Harbour Vision 2020

5G Networks in future harbors

Introduction

Telecommunication standard 5G stands for fifth generation from cellular network standard. Deploying of technology based on 5G standard began worldwide in 2019. 5G promises much wider bandwidth, eventually up to 10gbps which allows more data to be transferred. Latency in 5G network is pressed to minimum so there is much less latency between devices which are communicating via 5G network. These two qualities are main reasons why 5G network helps to design automated harbors logistics that gathers accurate sensor data, analyzes it, and directs logistics process where flowrate and quality of service are top priorities to customers.

Ship loading scene

In few decades scanning technology has become much cheaper and variety of sensors are multiplied. Cost of technology has come down also. These things combined has made possible to think new ways to use this kind of technology in industry fields that before calculated cost efficiency would be too low to cover investments in reasonable time. Also fear of implementing technology to be crucial part of processes was too high. With help of 5G networks now we can install multiple sensors that gathers different data and sends it forward to be analyzed in Ai process that makes decisions based on gathered data and guides the vehicle operator or automated vehicle. 5G network has great bandwidth and that allows all the analyzing and data processing power be centralized in cloud services so there is no need for edge computing solutions that are more expensive.

Truck guidance scene

Optical Character Recognition systems can be applied to warehouse systems to recognize arriving vehicles and information can be obtained from warehouse planning and visualize it for the driver when they arrive at the port. 5G network allows camera systems to installed with only power supply provided and, in this scenario devices operates only in picture transfer mode where raw data is sent to the ocr software what makes all the picture recognition. This kind of setup separates software from hardware and both can be updated individually. This is an example how 5G network wide bandwidth capability can make whole system more robust for changes and upgrades in future.

AGV Scene

In near future more tasks can be automated in changing and sometimes even in harsh environments where weather and visibility changes constantly. Transportation of goods in harbors can be done with automated guided vehicles. With 5G network vehicles can be controlled remotely and because there is virtually no latency from network sensor data such as speed, load, angle, location, proximity alerts and camera picture can be sent to guidance systems which analyses data and creates routes for the vehicle. When data is gathered from all operating vehicles systems can learn to operate better in harbor environment and make more sophisticated decisions based on earlier data.

Bulk extraction and loading scene

Quality management requires constant surveillance when goods are extracted or loaded in logistics process. 5G network enables different types of sensors installed in premises and requires only power supply to operate. Warehouse management system keeps track real time how much space is available, and sensors gathers data from stored materials that is essential for customer to know what kind of changes happens while material is stored. Transfer line weighs transferred material and sends data to warehouse management system, humidity and temperature sensors senses how environment affects material. Air purity sensors gathers data how much pollution material creates in atmosphere. These are just few of examples how simple sensor technology implemented in quality control services helps companies to achieve better cost efficiency solutions by tracking and improving handling methods, storage environment infrastructure changes and environmental effects.