

An introduction to Customer Flow Management

A Q-Matic white paper

About this white paper

This white paper serves as an introduction to Customer Flow Management – a methodology invented and developed by Q-MATIC AB. The information presented is based on more than 27 years of accumulated experience from a wide range of industries and countries.

The document begins with the definition of Customer Flow Management and then describes the methodology behind it to establish a common framework. It then explores some of the core elements of Customer Flow Management in more detail, e.g. the Customer Flow Management process and the main queuing principles. Finally, two case examples are used to illustrate some “real” effects of Customer Flow Management.

The publication of this white paper has a twofold objective

- 1) To establish a common framework in the industry
- 2) To increase awareness among businesses that could use Customer Flow Management to gain a competitive advantage

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An introduction to Customer Flow Management

Imagine yourself interviewing the head of supply or production in a product oriented company. You discuss the company's supply chain and production strategy to understand how the company manages these critical processes. It is highly likely that the manager has several presentations available "off shelf" to show how the company controls the flow of material and products in detail, arguing that they know exactly what happens in each step of the value chain from raw material to finished goods. It is also likely that the manager will refer to various supply and production philosophies like JIT, TQM and 6σ – all of them developed over decades to support companies striving for the optimal flow of material and products. The conclusion is often that this thorough understanding of the flow of material and products is a production oriented company's most critical competitive advantage relative to its competitors.

Now imagine yourself having a similar discussion with the head of operations in a service-oriented company, such as a retailer, retail banker, hospital or public institution. Would you expect an equally prompt and knowledgeable answer if you ask about the company's strategy for managing the flow of customers? Some managers would probably refer to their CRM system and claim that they have a good knowledge of the customers that were serviced yesterday or the day before that. Some managers might also claim that they control queuing with a system that assures order among the waiting customers. However, few could possibly claim to know what happens with their customers throughout the whole interaction process in real-time. It is fair to ask why this is the case. If the supply and production managers know the flow of material and products in detail, why doesn't the head of operations know the flow of customers equally well? Is the flow of customers less important than the flow of material and products? Is the flow of customers more difficult to monitor and control? The answer to both of these questions is certainly "No". Knowing your customers is absolutely a key success factor for any service provider that wants to be competitive. And today there is a well-developed understanding about how the flow of customers can be monitored and managed as well as technological solutions developed to support this. Hence, just like the production oriented companies who started to manage the flow of material and products 20-30 years ago, it is possible for service providers today to start managing the flow of customers to a far greater extent than is currently common practice. And the reward for those who do is as obvious as desirable – they gain a competitive advantage.

The shortcomings of CRM tools

In the quest for more data the IT industry has answered business' call for tools that will help them create, store, manage, and mine customer information. In the last ten years we have seen the birth and maturation of CRM, a tool that promises to transform companies into 'customer-centric' organisations, where they can 'know' every customer and deliver a level of personalised service that makes customers loyal to the brand. Although CRM has yet to live up to its billing, the promise is there. The ability to speak to customers one-on-one while referring to historical data for insight into the customer is a significant strategic advantage for the companies that 'get it right'.

A CRM tool is a tremendous investment for many organisations. It provides a data-rich view of their organisation's long-distance relationship with customers, insight into what the customer's preferences are, and the tools and data required to plan for the future. But there is a bigger picture. Business and service conducted with walk-in customers (for instance, consumer 'foot-traffic' in retail environments) typically falls outside the remit of CRM. How do managers make good decisions regarding face-to-face service in real-time? In many cases management has little information about the on-going activities in their branch or hospital waiting room and ultimately customer-facing operations are managed by 'feel' rather than by knowledge.

What is Customer Flow Management and how does it create competitive advantages?

Customer Flow Management = managing the flow of customers and their experience from initial contact to final service delivery

Customer Flow Management (CFM) helps companies adopt a consumer-centric perspective and begins when a customer makes an appointment for a visit or enters a shop, bank, hospital or a public sector service centre. It stresses the importance of planning and monitoring the customer's entire visit, possibly also capturing data and information at each point of contact with a member of staff or self-service point. Furthermore it can link all the service points together, helping managers understand the dynamics of the customer's visit and ultimately their experience. In short, CFM can link the vast amount of customer information in CRM databases to the real-time activities targeting and influencing the customers present in the service provider's premises.



Figure 1: The development from ERP and CRM to CFM

The benefits of this approach are significant. In the short-term it can increase sales and productivity by up to 30% and decrease costs by up to 30% by ensuring that the right customer is at the right place, at the right time and is serviced by the most appropriate staff member. It also increases customer and staff satisfaction by reducing the actual as well as the perceived waiting time and creating a relaxed environment characterised by a controlled and fair waiting process. It can also generate data and insights to drive ongoing business improvements with a mid- to long-term perspective.

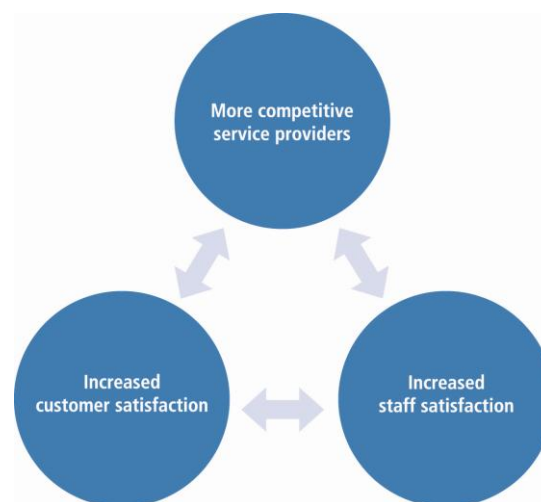


Figure 2: Customer Flow Management has benefits for all key stakeholders affected by it

Proof of concept

The most overwhelming proof of concept for Customer Flow Management is the empirical evidence from the retailers, banks, hospitals and public service centres that have already applied this with successful result. Over time the approach has proven itself in a number of ways

- **It is well developed:** it has existed and been developed for more than 27 years
- **It is market independent:** it has been successfully applied in more than 110 countries
- **It is industry independent:** it has been applied in as various industries as retail, banking, public sector and healthcare sector
- **It is thoroughly tested:** there are a minimum of 40,000 solutions implemented worldwide
- **It is well accepted by users:** more than 1,7 billion users are estimated to pass through the systems every year

In addition to this empirical evidence there are further scientific and theoretical studies focusing on and explaining selective parts of Customer Flow Management in more detail, e.g. in particular the queuing principles. The focus of these articles is mainly on the effects different queuing principles have on waiting time, queue length and efficiencies of the operations and services provided¹. This theory is the basis for the software developed to support the practical implementation of Customer Flow Management solutions.

¹ See for example “Queing Theory” by Ivo Adan and Jacques Reising, Department of Mathematics and Computing Science Eindhoven University of Technology, 2001, “A Note on Managing Waiting Lines” by professor Edward Anderson, UT McCombs School of Business, 2004

Review of the Customer Flow Management methodology

Before all the opportunities embedded in Customer Flow Management are explored, this chapter is devoted to describe the underlying working methodology. It is this structured approach that helps us to navigate through the wide range of opportunities by assuring that we start with the right pre-requisites and then choose the appropriate opportunities for further exploration. Without a structured approach it is easy to fall into the trap of choosing among the wide range of opportunities first and then adapting the business accordingly without assessing if the chosen opportunities were the most appropriate ones given the individual business' perspective.

Customer Flow Management methodology = a particular set of procedures specified to ensure that the flow of customers and their experience is optimised from the service provider's perspective

A 3-step approach to ensure a successful result

The Customer Flow Management methodology is a 3-step approach where each step needs thorough consideration to ensure a satisfactory result. This is not a once-only procedure but needs to be re-visited over time as the business and/or business environment changes.

The 3-step approach

- A. The first step is to map the current and define the target Customer Flow Management process (CFM process). The target process is defined as the optimal process for the service provider, taking into consideration how the process affects all key stakeholders (the service provider, customers and staff) and the direct and indirect impact that has on the service provider's Key Performance Indicators (KPIs).
- B. If the defined target process deviates from the current process a solution that helps the service provider to achieve the target process needs to be defined and implemented. The design of this solution will have a significant impact on the options available in the final third step and hence that should be considered before implementation.
- C. For some companies, step 1 and 2 are sufficient to achieve their objectives and targets. However, the real power of what we define as Customer Flow Management becomes apparent if the solution designed in step 2 not only supports the target Customer Flow Management process but also gathers and stores data on the flow of customers. Properly used the data can be analysed to generate insights about the service providers' processes and customers. These insights can then drive further development of the business. Developing the internal processes and routines to capture this potential is the third and final step of the Customer Flow Management methodology.

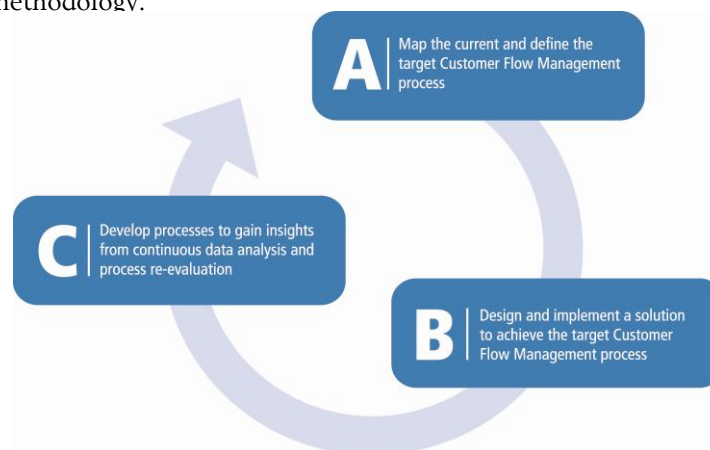


Figure 3: The 3-step approach of the Customer Flow Management methodology

A. Map the current and define the target Customer Flow Management process

All process improvements should start from the current situation. Understanding the advantages and disadvantages with the current process is the basis to be able to identify improvement areas. The basis for defining the target Customer Flow Management process is always the service provider's Key Performance Indicators (KPIs). Depending on what the service provider wants to achieve the target process can be very different. Although Customer Flow Management in general tends to offer possibilities to achieve sales growth, cost reductions, productivity improvements and increased staff and customer satisfaction simultaneously it is unavoidable that some prioritisations need to be made.

Besides the KPIs, it is critical to understand how different processes affect the key stakeholders. Two identical solutions can be perceived differently by the same customer group depending on the situation and environment in which they are used. This will ultimately have a direct or indirect impact on the service provider's KPIs.

It might seem quite trivial to map the current and define the target Customer Flow Management process. The service provider might feel that he/she already has a thorough understanding of the current process and has even experienced a preferred solution somewhere else. It could then be tempting to skip the first step and immediately define the target process as the experienced process and continue to implement a similar solution. It is important to understand the underlying assumptions in this case, e.g. both businesses have similar KPIs, customers with similar preferences and an environment/location layout that offer similar design possibilities. If these assumptions are not valid then there is no guarantee that the same type of solution is satisfactory in both businesses.

A generic framework to support the mapping of the Customer Flow Management process can be found in the next chapter. The objective of this framework is to ensure that all aspects of the Customer Flow Management process are considered when the current process is mapped and the target process is defined.

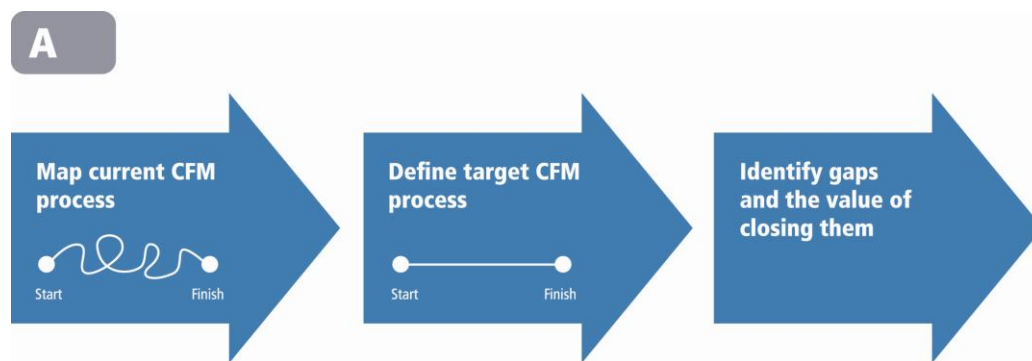


Figure 4: A process to map the current and define the target Customer Flow Management process

B. Design and implement a solution to achieve the target Customer Flow Management process

When the target CFM process has been defined and the gaps to current CFM process are identified the challenge is to take control of the flow of customers to close the gaps and achieve the target process. There are a number of tools that can be used when designing a solution. Depending on the complexity of the target CFM process and the gaps relative to the current CFM process, these tools will be suited and used to differing extents. The most commonly used tools are illustrated in Figure 5.

Improvement services include post-implementation reviews and training of staff and management. Experience has shown that although the initial effects of Customer Flow Management are often high, the effect decrease over time in some environments. Post-implementation reviews have revealed a simple explanation for this. Initially the managers and staff involved realise the benefits and exploit them. Due to natural staff turnover, understanding of the implemented solutions tends to decrease over time and the possibilities are not fully used. To prevent this, it is crucial to not only implement the solutions but also regularly monitor the effects and train staff to achieve the result. Hence, routines for post-implementation reviews and regular training should be a part of the solution design.

The solution design set the boundaries for the possibilities available in the third and final step in the Customer Flow Management methodology, e.g. when processes and routines to capture the potential from continuous re-evaluation of the whole processes are developed. A solution with a more complex hardware and software structure demands more from the users but also offers more possibilities for data capture, analysis and insights that can help drive the business forward. This dependence needs to be taken into account when the solution is designed.

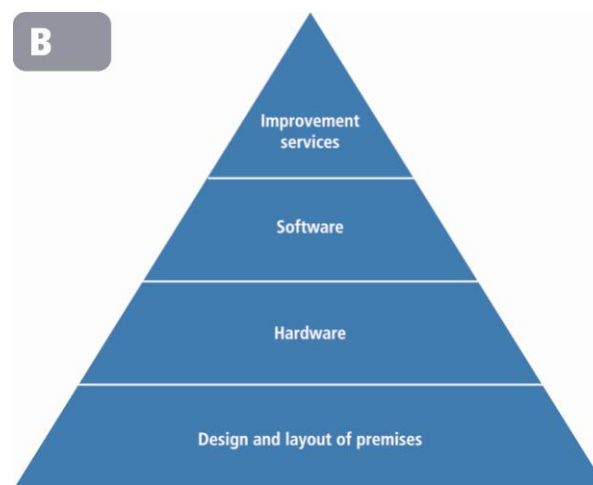


Figure 5: The most commonly used tools to design solutions

C. Develop processes to capture the potential from continuous re-evaluation of processes, data analyses and insights

Developing processes and routines for continuous monitoring, evaluation and improvement of the Customer Flow Management process is the final and most advanced step in the Customer Flow Management methodology. Continuous re-evaluation of the process can lead to insights that improve the customer flow and the business further. The information gathered, stored and analysed for this purpose is referred to as Management Information (MI). To fully capture the value from this requires additional commitment and involvement by management but is highly awarding if used properly.

In the case of the simplest Customer Flow Management process with one (or a few) physical queue(s) served by one counter (per queue) this can be done visually or with simple manual measurements. Staff or management might know the flow of customers well enough to describe it accurately by heart. Alternatively a staff member could occasionally count the number of waiting customers, measure the waiting time for some individual customers or just observe customer behaviour while waiting.

However, in more complex situations it would be desirable to implement a more structured approach. For example, the CFM solution could be designed to gather and store data on the CFM process. The data would then be the managers' tool when attempting to understand and improve the current

processes. However, the data is of little value if it is not analysed and used properly. Defining the necessary activities and assigning responsibilities is the key to ensuring the organisation captures this potential.

A service organisation reaching this level of understanding about their flow of customers can without doubt claim to have an equally advanced Customer Flow Management strategy as the production oriented companies applying JIT, Lean Manufacturing and 6 σ claim to have for production and supply chain.



Figure 6: Management information can be used to understand the dynamics of the business' flow of customers and lead to insights about future business development. In this example the potential effect of a coffee break for the service staff at 10:00 is illustrated. The waiting time is stable before and after the coffee break when all the service staff is available, but as the waiting time builds up during the coffee break it remains longer during the afternoon. Using this insight, the waiting time during the afternoon could be reduced significantly with a relatively small effort focused immediately after the coffee break.

Verify the feasibility of the planned solution

When the Customer Flow Management methodology has been applied and a solution to achieve the target Customer Flow Management process has been designed it is important to verify feasibility in terms of the expected benefits relative to the investment required. The information needed is already available if the methodology was followed. In the first step we assessed the value of closing the gaps between the current and target Customer Flow Management process. In the second step we designed the solution required and hence the investment can be derived directly from this. Comparing these with each other will give an estimate of the payback time and return on investment.

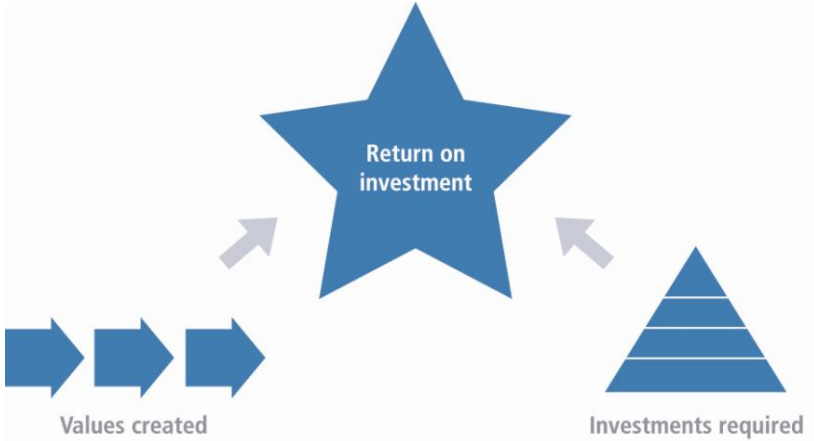


Figure 7: It's critical to relate the values created by the solution to the investments required to assure that the planned solution has a positive expected return on the investment

A framework to describe the Customer Flow Management process and identify the opportunities

The Customer Flow Management process is central and only when this process has been fully understood is it possible to design solutions that maximise the benefits for the service provider. It is also important to realise that there is not one single process that is “optimal” for all service providers but, as already stated, much depends on the KPIs of the individual service provider.

The Customer Flow Management process consists of several phases including Pre-arrival, Arrival, Queuing/waiting, Serving, Post-serving and Managing (illustrated in Figure 8). In fact, it is this view of the entirety of the customer service operation – and the resulting framework for making informed business decisions – that frames the boundaries of Customer Flow Management.

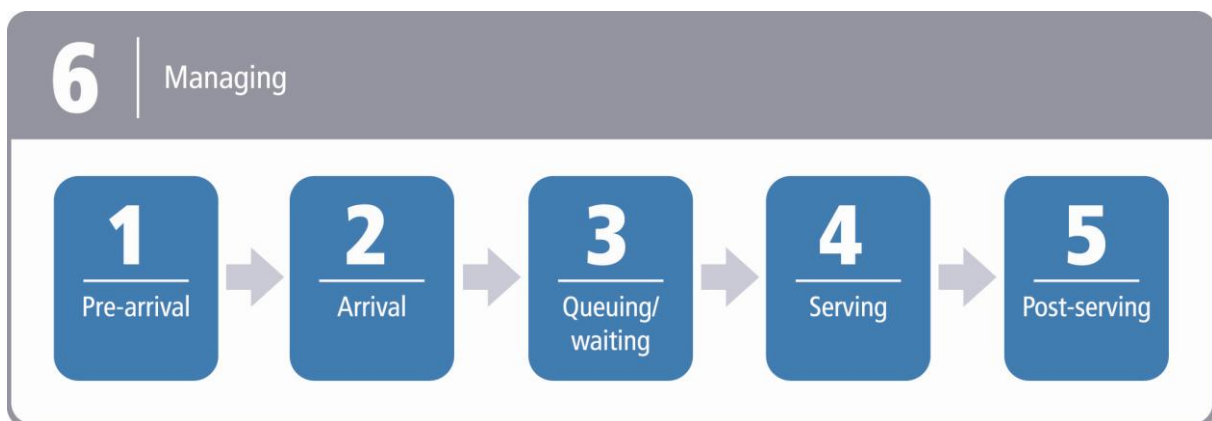


Figure 8: A generic framework to describe the Customer Flow Management process

1. Pre-arrival

Customer Flow Management can start before the customers physically visits the shop, bank, hospital or public service centre, by implementing a method to book appointments before arrival. This reduces the time spent waiting by the customer and hence has a positive impact on the customer’s service experience. For the service provider it can be a tool to control and steer the flow of customers away from peak hours to less busy parts of the day. It can also be a powerful tool that delivers the pre-visit data required for the service provider to staff more appropriately and deliver better customer service.

2. Arrival

On arrival, customers need to be placed in an appropriate queue. Customer Flow Management stresses the possibility of segmenting the customers in different queues if appropriate, rather than entering all customers in the same queue. The most common segmentation is based on customer needs, e.g. separate queues for separate services. Customers with more complex service requirements can then be managed separately, which reduces the risk of “blocking” other customers with a negative impact on their service experience. It also allows the service provider to match customers with the staff who have the most suitable competence to respond to their needs. This is positive both for the customers who get the best support and for the service provider that maximises the likelihood for potential cross- and up-sells. Another possibility for segmentation is to base it on customer attractiveness. VIP customers that are considered important for the service provider could for example be positioned at the front of the queue. In a world where service providers are struggling to build increased loyalty among their customers, this represents a very interesting opportunity.

Depending on the degree of complexity of the segmentation the queue entry point can and should be designed differently. In the very simplest case no special arrangements or at most a few barriers might be appropriate. In more complex situations various self-service terminals or even staffed greeting stations

can be used to ensure customers enter the queues correctly. From a customer perspective an important criteria to ensure a high service experience is to secure an “in-process feeling”, e.g. the customers need to know and feel that they have entered the queue correctly and will be served in the appropriate time by the appropriate service person.

For the service provider the arrival and queue entry is the first opportunity to start tracking the customer on site. This requires customer identification and the creation of an initial data point. If the customer is not identified and tracked at this point the next opportunity to start tracking the customer is at service delivery.

3. Queuing/waiting

After arrival and queue entry most customers will endure a period of waiting. A balanced and controlled waiting period is the desired optimum result of any manager. No one wants to have a completely empty waiting area, as it would most likely mean you are overstaffed. Besides, an empty shop or service area gives an impression of abandonment and will not attract customers. An empty hospital could give the impression that tax money is wasted. Equally, too many customers waiting is simply as off-putting. And in the case of a hospital or public service centre a too long waiting time might not be accepted by citizens who can demonstrate this in elections. CFM can help managers get the balance just right by improving staff planning and by adding more flexibility to the processes.

From a CFM perspective this step has the greatest risk of impacting customer service experience negatively if not managed appropriately. A customer who perceives waiting as long is usually not satisfied with the service. Customer Flow Management offers two approaches to manage this. The first is to minimise actual waiting. By choosing the most appropriate queuing principle and using available Customer Flow Management tools to plan staffing and monitor waiting in real-time the service provider can actively manage waiting time.

Another approach, which does not exclude the first, is to minimise the perceived waiting time. This can be made by engaging the customer in active waiting, e.g. fill the waiting time with activities that reduce the perceived waiting time and hence enhance the waiting experience². Imagine for example being able to broadcast specific messages, targeted at the customers who are currently in your front office or in your shop. A service provider using Customer Flow Management in an advanced manner can identify who is currently visiting and the manager can, using targeted broadcasting, keep them informed and/or entertained while waiting, even using adverts reflecting their specific interests. Other opportunities that both reduce the perceived waiting time and create additional value for the service provider are to

- engage the customer in activities to prepare for the service and reduce workload for staff, e.g. by filling out forms etc.
- create opportunities for further shopping while waiting, either through strategically placed goods where the customers are waiting or by allowing the customers to move freely around the service providers premises while waiting to be served
- use media to stimulate further sales. If the service provider knows which individual customers are waiting, the media content can be adapted to target the specific needs of the customers waiting

The queuing/waiting period finishes when the customer is called forward to be served. The method for calling customers has a great effect on the efficiency. It is crucial that the waiting customers are made aware of both the fact that they have been called and where they should go. This can be handled with

² See also “The psychology of Waiting Lines” by David H. Maister for a more detailed discussion about the difference between actual and perceived waiting time.

various types of visual and audio support tools. Correctly used, experience has shown that this can increase productivity and as a result, reduce waiting time by up to 30% in environments with short and standardised service requirements.

If privacy is important for the customer, which is often the case in public and healthcare institutions, service providers should consider calling customers forward anonymously based on some other identification than name (typically a number).

4. Serving

If the service provider chooses to identify and start tracking the customers as soon as they enter the queue, then the staff calling the customer forward can start preparations before the customer actually arrives at the service point. For example, staff could call up the customer's history on their screen. They can see every visit the customer has made before, who they saw and what the enquiry was about. When the customer is being served, data on their visit can be captured and made available for real-time insight through management dashboards. It can also be stored for later use. For instance, management could use the information to view customer wait times or find out how long different transactions actually take to complete.

The manager can also have an instant overview of the service situation at one or several locations in real time. CFM provides the ability to see details such as number of open counters, services offered, current waiting times, and number of customers seen at each counter as well as transaction times. Alert mechanisms can give the manager the opportunity to take action if waiting times exceed preset limits.

5. Post-serving

After a customer has been served, staff close the transaction and relevant data – like wait-time and transaction time – are recorded. If required, a case handling function can continue to manage the case throughout its lifetime, from the time it is created, signed over to different advisors or different departments and until the case is closed. Each step is documented and processed.

It is also possible to engage the customer in other value-adding activities like answering customer surveys. This could be done after the transaction is closed and as a result, will not affect the waiting time for other customers. The information gained could be highly valuable for the service provider as it could reveal the customer's perception of the service they have just received and highlight areas with improvement potential. It could also improve the customer's service experience if they feel that they have the opportunity to make their voice heard.

6. Managing

If data from the CFM process is gathered and stored then managers can, at any point in time, use that data to evaluate the current processes. Reports can be generated on employee–customer interactions, service times and customer wait times. Operational inefficiencies can be identified and addressed through process changes or training. Trend analysis provided by system reports help the user to manage staff rotas in line with peaks and quieter times in the service area. Customer segmentation, staff scheduling, media content, etc can be tested, evaluated and modified based on insights from analysis of the gathered data.

Statistical reports are also useful tools for achieving and reporting on a variety of organisational targets. For service providers with targets related to service levels rather than profits the information captured by the Customer Flow Management system can be an important tool to measure and evaluate performance. As the system can be seamlessly connected to any number of service access points over a wide geographical area, managers can have a complete overview of their service network.

Review of the main queuing principles

What type of queuing principle that is most appropriate in different environments ultimately depends on the service provider's KPIs. A service provider prioritising productivity will often choose a different queuing principle than a service provider prioritising customer satisfaction. Given that the choice of queuing principle has such a significant impact on all parts of the Customer Flow Management process this section is dedicated to deepen the readers understanding in this field. Queuing principles are classified into two main categories, *linear and virtual queuing*. The advantages and disadvantages of each of them are described in this section.

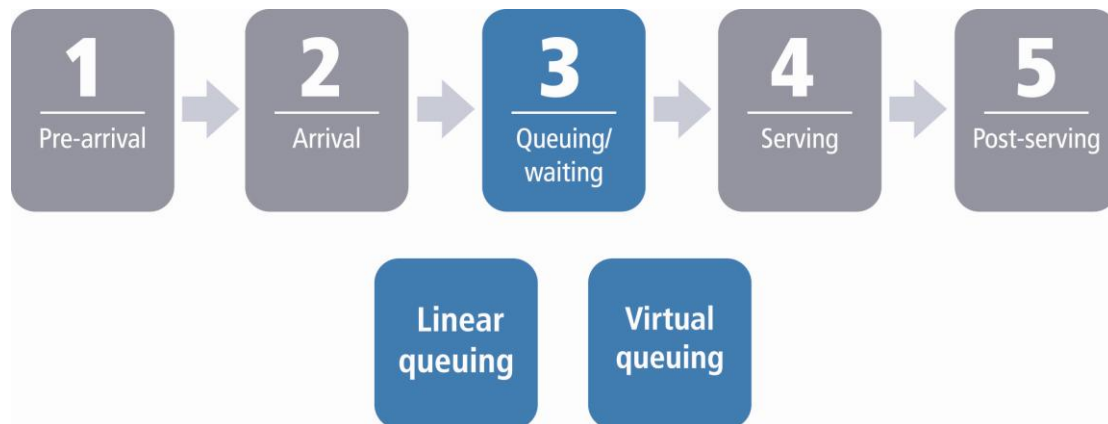


Figure 9: The main focus in this section is on the queuing/waiting part of the Customer Flow Management process

What is Linear queuing?

Linear queuing means that the customer waits physically in a line/queue. This is the oldest and most common way to manage queues and waiting. Over time several variations on this theme have developed.

- The most common type of queue is the Single-Queue-Single-Service-Point (SQSSP) illustrated in Figure 10. In the industry it is referred to as 'first-in-first-out' because the goal is to serve the customers in the order in which they arrived for service. This is typically found in service centres with few customers. Single queues with only a single service counter are experienced every day in coffee shops, convenience stores, and fast food restaurants. Because they limit the potential throughput by offering service that is only as efficient as the staff and the frontline customer being served, they can result in large variations in waiting time for customers.
- Because of the high traffic volume and the physical needs required to serve large volumes of customers in groceries and some retail stores, the Multiple-Queue-Multiple-Service-Points (MQMSP), illustrated in Figure 11, is often the method of choice in these type of stores. It also offers the possibility to segment customers based on service needs. Customers who require services with longer expected service time can be separated from customers with faster service requirements. Multiple queues without segmentation, e.g. where the same service(s) is offered in all queues, have always been a customer service problem though, because they require a great deal of strategising by customers. Even when it seems that they have chosen the correct queue there is still the risk that they will be served after another person – who arrived at a later time but chose another queue.

- The most advanced form of linear queuing is the Single-Queue-Multiple-Service-Points (SQMSP), illustrated in Figure 12. It is a quantum leap improvement over the single-service-point variant because the supply of service is actually distributed logically to the customer who queued first. A slow customer may slow delivery overall but customers in the queue will always be directed to the first available counter in order to complete their business. This eliminates the greatest problem of MQMSP. A scientific paper using simulations to compare the SQMSP and MQMSP in fast food and banking environments reached the conclusion that the SQMSP reduces the average queue length, the average queue time and the wait probability³.

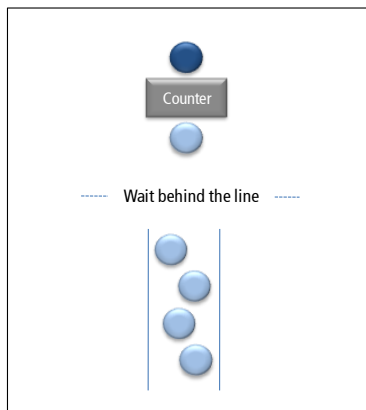


Figure 10: Single-Queue-Single-Service-Point

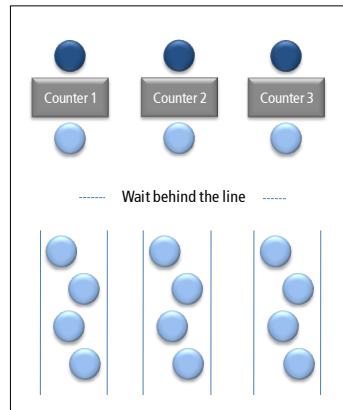


Figure 11: Multiple-Queue-Multiple-Service-Points

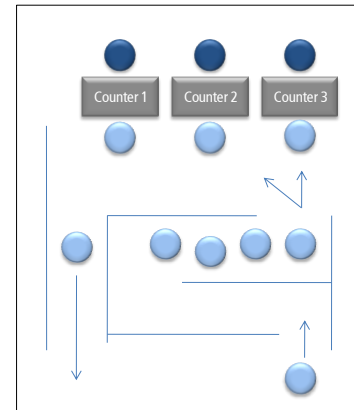


Figure 12: Single-Queue-Multiple-Service-Point

What is Virtual queuing?

Virtual queuing means that the customer is identified upon arrival and placed in a 'virtual queue'. The virtual queue is invisible in the sense that the customers are not confined to any particular waiting spot and hence don't know what position they have in the queue relative to other individual customers. This scenario requires customers to be either greeted and queued by a member of staff or entered into the queue through some type of technology, like a ticket-printer, a self-serve kiosk, etc. Identification can be made via some customer unique attribute (name, social security number, etc.) or an assigned attribute chosen by the staff or the customer (typically a number or a letter combination). Once the customers have been placed in a queue they can be engaged in active waiting with the guarantee that they will be served at the appropriate time. As in the case with linear queuing, virtual queuing has developed to become more sophisticated over time.

- In the most common type of virtual queues, staff call the next customer when service to the current customer is finished. This is illustrated in Figure 13. If there are several staff, customers could be called from the same queue (as the Single-Queue-Multi-Service point above) or from different queues based on some type of segmentation (as the Multi-Queue-Multi-Service point above).
- In order to speed up the process, staff can pre-call the next customer before service to the current customer has actually finished. This could be done automatically, for example by connecting the cash register with the queuing system and have the next customer called immediately when the currently served customer starts paying. It could also be done manually by providing the staff with a button to press when appropriate. In either case the effect is that a buffer zone with a waiting customer is created behind the currently served customer.

³ "Discrete-event simulation of queuing systems" by Zhang, Nq and Tay. Published in the Proceedings of the Sixth Youth Science Conference, 2000, Ministry of Education, Singapore

This will speed up the process, as there will always be one customer waiting to be served immediately. It also enables staff to call a new customer while still serving the current customer if the next customer fails to show-up at the buffer zone. This is illustrated in Figure 14.

- The buffer of customers waiting by the counter, ready to be served, theoretically speeds up the process of the virtual queue to match the linear queue from a waiting time perspective. However, the solution could have a severe negative effect on the perceived “fairness” as it does not guarantee that all customers are served in the same order as they entered the queue. A pre-called customer could be unfortunate and end up waiting in the buffer zone at one service point while other customers arriving later are served at other counters. The risk increases with increasing heterogeneity in service requests, e.g. in environments with low volumes of long, complex and heterogeneous service requests the risk would be high. The solution to this problem is illustrated in Figure 15 where the buffer zone is a common area where the next few customers to be served are pre-called, but each of the waiting customer is assigned to a member of staff in appropriate order only when the currently served customer at a service point is actually finished.

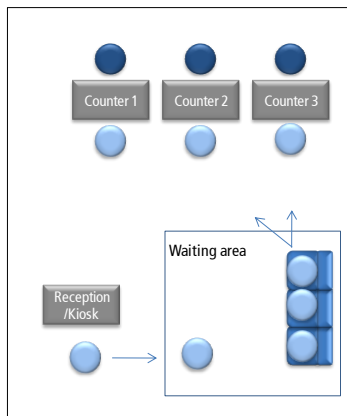


Figure 13: Virtual queue without buffer

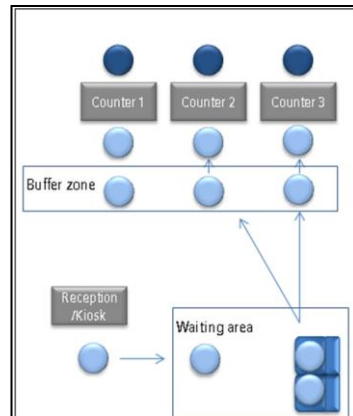


Figure 14: Virtual queue with individual buffer zones

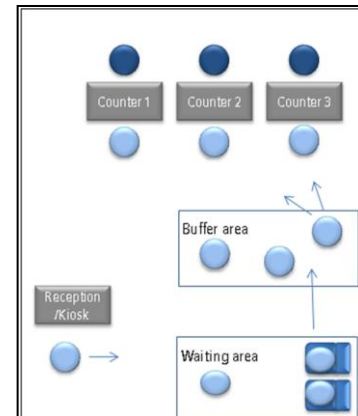


Figure 15: Virtual queue with shared buffer zone

What are the main differences between the different queuing principles?

Effects on queuing/waiting time

In a linear queue the time wasted between service is minimised, leading to a high throughput of customers and high productivity for the service provider. This is achieved as the next customer in the queue is ready to be served as soon as the member of staff finishes serving the prior customer. The greatest effect is achieved when visual and audio tools are used to alert the next customer and minimise potential hesitation about which service point to approach. The high throughput of customers leads to short waiting times, assuming that the service provider does not account for the full effect in productivity by reducing the number of staff.

The virtual queue needs some careful consideration as it could actually decrease productivity and increase waiting time in some environments if not designed in a proper way. In principle it is the choice of whether to use a buffer zone or not that needs to be considered. The reason for this is quite straightforward. A customer sitting in a waiting area might need more time to get to the service point than a customer waiting in a line. Also, if the customer is reading a magazine or filling out some forms the distraction can result in further time delays. In a worst case scenario the customer might have left

before receiving service, in which case the staff will spend valuable time waiting for a customer who will not show up. If the risk for any of these effects is high in a certain environment then the buffer zone should be considered if it is desirable to reach the same level of efficiency and waiting time as in the linear queue.

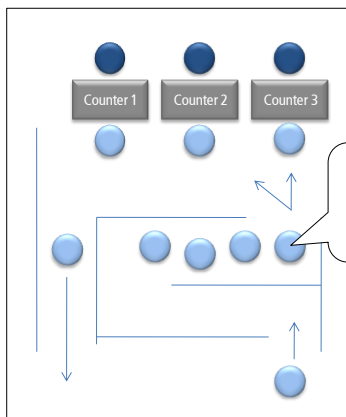


Figure 16: Alert customers at front of a linear queue

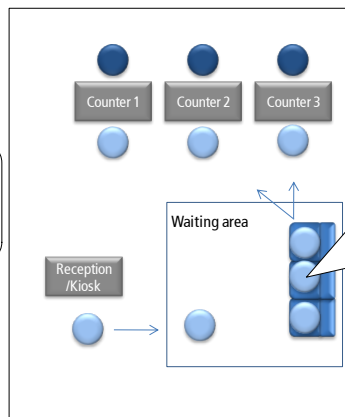


Figure 17: Potentially distracted customers in a virtual queue

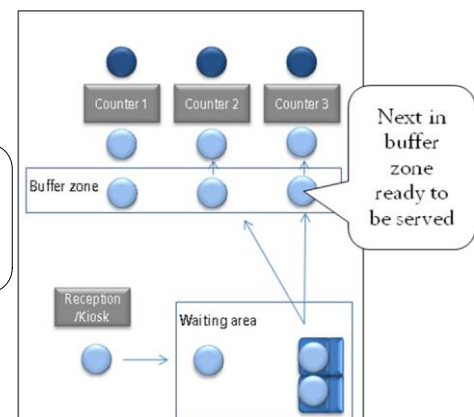


Figure 18: Alert customers in buffer zone of a virtual queue

Possibilities in using the waiting time for value adding activities

When a linear queue is chosen, the main opportunity to exploit the waiting time lies in the fact that all customers are physically gathered without the opportunity to leave their position in the queue. This offers the service provider an opportunity to use targeted media and/or sales opportunities along the queue as illustrated in Figure 19. However, this is also one of the main disadvantages of the linear queue. The customers have little control over waiting and therefore little opportunity to sit down or engage in other activities of their own choice. This could lead to lower customer satisfaction. Also, the customers do not have the opportunity to engage in impulse shopping except for the products positioned along the queue.

Customers placed in a virtual queue can perform several tasks while waiting such as filling out forms in a doctor's office or reading a magazine or newspaper. The service provider can also choose to use the waiting time to up-sell or cross-sell other products and services on their captive audience. This is illustrated in Figure 20. As a whole, this period of time between being queued for service and receiving service is referred to as 'active waiting' since we are now free to fill the customer's time with what we choose to be important, whether that be allowing them to relax in a quiet waiting room or, alternatively, seating them in an area where we can deliver a message about our products and services.

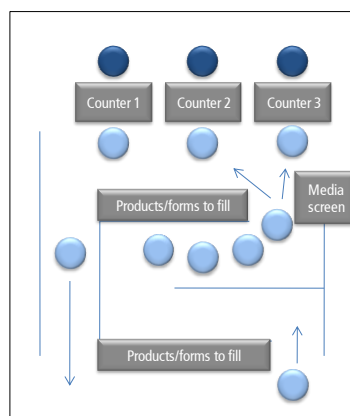
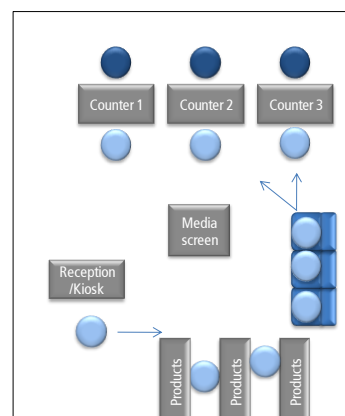


Figure 19: Possibilities along a linear queue



17 Figure 20: Possibilities with a virtual queue

Possibilities in identifying customers and gathering data for further insights

At the visit origination – whether it is through appointment booking or at the moment a customer arrives for service – an initial data point can be created that enables us to begin tracking the customer if a virtual queue is used. The system can monitor and measure the customer’s visit and record data on every interaction. This offers the opportunity to segment customers upon arrival, allow staff to prepare for and retrieve data about customers before serving them and use the stored data for analysis and insights. Using video or multimedia to inform, entertain or sell to those customers already on the premises for service is a tactic that can be quantified and measured through an increase in per-transaction revenue and new campaigns can be targeted to reach the right customers at exactly the right time. Figure 21 illustrates the information that can be obtained in each step of the Customer Flow Management process.

In the case of a linear queue, the customer is unknown to the service provider until the actual service point, limiting the opportunity to gather and use data about the customer visit before reaching the service point.

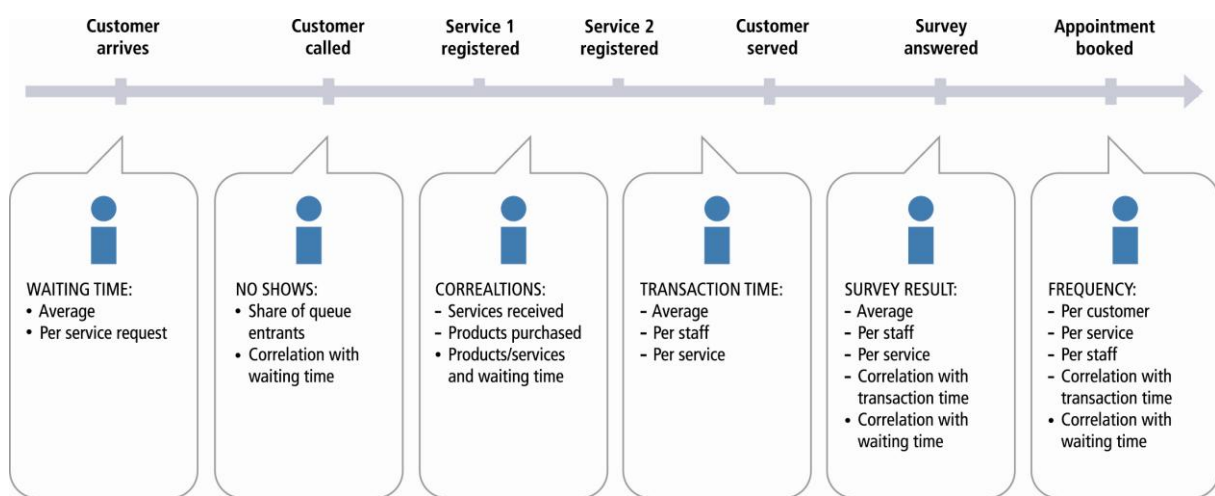


Figure 21: Information that can be gathered and analysed by management to improve the business. The information with a “•” in the illustration is only available when a virtual queue is used, whereas information with a “-” is available independent of queue principle.

Space required for the queuing/waiting area

Linear queues can require significant dedicated space for the queuing area. If multiple queues are used then space to separate the queues might also be needed.

For virtual queues, the service provider has more choice to decide whether to dedicate a particular area for waiting or integrate the queuing with the natural layout. It is also possible to use the same (central) waiting area for customers waiting for different services. This is often the case in public and healthcare premises. The choice will depend on the service providers KPIs, e.g. if the objective is to maximise sales or provide customers with a comfortable waiting experience.

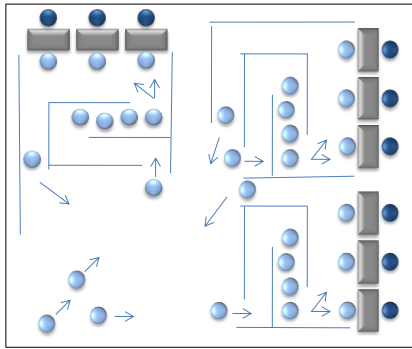


Figure 22: Space required for a complex linear waiting area

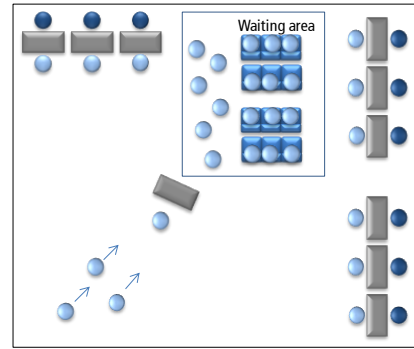


Figure 23: Space required for a complex virtual waiting area

When are the different queuing principles most suitable?

Situations most suitable for linear queuing

The linear queuing strategy is undergoing a renaissance in the retail marketplace as retailers experience the benefits of ensuring the fastest service for their customers. As the main benefit arises from the fact that the time wasted between each customer being served is reduced, the greatest benefits are seen in environments with short service processes. Also, given the disadvantage of multiple queues in situations with heterogeneous service times, the single queue with multiple service points is gaining ground in these environments.

Situations most suitable for virtual queuing

As the main benefit of virtual queuing is the opportunity for customers to engage in active waiting it is most commonly used in environments with longer waiting times. It is also well suited to environments with longer service times as the effect of a slow approach by a customer has a minor effect on the total time spent by the service staff on that particular customer. This is typically the case in the public and healthcare sectors. In finance this environment is found among the advisory services. Virtual queuing is also the preferred choice when the service provider wants to identify customers before approaching the staff for preparations.

Figure 24 illustrates the relation between waiting time, standby time and service time. The longer the waiting time ($T1$) is the more valuable it is for the customer and service provider to engage the customer in active waiting, hence virtual queuing is appropriate. The shorter the service time ($T3$) is the more important it is to keep the standby time ($T2$) down, e.g. either with a linear queue or with buffering for virtual queues. If a linear queue is used then short and homogenous service times ($T3$) make multiple queues a possible choice. However, if the service time ($T3$) is long and heterogeneous then single queues with multiple service points are more appropriate to reduce the risk of customers choosing the “wrong” (e.g. slow) queue.

Figure 25 shows a generic framework, summarising when linear and virtual queuing are most suitable based on two dimensions – the waiting and service time. In addition to this, segmentation requirements, the physical layout of the premises, information/data requirements and other relevant factors depending on the service provider’s situation need to be considered.

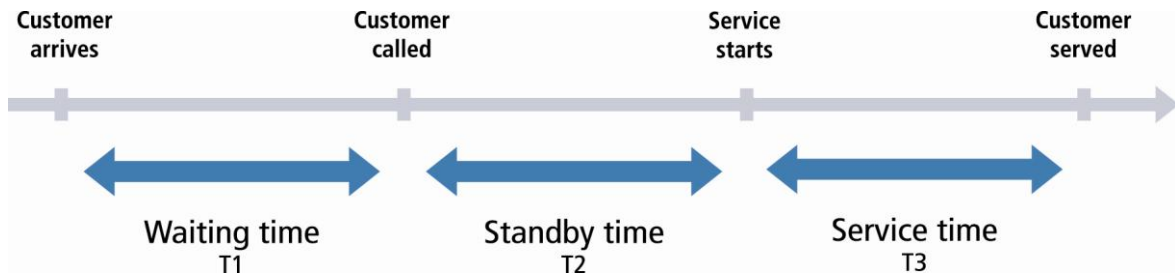


Figure 24: The optimal choice of queuing principle depends on the relation between the waiting time, standby time and service time

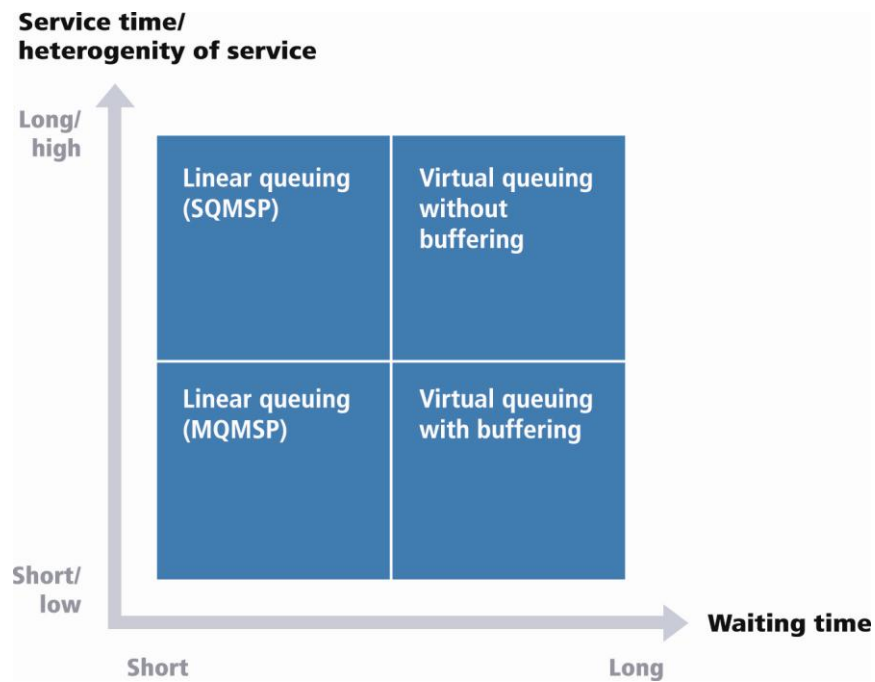


Figure 25: A simplified generic framework that gives some guidelines regarding when to use different queuing principles

Illustrating case examples

A linear queue solution

The service provider

The service provider is a large multi-national retailer selling fashion clothing, accessories and home décor. They have large department stores with a presence in both Europe and the US.

The service provider's issues

The key challenges addressed with the Customer Flow Management solution were all related to the check-out area where

- The check-out was inefficient with old-fashioned queuing based on multiple queues for multiple service points without segmentation
- The check-out environment was chaotic, stressing the customers
- Staff productivity was low

Chosen solution

A linear queuing solution was considered optimal as the waiting and service time were fairly short

- Multiple queues were replaced with a single queue feeding multiple checkout points
- An electronic call-forward system with modern LCD displays and voice was used to call customers forward to the next available check-out
- Media screens were used for directing customers and providing targeted advertisements

Result

The results were significant

- Customers preferred the new solution
 - single line queuing considered fair
 - media screens reduced perceived waiting time
- The improved customer flow reduced staffing needs by 15%
- Reduced “sweet-heartening”, i.e. less shrinkage due to customers picking check-out counters where they know staff who give non-approved discounts

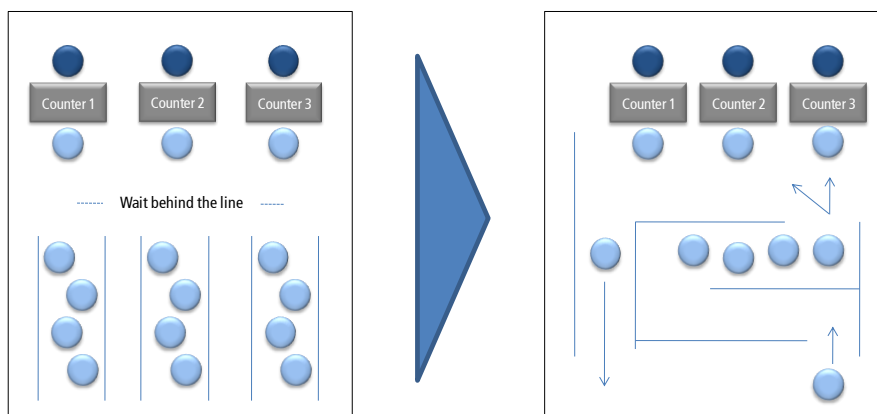


Figure 26: The traditional multiple-queue-multiple-service-points solution was changed to a single-queue-multiple-service-points solution

A virtual queue solution

The service provider

The service provider in this case is a multi-national provider of mobile telecommunication services. Sales are generated in strategically located stores where customers can buy products, services and get advice. A large share of the customers are 'walk-ins' who decide to take the opportunity to visit the store as they happen to pass by.

The service provider's issues

Two main issues were considered to hamper the sales in the stores

- Stores were unable to differentiate customers based on their service needs, leading to
 - transactional customers being mixed with potential new sales opportunities
 - customers not being matched with staff according to their service requirements and staff areas of expertise, resulting in varying customer service levels
- Waiting times were long and some customers left the stores without being seen by an advisor

Chosen solution

The issues were managed with a Customer Flow Management solution

- Specific service desks for different customer needs and corresponding staff capabilities were built
- Intelligent customer service terminals (touch screens) were installed. These identify customer needs, allocate the customer to an appropriate queue based on their needs and issue a ticket to allow customers to browse the store while waiting
- A waiting area was equipped with LCD screens to provide information on estimated waiting time and call customers to the suitable service desk by voice and screens
- Data on all waiting and services was also carefully monitored to improve the business and Customer Flow Management process further

Result

The effects of the solution were significant

- Contract volumes increased 26% with average upgrade volumes up by 10%
- Reduced transaction times with fewer customers leaving the store without seeing an advisor
- Increased customer satisfaction through shorter and more relaxed waiting times and higher quality advice
- Enhanced management information allowing customer service metrics to be included in KPIs and improved staffing rotas
- “[CFM provider] in the store really has been a revelation for us. It's allowed us not only to manage our customers better, but also manage the time of our team better ...” Store manager

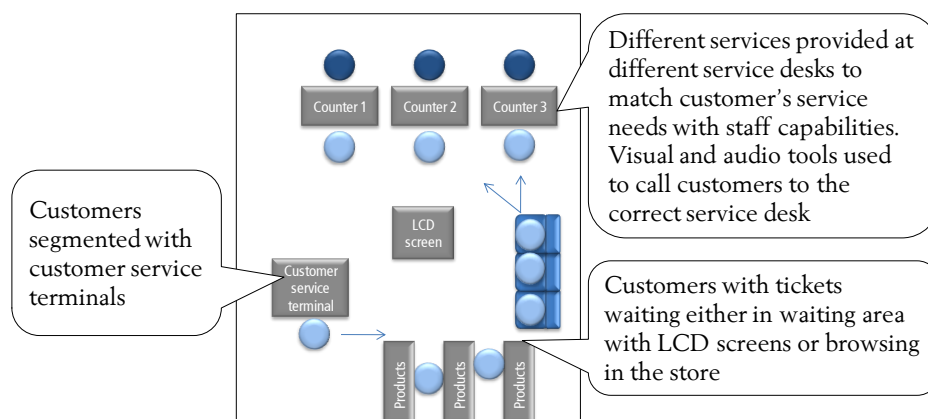


Figure 27: Customer Flow Management solution overview

Customer Flow Management – a natural next step for many businesses

Today, it could be argued that Customer Flow Management is already highly prioritised on management agendas, although commonly expressed in terms of “customer service improvement projects”, “up/cross selling activities” and “efficiency improvements”. The difference compared to the advanced management of the flow of materials and products is that the wide range of opportunities have not been gathered and structured in a single, common and well-documented approach. There has also been a lack of understanding of how the vast amount of customer information in CRM databases can be exploited and linked to real-time activities targeting and influencing customers present in the service provider’s premises. The introduction of Customer Flow Management offers service providers the opportunity to take a more holistic perspective on these activities. It is reasonable to expect that it will receive even more attention over the next few years as

- Empowered customers force service providers to improve their customer service
- Customer Flow Management delivers improved customer service
- The investment and risk is low compared to other customer service improvements initiatives

Empowered customers force service providers to improve their customer service

Customers have become more aware of the power they have to shape service providers by demanding more and better customer service.

In profit-driven businesses like the financial and retail industries, this is reflected in the fact that good customer service is being considered a competitive advantage. The trend in the bank industry to move more of the business to the Internet channel has not led to the vanishing of the customer’s need for face-to-face meetings with bank staff in real bank offices.

“ ... Banks continue to increase their footprint with the total number of branches increasing 29% over the past decade ... more personalised attention from bank staff and innovative branch design reflect greater emphasis on customer service ...” (*American Bankers Assoc. (2007)*)

The retailers have also identified the customer service as a key lever going forward, here illustrated by UK based Marks & Spencer’s annual report

“... As more and more people come into our stores, it is more important than ever that our customer service is effectively managed. Getting the right number of people with the right skills on the sales floor at the right time is the key...” (*Marks & Spencer Annual Report (2007)*)

In non-profit driven organisations like public and healthcare, customer service is driven primarily by a need for the service providers to meet institution targets set by governments, e.g. cost decrease and/or efficiency improvements. These targets are often defined as required service levels at a predefined cost level. With a growing awareness and concern among voters that tax-money is used in the most efficient way to guarantee the best possible healthcare and public services, Customer Flow Management becomes one of the tools for politicians and local managers to assure this.

Customer Flow Management delivers improved customer service

We argue that it is empirically proven that Customer Flow Management delivers improved customer service and list only a few illustrative examples below

Customer waiting time

- Bank: customer waiting times estimated to be reduced by 20%
- Hospital: patient waiting time is estimated to be reduced from 2 hours to 18 minutes
- Blood lab: turnaround time reduced from 27 minutes to 13 minutes

Customer perception

- Bank: 97% of customers preferred the new Customer Flow Management solution to the previous queuing system
- Retailer: 94% of customers preferred the new Customer Flow Management solution to the previous queuing system
- Hospital: 87% of customers preferred the new Customer Flow Management solution to the previous queuing system

For the interested reader more detailed information and relevant references can be provided upon request.

The investment and risk is low compared to other alternatives

Lately there have been indications that traditional investments to manage customer interactions are not fully satisfactory. According to McKinsey in their McKinsey Quarterly, Aug 2007, the finance industry needs to consider their investment approach.

“As executives struggle to find the right branch formats, we suggest that they replace the art of branch look and feel with the science of managing customer visits. They should expand their thinking beyond the familiar hardware of physical formats to include so-called soft issues such as choreography and the staff. By approaching such issues in a more analytical and disciplined way, they can improve their chances of earning worthwhile returns on their investment”. (The McKinsey Quarterly, Aug 2007)

It seems fair to assume that a similar approach in other industries would lead to a similar result and conclusions.

Customer Flow Management, on the other hand, is a low-risk-low-investment alternative. The implementation period is fairly short (measured in months rather than years) and the effects are visible within quite a short time period after implementation. Hence, for larger roll-outs in retail or bank chains it is possible to run and evaluate a number of pilots before the full investment is made. The absolute values created and investment required obviously varies greatly from business to business but the relation between these in most businesses corresponds to a payback time of less than 12 months.

Concluding remarks

At the time of writing this white paper there are some clear indications that the global market is starting to accept Customer Flow Management as a natural part of the ordinary operations of service oriented businesses. The stage with early adopters has long passed in the most advanced markets like UK, the Netherlands and Scandinavia and the ideas have now gained a foothold in most markets across the globe. It is in the light of this development that we see a need to formalise the already well-developed practice into a more structured theoretical framework to guide companies that see an opportunity to use Customer Flow Management to build a competitive advantage.

List of references

“Discrete-event simulation of queuing systems” by Zhang, No and Tay. Published in the Proceedings of the Sixth Youth Science Conference, 2000, Ministry of Education, Singapore

The McKinsey Quarterly, Aug 2007

“The psychology of Waiting Lines” by David H. Maister, 2005