

The Digital Revolution Steps in the Commercial Kitchen

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As more technology makes its way into commercial kitchens, everything from the amount of labor needed, to overall restaurant costs, could improve for restaurant owners and managers.



Disruption Is Sweeping

Through the Restaurant Industry

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ith the advent of 5G, and the greater connectivity the next wave of broadband will enable, this is an area ready for more innovation and

advances. As a result, today's suppliers are busy rolling out ranges of new equipment that uses digital, app-based and other technologies to improve and streamline operations.

While digitalization is by no means new, what is entirely new is the speed and intensity with which it now almost all areas of society – even professional kitchens.

The progressive interconnection of the areas of work and life and the transparency of all of the players connected with it, which harbors changes and risks, is also new. What does this mean for the commercial kitchen? Below Dieter Mailander analyzes the available prospects.

NEW POSSIBILITIES FOR IN-HOUSE WORKFLOW

- Digital cross-linking unites the data of different pieces of equipment of an operation, so that a chef is able to recognize, for instance, whether he or she exceeds a critical limit of their power consumption and thus generates increased electricity costs. The chef is able to counteract with suitable systems;

- Thermal data of food in the entire in-house process chain (frozen storage, cooking systems, equipment for stationary temporary storage, food distribution trolleys, equipment for regeneration and distribution) have to be collected, saved, and processed. Only then are the people responsible able to verify reliably whether the critical temperature limits of 65°C plus (hot components) or less than 8°C (cold components) are compliant. A usage which cannot be underestimated is available in the complete documentation of relevant HACCP procedures, which save a considerable amount of time;
- Digital cross-linking facilitates comparisons between different operations. The prerequisite is that they have agreed on a common standard, in order to report their data to a clearing center;
- The control of the total food flow from farm to fork.

From the almost 8 billion people who live in the world, around one billion are starving. After years of steady decline, the number of people in this situation has increased since 2016, even though there are enough resources to produce food for up to 14 billion people. This is not only about the production of foodstuffs, but also about careful treatment of food. The population in the European Community alone produces 88 million tons of food



waste annually, according to FUSIONS (Food Use for Social Innovation by Optimizing Waste Prevention Strategies). Digital cross-linking can help in the following areas:

- to initiate measures for preventative maintenance in good time, so that the off-times of systems with corresponding checks by service staff are minimized;
- to adapt delivery quantity precisely to the production needs, so that surpluses in the storehouses, which eventually have to be destroyed, can be avoided;
- to monitor the food temperature up to the distribution stage to guests, patients in hospitals or residents in nursing homes, in such a way so that the people responsible can be promptly notified, if it sinks below

the critical line. This way, they are able to counteract quickly and avoid foodwaste.

WHAT ARE THE POSSIBLE RISKS?

Digital cross-linking also raises many questions, which advocates have to take seriously if they don't want to be accused of naivety. Dealing with data collection, storage, use and security, protection of privacy and other things don't only affect big data giants like Google, Amazon, Facebook, or Twitter and their private customers, but also every manufacturer of equipment /systems which merge the data of kitchen customers into a main computer. This subject is relevant for the out of home market too. With the producers of canteen kitchens, customer data is accumulated, for instance, about the use of systems, which among other things allow conclusions on the workload of the operations – information which not every chef would like to disclose to their



Kitchen robots could check the cooking points some day and will be able to regulate the remaining cooking time.



providers. Whoever would like to promote digital cross-linking, has to take the worries of their customers seriously and prioritize data security.

DEFICIENCY: INTERCONNECTION WITH DIFFERENT MANUFACTURERS

The largest drawback of an interconnection of equipment between different manufacturers is frequently a missing common standard. Each piece of equipment, each system generates its own data, which is not compatible with those of the equipment of other manufacturers – an example: temperature control of a dish, which is served in hospital wards and in canteens and for whose production cooling is required. Some of the following components are used:

- Data record 1: cold storage
- Data record 2: cooking equipment/systems

- Data record 3: blast chiller
 - Data record 4: distribution trolleys
 - Data record 5: serving station.
- This example clarifies the chef's problem. If the equipment isn't programmed in such a way as to report the deviations between the target and actual figures, the people responsible will have to activate the five different data records, in order to meet the monitoring requirements. Because this is not acceptable on a permanent basis, software companies like M2M Systems or Awenko, but also hardware producers like Rieber with CHECK (an intelligent food-flow system) are working on solutions (usually via cloud) for this subject matter. In order to open its own system for other manufacturers, Rieber has outsourced CHECK and therefore has no access to the data of other users. In the meantime, competitors are also

using the platform of CHECK. With digital cross-linking, it is the same as with other technologies: it offers enormous chances but harbors considerable risks too. However, these risks have still never been plausible counter-arguments against new technologies. It has always been crucial how people use changes and manage to cap the risks.

A few decades ago, things were a lot simpler. What kind of expertise did a kitchen chef need at that time? Essentially, they had to have an understanding of food and its processing, know roughly about the technical aspects of his equipment, have a command of cooking processes, run staff, plan his goods as needed (mostly by telephone, fax, or directly with a representative), adhere to his budget, and organize the workflow. The world in the kitchen was simple and

clearly laid out – French fries were prepared in the deep-fat fryer, steaks were pan-fried on the cooking block, vegetables were cooked or regenerated in the first combi steamers with one of the few programs available. These innovative devices stood almost exclusively in large operations at that time. They usually had 20 trays and were therefore only designed for large amounts.

A NEW ERA

Up until the turn of the millennium, the situation changed noticeably. There were already smaller combi steamers in larger gastronomical businesses. The market leader, Rational, was present worldwide in all channels of distribution and developed its hot-air steamers to multifunctional devices with a variety of applications. The first program libraries came into being. The increasing electronically monitored devices were



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operated more and more frequently by way of touch screens. Alternatives, whose applicability were even more versatile, came out on the market simultaneously: for example, the steam pressure cooker. It is interesting that the equipment became more compact, even though the spectrum of its usage had massively widened. This resulted in new kitchens arising on considerably smaller spaces. Below you can find some digital applications which inevitably become interlinked with the commercial kitchen.

AUTOMATION

At least four factors promoted this trend, which has been noticeable since the turn

of the millennium, to automate procedures in commercial kitchens:

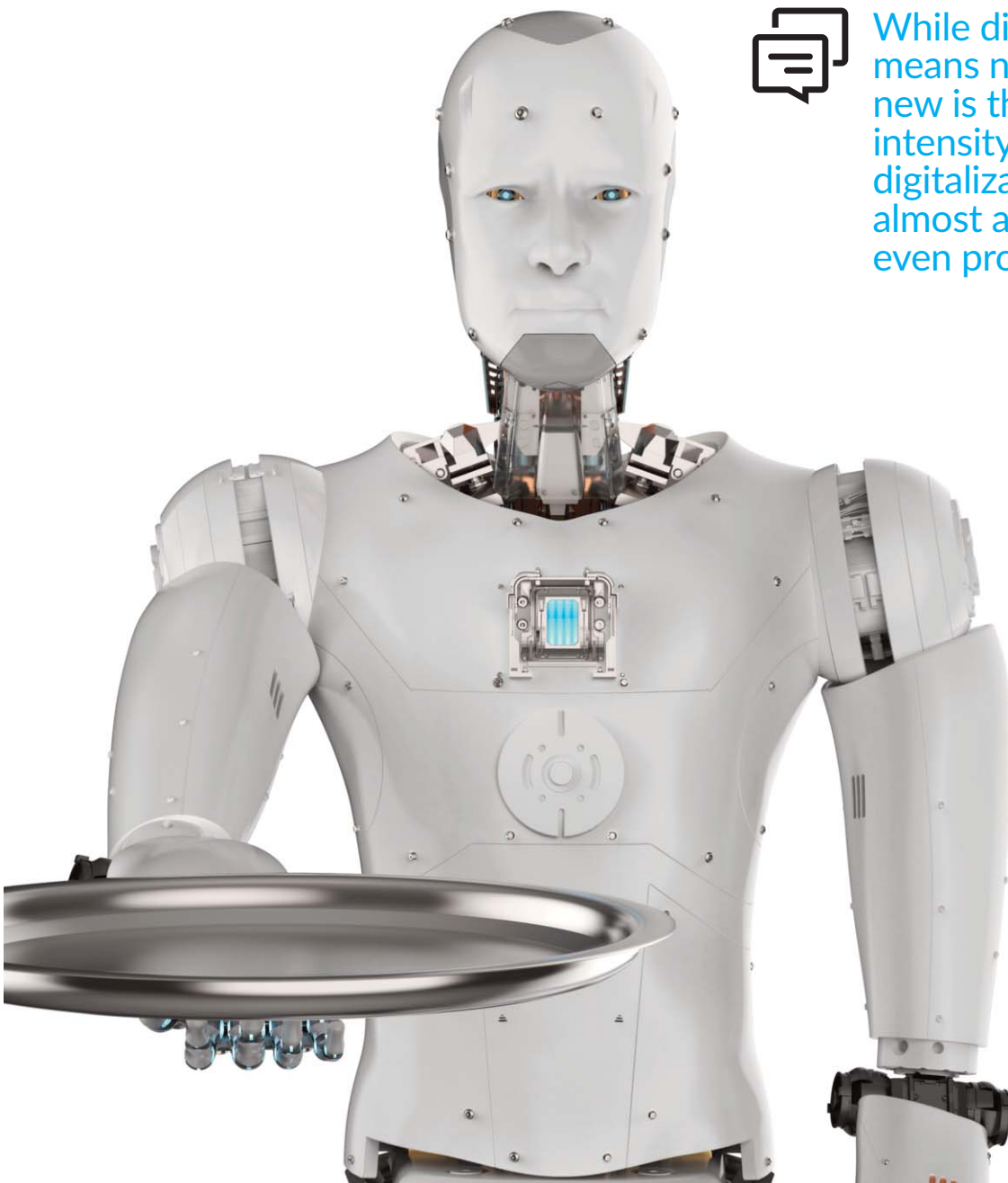
- Cost reduction;
- Staff shortage;
- Relieving the staff from physically taxing work;
- Hygiene improvement.

At the center of attention are those areas of the workflow which require frequently recurring and identical hand movements as well as repetitive, complex or difficult work. In the first case, the kitchen management could lower the costs due to the relatively short amortization period of the investments, which is often less than two years. In the second and third cases, the people responsible could



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take the pressure off their employees, make their working places more attractive, and thereby improve the employer branding: an effect which shouldn't be underestimated in regions where labor market has been swept clean. Hygiene improvement remains as a fourth driving factor. Trays, plates and cutlery, for instance, don't have to be manually handled after washing if the appropriate units are available. Cutlery can automatically be wrapped into napkins or packed in paper, respectively into plastic bags – even together





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with portion packages for salt and pepper, napkins and /or toothpicks.

KITCHEN 4.0/ARTIFICIAL INTELLIGENCE

Kitchen 4.0 is still a new and a small part of the cosmos of the “Internet of Things”. Devices and processes are now connected to each other. Data are transmitted and exchanged automatically between devices. Therefore, automation doesn't only relate to work performed manually in earlier times, but also to the exchange and evaluation of data and information. When, for instance, an external customer has transmitted his order, the system allocates a designated

production capacity automatically, in which thermal devices like blast chillers are integrated as well. In addition, it reserves the necessary capacity in the food distribution trolleys. The order is only then saved as finished, when the food distribution trolleys have returned with all of the services and the bill has been paid. Devices, which exchange data and therefore communicate with each other, are classified as artificial intelligence. However, it is not the devices that are intelligent, but the people who program them in such a way that they process the information precisely. Further stages of development are conceivable. Therefore, it is thinkable for instance, that kitchen robots will check the cooking points some day and will be able to regulate the remaining cooking time. Maybe one can also develop machines with sensor systems, which come close to those of chefs. Perhaps they will even be able to “season to taste” and add some



seasoning to food someday. It is conceivable that they “only” undertake the basic seasoning in the first step, but then develop further step by step.

KITCHEN 4.0 / INTERNET OF THINGS

Whoever integrates external partners into their system has pursued the first step to the kitchen-related “Internet of Things”. What this means is not the isolated measures like the accessibility to wholesalers or purchasing platforms, but also the inclusion of external private and governmental hygiene controls, the entire food chain from the field to the fork or the manufacturer of equipment, which takes care of maintenance and (preventative) upkeep of the equipment



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fleet. With complex food chains, it is also conceivable that blockchains are used. To put it in highly simplified terms, blockchains are continuously extendable lists of data records: subsequent transactions have to confirm earlier ones as correct. Therefore, this eliminates the possibility of manipulating or deleting the existence or content of earlier transactions, without destroying all of the subsequent ones as well. Chefs are able to consequently track their food without a gap.

The digital transformation has embraced almost all of the areas of professional kitchens. It must be assumed that this development will advance quickly. But this doesn't have to make anyone afraid. Whoever invests time in order to understand the developments in their area of work and whoever has the ambition to work with them will remain abreast with the development. ●

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