Key Performance Indicators vs. Sustainable Smart Cities-Critical Discussion

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Abstract: Key performance indicators represent a particular value or characteristic that is measured to assess whether an organization's goals are being achieved. The main benefit of a KPI is that it collects all the data from various individuals and combines it on a main data base. But does not address the constraints involved to achieve the goals is a setback for leaders to take decision. Smart city is a complex system and attributes vary from state to state and city to city even with same IT system. In this context KPI metrics confuse the stake holders rather helping in promoting the sustainable smart city services. Hence combination of systems engineering methodology may help solving complexity involved in smart city performances.

Smart city concepts have gained momentum due to huge publicity in India. The expectation of people has gone up and believing that quality of life will be assured by blending information technology with physical infrastructures in the name of smart city development.

This concept is not new and many urban planners, policymakers already attempting through various research and polices to improve the life of urban population. Many schemes also are in reality in India, but in vain.

In this situation the concept of smart city wired in the minds of urban population with lot of enthusiasm and hope. Already many major cities in India have started preparing the strategic report with skeptical mind.

Many documents, concept notes, methodology have been published in India and abroad regarding the approaches for delivering smart city. As we move forward on to achieve the smart city goals, cities will be encouraged to harness information technology to tackle urban challenges and provide a better quality of life to its citizens. Intensive use of information technology or digital applications in city operations promises the following:

a) Enhancing the efficiency in city services and maintenance,
b) Assurance to improve mobility
c) Innovative solutions for quality of life in city d) Ensuring environmental sustainability

At this stage, it is essential to evaluate the performance of various city endeavors in view of smart concepts. One such approach for measurement is provided by key performance indicators (KPIs) that facilitate the monitoring of the progress achieved in smart city transitions.

Achieving smart city is a continual process at various phases over the period. It is essential that a set of indicators are defined that would promote the city.

This process may enable the stakeholders to improve the services which they envisaged towards sustainable development in city.

The intention of identifying the KPI is to establish the criteria to evaluate technology contributions in making cities smarter and more sustainable,

and to provide the cities with the means for self-assessments.

In this context, mentors believe, the KPI provide a set of credible, relevant, objective and comparable indices to assess the progress achieved in smart city development. But, methodology expert's points of view that KPI is too small tool to fight with smart city challenges.

The definition of quality of life and a methodology for its assessment have been developed in many countries, and in most cases, the scope is based on the triple bottom line of environment, society, and economy.

Therefore, the goal of the new set of key performance indicators (KPIs) and assessment methodology for improvement and decrease of environment, society and economy with respect to the quality of life of citizens provided by technological solutions based on the triple bottom line.

But, in systems point of view objective measures are based on intrinsic and extrinsic values. The KPI outcome is mere percentage and units with mental model perceptions.

Technology is changing far faster than the institutions we've traditionally relied on to inform and enforce our choices and values. Smart city is a complex world with volatilized technological solutions. In the recent past most of the technology were considered as solution becomes obsolete and survived for a little time. Understanding the city with smart system needs a holistic approach in the combination of systems engineering methodologies.

Definition of Key Performance Indicator(KPI), a set of quantifiable measures that a company or industry uses to gauge or compare performance in terms of meeting their strategic and operational goals. KPI varies between companies and industries, depending on their priorities or performance criteria.

KPI helps organizations to understand how well they are performing in relation to their strategic goals and objectives. This helps for well-articulated organizations to make decisions easier. KPI empower employees and provide them to learn the relevant information from the data collected by the company. That will provide answers to important questions which are generated with company objectives.

KPI usually linked to company strategy and it does not deal complexity because organizations mostly run with limited circles with minimum objectives. The elements involved in the systems can be visualized with mental models.

In the context of smart city, socio-technological problems are typically large and complex. Hence it is difficult to normalize data with KPI score to assess performance of smart city.

A systemic method of dealing with complex system may have much to offer with respect to measuring objectives of smart city.

The city issues are having very high interaction with policy of the local body and that depends on legislative system. Measuring the performance of technological systems directly or indirectly affect the political bodies. In the absence of choices in KPI metrics, manipulation in data is possible under political compulsion. But in systems approach priorities help the leaders with choices of decisions.
KPI may be useful for very small organization. The data collection is possible only with limited circle

with limited objectives. KPI indicate numbers but not reflect the behavior and emotions. This has been advocated for monitoring smart city development is not really wise. It needs critical discussions in view of sustainability in the complex technological societal world.

In the recent past, in developed countries, have been led to the conclusion that something is seriously wrong with technology and the use of technology in the solution of complex, large scale problems facing society. The problems involving health care, crime, urban transportation, environmental pollution, energy resources, food processing and excessive inflation and recession are having been called crises.

The state of complete confusion and disorder in systems is chasing of numbers in the name of research methods. A well-designed set of KPIs ought to provide the vital navigation instruments that give everyone an understanding of current levels of performance.

Key performance indicators represent a particular value or characteristic that is measured to assess whether an organization's goals are being achieved. But does not address the constraints involved to achieve the goals is a setback for leaders to take decision. However, in practice, these well-intended KPIs can turn toxic in the large scale systems performance.

In reality, many times things go wrong with KPIs, because the stakeholders turn from a measure into a target. “I” indicates performance, never provides a complete picture of present and future, but simple numbers. In a system “symptom” is important to prepare for crises, but KPI does not do.

Lack of understanding the structure of the underlying system often leads us to wrong conclusion regarding performance. In the absence of systems approach, KPI score would attempt to produce a solution to one crises may well be to the detriment of and at the expense of the crisis in another problem area.

Even when policies to resolve a crises or improvement have been developed on the outcome of KPI, the time needed to implement them may be so great that counter intended results may occur as the correct policy for one time is applied at some other time.

KPI data or methodology is not adequately supporting the following in view of smart city as complex system:

1. To measure the impacts or problems involving many considerations and inter relations.
2. To gauge the judgment in the areas of far reaching and controversial environment.
3. To identify knowledge from several discipline assess the interlinked societal problems
4. To deal with problems in future events are difficult to predict. (Technology Impact, Social impact etc.)
5. To improve with problems in which structural and institutional elements are given full considerations.

Technological innovation may be either beneficial or detrimental or both for social and environmental systems. An inter disciplinary systemic approach is needed to identify the hidden impacts involved in smart city concepts in order to determine intended and unintended externalities of a technological innovation from variety of viewpoints and disciplines.

Technology forecasting, Technology assessment, Risk assessments are not addressed in any of the document or report prepared in view of smart city development in the context of India, but KPI is preferred, because of its simplicity.

Many recent trends inclusive of growing societal complexity, increasing technological power over nature, shifts in social values, larger size and scope of human enterprise are not analyzed in smart city documents. In the poorly articulated system the impact would be worse than last with well-articulated hardware.

It is premature to say that we understand smart city concepts, how to implement meaningful choices and responsible values when it comes to emerging technologies. Indeed, much of what we do today is naive and superficial, steeped in reflexive ideologies and overly rigid worldviews.

But the good news is that we do know how to do better, and some of the steps we should take for livable atmosphere. It is, of course, a choice based on the values we hold as to whether we do so. However, once we achieve livable city within the policy frame work of India that makes us smart and sustainable in the digital world.

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