Productivity Link

Contents

Implementing Technology & Innovation in the Food Industry

1.   Introduction

Technology and innovation are key tools used by businesses to improve their competitive position. Implementing technology and innovation results in better products and services, improves the daily operations of businesses and increased productivity.

2.   Technology and innovation is key to growth

In its 2013 Food and Beverage Industry Outlook survey, KPMG reports that technology will be the greatest driver of future growth, providing businesses in the industry with opportunities to explore new ways of doing business, as well as to better understand and engage with consumers.

Technology and innovation has had and will continue to have a profound impact on the food industry. Today, technology applications are helping operators improve ordering functions, ticket times, table turns, inventory control, kitchen organisation and accuracy, book keeping tasks and the capture and timely reporting of operational information. Technology is also used to communicate and engage their customers, apart from improving their day-to-day operations. Digital menu boards are used to showcase everything from daily features and promotions to back-of-the-house food preparation activities. Point of sale (POS) systems, with functions that include real-time inventory management, scheduling, surveillance and book keeping, are being adopted by many businesses. Through the adoption of new technologies, businesses can offer better products and services in increasingly larger quantities and hence, satisfy a wider range of customers.

The use of technology in the food manufacturing sector is not restricted to certain parts of the production process; rather, it permeates the whole process, where advanced technologies are used in all the stages of food production. They are used in the initial stage to help evaluate and improve the quality of the raw ingredients used. In the preparation stage, they are used to aid shipping and handling of materials. The last stage of processing food will make use of methods like

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conservation and separation, potentially adding new ingredients to create the final product. The packaging process is also now less expensive and more sophisticated, with the growth in the number of new materials that can be used to wrap or seal items. Special machines are used to create the packaging and automate this process to maximise efficiency and reduce costs. Meanwhile, food quality and safety have both increased due to new technologies that make it easier to follow international standards and regulation regarding the contents of products.

3. **The emergence of mobile devices, social media and cloud computing**

The emergence of mobile devices and cloud computing is making more of an impact than ever everywhere, including the food industry. Technology such as online reservations, social media and new payment methods has infiltrated the food industry, with some of the advances serving to improve both industry and customer experience.

The use of social media and other digital marketing channels continues to gain ground. They are being increasingly utilised by food and beverage companies for engaging consumers. Today's companies are also learning that cloud is much more than just another IT cost reduction lever and they are placing more emphasis on determining how to leverage on cloud technology to enable business transformation: shifting away from pure cost reduction objectives to taking a more strategic approach. While cost reduction is a given, transformation is critical. In KPMG's 2013 survey, almost two-thirds of food and beverage executives say they have adopted, or plan to adopt, cloud technologies into their business strategies and operations. Of those who have adopted cloud computing, a sizable majority found integration to be easy or cited only minor challenges.

However, with every new advance comes a new challenge and with technology evolving faster, these challenges can seem insurmountable. It is how the industry deals with these advances and the challenges that accompany them that will determine the fate of many businesses.

Mobile devices

In the United States, restaurants are starting to allow their customers to use iPads to place their orders. While this is a good initiative that may appeal to the customers due to its convenience, it might not work out so well for the servers who are displaced by a tablet. However, tablets have the potential to help hosts deal with incoming patrons who may have made reservations. This can be accomplished through connecting the restaurant's website to some form of online reservation system and then simply using the tablet as a means of checking out who is scheduled when. This allows the restaurant to maintain their computerised system on their main computers while the tablet is used for secondary tasks. Mobile devices are also not limited to "the serving side of things". They can also be used to track inventory, regular checklists, etc.

Social media

Social networking sites have played a huge role in shaping the views of society on a myriad of issues, and they are also having a large impact on the food industry. For example, in the food service sector, social networking sites are playing a role in shaping people's opinions of dining establishments. With tools such as Foursquare, customers can leave their thoughts on a restaurant – good or bad – when they check-in. If a patron has an experience they want to share on Facebook or Twitter (again, good or bad), they can influence a lot of users with just one update.

Restaurant operators are also increasingly using social media as a key tool in their marketing strategy and to build and maximise their brands. They use these platforms to reach out to old and new customers, generate buzz and share and curate content. Some of the most popular mediums are: Facebook, online review sites such as Yelp and Urbanspoon, Twitter and blogs. The shift to social media "underscores the fact that restaurants are aware of the impact that social sites are having on their business".

4. Benefits of technology adoption

Gains in economy, flexibility, motivation and control, premised on the use of technology, are in turn expected to result in more sales, increases in productivity or quality, or better cost savings.

Here are some of the key benefits of technology adoption and innovation.

Productivity improvement:

- Reduced labour
- Reduced materials
- Reduced capital
- Reduced set-up time
- Reduced rejection rate

Product improvement:

- Nutrition
- Taste or appearance
- Shelf-life
- Consumer convenience

Regulatory compliance:

- Worker safety
- Food safety
- Environmental protection
- Food composition

5. Implementing technology

The introduction of new technology into an organisation can be framed as a process innovation. It involves the search for a better way to communicate, design or manufacture of products or introduction of better or innovative services, leading to the choice of technology that has promise of improving things, etc. This is followed by the implementation of the technology, its adoption by users, and the attainment of desired goals.

A successful technology implementation or upgrade process should begin by asking the right questions:

- What are the operational issues that are to be addressed?

- How is work completed today? What is working? What is not working?

- How can the current process be improved through the use of enabling technology?

- How to select the right technologies that meet the needs?

- How to choose from the range of suppliers offering competing solutions?

- How will the chosen technologies be integrated into the daily operations to ensure the benefits are maximised?

- How will the staff be trained?

Define a strategy: Identify technology wants, needs and requirements

The first step in the technology implementation is defining the technological requirements of the organisation. This is very critical as this strategy would drive all the technology-related endeavours in the organisation. It has to be clearly defined as to what are the objectives of the organisation is where the technology is concerned and how they are aligned with the company-wide strategy. This action will ensure that implementation of the technology is well integrated into the business plan of the organisation.

The organisation should also set for itself some targets which have to be achieved after the implementation of technology.

Development and implementation calendar

Technological implementation requires time and resources. Every implementation plan should include a detailed description of what tasks need to be accomplished and what equipment needs to be purchased during the implementation period. This advanced planning helps a business anticipate costs, avoid delays and minimise interruptions to work processes. This also allows employees to plan their work around interruptions.

Training

If employees are not prepared to operate and take full advantage of new resources, implementing new technology can be counter-productive. Employees who do not know how to use new equipment are likely to become less productive and less satisfied with their jobs, unless they receive proper training that prepares them for the technological change. This training should be included in a technological implementation plan, complete with a calendar or training events to keep

employees informed and allow for a budget to cater for training resources.

6. Embracing innovation

Innovation is the key to growth in today's business world. It brings market advantages to customers and competition. Innovation also drives the productivity and performance of businesses and helps them to improve and grow. Among the benefits of innovation include: having more efficient work processes, saving resources, drive sales and results, business agility, increased customer satisfaction, diversity and competitive advantage.

The two types of innovation that are most relevant to the food industry are: product innovation and process innovation. Process innovation involves the implementation of a new or significantly improved production or delivery method. Product innovation is the development and market introduction of a new, re-designed or substantially improved good or service.

Below is an example of the steps in the product innovation process, which businesses in the food processing sector can undertake.

SWOT analysis

The first step in innovation should involve a strengths, weaknesses, opportunities and threats (SWOT) analysis of the organisation. It is an important part of evaluating if innovating is a viable option. Evaluating the organisation's strengths means identifying its attributes that are helpful to achieving the objective. Evaluating the organisation's weaknesses means identifying attributes of the organisation that could be seen as a roadblock to achieving the objective. Opportunities are external conditions that are helpful to achieving the objective and threats are external conditions which could do damage to the objective.

Idea generation

Once the SWOT analysis is completed and it has been determined that innovation is viable, the next step involves brainstorming in relation to the product innovation, putting ideas down on paper, discussing possibilities and options, and identifying advantages and disadvantages. This process should be open and visible

and present possible outcomes that are achievable and measurable.

Market research

Market research is a critical step that will help the organisation to determine if there is a place for its product on the market. Does it meet consumer needs? What is a good price point for this product? Is there any other product on the market that is the same or similar? It is important to know if there are products that are similar, and comparisons are made in terms of prices, size, features, etc. These are all important questions to have answered before proceeding with the development of the product.

Identify resource requirements

It is crucial to make a list of the resources that are going to be needed to carry out the project and take the product to market. Each phase of the project (design and testing, development, production, distribution, marketing, etc.) has different requirements. Identifying those that are needed and what is already available will not only help determine the manpower resources, but also estimate the costs associated.

Identify resource availability

Determining what the resources will cost, how long they will be needed and how they will be accessed is essential.

Factor assessment

Some critical factors must be assessed before proceeding with the development of any product. Things such as technical feasibility, cost of production expectations, market concerns, likelihood of satisfactory financial return, risks involved, and commercialisation issues must be addressed at the beginning of any product development.

Product development

The organisation can finally proceed with the work needed to actually develop and bring the product to market. Activities such as formula and recipe development, sensory evaluation, shelf life studies, scale

up, test market and commercialisation are important to the product development stage and should be done in order to avoid costly mistakes at this point.

Case Study

Select Group

Select Group is a leading food service provider in Singapore. It manages thousands of staff trained in all aspects of the food service industry and has established substantial brand presence in Chinese fine dining, events catering, institutional catering, Thai casual dining, themed food courts, quick service restaurants, and a Hong Kong dessert chain. As part of its effort to boost productivity, Select Group is always on the lookout for new breakthroughs and technology.

Automated kitchen

The automated kitchen concept was first introduced by Select Group for its Lerk Thai franchise. Previously, the cooking was done by chefs, and the quality of the final product depended largely on the chef's skills and judgement. Thus, they encountered inconsistent food quality, particularly when it involved their less experienced chefs.

At the end of 2010, Select Group decided to do a kitchen-wide revamp, replacing all its manual equipment with automated ones. These include the noodle boiler which automatically lowers baskets into the boiler and brings them up at the precise time; deep fryer; slicer; food mixer; and wok which tosses the food around to ensure even heat distribution. These systems free up the chefs for more skilled work and allow them to serve up food faster.

With the automated kitchen in place, when an order comes in for a bowl of fried rice, all the chef needs to do is toss in the ingredients and set the timer. The automatic wok will do the stir-frying. While stir-frying may seem like an easy task, it is tiring on the arms. Hence, one benefit of the auto-wok is that it can work long hours without a break, and the chefs can adjust the wok's speed and temperature to cater to different recipes. Additionally, it allows the chefs to prepare the ingredients for the next dish; hence shortening the customer's waiting time. Cooking time is also significantly reduced, as it takes half the time to prepare a dish with the automated equipment.

Positive outcomes

Select Group received positive outcomes. They reported that their sales went up by 30 percent. The feedback received from their customers since the implementation also had been glowing. Customers praise the consistent quality of the food as well as the speedy service rendered. This is also a "morale

booster for staff who are pleased with the increased efficiency in the kitchen operations".

By embracing automation, Select Group has also managed to reduce its manpower by 20 percent. This, however, does not mean a loss of jobs. Instead, their excess manpower is redeployed to the central kitchen, where "they help with preparation of food items such as sauces". Meanwhile, the chefs are also now spending more time innovating and coming up with new and exciting menu creations.

Recommended Readings

Articles can be retrieved from NLB's e-Resources –
http://eresources.nlb.gov.sg

Books are available at the Lee Kong Chian Reference Library.

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SINGAPORE PRODUCTIVITY ASSOCIATION

The Singapore Productivity Association (SPA) was set up in 1973 as an affiliated body of the then National Productivity Board, now SPRING Singapore. Its objective is to promote the active involvement of organisations and individuals in the Productivity.

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CPP Course Syllabus	
CPP	**CPP (Retail)**
Module 1: Understanding Productivity 　　　　**(Duration: 1 day)** • Introduction to Productivity and Quality Concepts • Factors Affecting Enterprise Productivity • Productivity Movement in Singapore • Productivity Promotion in Businesses • Productivity Challenges	
Module 2: Productivity Tools, Techniques & 　　　　**Management Systems** 　　　　**(Duration: 3 days)** • Business Excellence • Productivity Measurement & Analysis • Process management: 　▪ Cost of Quality 　▪ Lean Six Sigma 　▪ Process Mapping & Analysis • Integrated Management Systems	**Module 2: Productivity Tools, Techniques &** 　　　　**Management Systems** 　　　　**(Duration: 3 days)** • Delivering Service Excellence • Productivity Measurement & Analysis • Process management: 　▪ Cost of Quality 　▪ Lean Six Sigma 　▪ Process Mapping & Analysis
Module 3: Innovation & Service Excellence 　　　　**(Duration: 3 days)** • Knowledge Economy & Innovation • Service Excellence • Team Excellence	**Module 3: Innovation & Service Excellence** 　　　　**(Duration: 3 days)** • Introduction to Service Excellence & Sales Productivity • Store Management & the Roles of a Store Manager • Minimising Operational Constraints & Focusing on Sales • Setting Goals & Analysing Statistics • Coaching & Motivating Sales Staff • Service Behaviours that Encourage Business
Module 4: Critical Success Factors 　　　　**(Duration: 1 day)** • Management Commitment • Managing & Sustaining Change • Overcoming Resistance to Change • Training and Education • Planning for Implementation and Control of Productivity Improvement Programme • Briefing on project assignment & Role of Productivity Practitioner	

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As part of the CPP curriculum, participants are required to start a productivity improvement project upon completion of the in-class component. Project guidance will be provided by a professional consultant assigned for this purpose and is for a total of 2 man-days.

Funding & Payment

The course is supported by the Singapore Workforce Development Agency (WDA). Funding is available at 70% and 50% of the course fees respectively for SMEs and MNCs/LLEs/Statutory Boards. Please find the prices payable in the net fee table below:

For All Entities:	Nett Fee:	Nett Fee (with GST):
All Entities ($3950)	$1,185	$1,267.95

Here are the schedules for CPP:

Retail & Food:

September 2013		
Date	**Module**	**Time**
Monday, 2 September 2013	Module 1	9-5 pm
Wednesday, 4 September 2013	Module 1& 2	9-5 pm
Monday, 9 September 2013	Module 2	9-5 pm
Wednesday, 11 September 2013		9-5 pm
Monday, 16 September 2013	Module 3	9-5 pm
Wednesday, 18 September 2013		9-5 pm
Monday, 23 September 2013		9-5 pm
Wednesday, 25 September 2013	Module 4	9-5 pm

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November 2013		
Date	**Module**	**Time**
Tuesday, 5 November 2013	Module 1	9-5 pm
Thurssday, 7 November 2013	Module 1& 2	9-5 pm
Tuesday, 12 November 2013	Module 2	9-5 pm
Thursday, 14 November 2013		9-5 pm
Tuesday, 19 November 2013	Module 3	9-5 pm
Thursday, 21 November 2013		9-5 pm
Tuesday, 26 November 2013		9-5 pm
Thursday, 28 November 2013	Module 4	9-5 pm

Generic:

October 2013		
Date	**Module**	**Time**
Tuesday,1 October 2013	Module 1	9-5 pm
Thursday, 3 October 2013	Module 1 & 2	9-5 pm
Tuesday, 8 October 2013	Module 2	9-5 pm
Thursday, 10 October 2013		9-5 pm
Wednesday, 16 October 2013	Module 2 & 3	9-5 pm
Friday, 18 October 2013	Module 3	9-5 pm
Monday, 21 October 2013		9-5 pm
Wednesday, 23 October 2013	Module 4	9-5 pm

Core Faculty Members

MR. LAM CHUN SEE
B. ENG IN INDUSTRIAL & SYSTEMS ENGINEERING (UNIVERSITY OF SINGAPORE)

Chun see manages his own consultancy practice, Hoshin Consulting and is also an associate consultant/trainer to the PSB Corporation and Singapore Productivity Association. Prior to running his own practice, he has had years of experience as an industrial engineer with Philips, and trainer and consultant with the then National Productivity Board, APG Consulting and Teian Consulting, He was conferred the Triple-A Award in 1989 for helping to transfer Japanese know-how, particularly in the area of 5S, into local programmes and packages. Throughout his years of consultancy experience, Chun See has assisted many businesses in analyzing their productivity and quality objectives and performance; primarily through the application of the PDCA technique and basic QC tools.

MR. LEE KOK SEONG
M.SC. IN CHEMICAL ENGINEERING (IMPERIAL COLLEGE, LONDON UNIVERSITY), B.SC. IN CHEMICAL ENGINEERING (NATIONAL TAIWAN UNIVERSITY)

Kok Seong has accumulated vast experience in the areas of productivity training and management consultancy throughout his 30 years of experience with the Standards, Productivity and Innovation Board (SPRING). He has provided consultancy assistance and training for numerous organisations both within and outside of Singapore in the areas of Productivity Management, Operation and Production Management, total Quality Management, Total Productive Maintenance, Shopfloor Management, Occupational Safety Management, Industrial Engineering Applications and Supervisory Management. He has also been greatly involved in the pinnacle Singapore Quality Award (SQA) initiative since its inception in 1993. his track records include the assessments and site visits of award recipients like Micron Semiconductor (formerly Texas Instruments), Motorola, Baxter Healthcare, Philips Tuner Factory and Teck Wah Industrial Corporation Ltd. Mr. Lee is currently a certified

SQA Senior Assessor, as well as a resource person for Basic and Advanced Training Courses for Productivity Practitioners, a position he has taken on since 2007.

MR. LOW CHOO TUCK
M.SC. IN INDUSTRIAL ADMINSITRATION (UNIVERSITY OF ASTON, UK); B.SC. IN PHYSICS (NUS); DIP IN QUALITY CONTROL INSTRUCTORS (INTERNATIONAL QUALITY CENTRE, NETHERLANDS); CERTIFICATE IN PRODUCTIVITY DEVELOPMENT (JAPAN PRODUCTIVITY CENTRE); CERTIFICATE IN ADVANCED MANAGEMENT DEVELOPMENT (INSEASD)

Choo Tuck currently provides training and advisory services in productivity and quality management to businesses and government in the Asean region and Middle East. He was previously the Executive Director of the Restaurant Association of Singapore as well as the Singapore Productivity Association, and was also the Director for Strategic Planning in SPRING Singapore. During his many years of service with SPRING Singapore, he gained wide experience in productivity training, management consultancy and productivity promotion, and has helped more than a 100 businesses in improving productivity, quality control and business excellence, including organisations such as Cycle & Carriage, Motorola, PUB and DBS. On top of that, he has also served as an Asian Productivity Organisation (APO) expert on Productivity for several APO member countries, and was part of a team of experts engaged by the Singapore cooperation Enterprise to provide productivity expertise to the Government of Bahrain in 2007 and 2008.

MR. QUEK AIK TENG
B.ENG (HON.) IN MECHANICAL ENGINEERING (UNIVERSITY OF SHEFFIELD); DIP. IN BUSINESS EFFICIENCY (INDUSTRIAL ENGINEERING_ (PSB-ACADEMY); CERTIFIED MANAGEMENT CONSULTANT (CMC); PRACTISING MANAGEMENT CONSULTANT (PMC); MEMBER, INSTITUTE OF MANAGEMENT CONSULTANTS (IMC) SINGAPORE

Aik Teng currently manages his own consultancy, AT Consulting Services. One of his most recent projects includes being the LEAD Project Manager for the Singapore Logistics Association. Prior to running his own consultancy, he has been with SPRING Singapore for 20 years, and was the Head of the Organisation Excellence Department from 2004-05. He was also SQA Lead Assessor and Team Leader up till 2008 and has been involved in the SQA initiative since its inception in 1993. tasked to start up the consultancy unit within the then Productivity & Standards Board (PSB) to provide training and consultancy services to organisations, his consulting team assisted close to 30 organisations during that period. He was also involved in a project coordinated by the Singapore Cooperation Enterprise (SCE) to assist the Bahrain Labour Fund in their Labour Reform strategy, which included helping the Bahrain government to initiate a Productivity Movement as well as develop the productivity of the local enterprises. In addition, he was appointed as Project Manager to assist the Government of Botswana to implement a national Productivity Movement, from 1994 to 2003. Botswana is currently held as a model of Productivity in the Pan-Africa region.

MR. WONG KAI HONG
MBA IN STRATEGIC MARKETING (HULL), BSC (NUS)

Kai Hong is a business consultant, management trainer and company director. He has spent almost 2 decades in the consumer products industry, having worked with retailers like Isetan, Metro, Royal Sporting House, The Athlete's Foot and Sunglass Hut; brands like Reebok and Doc Martens; and technology group Wearnes Technology. He has been involved with various functions including operations, business development, project management, human resource, training, marketing, logistics, budgeting and general management. He has developed businesses in Singapore and many Asian cities such as Seoul and Beijing.

For registration or more information, write to us at CPP@spa.org.sg.
Alternatively, you could also contact our secretariat:
Ms. Angela Poh
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