



Welcome to
the New World of Planning

Discover the value of innovations in resource planning

Ronald Buijsse | Goos Kant

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ORTC

Winner of the Dutch Logistics Award 2009

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The ORTEC Plan for Success Model fold out page in the back of the book

Energized...

As I write this foreword it is that time of year again. At hundreds of secondary schools across the country, scheduling committees are hunched over masses of data for the coming year: students, study profiles, classrooms and part-time teachers need to be planned. Friends who work in education have told me that this is the worst assignment there is. And what's more, no matter how hard you try, the results are never good enough. On the other hand, it does have its positive aspects, as I discovered from the following anecdote: on the last day of term a teacher called in to drop off a bottle of wine as a gift to her colleague who was assigned the task of developing the schedules. When she arrived, she noticed another teaching colleague obviously had the same thought because the two of them were both sat on the sofa sharing the exact same bottle of wine!

In the business sector, tools have been used for a number of years to help with these types of scheduling activities. However, time and developments are quickly advancing and tools become more and more 'leading', although still controlled by people. This new situation is summarized in this book by the words 'the New World of Planning'. And in this new world, a 'new type of person' is also required!

That means people who understand the tools, are articulate and able to analyze and communicate the requirements. To succeed in the New World of Planning, user education and user acceptance are essential in order to promote this type of cultural change. As our goal ultimately, is to support people to achieve optimal targets.

That is also the essence of innovation in logistics: new forms of cooperation in order to break down barriers and create transparency so that an optimal flow of goods and/or services can be achieved. In the coming years, logistics innovation will therefore be characterized by solutions in the area of supply chain management and 4C (cross chain control centers). New planning tools are therefore essential and that is why, in our opinion, ORTEC is the rightful winner of the Dutch Logistics Award 2009

The step towards education needs to happen quickly. This is to ensure that teachers are supported and young people are familiarized in a fun kind of way about the concepts and tools that form part of the New World of Planning. Which is also a bit of a shame because if your second period was free, you could play truant during the first hour and so have a lie-in and start the new day feeling energized...

Mieke Damen

Vice-chairman, Dutch association for logistics management (vLm)

A quiet revolution

A quiet revolution is underway in the logistics world. Whereas planning was once the exclusive domain of generals, it has now become almost a part of everyday life the world over. Just think about the number of to-do lists, planning reports and large planning boards that are a feature in every company. And what's more, these manual, paper-based planning methods are steadily decreasing, being replaced instead by more modern, digital methods.

Despite this revolution, the term 'planning' is not popular with a large number of people because it is often associated with restrictions. The familiar expression, "It can't be done because it doesn't fit into the plan" is undoubtedly a contributing factor. This negative association makes the planner's role quite difficult because he or she is often the bearer of bad news. People do understand that a planner must try to match a large number of requirements to a limited number of options. But they also wonder about the actual criteria that are used to develop a good plan. In many cases these criteria are not transparent or open for discussion.

So what is it that makes planning appealing and why has a book been written on this subject? The main reason is that a good planning process can actually create a lot of opportunities. Indeed, in many situations clever planning can deliver unimaginably more with the same number of resources. Whereas poor planning only respects a mere four out of ten requests, good planning is able to increase this result to ten out of ten, which will naturally have a positive impact on customers, management, company employees and often on society too. Customer service is improved, management sees better results and for employees there are all kinds of benefits. For example, working conditions are improved because employees can work more flexibly. And they are less hindered by unforeseen events, which enables them to optimally focus on their job. And all of these improvements naturally lead to increased sustainability in society because effective planning reduces raw material wastage, i.e. fuel and finished products. In short, good planning creates an all round win-win situation.

The discipline of planning is currently undergoing a rapid development. Long gone is the problem of planners having insufficient time to calculate a large numbers of options. Modern tools now provide the solution by making things affordable and achievable in terms of turnaround time. The combination of modern entrepreneurship and information technology brings a whole host of useful data to our fingertips. For example, information on traffic congestion, road works and planned events, but also on working conditions and legal limits. And last but not least, modern, real-time communication methods enable everyone to have immediate visibility of the plans and adjustments can be made right up until

the last minute. It was only with the widespread use of mobile phones that this became possible. The success of this new way of planning can be compared to a fairytale. The story of the big bad world, where nothing was possible, until a prince on a white horse came and changed everything. In reality, however, thousands of people, on many fronts, have been doing groundbreaking work for a number of years: innovative users, developers, entrepreneurs, suppliers and consultants. What innovations have contributed to the current planning revolution? And what results have been achieved? The answers are to be found in the following pages of this book.

There are five chapters in total. Chapter one discusses the differences between ‘the Old World of Planning’ and ‘the New World of Planning’. Chapter two reviews the factors that determine the content of a planning process: the business model, the customer requirements and the availability of resources. In chapter three, the various steps in the planning process are highlighted. Chapter four then addresses the results that can be achieved by implementing effective planning. And finally, chapter five answers two key questions: what are the factors that determine success? And what type of developments and trends can you expect to see in the future? Each chapter provides a combination of practical accounts and background information about planning.

In order to highlight the key focus areas that act as starting points for successful planning, ORTEC has developed a ‘Plan for Success Model’. This model is the recurring theme throughout all chapters and has been included on a fold-out page in the back of the book. This should be useful for clarification when reading the contents of the book.

Finally, a word of thanks to the many people who provided invaluable input. The contributions range from case studies to anecdotes and from soft to hard facts. Some contributors are anonymous and some are mentioned by name. They include, for example, the large number of planning software users who recognize the usefulness of such systems and subsequently integrated them into their daily lives. There are also the numerous developers who, on the basis of questions from the field, saw repeated opportunities for improvements and new solutions. And not to mention the many people at a distance, who recognize that the results from the planning process provide the most reliable guidance for successful operations. Gerrit Timmer, co-founder of ORTEC, puts it very aptly as follows: “When you fail to plan, you plan to fail.”

Welcome to the New World of Planning.



1. From old to new

What is planning?

Before we begin, it is important to define what we mean by planning because the term is so widely used nowadays that it means different things to different people.

Listed below are a number of examples that reflect this wide interpretation:

- Planning is grouping activities according to time and location
- Planning is the matching of supply and demand
- Planning is setting goals, allocating resources and the subsequent processing of the results to be used as input for the following planning cycle
- Planning is about preventing problems
- Planning is about reducing waste (time, money, resources)

The planning discipline offers up a more detailed description, which distinguishes various levels and steps:

- **Planning** is establishing objectives and constraints in advance and the subsequent matching of resource supply and demand. This type of planning can take place on four levels:
 - Strategic: over a time span of several months or years
 - Tactical: over a time span of a couple of weeks to a few months
 - Operational: over a time span of 1 day to 1 week
 - Real-time: live monitoring of supply and demand and real-time adjustments where necessary
- **Scheduling** is the detailed matching of demand to the available resources, as well as determining the order sequence for execution.
- **Dispatching** is the matching of an order to a resource on the actual day of execution. For example: John drives truck number 10 from Amsterdam to Brussels with packages X, Y and Z.

A planning and execution process can be divided into several phases. These are classified below into six steps, which will be discussed in detail in chapter three:

1. Determine planning scope (which type(s) of resource(s) to include: for example, workforce scheduling and/or production planning and/or distribution planning; which time horizon: strategic, tactical and/ or operational)
2. Collect data (internal and external)
3. Make decisions, on a global level and subsequently on a more specific level
4. Communicate decisions
5. Execute the decisions and make adjustments where necessary
6. Collect results and analyze and translate them into improvements for the future

“Planning is bringing the future into the present so that you can do something about it now”

Alan Lakein

Why and when to plan?

Why do people plan? And also, why not?

The most concrete reason for effective planning is due to situations that involve:

- High levels of complexity in supply and demand and the balancing thereof
- High degrees of uncertainty about supply and demand
- Highly pressurized decision-making
- A high risk of making wrong decisions

Complexity requires careful thought prior to execution. If this does not take place, it will soon become apparent during execution that certain aspects of the planning do not work. Factors that influence the level of complexity may rest with the customer, the supplier and even the organization itself. Such factors relate to, among others, the number and complexity of different products, services, processes, locations, type of resources and predefined conditions.

Uncertainty requires scenarios to be prepared in advance and measures should be taken to remove the uncertainties.

Time pressure requires good preparation so that you can take action quickly and effectively. For example, in the event of an unexpected order, fire, accident or sudden surge in demand or supply.

Risk is the measurement of potential damage should something go wrong. An aspect could be simple to fix, have a high degree of certainty but still pose a high risk. For example: a flat tire on an ambulance, or a leak at an oil wellhead.

In the following examples, planning is sometimes unnecessary or less important:

- With flexible or inexpensive resources. This applies to, for example, employees that can be assigned to many different jobs. With this flexibility it is easier to anticipate changes and to remain effective at the same time. If a machine or person can only carry out a single job, (e.g. tunnel boring) and if the resource is also very expensive (e.g. a surgeon), then it is actually extremely important that the resource is optimally used.
- With flexible customers. If a customer is willing co-operate by tailoring his demand to the supply (which is becoming less common), then the remainder of the planning activities are under less pressure. Customer flexibility can be as a result of actual customer choice, or due supplier domination, e.g. a monopoly, a unique ability or high customer loyalty.

**“Plans are nothing,
planning is everything”**

Dwight D. Eisenhower

Plan for Success Model

A planning process balances supply and demand in such a way that the objectives of the organization are achieved and the constraints are respected. In order to effectively execute each step of the planning process, the following points must be clear:

- What is the input for the planning process?
- What is the intended output of the planning process?
- What are the predefined conditions and steps in the planning process?

These three basic principles can be further refined:

- Input refers to among other things, the business model, the demand factors and the availability of resources.
- Output is all about the proposed targets, such as profitability, management flexibility, customer and employee satisfaction and sustainability.
- The planning process (which is to get from input to output) focuses on the planning scope, data collection, decision-making (including the development of scenarios), communication of the decisions, possible adjustments during execution and the processing and feedback of results.



These points are summarized in the ORTEC Plan for Success model, which maps out all planning related activities. The model can also be used to analyze an organization's progress in relation to innovations in planning. It is therefore both a benchmarking and analysis tool.

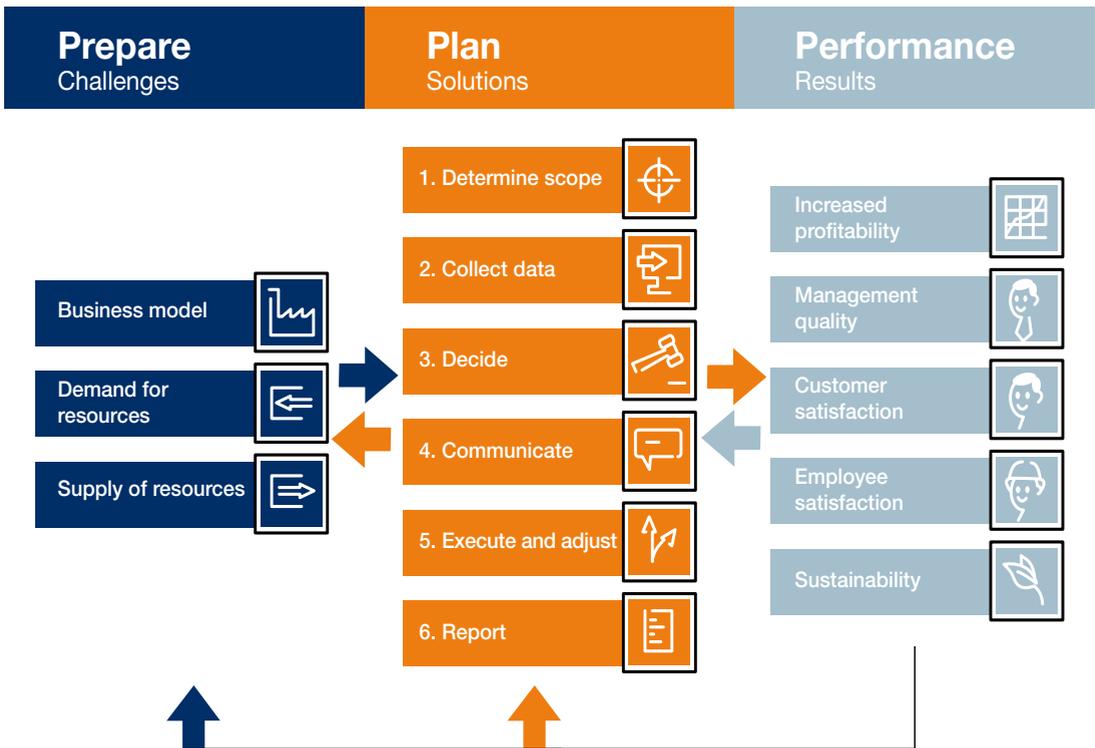


Figure1: The ORTEC Plan for Success Model

What is new in the New World of Planning?

The New World of Planning is derived from the term 'the New World of Work', which is about working more independently from the workplace. Not just within teams but also between teams and organizations. And this means having direct access to source information that can be shared with all team members. And having the resources in place to help the company to concentrate on the aspects that require the most attention.

In the New World of Planning the most important data is stored in an electronic back-office system. This is fed directly to all kinds of screens as a visual display that highlights the activities that need to take place. Communication is via mobile phones, personal digital assistants (PDAs) and navigation systems. And the results are immediately visible and able to be processed.

By way of example: a customer calls and asks if five people are available tomorrow to service a machine. The contact person on the phone or the requestor themselves can immediately see whether the request falls within scope and if the right people are available. The appointment, including equipment and allowed time is subsequently booked, the job is carried out the following day, it is possible to verify if the service engineers are actually en route and have arrived on time, and to see from the customer feedback whether the job was carried out satisfactorily. A few minutes later, the invoice is sent and where necessary an evaluation of travel time and allowed time is carried out. And that in a nutshell, is the reality of the New World of Planning.

The New World of Planning, just like the New World of Work, is a broad concept. Below is an illustration and a table highlighting the main differences between the Old and New Worlds of Planning.

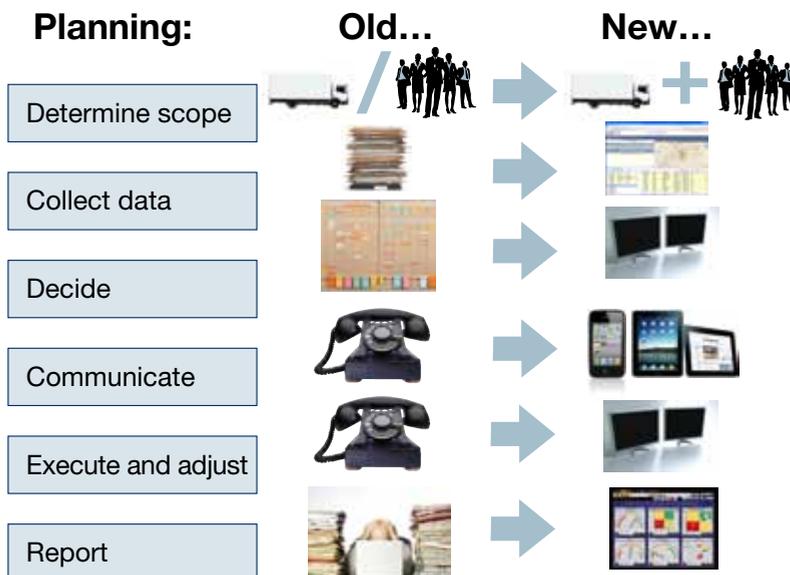


Figure 2: Differences between the Old and New Worlds of Planning

Planning Process	The Old World of Planning	The New World of Planning
1. Determine scope	The scope of planning is usually limited to one type of resource (machines or people) and one functional area (production, inventory or distribution)	The scope can include multiple resources (people, locations and machines) and several functional areas (production, inventory and distribution optimization)
2. Collect data	Limited number of sources, extensive data conversion	Almost unlimited sources, minimal data conversion
	Batch imports of mostly internal data	Real-time internal and external data imports thanks to excellent integration capabilities
3. Decide	Little time for formulating scenarios in advance	Sufficient time and resources available for formulating scenarios in advance
	Manual matching of supply and demand, lengthy process, 1 x per week or month	Semi-automatic or automatic plans, high performance, run-time of minutes or hours
	Due to time pressure there is minimal time for validations. These are partly visual	Numerous validations are possible, these are mainly done automatically, management by exception
	Only 1 or a small number of options can be determined	A range of options can be proposed
	Little time for exceptions: solved outside of the system	More time for exceptions, some of which can be handled via drag and drop functionality
4. Communicate	Communication via email, fax, paper; most of it is still verbal	Communication in a structured form, via automatically processed messages and by means of a wide range of mobile devices
5. Execute and adjust	Collect results afterwards; interim adjustment is only possible when feedback from the field is received on time	Real-time monitoring and real-time intervention possible
6. Reporting	Partly manual, partly electronic	Almost everything is electronic, sometimes also in real-time, for both financial as well as operational departments (including KPI reports to management)

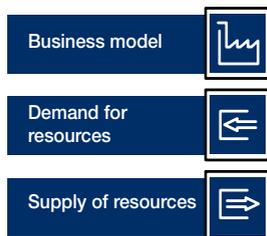
Table 1: Differences between the Old and New Worlds of Planning





2. The challenges

More profit and greater employee satisfaction thanks to workforce scheduling at an installation company



Are planners magicians?

Every Monday morning it's the same old routine. The team receives the plan for the week, which of course causes lively discussions: "What jobs have you got?". "Has Alex from the planning department dropped you in it again?" But it can also go along the lines of: "Who on earth thought this up?" Or: "Now I won't be able to make Wednesday's training practice again and we've got a really important match on Saturday". No one understood how Alex operated. What were his criteria for matching supply and demand? Alex preferred to keep his way of working to himself because otherwise it would only restrict his planning freedom.

When the number of employee and customer complaints rose sharply, management called a meeting with all employees, including the planners. It soon became clear that everyone had the best intentions, but due to a lack of understanding, tensions often arose. Because it was impossible to inform everyone about all aspects of the operations, the management took three decisions.

- 1. They introduced a planning application in which the 'decision rules' are explicitly visible, bringing greater transparency and predictability.*
- 2. Planners were given practical on-the-job training by employees in the operation and vice versa.*
- 3. New employees were given introduction training that would enable them to quickly increase their knowledge and understanding of the aspects involved in planning.*

In short: the solution was to create a more explicit business model that would be better embedded in the systems and explained in more detail to the parties involved. This led to results such as increased employee satisfaction, less turnover of staff and improved customer service. Furthermore, the costs for creating the planning decreased by up to 40%, while it took less time to generate the plans which were even more complete. So we can conclude that planners are indeed magicians, but fortunately their work is more transparent!

“The Netherlands has a lot of traffic jams, short travel distances and a large port and airport. This calls for intelligence in logistics. We serve as an example for other countries, demonstrating how a small country can also be great”



Is planning a form of magic?

The way in which the planning balances supply and demand is no coincidence. At least, not usually. It is the result of an ideal picture or (business) model that has been formulated by management. In this model, the target areas, core competencies, objectives, principles, priorities and primary measurements (key performance indicators or KPIs) are combined.

For example: two transport companies each receive 100 orders per day. Company A has a limited number of its own vehicles and so hires in the rest. Its business objective is maximum profit per euro sales, and sales volume is not important. Company B has a large number of its own vehicles. Its business objective is maximum sales in order to quickly recuperate the money invested in the trucks. This company accepts any contract as long as the fee exceeds the cost per kilometer and contributes to the fixed costs.

From this example it would seem that a truck is not merely a truck, but also an important part of the business model. And this model determines the way in which priorities, objectives, resources and orders will be combined to create a plan. Whereas company A will turn down a contract with a low profit margin, company B will accept it and readily incorporate it into the schedule.

The business model also contains other aspects that affect the method of planning. These are:

- The type of demand that the organization actively seeks (target group, type of requirements)
- The type of resources that the organization purchases or hires
- The way in which the organization manufactures its products? (to stock or to order; in-house or via third-parties)?
- The way in which the organization delivers its products or services (either directly or through agents)?

Different business models lead to different planning needs

Sometimes a magician could come in very handy

In the airline industry, EasyJet and Lufthansa's business models vary greatly and these differences are evident in their respective planning processes. Both supply travel, but the matching of demand and resources is based on very different principles. For example at EasyJet (low cost airline), passengers who make early bookings are able to secure cheaper fares. There is no allocated seating, no catering, minimal luggage and cleaning is carried out

“It’s like sitting in a high transmission tower and controlling all the flows of goods around the world”



by the cabin crew. As a result, these aspects do not need to be included in the planning process, or only partially. At Lufthansa (all round, high level service) on the other hand, seating requirements and rates are variable, there is plenty of space for luggage, flight attendants operate as hosts/hostesses rather than cleaners and the flights depart from the best gates. All these elements are reflected in the service levels, price and of course, the planning, for which sometimes a planning magician would come in very handy!

New magic spells continue to emerge

New concepts and tools, and therefore new business models

As a result of new insights and advanced planning tools, new types of business models are emerging and organizations are now able to manage even more complexity. In the past, companies were only able to focus on one or just a small number of specialisms, but now it is possible to combine much better information from a multiple range of sources. Consequently, the logistics world has established a new business model based on the concept of 4C (cross-chain control center), which is a control center for coordinating and directing multiple supply chains. This type of control center or control room needs to be equipped with the latest technology and supply chain professionals. It is not, however, just about the management of physical goods flows, but rather all about information- and financial flows, because these are essential for creating the best cross supply chain plans.

Added value from the New World of Planning

Increased management quality

*The Cross Chain Control Center (4C):
a promising business model for
logistics service providers.*

In the New World of Planning business models are more explicitly defined, which creates clarity for everyone involved. Furthermore, thanks to the New World of Planning management receive better quality information sooner, which enables them to make more timely changes to the business model, the objectives and the resources. This leads to increased management decisiveness and greater credibility in the plans.

“TNT labels packages for its large customers in advance, so they enter the network already sorted”

How much complexity can the customer demand?



Higher levels of customer satisfaction thanks to a new method of distribution planning

All animals are equal, but some are more equal than others

In the past animal feed consisted of just one type, with each cow, pig or chicken receiving the same feed. Nowadays the situation has changed. Each delivery is now customized, partly because each customer's feed order is mixed with a different amount of nutritional supplements. Produce-to-stock has virtually disappeared and every order is now unique and on demand. But the ability to order today for delivery tomorrow is still in force and this causes bottlenecks in the planning and at the physical loading facilities. How do you link each unique order to a suitable production and distribution time and truck compartment (with regards to size and cleanliness)? The launch of a new planning software package and new loading facilities, now means that each herd will receive the right supplemented feed. And the animal feed manufacturer, despite the extra large variety and process complexity, can specify the delivery time upon receipt of the order.



Customer demand is increasingly varied

Naturally, customer demand is crucial for the planning process and the output thereof. The reason for stating this fact is due to the number of different types of customer demand and methods for receiving them. Business survival will be greatly impacted if the planning process only begins once the order has been received. Many industries therefore plan on the basis of demand forecasting. The forecast may be based on historical facts, a customer's current stock or point of sale data, promotions, events, or a combination of them all.

“More reliable forecasts thanks to improvements in the quality of point of sale data”



Besides the time of order receipt or forecasting, demand can vary in terms of:

- Delivery time: from months to seconds
- Content: each order is the same or entirely different
- Composition: product or service, singular or aggregated
- Source: from the warehouse or distribution center, or still to be produced, ordered or perhaps even designed

*Greater management control
thanks to dynamic distribution
planning*



Events are not always a cause for celebration in the planning department

In the past, a food manufacturer's sales promotions generated five percent of the demand. Nowadays, it's more than forty percent. As a result, demand patterns have become very volatile because it is hard to predict the result of the promotion events. Through a combination of demand forecasting, dynamic distribution planning and load optimization, the (volatile) demand patterns can be predicted more accurately and better anticipated.

“Past performance is no guarantee of future results, but it is certainly a good indication”

More sales and profit thanks to demand-driven price optimization at a travel company



The price changes with every mouse click

Demand forecasting is often quite challenging, especially if the product or service is perishable or has a limited life span, i.e. bread or airline seats. It is a well-known fact that the cost of an airline ticket fluctuates more than a loaf of bread, with seat prices changing per minute or even per mouse-click by means of complex pricing rules. These types of innovations have greatly improved the seat occupancy rates in the travel industry. There is also better interaction between supply and demand and many more people are able to reach their ideal destination.

Added value from the New World of Planning

Increased management quality	Thanks to the tools in the New World of Planning, demand patterns can be detected earlier enabling resource availability to be adjusted in a timely manner.
Planner effectiveness is improved	Planners can focus more on drawing up scenarios because demand information arrives electronically and almost in real-time.
Employee effectiveness is increased	People carrying out the jobs can work more efficiently because data from the New World of Planning is more real-time and therefore a better reflection of current situation.

Unraveling the puzzle



Greater employee satisfaction thanks to the introduction of a workforce scheduling solution

Stress due to vacation leave

Each year December is a stressful month. This is not so much to do with the work activities or because it's the year-end, but due to the need to plan the holiday rota for the coming summer. Every year many of the staff can only take a short holiday because at least forty percent of the workforce is required to ensure that operations are maintained. A few simple rules were introduced in order to meet the holiday preferences of more than one thousand employees as best as possible. People without children or with children less than five years old had to work through the summer holiday period every other year because they have the option to book holidays outside of the school term. People with school-age children had to work through the holidays once every four years. And people with older children, once every three years. But what about couples who both work at the same company? Or, with people who organize football camps every summer? Going to see the director could sometimes help with these situations, but otherwise the policy was rigidly enforced. That is until a potential supplier of a scheduling software package was asked to solve this puzzle.

The result?

Almost all preferences could be honored. Hardly anyone wanted to take leave for the entire holiday period, but usually just for part of it. And Emma was more than prepared to change her preferences if this would allow her colleague, Martin for example, to organize a football camp. Employee stress levels were dramatically reduced when the scheduling software was updated with shift swapping functionality that even enables changes to be made afterwards. Moreover, the new scheduling software had a positive 'side effect': staff turnover dropped from 15% to 10% and employee satisfaction ratings increased from 7.4 to 7.9 (out of 10).



The supply of resource is greatly improved

Organizations employ a whole host of resources to ensure that demand is met: people, machines, computers, vehicles, auxiliary materials, locations, money, etc. Moreover, with regard to employees, there are millions of functions and experience patterns to consider. There are also millions of types of machinery and other tools. Workforce scheduling is most effective when planners can use different criteria to optimally meet the demand. For example: “Martin can do this job, but Jessie can do it better”. How can a company efficiently manage the available resources, without putting everyone into the same box and thereby compromising the unique qualities of a resource? Effective planning offers the solution.

The determination of resource availability is greatly improved nowadays. ERP packages or industry-specific options such as TMS (for transportation) and HR (for healthcare and service organizations) play a part in this. Furthermore, the purchase or hire of resources from suppliers has become much more transparent because web applications and market places enable customers to instantly see the availability of products or services. The aforementioned software packages are particularly strong in ‘data entry and reporting’, but much less applicable for planning activities. Often they only determine if a resource is available but not whether it possesses the right capabilities.

The biggest innovation in the field of planning is in relation to people - the most flexible and varied resource that exists. Systems now offer increasingly more opportunities to record unique knowledge, experience and availability. Furthermore, the phenomenon of ‘self-rostering’ is sharply on the rise, which is a feature greatly appreciated by variable-shift workers. Combining this functionality with the flexibility of ‘the New Way of Working’ can create great win-win situations for employees, customers and management alike.

More profit and greater customer and employee satisfaction thanks to the introduction of workforce scheduling software



Utilizing employee capabilities

An organization was dealing with an increasing number of foreign clients who were unable to speak the local language fluently. As a result of these communication challenges, especially during difficult client meetings, external interpreters had to be brought in on a regular basis. That is until someone made the suggestion to assess the foreign language capabilities of the current staff. It soon became apparent that not only the clients were becoming more international, but the personnel too. And as a result, it was agreed that the workforce scheduling software would also be used to record the employee’s language capabilities. A test showed that in more than fifty percent of cases, a member of staff could act as an interpreter. That alone resulted in a saving of hundreds of thousands of euros, further increasing the return on investment of the planning system. Employee satisfaction also increased because staff with language skills really appreciated the opportunity to assist their compatriots in their native tongue. And last but not least: greater customer satisfaction. Clients began to experience a very personal quality of care, at no extra cost.

Added value from the New World of Planning	
Improved management quality	In the New World of Planning, the unique characteristics of resources (employees, warehouses, freight compartments) can be better linked to the specific characteristics of the demand. It is also easier to include external resources in the planning.
Increased planner satisfaction	Planners can match supply and demand more effectively due to a good overview of all resources.
Increased employee satisfaction	Employees are more appreciated and utilized according to their unique capabilities.



3. The solutions

*More
management quality
and customer satisfaction
thanks to a supplier's
planning improvements*



Complexity and uncertainty can be transferred

A construction company faced planning challenges time and time again with each new building project. The unique nature of each project and the small deviations in the construction schemes were the contributing factors. This had a detrimental effect on the company's ability to be decisive and in some cases, twice as many resources were assigned than actually required.

A software package was introduced in order to reduce the number of planning deviations, but this was only partly successful. Why was this the case? Well, most of the deviations were a result of their supplier's unsuitable or badly executed planning. This is a good illustration of the way in which external factors can increase the complexity of the planning process.

The construction company assumed that supplier unreliability could be eliminated by utilizing its own resources to carry out more of the jobs. However, calculations soon proved that this would result in increased fixed costs of nearly 10 percent and it was unlikely that the extra resources would be optimally utilized.

And what if things were reversed? For example, by purchasing more from fewer suppliers and thereby forcing them to improve their planning process? This would mean that the suppliers would become more dependent on the construction company and therefore have to give more priority to optimal planning. By purchasing larger volumes it would be possible to negotiate lower prices and transfered part of the planning complexity to the supplier. This option proved more effective than the option of utilizing their own resources to carry out more of the jobs. Thanks to the increased role of their internal buyers, the construction company was able to more frequently prevent and better anticipate deviations to the plans. Furthermore, the suppliers were able to operate more reliably as a result of the increased sales volume and the improvements made to their own planning processes. These factors also contributed to greater flexibility with regards to taking on new projects. This is a good example of transferring complexity and improving flexibility. And it is all thanks to a slightly different business model and improved planning at the suppliers.



The planning process in steps

A planning process can consist of dozens of steps, spread over various time periods (long-, medium-, or short-term planning). Furthermore, the process can vary from indicative to very concrete. In our illustration of the New World of Planning, the planning process has six main steps as a starting point. These are:



This chapter examines each step in more detail and highlights the innovations that have given rise to the New World of Planning. The content of each step is also illustrated with case studies and quotes from the logistics world.

“An optimally loaded truck does not always follow the most logical route”

How do we link everything together?



The first step in the planning process is to determine the scope. Which areas of focus should your planning include? Planning within an organization can consist of several sub-plans, for example in the area of:

- Demand
- Purchasing
- Production
- Distribution
- Service

As is the case in the logistics supply chain, sequencing plays an important role. Consequently, demand planning serves as input for production planning, which in turn serves as a starting point for purchasing planning. However, once the purchasing planning is complete, it is often necessary to recalculate the production plans and based on this recalculation, it may be more effective to reduce production slightly or even to increase the output depending on, among other factors, minimal or optimal order quantities. For example: the final ten pallets of raw materials required would result in an additional shipload, thereby increasing the inventory costs. In the field of planning this is referred to as sub-optimization: when a manufacturing unit schedules production to benefit its cost structure without regard to customer requirements or the effect on results for other business units.

Another aspect relating to scope involves the resources that will be included in the planning, namely:

- Machinery
- Employees
- Inventory
- Warehouses
- Transport capacity

Therefore, a plan could incorporate production and distribution, only taking into account the availability of the machines. However, a plan could also incorporate demand, production and distribution while taking into account the availability of people, machines, inventory and warehouses. In this way, when more operational aspects are incorporated into a plan the complexity of the planning increases, but there is less opportunity for sub-optimization, fewer unforeseen events during execution and an increased likelihood of good results.

“Optimal planning does not always result in a fully loaded truck”



Added value from the New World of Planning

More profit

By incorporating more aspects in the planning, results can be more reliably controlled, which leads to increased profitability.

Higher levels of management quality

Thanks to the tools in the New World of Planning, planning scope can be greatly increased allowing management to operate more decisively. A retail example: distribution warehouse storage costs, distribution to stores and store inventory management can all be included in the same optimization process.

More planner satisfaction

Planners have direct insight into the possibilities and limitations of stores, warehouses or teams. This enables the planner to create more opportunities and thereby exclude fewer options.

More employee satisfaction

Warehouse, transport and store employees are less hampered by the need to solve problems that arise from conflicting sub-plans.

A good data analyst is worth their weight in gold



More profit by feeding the retailer's daily point of sales data into the manufacturer's distribution plan



Much to be gained by talking up- and downstream in the chain

Suppliers of fast moving consumer goods need to operate with a great deal of flexibility. Their customers, the retailers, have a daily fluctuating demand and limited storage space. At the same time, a retailer's image and turnover will be adversely affected if items at the stores and distribution centers are 'temporarily out of stock'. For this reason, a supplier of consumer goods aims to rapidly deliver both large and small orders to their clients.

For one retail customer, this type of service was badly needed. The retailer's demand patterns varied greatly: sometimes they ordered twenty roll cages, at other times only five; for next day delivery or for within one week. When the manufacturer discussed the demand pattern with the retailer, the retailer was very surprised because the products in question had a very regular customer demand. The distribution center's buyer also confirmed this. So why was the manufacturer receiving irregular orders?

Upon further investigation, it was discovered that the buyer was also functioning as the distribution center's workforce scheduler, which is why the orders were sometimes on time, but on other occasions they were a little late. They were never too late, because that would be viewed as a 'mortal sin'. In order to remedy this problem, the parties decided to conduct a test involving the retailer's point-of-sale (POS) data. Each day the POS information was fed into the manufacturer's distribution planning system to ensure that the retailer's demand could be met. The test proved effective and the process was implemented with numerous positive results: decreased workload for the manufacturer and reduced distribution costs for both the manufacturer and the retailer because rush orders and excess stock were eliminated.



“Planning is more reliable with high quality route maps”

Data collection that is increasingly automated and externally sourced

What is your customer demand? Which resources are available? What constraints are there and how are they incorporated into the planning? A data analyst or a team of analysts specializes in collecting, verifying and enriching data that is relevant for planning. This type of data may include: incoming orders, resource registration including characteristics, and constraints, such as the working time regulations. But it may also include demand forecasts. Technological innovations in the area of data analysis are rapidly advancing. The use of external traffic information to optimize vehicle and route scheduling is a case in point. Other successful examples are the retrieval of customer point of sales data and giving suppliers access to production data. This provides suppliers with an earlier indication of delivery requirements. Cross-boundary cooperation is often referred to as ‘supply chain collaboration’, which leads to strong improvements in the planning results of all cooperating parties.

Added value from the New World of Planning

More profit	In the New World of Planning the use of multiple sources, internal and external, is pivotal. This used to be very time consuming and resulted in numerous complications, but it has improved enormously thanks to modern data collection and processing techniques.
Higher levels of management quality	Due to more complete and up-to-date data, management has access to better control information, which increases their decisiveness and credibility.
Increased planner satisfaction	Data collection, validation and enrichment activities require much less time. At the same time, more data and calculation power is available to make better plans more quickly.
Employee satisfaction is improved	Employees get more and earlier attention from the planner. Previously, the planner was mainly focused on data collection and spent less time on the creation of plans and subsequent communication.

Breaking up is not always hard to do



More profit and management quality by means of vehicle routing and load planning at a manufacturer



Please split this order into parts first!

Every company likes to receive large orders. The bigger, the better. However, the execution of a large order is not without its challenges. For example, a customer orders 50 pallets of toilet paper, 20 pallets of kitchen roll and 40 pallets of tissues, which require delivery to two distribution centers. Complications can arise due to the fact that:

- *The 50 pallets of toilet paper are stored at 3 different locations*
- *The 20 pallets of kitchen towels still need to be produced*
- *The 40 pallets of tissues must be purchased from third party*
- *The maximum number of pallets per truckload is 26*

To ensure that this order does not result in inefficient load capacity utilization for multiple routes, optimization is essential. This can be achieved by splitting and reorganizing the orders. In order to be able to optimally plan the orders, their impact on the logistics chain should be verified prior to input into the order and production systems. As a result of this verification, the order may be split into several partial orders, which at a later stage are merged into a limited number to orders requiring execution. This will lead to far fewer logistical movements.

The positive impact of improvements in calculating power

Decision making processes can consist of manual, intuitive decisions or automatic, model-based decisions. It is also possible to use a combination of both methods during a single process. Furthermore, decision-making is often based on a number of sequential steps. At first, rough scenarios will be drawn up, followed by a preliminary draft plan and then several variants are created. The final plan is only formulated on the actual day of execution. This plan can be occasionally adjusted during execution in response to unexpected events. Each of these steps is dependent on the availability of sufficient calculation.

Model-based decisions

What are the ingredients for automatic model-based decisions?

- A decision model
- An algorithm (an advanced mathematical step-by-step solution to a complex problem), for situations where a lot of data or calculating power is required
- A parameter list that establishes the right settings within a system for specific types of decision-making

These elements also form the basis of an Advanced Planning and Scheduling (APS) system, which is an essential component when launching the New World of Planning within an organization. The implementation of an APS system has both major consequences on the decision-making phase, and on the preceding and subsequent phases because APS systems also contain features such as:

- Automatic import and enrichment of data due to excellent integration with sources such as ERP, HR and TMS systems
- Advanced visualization tools
- Comprehensive data export and reporting tools

How does the transition from the Old to the New World of Planning affect the planner during this phase? The transition is gradual, but it is evident that the planner function will require additional roles and skills. The role of the planner is constantly expanding, because the availability of new tools provides increased decision-making support. However, the role is also increasingly divided into:

- Planners functioning as process and system specialists, who test planning methods and tools and ensure the high quality of the plan.
- Planners functioning as communicators, who understand all the results and at the same time, can explain this information clearly to colleagues working on the execution of plans.

In this decisionmaking phase, numerous cost savings can be realized by optimizing the decision-making process. Optimization is much more than just the 'simple' matching of supply and demand, which in itself is often a difficult task. Optimization includes the re-shuffling of orders and resource supply in order to be more productive with less resources. Optimization relies on a great deal of calculating power in order to determine multiple scenarios. Optimization becomes an important part of the decision-making process when thousands of orders with just as many sources and destinations have to be matched. Optimization focuses above all on merging supply and demand so that more efficient logistical combinations are created.

“Route scheduling and loading is increasingly performed by one touch of a button”

Added value from the New World of Planning

Higher profit	The typical decisionmaking tools in the New World of Planning are especially geared to facilitating decision-making phase. Decision making becomes more simple, can handle more complex issues and options and takes less time. This leads to much better results and a significant positive impact on profitability. Especially when optimization is applied. In some cases, millions have been saved and in others, a 40% increase in revenue was generated while using the same number of resources.
Higher levels of management quality	With the new software tools, management can focus more on exceptions.
Increased planner satisfaction	Planners can mainly focus on exceptions, because decision-making is now automated. The proposed alternatives are immediately visible, including the costs and benefits of the proposed change.
Increased employee satisfaction	Plans for the employees are less often reversed due to errors. Customer requirements are now the only reason for amendments.
More sustainability	Improvements in decision-making lead to multiple environmental savings: fewer CO ₂ emissions, less consumption of raw materials.



Distribution planning for home deliveries no longer requires any human intervention

“Computer games are a source of inspiration for making planning screens even more interactive and intelligible”

Is it difficult to communicate planning information?



More profit and customer satisfaction thanks to advanced service planning

What kind of strange schedule is this?

Richard, who lives in the south of the city, is a service engineer at a technical installation company. When checking his daily schedule, he sees that his first job is in the north of the city. His next assignment is to travel east in order to pick up some parts from the warehouse that are required for his following job in the north. His final route takes him southwards before his last assignment in the east of the city. He is not at all impressed with the route plan, wondering why on earth the schedule was not planned more efficiently. Richard feels more like a taxi driver than a well-trained service engineer...

Some companies are very successful at incorporating a large number of factors into their planning. And it is often the case that the people carrying out the jobs are unaware of them. A customer, for example, may have the option to pay a premium for an early morning service appointment that requires the engineers to drive from the south of the city to the north. There is no reason why this set-up could not be explained to the service engineer. However, what if there are several combined factors that he is not aware of? For example, suppose a customer in the north has paid a premium for an early service appointment and another customer in a nearby location can only be visited after 15.00 because the part has not yet arrived. And in addition, a traffic delay is expected between 12.00 and 14.00 on the widely used city bypass. If the service engineer is not made aware of this background information, he will naturally assume that the route schedules are completely inefficient. Even though they are actually the most viable option for both the company and its customers and the ones that deliver the highest revenue and levels of customer satisfaction. This demonstrates the importance of communication in the New World of Planning, because factoring in multiple requirements into the plan is fine as long as the people assigned to carry out the work are well informed.





Communicating the plans effectively

In the past it was often the case that early morning planning meetings would take place around the planning board or in the staff restaurant. However, more and more companies are now sending plans to the workforce via electronic means. In addition, the schedules now include the times when the required spare parts can be picked up from the warehouse. This last piece of information prevents bottlenecks by ensuring that the engineers don't all turn up at the warehouse at the same time. The advantages of communicating in this way are that employees are able to give earlier feedback on the quality of the planning and there is less stress regarding the upcoming schedules, which has been proven to significantly reduce absenteeism.

Planning-related communication naturally includes an additional and important third party: the recipient of the service or product. Whereas customers were often required to wait an entire morning or afternoon, it is now often the case that they are given a timeslot accurate to within an hour, which is communicated via SMS, email or an online 'cockpit' that provides customer order tracking facilities. It is clear that the internet has brought about a revolution in the way that planners, the people carrying out the jobs and customers communicate. And oral communication is being increasingly replaced by standardized digital messages, which are processed automatically in back-office systems for operational and financial order completion. Likewise, if a job was unable to be executed, planning updates can offer a second appointment straightaway. This is now possible due to the online communication tools such as onboard computers, personal digital assistants (PDAs) and navigation tools that have been brought on to the market by a number of different suppliers.

Meanwhile, sophisticated mobile phones are a valuable communication tool, not so much for their calling functionality, but more so due to their messaging and positioning functions. Online messages are becoming increasingly more elaborate and specific: messages such as ‘deliver before time x, at address y’ are now able to display information such as ‘deliver to building C, gate 6, which opens only after a telephone call to a specific number of a specific person’.

Furthermore, the employees have more resources at their disposal to help them to correctly interpret the assignment. For example, vehicles are now equipped with digital maps to assist with accurate navigation; and engineers have access to electronic manuals that provide maintenance and repair instructions for a particular product or details regarding the required actions for a specific service delivery. Despite all this, digital communication can also have a downside: now that customers and/or field service employees have increased visibility of the process, suppliers are under more (time) pressure to stick to their plans in order to avoid potential fines.

*More management quality,
employee safety and
satisfaction thanks to
service planning*



Well prepared for dangerous situations

Prior to attending a service appointment it is useful to have access to relevant customer specific information. At an all round service repair company, the engineers deal with ever changing customer situations in relation to companies and individuals. With individuals it can relate to situations involving children (“my parents are not home at the moment”) or the older generation (“would you like a cup of coffee?”). But there are also less innocent situations, such as appointments at addresses where violence is a regular occurrence, or a street where there is great deal of tension. Consequently, the service company decided to record and encode information about possibility of threatening behavior and to make this available to a limited number of engineers. These engineers are also equipped with a panic button on their PDA, so in the event of any threatening behavior, they can immediately warn the police. For although the customer is king, service also has its limits...

Added value from the New World of Planning

Increased profits	The communication or adjustment of the planning requires much less working time. That means there is more time for billable work and costs are lower, which in turn leads to increased profits.
Higher degree of management quality	As a result of improved communication methods in the New World of Planning, there is less chance of late reactions or time wastage due to more direct contact with those carrying out the jobs.
Planners are more effective	Planners can respond more quickly to questions about the planning because the recipients receive the information earlier and the interim results are available more quickly.
Employees are more effective	Employees experience less stress when planning deviations are required because there is more opportunity for consultation. The downside is that they lose part of their 'freedom'.



“Computer systems are far from rigid:
they rapidly calculate alternatives”

‘Just do it’ and remain creative



*Greater management quality
and employee effectiveness
through the use of a loading
software application*



The load planning software generates incorrect orders

Innovation can sometimes lead to widespread resistance. This was certainly the case for a consumer goods manufacturer whose employees had been getting a buzz out of solving the loading assignment errors on the shop floor for a number of years. The manufacturer addressed this by purchasing a load optimization software package that would allow them to use the same number of trucks to transport five percent more volume. Soon after the implementation, it became apparent that the software was not delivering the predicted results. Packages were being repeatedly left in the warehouse because the trucks were already full. The software supplier was brought in to resolve the problem as quickly as possible and after investigation they were able to confirm that the software was operating as intended. Consequently, a check was performed on the execution of the process. It emerged that while the loading staff did check the loading lists when filling the trucks, they still continued in their old ways of working. Once they were told to accurately follow the loading lists 100%, the cargo was a corresponding match. Profit for the carrier, but a big letdown for the loading staff because they felt like they were demoted to simple robots...

Execute and adjust

If an order is correct it is much easier to execute. By correct we mean that all items are in stock, the instructions are complete and the recipient is present. But in the real world order execution doesn't always go to plan because, for example, customers often specify additional requirements, there may be physical obstacles to overcome (for example when unpacked removal boxes are blocking access to the boiler) or there could be specification errors (box is 1.5 m³ instead of the required 0.5 m³). How can these unforeseen events be overcome?

Previously, successful execution was determined by the on-the-spot creativity of the person carrying

**“A good plan that is poorly executed
is the same as a bad plan”**

out the job. Nowadays, a remotely located expert is on hand to help - photos of the unforeseen event or difficulty can be easily taken and sent electronically. Also the source of an error can be quickly found and corrected. To be able to adjust the plans during execution, the communication tools of the planning department, customer, supplier and person carrying out the job are essential. For transportation and field service jobs, this includes the immediate availability of traffic information to enable drivers to avoid traffic jams. For other types of jobs, mobile communication devices are also a vital requirement.

Up until recently, engineers or the employees carrying out the jobs needed to possess in-depth technical knowledge, even though this knowhow was only utilized for a limited amount of time. For instance, only during execution of an installation or repair, and not while driving, loading the truck or consulting with the customer. Nowadays, it is possible to divide the skills by placing:

- Less experienced employees in the field
- More experienced employees on standby at the office

It is also possible to operate a mix of the two: experienced employees carry out the complex tasks and the less experienced employees consult with them in the interim.



“Even if you place an order at amazon.com at 21.25, you’ll receive your book the very next day”

Lower costs and greater management quality thanks to dynamic vehicle routing and scheduling



What should we do with the keys?

A successful international retailer supplies its hundreds of stores on average twice a week. The deliveries partly take place during store opening times, but in the main, they are outside of these times. For this reason drivers are given keys to access special store areas where they can unload the roll cages. Each day a total of about seventy drivers, in possession of hundreds of keys, begin their routes.

The retailer decided to switch from static planning (a single plan per month) to dynamic planning (rescheduling two to three times per week). It appeared that great benefits would be realized in the area of improved truck utilization and fewer bottlenecks in the stores caused by over or under stocking. However, there was still the question of how dynamic scheduling would affect the organization of the keys? The key allocation list would now need to be updated several times a week instead of once every month. And sometimes the list even changed during the day, only a few hours before the route was due to start.

Thankfully, the retailer did not need to employ someone to organize the key allocations because a more creative solution presented itself in the form of an electronic key cabinet. By exporting the route schedule of store deliveries and pickups from the planning system to the electronic key cabinet, all drivers would be able to access the keys at the touch of a button. In summary, while dynamic planning delivers great advantages, there are sometimes unexpected bottlenecks that need to be resolved.

Added value in the New World of Planning

Higher degree of management quality

Dynamic planning eliminates waste by enabling adjustments to be made during execution.

Increased employee effectiveness

The people carrying out the jobs are informed more quickly of possible (better) alternatives.

Big brother is watching you



More management quality and lower costs due to the introduction of vehicle routing and scheduling

The impact of regular drivers on customer goodwill is relative

For years, customers of a beverage wholesaler had a regular driver and a fixed delivery time. This set-up was maintained so that the driver could cultivate customer goodwill and be in a position to estimate delivery requirements and times. A test confirmed that the principle was functioning as intended, because the number of customer complaints soon grew once the drivers were switched. If the beverage wholesaler was to introduce dynamic routing based on order volume and delivery times, large cost savings could be made and specific customer requirements could be more easily accommodated. However, dynamic routing would involve changing customer delivery timeslots and alternating the drivers. When a test was conducted over a longer period of time, after a brief spike, the number of complaints steadily decreased and customer loyalty began to increase.

How was this achieved? In the old way of working customers were aware that their driver had limited space in the truck, so often placed additional orders with a competitor. In addition, complaints were not voiced, but dealt with by utilizing the alternative supplier. As soon as customers realized there was more flexibility with their existing supplier they began to include the adhoc orders. And in addition, complaints, as well as special requests (such as delivery on a different day) were communicated much earlier. This meant that the beverage wholesaler could react more quickly. The result of switching to dynamic routing was increased sales and higher customer loyalty.



“The British supermarket chain Tesco measures how long trucks are stationary during unloading. Objective information is collected in order to determine the cause of delays”

Fast reporting of results is increasingly important

Every company likes to report success because it is great when everything goes to plan. But what happens if the execution of the plans goes unexpectedly wrong? How can the planner, the person carrying out the job and the customer creatively resolve bottlenecks? And how much time should be allocated to determine the cause of the problem? And obviously, everyone can learn from mistakes.

Lesson 1: the later a mistake surfaces, the harder it is to determine why it happened

Lesson 2: the later a mistake surfaces, the more difficult it is to repair or limit the damage.

It is therefore extremely important to be able to see the results already during or after the execution of an action. How does that work in practice? The modern methods of communication that form part of the New World of Planning also play an important role in this area. The use of a PDA to record customer signatures that can be sent in real time to the planning system is a very direct mode of communication. Immediately upon receipt of the signature, the recipient can be contacted for feedback about the level of service (has the product been delivered without damage and on time?). This information also enables companies to quickly deal with mistakes and to make adjustments. For example, if after five deliveries it is noted that three of the five recipients are dissatisfied, the remainder of the deliveries can be placed on-hold until the bottleneck has been solved. And finally, the sooner a successful delivery can be confirmed, the faster the invoice can be processed and sent to the customer. And there is less risk of queries after the event.



It could seem that this type of rapid reporting is a little bit like ‘big brother is watching you’, when in fact it is actually more about ‘big brother is helping you’. In addition, the ability to invoice quickly results in decreased working capital requirements, which means less credit is needed, less interest is paid and therefore extra profit for the organization.

It is obvious that the most important technological innovation in the reporting phase is the advancement of modern communication tools. But in addition, it is also about the planning department being able to receive and read preformatted automated messages. These types of messages are essential because the planning system can use them to create ‘management by exception’. For example, if on a single day there are 1000 orders, it is important to focus on the 10 that are problematic. An advanced planning and scheduling (APS) system can support this requirement by only displaying difficult orders on the planning screen. It is of course acceptable to use a ‘job complete’ type of message as a way of determining that an order has been successfully executed. But is this procedure sufficient and does it really indicate a successful execution? More and more service organizations are choosing to call their customers, almost immediately after delivery, to confirm if the customer is indeed satisfied. Alternatively, customer feedback forms, which provide additional, valuable information, can be used for continuous improvement during planning.

Added value in the New World of Planning	
Higher profit	Faster billing leads to faster payments and therefore lower interest costs.
Higher degree of management quality	The invoice can be issued immediately upon signature of the goods/service receipt, which leads to a sharp reduction in working capital and interest costs.
Planners are more effective	Planners no longer have to settle or close each order at the end of the day, which means they can operate more as planners and less as accountants.
Employees are more effective	The people carrying out the jobs are no longer questioned by the accounting department about what happened with particular orders on such and such a day. This enables them to fully focus on the execution.



4. The results

The previous chapter examined how the planning process progresses and the types of modern concepts and resources that are available. The logical next step is to examine the benefits. What does effective planning lead to in terms of results? For companies, it is ultimately about profit within a set of preconditions. How can you achieve maximum revenue with minimum costs and a high return on investment? But that is not the only result that counts. Good planning in the New World of Planning also contributes to management quality, customer and employee satisfaction and sustainability for society. These aspects are dealt with in this chapter.



Extra profit for the company



Trucks are loaded more efficiently and sales increase



Loading is visible at order acceptance

A manufacturer of domestic paper products (kitchen rolls, toilet paper, tissues) never knew exactly at order acceptance whether or not a truck would be fully loaded. Due to the fact that not all trucks could carry the same volume, the company introduced a few rules of thumb, based on the maximum pallet capacity per truck. This was the case until an idea was formed to implement a loading software package that could automatically display, in real-time, a virtually loaded truck once an order had been accepted over the telephone. The software would also be able to enter the load volumes for the subsequent truck. The result: 15% more cargo was ordered because extra volumes could be transported per route. Further results: the 15% extra load per truck did not lower the size of the next order. Instead, the manufacturer actually secured additional shelf space in the stores, at the expense of their competitors, because the customer was able to take advantage of the lower delivery costs.

“Planning systems have a return on investment of less than a year”

Lower costs at a service company thanks to a workforce scheduling solution



Salary calculations are greatly improved

A service company decided to extend its payroll system by introducing a new workforce scheduling software package. This would enable the company to control all aspects of legislation within the scheduling software and thereby simplify the data flow for calculating payroll. When comparing the new salary data with the previous calculations, it was clear that the new system had generated consistently lower payments. The reason for this variance was due to the fact that the new system could incorporate the small nuances of the legislative process more effectively, thereby reducing the salary costs by almost one percent. Based on calculations, it became apparent that the company had been overpaying its staff for a number of years. While this discovery was not good news for employees, the salaries could not be adjusted retrospectively so no further action was taken. However, there were positive results for the company’s management because the money invested in the purchase of the new system was unexpectedly recouped within a few months.

By improving the planning process, it is possible to carry out more assignments with the same number of resources. Alternatively and if desired, the same amount of work can be carried out with fewer resources. In general, there are three areas that reflect these improvements:

In the planning department:

- Less work: workload reductions of more than fifty percent
- More capacity: planners are able to create plans quicker and more frequently

During execution:

- Improvements in the utilization of resources by up to forty percent (people, machines, trucks, inventory)
- Less stress, therefore less turnover of staff

“Effective transport planning saves five percent in costs”

In finance

- Faster billing: this leads, along with lower inventory, to reductions in working capital and less interest costs

A few quotes about the financial results that can be achieved with improvements in planning:

<p>Tim Hyatt <i>Operational Excellence Manager</i> Coca-Cola Enterprises</p>	<p>“The use of a vehicle routing and scheduling solution results in savings of 45 million dollars per year. This is based on an annual turnover of 21 billion dollars. From 430 distribution centers, Coca-Cola Enterprises deliver to an area that includes more than 400 million consumers. Each day, more than 300 planners create planning schedules for 10,000 drivers.”</p>
<p>Mark Bradley <i>Global Operations Director</i> TNT Express</p>	<p>“Planning solutions are being implemented in multiple countries throughout the world and they have delivered significant savings and service improvements in all functional areas of operation.”</p>
<p>Erik van Mook <i>Information Manager</i> G4S</p>	<p>“The new software not only enables us to win new customers, but to also improve service levels for existing customers. And most importantly man hours are drastically reduced.”</p>
<p>Ronny van den Driesch <i>Audit & Vehicle Manager</i> Carglass</p>	<p>“The service cars at our service centers have achieved 10% mileage savings. In addition, there is less stress and increased service levels. Our customers and employees are our main concern and if they are satisfied, then our shareholders are content and the circle is complete.”</p>
<p>Jan Kerremans <i>Supply Chain Development Manager</i> AB-Inbev</p>	<p>“After the implementation of the planning system, the savings were found to be higher than expected and the project had a return on investment of less than one year.”</p>

“Companies use ORTEC systems in order to realize business growth”



A more reliable and effective management

In addition to profit, other forms of success can also be achieved with effective planning that is supported by advanced planning software. For example, the availability of improved information enables management to make more accurate and accelerated decisions. And as consequence, there is an increase in management decisiveness and credibility.

More control over invoicing thanks to the use of load optimization software at a car manufacturer



No more discussions about invoices

In the automotive industry, the availability of spare parts is crucial for top-selling brands. Air freight charges for the timely delivery of these parts are, however, rising substantially. This is as a result of the increase in the number of different models and because unique models are sold increasingly across the globe. Spare parts should preferably be available on call, because keeping them in stock is not profitable. So how can car manufacturers forecast their air freight costs? And how can they keep these types of costs under control when each order is always unique? What matters most is being fully aware of the space required for a shipment of parts. To deal with these types of issues, a car manufacturer introduced a load optimization solution for its shipping department that was able to calculate the amount of space required for a spare parts parcel. This information ensured that the car dealers could better anticipate invoice amounts. Moreover, there were no more discussions afterwards about how much expensive air cargo space was actually utilized. The result led to increased satisfaction for the management of both the manufacturer and the dealerships.

*More credibility for the
planning department
thanks to a new workforce
scheduling software
package*



The planning department becomes more reliable

In the past, the planning department and poor quality planning was often blamed for problems that occurred during execution of the service schedules. The field service employees conveniently overlooked the fact that their actions were also a contributing factor: neglecting to inform the planning department about issues relating to the exact number of hours worked, about required spare parts or about learning points during specific types of repairs. When management stepped in and assigned the planners the task of coaching the field service employees, the latter reacted skeptically. Any advice that was given to them was ignored under the guise of: "if your plans are incorrect, then these suggestions are hardly likely to work either." Fortunately, the introduction of a new planning software package changed this situation. The planning department now had more time and opportunities to accurately determine the orders and to match them with the exact skills and working hours. After half a year, the planning department could stand firm when it came to bottlenecks in the planning. And the planning schedules were seldom wrong. As a result, any advice now given by the planners received a much more positive response. Both the decisiveness and the reliability of the planning department, and therefore the company, had grown enormously.

A few quotes about the management quality results that can be achieved with improvements in planning:

<p>Cyril Turner <i>Atlanta Division general manager</i> Coca-Cola Enterprises</p>	<p>“The vehicle routing and scheduling system is a great tool for creating ‘what if’ scenarios.”</p>
<p>Maarten Maasland <i>Driver Supervisor</i> Schenk Tanktransport</p>	<p>“In the meantime, our productivity has grown significantly, while still using the same number of planners to create the plans.”</p>
<p>Simon Siemonsma <i>Project manager</i> Keune Haircosmetics</p>	<p>“The loading software package has lowered the error rate and brought greater order picking transparency.”</p>
<p>Jaco Wobma <i>Project manager</i> Centraal Boekhuis</p>	<p>“The new vehicle routing and scheduling software enables us to more effectively manage our processes. In addition, we expect to be able to further increase our service levels while exerting more control over our operating costs.”</p>
<p>Jan Hendrik Kieft <i>Staff officer – workforce scheduling</i> Bartiméus</p>	<p>“The new workforce scheduling software gives us more insight into and control of the planning process.”</p>

“A housing corporation can make faster appointments in order to resolve resident’s complaints”

Improved customer service



Higher levels of customer satisfaction thanks to the centralized introduction of a vehicle routing and scheduling system

Improved customer satisfaction ratings

An international consumer goods supplier has been devoting a number of years to optimizing its international vehicle routing and scheduling operations. The first phase involved centralizing the planning processes by implementing a planning software solution for all regions so that the supplier could take over the creation of the planning schedules from its transport operators. As a consequence, the feasibility of customer appointments could be checked directly and the supplier would have more control over monitoring execution of the plans. A further challenge was to improve data input by providing customers with daily sales figures. This resulted in planning improvements, which in turn led to higher levels of customer satisfaction (on a scale of 1 to 10, the ratings rose from 7 to 8). Furthermore, the supplier achieved fifteen percent savings in transportation costs. These savings were realized both in the area of planning costs (the same number of planners could perform more tasks) and execution costs (the transport operators are paid less because the supplier now manages all of the administrative tasks). A further phase in the optimization is to give the suppliers access to production and inventory data in order to help them to make optimal deliveries. This will also lead to combined savings in the areas of planning duration, inventory costs and transportation costs. To summarize: in addition to improving customer satisfaction, the consumer goods supplier also achieves better financial results.

“Planning improvements can therefore increase customer satisfaction”

The list below is a summary of a number of quotes:

<p>Chris Daenen <i>Customer service director</i> Electrolux</p>	<p>“The service scheduling software has enabled us to increase our customer focus. The software helps us to optimally schedule our employees so that we can offer our clients the most suitable proposal.”</p>
<p>Wim van der Staaij <i>Cluster-manager</i> Delta Psychiatric Center</p>	<p>“With our workforce scheduling solution we can more efficiently respond to client health care demand.”</p>
<p>Ad de Rooy <i>Logistics director</i> De Rooy Transport – Logistiek</p>	<p>“Now that route schedules are automatically transmitted and we can view the statuses 24 hours per day, service and quality levels have increased yet again!”</p>
<p>Eric Delaroue <i>Managing director</i> Cremonini</p>	<p>“Our new planning software has delivered time savings, increased reliability and customized reports, which means we can better align our supply to the wishes of our customers.”</p>



“Health care employees can influence their own work roster. This results in less absenteeism and more happy faces”

Satisfied employees



It is, of course, very rewarding if management is pleased with the results and customers are happy with the service levels. But in terms of employees, how do they stand to benefit from improvements in planning? Listed below are two cases and a number of customer quotes that explain the advantages.

Higher levels of employee satisfaction thanks to the introduction of a workforce scheduling software package at a service organization

Why does Bart always get home earlier than Ruben?

For a number of years, a service organization had been working on the principle that all orders should first be given to the team leader, so that he or she could assign them to the most suitable employee. Because this was quite a subjective way of working, it was often regarded as showing favoritism: experienced service engineers were allocated the more predictable jobs, while less experienced engineers were given the difficult assignments and more challenging new service contracts. Consequently, the experienced engineers often arrived home by 16.00 and the newer employees only got there at 17.30. The former group was naturally very loyal to the company, but in the latter group, there was a high turnover of staff. And because the less experienced engineers were often assigned to new clients, customer satisfaction in this area was below standard and it became increasingly difficult to attract new customers. A process reorganization, however, led to significant improvements. In future, a centrally based planner would now allocate jobs based on an employee competency profile that was set up in the planning system. The team leader could still adjust the plans if it was clear that there was a definite mis-match between the employee and the assignment. However, the team leader now functioned more as an advisor and coach rather than a controller. This led to a reduction in combined planning time of thirty percent and an increase of twenty percent in average employee utilization. The latter was mainly as a result of more insight into peaks and troughs, enabling simple tasks to be passed more easily between the teams. More importantly, new, talented engineers no longer had to start at the bottom of the ladder. As a result, both employee and new customer satisfaction rose by an average of almost one point.



Greater employee satisfaction thanks to the introduction of a workforce scheduling software package at a healthcare institution



How an employer helps sports teams to win titles...

For semi-professional athletes, it is extremely difficult to work in a company that operates two or three shift rotations. Athletes always train at set times and the international competitions in which they participate take place irregularly. For the planner, incorporating these kinds of specific requirements into the shift roster planning was simply too complex. As a result, non-professional athletes, sometimes working part-time, were faced with the additional challenge of having to negotiate shift swaps with their colleagues. At least that is until a new workforce scheduling system was introduced that was able to handle the complexity of their requirements. Besides scheduling the athletes, the planner was also able to assist an additional, special group of employees. Namely those who were providing temporary or prolonged special care to sick children or elderly parents. By including this group’s special requirements into the schedule, the remainder of the workforce was more accepting of the flexibility given to the athletes and as a consequence, employee satisfaction increased. A further advantage was that the organization was more frequently mentioned in the sports news following a top performance by one of its employees. The organization was all of a sudden in great demand among young athletes wishing to combine a career and sport. In summary: a business, sporting and social success.

<p>Jan Kerremans Supply chain development manager AB-Inbev</p>	<p>“Good planning takes away the need to micromanage our drivers.”</p>
<p>Simon Siemonsma Project manager Keune Haircosmetics</p>	<p>“It is now easier to reassign jobs and employees, because everyone can work with the load optimization software!”</p>
<p>Eddy Nuyttens Zone chief inspector Politiezone Gavers</p>	<p>“A huge benefit is that employees can now access their shift roster via the Internet, even from home in order to request leave and swap shifts.”</p>

“The United Nations’ World Food Program saves on logistics costs, enabling more people to receive food aid”



Benefits for society

What does advanced planning mean for society? Or for sustainability? Or for corporate social responsibility? These notions are often vague. The following cases, however, clearly illustrate the contributions that planning can make.

Increased aid thanks to helicopter route optimization for emergency relief in Africa



Food transportation in disaster zones: a blessing in disguise

Disasters are often unexpected, of catastrophic magnitude and the affected area is almost never prepared to deal with the situation. One example is the summer 2010 Pakistani floods, where millions of people suffered. Similarly, we can recall the September 2008 disaster that saw seventeen African countries hit by floods. Helicopters loaded with food relief parcels were immediately dispatched to the area, because ship transportation would take too long to reach those affected. In these types of situations, how do you determine the most effective distribution structure? How many distribution points are needed and where should they be located? How do you minimize helicopter flight times over such a vast area? Via the World Food Program, the UN High Commissioner for Refugees learned about the existence of a few clever mathematicians with extensive experience in planning. These people were immediately brought on board and provided with all the relevant data: the location and number of refugees; the locations that could serve as distribution points; the number of available helicopters and when they would be arriving; and the location and time of the first food shipments. Within a day, a suitable option had been calculated, which enabled to helicopters, after arrival, to immediately get to work delivering food aid in the most efficient and effective way.

“Trucks are driving fewer miles as a result of optimally planned routes and loads. This has a positive impact on CO₂ emissions”

Less CO₂ thanks to increased calculating power

Companies and agencies are under pressure to find new opportunities to reduce CO₂ emissions, which sometimes creates quite a difficult challenge. For instance, what should be done with bulk liquid transportation, whereby trucks are fully loaded in terms of weight, but only fifty percent of the compartment space is used? How do you address the issue of trucks that depart with full loads but return empty? The following examples illustrate a number of intelligent solutions that have delivered positive results in these areas.

Reduced CO₂ emissions as a result of cooperation and route and load optimization



A customer and supplier share transport operator

The distribution centers of a retail store chain have two streams, often handled by different transport operators. Stream 1 is the supply of goods from the suppliers and stream 2 is the transit to the stores. The supplier's transport operators leave with empty payloads and the trucks of the retailer's transport operators arrive at the distribution center also empty. Partly due to the need to protect the environment, a retailer has teamed up with the transport operators of its suppliers. As a result, trucks can carry full loads to supply the distribution centers and then be reloaded for delivery to the retail stores. Or viewed the other way around: the retailer's transport operators, after delivery to the retail stores, drive to the supplier's warehouse to collect supplies for the distribution center. This has led to savings amounting to tens of percent.

Lower costs through better insight into the diversity of trailers



Load optimization software offers insight into available cargo space

The ambitions to reduce CO₂ have brought about lots of innovation at truck building companies. Whereas standardization prevailed in the past, nowadays there is much more diversity. This is mainly due to continuous innovation in vehicle fleets and the need to deploy multifunctional payloads. With intelligent loading software it is now easier to handle diversity. Planners can go online and visually display, in real-time the loaded volume of a truck, regardless of trailer type capacity or whether or not the pallets can be stacked. Furthermore, once the first load has been delivered, the available

capacity for return shipments is immediately clear. This all began in order to find a solution to a sub-problem, namely to load the truck in reverse order to the route sequence. In the meantime, loading software has become an essential tool to efficiently manage a wide range of diversity in loading capacity.

*Lower costs by offering
more choice*

Delivery or collection? Let the customer choose

Parcel delivery is only efficient when vehicles are fully loaded and the route is the same for all parcels. Delivery is less efficient during the 'last mile', i.e. during the route from the final distribution point to the customer's door, when it is often the case that the recipient is not at home. By introducing a new software product, a home delivery provider now lets the customer choose between specifying their preferred delivery date and time or opting to pick up the parcel from a collection point that is near to their home or work address. This provides a further opportunity to greatly reduce CO₂ emissions.

Edward Peeters

Senior Transportation manager

Toyota

“The vehicle routing and scheduling system contributes greatly to the optimization of our logistics network. Furthermore, we also want to use the software to reduce our CO₂ emissions by 10% in 2010. “

Jaco Wobma

Project manager

Centraal Boekhuis

“The vehicle routing and scheduling software has enabled us to reduce the number of routes and the trucks are now optimally loaded. This leads to a decrease in the number of (empty) miles, which allows us to reduce our CO₂ emissions.”



5. Looking to the future

This final chapter looks at the future of the New World of Planning. How can organizations be encouraged to embrace advanced resource planning and what type of success can be achieved as a result? Which innovations will contribute to its impact and spread? And finally, a glimpse of what a day could be like in 2015.

How to secure acceptance?

The New World of Planning offers a multitude of promises, but also some constraints. The following points highlight the support that is required in order for companies to successfully embrace the New World of Planning:

- A good information infrastructure: by means of an ERP, TMS, or HRM system. This is required in order to feed the planning environment with the correct data. In ICT 4 aspects are important for future innovations:
 1. Transparency (via ERP)
 2. Excellent integration
 3. Open systems (communication via community systems such as portbase)
 4. Real-time information about the processes by means of pick to voice technology, PDAs and navigation devices, and two-way communication via location based services and connected navigation.
- A good mix of expertise within the project team: in the areas of planning (preferably with a business background); project management; ICT knowledge; and process knowledge (for planners and people involved in executing the plans). In addition, management commitment is essential because the introduction of a new planning approach will impact the entire organization.
- A good means of communication: between the planners and the workers, in order to exchange planning, execution and feedback results.
- A planning reorganization: advanced planning requires a different kind of organization, which is often based on a split of responsibilities: one group of planners focuses on the effective set-up and use of the systems, while another group looks after communication to the users.
- The most relevant and adequate decision criteria should be available within a planning system. If this is not possible, then a large number of manual adjustments may be necessary.
- Room for optimization: to split or regroup orders according to locations or time in order to be able to carry out more assignments with fewer resources. Even without optimization, advanced planning can bring significant financial, strategic and operational advantages by simply offering transparency, calculating power and efficient information processing.

Extra inspiration for innovation

There is no fixed standard for the New World of Planning in the coming years. It will continue to evolve, because the stimulus for it also continues to develop. What can be expected, both now and in the medium term? The most important key words are:

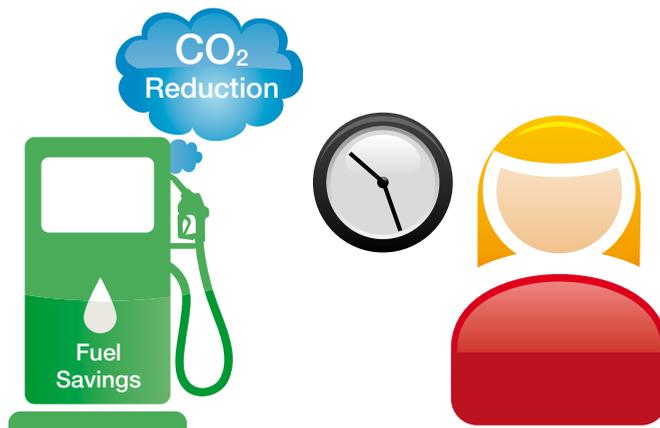
- Increased supply chain cooperation
 - Customers provide point-of-sale data direct to the supplier
 - Transport operators give other companies access to their routes. This will enable companies with less strict deliveries to piggyback on to the routes of companies with strict delivery times.
- Broader planning scope and greater input
 - Incorporating route, loading, stock positions and driver working hours into a single plan instead of sub-optimization in multiple, separate schedules
 - Apart from distances and delivery times, taking into account other factors such as: expected traffic jams, unforeseen events, road works, return trips, etc.
 - Adopting government initiatives in order to make mobility more manageable and predictable.
 - Taking advantage of the growth in location based services
- Increased knowledge of planning and planning tools
 - There are a number of courses that are increasingly focused on the aspects of the New World of Planning
 - More and more students with a business background are opting for a career in the control room of the world, i.e. the planning department.



In addition, there are trends in each sector that will increase the need for the New World of Planning.

The most relevant trends are:

- The need for sustainability
- The need for economic recovery
- Greater variation in the demand for products and services:
 - a. Revenue management will play a greater role: influencing demand by means of price variations. Just consider airline ticket prices and the variable delivery costs at supermarkets.
 - b. Customers want increasing involvement in the planning and execution processes
- On demand production and service provision
 - a. An increasing number of production- and service processes are now simply based on a specific type of demand ('on demand production', 'on demand delivery', 'on demand services', and so on)
- The need to expand the planning scope: combining routes, loads, drivers, etc., within a single plan.
- The need for additional source information: incorporating internal and external data into the planning system
- Additional tools to accelerate decision-making and provide planning visualization:
 - a. the desire to make concrete plans and to outline scenarios earlier and more quickly
 - b. to modernize user interfaces based on for example, experiences from the gaming world
- Improved communication: make use of a multitude of (new) possibilities, (e.g. iPad)
- Adjustment: even though plans are improved and created closer to the time of execution, a requirement still exists to be able to make adjustments in real-time
- Reporting: there is a strong desire to be able to go 'paper-free'. A great deal of progress has been made in this area already, but this is a continuous improvement process



Life in 2015...

It is 6.45...

Yesterday's traffic predictions indicated that this morning's rush hour would cause a twenty-minute delay, instead of the usual thirty. Consequently, the alarm clock goes off ten minutes later than usual. While in your car you use iControl to check your emails and today's order status, which deviates by five percent than what was forecast the previous day. With a few touch screen commands you establish that this is due to a customer, two steps further down the supply chain, who, despite not ordering for few months, has suddenly sent in a large order. With a touch of a button, you send a message of congratulations to the account manager. And while the car uses its sensors to work a route through the traffic congestion, you check your agenda and make a few changes to your schedule. As the weather is nice, you decide to play golf after work. You can see that Robert has space in his calendar and that two of your favorite courses have slots free for eighteen holes, so you make a reservation. You also notice a few changes: Teresa off sick, so your meeting with her is cancelled. You decide to fill this time by using EasyMeetings.com via iCheck to request a telephone meeting with two of your contacts. And while you're at it, you order your lunch too: a healthy salad and low calorie ice cream. It will be ready in the cafeteria at 12.30, at table 24.



It is 8.45...

The journey to work went well. During the first videoconference meeting with colleagues in the Far East you discuss a number of leads and the upcoming marketing campaigns. All the potential trade fairs and webinars are displayed on a large screen, including the expected number of attendees and audience type. The second screen shows the utilization of the marketing team, who are responsible for organizing the trade shows and webinars. And a third screen shows the anticipated product releases. After about



one and a half hours, an entire marketing campaign was planned: press releases, e-mail shots, resources to man the stands, the construction of the stands, and presentations that would be delivered by the product release team. This all meant that the campaign team would visit five countries in a time span of two weeks but they would still be able to take two days off.



It is 12.25.

You go to the cafeteria where your pre-ordered lunch is waiting for you. This set-up is much better than in the past when you still had to walk along the buffet selection and hope that your favorite dishes were still available. What's more, you then had to deal with the ticket punching system. During lunch, Robert accepts your invitation to play golf and a message has been sent to the family calendar, Whereareyou.com, so that those on the home front are kept in the loop...

The key performance indicators are displayed on screens in the cafeteria. You can see that utilization is now at seventy-eight percent, with a peak at the call center and a dip at the distribution center. Fortunately, this was already predicted earlier in the week, so the distribution center's part-time workers were not called in today.



It is 14.00...

You have an important meeting to discuss prices. Once a week the prices of online products and services are determined in order to ensure the most optimal utilization. In the event of any peaks, flexibility can be maintained by allowing colleagues in India to work overtime or colleagues in the US to start earlier, but these options are not preferred. Thanks to the revenue management system, utilization has risen five percent and sales have even increased by eight percent.

It is 16.00...

You leave the office and head for the golf course. Now that balls fitted with RFID chips are accepted, golfing has become much more enjoyable. You no longer have to spend ages trying to find the lost ball, which means that flow on the courses is much improved. It seems incredible now to think that previously you had to wait while another person looked for their ball. During the game, you can continuously compare your results to your previous scores and against the performance of the other players on the course. That makes it extra exciting. At the sixteenth hole, you place an order at the bar (hole nineteen) for your favorite drink.



After playing golf, you head for home. A final check shows you that in the morning, you don't have to get up until 6.55. And tomorrow's utilization forecasts are at eighty percent, perhaps partly due to the price adjustments that were made this afternoon. Life gets more beautiful by the day!

Colophon

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Ronald Buijsse (1960) has been working as the corporate marketing director at ORTEC since 2007. Prior to this, he held commercial and marketing positions at Phillips, Digital Equipment and advanced solution providers in the media and broadcasting industry. His career has developed alongside the rise of new marketing concepts such as electronic banking, multi-media database publishing and new media formats. He combined studies in Marketing at Tilburg University, Eindhoven University of Technology and Indiana University School of Business.

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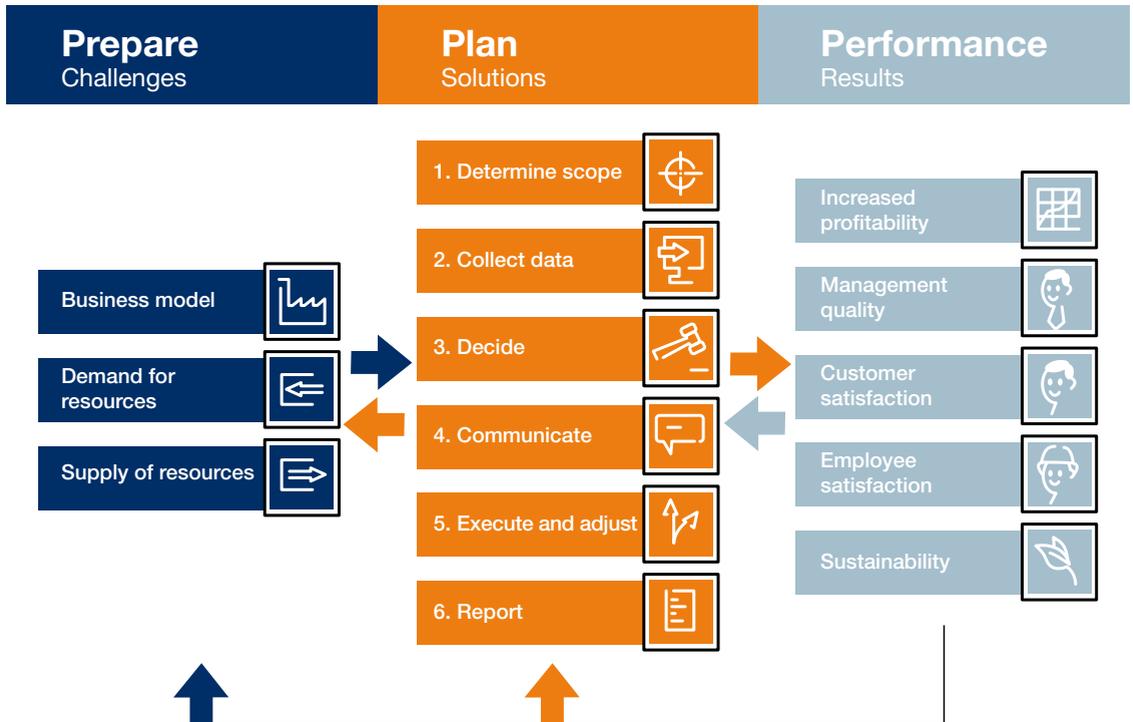
For the latest information about the New World of Planning, visit: www.ortec.com/newworldofplanning

The ORTEC Plan for Success Model

The New World of Planning is derived from the term 'the New World of Work'. The New World of Work is about working more independently from the workplace. Not just within teams but also between teams and organizations. And this means having direct access to source information that can be shared with all team members. And having the resources to help the workforce to concentrate on activities that actually require their focus. In the New World of Planning the most important data is stored in an electronic back-office system, there is a direct visualization on all kinds of screens so that it is easy to see what needs to take place, communication is via mobile phones, personal digital assistants (PDAs) and navigation systems, and the results are immediately visible and able to be processed.

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The ORTEC Plan for Success Model





ORTEC is the market leader in the area of advanced planning and in 2009, next to many other international recognitions, won the Dutch Logistics Award. This accolade was a great motivating factor for writing a book that will take its readers on a journey of discovery into The New World of Planning. ORTEC wishes to illustrate the wealth of planning opportunities that exist and to bring the discipline of planning under the spotlight. The aim is to inspire others to take planning within organizations to a higher level. We would be delighted if you could join us on this journey of discovery and at the same time learn more about the benefits that The New World of Planning can bring to your company or organization. Where do you feature in the 'ORTEC Plan for Success Model'?

The New World of Planning is applicable for all companies and organizations, irrespective of the sector in which you work, e.g. transportation, logistics, professional and/or public services or healthcare. According to co-author Ronald Buijsse, "Planning is a discipline that is very up and coming and that is what we wish to illustrate by means of this book."

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