

## ***Honored Article***

# **Effect of Silos on Innovation**

Bandula Wijay

Date Received: 12-12-2022 Date Accepted: 15-12-2022

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It is human behaviour to gravitate towards silos-type living and is quite evidenced by human history. However, such a type of living and attitude does not support modernization through innovation to provide a better living for humans. Even in the past, the concept of silo-type divisions did not provide rapid development. Still, it was only after the humans came out of the silos, at least in part and started collaborating with each other the development started taking shape.

In most developing countries, the life of human civilizations continues to be fragmented and tends to mostly exist in silos. Some of this, if not all of it, culminates from some degree of the selfishness of the people. As a result, not only the concept of silo living has affected development as evidenced and expressed in the early and late education of the population. For example, if one examines the subjects learned at the elementary level in a school, in a civilization that lives in silos, one will observe that the subjects are more focused on keeping education on track for a specific purpose. And not balanced so that the student has the opportunity to learn a variety of subjects and learn the skills needed to result in a diversified skill set.

So, what would be a silo-controlled education? This is one where a student will learn only the subjects needed for him or her to become what society considers as success. This system mostly encompasses math and language skills, with some history, geography, and science added to complement the math and language skills. In the process, the student will not learn much of life skills or those skills necessary to improve and sustain the world we live in. As the education of the student continues, the student has only learned those facts that are the basics required to become the skilled worker that was intended by the system. Thus, only becoming a workhorse to perform a given task- such as becoming a doctor, engineer, or tradesman. This type of concept is very prevalent in developing nations and this is mainly because of the protectionism that co-exists with education.

Development is multifaceted. During the last four to five hundred years, as the world developed and became industrialized, man has innovated many things that have enriched human living. From the time man learned to create fire, to date, there has been so much development to help humans live a healthy and comfortable life, which is far from that of the life of the hunter-gatherer. In most of these developments, one thing is very clear. The man has collaborated with others to crystalize the concepts that were thought out by one and put them to work in collaboration with others.

Most modern innovations are multidisciplinary, irrespective of the field or end use. These concepts leading to a product or service being developed need multiple skill sets. The development of even a simple device needs the knowledge base of various fields of science and humanities, from science, engineering, social science, medical science, etc. When all these knowledge silos are opened to each other, a collaborative development environment happens during the development of the device or the product.

Without such open collaboration, innovations will not happen. While someone may be able to invent a concept while being in a silo, it will be impossible to make an invention transform into a useful product without collaboration and breaking down the walls that keep scientists apart from each other.

In some cultures, this need is poorly understood, and school curriculums are designed so narrowly, and as a result, the 'student's exposure to the knowledge base needed for an innovative mindset is absent. A good example is a narrow curriculum designed for Advanced Level students. For the longest time, and even currently, students study just three subjects before entering higher education in a university. The student's exposure has been artificially controlled and therefore is limited to a narrow area, hence preventing the student in his ability to have a line of communication with other fields, which would be essential for collaborative work. In addition, it has forced the student into a silo that will limit his ability to advance knowledge and implement workable solutions benefiting man.

The United States has been very successful in providing a regular supply of innovations, especially during the past 70 years. One reason for this achievement is the fact that students in the US school system learn a multitude of subjects at all levels, from elementary school to university. A student entering to do science or engineering has to take multiple courses, such as economics, history, political science, social science, etc. to enrich their university education. Several universities, including Texas A & M University, have a "Physicianeer"" program where the students who want to become medical doctors will also have an engineering curriculum. And they graduate both as a physician and an engineer. The impact of this is very clear in the innovations that come from US institutions. It is easier for someone to reach out to another in a different field if that person has a background in the other's field and has a common language to discuss the problem when problem-solving is needed.

Most of the silo doctrine, unfortunately, stems from the clannish culture. This often is based on social and economic status in society. This, unfortunately, is deep in the cultural beliefs of society. One group feels that they are superior to the other. As such, they are very reluctant to reach out to a different group for solutions to a problem that needs solving and thereby result in an innovation. No field in modern-day life can exist on its own and innovate on its own. It doesn't matter what products that we look at, the final result is a joint effort by people from different backgrounds have contributed to its success. So long as the culture remains clannish, it would be impossible to become and develop a culture of innovations, and unfortunately, most developing nations have acquired this cultural attitude.

So, what can the policymakers do to change this cultural attitude? While this can be a tall order in most cultures, some preliminary steps can be taken to develop an environment of collaboration among the citizens of the culture.

To start with, elementary to university education should be diversified by introducing subjects that are outside the normal math and language skill learning process. Various subjects that enrich the students learning process should be introduced into the curriculum from kindergarten to university education. Universities should develop the "Major" – "Minor" concept, where a student is a major in engineering and a minor in biology, or a student is a major in medicine and a minor in engineering. Or a student is a major in chemistry and a minor in medicine. This not only provides the student with a broader knowledge base but will also provide access to a group of contemporaries in the minor discipline, who someday may work together to solve problems and jointly innovate things to help humanity.

Policymakers must make a conscientious effort to eliminate or minimize the silo effect on the community as a whole. This would be helpful not only at the primary, secondary, and higher education institutions but also in the general business and social environments. This is possible by empowering people from all walks of life to decide on how the systems operate. For example, in a hospital setting, the workings of the hospital administration – treatment of patients and their family needs can be empowered to a group consisting of employees in all different work responsibilities and giving them a say" as to how

the hospital is run. The administration should not be limited only to the hands of a few administrators and/or physicians. By providing this empowerment, the workers will feel participation in the decision-making process to provide a better service for the patients. Again, the purpose of this would be to bring down the silos and provide access to various disciplines. This type of systematic cultural change and breaking down the clannish culture should be undertaken by the policymakers in all areas, of the day-to-day working, of the government, and the business environment. With time, the nature of collaborative work will become the standard in the country, and innovations both in the field of science as well as the general social welfare of the population will happen a norm.

In summary, innovations and innovative mindset needs the culture of reaching out across the silos to others in different silos to develop an environment of innovation. This is accomplished by making a conscientious effort to revamp the primary, secondary, and higher education in the country and paying more attention to the development of useful skills than dormant knowledge. Universities should adopt the major/minor type of degree programs and allow students to obtain multiple degrees and diplomas during their university tenure. There are lessons to be learned from the culture in other countries, such as the United States, and adopt similar systems. Special organizations and events should be initiated and should be set up at the universities to bring down the barriers to the silos mentality and promote collaborative working culture.

Professional degree programs such as engineering, medicine, and law education should be reformulated so that the student has the opportunity to learn subjects that are outside their normal curriculum but are very relevant to their practice eventually while providing them with substantial knowledge and understanding of the affiliate subjects which will accelerate the process of innovation within their fields. This should be done both by remodeling the education at the Advanced Level, by incorporating more general and specific subjects so that the knowledge base of the student entering the university is broad and thereby providing adaptability to learn outside their chosen field, and also by incorporating the same concept in designing the curriculums in science, engineering and medicine programs to facilitate the culture of innovation and abolition of the concept of silos in the country at all levels.