

MPRA

Munich Personal RePEc Archive

Point X and the Economics of Knowledge

Bhekuzulu Khumalo

Bhekuzulu Khumalo

15. February 2007

Online at <http://mpra.ub.uni-muenchen.de/3735/>

MPRA Paper No. 3735, posted 28. June 2007

**Point X and
The Economics of Knowledge**
Bhekuzulu Khumalo

Abstract: In this paper the theory developed in the paper “The Fundamental Theory of Knowledge” by the same author is developed further. This paper looks at point X, as it exists in the dimension that is called mthetho, the laws that govern the universe. Analyzing point X gives a more firm understanding of knowledge and its properties. The timelessness and independence of point X shall first be established and verified. The paper will eventually demonstrate that the timelessness and independence of this point X is what gives knowledge its power in terms of economics. The concepts developed in the paper “The Fundamental theory of Knowledge” are tested against this concept of timelessness and independence of point X, if a contradiction were to be found the theory would have serious contradictions, the paper proves that there are no contradictions. The principles of negative and obsolete knowledge are discussed in relation to point X. The laws of knowledge are tested against point X, against the timelessness and independence of point X. The law of consistency, arguably the most powerful law in investigative knowledge is also discussed in relation to point X; again the paper establishes that there are no contradictions. The law of consistency demonstrates the importance of point X, and therefore knowledge in the economic reality of human beings. Finally the foundations of material progress are discussed in the paper again with point X being the reference point.

The dimension that consists of the laws of the universe was named mthetho. In terms of knowledge the universe is made up of five dimensions, three of space, one of time, and one of mthetho. A name defining the dimension of the laws had to be established because such a name did not exist. Point X is a point in the mthetho plain, within the one dimension of the plain that is defined as the laws that govern the universe or to be more precise the laws that govern all existence. Fig 1 below demonstrates a point X; there would be many such points. As the combinations of knowledge are uncountable, there are as many such points as there are laws of the universes, however all are bound by the seventh law of knowledge, you can not know

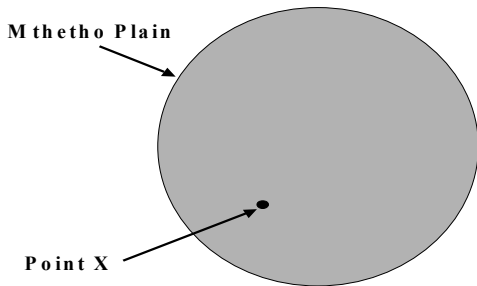


Fig 1

more than everything.

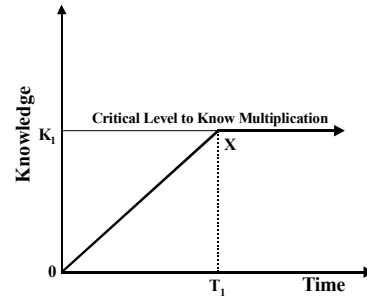


Fig 2

Point X is a timeless point because time cannot affect it. Even if it is a law of the universe that is unknown to humans it exists and has existed as is since the beginning, since existence came into existence. This timeless factor is demonstrated for humans in Fig 2 above. Taken that all knowledge, all laws of the universe are represented in the dimension that governs existence then a child who for example learns the laws of multiplication, though these being mathematical laws there are constant, they existed before that child learnt them, they existed before humans learnt to multiply. Once the child learns how to multiply that knowledge becomes timeless to that human as is demonstrated in Fig 2.

In Fig 2 above the child learns how to multiply at point T_1 , the amount of knowledge that it takes to learn this phenomenon is K_1 , this is a point on the mthetho plain. Once the child arrives there that knowledge becomes timeless to them though always timeless in a universal point of view. Every new piece of knowledge once understood becomes timeless to that individual and once disseminated to society it becomes timeless to that society.

Fig 2 confirms the fact that a graph is not a solid line rather many points so close that they are for the purpose of practicality drawn to resemble a line.

Take atomic energy is an example. It is not that the laws that govern the creation of an atomic power station did not exist five thousand years ago; these laws indeed existed since the beginning of time, since existence. It is only that humans learnt of these possibilities at the beginning of the twentieth century, and the awesome destructiveness that these laws could unleash on humans where seen in 1945 when the Americans dropped the atomic bombs on Japan. This atomic knowledge has now become timeless for much of human society.

Fig 3 below can now be understood without much explanation, each new point of knowledge that comes into existence, each new law of the universe that is learnt becomes timeless to those individuals and to that society. If the word gets out, as it should, those new laws of the universe that are discovered become timeless to humanity.

As point X is a timeless point on the mthetho plain containing specific information no human can lay a claim on it, what they can claim is that they discovered that specific point however that point has always existed. The patent system is just in order to give credit to the human being who discovered the point for that society, but the point as such has always existed. Fig 3 below demonstrates this concept. Point X is available to all societies that investigate towards that point. If you do not investigate towards that point then

an individual or human being will not be able to understand that point. If a society does not investigate how to create coca cola or a similar type beverage then they will not be able to create it though the laws of the universe say if a sugar mixture is mixed in such a manner one can have a coke or a coca cola substitute. In Fig 3 point X is available to society 1, in Fig 4, this same point X is available to society 2. Note that point X does not increase in value it remains timeless.

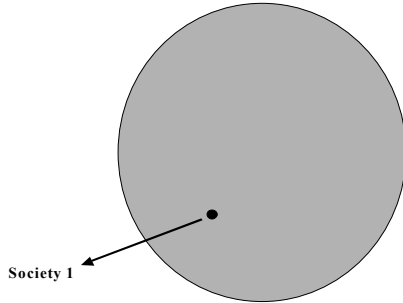


Fig 3

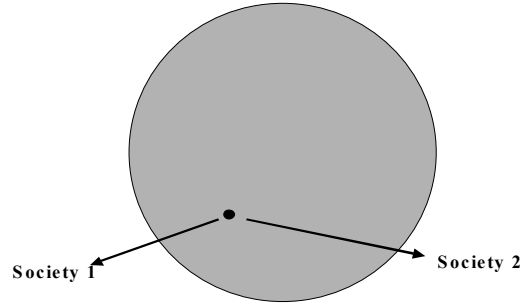


Fig 4

It now can be more readily understood that when you add the knowledge of society 1 and society 2 if one values point X twice then it is clearly double counting, society 1 and society 2 of course can be replaced by individual 1 and individual 2. That we both know a law will not increase its value. This concept has been termed the law of zero. This law simply state knowing the same thing and adding it up will result in itself. What the law of zero is basically saying is that you can only add unlike knowledge.

Take an automobile manufacturer like Ford or BMW. They make thousands of cars if not millions. In a particular model they might manufacturer many thousands, it does not mean that with each new car for the show room Fords knowledge increases. That would be tantamount to adding point x twice in Fig 4. Each BMW 325 is the same unless upgraded for the new year. All the models took the same knowledge to create even if it sells one BMW 325 or five million BMW 325 models.

Nature of point X

Knowledge can be said to have depth and breadth. Given the scenario of depth and breadth point X can be illustrated as in Fig 5 and six below. Fig 6 demonstrates that there are so many points on the plain rather than just point X.

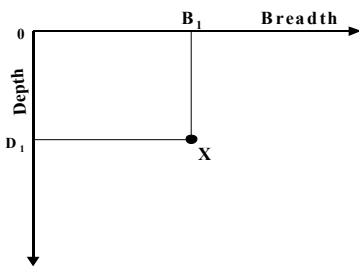


Fig 5

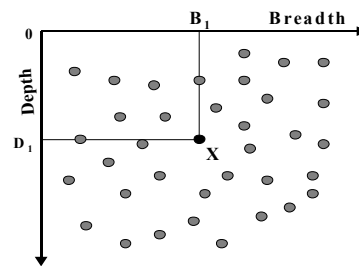


Fig 6

Even though Fig 6 demonstrates that there are so many points on the knowledge plain, specifically the mthetho plain, because not all knowledge is about the laws of the universe. *To know that across the mountains in the valley there is fresh water can be considered as knowledge.* All these points are independent of one another. Point X no matter how it looks graphically is independent from all the other points in Fig 6. By independent it is meant has information that cannot be changed or affected by any other point because each point is timeless. However if we are speaking of the same discipline all the other points will contain information that is similar to point X but at varying depths and breadth.

In Fig 7, Fig 6 has been divided into four quadrants, A, B, C, and D. The points in quadrant A all contain less knowledge than point X. In quadrant B all the points have less depth than point X but more breadth. All the points in quadrant C are superior to point X. In quadrant D the points have less breadth but more depth than point X.

When talking about superior points it means that the points are in everywhere a better point to be on the knowledge plain, specifically the mthetho plain. Note that some points in quadrants B and D are inferior to point X and others are superior.

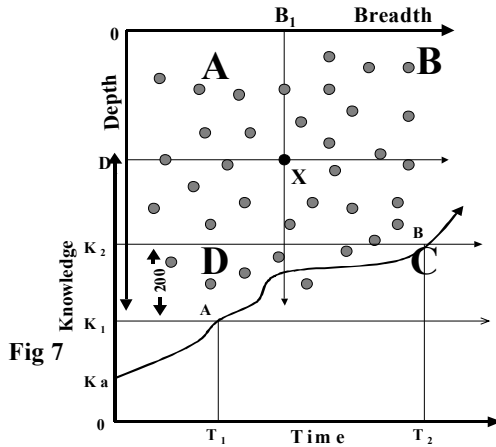


Fig 8

Fig 7 above demonstrates a very important concept in economics, choice of depth and breadth that graphically would be difficult to demonstrate. Take the situation we find in Fig 8 below. An individual or society has increased its knowledge base by 200 knowls between time T_1 and T_2 . As illustrated its knowledge has increased from K_1 to K_2 a value of 200 knowls.

From the graph illustrated in Fig 8 what is known is that there is a 200 knowls increase in knowledge. What this overall macro picture cannot demonstrate is what has caused the increase in knowledge. To understand this we need a graphical system that can demonstrate choice like the type used in Fig 5 – 7.

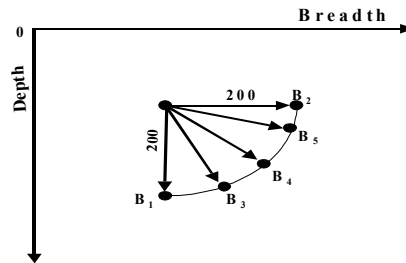


Fig 10

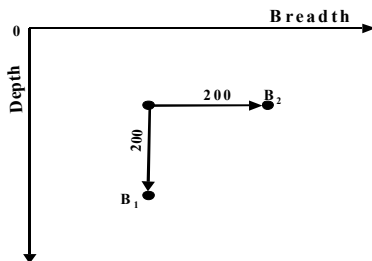


Fig 9

Fig 9 demonstrates that this knowledge growth could be breadth or depth. For example a medical student studying the heart, they could learn more about the heart and this would be depth or, they moved onto a new topic and are studying the liver. Either way their knowledge could have grown by 200 knowls worth of knowledge. The knowledge increase need not be specifically depth or breadth; it could be a combination as expressed by point B₃, B₄, and B₅ in Fig 10. Not forgetting that breadth and depth could be interchanged with weapons or bread as illustrated in Fig 11 and 12.

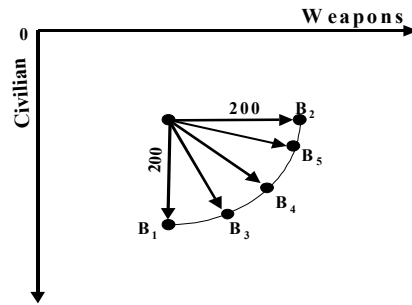


Fig 11

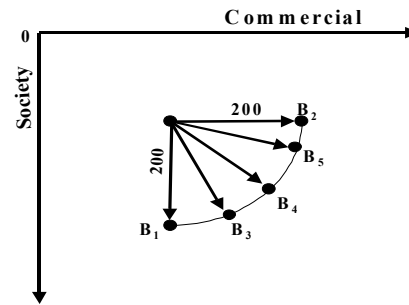


Fig 12

When is Work Done?

Economics is about the distribution of resources. This is basically about who gets what. The human who gets that what is the one who can afford it in any society from communism to a society where private ownership is allowed. If it can not be afforded it will not be demanded, the law of supply and demand is just that it is not an ideological proposition merely a law. A true science must adhere to laws of the universe not ideology of human beings. For that thing to be distributed it must first be produced. Effort must be utilized to produce that thing. That thing is not being produced for nothing it is being produced in order to be consumed. For that effort to be fully utilized the produced product must end up being consumed only then in terms of production can it be said that work is done by the producer be it an individual or a large multinational corporation.

Take an automobile manufacture like General Motors, it makes millions of vehicles annually and millions are sold. There are however millions that are not sold. Those vehicles that are not sold can not be considered work done, merely effort utilized. For work to be done the aim must be achieved that is to say the cars must be sold. If those cars are not sold it is a wasted effort but never work done.

If it were work just to manufacture motor vehicles rather than effort, then the world would exist in a Utopia where everything is for free, because where work is not done those who utilize their efforts would not get paid.

Work is the underlying principle of a productive society, if not of all societies. A reasonable economist must understand the difference between work done and effort. The concept of work however is another paper all together; the paragraphs above are merely to demonstrate the importance of this concept.

This paper is about knowledge economics; however the question of when work is done is central to economics. Being central to economics it is therefore important the question when is work done in knowledge economics. Work is done when there is an increase in knowledge. Taking the equation derived in the paper "The Fundamental Theory of Knowledge" $Y = f(Y_{t-1}, X_1, X_2, X_3, X_4, X_5) + Ka$

Where:

- Y_{t-1} = knowledge level of last time period
- X_1 = Economic freedom
- X_2 = Conversion rate (use of knowledge)
- X_3 = Academic Freedom
- X_4 = Research, Private and government.
- X_5 = Literacy rate.
- Ka = 1 000 knowls of knowledge needed to survive.

Y was also summarized as a function of X i.e. $Y = f(X_i)$. A derivative of this function giving a positive means work is done with an increase in X, giving a negative means work is not done given an increase in X. i.e.:

- $dy/dx > 0$ then work is done with an increase in the X variable.
- $dy/dx \leq 0$ then work is not done with an increase in the X variable.

Taking the equation $Y = f(Y_{t-1}, X_1, X_2, X_3, X_4, X_5) + Ka$ (1)

Then $dy/dy_{t-1} = 0$. Knowledge of the last time period is a constant and therefore can not change.

- i. $dy/dx_1 > 0$. An increase in economic freedom one can reasonably expect an increase in knowledge.
- ii. $dy/dx_2 > 0$. An increase in the conversion rate of knowledge will lead to an increase in the knowledge base.
- iii. $dy/dx_3 > 0$. Greater academic freedom will lead to an increase in the knowledge base that would be a reasonable expectation.
- iv. $dy/dx_4 > 0$. An increase in research be it in private hands or government hands will lead to an increase in the knowledge base.
- v. $dy/dx_5 > 0$ There must be a positive relationship between knowledge and the literacy rate.

All the variables included in the equation have a positive relation with knowledge. An interesting thought is what a decrease in any of the variables would lead to, would a decrease in the knowledge base be expected. Knowledge is a unique commodity, this should not be expected rather the knowledge base would be expected to remain the same as what is known is already known unless the society collapses as did ancient Egypt, Mayans, Great Zimbabwe, Babylon, or Rome. A society cannot know less than what it knew in the last time period, the variables therefore to be rational at worst have no influence and at best have a positive influence. A collapse of a society need not be dramatic; it could be just like Cambodia under Pol Pot knowledge was lost because it was despised. A major collapse like Rome leads to a dark age.

Negative, Obsolete Knowledge and Point X.

In the paper the “Fundamental theory of Knowledge”, the concept of negative and obsolete knowledge was discussed. These are important concepts when it comes to research and investigation. A good investigator of knowledge does not want to lose information in their investigations. Returning to Fig 7 above, a good investigator prefers to arrive at quadrant C whilst they do their investigations. Quadrant C represents no loss of information. However there are some points in quadrants B or D where a good investigator will not mind arriving at if a loss of information results in a gain of knowledge.

Knowledge has been said to have depth and breadth. Take a 50 knowls movement of knowledge in either breadth or depth and a 200 knowls movement of knowledge in either depth or breadth. A 50 knowls movement of knowledge in depth is followed by a 50 knowls movement of knowledge in breadth, this concept is demonstrated in Fig 13 below.

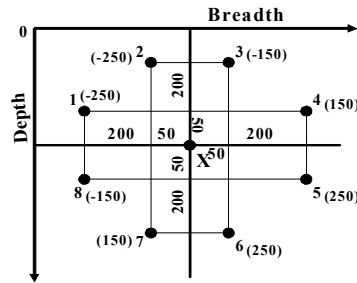


Fig 13

Given such a scenario is described for Fig 13 there are 8 point one can arrive at from point X. These points are numbered 1 – 8. Given a 50 knowls movement in knowledge followed by the corresponding 200 knowls movement in knowledge, the total gain of knowledge is given in brackets. Quadrant A both points 1 and 2 lead to a -250 knowls gain in knowledge. In quadrant B and D one point gives a -150 knowls movement in knowledge and the other point a 150 knowls movement in knowledge. In quadrant C both points give a 250 knowls gain in knowledge. Though points 7 and 4 result in a net gain in knowledge, the investigator would not be distraught, but the good investigator would not maximize utility due to the loss of information, information lost is equal to 50 knowls in both instances. *Note that though both point 8 and 3 result in a net loss of knowledge of 50 knowls, there is a gain of knowledge equal to 50 knowls of information not contained in point X.* Though points 5 and 6 result in equal gain in knowledge, the question of which of these points is better, there must be a best point. This best point is the critical level, the level that leads to discovery, and in use/ practical knowledge, the level that allows a task to be undertaken.

Critical Level/ Point of Knowledge

The paper “The Fundamental Theory of Knowledge” discussed critical levels of knowledge. These were described as the level of knowledge needed to make a discovery of a yet unknown law of the universe. The critical level of knowledge was also given as the level of knowledge needed to undertake a task when it comes to the use of knowledge, for example, a plumber needs to understand so much about pipes before they can actually do the plumbing job satisfactory. It should now be understood that this critical level is actually a critical point of knowledge. It is a point of knowledge that has within it enough information to lead to a discovery of a new law of the universe. It is a point of knowledge that has within it enough information to allow an individual/ society to undertake a task.

A critical point is a point that lies within the laws of existence plain/ mthetho plain where if one does not have the information contained within that point they can not move to quadrant C as described in Fig 7 above. Such a point is therefore crucial in the material progression of a society.

The path to a critical point need not be linear only consistent. Two different scientists may very well arrive at the same point taking different paths, once at that point however the information is the same. Take Bell and Meucci, both have more than enough credit to claim invention of the telephone. Though this credit was first given to Bell, the USA where the patents were filed changed its mind at the beginning of the twenty first century and said it was Meucci who invented the phone. *Politics place a lot in many instances giving credit to those who do not deserve it merely for ideological reasons. In this enlightened age people are suing each other everyday. The lady whose works were stolen to create the Matrix movies.* One hears of scientists on opposite sides of the world arriving at the same conclusion even though they have never met. Fig 14 below illustrates this point. Fig 14 below describes two investigators, 1 and 2 on their path to a critical point X. Path need not be exactly the same, however as they are dealing with the same discipline information is relevant to leading to critical point X.

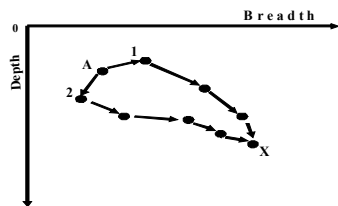


Fig 14

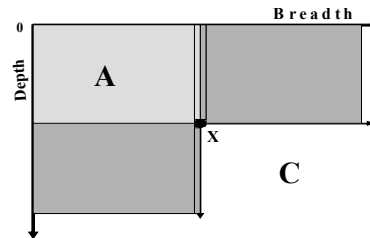


Fig 15

Fig 15 describes the nature of a critical point. From a critical point one can only move to quadrant C. It must be remembered that every point has its own 4 quadrants, A to C, however once arriving at a critical point there can be no loss of information. It is illogical to lose any information at this stage. Once Maria

Curie discovered radium it would be illogical that she would lose such information on further investigation, or any information that led to her discovery of radium. There is no more investigation to be done to arrive at radium. In use knowledge for purposes of the job place, there is no more investigation to be done or knowledge to gather to be able to make concrete forms in construction, at that point one can do the job.

As it is only rational to arrive at quadrant C from a critical point, it is for the same reason only rational to arrive at a critical point from quadrant A. There can be no loss of information to arrive at a critical point. That is not consistent. Critical point X therefore defines the depth and the breadth that one can reach before they arrive at a critical point or the depth of knowledge will become meaningless to the mind. One can not reach a greater depth of knowledge than that represented by the critical point that is the boundary. One can not reach a greater breadth than that represented by the critical point, that is the boundary.

Obsolete Knowledge

Obsolete knowledge is just that, it is a point of knowledge that is no longer relevant. Take a blast furnace of 2006, those early man of around 4 000 BC also had furnaces for the same purpose of smelting iron ore. If one had a time machine and brought somebody who worked in a furnace of 4 000 BC and brought him to today's world they would be shocked by the amount of iron produced in a single day by one blast furnace, more than they produced in two life times. That knowledge of smelting iron ore that was prevalent 6 000 years ago, even one hundred years ago can be considered obsolete, irrelevant in today's world.

Take Fig 16 below. Point C is a critical point of knowledge. To arrive at point C an investigator goes through points A and B. As can be seen from the illustration below, point C has all the information that points A and B have and more. However, this must not be confused with set theory, there is no interdependence amongst the points. All the points are timeless and independent. Point B is not a subset of point C, neither is point A a subset of point B. They exist because they contain information. The diagram is merely an illustration remember the path to a critical point need not be through A and B.

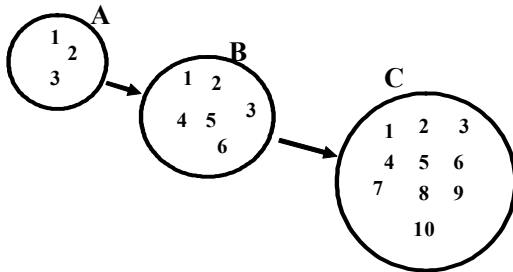


Fig 16

At point C as represented by Fig 16, points A and B become irrelevant, they become obsolete.

A critical point on the mthetho plain, a law of the universe so to say never becomes obsolete. Human beings all over the world learnt of iron thousands of years ago. It is critical to know where iron comes from before one can smelt iron ore and derive iron/ steel. This critical level was reached thousands of years ago. What becomes obsolete when dealing with the laws of the universe is how we arrive at a critical point. After arriving at a critical point that knowledge is used. It is in use knowledge, doing knowledge where there are changing critical points. However the use knowledge must always contain the critical point, i.e. the law that governs that material. It is crucial to know how a microchip operates before one can make a microchip. How a microchip operates is a critical point of the material, as it must consider the basic property of the material being used to make a microchip. This critical point was established by a certain jack Kilby. What changes in the context of the microchip, it gets better and stronger but must adhere to the information contained in the critical point that was first arrived at by Jack kilby.

A movement from point A to point B as there is a gain in information contained in the points, work can be said to have been done by the investigator. Having arrived at point B and the investigator arrives at point C,

more work can be said to be done. If however an investigator thinks very much, but does not move, from point B to point C, it is only effort that is being utilized. No matter if they go to their place of employment and claim to be working, there is no movement.

Flow of Knowledge and Point X

Knowledge needs to be transmitted properly or there will be distortions. Take four individuals, A, B, C, and D, as illustrated in Fig 17 below. Individual A witnesses an event that the other individuals did not witness. Individual A describes the event to individual B. Note that there is some loss of information that B has. Individual B in turn describes the event to individual C, there comes a slight exaggeration represented by M. When individual C describes the event to individual D, there is further loss of information and that is replaced by N and O. If D were to relate the story to A, would very much indeed be surprised as that would not be what he witnessed. This is an example of exaggerated gossip, there is loss of information replaced with false, it is only right that courts reject hearsay.

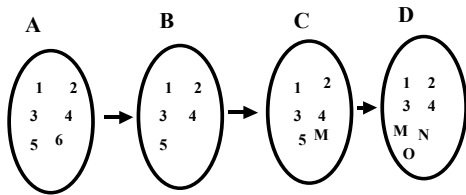


Fig 17

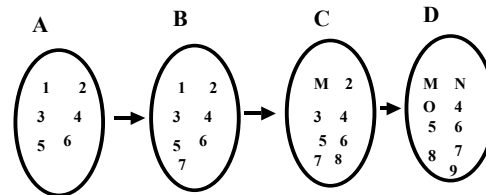


Fig 18

Take the transmission of history. By oral means history is most likely to create myths and create mystical events that can only be attributed to superhuman beings. Take four generations A, B, C, and D as illustrated in Fig 18 above. The A generation knows the history that is real represented by real numbers. They transmit the history orally to generation B. There is no loss of information and generation B has more historical information represented by the increase to 7 of the information that they contain. When generation B relates history to generation C, old history becomes clouded in myth this is represented by M replacing 1. By the time generation C gives history lessons to generation D there is so much loss of information that only recent events can be relied upon to be factual. There needs to be an effective store of information outside the human mind. This can be rock carvings, rock paintings, writing, video or disk, but there needs to be a method of storing knowledge in such a manner that the human mind can deal with it.

Before the invention of electronic means writing was the best way to store information. This however does not mean one can not write lies and pass them of as facts for political and ideological reasons. Lies can be found everyday in most newspapers of the world to support the interest of the owner, be that the state or individuals. However, if something is written down that is a fact, it is unlikely that distortions will ever occur, because there is a reference point. A mind need not store too much information or that human will end up 'canonizing' subject matter and therefore when found to be wrong that mind that merely stored information will find it difficult to reject what it crammed no matter the evidence. With a reasonable information storage system there will be a proper transmission of knowledge from one person to the next, from one generation to the next. This is illustrated in Fig 19 below, each generation grows the information with no myths being created.

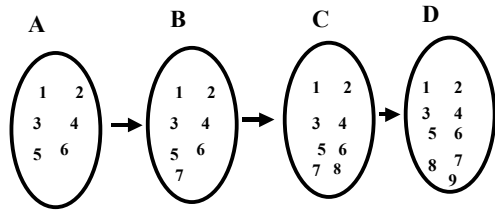


Fig 19

When a transfer of knowledge occurs there is a time lag. For example take a scientist who discovers a new law of the universe. The scientist must first discover the law of the universe, then they must let it out to the society, there is a delay. This delay is illustrated in Fig 20 below. This demonstrates a lag in the time A gets information and dispenses that same information to B. To be more realistic, A will dispense that information to many B's as represented by Fig 21, where A dispenses information to B_i's represented in the illustration by B₁ – B₅.

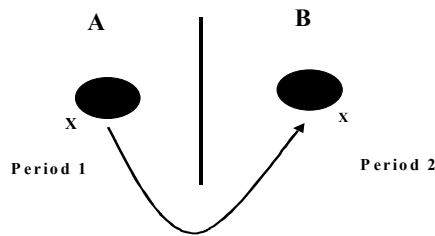


Fig 20

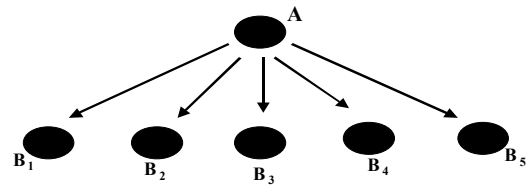


Fig 21

Thinking rationally about Fig 21 it also can with no falsehood represent a teacher teaching students. A could be the teacher and B₁ to B₅ the students. B₁ to B₅ are six independent variables receiving information from A, an independent variable.

Take three societies A, B, and C. Assume that B is totally dependent on A for knowledge and that C is totally dependent on B for knowledge. It would mean that B must wait for A to find out new laws of the universe and that C in turn will have to wait for this information from B. There are time lags. Assume again that B receives the information A has exactly after a period and that C receives that same information exactly after a period that B has represented the information. This is illustrated in Fig 22.

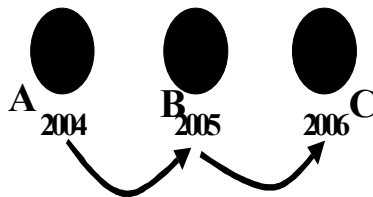


Fig22

As can be seen from fig 22 above, society A finds a new law of the material in 2004. Society B receives this information in the next time period, which would be 2005. As society C only receives knowledge from society B it means it will only have the knowledge that A discovered in 2004 in 2006. This lag represents serious economic implications. It means society C in terms of knowledge will always be behind societies B and A if the assumptions laid out above hold.

Fig 23 below demonstrates what would happen over six periods. By the sixth period, society A will be at point X_6 , society B at X_5 , and society C at X_4 . Such a lag is very costly for society C.

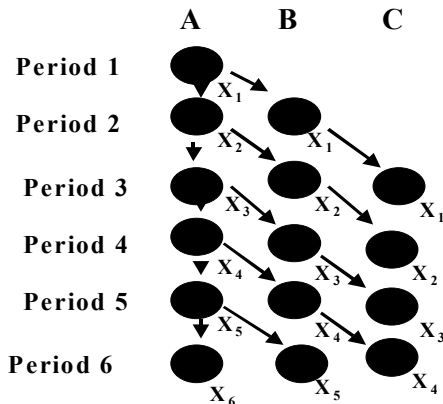


Fig 23

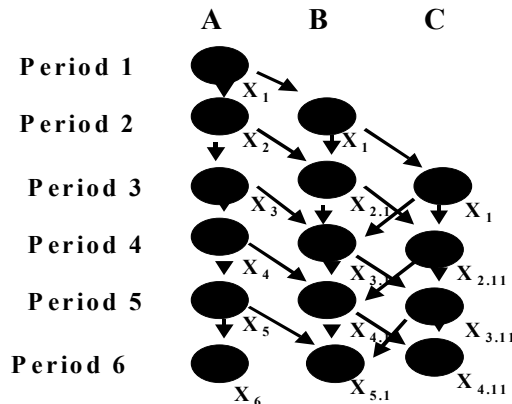


Fig 24

Keeping the same assumptions as those given for explaining Fig 22 and 23 to explain Fig 24 whilst adding other assumptions. Firstly Assume that society B and C now do their own research and investigation only after A has initiated the investigation. A only receives knowledge from itself, whilst B receives knowledge from both A and C. With these further assumptions we would end up at the illustration given by Fig 24 above.

At period six of Fig 23 it is clear that $X_6 > X_5 > X_4$. However with C and B doing their own research and investigation and B receiving knowledge from both B and C it can not be clear which society knows more about point X but a reasonable assumption is that B has the greatest knowledge of point X though A's research is ahead, it can not have the depth that is represented by $X_{5.1}$. Point $X_{5.1}$ has not just the influence of point X_5 but also $X_{4.1}$ and $X_{3.11}$. Whatever information was missing in point X_5 , point $X_{5.1}$ has added that information.

Taking the case of society C, it can be reasonably assumed and expected that point $X_{4.11}$ is greater than point X_4 because it has the input of point X_4 , $X_{4.1}$ and $X_{3.11}$. Remember that point $X_{4.1}$ has the information contained in X_4 but more, it is a superior point. By involving themselves in their own investigations both societies C and B have gained with society B having gained the most, as it is the most open society. Society A only accepting knowledge from itself will be disadvantaging itself. *As will be discussed later, society B is in fact accepting the k factor and using it to propel itself forward, being the most open society. It reduces any k factor and uses the k factor as a guide. An open society will do that, a closed society by any means racial or political needs other factors to stop competition, these are usually sinister and backed heavily by ideology and politics rather than economics.*

In the long run the center of the world will gravitate towards a society exemplified by society B in Fig 24 as such societies have access to knowledge from all other societies including their own. Holland has become an irrelevant society even though it has a high GDP per capita, countries with larger populations like China, Japan, Brazil, India have become more important because knowledge flows. Holland once believing they are superior solely because of skin colour have been proved it is not really true, it is merely economic policy and the greatest policy is to allow knowledge to flow.

Point X and the laws of Knowledge

Being a point on the mthetho dimension, on the dimension that consists the laws of existence, point X must follow the laws of knowledge as laid down in the paper "The Fundamental theory of Knowledge". These seven basic laws of knowledge, (basic because each discipline will have its own laws), are:

1. Knowledge is a real factor
2. The law of consistency
3. Knowledge is gathered by the mind.

4. Knowledge has a cause and effect factor.
5. Knowledge creates a force.
6. Where the gain of knowledge can be freely pursued it attracts thinkers thus allowing that more free society to have access to knowledge.
7. The limit of knowledge is Konke.

In truth the seven laws can be reduced to six because one can argue that the sixth law is part of the third law.

For point X to satisfy the first law it must be real. Point X has information that pertains to the laws of the universe. Unless the laws of the universe are not real then point X can not be real. The laws of the universe are real therefore point X is real.

The common denominator of existence is energy, matter and what they are composed of. For anything to be real it must be consistent with matter. All knowledge is therefore ultimately linked to energy and matter and how that energy is transformed. A very wise person will ask what about investments they are not matter. Ultimately, the investment must be about producing and transforming known matter, otherwise it would just be worthless money floating around that ultimately will not demand goods and services. Ultimately an economy is sustained by producing something, people would starve.

For anything to exist it must be consistent with the laws that govern energy and matter. If true there are ghosts, then they are matter not nothing and must posses an energy type not yet understood by human beings.

Elbows, hearts, silicone can not gather knowledge only the mind therefore. Only the mind can know and comprehend what information is contained in a point X.

New knowledge is gathered by the mind investigating. Take an investigator at point X in Fig 25 below. To get to point X they came from, point W. The cause of getting to X is that they first where at W. the effects from W is that they could arrive at Y. All new knowledge will have an effect on society sooner or later in the insatiable desire to know everything. In knowledge economics, one piece of knowledge leads to the next piece of knowledge, you can not be born knowing, the effects of going to school and increasing a point X is that one will know more. There must be a cause, an economist of the twentieth century is not expected to understand that in knowledge economics, two plus two is usually never four that would mean two people know one hundred percent different things. This gives knowledge that property that we as human beings can all know and nobody loses because the knowledge pool does not diminish. Philosophers have understood this for centuries but could not explain it.

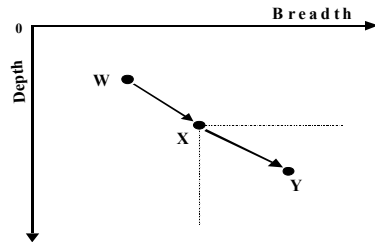


Fig 25

One of the reasons why there will always be an effect is that the more society knows the better. First of all it means a society can protect itself from all types of dangers that the universe offers from man and from nature, by nature it is meant everything that is not mankind. For any society more knowledge is better. However not understanding knowledge an economist can mislead the public and talk about the amount of knowledge a society needs is and should be determined by the market. The market however does not create new knowledge as such. Market forces talk about distribution of existing knowledge like how many doctors should there be, how many engineers, labourers, accountants, economists, nurses, however this knowledge

is institutionalized knowledge that already exists. Without more knowledge we would still be in the stone age. Galileo, Marie Curie, Einstein, all the knowledge they brought did not exist in the market before them.

It is therefore important for a society to allow free thought if it is ever to get the benefits of being a leader in some field of knowledge. Unless of course the society advocates the option of waiting for other societies to find knowledge and it just takes from them, this would lead to the case of society B and C as illustrated in Fig 23, hardly a desirable effect but most societies that abandon knowledge search to others exist in a state of perpetual lag such as one finds in Africa, most Asian societies and Latin America.

It is interesting to observe that not to lag means mainly an open society, for example Canada allows knowledge from America so even though Canada has never really had any significant thinker in terms of bringing in new knowledge in any field but because it is open what new law of the universe discovered in America, Britain, France, Germany, or Japan quickly finds its way to Canada, Belgium, Spain, Poland, Israel and other open societies in terms of knowledge. A country like Canada can afford to distort the market due to its proximity to the USA.

Progress is only possible with the increase in knowledge, knowledge that was not available, that is what an increase in knowledge is, not having many engineers with the same knowledge though many engineers with the same knowledge can progress a society significantly with the present knowledge.

The fifth law is that knowledge creates a force. Take two societies A and B as illustrated in Fig 26 below. Society A has knowledge 1 – 8, and society B has knowledge 1 – 11. Assume society A is an open society and is willing to progress. It could investigate and get to 11 or it could merely pay for the knowledge from B, this could be as simple as purchasing books. That 9 – 11 that society B has and society A wants is the knowledge force or k factor.

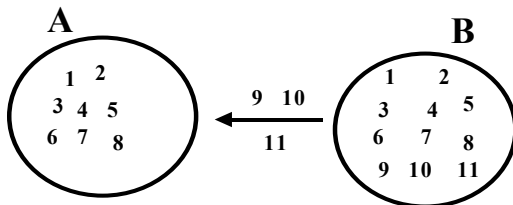


Fig 26

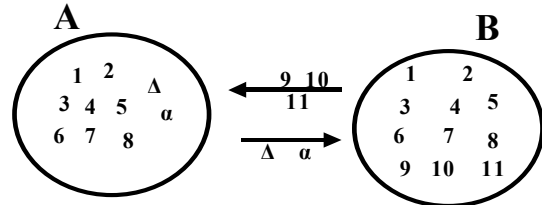


Fig 27

Knowledge need not only move in one direction as Fig 27 illustrates a more realistic situation. Δ and α , (delta and alpha) are pieces of knowledge that B does not have but A possesses. In a free exchange of knowledge the difference between the two will be the k factor. Note both are exerting a k factor over each other but the greater k factor will be determined by the difference in terms of knowls between what is being exchanged. Who has the more influence or the K factor depends on the differences of the k factors i.e.:

$K = ka - kb = \Sigma(\alpha, \Delta) - \Sigma(9, 10, 11)$. If positive then A has the larger influence and exerts the final K and if negative B has the larger influence and exerts the final K.

The illustration represented by Fig 27 leads to a very important factor in knowledge economics, the influence of outside economies, the influence of outside knowledge. From here we can derive a final function for knowledge. The influence of outside knowledge will therefore influence a society. Not the influence of outside knowledge as such but the influence of outside knowledge that a society does not possess. This would be expressed as:

$$Y = f(\Sigma Y_{it-1} - Y_{t-1}) \quad (2)$$

Where Y_{it-1} is the knowledge of society i, where ΣY_i is the sum of all societies.

$$f(\Sigma Y_{it-1} - Y_{t-1}) = f(X_6) \quad (3)$$

$dy/dx_6 > 0$ it is expected if X_6 increases in an open society this would be a possible influence on knowledge in a society. Remember no society has all knowledge of the world.

Therefore our final function for knowledge is to take equation (1) above and include outside knowledge, that is to say X6 and the final function is as follows:

$$Y = f(Y_{t-1}, X_1, X_2, X_3, X_4, X_5, X_6) + Ka \quad (4)$$

The k factor can very well be zero with exchange of information. Take two scientists working on a top-secret government project targeting splitting of protons to create very awesome and destructive weapons. The two scientists are from opposing societies each already possessing the knowledge of splitting atoms for weapons. At a certain period both scientists discover the knowledge to target protons and split them. The destructiveness is so great they can only be tested in space beyond the moon. Having scared each other they reach peace talks and promise such weapons will not be used on the earth because of so much anti matter created. One such bomb having the power of fifty ICBM's each carrying two nuclear warheads. At the peace talks they agree to share data on their weapons. Each scientist finds out that they took a different path to point X, the ability to create such a proton/ neutron bomb.

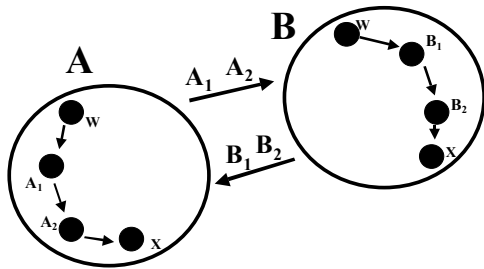


Fig 28

Fig 28 above demonstrates the two scientists, scientist A from society A and scientist B from society B. Having arrived at point X from point W, point W is the knowledge of creating thermo nuclear weapons. With the exchange of information, because it is hindsight information, both are at point X, there is no k factor no matter $A_2 > B_2$ or $B_2 > A_2$. One say A_2 rather than $A_2 + A_1$ because point A_2 already contains all information of point A_1 therefore to add the two will result in A_2 . The same with B_2 it has all the information of B_1 . Though there is no k factor there is an exchange of knowledge.

The k factor is operating every day, one goes to teachers, lecturers, one goes to seminars to learn more, everyday it is at work, one goes to somebody with more knowledge in a particular field.

The k factor is not constant, it should not expected to be, societies catch up and societies fall back.

As knowledge is gained by the mind if the mind is not allowed to gather that knowledge then it will not except in secret, Galileo is a good example even after all these years. This happens everywhere every time. Laws, social prejudices, all these factors are at work everyday. One can not therefore find a point X if they are prohibited.

From the paper "The Fundamental theory of Knowledge", the relationship $\bullet + 1$ can not exist because there is nothing more to add.

Consistency and the Power of Point X

Point X is an independent point on the mthetho plain. Though in the preceding paragraphs consistency was mentioned, it is has more importance than what has been described. Anything that is consistent can not contradict itself. All other points leading and preceding point X can not contradict point X. That inconsistent with point X is not negative knowledge because there is no such thing in reality, rather it does not exist. Laws of existence can not contradict themselves. Consistency must not be confused with logic.

Logic can only be built up on known knowledge. Therefore logic is a part of consistency but not the full concept of consistency.

Having discovered that when crude oil is heated it can be distilled into various constituencies, diesel, gasoline, aviation fuel, grease, engine oil and the such one can then build logic upon that. One can then build an argument if this then that, if A then B, but note that A and B must be known variables.

Having discovered radium Marie Curie could then give the logical steps to arriving at radium. Logic is a map of the known, consistency is a guide into the unknown. Having discovered the principle that in knowledge $2 + 2$ is not always four, logical steps can then be built that must be consistent with all other laws of knowledge economics if they are real.

However when investigating scientific phenomenon there is a known variable but in discovering a new law of the universe for it to be discovered means that it is not known. Logic therefore can not apply as such, only consistency can apply. The new law of the universe that is discovered for it to be real must be consistent with the preceding information or there is a contradiction somewhere. An eagle cannot have sharp talons and no sharp talons at the same time that would have to be two different birds. Contradictions are a sign that somewhere one is wrong.

Consistency also means that two different thinkers who have never met can end up with the same conclusion about phenomenon. Though this is the exception rather than the rule. Lao Tzu a Chinese philosopher from around 550BC advocated minimum government and more freedom, the Physiocrats and Adam Smith would essentially say the same thing during the 18th century. Thinking rationally with consistency should lead to the same conclusions be one in New York, Kigali, Mumbai, Maseru, Toronto, Kuala Lumpur, Amman, Berlin, Moscow, or Lima.

Point X and the Foundation of Material Progress

That knowledge is the prime commodity there should be no doubt. There is a common mistake being made by economist whose mind is in the wrong mode but contradict existence they do. This common mistake is epitomized by Kathryn A. Baker and Ghuzal M. Badamshina who in their paper entitled knowledge management they say, "Knowledge is clearly the primary source of wealth in the high-tech industries (such as computer and software industries) and other knowledge intensive industries (such as pharmaceuticals), but it is fast becoming the primary source of wealth in more traditional sectors of the economy as well (Stata 1989). It is estimated that knowledge now accounts for approximately three-fourths of the value added in the manufacturing sector (Stewart 1997). This trend is pervading even the oldest sectors of the economy, such as agriculture. Agriculture has been transformed by biotechnology, moving it beyond process innovation to fairly radical product innovation. For instance, corn is no longer a simple commodity but has become a knowledge intensive product with hybrids rich in corn starch being developed for industrial users and high oil content strains created for food processors (Stewart 1997). Far more radical knowledge-infused product and service innovations are emerging in all sectors of the economy."

A piece of iron that has just left the smelter today of 5 000 years ago is totally value added it does not exist in nature. Take the leather shoes a caveman wore in the cold, is that not one hundred percent value added. Knowledge has been misunderstood because of the levels of production. Be it I make 200 kg of iron a year or one makes 200 kg of iron per minute the only difference is the intensity of the work being done. However both of us are creating a one hundred percent value added product.

A man who understood the complexity of suggesting we have suddenly entered the knowledge economy is Frank Webster. "The railway signal man must have a stock of knowledge about tracks and timetables and roles and routines; he needs to communicate with other signal men down the line, with the station personnel and engine drivers, is required to "know the block" of his own and other cabins, must keep a precise and comprehensive ledger of all traffic that moves through his area, and has little need of physical strength to pull lever since the advent of modern equipment. Yet the railway signal man is, doubtless, a manual worker of the industrial age. Conversely, the person who comes to repair the photocopier may know little about products other than the one for which he has been trained, may well have to work in hot

dirty, and uncomfortable circumstances, and may need considerable strength to move heavy machinery and replace damaged part. Yet he will undoubtedly be classified as an information worker, since his work with new age machinery suites Porat's interpretations.

The point to be made here is simple: we need to be sceptical of conclusive figures that are the outcomes of researchers' perceptions of where occupations are to be most appropriately categorized. As a matter of fact, social scientists know very little about the detail and complexity of peoples' jobs; there are precious few ethnographies that record the detail of working lives. And researchers trying to label "information" and "noninformation" work are just as much in the dark as the rest of their social science colleagues."

Essentially what Frank Webster is saying is do not rush to conclusions if you are not sure. Not as a social science but as a science can we see the picture more clearly. Always have we existed in a knowledge economy, you try and build an igloo without the know how.

It is now understood that investigation leads one/ society from a point X to a point containing more information than point X. Take two individuals at point X. Both of them have reached the critical level X. The first individual decides to investigate point X further. They understand they must be consistent and hopefully they will in turn discover new laws of the universe previously unknown. If they are known why bother investigate, rather go and read a book, no need to reinvent the wheel.

The second individual decides they do not desire to investigate point X any further they will rather use the knowledge they have to participate in the production of goods and services. The second individual creates a product from the information contained in point X.

Let us take copper. The first individual wants to know more about copper and its properties, hopefully they will discover something unknown. The second individual decides to create a radio. This is described in Fig 29 below.

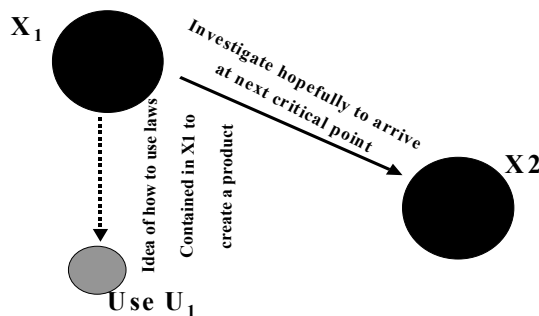


Fig 29

What Fig 29 is attempting to describe is the phenomenon that each X_1 point has a corresponding use if human beings seek it. Point X_1 for example could be to know the laws that govern uranium and how to derive plutonium from uranium, whilst point U_1 is actually using those properties for human existence. Do not confuse point X_1 with theory. Point X_1 contains established laws of existence, if one likes laws of the universe. Theories are just that, established facts are what can be used.

For example, it is not theory to say too much money causes inflation it is fact. As an established fact central bankers to run the money supply of a nation can then use it in economics.

U_1 can be considered derived knowledge or secondary knowledge. X_1 can be considered primary knowledge.

Note a gun is not primary knowledge. However, for the gun to work it must adhere to the facts established within primary knowledge. Primary knowledge must follow the laws of knowledge. It must be a real factor. A motor vehicle must be real, it takes real knowledge to create an engine. All the properties of the motor vehicle can not in any way contradict the laws established by primary knowledge. Primary knowledge

allows human beings to distinguish between materials in the material realm. A bridge built out of cotton would not have the property of a bridge built of wood or steel. That is why secondary knowledge can be called derived knowledge. To build a bridge the human being must first understand the materials to be used, only then can the bridge be built.

An idea can only be thought of by the mind. Take light bulbs, Thomas Edison invented them. However he could not do it without thinking about it, his heart did not do the thinking, or his elbow, or testicles for that matter, his mind did all the thinking. Incidentally Thomas Edison could not invent the light bulb without first knowing the laws that govern each property that constitute the light bulb, or the batteries that he invented.

The cause and effect of secondary knowledge is evident all the time. Cars get better everyday, computers get faster, the evidence is all around, and weapons become more destructive, rivers are polluted.

Countries that allow people to think freely have the greatest success in the material realm, that there should be no doubt. The effects of secondary knowledge are greatest in such societies. Material progression is most evident in countries where there are basic forms of freedom to think about products.

The limit of knowledge is konke must apply in secondary knowledge. As secondary knowledge is derived from primary knowledge, it is therefore limited by the limitations of primary knowledge.

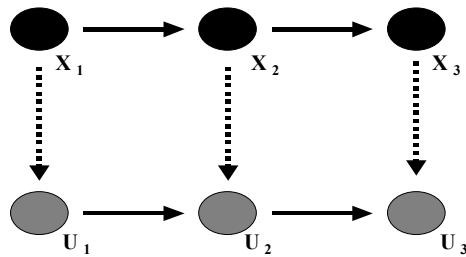


Fig 30

Fig 30 above describes what is happening in the real world. Assume for every increase in X there is a corresponding increase in derived knowledge, U_i 's. Having established the fact that going to a point with more information is an increase in knowledge at that point will have all the information of the point below must hold true with secondary knowledge. $U_2 > U_1$, therefore U_2 has all the information contained in U_1 , the argument would hold also with U_3 and U_2 . $U_3 > U_2$, therefore U_3 has all the information contained in U_2 and by implication all the information contained in U_1 .

This relationship that $U_3 > U_2$ means that even with use/ derived knowledge the laws of summing up knowledge are the same. If we both can fix the same car equally well then adding our knowledge of fixing cars will not result in greater knowledge, it would be $2 + 2 = 2$.

Use knowledge is derived from primary knowledge but it is derived in such a manner as to be of some use to a society. Products are the result of thinking creatively. An individual could very well know the properties of everything that goes into an ipod for example but it is the creative mind that will come out with the ipod. The first individual might call an ipod a gimmick but it is good for the bank account because society demands it and is willing to pay for it.

A function for use knowledge can be derived. Taking total use/ derived knowledge as Y_u , then:

$$Y_u = f(Y, Y_{ut-1}, U_1) \quad (5)$$

Where:

Y = all primary knowledge and is equal to equation (4) above.

Y_{ut-1} = Secondary/ derived knowledge of last time period.

$$U_1 = f(\Sigma Y_{uit-1} - Y_{ut-1}) \quad (6)$$

Where:

Y_{uit-1} = secondary/ derived knowledge of all other societies.

Note that literacy rates, economic freedom, conversion rate, academic freedom are not included as they are already included in the variable Y.

$$dy_u/dy > 0$$

$$dy_u/du_1 > 0$$

The two expressions for knowledge are therefore equations (4) and (5).

Equation (6) is an expression of a k factor and that too is most evident in the availability of goods and services.

The laws of existence exist be it humans know them or do not. However with use knowledge, products, especially manufactured products only exist because human beings have created them. A human being can claim nothing that exists, a human being cannot claim point X. A human being though can claim a point U because they have created it by using the laws contained in point X. One cannot claim a gene or an atom, but one can claim the use of genes to create materials.

To move from a point of knowledge it is generally agreed that there must be an incentive. It should be remembered that rockets were the stuff of hobbyist before the Nazis turned them to weapons of war. The Nazis had an incentive to do this. However it was their original research that led to Sputnik and the walk on the moon. Where the Nazis saw war uses, other societies saw the progression of mankind.

Note

When investigating one does not really know where they will end up. With use knowledge one knows what they are going to build, the Nazis knew that they wanted rockets to bomb London and other territory of their enemy. This knowledge already existed. Maria Curie did not know she would end up with Radium, she was investigating radioactive material, in her case pitchblende and uranium. There is more uncertainty with investigating new laws of existence than with creating products. The only uncertainty with creating products is will people want them or not. General Motors can build a ridiculous car that nobody wants but they would have controlled the whole process.

With investigating new knowledge and adding to the stockpile of existing knowledge one is not sure where they will end, they very well could have an idea of where they want to go, but it does not mean that they will get there. Maria Curie keeping to the principles of consistency, if she where to find a new element she would expect it to be radioactive like uranium. She would have an idea of the atomic number. For example manner times astrologers find new planets and new stars because they expect them to be there because of laws they have discovered that predict such phenomenon.

This uncertainty can be explained by a principle known as the "Heisenberg Uncertainty Principle". This was a principle developed out of quantum mechanics and very well applies to investigative knowledge and where one will end up from a certain point X. In fact it is very difficult to predict the future, one can only control what they can. One does not know what they will find in the unknown, the idea though is one must not be afraid to know. Without use, there can be no progress. It is true politics and ideology stop people using their knowledge all over the world.

Ideas though do not need massive amounts of capital to be conceptualized. Take high school teacher Konstantin Tsiolkovsky who in 1903 published the first work on space travel. It was his ideas to use liquid fuels and stage rockets. He worked in poverty and starved himself to purchase books that would lead to his development of such a theory. His theories would take human beings to the moon. Whittle without any assistance from institutions for endowments managed to develop theories that would lead to the jet engine. Thinking is in the mind and nothing else.

Reference:

- Baker, K.A., & Badamshina, G.M.(2002). Chapter 5 – Knowledge Management. www.astro.temple.edu.
- Khumalo, B. (2004) The Fundamental theory of Knowledge. http://asp.african-institute.org/Pdf/The_fundamental_theory.pdf
- Webster, F. (2002). Chapter 4 – The Information Age: An Anthology of its Impact and Consequences. <http://www.ndu.edu>