

# Lessons from the bucket brigade

BEFORE the era of firefighting engines, people would tackle a fire emergency by forming a line where buckets of water are passed to people nearer to the source of the blaze.

These bucket brigades, as they were known, became an efficient method of transporting objects across long distances, provided there were enough people to do so.

What is less known is that the concept of the bucket brigade can be used to organise order picking in distribution centres, thus improving productivity.

This idea will be among others shared by Associate Professor Lim Yun Fong of Singapore Management University's Lee Kong Chian School of Business, who teaches classes on operations management and is running a masterclass on how to boost productivity in the service industry.

An example of how bucket brigades work can be found on the bucketbrigades.com website set up by John Bartholdi III at Georgia Tech and Donald Eisenstein at the University of Chicago, Dr Lim said.

Lessons were drawn from nature, where smaller, slower ants forage out further, and pass seeds to larger, faster ants who bring the seeds home.

In a distribution centre for retail products, for example, order pickers are hired to pick the required items, sometimes in the right order, and put them together in a package.

"Each worker carries a product towards completion; when the last worker finishes his product he walks back upstream to take over the work of his predecessor, who walks back and takes over the work of his predecessor and so on, until, after relinquishing his product, the first worker walks back to the start to begin a new product," the authors wrote.

"If, in addition, workers are sequenced from slowest to fastest, then we call the system a 'bucket brigade' and the workers will spontaneously gravitate to the optimal division of work so that throughput is maximised."

American pharmacy retail chain CVS was among the first to test Dr Bartholdi's and Dr Eisenstein's idea.

CVS relied heavily on temporary workers during peak periods. Temporary workers are not as productive as full-timers, but cost just as much.

Making matters worse was how the fastest worker, or picker, was put in the first position on a pick lane. The original idea was to enable the worker to keep his or her lane full of work.

But this only resulted in congestion. Eventually, the fastest worker would get stuck behind a slower worker, and became underutilised. Slower workers would get frustrated at not being able to keep up.

Workers, assigned to a fixed zone, ended up feeling isolated and under pressure, Dr Bartholdi said.

Bucket brigades were thus implemented, putting the slowest worker first and the fastest worker last. Workers could now move beyond their zone after completing their work to help out with the work of a predecessor.

They felt more like a team as a result. "This increased pick rates and accuracy because workers could more easily put the product in the correct tote," the authors said.

They added that pick rates increased by 34 per cent after the operational change, which cost nothing to implement.

The idea has also been used at other places like sandwich chain Subway, where the person putting the sauce on one sandwich, for example, might be working at the cashier for the next sandwich.

Where improving productivity is concerned, Dr Lim said that there are three takeaways for companies:

- ◆ Always remain open for necessary changes.
- ◆ Try adopting some low-cost technologies.
- ◆ Build a flexible workforce by cross-training the employees and incorporating a flexible-hour work scheme.

"A flexible workforce allows a company to be more robust and to better utilise their resources," he said.

"For example, if employees A and B are cross-trained to do each other's work, then the business will be less affected if one of the employees is absent. The company can also become more productive if one employee, after finishing his own work, can help the other.

"We encourage teamwork, but the question is how to coordinate these employees."