

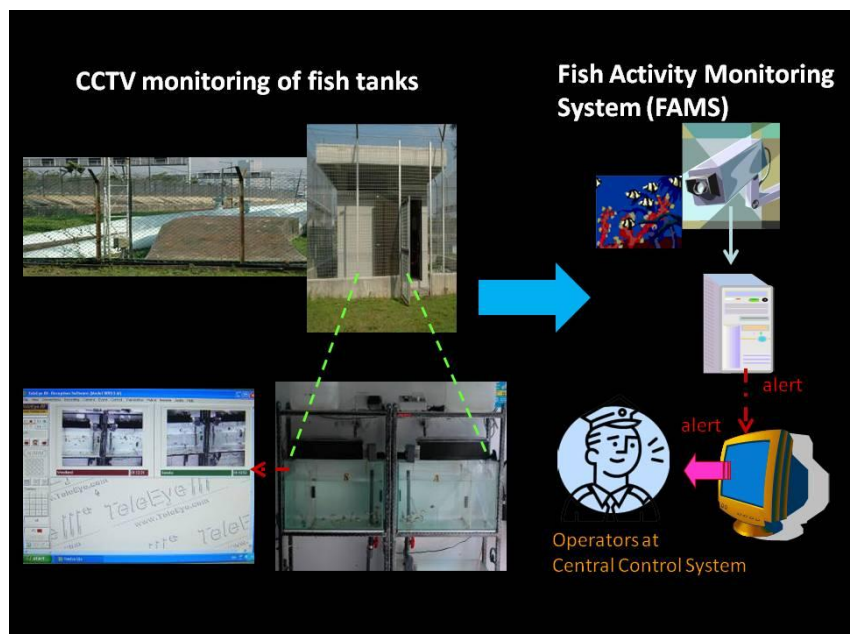
## THE 2012 IWA PROJECT INNOVATION AWARDS ASIA PACIFIC REGIONAL COMPETITION EXECUTIVE SUMMARIES OF WINNERS AND HONOUR AWARDS

### APPLIED RESEARCH – HONOUR AWARD

#### **Fish Activity Monitoring System**

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There is a wide range of possible physical, chemical and biological contaminants that could compromise the safety of the water supply. However, conventional instruments for detecting contaminants are unable to detect the spectrum of possible contaminants in parallel or to elucidate the synergistic toxicity effects of a contaminant mixture. To address this, PUB, the national water agency of Singapore, monitors live fish (analogous to canaries in mines) in addition to conducting comprehensive physical and chemical analysis to ensure safe drinking water. Fish is presently monitored using remote video cameras, but this has some limitations. Firstly, the operators at the control centre have to constantly monitor video footages from about a hundred of tanks. Secondly, the transmitted video footages do not provide the intelligence to automatically alert the operators on key events. An online Fish Activity Monitoring System (FAMS) was thus developed to automate the monitoring process.



FAMS is a pair of electronic eyes that constantly provides analysis of fish motion activities and looks out for signs of distress, abnormal fish activity patterns and fish death events from both top and front views. To cater for spatially distributed monitoring points, a network communication module is also developed to allow two-way communication between FAMS server at the central control centre and individual FAMS monitoring unit at the remote sites. FAMS notifies the operators at the central control centre on any sudden dip in the number of live fish via visual and audio alerts. Raising safety levels further, FAMS triggers early warning alert when a large number of fish show signs of distress. FAMS is also designed to be functioning in outdoor environments such that it can be installed right next to the water sampling point. The use of FAMS allows easier management and tracking of water quality at great scalability. At present, 42 units of FAMS have been installed at various strategic locations across Singapore. And, the community in Singapore can be ensured safe drinking water supply at a relatively low added cost.