

## A New Model of Human Needs as the Foundation for Innovation Management

Oliver Yu

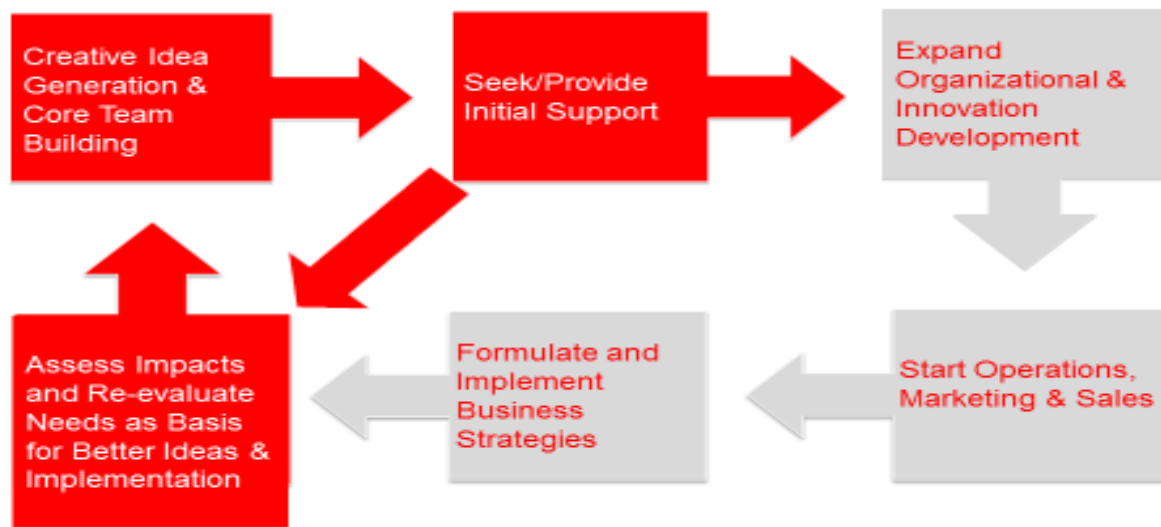
San Jose State University, San Jose, CA - USA

**Abstract**--Defined as an idea implemented with impact, innovation can be viewed as a process involving the synergistic investments of time, money, effort, and other resources by the key participants: the creator, the core team, the supporter, and the adopter of a new idea, product, or service. A basic requirement for creating synergy in this investment perspective of innovation process is for all participants to perceive sufficient values in their respective investments. Since human needs are the motivators of human behavior and values are generated by fulfillment of these needs, understanding of human needs provides the foundation for effective innovation management by developing motivations for the key participants to perceive sufficient values for their investments in the innovation process. The traditional Maslowian model of human needs, although widely known, is not very applicable in forging this synergy because of its impractical hierarchical structure. This paper presents a new model with applications by classifying human needs into two interactive dimensions: the dimension of physiological vs. psychological needs and the dimension of safety/security vs. stimulation/growth needs. This new classification provides a basis for effective innovation management by pinpointing the specific needs that can be used to motivating participation and forging synergy in the investments by key participants in the innovation process. Moreover, it can be extended to the classifications of organizational and societal needs to provide the bases for strategies for technology investments, and used to develop effective motivators for all key participants to perceive sufficient value in their respective investments in the innovation process.

### I. INTRODUCTION

By defining innovation simply as “an idea implemented with impact”, Yu [10] has developed a conceptual model of the innovation process as an idea implementation system as shown in a revised version in Fig. 1.

Major elements in the system include creating the idea; seeking and providing resource support; developing usable method, product, or service from the idea; and promoting and achieving impact through its adoption by the end-user. By this model, the innovation process has four key participants: the creator, the core development team, the resource supporter, and the adopter of the new idea and its resulting usable method, product, or service. This model also provides an investment perspective for the innovation process, in that each participant is viewed as making an investment of time, money, effort, and other resources to implement the creative idea. (This is true even for the adopter because the adoption of a new idea and the related method, product, or service also requires time, money, effort, and other resources.) From this perspective, innovation management can then be viewed as the process of forging synergistic investments of time, money, effort, and other resources by these key participants to the implementation of a new idea and the resulting usable method, product, or service. A basic requirement for this synergy is for the participants to perceive sufficient values in their respective investments.



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Fig. 1. A Conceptual Model of the Innovation Process as an Idea Implementation System

Since human needs are the motivators of human behavior [5] and values are generated by fulfillment of these needs [4], understanding of human needs provides the foundation for effective innovation management by developing motivations for the key participants to perceive sufficient values for their investments in the innovation process. The traditional Maslowian model of human needs [5], although widely known, is not very applicable in forging this synergy because of its impractical hierarchical structure. By exploring the underlying determinants for the needs, this paper presents a new model by classifying human needs into two interactive dimensions: the dimension of physiological vs. psychological needs and the dimension of safety/security vs. stimulation/growth needs. The paper further discusses applications of this new model not only to individuals but also to organizations and the society as a whole. It should be noted that the focus of the new model is simply a new classification scheme of the well-recognized human needs that is more logical and functional than those in the traditional models. However, the new model can be useful for the empirical testing of the hierarchical structure among the needs in relation to increasing resource availability, which in turn forms the basis for developing effective motivators for the key participants to invest in the innovation process.

## II. A BRIEF REVIEW OF THE MASLOWIAN MODEL OF HUMAN NEEDS

One of the most popular model of human needs is the hierarchy of human needs presented by Abraham Maslow in his seminal paper, "A Theory of Human Motivation" [5]. The two major characteristics of the Maslowian model are:

- (1) There are five types of basic needs: physiological, safety, love, esteem, and self-actualization.
- (2) These basic types of needs are related to each other, "being arranged in a hierarchy of prepotency", in which when a lower-level of needs is satisfied, the next level of needs emerges.

A popular depiction of this hierarchy of human needs is shown in Fig. 2.

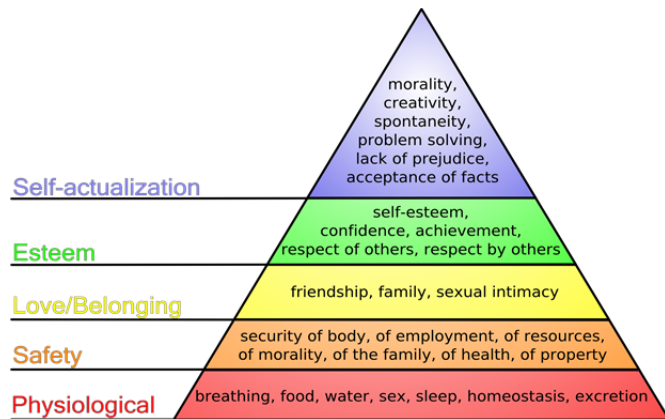


Fig. 2. Abraham Maslow's Hierarchy of Human Needs.

The Maslowian model has not only influenced the work of many prominent researchers in the field of management and organizational behavior (Wabha and Bridwell [9]) but also appeared to be widely adopted by the business community, as a recent Harvard Business School survey of managers by Amabile and Kramer [3] showed a 95% implicit acceptance of the hierarchical nature of human needs for employee motivation. On the other hand, the model has largely been criticized for the impracticality of its hierarchical structure and the ambiguity in the characterization of "self-actualization" (Neher [8]; Wabha and Bridwell [9]). Even random observations of human behavior can already produce many counter examples to the hierarchical structure. Specifically, people have often been observed to forsake physiological and safety needs to satisfy love and esteem needs, such as sacrificing their lives for love or risking their health for achievements. Moreover, people have also been observed to not strive to fulfill the self-actualization needs even their love and esteem needs have been satisfied, as shown by the behavior of some of the nouveau riches. On the other hand, people who have satisfied their love and esteem needs have frequently been observed to exhibit strong needs for legacy, altruism, spirituality, and meaningfulness of life, especially during old ages, rather than the lofty need of self-actualization, as witnessed by the widespread volunteerism of the middle-class and the philanthropic activities of many wealthy individuals.

In sum, Maslow's model describes well the physiological needs for survival and safety and the emotional needs for love and esteem, as well as the needs for psychological growth in the form of self-actualization, but is deficient in explaining the commonly observed counter examples of the strict hierarchical progress of needs. Furthermore, it appears to have neglected a major category of human needs for recreation and entertainment.

## III. A NEW MODEL OF HUMAN NEEDS

Given the deficiencies of the Maslowian model, it may be useful to develop a more comprehensive new model of human needs by reviewing other major theories and exploring the underlying determinants of human needs.

A review of recent literature shows that other major theories of human needs, such as the Existence-Relatedness-Growth Theory of Clayton Alderfer [2], the Achievement-Authority-Affiliation Theory of David McClelland [7], and the Autonomy-Competence-Relatedness Theory of James Adie, et al [1] are largely variants and refinements of the Maslowian model. Only the categorization by Manfred Max-Neef [6] includes needs of Understanding, Idleness, and Leisure, which are not directly related to the needs of security or growth in the other theories. Combining these major theories with direct observations of human behavior provides the following insights on human needs:

- (1) In addition to security and growth needs, there are also needs for idleness, relaxation, recreation, entertainment,

and leisure, as well as needs for sensory gratifications, such as tasty foods, beautiful sceneries, and exciting adventures.

- (2) While self-actualization may be the highest level of human needs, lesser needs in this category would include the needs for tranquility, spirituality, caring for other people and living organisms as well as the environment, and meaningfulness of life.
- (3) Instead of being strictly hierarchical, human needs tend to move in diverse directions after the satisfaction of the physiological survival needs. Some people may strive for achievement and fulfillment needs, while other may settle with stability and entertainment needs. Furthermore, these moves may change with the circumstances encountered at different times by different people. For example, a person may feel the needs for leaving a legacy at old age by donating most of the accumulated wealth or for altruism by voluntarily sacrificing own life to save others.
- (4) The move of needs from one category to another in the new model appear to be affected by available resources to form a hierarchical structure. These resources are not simply physical or financial resources, such as energy, materials, and financial wealth that provide means and capabilities for managing the physical environment. They also include psychological resources, such as education and knowledge as well as intellectual and emotional maturity that provide understanding and tools for managing oneself as well as the interactions with the physical environment and the emotional relationships with other people and living organisms in the world.

Based on these insights, a new model of human needs can be developed with the following characteristics:

- (1) The needs can be classified into two broad dimensions: the dimension of physical/physiological-based vs. psychological/emotional-based needs, and the dimension of safety/security-oriented vs. stimulation/growth-oriented needs.
- (2) The physical-security needs for survival and subsistence are the most basic. Needs in other categories generally emerge after satisfaction of these basic needs.
- (3) As more physical, financial, intellectual, and emotional resources become available, the needs can move in diverse directions into other needs or even with different combinations of needs for different people at different times.

A broad categorization of human needs is given in Fig. 3. Details of human needs in each category are discussed below with examples given in Fig. 4.

For the Physical-Security category, the needs start at the lowest level with the survival or subsistence needs of air, water, food, sleep, and shelter, and move to needs for physical safety and health. With increasing availability of mainly physical and financial resources, they then move to

the needs for financial viability and stability, and physical comfort and conveniences.

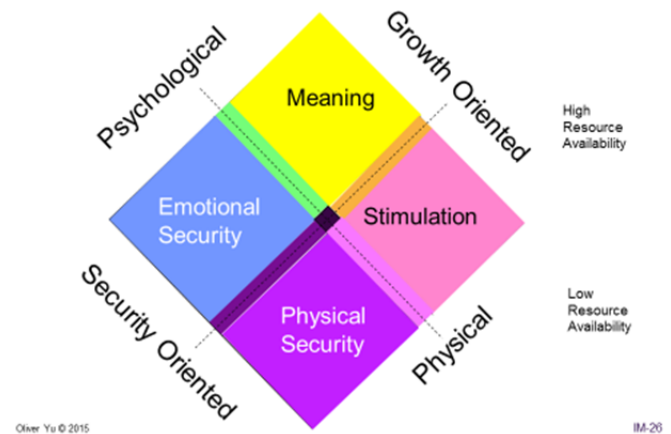


Fig. 3. Broad Categorization of Human Needs based on the New Model



Fig. 4. Details of Human Needs Based on the New Model

For the Psychological-Security category, the needs are more complex. They start with the needs to avoid the unknown, which include the needs of superstitious and even religious beliefs if they are driven by the needs to avoid the unknowable existence of an undesirable afterlife. They expand into the needs for social interactions with others for affinity, relatedness, love, and affection, as well as the needs for either ego protection or submission to others to preserve social order and stability. With increasing availability of mainly intellectual and emotional resources, they move to the needs for power, possessiveness and control of resources and relationships, and finally to the needs for harmony in the social environment.

For the Physical-Stimulation category, the needs start with sensory stimulations and pleasures, such as sex, tasty foods, recreation, entertainment, beautiful sceneries, and exciting adventures. They then move with increasing availability of mainly intellectual resources to knowledge acquisition and artistic and other creative pursuits. Interestingly, this

category also include the needs for idleness and relaxation for the pleasures of physiological recovery from stimulations.

Finally for the Psychological-Stimulation category, the needs start with self-esteem which is more than ego satisfaction but the sense of value about oneself. They then move with increasing availability of mainly emotional resources to empathy and altruism not only for other humans and living organisms but also for the physical environment as a whole, and eventually to the needs for spirituality, morality, and meaningfulness of life.

It is important to note that this categorization of needs is by no means absolute. Many needs can cross over from one category to another. For example, the need for creative pursuits can be a part of the need for self-esteem, and the need for ego-protection can also be the beginning of the need for self-esteem. Similarly, the need for harmony in the social environment can also be the need to feel empathetic and altruistic to others.

Furthermore, with increasing resources, the move of needs among the categories can be very diverse. For example, as financial and intellectual resources increase, a person's needs can move from those in the Physical-Security category to a combination of needs in the other three categories. Moreover, the move may not even be hierarchical. For example, with increasing financial resources, a person may sacrifice the needs of physical safety and health in the Physical-Security category to satisfy the needs for recreational excitement in the Physical-Stimulation category. Similarly, with increasing emotional maturity, a person may transcend needs in the Physical-Security category to the needs for spirituality and meaningfulness of life in the Psychological-Stimulation category.

#### IV. EXTENSION TO THE COLLECTIVE NEEDS OF AN ORGANIZATION AND THE SOCIETY

The new model of human needs can also be used to categorize the collected needs of an organization and the society as a whole.

The extension to the needs of an organization is shown in Fig. 5,



Fig. 5. Extension of the New Model to the Collective Needs of an Organization

Specifically for an organization, when it first starts with limited financial, technical, and management resources, there is a strong need for financial survival and growth. As the organization acquires increasing resources and capabilities, it will move into the needs for market expansion and dominance, and at the same time, it will have the needs to continue development and innovation. Finally, when it achieve financial stability and management maturity, it starts to have the needs for social and even global responsibility.

Similarly, as shown in Fig. 6, for a society as a whole, when it is at an early stage of development with limited resources, there are strong needs for political stability and economic growth. As the society stabilizes and grows, it then has the increasing needs for independent sovereignty, national security, and local influence and even dominance. Then with further increase in resources and maturity, it has the needs for social equity and international harmony.

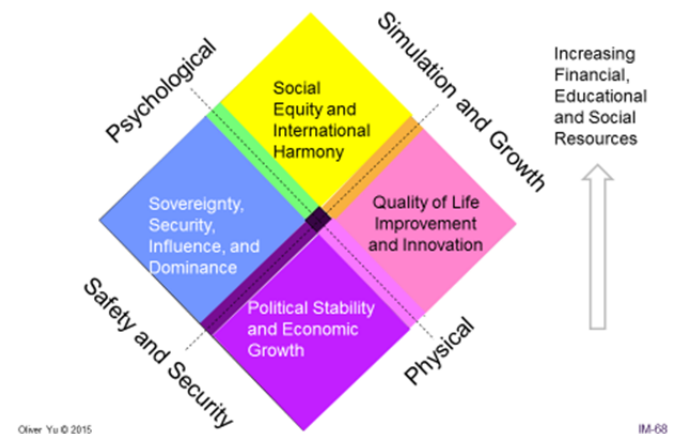


Fig. 6. Extension of the New Model to the Collective Needs of a Society

#### V. APPLICATIONS TO INNOVATION MANAGEMENT

The understanding of human needs from the new model can now be applied to the management of the innovation process as the basis for developing effective motivations for the four key participants in the process. Specifically, it can be applied to develop motivators for the generation of creative ideas, participation in the core team, funding support for the implementation, and the adoption of an innovative idea and the resulting product and service. These applications are discussed in further details below.

For the idea creator and members of the core team, sample motivators based on various needs are shown in Fig. 7.

Specifically for these two participants with low physical and financial resources, financial rewards and materialistic support can be effective motivators to satisfy the physical-security needs. With increasing financial and intellectual resources, motivators to satisfy psychological-security needs, such as peer recognition, management approval, title, position, power and authority may be more effective for some, while motivators to satisfy psychological-stimulation





Fig. 7. Sample Motivators for Idea Creator and Members of Core Team

needs, such as enjoyable workplace, intellectual stimulation, and creative freedom may be more effective for others. Finally, for these participants with mental maturity, motivators to satisfy psychological-stimulation needs, such as a sense of achievement and fulfillment of meaningfulness of life, can be most effective.

For the supporter of the innovation process, sample motivators as shown in Fig. 8. For the supporter, it is commonly believed that satisfying the physical –security need in the form of financial rewards from the funding support as almost the exclusive motivator. However, many innovation supporters are family members and friends of the idea creator motivated by satisfying the love and affection needs, or kindred spirits, such as the crowd-funders, who believe in the same vision and motivated by satisfying the stimulation needs, or cause, or non-profit volunteers motivated by satisfying the needs for meaning in life. In other words, for the supporter with increasing intellectual and emotional resources, motivators to satisfy needs other than financial rewards, such as affection, affinity, relatedness, intellectual stimulation, altruism, and meaningfulness, can be equally if not more effective.

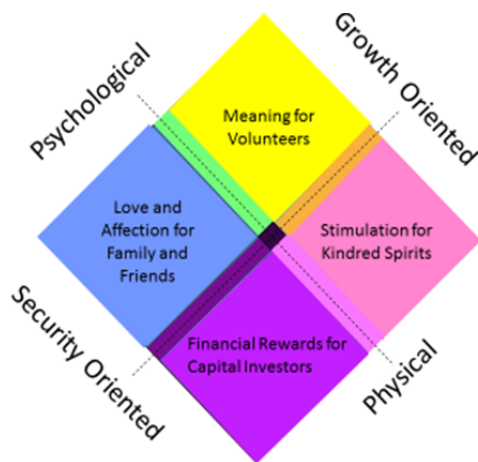


Fig. 8. Sample Motivators for Supporter

Finally, for the adopter of the creative idea and the related product or service, sample motivators are shown in Fig. 9.



Fig. 9. Sample Motivators for the Adopter of Creative Idea and Related Product or Service

Specifically for the adopter with low physical and financial resources, low cost for the product or service is the most effective motivator. As financial resources increase, safety, convenience, and quality of the product or service become important motivators for adoption. With further increase in financial and intellectual resources, motivators to satisfy the psychological-security needs, such as sociability and prestige, become important for some, while motivators to satisfy the psychological-stimulation needs, such as excitement and aesthetics become important for others. Finally for the adopter with emotional maturity, motivators to satisfy the psychological-growth needs, such as significance and meaningfulness of life from the product or service, become effective.

## VI. SUMMARY AND FURTHER RESEARCH NEEDED

By classifying needs into two dimensions: the dimension of Physiological/Physical-based needs vs. Psychological/

Emotional-based needs and the dimension of Security/Safety Oriented needs vs. Stimulation/Growth Oriented needs, a new model of human needs has been developed. This model can be extended to classify the collective needs of an organization as well as for a society as whole. Moreover, the new model can be applied to develop effective motivators for the four key participants in an innovation process: the creator, the core development team, the supporter, and the adopter of the creative idea and related product and service to perceive sufficient values from fulfilling their individual needs by investing in the innovation process.

Sample motivators for different participants based on these applications have been developed. However, due to the wide variety of technology, product, service, management, social, theoretical, ideological, and philosophical innovations, additional research will be needed to expand the applications to specific innovations to develop detailed motivators for individual participants in order to achieve effective management of the innovation process by successfully implement the creative idea to generate large impacts.

In addition, categories of individual, organizational, and societal needs in the new model all exhibit a hierarchical structure in relation to increasing availability of financial, intellectual, and other resources. Thus, the new model can be used for empirical testing of such hierarchical relationships, which can, in turn, form the basis for developing effective

motivators for the key participants to invest in the innovation process.

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