	
1	2	3	4	5	
<b>5. Again, regardless of the amount of formal authority your leader (follower) has, what are the chances that he or she would “bail you out” at his or her expense?</b>					
None	Small	Moderate	High	Very high	
1	2	3	4	5	
<b>6. I have enough confidence in my leader (follower) that I would defend and justify his or her decision if he or she were not present to do so.</b>					
Strongly disagree		Disagree	Neutral	Agree	Strongly agree
1		2	3	4	5
<b>7. How would you characterize your working relationship with your leader (follower)?</b>					
Extremely Ineffective		Worse than Average	Average	Better than average	Extremely effective
1		2	3	4	5

Table 3. LMX-7 questionnaire. NOTE: all responses rated a leader; no follower were evaluated

### **Field Work**

After agreeing to participate in the study, participants were requested to schedule times and dates with the researcher that they felt would allow for observation of a normal work day. Participants were asked to schedule time for a 30-minute interview and one short observation (< 1 hour) and to complete a “consent to participate in research” waiver. Actual observation

times ranged from 30 minutes to 1 hour; locations of the observations were in participant's work place (offices, meeting rooms, maintenance shops, and various locations around campus including campus grounds). Participant interview questions are listed in Table 4.

1. Are you aware of your group's mission/vision statement? If so, how did you learn of it? Do you think that mission statement is good?
2. Do you believe your job contributes to the goal of the mission statement? If so, how? If not, what might you do differently (actually or hypothetically)?
3. Do you think there are enough training opportunities for you and your group to fulfill the mission/vision? Is there any training you'd like to take that could be applicable to the mission/vision?
4. What the primary sources of information you use for your job? (vertical up/down, horizontal) Which do you think are effective or which could be improved?
5. How often does your boss's boss come into your work area? Do you believe that person understands what you do?
6. How often do you have departmental meetings with management? Are those meetings beneficial for you? If not, what information would you have liked to receive?
7. How long have you worked in this position? Would you say conditions in your work center are better, worse or the same as when you started? If you had the power to change anything, what would that be?
8. Do you anticipate any positive changes from the new Vice President and new Director in your organization?

Table 4. Interview questions for research participants.

Meetings with participants included a 30-minute interview and 1-hour observation of a normal work day. During office observations the researcher asked to see any spreadsheets or forms participants were working with and hear their explanation of the task at hand. It was the researcher's intent that participants would not feel nervous about being observed and be forthcoming with information about their job responsibilities.

The researcher observed and recorded events relating to a participant's normal work day. The researcher made particular notes on *unscheduled* activities that occurred. Data collection was

done via field notes; no audio or video recording was used. Specific focus was given on events relating to information sharing within the work group and any collaborative efforts that occurred (planned and unplanned). The researcher took images of artifacts used by participants; examples of artifacts included written and electronic documents, meeting spaces, communication centers, websites, and numerous physical objects specific to the job duties of participants. After each meeting the researcher reviewed observations with the participant to ensure proper context was recorded.

When participant observations involved field work, the researcher was frequently able to assist participants with their tasks in a “hands-on” (e.g., transporting ladders, holding doors open, etc.). Using such a routine was useful in framing the context of work disruptions that participants encountered (e.g., encountering locked doors and getting “emergency” phone calls).

At the end of each observation, the researcher validated observations with participants to solicit more feedback and any final comments.

Interviews with participants were based on 8 questions that ranged from a participant’s knowledge of their organization’s mission to their relationship with their 2<sup>nd</sup> level manager to their expectations of the organization’s performance in the future.

Summary data from the 2014 all-employee survey was obtained from the study group’s Human Resources department and then used to triangulate LMX-7 survey data, interviews, and direct observations.

The researcher used memoing and coding to establish categories for the notes taken during interviews and observation and for the artifacts that were encountered.

### **Data Analysis**

Activity Theory and LMX were used for overall evaluation of the study group. Activity Theory was selected to “get the big picture” of operations in the organization of study. Activity Theory stresses the importance of viewing an organization—not just individuals. Activity Theory also provides a good examination of human-computer interfaces, which are very much a part of the study group’s daily routine. According to Activity Theory, the computer is just another tool that mediates the interaction of human beings with their environment; its purpose is to help achieve goals that are meaningful beyond the mere *usage* of a machine<sup>12</sup>. Such a perspective was desirable for discerning between organizational process breakdowns and employee performance issues.

LMX was chosen to evaluate how effective relationships are between managers and front-line employees; those relationships are critical for establishing an environment that foster internal communication. Communication occurs when a “sender” and “receiver” exchange information

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<sup>12</sup> Nardi, B. (Ed.). (1996). *Context and consciousness: Activity theory and human-computer interaction*. Cambridge, MA: MIT Press. p. 106

so understanding relationships of those parties is important, most especially when those two parties are a leader and a subordinate. Environment drives overall conditions and LMX drives the environment, so understanding LMX within an organization is quite useful to interpret actions within it. A subject’s reaction to environment determines actions,<sup>13</sup> and as early as the Hawthorne studies, researchers have recognized the effects of informal social relationships on work-related outcomes<sup>14</sup>. This study examines how LMX relates to the activities within an organization and how it may influence the effectiveness of its internal communication.

**Quantitative Analysis**

Raw data from the 2014 all-employee survey was obtained in order to perform linear regressions on the various constructs in the survey; such analysis is useful to forecast how much overall job satisfaction might be increased via improvement of scores from any single driver in the survey (internal communication is one of those drivers, which received low scores in the 2014 survey). The raw data contains highly privileged input so extra steps were needed to insure privacy of all the survey respondents.

“Environment” is a major factor in LMX relationships so the survey construct of “job satisfaction” was selected as the dependent variable for the regression. Regressions were done with a (1) linear model, (2) linear-log model, (3) log-linear model, and (4) log-log model. The log-log model yielded the highest r-square value and was thus selected as the best predictor. The “supervision” construct was in the highest drivers of all regressions, indicating improvement of LMX relationships should be considered.

Results of the regression are in Table 5. Higher coefficients of the survey construct categories indicate the best areas to improve for achieving a better score for “job satisfaction.” P-values of less than 0.05 indicate there is a 95% probability the regression results were *not* due to chance.

		<i>Coefficients</i>	<i>P-value</i>
Diversity		0.252274014	0.00572609
Physical Environment		0.226192956	0.010402367
Supervision		0.204589996	0.002418077
Ext Communication		0.185081624	0.022681021
Benefits		0.16485901	0.049494643

Table 5. Linear regression with top 5 constructs to target for improvement.

<sup>13</sup> Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press. Chapter 4.

<sup>14</sup> Sparrowe, Raymond T., Liden, Robert C. Process and Structure in Leader-Member Exchange *The Academy of Management Review*. Vol. 22, No. 2 (Apr., 1997). p. 526



### **Qualitative Analysis**

All notes taken during interviews and observations were coded ("tagged") to systematically categorize those annotations into their context within Activity Theory. Such a categorization "is needed to truly see the research topic from the perspective of the interviewee, and to understand how and why he or she comes to have a particular perspective."<sup>15</sup>

The coding categories were consistent with the Activity Theory Triangle: tools/instruments, actor/subject, object, outcome, rules, community, and division of labor. Table 6 includes description of how codes were defined and a partial listing of participant coding is in Table 7.

<b>CODE</b>	<b>DESCRIPTION</b>	<b>EXAMPLES ENCOUNTERED</b>
<b>TOOL</b>	articles, policies, or procedures a participant uses in pursuit of an object	PC, phone, spreadsheet template, S.O.P.s, vehicle, radio, ID badge, keys, screwdriver, floor buffer
<b>ACTOR</b>	someone pursuing an object or an outcome	front-line technician, supervisor, manager
<b>OBJECT</b>	task a participant is pursuing	completing a work order, attending a meeting, finishing training class
<b>OUTCOME</b>	some purpose a participant is pursuing	training a department on a specific procedure, status of compliance to a regulation, establishing a working relationship with another individual
<b>DIV LABOR</b>	situation when object or outcome are beyond control of participant	contacting another department in order to close a work order, soliciting input from other groups to establish a procedure
<b>RULES</b>	protocols, regulations, or rubrics that guide or restrict a participant	wearing hard-hat in construction zone, completing vehicle mileage log, time card tracking, emergency light testing
<b>STAKEHOLDER</b>	individuals impacted by the participant's pursuit of an object or outcome	building occupants in locations of a work order, faculty, students, prospective students, community

Table 6. Coding criteria for participant observations.

<sup>15</sup> Cassell, C., Symon, G. 1994. *Qualitative Methods in Organizational Research: A Practical Guide*. <https://books.google.com/books?id=b5TZAAAAMAAJ>. p.1

PARTICIPANT #12							<i>OBSERVATIONS: 10/21/15</i>
TOOL	ACTOR	OBJECT	OUTCOME	DIV LABOR	RULES	STAKEHOLDER	
	X	X					joined participant in meeting they were chair of: training on software tool
	X	X		X			8 attendees in meeting; they were all engaged in discussion (attendees seem to like what is being discussed)
	X	X	X		X		gist of meeting was how to separate tracking of planned vs reactive maintenance
	X	X			X	X	participant said "someone changed my procedure-I'll kill them" (as pulling up a particular screen for the demo)

Table 7. Partial coding example for participant #12.

## RESULTS

### *Leader-Member Exchange Survey*

All respondents to this survey ranked their supervisor (no submittal ratings for a subordinate were collected).

While the average score from the LMX-7 survey was classified as “moderate” (22.5), 30.3% of responses were “negative” (less than 20). We can interpret LMX-7 scores using the following guidelines:

**very high = 30–35      high = 25–29      moderate = 20–24      low = 15–19      very low = 7-14**

Scores in the upper ranges indicate stronger, higher-quality leader–member exchanges (e.g., in-group members), whereas scores in the lower ranges indicate exchanges of lesser quality (e.g., out-group members)<sup>16</sup>. From the 5-point Likert scale the researcher treated a combination of “1” or “2” ratings on any question to be a negative indicator and a combination of “4” and “5” as positive. The percentage of negative ratings for the 7 questions was 30.3%. This indicates that 3 out of 10 employees have a negative relationship with their 1<sup>st</sup> line supervisor and thus there is opportunity to improve Leader – Member relationships. It is of note there was no central tendency bias<sup>17</sup> in this survey as 50% of the responses were in the two extreme ratings. Using the rating criteria above, Table 8 shows the summary on the quality of LMX relationships in the study group.

<sup>16</sup> Graen, George B., and Mary Uhl-Bien. 1995. Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *The Leadership Quarterly* 6 (2): 219-47.

<sup>17</sup> Dimitrov, Dimiter M. 2011. Statistical Methods for Validation of Assessment Scale Data in Counseling and Related Fields. p. 183

NEGATIVE SCORING	NEUTRAL SCORING	POSITIVE SCORING
30.3%	16.4%	53.3%

Table 8a. LMX-7 survey average scoring.

<u>RANKING</u>	<u>%</u>	<u>Question</u>
<b>Most Positive Score</b>	68.9%	1. Do you know where you stand with your leader and do you usually know how satisfied your leader (direct report) is with what you do?
<b>Most Negative Score</b>	49.2%	5. Again, regardless of the amount of formal authority your leader has, what are the chances that he or she would bail you out at his or her expense?

Table 8b. LMX-7 highest and lowest scores.

Note that while question #1 asks “do you know where you stand with your leader...?” and 68.9% of employees say they do, the question does not ask if they *like* where they stand with their leader. As such the 30.3% overall negative rating may not fully reflect all of the negative sentiment in the study group. Of all the survey respondents sub-group 1A, from organization #1, gave the highest percentage of negative feedback (35%). A full summary for results of the LMX-7 questionnaire is shown in Fig. 3.

### ***Interviews***

Fifteen interviews were conducted. Twelve participants responded directly to the researcher’s e-mail seeking volunteers and 3 contacted the researcher after having that e-mail referred to them by a colleague. All interviews were conducted at a participant’s work site; participants dictated the times/dates for interviews.

The researcher noted that every interviewee was enthusiastic about participating in this study, but 20% (3) of the participants expressed strong displeasure with their jobs during interviews. While salary was not a topic in the interview script, every participant expressed displeasure with current pay scales, saying they were too low.

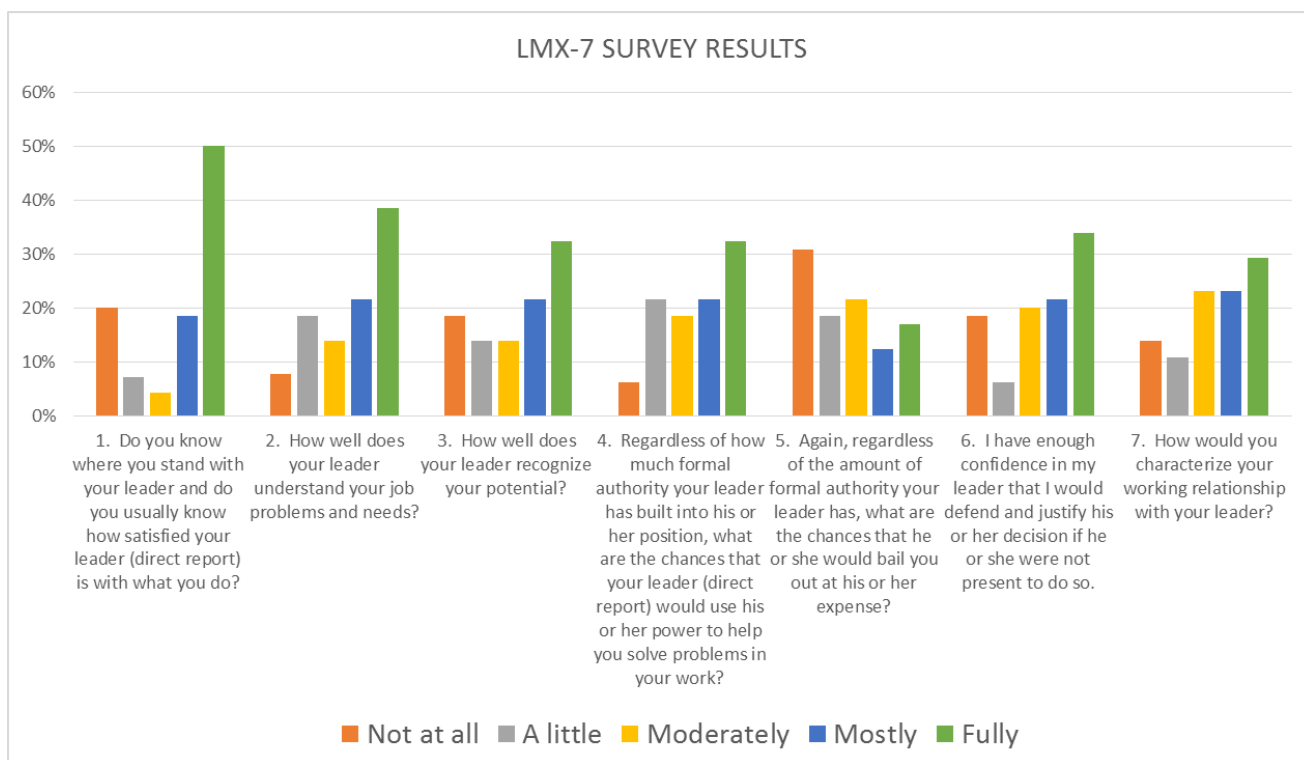


Fig. 3. Average of responses to each question from the LMX-7 survey.

A common response to question #5 (“how often does your boss’s boss come in to your work center?”) was that the participant’s 2<sup>nd</sup> level manager rarely visited their work center; they also perceived that their 2<sup>nd</sup> level manager did not fully comprehend the demands of their normal workday. This feedback is consistent with the 30.3% negative rating obtained in the LMX-7 questionnaire.

**Observations**

Study participants scheduled observations during times that reflected their normal work routine; as a result, the researcher was able to witness disruptions and participants’ responses to those disruptions. For purposes in this section a disruption was any unplanned event a participant encountered that impeded the immediate task at hand for them.

Multiple disruptions were noted when technicians could not access an area they needed to enter in order to perform a service; the work orders given to them in each case made no reference to accessing a controlled area (delays to obtain access ranged from 10 minutes – 1 hour). The unexpected delays in each case negatively impacted the anticipated cycle time that was expected from the technician for that task and delayed the start time for their next scheduled work order. The researcher noted frustrations from technicians in these instances and the technicians said this is a recurring issue. A summary of noted disruptions is in Table 9.

<b>CATEGORY</b>	<b>% (#) OF PARTICIPANTS IMPACTED</b>
Experienced a disruption	53% (8)
Experienced multiple disruptions	27% (4)

Table 9. Disruptions logged during observations.

Disruptions are not a categorically bad thing; they often serve as a catalyst for continual improvement. Critical for such improvements to occur, though, is good internal communication (which is documented to be lacking in the organization of study).

Multiple disruptions (12 across the 15 observations) were noted when a participant’s phone would ring and a caller requested an immediate response to a situation somewhere on campus. In most cases the participant considered the disruption a true emergency and gladly responded. Examples of those calls included flooding in a mechanical room, protecting tree roots from excavation equipment, vandalism to a security gate, making a decision to leave an emergency exit open after hours, and a student recovering a lost item. In those cases the participants accepted their disruptions as a part of their normal routine.

There were 441 distinct observations cataloged during the observations. As expected for the observation of an individual, “actor” was the highest percentage of coding. “Outcome” and “object” were the next highest categories, which accurately reflected a strong commitment observed in the participants. Coding observations are in Table 10.

<b>CODING OF OBSERVATIONS</b>						
<b>TOOL</b>	<b>ACTOR</b>	<b>OBJECT</b>	<b>OUTCOME</b>	<b>DIV LABOR</b>	<b>RULES</b>	<b>STAKEHOLDER</b>
25%	57%	27%	33%	5%	7%	8%

Table 10. Percentages of coding categories.

Noted artifacts during observations were expected for the profession of each participant, though there was a wide array associated with the disparate functions of the participants. The wide variety of artifacts illustrates the group’s need for detailed internal communications; they need to have extensive information that supports a very diverse portfolio. It’s important to note Nardi’s comment, “activity cannot be understood without understanding the role of artifacts in everyday existence.”<sup>18</sup>

As previously noted, some participants were clearly dissatisfied with their job. Every participant who was observed, however, displayed strong pride in the work they did. An additional positive note is reflected in the total positive score (52.3%) from question #7 of the LMX-7 survey (“how do you characterize the working relationship with your boss”).

<sup>18</sup> Nardi, B. (Ed.). (1996). *Context and consciousness: Activity theory and human-computer interaction*. Cambridge, MA: MIT Press. Chapter 2.

### **LMX Employee Survey Data**

Summary scores from the organization’s 2014 all-employee survey were used to triangulate information from the LMX-7 survey and the data collected from meetings with participants. The response rate to the all-employee survey was 31.09%. Of particular note from that survey are scores from following survey questions:

- “My work group uses the latest technology to communicate and interact” (question #6).
- “The right information gets to the right people at the right time” (question #35).

Scoring on those two questions, from one group within the organization of study, is listed in Table 11.

	<b>Group Score</b>	<b>Organization Score</b>	<b>Benchmark Score (from survey provider)</b>
<b>Question #6</b>	2.95	3.60	3.76
<b>Question #35</b>	2.64	3.47	3.61

Table 11. Comparison of critical question scoring for the group with overall organization and benchmark.

Question #6 is used in the construct score for the organization’s level of internal communication. Question #35, while used to compute ranking for information systems, per se, is clearly a contributor to overall internal communication in the organization.

In general, most scores from the survey fall between 3.25 and 3.75. Scores below a 3.25 indicate general dissatisfaction and scores above 3.75 indicate positive perceptions [source not cited for anonymity of the university].

The group scores for both of those questions clearly indicate concern for the level of internal communication with the indicated group. Again, that group is heavily comprised of front-line technicians that interact directly with students and faculty on the campus of study. Improving the score of the noted group would also improve the score for the organization, getting closer to the benchmark target. The benchmark score is derived from businesses with a similar organizational mission.

While the LMX-7 questionnaire does not explicitly ask about communication, dissatisfaction with internal communication can still be associated to that survey. Question #2, “How well does your leader understand your job problems and needs?” had a 19.4% negative response. If a manager is unaware of their employees’ needs, that is indicative of poor internal communication between the leader and the member.

### **2014 All-Employee Survey Data**

Raw data from the 2014 all-employee survey that contains every individual’s responses to the 71 interview questions was obtained for analysis. Linear regressions were performed on the 14 survey constructs of that survey:

- Supervision
- Quality
- Benefits
- Strategic
- Information Systems
- External Communications
- Employee Development
- Team
- Pay
- Physical Environment
- Diversity
- Internal Communications
- Employee Engagement
- Job Satisfaction

Performing linear regressions provided a forecast of how improving satisfaction for *any* of those 14 individual constructs would change the *overall* employee satisfaction score, and what the degree of those forecasted changes would be. The regression was run using “job satisfaction” as the dependent variable. All p-values were well below the 0.05 threshold that confirms a better than 95% probability results were not random.

In all regressions diversity and supervision were in the top 3 constructs to target for improvement. Those 2 constructs are associated with LMX relationships, and are shown in Table 12. From the coefficients in Table 12a, a 0.25% increase in job satisfaction from a 1% increase in diversity is forecasted. That may be considered “small” but it’s important to note that improving that area provides that highest payback compared to a 1% improvement in other constructs. The r-square value in Table 12b was the highest of all regressions performed.

	<b>Coefficients</b>	<b>P-value</b>
Diversity	0.252274014	0.00572609
Physical Environment	0.226192956	0.010402367
Supervision	0.204589996	0.002418077

Table 12a. Linear regression of employee survey responses.

R Square	0.787492
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Table 12b. R-square value of regression.

### ***Human-Computer Interface***

Other observations noted from the Activity Theory underway in the organization of study deal with Human-Computer Interaction (HCI). HCI is the study of how people interact with computers and to what extent computers are or are not developed for successful interaction with human beings. The study group heavily relies on one specific software tool for labor tracking, cost analysis, and equipment maintenance. That tool is universally despised for its difficulty to use and its data storage structure; all users interviewed expressed frustrations with it. Executives are aware of the shortcomings with this tool so it is scheduled to be discarded in 2017. In the interim, though, this tool is impeding information flow in the organization.

Examples on the inefficiency of this tool follow:

- The tool has no useful reporting functions, so dedicated personnel have been hired to extract data from the tool and then create documents needed to produce metrics for the efficiency and effectiveness of the organization. Proficiency with sequel programming is needed to perform that function.

- The “front end” of this tool is not at all intuitive and observed participants publicly displayed frustration when using it.
- The researcher was told at one point that exporting a spreadsheet into Excel took 2+ hours. While that issue has been tempered, 1 participant complained during an observation that “it takes 30 seconds to print that!”
- Work orders printed from this tool lack critical information that is needed to complete tasks. An administrative person was observed printing a work order and subsequently making 3 phone calls to obtain information needed to assign the work order. With the information obtained from the phone calls, the participant then accessed 4 different screens in the software to enter required data.
- If an employee assumes a different role with a different labor rate, the tool automatically changes historical charges according to the employee’s new labor rate. When this happens during an active project, it can cause a project to go over budget. When it happens with closed projects, it creates accounting errors.

The tool impedes information flow and the inefficiency of the tool propagates throughout the organization. Use of this tool is mandatory, though; no work-around for it has been developed. Some participants indicated they spend 80% of their work day using the tool. Even the individuals who do not work directly in the tool are impacted by its inefficiency, because it is the tool of record for all labor costs, material usage, and equipment tracking.

The tool impedes productivity and it affects employee morale. From Nardi’s *Context and Consciousness: Activity Theory and Human-Computer Interaction* “HCI must incorporate meaningful context of a user’s goals, environment, tools, and interactions.”<sup>19</sup> Enhancing HCI in this organization will be extremely helpful to improving internal communications (and morale).

## RECOMMENDATIONS

### ***Provide a New Software Tool***

While the organization of study has documented problems with information flow to front-line employees and internal communication in general, it is poised to improve this situation. Interviews and observations of participants in this study documented a strong feeling of pride in completing daily tasks (objects of their activity system) and a commitment to organizational goals (outcomes of their activity system). This positive attitude can be confirmed with responses in the all-employee survey. Measures for “atmosphere” and “employee development” were scored to be “positive perceptions” (3.95, 3.79 respectively). “Job satisfaction” and “benefits” scored in the upper tier of average rankings (3.65, 3.70 respectively). In general, employees have a *good* attitude but there is a missing ingredient for improving communication flow in the organization: better work order management software (this impacts the tools of their activity system).

The study group has a unique opportunity to roll-out a new integrated work order management system (IWMS). There is a major initiative underway at the *university level* for the organization

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<sup>19</sup> Nardi, B. (Ed.). (1996). *Context and consciousness: Activity theory and human-computer interaction*. Cambridge, MA: MIT Press.



of study; numerous legacy systems for managing the accounting and personnel businesses are being retired to enable adoption of a cloud-based enterprise resource system (ERP). This project will change how *many* pieces of information are handled across the university so “information flow” will soon be in the spotlight much more than it currently is just for the group of study. The organization of study should embrace this ERP roll-out along with deployment of its new IWMS. If a positive attitude can be associated to the new IWMS and ERP roll-out the group of study stands to make significant improvements to *all* of its functions—not just with internal communication.

It is important to note the ERP roll-out will be a *major* change and that change can be especially difficult in bureaucracies. Success in managing this change will be dependent on how much front-line employees feel they are a part of that change. A contract for the new IWMS has yet to be released so there is ample time to establish a team that can “champion” its deployment; that team should consist of front-line “super-users” that will ultimately be tasked with in-house training on the new tool. There should also be representation from management on this team.

The new IWMS will afford labor savings compared with time currently needed to enter and retrieve data from the existing system. The study group currently has 11% of its positions unfilled and has a 30% turnover rate in their staffing; the excessive hours currently being spent to manipulate the existing software can be redirected to other functions needing attention and thus improve the productivity of the group. Implementing a new IWMS should improve productivity *and* morale in the study group.

This recommended improvement should have the highest priority in the study group’s strategic plan. It is imperative, though, that the study group establishes adoption of the new IWMS as a “group” task and not a “top-down” directive. Caution for the importance of including front-line employees in this roll-out is documented by the response to question #4 of the all-employee survey: “In my work group, I have an opportunity to participate in the goal setting process.” The score on this question was 3.25, which is categorized as “of concern because it reflects a general feeling of dissatisfaction.” That score was well below the overall organization score of 3.72.

### ***Establish Better Leader-Member Relations***

Establishing better Leader-Member relationships can be done *in concert* with the adoption of a new IWMS. If executives can show involvement with the new IWMS roll-out they will be demonstrating that they understand the old tool was not adequate and that they understand their employees needed a better tool to conduct their business. In tandem with showing them they support the new tool they will be simultaneously strengthening employee bonds with them. A prime example of how to accomplish this would be having executives and managers attend training classes *with* the front-line employees. That would promote the perception that the change is a “shared” learning experience and that managers and executives are accessible to front-line employees.

Interactions of 2<sup>nd</sup> level managers with their front-line employees were noted to be lacking in some cases during participant interviews. Addressing this should be relatively straightforward; those managers merely need to schedule time to attend each of their direct reports’ staff

meetings. Less than one hour each month attending those meetings could have significant impact. Even if the 2<sup>nd</sup> level manager has no items to formally address in the meetings, their mere presence will send the following significant messages to the front-line employees: (1) they are accessible, and (2) they've been directly exposed to challenges in the work center. These two messages can strengthen LMX relationships in the organization.

Linear regression on survey results indicates that “diversity” and “supervision” are among the best individual survey constructs to target for improving “job satisfaction” score on all-employee surveys. Diversity is negatively impacted when leaders create in-groups that are comprised of individuals that are like themselves. Results from the LMX survey indicate more than 30% of employees have a negative perception of their relationship with their 1st-level manager so improvement in supervision is warranted.

Managers and supervisors should have goals for a minimum level of human resource training each year. Vice Presidents and Directors can set mandatory classes for their groups as they see fit but individual managers and supervisors should also select training classes they personally find interest in. Numerous human resources classes are already in existence so no funding should be necessary to implement this training objective.

The additional HR training for managers and supervisors should yield a positive impact on the “rules” and “community” of the study group’s activity system. Better function of the activity system will promote better internal communication within the organization.

### ***Conducting Future Employee Surveys***

Performing linear regression on all-employee surveys, as was done in this study, should be a standard procedure for future surveys (researcher has confirmed regressions have not been done). Accomplishing that activity will help identify the areas where spending is best used to improve employee relationships. Drilling down to specific questions that comprise the 14 general survey constructs can highlight specific issues that might be overlooked when addressing overall constructs. Such discoveries may be addressable at a more local, work center level rather than from a divisional perspective so corrective actions might occur more quickly.

In addition to the current bi-annual, university-level all employee survey individual units should plan to conduct bi-annual interviews for their specific *sections*. The university-level surveys can continue on even numbered years; the unit-level surveys could be done on odd numbered years. Individual unit surveys could focus on the objects that are pertinent to outcomes needed at the university level. Requesting employees to take 1 survey annually is not unreasonable. Making surveys an annual event may even improve response rates.

### ***Using Technology for Internal Communications***

As previously mentioned, there is some reticence within the study group for using electronic communications. While there is no survey data to confirm demographics of e-mail usage, the researcher did receive anecdotal feedback from supervisors that there were older employees in their work center who did not use e-mail. Since 23% of the study group is 60+ years old, it is reasonable to forecast that attrition will bring younger employees into the work center; that

attrition rate should increase usage of electronic communication even if no formal initiative is launched to change that situation. As senior team members leave the organization, their younger replacements should be more comfortable using the latest technologies for communication. While electronic communication is not the consummate method for internal communication, it is certainly a very necessary component of it.

### ***Publish Future Plans to Improve Internal Communication***

As noted earlier, the inclusion of front-line employees in upcoming projects is of paramount importance. The first step to that end is ensuring all employees are *aware* of the plans to institute a new IWMS and to roll-out a new ERP system. That announcement should also state that front-line participation in those endeavors will be needed and volunteers will be recruited. A publicly accessible “status board” should be created so progress on the two projects is always available for viewing.

Goals for completing these two projects should be incorporated into the annual goals for all directors; they should then cascade those goals through their respective organizations. Success on these projects will depend on a “bottom-up” initiative, but that cannot begin without one very important “top-down” directive.

LMX research on exchanges between individuals and their supervisors has generated much documentation of the tangible and non-tangible resources between those two groups, specifically noting how important environments are to those ends. Organizations are subjective forms that are constructed by their members, and superior-subordinate relationships are cited as key factors for internal communication in numerous studies.<sup>20</sup> The LMX survey indicated 30% of front-line employees have a negative view of the relationship they have with their supervisor but publishing organizational plans can help create a more positive environment to improve those LMX relationships. Publishing plans will also help increase OCB, which was demonstrated to be quite effectual for front-line employees when they encountered disruptions in activity theory functions they performed. Better LMX relationships and more robust OCB would help improve internal communication for this study group. Publishing future plans is a key first step to that end.

This comment, from the audit recommendations, is a good summary for this study:

*“Top leaders need to be understood and have the message clear and correct with the accuracy needed to build trust and confidence as well as ensuring all are working as a team.”*

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<sup>20</sup> Jablin, F. M., & Putnam, L. L. (Eds.). (2001). *The New Handbook of Organizational Communication*. Thousand Oaks, CA: SAGE Publications, Inc., p.7

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