Towards a Conceptual Lean Communication Protocol to Guide Decision-Making

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Abstract

Lean communication is a unique perspective on lean thinking and how it relates to organisational communication. The problem is that lean organisations do not always align their communication process with lean thinking principles. The study aimed to develop a conceptual lean-focused communication protocol to guide decision-making when there is a need to convey information. A communication strategy planning tool is used to design a communication protocol, resulting in a specific output of language, media, and message style for effective and accurate communication. The study produced a conceptual protocol for communication to help organisations align their communication process with lean thinking by meeting specific design requirements and minimising the communication waste identified. The solution impacts the industrial engineering industry by showing how technical thinking and philosophies such as lean can be applied to human behaviour and processes. Also, business operations can be improved by addressing problems with a focus on human engineering.

Keywords
Lean, Corporate, Communication, Communication Waste, Information Sharing.

Introduction
Incorrect communication in a business can lead to waste that will, in turn, negatively impact the business and its operations (Yankelevitch and Kuhl, 2015). Therefore, an opportunity exists to use a proven optimization philosophy such as lean to improve an unconventional communication problem. This implies that processes are now defined not only as producing a product but also as any process that can be defined in terms of waste and value.
In terms of lean, waste can be seen in the form of overproduction, waiting, unnecessary transport, incorrect processing, defects, excess inventory, unnecessary inventory, and people's unused creativity (Liker 2021). These eight forms of waste establish where improvements can be made to minimize unnecessary costs in a production process.
Lean organizations are no longer only seen in the manufacturing and production industry. They can be found in any number of organizations aiming to minimize waste and improve productivity (Liker 2021). In the same way, communication can be seen as a process that can be improved in terms of lean.

Lean communication evaluates communication as a process requiring improvement by identifying waste and non-value-adding and value-adding practices. Traditionally, value is explained in terms of what the customer is willing to

pay for. Therefore, anything that will translate into more money spent by the customer can be seen as a value-adding activity. This will, however, look different in terms of processes such as communication. A value-adding activity can be seen as an element contributing to an accurate understanding of the message. Minimising waste and maximising productivity are core principles of lean thinking. Minimising these barriers will provide a more efficient and effective communication process, with fewer misunderstandings and miscommunication. For example, delivering information from one person to another, or one department to another, can be analysed to determine waste, such as misunderstanding of information or waiting on information. It can also be seen that there is a lack of understanding of communication as a process, of lean information concepts, and their implementation (Redeker et al.2019). This can pique interest in the communication process and how it can be improved with lean thinking. Alpenberg and Scarbrough, 2016, took one approach to communication and lean. Their research showed the impact of specific language within lean implementation. Research done by Cornelissen shows the importance of planning the communication process (Cornelissen, 2016). However, the literature shows a gap in the methodology used to implement lean communication practices and control the information-sharing process (Redeker et al. 2019).

Lean communication can be seen as the missing link between organizational communication and people management in lean organizations. This link integrates lean principles and corporate communication principles, emphasizing improved communication processes to enhance overall organizational effectiveness and efficiency. Figure 1 shows the common ground explored in this paper regarding lean communication. There is an overlap between an efficient lean organization with little waste and high productivity and corporate communication as a process found in any organization. It is necessary to create a way of communicating that will make an already lean organization even leaner, or at the very least, to create an effective communication process within a corporate environment.
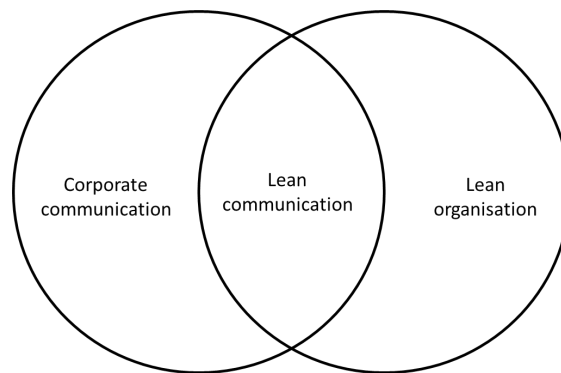

Figure 1. Integrated Communication Diagram

To summarise, the problem is that communication processes do not always align with lean principles within lean organisations. Therefore, this study aimed to develop a conceptual lean communication protocol to guide decision-making when conveying information.

Literature Review

When looking at the communication process in terms of lean, forms of waste must be considered in terms of the communication process. Table 1 shows this adaptation. The first column provides the traditional form of waste, the second column translates the traditional form of waste in terms of the communication process, and the third column provides a further explanation.

Table 1. Lean waste in communication

Lean Waste	Communication Process Waste	Description
Overproduction	Sharing too much information on various platforms.	According to Redeker et al., an excessive number of systems and multiple data sources (several systems or media forms with the same information) is overproduction in terms of communication. Overproduction in communication can also indicate areas where energy, time, and employees' time are wasted. Alternatively, there is

Lean Waste	Communication Process Waste	Description
		idle time in the information flow since too much information cannot be properly processed.
Waiting	Not sharing information soon enough.	According to Redeker et al., waiting for information, or information only being transferred if action is taken, can be seen as waste in the form of waiting. Examples may be the need to share information to implement change, such as implementing new standard procedures to optimise a process and holding this information longer than required, which causes a delay in implementing the new procedure.
Unnecessary Transport	Unnecessary media used, like taking more time to do an in-person meeting when an e-mail would have sufficed.	Sharing information face-to-face when it is not necessary, and perhaps an e-mail could have been sent.
Incorrect processing	Incorrect language or communication style used.	This can then lead to the misunderstanding of information, which leads to the information having to be re-shared for it to be understood correctly.
Defects	Misunderstood communication.	According to Redeker et al., this is flawed or inaccurate information, lack of common standards regarding information formats, and problems converting information from the media/system in an understandable way. It can also result from ineffective communication or communication not done through the correct media form, causing the receiver to misunderstand the information completely and implement inaccurate changes.
Unused people creativity	Not allowing for feedback or input from employees.	This could be in the form of communicating through e-mail or other more one-sided communication, which can lead to the receiver of the information not feeling free to communicate and relay their ideas.

Waste in the communication process minimizes the effectiveness of the communication and of the company as a whole. Therefore, identifying waste in communication allows opportunities for improvement to be identified. Together with the eight forms of waste, the 14 lean management principles (Liker 2021) are also applicable to lean communication. These principles fall under the 4P model (Liker 2021):

Philosophy
1. Long-Term Systems Thinking – Base management decisions on long-term systems thinking, even at the expense of short-term financial goals.

Process
2. Continuous flow – Connect people and processes through continuous process flow to bring problems to the surface.
3. Pull – Use "pull" systems to avoid overproduction.
4. Level – Level the workload, like the tortoise, not the hare.
5. Standardised Processes – Work to establish standardised processes as the foundation for continuous improvement.
6. Design-Build in Quality – Build a culture of stopping to identify out-of-standard conditions and build quality.
7. Visual Control – Use visual control to support people in decision-making and problem-solving.

8. Technology to Support People and Processes – Adopt and adapt technology that supports your people and processes.

People

9. Grow Leaders – Grow leaders who thoroughly understand the work, live the philosophy and teach it to others.
10. Develop People and Teams – Develop exceptional people and teams who follow your company's philosophy.
11. Partner with Value Chain – Respect your value chain partners by challenging them and helping them to improve.

Problem-Solving

12. Observe Deeply and Learn Iteratively – Observe deeply and learn iteratively to meet each challenge.
13. Align Goals – Focus on the improvement energy of your people through aligned goals at all levels.
14. Bold Strategy, Large Leaps and Small Steps – Learn your way to the future through bold strategy, some large leaps, and many small steps.

Although there are constraints when using more inherently lean communication media, a group would adapt their behaviour to combat these constraints (Kock, 1998). One of the most prominent constraints mentioned by the study participants was the ambiguity related to e-mail communication. Instead of causing less equivocality reduction as proposed by the richness theory, this sparked a reaction from the participants to change how they construct and word their messages. This reveals that people would adapt behaviour to combat constraints or limitations when given the chance. This can be interpreted as continuous improvement, allowing employees to adapt rather than fix their problems and allowing for better communication and information flow practices.

Studies using lean as a way to improve information sharing and communication resulted in improved operations of a company, especially when combined with the advancement of technical innovation regarding information sharing and communication (Redeker et al., 2019). It also identified a lack of a clear methodology for implementing lean communication as a standard practice. In considering the left side of the Ven diagram in Figure 1, Cornelissen (2020) states that communication strategies can be described by three elements that allow for a conclusive and well-thought-out communication process and can be used to determine the benefit of using the communication planning process.

- **Planned and emergent processes** – As with any process, a communication strategy must have carefully planned and predetermined processes that are logical and rational, as well as more emergent processes that arise without being predetermined. These processes still fall within the scope of the strategies set in place. A communication strategy is established on planned programs and specific in-the-moment responses.
- **Plans and tactics** – Along with more immediate and direct tactics, a strategy has a general direction. When determining the communication protocol, there would be a clear direction of what the company hopes to achieve over a longer period.
- O**rganising and adapting to the environment** – Strategically managing an organization involves balancing the current and future states and how to achieve the desired future state. Therefore, a communication protocol would need to consider the desired outcome for the company and the method to achieve it while also determining what is feasible in the current state of the business.

Along with these strategic elements, five specific communication styles have been identified that are used when determining how to properly communicate something to someone with a specific goal in mind (Cornelissen, 2020). These communication styles may be used where they are applicable in different scenarios and will generate the best possible outcomes. The communication styles are:

1. Rational message style – Addresses important factors identified and bases information on those factors. In other words, superiority claims about the products specific to the organization are made.
2. Symbolic association message style – An image is used to create a positive association with the organization. This can be done using colours in the message or any other visual aspects.
3. Emotional message style – Relying on emotional topics to anticipate and foresee emotional interpretations and responses to a message.
4. Generic message style – The message being communicated is not differentiated from another, and non-specific language is used.
5. Pre-emptive message style – A generic message with a subtle suggestion of superiority is used.

Understanding these strategic elements and messaging styles can be used in the communication process to improve outcomes and understanding of shared information. Planning of communication programs and campaigns is a process that can be used for developing a communication protocol, Figure 2 . This can be adapted to establish the requirements of a communication protocol. At the top of the figure, the vision refers to the overarching message the company wants to deliver to the public, meaning what it wants customers to perceive about the company. This is not as relevant when designing an internal communication protocol. Reputation, seen in Figure 2, refers to the perceived reputation of the organization by the public. Again, this is not as relevant when determining a communication protocol for internal communication only. The planning of a communication programme and campaign is given by Cornelissen, 2020, in the following seven steps, as shown in Figure 2:

1. Strategic Intent – This step represents the gap between how the organisation is perceived and how it wants to be perceived. It entails the identification of this and the general goal of the organisation.
2. Define communication objectives – The specific objectives for the program are set for a particular stakeholder group – An example is the case of a report in which the stakeholder group would be the employees. Objectives would include, among others, whether change is required or merely a consolidation of the stakeholders' awareness, attitude, and behaviour.
3. Identify and prioritise target audience – This is where stakeholder groups are identified based on their relevance and importance to the proposed outcome.
4. Identify themed messages – Based on the determined objectives and target audience group, the theme of the message should be determined. This determines what the core message would be.
5. Develop message style – Determine which of the five message styles would suit the message's theme and the audience. In other words, how can the message be communicated to be best understood and interpreted?
6. Develop media strategy – This step entails the identification of a carrier for the message. Identify which media or platform to use for specific messages and communication.
7. Prepare the budget – The final step is to evaluate the financial implications of the programme and determine the budget for the programme. It is likely that most of the budget will be spent on the media used, but that would depend on the program.
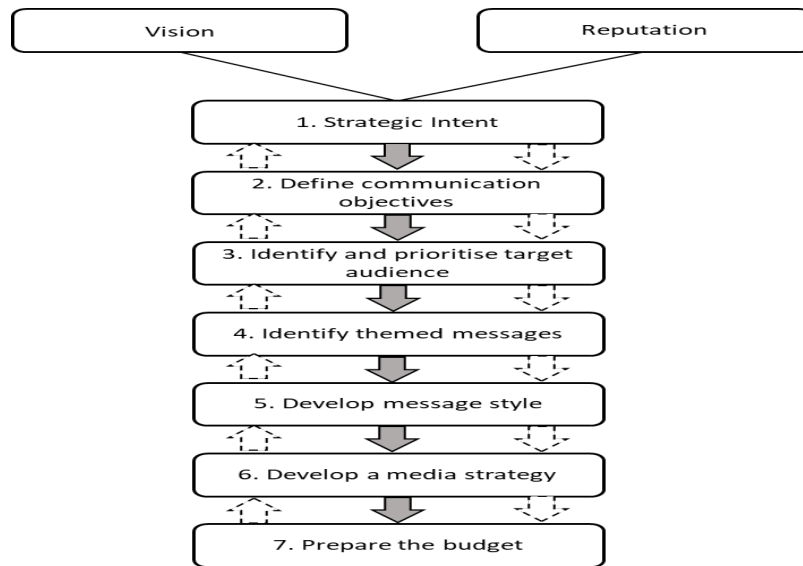

Figure 2. Planning communication programmes and campaigns (Cornelissen, 2020)

Dowson et al. (2024) show the connection between a lean communication approach and effective learning and understanding in relation to project management. This study revealed a mutually beneficial relationship between implementing lean practices and the learning of these practices when conducting a lean approach. This creates the reasonable assumption that the lean approach creates improved understanding and, thus, improved effectiveness and efficiency (Alpenberg and Scarbrough, 2016).

Alpenberg and Scarbrough (2016) identified the communication style within an organisation that resulted in the most significant success in terms of lean implementation. They identified six different language practices that they had evaluated in nine different organisations:

- Blending – The manager becomes part of the working situation by acting as a participant, not an outsider. Here, communication uses indirective, inside information. This can sound like "we" rather than "you" or "your work practice".
- Separation – The opposite of blending indicates the exchanges between the manager and employee are separate from one another. Language such as "I want you to…" is used instead of "We need to…".
- Positive engagement – Use positive language and indicate progress by focusing on moving forward. This language may be "Why is it done in this way?" and "Is this the better approach?".
- Negative engagement – The opposite of this will have a negative theme and focus more on the mistake made rather than the solution moving forward. This language might be: "You did this incorrectly. Do not do it like that again.". This does not necessarily mean aggressive language; it is just a more direct communication of the problem.
- Soft words – The response from the manager is positive. The manager uses words of encouragement to change behaviors or patterns.
- Hard words – The opposite of soft words. These words are intended to have a negative effect and rely on this emotional response to deter unwanted behavior in the future.

Table 2 shows which of the six language practices were used in each of the nine organizations and what the observed practice was. The study concluded that to have an observed practice of embedded lean, a combination of positive engagement, soft words, and blending should be used (Alpenberg and Scarbrough 2016). These practices are soft skills that, when used correctly, make the implementation of lean more effective. It creates better recipient buy-in and allows a better transition into a lean organization (Alpenberg and Scarbrough 2016).

Table 2. Summary of management communication practices observed (Alpenberg and Scarbrough, 2016)

Observed Practice	Embedded lean				Failed lean			Weak lean	Traditional US Manufacturing
	Scania	Toyota (2007)	Toyota (2005)	Toyota (1973)	Subaru (1995)	Suzuki GM (1997)	Mazda (1990)	GM (1999)	Ford (1991)
Positive engagement	X	X	X	X					
Negative engagement					X		X	X	X
Soft words	X	X	X	X					
Hard words					X	X		X	X
Blending	X	X	X	X					
Separation					X	X	X	X	X

In conclusion, the method of Cornelissen (2020) and the language practices stated by Alpenberg and Scarbrough (2016) were combined in Table 2 to indicate an example of how lean principles can be incorporated into a communication protocol. The seven steps in Figure 2 are expanded on in Table 3, showing how each step is defined and then adapted to fit a lean approach to communication decisions. This communication program describes a broader interpretation than this paper requires; therefore, each step is interpreted and adapted to fit the needs of the specific communication protocol being designed. The first column of Table 3 gives the steps defined by Cornelissen. The second column lists descriptions adapted from Cornelissen and elements about the communication process under investigation. The third column elaborates on the lean conclusion that can be drawn from the specific step. In other words, it explains how each step can be seen within leanness. The lean conclusions are drawn from a combination of

theories and resources in the literature. The eight forms of waste and the 14 lean management principles (Liker, 2021) were used to evaluate the "leanness" of each step of the communication protocol design.

Table 3. Lean interpretation of theory-based communication programme planning

Step	Description	Lean Conclusion
Strategic intent	This step represents the gap between how the organisation is perceived and how it wants to be perceived. It entails the identification of this and the general goal of the organisation. The strategic intent will depend on the intended recipient of the communication. However, the general rule is a favourable reaction to information communicated and of the carrier of the message. For example, when communicating with the operators, the intent would be to promote understanding since that would, in turn, promote continuous improvement.	According to the first lean principle, long-term systems thinking as a philosophy (Liker, 2021), which points to establishing the purpose and long-term goals to be achieved to make the communication process effective.
Define communication objectives	The definition of the communication objectives is set for a particular stakeholder group. Objectives would include whether change is required or merely a consolidation of the stakeholders' awareness, attitude, behaviour, and others.	The lean interpretation of communication objectives would be communicating information whose underlying objective is to promote lean thinking, such as continuous improvement among all phases of employees. This can be done in terms of the five elements of lean: defining the value, mapping the value stream, creating flow, using a pull system, and pursuing perfection (Liker, 2021).
Identify and prioritise the target audience	Stakeholder groups are identified based on their relevance and importance to the proposed outcome.	Since the outcome of this report is better communication within the business, the stakeholders involved are the employees, specifically managers, supervisors, operators, and other employees. Accurate and constant communication will help enable an organisation to create mutual trust and understanding between different employees, aligning the business further with leanness and partly addressing principles 9, 10, and 11 of the 14 management principles found in leanness.
Identify themed messages	Based on the determined objectives and target audience group, the theme of the message should be determined. This determines what the core message will be.	The theme of the message should be conclusive understanding. This addresses communication waste and aligns the protocol closer with lean thinking. Therefore, all information communicated must refer to the core theme of creating a message that the stakeholders can understand. Establishing the correct theme leads to better understanding and, thus, less waste.
Develop message style	Based on the five different message styles, it is determined which of the five would suit the theme of the message and the audience. In other	The message style will depend on the information communicated; however, the style should be based on the practices of blending, positive engagement, and soft words (Alpenberg and Scarbrough, 2016). This

Step	Description	Lean Conclusion
	words, how can the message be communicated to be best understood and interpreted?	will promote leanness within the business and make communication more lean-oriented.
Develop a media strategy	This step entails the identification of a carrier for the message. In other words, the media or platform that should be used for specific messages and communication.	Although media does not necessarily mean creating an app for the communication of information, information flow should be considered in such a way as to minimise the waste created by excessive information or how information is communicated (Redeker, et al., 2019). Another way of interpreting the media is by choosing lean media, as communicated by Kock (Kock, 1998), to encourage independence and behavioural change. Kock mainly refers to the media richness theory, establishing that media can be either rich or lean. Rich media, such as face-to-face meetings, do not necessarily result in better understanding. The conclusion is that if media is used effectively, rich communication media is not required for proper understanding. In other words, lean media, such as e-mails, can be effective when used correctly.
Prepare the budget	The final step is to evaluate the financial implications of the program and determine the budget for the program. Most of the budget would likely be spent on the media used, but that would depend on the program.	There is no need to allocate a budget for implementation in the initial stages; the cost will be minimal. However, further investment can be explored once the protocol is fully integrated into the company.

When designing a lean communication protocol, the steps in Figure 2 can be adapted to fit a leaner approach to communication. The identified literature was used to create a communication program with a core focus on lean thinking. According to Alpenberg and Scarbrough (2016), a specific language yields more successful results when used in implementing leanness.

Design Requirements

With the aim of the study in mind, the lean communication protocol should align with the following lean-thinking principles:

- Standardised procedure for communication, showing that there is a specific way to communicate that can be applied throughout an organization. (Principle 5 of lean, standardized processes (Liker, 2021))
- Improved flow of information means information flows from one stakeholder to the next with few barriers. (Principle 2 of lean, continuous flow (Liker, 2021))
- Effective and efficient manner of communication, which will improve overall understanding and comprehension.
- "Pull" of information based on the need for communication, meaning communication only occurs if the information is required and necessary, based on its urgency and impact. (Principle 3 of lean, pull (Liker, 2021))
- Communication waste is minimized.

Method

The communication protocol designed in the current study aims to improve information flow and general communication practices. The protocol will act as a guideline for making communication-based decisions. It offers the output of the specific language appropriate to different scenarios, specific media that apply to them, and the style best suited to communicate the information. The communication protocol was developed based on the "communication program and campaign planning" process shown in Figure 2 by Cornelissen (2016). The planning

process is a general corporate communication strategy adapted to fit this paper's scope. This original planning process comprises seven steps, six of which were used to develop the different phases of the communication protocol. The seventh step refers to budget preparation, which was not relevant to the design of the communication protocol itself. Table 3 shows the seven steps given by Cornelissen and the lean interpretation. These steps were used as a primary framework to establish the communication protocol. Each step is used to determine what the communication protocol will entail, what decisions will be made, and what the goal of the communication protocol needs to be.

Step 1

The first step of developing the communication protocol was to determine the strategic intent of the communication in general and the communication protocol.

- Determine Strategic Intent:When communicating information, the intent is that its meaning is fully comprehended. When communicating instructions, the intent is to communicate a perceived confidence in the person's ability.

Step2

The communication objectives are determined to clearly define the communication protocol's purpose and establish a clear goal of what the communication protocol aims to achieve once implemented. This is seen in the second phase of the communication protocol (Figure 5).

- Define communication objectives: Promote continuous improvement using blended language with positive engagement and soft words (Alpenberg and Scarbrough, 2016). Increase the effectiveness of communication by mapping the flow of information and determining the best possible method of communication. Promote understanding by implementing information sessions (that could be in the form of Q&A sessions) where new or unfamiliar information is communicated. Standardise the communication process by creating a decision tree to make communicating information to various stakeholders easy and accessible.

Step 3

The third step in the communication protocol decision-making phase is determining which stakeholders receive the communication. This is seen in the third phase of the communication protocol (Figure 6).

- Identify and prioritise the target audience: Employees (all), managers (upward staff), operators (downward staff), peers and equals.

Step 4

The fourth step is establishing the theme of the message being relayed. This can be seen in the fourth phase of the communication protocol (Figure 7)

- Identify themed messages: The theme of the message is similar to the objectives but is more general and more of an overview of the intended goal to be reached (Cornelissen, 2020).

Step 5

The message style forms part of the output of the communication protocol. This is illustrated in phase five of the communication protocol (shown in the orange block).

- Develop Message Style: The style of the message will be determined on a case-by-case basis. Examples include a rational message style, a generic message style, or a pre-emptive message style (Cornelissen, 2020). The style will depend on the stakeholder being communicated with and the information being communicated.

Step 6

Finally, the media is established. This also forms part of the output of the communication protocol. It is seen in phase six (in the blue-green block in the middle).

- Develop a Media Strategy: E-mail communication would be sufficient for communication on a day-to-day basis. More training or information-dense communication in a face-to-face interactive environment would be more justified. With the communication of instructions, a hybrid method could be used to ensure the initial understanding, and then the communication could be switched to online once the understanding has been established.

These steps established the groundwork for the final graphical design of the communication protocol. They show the theoretical decisions that led to its design and the different decisions included within the protocol.

The design is then taken a step further and is used to determine if using lean as a method of improvement for this process will yield better results. When developing the conceptual design of the communication protocol, lean principles were adapted to provide the most effective outcome. The theory explained can be used to strategically plan the communication protocol, which can then be combined with information from the literature to deliver a concrete and standardised communication protocol,

In concluding the communication protocol design, a lens of leanness was used as a basis for the decision. For example, when determining the communication objective, the importance of continuous improvement should be included in addition to setting an objective of minimising miscommunication (in other words, minimising waste). This lens was applied throughout the design process, allowing for a generic communication strategy to be classified as lean.

Results and Discussion
The problem identified is that communication processes in lean organisations do not align with lean thinking, leading to inefficiencies. If communication is considered a process like any other production process, it allows for applying lean thinking.

Protocol Overview
The communication protocol design in the current study is intended to improve information flow and general communication practices.
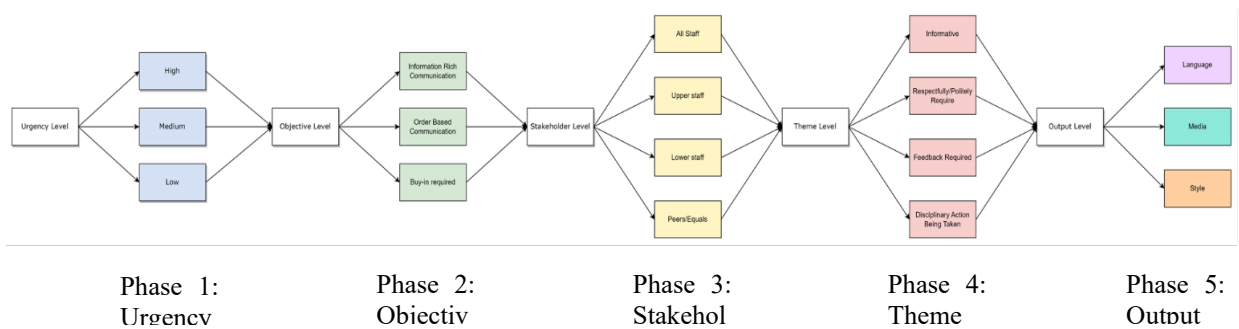
Figure 2. Communication protocol phase overview

Figure 3 shows an overview of the communication protocol phases. It indicates how the decision-making takes place; four decisions are made throughout the protocol to achieve the final phase, the output generated by the protocol. The communication protocol is separated into five phases. Each phase represents a different factor to be considered to allow for better communication. The first four phases are more focused on the efficiency of communication. In these phases, the communication is classified so that precise output can be determined. Communication is differentiated into different types, each requiring a different communication approach. This leads to the final phase, providing the output required for effective communication. The last phase provides specific output options for the three factors specified. This enables a better understanding of how information should be communicated to avoid communication barriers. Each protocol phase coincides with a decision or with the output phase.

Phase 1 - Urgency
The first phase is the urgency phase. This decision determines the urgency of the communication:
1. High – Immediate action is required; the communication is time-sensitive.
2. Medium – Action is required; the communication is not as time-sensitive.
3. Low – Communication is necessary, but nothing depends on its immediate implementation.
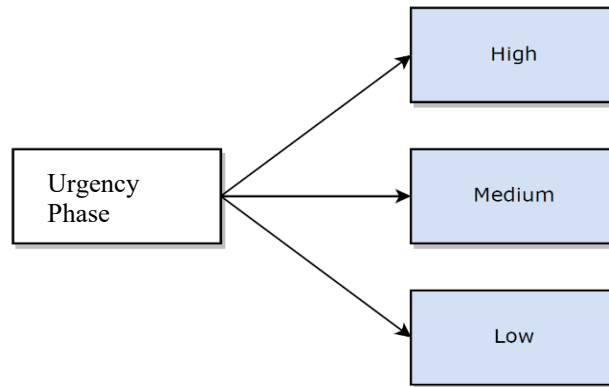
Figure 3. Urgency Phase (Blue)

Phase 2
The second phase of the protocol is the communication objective.
1. Information-rich communication – Implementing a new plan or protocol that requires behavioural changes, a new way of operation, a change in standard procedures, and implementing new concepts.
2. Order-based communication – Singular order to change a specific manner of doing something.
3. Buy-in required information – Change the company directive or operations for which buy-in is required to make it a success.
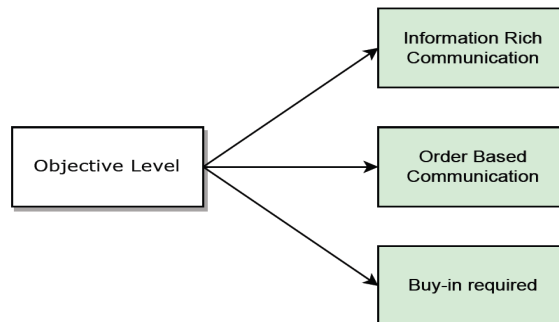
Figure 4. Objective Phase (Green)

Phase 3
The third phase of the protocol addresses the stakeholders involved in the communication.
1. All staff – The communicator communicates with all staff members at all company levels.
2. Upper staff – The communicator communicates with employees at levels higher than their own.
3. Lower staff – The communicator communicates with employees at levels lower than their own.

4.   Peers/Equals – The communicator communicates with employees at their own level.
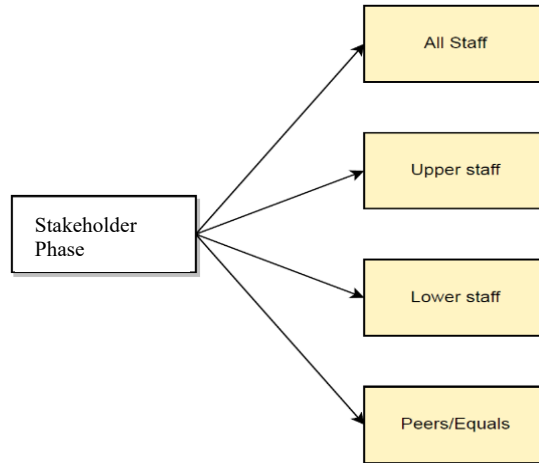
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Figure 5. Stakeholder Phase (Yellow)

Phase 4

The fourth phase classifies the theme of the communication, in other words, the desired result of the communication.

1.   Informative – Inform stakeholder of changes that do not require their direct behaviour change.
2.   Respectfully/Politely require – Respectfully require information or behavioural change. The previous way of doing something was not incorrect. This is just a new way of doing it, or specific information is required from a stakeholder.
3.   Feedback required – Changes are proposed but require input from stakeholders for improved implementation, or new ideas are required. This could also be seen as a form of troubleshooting, using stakeholders' knowledge to identify and improve flaws in a plan.
4.   Disciplinary action being taken – Disciplinary action taken requires communication change in a stern manner that communicates the seriousness of the wrongdoing.
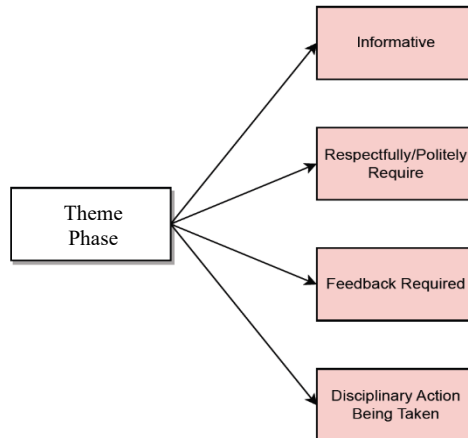

Figure 6. Theme Phase (Pink)

Phase 5

The final phase of the communication protocol is the output. This is the final deliverable of the protocol and shows what direct changes in communication need to take place when using the communication protocol (Figure 4). The

details of each output element (language, media, and style) are presented in Table 4. Each of the previous 4 phases has led to a specific path in the communication protocol, which led to the unique output explained in the final output phase.
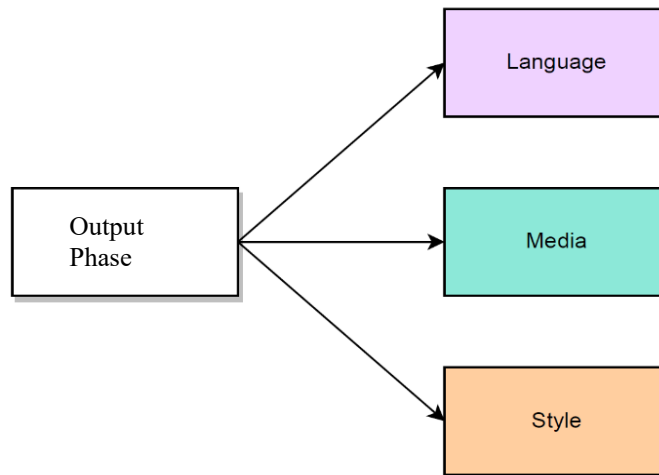

Figure 7. Output Phase

The output phase provides the communication information essential when trying to communicate specific information accurately and effectively:

- Specific language: that which will allow for buy-in and proper understanding from the stakeholders (reflected in the purple block).
- The media is chosen to be the most efficient way of communicating specific information with a specific objective, urgency and theme. (This is illustrated in the blue-green block.
- The communication style is specified. This is illustrated in the orange block and the Style row of Table 4.

Table 1. Specific outputs.

Output	Description	Options
Language	The specific language used to communicate.	- Direct: No emotive language, directly communicating information. - Blending: This indicates that the manager becomes part of the working situation by acting as a participant, not an outsider. Here, communication is done using indirective, inside information. This can sound like "we" rather than "you" or "your work practice". - Positive engagement refers to using positive language and indicating progress by focusing on moving forward. This language may be "Why is it done this way?" and "Is this the better approach?". - Soft words: This implies that the response from the manager is positive. This is more words of encouragement, encouragement to change behaviours or patterns.
Media	The media is used to communicate.	- Face-to-face (in-person meeting or online meeting) - E-mail (or other digital communication)

Output	Description	Options
		• <u>Handouts</u> (information printed or compiled into pamphlets or documents) • <u>Notice boards</u> (information made into a poster and placed in designated areas)
Style	The message style used.	• <u>Rational message style</u>: Rational message style addresses important factors that can be identified and bases information on those factors; in other words, superiority claims are made about the specific change. • <u>Generic message style</u>: Generic message style implies that the intention behind the message being communicated is not differentiated from another. No specific language is used—direct communication with little indication of preference or benefits. • <u>Pre-emptive message style</u>: Pre-emptive message style refers to a generic message with a subtle suggestion of superiority.

The completed communication protocol is provided in Appendix A, where the entire protocol is divided into three degrees of urgency. It can be seen how each decision made throughout the communication protocol yields a unique output.

Validation

The validation of a solution is based on the ability to address the problem. This study, therefore, requires proof that the communication protocol is aligned with lean thinking. The following lean elements were used for this purpose (Liker 2021):

1. Standardised procedures;
2. Improved flow;
3. Effective and efficient communication;
4. Pull, and
5. Waste reduction.

Table 5 shows the requirements listed in the first column. The second column shows whether or not the lean communication protocol met the requirements listed, and the third column provides an explanation.

Table 2. Lean element adherence.

Lean Element	Yes/No	Explanation
• Standardised procedure for communication	Yes	By following the outlined decision protocol, a specific method is followed for communicating with stakeholders. This acts as standard procedure.
• Improved flow of information	Yes	A specific flow is established since there is a standardised communication procedure. This is an improvement, as no standardised procedure existed before the communication protocol was developed.
• Effective and efficient manner of communication	Yes	The communication protocol allows for efficient communication since the classification of communication into a specific type allows for the avoidance of time wasted on wondering how to communicate specific information. The protocol also improves effectiveness since the language and styles identified for the different communication types are proven to aid lean organisations in bettering the communication process. As a result, less information is being misunderstood or misinterpreted.

Lean Element	Yes/No	Explanation
• Pull based on the need for communication	Yes	Communication is decreased due to a straightforward communication process that will filter out unnecessary communication.
• Communication waste is minimised.	Yes	This is explained in detail in Table 6. It is shown that communication waste identified in the study can be addressed with the communication protocol.

To adequately show the alignment with lean thinking, the lean waste elements are evaluated individually to determine whether using the communication protocol would reduce or eliminate the waste forms.

Table 3. Communication waste addressed.

Lean Waste	Communication Process Waste	How the communication protocol addresses the relevant factor.
Overproduction	Sharing too much information before it is required.	Identifying the communication theme, stakeholder, and objectives provides the communicator with the specific language and media that would help avoid communicating too much information or too little information to too many stakeholders.
Waiting	Not sharing information soon enough.	The initial decision to determine the urgency of the communication will aid in avoiding or eliminating waiting times. Urgent communication will be communicated immediately, for example.
Unnecessary Transport	Unnecessary media used.	Providing specific communication media for each communication form allows information to flow in a way that does not waste unnecessary media.
Incorrect processing	Incorrect language or communication style used.	The output of the communication protocol addresses the language and style of communication required to ensure an accurate understanding of the information being communicated.
Defects	Misunderstood communication.	The specific decisions based on the theme, objective, and stakeholder will ensure that communications will be accurately understood and not misunderstood, irrespective of how communication occurs. This allows limited opportunity for errors.
Unused people creativity	Not allowing for feedback or input from employees.	This is addressed by considering who is being spoken to and what will be gained from the communication. This means it is important to consider whether or not feedback is required and whether it would be helpful before determining how the communication will occur.

Conclusion

The one thing lacking from previous research on lean communication is the method used for establishing lean communication within an organisation, for example, a protocol or procedure to follow that allows for lean communication. This study has shown the value of using lean as a lens for improving the communication process and how lean waste can be identified within the communication process. Furthermore, this paper adapted established corporate communication planning processes to fit the lean principles. This resulted in a conceptual communication protocol that could address lean waste, create standardised communication, and aid in the decision-making phases of the communication process. If the communication protocol is implemented effectively, it could allow for a better understanding of the company by the employees and a better understanding of practices implemented within the company. This improved understanding achieved by a clear communication protocol will then promote employee buy-in to create a culture of continuous improvement and add value to the people and the operation. The study lays a foundation for lean communication by combining existing theories and principles. It is suggested that future research should focus on validating the conceptual protocol in a real-world context by researching a method of implementation.

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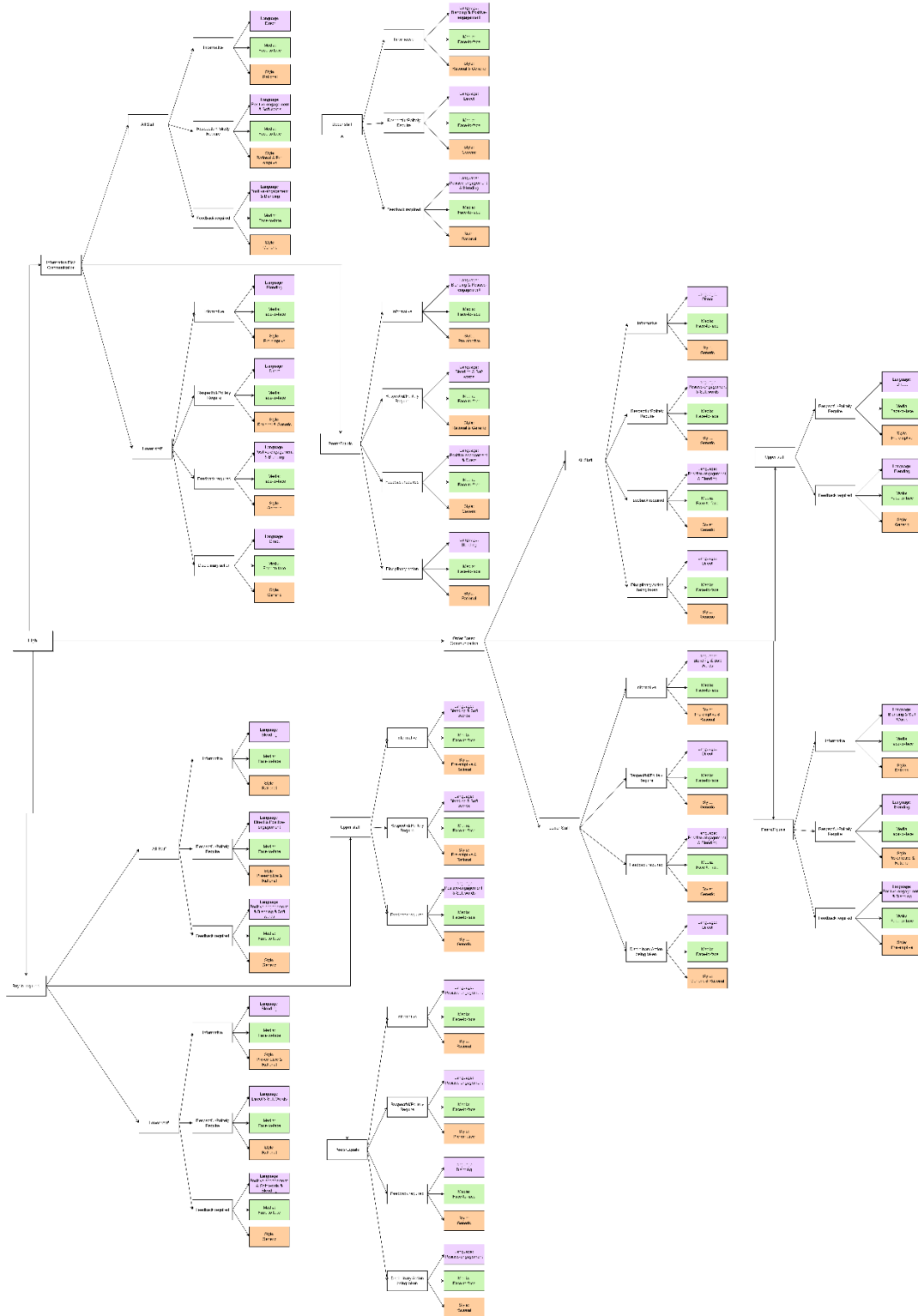
Appendix A

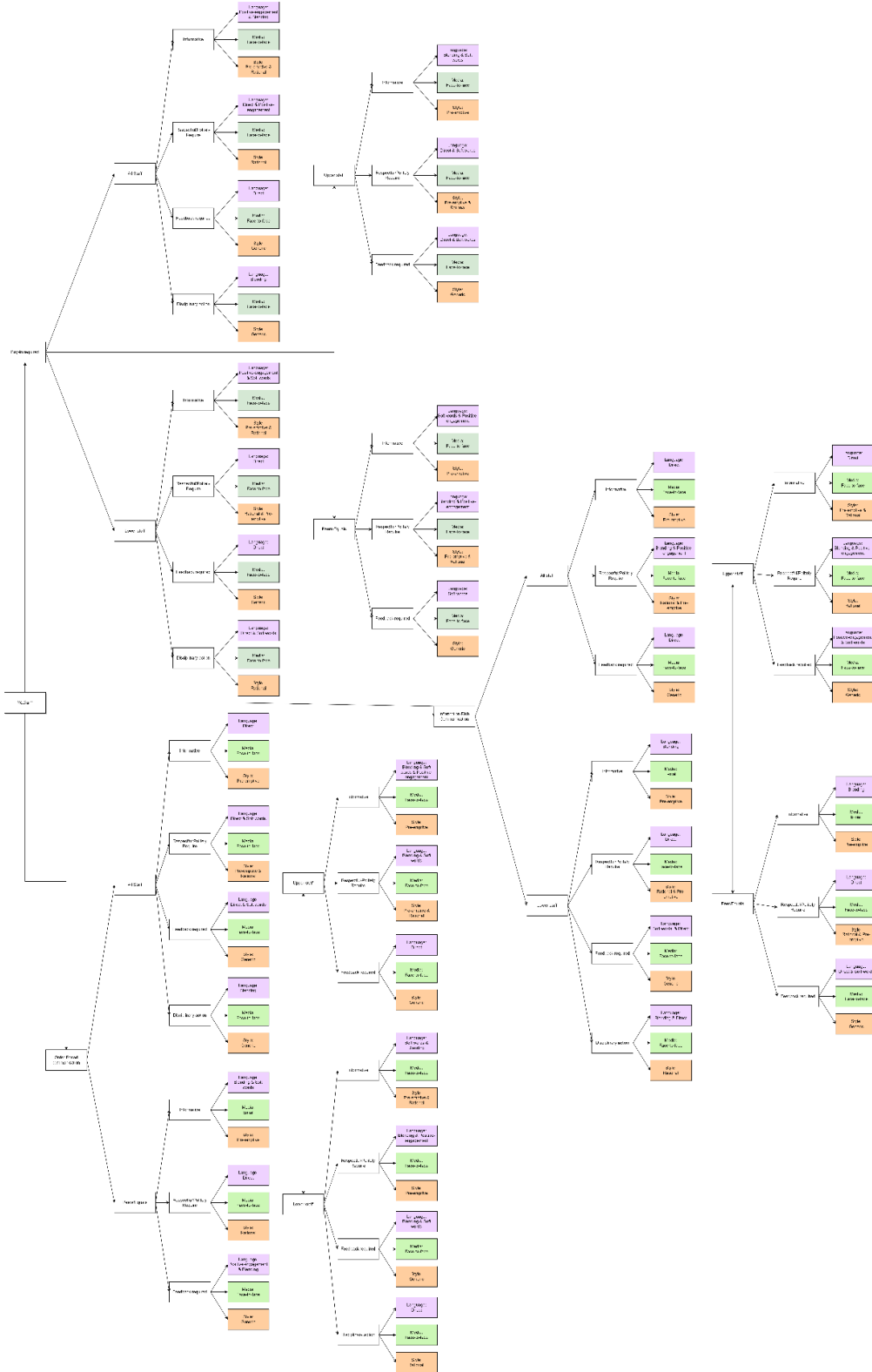Figure 8: High urgency complete communication protocol.
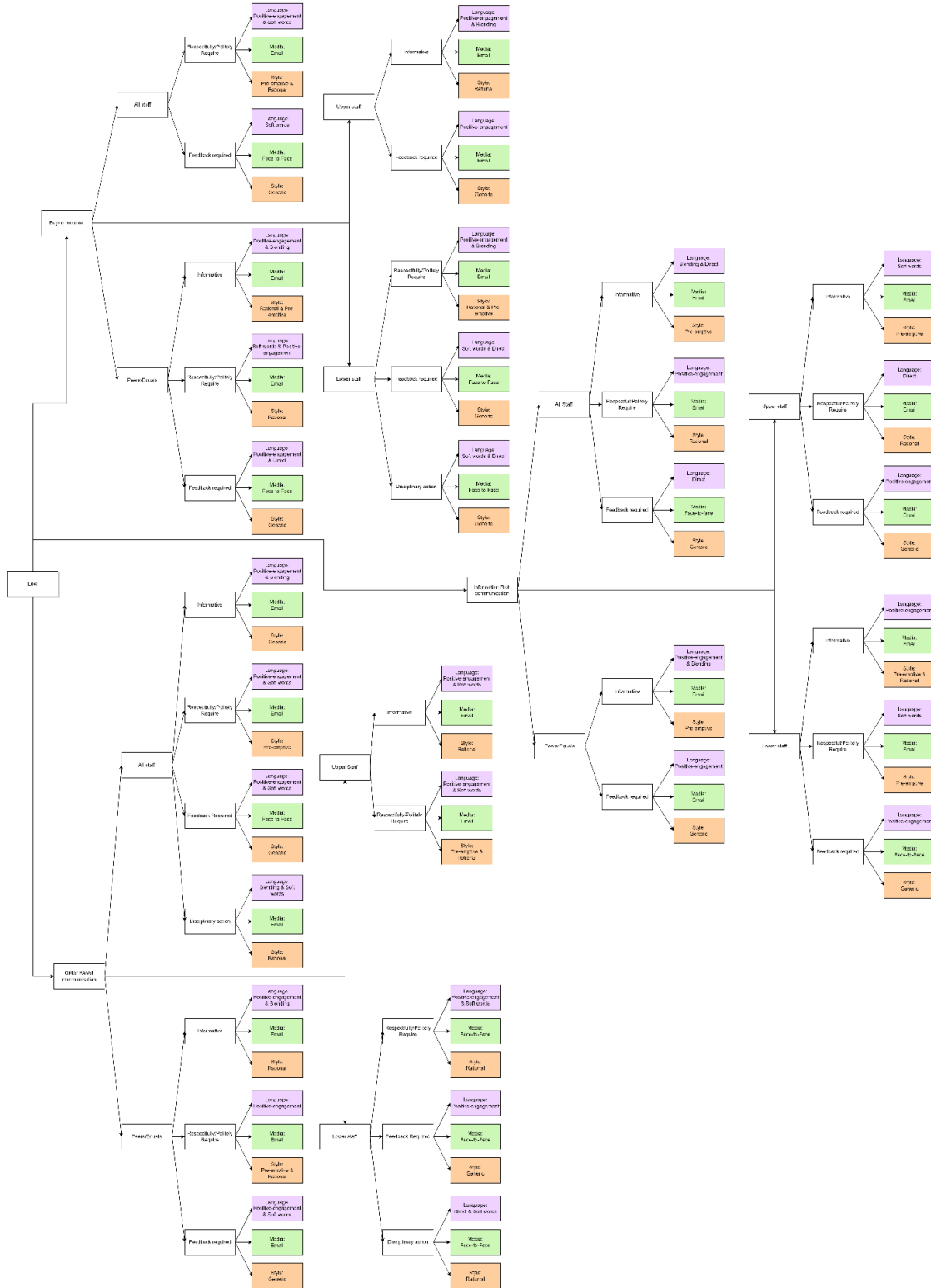
Figure 9: Medium urgency complete communication protocol.

Figure 11: Low urgency complete communication protocol.