

# Intelligence and Its Many Facets an Exploration with a Missing Link

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## Abstract

Intelligence is the capacity as well as the ability to learn, develop & apply the acquired knowledge for the development, adjustment & prediction of sequential patterns. Intelligence is the basic ability for measurement of different kinds of intelligence tests. Though positive feelings encourage self-esteem and a sense of worth, conveying that they are important factors for “intelligent” beings. As in<sup>1</sup> two principal classifications of intelligence are the operational and the “real” definition. Operational intelligence is measurable with specific aspects. But the real intelligence is one that characterizes the true nature of the thing being defined. Prediction and behaviour are closely related<sup>2</sup>. But behaviour has emotional impact over it, although intelligence has no direct control on emotions. Hence there must be a link between emotion and intelligence. In<sup>3</sup>, the appearance of emotional intelligence (EI) into masses served as a missing link in peculiar findings that people with average Intelligence Quotient (IQ) surpass those with the highest IQ. This throws dislodge to the assumption that the sole source of success is only IQ. But emotion is very lubricious as well as habitat dependent. By measuring Emotional Quotient (EQ) of a person in different situations randomly for same purpose and then trying to convert it into wisdom, we could achieve stability. In this manner with the help of wisdom we could proceed from conscious level to advanced consciousness level. A small act of security concern, depicting an individual’s security quotient (SQ), along with emotional content in any social circumstance/domain could be merged into an intelligence activity. The main objective of this paper is to develop an interlink between emotional intelligence quotient (EIQ) & wisdom quotient (WQ) within any specific range of security with recurrent feedback analyzed by self-actualization. If this hypothetical relation is imposed on any computational intelligence model and then experimented with human subjects belonging to various classes, cultures and ages, then our prediction or visualization could be fine-tuned or smoothened to become a general working model.

**Keywords:** Emotional Intelligence Quotient, Wisdom Quotient, Self-Actualization, Security Quotient

## 1. Introduction and Background

According to the American Psychological Association, intelligence identifies intellectual functioning with respect to verbal, reasoning, decision making, problem solving and comprehending skills. Intelligence quotient tests compare the performance of an individual with the group having similar age by taking same test. However, these tests do not measure all kinds of intelligence; for example, such tests cannot identify the difference in social intelligence. Generational IQ improvement has been found in the population as a whole. Intelligence tests are use-

ful in educational guidance and in assessing the mentally retarded children. They are useful in determining the IQ level of students. Intelligence tests are used in recruitment of army personnel. All the intelligence tests as in<sup>4</sup>, can be broadly classified into i) Verbal tests consists of entirely verbal material dealing with vocabulary, general information etc. E.g.: Binet test, Stanford-Binet test, OTIS test ii) Nonverbal or performance test – involving no language. But items are pictures, drawing, block patterns, etc. E.g.: Goddard form board, R.P.M., etc.

Intelligence tests can also be classified as: i) Individual tests – can be administered to only one individual at a time.

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E.g.: Goddard form board, Bhatia test of intelligence, etc. ii) Group tests – can be administered to a large no. of individuals at a time. E.g.: Army Alpha, Army Beta & RPM. Intelligence tests can also be classified as: i) Power tests: Allow sufficient time to the subject to answer the items. E.g.: Wechsler's test of Intelligence; ii) Speed tests: There is time limit to answer. The subject should try to answer as many items as possible within that time limit. E.g.: Khos block design test, Alexander pass along test, etc.

Social Intelligence<sup>5</sup>, is the ability to understand and manage people. Though Genetics plays a vital role in intelligence but social intelligence (SI) mostly flourish with learning from social circumstances. SI develops from perspicacity with people in society. Key elements<sup>5</sup> proportional to the social intelligence are: i) Verbal communicativeness and volubility so that the extremely socially intelligent person can converse with wide range of people in the society; ii) Knowledge of social parts, protagonist, polity socially intelligent individuals are well versed in various formal and informal rule; iii) Effective listening skills and understanding what other people wants, socially intelligent people are good watchers and manage themselves with others people wants; iv) taking social responsibility and social efficiency, the socially intelligent person knows to play diverse roles in the same society for which they feel free with all types of people. Hence, an SI individual senses socially self-confident and effective; v) Impression management skills, socially intelligent individuals are impression concern; they can manage impression and balance their personal as well as social trustworthy images, which they wants to portray.

Emotional intelligence (EI)<sup>6</sup> is taken as a subset of social intelligence as it monitors ones and other's feelings, with effective emotional manipulations. EI is also a part of Gardner's personal social intelligence. Social and personal intelligence both involves knowledge about self and others. Hence we can conclude emotional intelligence as a self-regulation in a social circumstance.

From Applied Psychology updates up to 2004, there are currently 3 major EI models: the Salovey-Mayer's Ability Model based on perceiving, using, understanding & managing emotion which is most consistent model in EI, the test is modelled on the ability based IQ test. The Daniel Goleman mixed Model consists of sets of emotive proficiencies within each paradigm of EI. Five major EI concerns are self-awareness, self-regulation, social skill, empathy and motivations. Though emotional proficiencies are not native talents but a cultivated capability.

Trait based EI model proposed by K.V. Petrides trait is a assemblage of emotional self-perceptions located at the subordinate level of personality.

Maslow's Hierarchy of Needs (1943, 1970) as in<sup>7,8</sup>, configured that people get motivated for certain needs and after achieving certain need why people head on to next level of desire, so on. Pyramidal model of needs developed, which is categorised on the survival need with respect to primary and psychosomatic requirements for existence (e.g. physical stability, security, adoration, and reverence) and psychological progression needs (self-actualization) for mental stability. Maslow (1970), improved his need pyramid into a eight level structured such as level-1, Biological and Functional needs - breath, hunger, thirst, lodging, cordiality, etc; level-2, Protection of self needs - shield from enemies, safekeeping, command, rule, steadiness, etc; level-3, affection and associational needs - alliance, understanding, friendliness and care - from work group, family, friends, and relationships; level-4, Approval needs - self-worth, attainment, enlightenment, liberation, prominence, self-control, reputation, decision-making accountability; level-5, subjective needs concerning intellect - awareness and thoughtfulness, inquisitiveness and interestingness, assessment, the urge for finding something and expectedness; level-6, creative and inventive needs – obligation and artful towards beautiful things, steadiness, custom, etc. level-7, Self-subconscious realization needs - understanding personal perspective, self-progression, pursuing individual progression and ultimate knowledges; level-8, Wholeness needs - serving others to attain self-potentiality.

Hence we can figure with respect to social circumstances the intellect of a person travels from basic level to growth level for the purpose of shaping the existence, maybe its one in a hundred as in<sup>8</sup>. Transcendence level can be compared with wisdom for achieving common good. As in<sup>9</sup>, wisdom is a distinct psychological concept compared to other psychosomatic conceptions as social intelligence, development, originality, etc. It is a balance between intellects, motivation, and affection and has a higher degree of personal as well as interpersonal competence. It involves well-being of oneself and others. Wisdom in psychology is the expert knowledge concerning with the context of life experiences and it becomes constant after a certain age and is independent of chronological age. So wisdom is stable component of intellect, but it need to be developed profoundly.

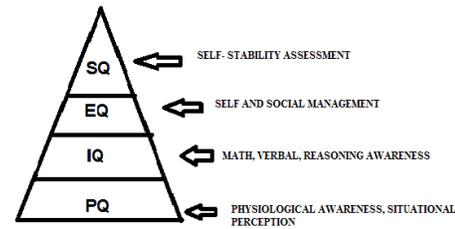
In<sup>10</sup>, the projection and prediction for feelings depends decisively on what basis the emotions are taken. In sentimental and emotional calculation, affection frequently considered as some kind of evidence-which has distinct units or positions inside toward an individual so that they could be transferred in a distinctive method from persons to computational systems and reverse. Establishing emotion as detached, outwardly measurable unit to reaction as familiarity, valuation, too, adjusts concentration from outwardly pursuing the exchange of emotional evidence to illustrating emotions so that they exist during interaction.

This paper<sup>11</sup> explored the analytical and sentimental-traits of intelligence as well as the associated interactive and emotional effects over employees' enactment in a company. Emotional Intelligence brought up a momentous connection with employees' enactment representing that emotional intelligence has more importance than the Intelligence quotient at any workplace. It depicts that there is a positive relation between emotional intelligence and cheerful comportment and negative proportion to emotional intelligence and depressed mood. Employees who have high emotional intelligence sense more the challenges faced by them. They developed the quality to diagnose their own and others' feelings, understands the complexities of fluctuating emotions in others which support them to take better choices and to crack difficult problems that enhanced employees' performance. But IQ should not be completely overlooked yet it detects that EI has an important role to construct than IQ for enhancing organizational effectiveness. Therefore, it is obvious that emotional intelligence can be better analyst of "success" than orthodox methods of IQ tests.

## 2. Contributory Work

In this work there was an attempt to develop a human intellect pyramidal model (Figure 1) and correlate it with wisdom, so the result has less chronological impact on the redefined intellect. Further with the stability of the constructed model we could be able to proceed towards advanced consciousness level. For achieving this model, preliminary survey has been conducted over 112 participants tested for 5 different criteria like food, shelter, health, education and social well-being. This experiment was done under 3 constraints, viz., (i) all 5 criteria, (ii) education, shelter and social well-being (iii) food, health,

education and social well-being. The quantitative analysis of this experiment was done to get the model.

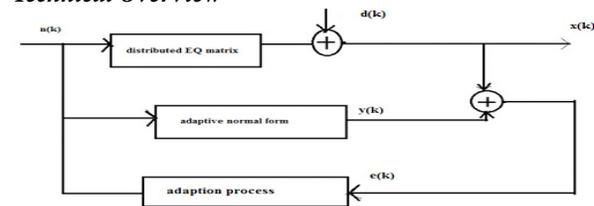


**Figure 1.** Pyramidal Model of Sequential Intellect Comprising of various Quotients.

PQ= Physiological quotient; IQ=Intelligence quotient; EQ= Emotional intelligence quotient; SQ=Self-realization quotient

A distributed matrix is obtained by plotting emotional intelligent quotient with respect to different physiological security concerns.

### Technical Overview



**Figure 2.** Adaptive Network Model for Stable Intellect.

The adaptive normal form is a finite impulse response filter of length with the adjustable impulse response coefficients. N

$$w(k) = [w_1(k), w_2(k), \dots, w_N(k)]^T \tag{1}$$

Here T denotes the transpose operator. In the system identification context, the adaptive normal form attempt to learn the distributed matrix system by using a model of the unknown system represented by w(k). The difference between the noisy response of the matrix system (the desired response d(k)) and the response of the filtered adaptive normal form y(k) is called the error signal e(k).

$$e(k) = x(k) - y(k) \tag{2}$$

At each iteration k the adaptive filter updates coefficients in order to minimize the appropriate norm of the error signal e(k). When the error norm is minimized in a statistical sense, the corresponding w(k) gives an estimate

of the EQ matrix system parameters. If the EQ matrix system is time varying, i.e. its parameters change with time, the adaptive normal form can track these changes by updating its coefficients in accordance with error signal. It can take several iterations for the adoption process to converge. The time taken by the adaption process to converge provides the indication of the convergence rate. There are two main tasks performed by the adaptive normal form; viz. adaption process and filtering process. In<sup>14</sup>, these processes are identified by the adaptive filter block i.e. adaptive normal form and adaptive process. For linear adaptive normal form given by equation (1), is the filtering process involves convolution. If the number of filter coefficients is large, the convolution operation may prove to be computationally expensive. Reduced complexity convolution techniques based on fast Fourier transform (FFT), such as overlap-add and overlap-save may use to ease computational demand. The adoption process has also become computationally expensive for long adaptive algorithms due to the arithmetic operations required to update the adaptive filter coefficients. The computational complexity of the adoption process depends on the adoption algorithm employed. In this method we can converge the time to a fixed point, hence by comparing with ideal normal matrix i.e. wisdom and with iterative error estimation we could achieve our desired value.

**Conceptual Overview**

If EQ in matrix form for different physiological levels is obtained along with the corresponding IQ level of a person, then we would have for each node *k* whose access to time realizations is {dk(i),v(k,i)} of zero-mean spatial data {dk,vk},k=0,1,2,...,L, where each d(k) is a scalar measurement and each v(k) is a row regression vector. We collect the regression and measurement data into two global matrices, as follows:

$$U = \begin{bmatrix} v1(1) & v1(2) & \dots & v1(M) \\ v2(1) & v2(2) & \dots & v2(M) \\ \vdots & \vdots & \ddots & \vdots \\ vL(1) & vL(2) & \dots & vL(M) \end{bmatrix} \quad (L \times M) \tag{3}$$

$$d = \begin{bmatrix} d1 \\ d2 \\ \vdots \\ dL \end{bmatrix} \quad (L \times 1) \tag{4}$$

These quantities collect the data across all *L* nodes i.e. *L* quantified situations. We know, from linear algebra  $U^{-1}U=I$ , where *I* is the identity matrix. But in practical comparison we would get,  $U^{-1}U= I+(\text{error})$ . If *d* in equation (4) is a corresponding IQ matrix then we get,  $d(U^{-1}U)= d(I+ \text{error}) \approx d$  when error is minimum (5)

Assuming wisdom as normal matrix for *L* nodes as Wisdom quotient (WQ) =*I* such that

$$I = \begin{bmatrix} 1 & 0 & 0 & \dots & 0 \\ 0 & 1 & 0 & \dots & 0 \\ 0 & 0 & 1 & \dots & 0 \\ \dots & \dots & \dots & \dots & \dots \\ 0 & 0 & 0 & \dots & 1 \end{bmatrix} \quad (L \times M)$$

Comparing, equation (3), (4), (5) with<sup>14</sup>, we find, after repetitive modification of error and comparison with standard normal matrix we would get the desired time convergent intellectual value to proceed. Equation (5) can be treated as self-realization equation.

**3. Conclusion and Future Work**

Authors in this paper have brought out a pyramidal intellect model correlating the various quotients of intelligence, namely, physiological, intelligent, and emotional and self-realization levels. Thereafter, an adaptive model for achieving stability of the total quotient of wisdom is developed. The precedence for this model is a survey conducted over 112 participants tested for 5 criteria under 3 constraints. The mathematics used here could be replaced by soft computing techniques of optimization, as an enhancement in future. Also, the stability model obtained could be verified by reversing the process, so that the regulatory parameters could be identified or discovered.

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