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**DEVELOPING TOOLS AND TECHNIQUES
TO INCREASE COMMUNICATION EFFECTIVENESS**

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ABSTRACT

The Public Affairs Office (PAO) of the Johnson Space Center (JSC) is responsible for communicating current JSC Space Program activities as well as goals and objectives to the American Public. As part of the 1996 Strategic Communications Plan, a review of PAO's current communication procedures was conducted. The 1996 Summer Faculty Fellow performed research activities to support this effort by reviewing current research concerning NASA/JSC's customers' perceptions and interests, developing communications tools which enable PAO to more effectively inform JSC customers about the Space Program, and proposing a process for developing and using consistent messages throughout PAO. Note that this research does not attempt to change or influence customer perceptions or interests but, instead, incorporates current customer interests into PAO's communication process.

INTRODUCTION

The Public Affairs Office (PAO) of the Johnson Space Center (JSC) is responsible for communicating current goals and objectives plus all JSC activities to its many customers including the American Public, educators, the media and so on. In addition, by recent executive order, all agencies in the government are to become more customer-focused. These far-reaching responsibilities led to PAO's development of the 1996 JSC Strategic Communications Plan in order to ensure that the American public understands the Space Program's human space flight activities and related research.

As part of the 1996 Strategic Communications Plan, a review of current PAO communication procedures was conducted. The 1996 Summer Faculty Fellow in PAO performed research activities to support PAO's efforts in this area as follows: 1) review current research concerning NASA/JSC's customers' perceptions; 2) develop communication tools which enable PAO to more effectively inform JSC customers about the Space Program; and 3) propose a process for developing and using consistent messages throughout PAO. Each of these activities is discussed below.

CUSTOMER PERCEPTIONS

A recent poll (Ladwig and Miller 1995; Miller 1994) found that only nine per cent of the U.S. public surveyed felt that they were well informed about space exploration. Several factors contribute to this low number. First, Americans face many demands on their time including family, work, leisure, and so on. Time allocated to understanding the Space Program depends on how it ranks with the other priorities of Americans.

Second, people are typically cognitive misers, preferring those items easier to understand. The Space Program is a long-term, complex program which is very scientific in nature. Because of its complexity, people are likely to spend more time to obtain the same level of understanding of Space Program activities than they would other topics, such as sports. Research, such as Miller 1994, found that scientific literacy in the U.S. is quite low. For example, only 72% answered correctly (in a multiple choice questionnaire format) that it takes one year for the Earth to rotate around the Sun.

And, third, people tend to allocate time to those items of interest to them. Again, Miller 1994 shows that Americans are more interested in issues such as the environment, economic conditions and local schools than space exploration.

Yet, national legislation has assigned NASA the task of informing the American public about the Space Program. One of the major functions of NASA outlined in The National Aeronautics and Space Act of 1958 is to "provide for the widest practicable and appropriate dissemination of information concerning its activities and results." In addition, a 1993 Executive Order directed all government agencies to be customer-driven, putting the customer first while providing the customer with the highest quality service. Thus, this research project focused on aiding PAO in developing appropriate tools and methods to effectively accomplish the goals of these directives. For example, see NASA's Customer Service Status Report to the President, March 8, 1994.

COMMUNICATION PROCESS

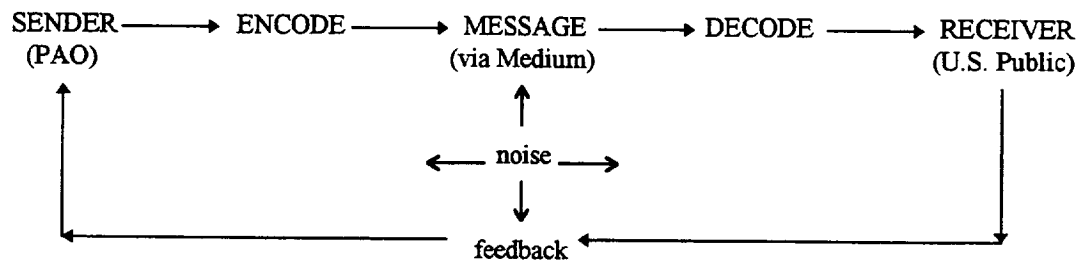
Most proposed communication models are similar to the one shown in Figure 1. In order for the receiver (customer) to obtain the intended message, all of the steps in the model need to take place. The sender (PAO) needs to encode the message in an appropriate manner that the receiver can understand. This encoding may not be easy, especially when the reported activities are highly technical in nature. The sender must transmit the message through a medium that the receiver uses. This not only means TV, for example, but one of the specific TV channels that the receiver watches.

Next, the receiver needs to decode the message. Decoding includes information processing of the message similar to the model in Figure 2. The receiver must first pay attention to the message. If the receiver is not paying attention, the message is lost. As previously discussed, the Public has many other priorities and their attentiveness to Space Program messages may be quite low.

Once attentive, the receiver needs to put the message into language he or she understands for comprehension. This may be an arduous task for Americans low in scientific literacy. Further, research has shown that exposure to the message multiple times is often needed for adequate comprehension and retention of the correct message meaning. That is, the message needs to be sent multiple times and the receiver needs to take in the message multiple times for adequate comprehension and retention to take place.

COMMUNICATION TOOL DEVELOPMENT

The first major objective of this research was to develop tools that would enable PAO to better inform its customers about the Space Program. Data from Ladwig and Miller 1995 suggest a high correlation ($r = .79$) between an individual's interests and his or her perceptions of being well informed. No data was found to determine the temporal positioning (cause and effect) of these two variables. It is quite easy to envision



Communication - the passing of information or ideas between the sender and receiver to inform, remind and increase awareness

Encode - putting the message into understandable form for the receiver

Medium - the way message moves from the sender to receiver - TV, radio, newspaper, etc.

Decode - receiver translates message into understandable form to the receiver

Feedback - sender monitors how message is being received by measuring receiver responses

Noise - factors that can distort or interfere with the message being sent

Figure 1. - Communication Process Model

MESSAGE → ATTENTION → COMPREHENSION → RETENTION

Attention - awareness, notice, concentration of the mind on something

Comprehension - Understand the meaning

Retention - remember, keep in mind

Figure 2. - Receiver Decoding Message - Information Processing Model

situations which illustrate either or both. This research is concerned with how customers become better informed and, therefore, attempts to capture that portion of the relationship where being interested influences being informed. Attention is a major step in processing message information as shown in Figure 2. Typically, an individual will pay more attention to a message concerning a topic he or she is interested than a message concerning a topic he or she is not interested. Attentiveness to a message increases comprehension and retention of the message which, ultimately, increases how well informed the individual is.

Thus, a basic assumption of this research is that a customer's interest or lack of interest in a topic will influence how informed the customer will be. Note, there was no attempt in this research to change or influence customer interests; instead, the proposed communication tools incorporated current customer interests.

From past research (JSC Open House Survey 1995; Ladwig and Miller 1995; Miller 1994; Yankelovich 1996), several thematic areas were identified as being of current interest to NASA/JSC customers. From this data, it appears that customers are more interested in certain aspects of the Space Program than others. The fundamental concept of this research was to develop messages that inform customers about the Space Program but in a manner more in line with customers' current interests.

To accomplish this, a matrix was developed which incorporated customers' current thematic interest areas obtained from research described above and the JSC activities portion of the Space Program. Each JSC activity was related to a thematic area of interest to the customer. The JSC list of activities was developed using the 1996 NASA Vision and Mission and NASA Strategic Plan, the 1996 PAO goals and objectives, JSC's areas of excellence, schedule of current and future JSC Program events and related activities, and so on. Thus, the Themes and Messages Matrix includes themes from customers' current interest areas and messages from JSC activities.

It is envisioned that PAO use the Themes and Messages Matrix to aid in developing messages for JSC customers. When developing messages about JSC activities, PAO incorporates into the message a key thematic area of interest to the customer. Key thematic interest areas are incorporated into JSC messages for three major reasons. First, messages that include a customer's interests will more readily get the customer's attention. If the customer is attending to the message, he or she will listen more closely or read more carefully and, hopefully, retain more. Second, the message is expressed in terms the customer understands since the thematic areas were developed from customer perceptions and feedback. Customer comprehension and retention will increase when the message is structured in a way tailored to the customer. And, third, though the JSC activities reported may vary considerably, the thematic interest areas vary less. This allows for repetition of the thematic interest areas even though the JSC activities may change. Repetition of a thematic area will aid in retention of the JSC activity. Ultimately, as the customer retains more information about JSC activities, he or she will become better informed about the Space Program.

Since Space Program goals and customer interests may vary from time to time, the Themes and Messages Matrix can be revised periodically to reflect this new information.

THEMES AND MESSAGES MANAGEMENT

The second objective of this research was to develop a process where "Themes and Messages" (T&M's) are updated on a timely bases, used consistently throughout PAO, and incorporated into appropriate PAO products. Figure 3 shows the proposed process. The main drivers of messages from PAO to JSC customers are the program and center events and activities (e.g. Shuttle missions, Space Station milestones, special JSC projects, etc.). The earlier customer thematic interest areas are associated with upcoming JSC events and activities, the more effectively PAO teams can integrate T&M's into their products. Thus, PAO personnel who are in the best position to know of upcoming events and activities were identified. These key personnel will come to the weekly PAO Staff Meeting with suggestions for T&M's for the next reporting period. PAO Management approve a set of T&M's and inform the team leads, whose teams integrate the T&M's into their products.

CONCLUSION

Communication is more effective when an organization considers customer perceptions and knowledge. It was proposed that including current interests of customers into PAO messages will aid communication by enhancing customer understanding and knowledge of the Space Program. To accomplish this, a matrix was developed which related JSC activities to current thematic interest areas of the NASA/JSC customers. In addition, a process was developed to aid in identifying messages and using these messages consistently throughout PAO.

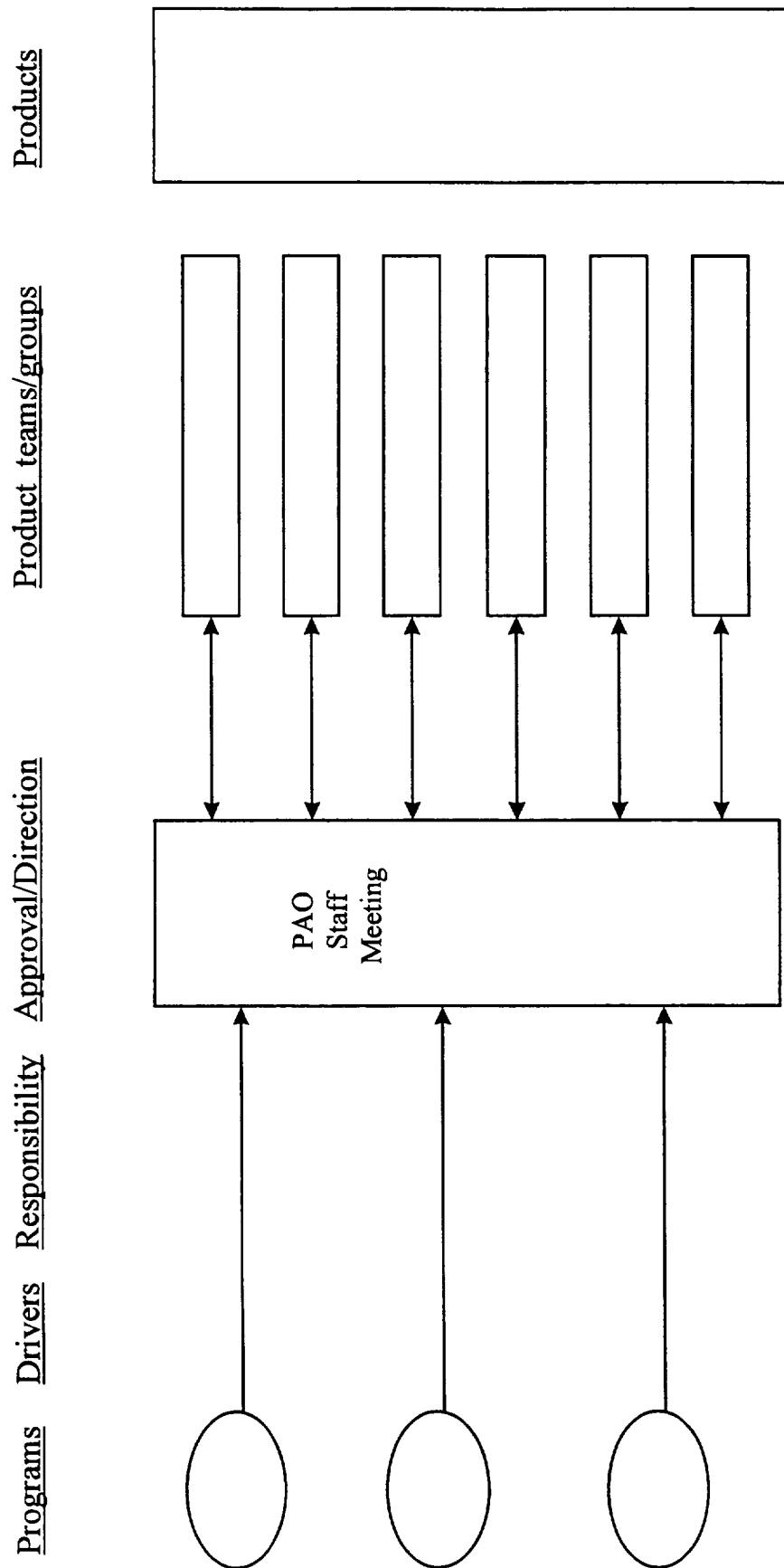


Figure 3. - Process for Developing and Using Messages

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