S1-241144

Study of some prospective KVs and their relationship with KPIs

Source: IIT Bombay

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Relation between KPIs and KVs

Why KVs: Take away from [Source: 6G IA SNVC-SG]

Using KVs/KVIs when developing 6G serves two purposes:

- to demonstrate and validate that 6G would contribute to meeting societal needs, and
- to impact technology development in a value-benefitting direction

KVs/KVIs differ from Key Performance Indicators (KPIs) in that they provide deeper insight into human-related factors and can require conversations and creativity to emerge

KVs can be categorized in following areas -

- Environmental sustainability (e.g. Energy factor)
- Societal sustainability (e.g. Trust factor)
- Economic sustainability (e.g. Cost factor)

- KVs are impacted by KPIs either in direct or indirect way
- Combination of various KPIs can effectively project KVs, ensuring a comprehensive understanding of performance outcome
- Examples:
  - Energy related KPIs
    for projecting green-ness of the technology
  - Security related KPIs
    for projecting trustworthiness of the technology
  - Economy related KPIs
    for assess the affordability of the technology

Can we grade KVs based on metrics of existing and new set of KPIs required (specifically designed and added to project KVs otherwise not needed as service performance criteria)?

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Sample exercise 1 for mapping existing KPIs to KVs

Proposed KV 1: **Energy factor** α [1/service bit rate, Energy efficiency…….]

Proposed definition: a factor to project/quantify energy saving in the network

Existing KPIs (listed from various sections of TS 22.261)					
Service bit rate	Latency	Service area	UE speed	Reliability	Area traffic capacity
Positioning accuracy	Number of UEs	Area user density	Sync accuracy	Payload size	Communication service availability
Range of hops for UE relay	Number of hops for UE relay	Device density	Typical battery capacity	**Battery life expectancy**	Ranging accuracy
Confidence level	Maximum divergence from UTC	Granularity of the time stamp	Propagation delay	**Joules/bit**	

Indirect performance characteristics
Resource efficiency
Energy efficiency
Programmability
Support for multiple access technologies
QoE
Scalability

Direct relation **In-direct relation** **Prospective new option**

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Sample exercise 2 for mapping existing KPIs to KVs

Proposed KV 2: **Trust factor** α [Reliability, Communication service availability…….]
Proposed definition: a factor to project/quantify availability, reliability and security of communication services

Exiting KPIs (listed from various sections of TS 22.261)					
Service bit rate	Latency	Service area	UE speed	**Reliability**	Area traffic capacity
Positioning accuracy	Number of UEs	Area user density	Sync accuracy	Payload size	**Communication service availability**
Range of hops for UE relay	Number of hops for UE relay	Device density	Typical battery capacity	Battery life expectancy	Ranging accuracy
Confidence level	Maximum divergence from UTC	Granularity of the time stamp	Propagation delay	**SecL (Level of security)**	

Indirect performance characteristics
Resource efficiency
Energy efficiency
Programmability
Support for multiple access technologies
QoE
Scalability

Direct relation **In-direct relation** **Prospective new option**

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Sample exercise 3 for mapping existing KPIs to KVs

Proposed KV 3: **Cost factor** α [1/QoE,1/service bit rate, Area user density…….]
Proposed definition: a factor to project/quantify affordability aspects of the network

Exiting KPIs (listed from various sections of TS 22.261)					
Service bit rate	Latency	Service area	UE speed	Reliability	Area traffic capacity
Positioning accuracy	Number of UEs	**Area user density**	Sync accuracy	Payload size	Communication service availability
Range of hops for UE relay	Number of hops for UE relay	Device density	Typical battery capacity	**Battery life expectancy**	Ranging accuracy
Confidence level	Maximum divergence from UTC	Granularity of the time stamp	Propagation delay	**Cost/bit (if feasible in some way ☺)**	

Indirect performance characteristics
Resource efficiency
Energy efficiency
Programmability
Support for multiple access technologies
QoE
Scalability

Direct relation **In-direct relation** **Prospective new option**

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Small steps without disturbing existing methods (Optional for applying in Industry practice)

Step1

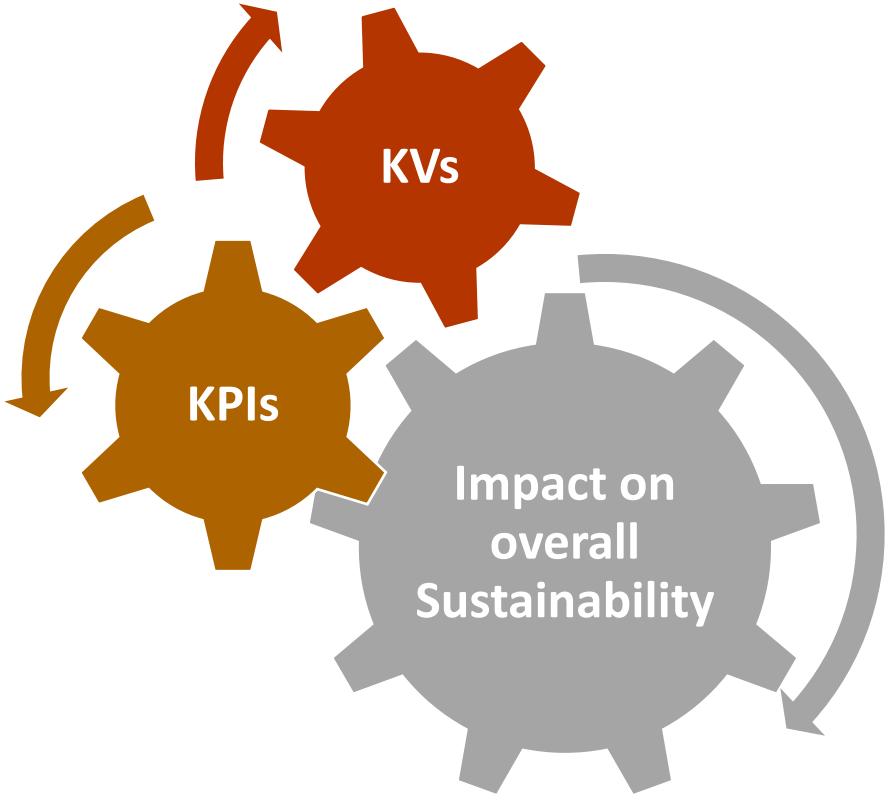
Identify a set of KVs, their definitions, use cases, and impacts

Step2

Explore and document relationship between KVs and existing KPIs

Step3

Identify new set of KPIs required for representing identified set of KVs



Thank you

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