The Talk Between Computers

[*Enhancing Data Transmission accuracy in Port Weighbridges by Preventing Electronics Vulnerabilities.*]

Case Study:

While examining the execution of a Contract pertaining to outsourcing of weigh bridge operations in one unit of KoPT, serious deficiency was noticed in the mechanism of data transfer between Weighbridge-attached computers and Port's own computer system (POMS). It was found that while the governing contract envisaged "networking" to be undertaken between weighbridge locations and Ports own computer system with the intended purpose of establishing a seamless real-time data transfer between the "data generation nodes" (at the Weighbridge end) and "data-destination nodes (at Port computer end), the same had not been done even after 3 years of project commissioning.

A real time data transfer was essential for such a project because the payment to be disbursed to the Service Provider was contingent upon the number of instances of weighment performed by each weighbridge (in some other Ports such payment could also be dependent upon the tonnage weighed). In other words the accuracy and authenticity of weighment data made available to Port Authorities by the said Service Provider was financially sensitive in nature.

Notwithstanding the above factors, the said weighbridge Service Provider was allowed to dispense with "Networking" and permitted to transfer Weighment data from Weighbridge-attached Computers to Port's System through a non-real time/batch processing mode with a definite time-lag of 10 minutes. No reason for deviating from the contractual provision could be found in the relevant file. In fact, a SOP (Standard Operating Procedure) meant for operation of weighbridge which was created at post-contract stage mentions the data communication as "real time data transfer with 10 minute time lag" – a contradiction in terms. As is generally known, a communication mechanism between two computer nodes cannot be called "real-time" if the same happens after a 10- minute time lag.

What is more, this permissible time-lag allowed between an instance of vehicle weighment and its eventual reporting by Service Provider, electronically, to Port's own Computer System was further enhanced, again for reasons not recorded anywhere. It was observed that the head of Traffic Department was unwilling to depend upon the authenticity of the electronically transmitted data (doneafter a time-delay) and wanted the Service Provider to furnish a written declaration guaranteeing that no Weighment had been missed out in their transferred data. In other words, the situation came to a stage where more reliance was placed on a written self-certification ofthe Service Provider instead of the electronic data-transfer mechanism envisaged in the contract. On spot check it was found that even this time-lag of 15 minutes is not being maintained by the Service provider.

Providing a time-lag between generation of data and its receipt at Port's own computer system creates a vulnerability that compromises the authenticity and accuracy of the reported data. To ensure the same it is necessary that such data transfer takes place simultaneously and instantaneously between the nodes attached to the Weighbridge and Port's own computer system or dedicated Node operated by Port Personnel right at the moment of vehicle weighment.

Suggested System Improvement:

1. If the Weighbridge-operation in a Port is outsourced to a Service Provider and periodic payment made to such Service Provider for operation of weighbridges is contingent upon the quantum of Vehicle weighment (by number or weight of vehicles passing through), then the electronic data-transmission between Weighbridge-attached Computer(s) and Port Server or any other dedicated node operated by port authority must be seamlessly done on a real time basis.

2. Transfer of in-situ data generated in the weighbridge computers can be achieved both through physical networking of Weighbridge locations to Port's own system or through some form of wireless communication. If after vehicle weighment, the weighment data is not broadcast simultaneously to the computer attached to the weighbridge and to Port's own Computer System and data transfer is allowed to be effected later with some "time-lag", then theauthenticity and accuracy of the electronically transmitted weighment – data for the purpose of billing can be seriously compromised. This is so, since, it would be possible to alter/modify the data generated from the Weighbridge computers during the time-lag and send such altered data to Port's own system.

3. Efforts should be made to remove potential vulnerability in the existing data-communication mechanism between Weighbridge attached Computers and Port's own server/dedicated node.

4. The said aspect must also be clearly spelt out in the technical specification and terms of any future tender for contracting a Weighbridge Service Provider.

Impact of system improvements:

Ensuring accurate measurement of cargo in weighbridges within port area is essential to prevent overloading. The certificates of weighment from port-operated weighbridge have custom and insurance related implication. **The above system improvements have already been accepted by Kolkata Port Administration.**

Sustainability and way forward:

Since weighbridges are being operated practically by every port and since many ports have similar outsourced mode of weighbridge operation, theabove system improvements suggested above have implication for other ports.

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