Testo Food Solution
White paper
ROI of a digital QMS

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ROI: How to make the success of a digital quality management system measurable.

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Executive summary

Digitalization has for a long time been more than a megatrend, it is experienced daily in reality. And since food safety presents an immutable requirement for all companies in the food sector, this topic should be treated as a priority in digital transformation.
However, the control and monitoring of all food safety measures still often take place with paper-based quality management systems (QMS). A digital QMS allows you and all other process participants to maintain food safety more easily, faster and more reliably.

The investment in such a system not only introduces a new tool which improves the implementation of food safety. Even existing, routine processes are almost automatically optimized. This “secondary optimization” creates company-wide synergy effects with regard to efficiency and savings.

All these effects can be measured and evaluated financially. As is clear from the example of a large European supermarket chain, savings of up to seven figures are possible through the introduction of a digital QMS.

Introduction

Retail companies such as supermarkets, service stations and convenience stores use different systems to implement and document food safety. Most apply a paper-based quality management system (QMS). The measures fixed in these have grown over years, and the staff are familiar with their implementation. However, in the food sector, the insight that quality management is no longer conceivable without digital systems is becoming more and more established. For this reason, more and more companies are switching over, and are benefiting from the advantages and the continuous progress in the development of these solutions. Compared to their analog equivalents, digital QMS persuade through more certainty in terms of compliance, higher visibility of the relevant parameters and increased efficiency of all procedures involved – all factors which make it easier for the users to implement food safety requirements.

The decision to switch over from a manual to a digital QMS, however, is not to be taken lightly – it involves a considerable investment in terms of time and resources. If one takes not only the initial costs, but also the repetitive costs into consideration, the calculation becomes even more complex. It is thus only consistent to take a closer look at the return on investment (ROI) of a digital QMS.

This white paper presents for you, in a compact form, which factors play a part in the calculation of the ROI, and uses the anonymous calculation example of a large European supermarket chain to demonstrate how a digital QMS allows more efficient work while lowering costs and saving time.

What is a digital quality management system?

The use of a digital QMS allows food safety as well as the freshness and quality of the products to be increased. In addition to this, quality processes in the company are optimized, and the certainty with regard to quality checks carried out and data documented, is raised. These data are no longer gathered manually on paper, but with digital checklists.

The interplay of handheld measuring instruments which automatically transfer the measurement values to the system, and data loggers which reliably record and evaluate temperatures in a certain rhythm, allows full transparency over the recorded quality data to be obtained in one system. In cases of deviations, staff receive alarms and can not only analyze the data and performance of the sites, but can optimize processes before problems occur.

Overall, these properties and advantages ensure that the use of a digital QMS noticeably lowers costs.

Relevant advantages of a digital QMS

This paper shows the example of a large European supermarket chain with 750 stores, which has switched over from a paper-based QMS to a digital one with integrated, automated temperature monitoring. The financial advantages created by the introduction of the digital QMS have been calculated.

The overview shows the sum of the savings per store as well as for the overall supermarket chain. Following the overview, the savings and optimization potential of this supermarket chain is demonstrated.

Advantages of a digital QMS	Savings and optimization potential	Annual savings +€	
		Per store	Over all 750 stores
Paperless work	Paper, printer cartridges, ring folders, pens	€36	€27,000
Automated temperature monitoring	Manual readout and documentation	€1,200	€900,000
Energy savings in refrigeration and deep-freeze appliances	Energy costs	€1,703	€1,277,250
More efficient in-house audits	Searching through ring folders on site	€458	€343,500
Improved quality processes and lower training costs	Less training requirement	€1,650	€1,237,500
Less food waste caused by temperature-related spoilage	Less food waste	€17	€12,750
Total		**€5,064**	**€3,798,000**
Certainty regarding food safety in your company			**Priceless!**

Savings of a European supermarket chain per supermarket, as well as over all 750 stores, when switching over from a paper-based QMS to a digital one with integrated, automated temperature monitoring.

The calculation of the ROI starts with determining the costs of your manual QMS. You can then compare these costs with the projected costs of the installation and care of a digital system.

The exact calculation of the financial effects of the implementation of a digital QMS is complex. It involves considering direct and indirect factors. For retail businesses, the following advantages of a digital QMS are particularly relevant:

More reliable quality checks

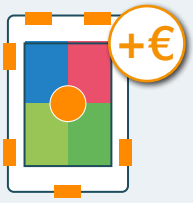
The quality management at the European supermarket chain in the present example reports that quality checks are considerably more efficient after the introduction of the digital QMS, in comparison to the paper method. Fewer methodical errors were observed, while returned deliveries and post-rectification of defects were reduced. Thanks to the improved adherence to compliance, customer satisfaction was also improved.

Considerably less paper

The quantity of paper which piles up over the course of a year with an analog QMS is huge. If the quality checks are carried out digitally instead of on paper, and the temperature values of the refrigeration units are measured and documented digitally, instead of being entered into lists, the expenditure for paper, printer ink, ring folders and pens is eliminated. The space-consuming storage of the paper documents also becomes superfluous. All measurement values and recorded data are stored digitally and can be called up from anywhere and at any time with just a few clicks.

Example calculation: European supermarket chain with 750 stores

Savings through paperless work:
€27,000 annually plus direct contribution to environmental protection.



Automated temperature monitoring

In order to guarantee food safety, it is necessary to check the temperatures of refrigeration and deep-freeze units as well as refrigerated rooms. The manual implementation and documentation of temperature checks is time-consuming. The process is simplified if temperatures are measured, documented and checked automatically, allowing an immediate reaction to warnings and alarms for critical temperature ranges. And when your staff no longer need to read out and document the values manually, they have significantly more time for more profitable activities.

In our example, the supermarket staff noted the temperatures of the refrigeration units manually before the introduction of a digital QMS. In this context, it became apparent that staff were noting clearly deviating temperatures, but not doing anything about it, in spite of the fact that the temperatures of the refrigeration unit were outside the defined limit values. Now that the refrigeration units have been equipped with data loggers which automatically record the temperature values at defined intervals, the supermarket chain can be sure that the documented values correspond to the actually measured readings. The temperature is not only checked at two defined times during the day, as was the case manually, but the long-term temperature curve of the refrigeration unit is now known. The system also presents temperature and limit values graphically. And the most important thing: If a limit value is exceeded, the system gives out an alarm, allowing an early reaction.

Example calculation: European supermarket chain with 750 stores

Savings thanks to automated temperature monitoring with alarms:
€900,000 annually.

Reduced operating costs for refrigeration units
With an automated temperature monitoring system, the exact temperature curves of the refrigeration and deep-freeze units, including the defrosting phase, are known. Special data loggers can also simulate the product temperature curves and document when the door was opened, in addition to measuring the air temperature. How many hours per day are the doors of the refrigerated rooms and refrigeration units in your supermarket open? An unnecessary energy loss can quickly develop into a problem with food safety.

Thanks to the introduction of a digital QMS with automated temperature monitoring, those responsible for quality at the supermarket chain became aware that many refrigeration units in the markets were set considerably colder than is useful and prescribed. Field studies have shown that temperature settings and the control of refrigeration units are far from optimal – with regard to food safety as well as energy. In order to be on the safe side, many deep-freeze and refrigeration units are set at lower temperatures than necessary. This happens as a result of a lack of transparency over the temperature curves of the refrigeration units and the development of the product temperature during the defrosting phase.

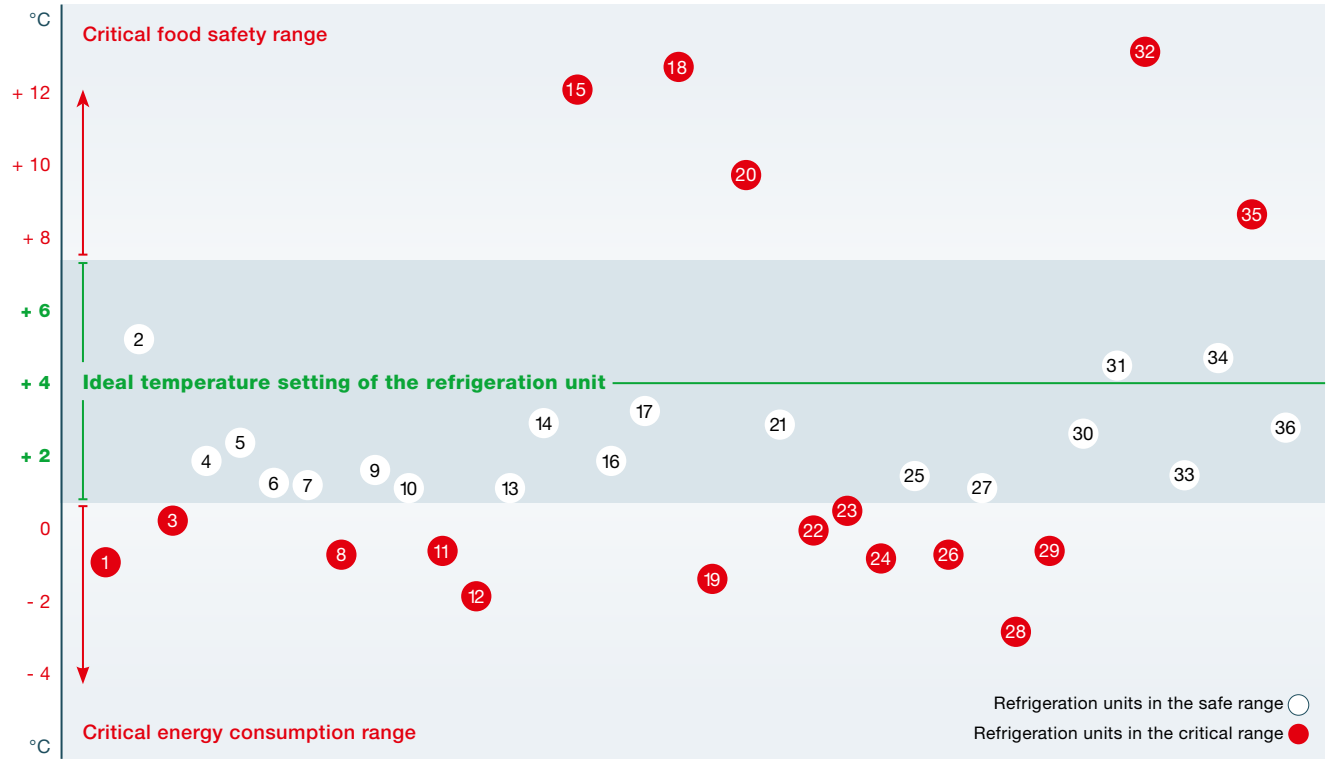
However, considerably cooler temperatures also involve a higher consumption. And energy is a cost factor which is multiplied by the number of refrigeration units and stores. Every degree counts when it comes to cooling and costs.

Once these data were known, and the temperatures of the refrigeration units were being continuously monitored, the project team derived an optimization of the temperature settings from this, noticeably reducing the energy costs.

Example calculation: European supermarket chain with 750 stores

Savings through a reduction of energy consumption:
€1,277,250 annually.

This representative analysis of one supermarket shows the average temperature in its refrigeration units.



The overview clearly shows that most of the 36 refrigeration units in the representative supermarket are set either too cold or too warm with regard to their mean temperature – and that costs energy and money.

Reduced time and effort for in-house audits

Access to real time reports and a complete overview of the performance of all sites simplifies decision-making in daily business. Thanks to the digital transparency over the performance of the stores, paper documentation no longer needs to be examined in the individual supermarkets on site. With a digital QMS, searching through file folders is a thing of the past, and you can carry out in-house audits in a targeted way, where they are really needed. This is also possible remotely – which is a special advantage in times of contact limitations.

Example calculation: European supermarket chain with 750 stores

Savings through a reduction of in-house audits: €343,500 annually.

Reduced costs for staff training

In contrast to paper lists, digital systems offer many different possibilities for guiding and supporting staff in conducting quality checks. This reduces the staff training effort required for food safety. For example, situations can be recorded and documented using the integrated photo function of the digital QMS instead of noting them down in a handwritten paper list in differing degrees of detail.

If the values recorded in a digital checklist do not correspond to the defined standard, the staff are guided by the system to initiate and implement the right corrective measures. Everyone in the team thus knows what he or she has to do – with a minimum of training effort. Since in addition to this the manual temperature checks are eliminated, there is no need for them to be trained either.

It has furthermore become apparent that the staff enjoy conducting quality checks digitally more than looking after paper lists. This improves their consciousness of quality and food safety in the company. And if you are wondering whether the savings achieved justify the acquisition:

Example calculation: European supermarket chain with 750 stores

Savings in training costs: €1,237,500 annually.

Less food waste

In the context of globalization criticism and lack of resources, the topic of food waste is increasingly in the focus of the consumer. That is reason enough for retail to treat this topic with some urgency.

In supermarkets food waste is caused mainly by spoilage. The use of a temperature monitoring system significantly contributes to maintaining the cold chain and noticeably reduces the amount of spoiled food. Thanks to the alarms not only limit value violations of temperatures are identified early. The staff can also react in a targeted way when the doors of storage rooms and refrigeration units are left open too long and the temperatures deviate into ranges which endanger the freshness, quality and food safety of your products.

In our example, the supermarket chain also reports that they have recorded less food waste during incoming goods inspections thanks to the non-contact temperature measurement and digital documentation.

Example calculation: European supermarket chain with 750 stores

Less food spoiled or substandard due to temperature: €12,750 annually.

The positive business case of a digital quality management system

In particular the benefits of the two core functionalities of a digital QMS – digital checklists and automated temperature monitoring – make a crucial contribution to a positive business case. In addition to the key financial factors which were taken into account in calculating the ROI, with the introduction of a digital QMS you also benefit from the non-monetary aspects presented on the right – because in the end it is the certainty of food safety in your company which is priceless.

Direct factors
Indirect factors

The ROI of a digital QMS is based on both direct and indirect factors.

Conclusion

The implementation of a digital QMS saves money. And what is more important: the company works in compliance with the industry standards. This creates the basis for fast and flexible reactions to changes.

The example demonstrated in this white paper is only one of many possible scenarios. Every company in the food sector – whether producer, dealer, supermarket or restaurant chain – has individual circumstances. For example, the advantages of frying oil quality measurement can be added to the financial factors, should it be used.

Would you like to find out how you can use a digital QMS efficiently in your company, in order to better guarantee food safety and sustainably lower costs? We look forward to continuing the conversation on digital QMS in more detail with you, and to being involved in the calculation of your individual, tailor-made ROI.

>> Contact

These white papers might also interest you.

The 5 keys to measurable food safety in restaurants and retail grocery stores.

>> to the white paper

The advantages of digital quality checklists for ensuring food safety.

>> to the white paper

The food waste challenge: Increase sustainability and reduce costs.

>> to the white paper

First Expired – First Out: Improve food quality and reduce costs with the FEFO method.

>> to the white paper

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About the author

Stephanie Burchardt studied Nutritional Science at the Technical University of Munich School of Life Sciences from 1990 to 1996. The emphasis of her studies was on food technology and quality management. After earning her degree, she worked in the food sector for over 10 years. As a Quality Manager with the VION Food Group, she shared responsibility for food safety and compliance for seven production sites of the subsidiary Lutz Fleischwaren AG (meat products), as well as for retail and wholesale.

Since 2007, Stephanie Burchardt has been working for Testo SE & Co. KGaA, an expert company for high-precision measurement technology and innovative measurement solutions. As the Product Manager for portable measuring instruments for temperature and analytics, she introduced the cooking oil tester testo 270 to the global food service industry. In 2014, she took over the management of the Business Unit Food, making a crucial contribution to the foundation of the new business model Solutions. The focus here is on application-specific, comprehensive QS solutions consisting of measurement technology, software and services. Once the new company division was founded, she became the Director of Product Management for Food and Life Science Solutions.

Stephanie Burchardt took over her new position as Senior Strategy Consultant at the beginning of 2020. She promotes the further development of Testo's innovative digital solutions for food safety management including high-precision measurement technology, to the next generation.

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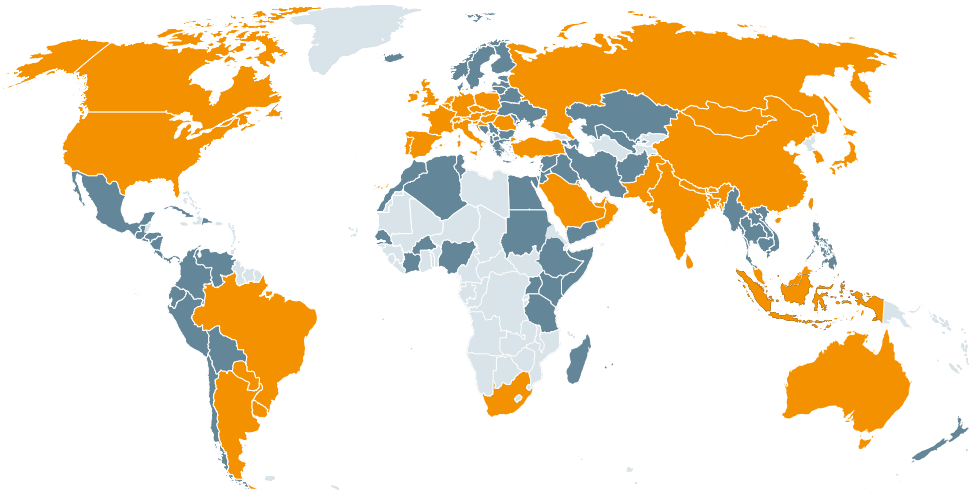
About us: This is Testo.



Subsidiary
Retail partner

Testo, with its headquarters in Titisee in the Black Forest, is a world market leader in the field of portable and stationary measurement solutions. There are 3,000 employees involved in research, development, production and marketing for the high-tech company in 34 subsidiary companies all around the world. Customers all over the world are impressed by the measuring technology expert's high-precision measuring instruments and innovative solutions for the measurement data management of the future. Testo products help save time and resources, protect the environment and human health and improve the quality of goods and services.

In the food sector, measuring instruments and monitoring systems from Testo have proven themselves for decades, and belong to the standard equipment of food services, supermarkets and food producers.

An average annual growth of over 10% since the company's foundation in 1957 and a current turnover of over a quarter of a billion euros clearly demonstrate that the Black Forest and high-tech systems are a perfect match. The above-average investments in the future of the company are also a part of Testo's recipe for success. Testo invests about a tenth of annual global turnover in research and development.

For the food sector, Testo has developed specific solutions which combine precise sensors with intuitively operated software and comprehensive services, tailor-made for the requirements of the respective field.

More information at www.testo.com

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