Holy-Dis

L'esprit d'innovation

White Paper

(WFM)

Optimized scheduling of activities and corresponding staff in Call Centers

With many thanks to Holy-Dis Product Team as well as to Vincent Vanden Bossche – President of Call Communications (Belgium).

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Contents

1 Foreword

Contact centers have become an everyday part of the lives of every consumer. They provide us with all sorts of services, including airline ticket bookings, after-sales service for electrical appliances, technical support for configuring our internet connections, or marketing for new banking services, for example. Several million people all over the world work in such centers, providing a 24/7 response to our growing need for remote services.

The task of planning appropriate resources to handle the uninterrupted stream of calls and email messages arriving at contact centers has been made even more complicated in recent years by constant changes in the economic, legal and social landscape. Resource planning, which is important from both a strategic and an operational perspective, has become a real brain-teaser and a daily challenge for managers. Human resources management in general, and HR planning in particular, is clearly now a job for specialists.

The full significance of this observation becomes clear when you consider that on average, human resources account for as much as 70% of a contact center's running costs, way ahead of telephony, technology and real estate costs.
The art of managing an organization's human assets clearly involves planning, i.e. marshalling human resources to match changes in the enterprise's activities.
«The right person, in the right place, at the right time» is a familiar saying, but the problem is knowing what is «right» in every circumstance. This is the key challenge for resource planners.

Human resources account for as much as 70% of a contact center's running costs

The best choice is one that matches the skills and number of employees to the organization's changing tasks and fluctuating activity levels, meeting quality of service and profitability targets while also upholding individual employees' rights and reasonable expectations.

For an existing or prospective customer or user, difficulty in getting through to a contact center is the leading source of dissatisfaction. The customer is forced to hold if there are too few operators at their desks when they call, and they may hang up dissatisfied and not call back. Conversely, having too many operators on duty generates unnecessary costs for the company.

Contact centers, which were originally considered to be cost centers, now play multiple roles, including generating sales, building customer loyalty and streamlining operating costs…
In the past, contact centers tended to communicate exclusively by telephone, and were therefore often referred to as «call centers». These days, many other communication channels are also used, including email, chat and web callback services to satisfy an increasingly well-informed consumer population that has embraced new technologies.
Contact centers have come a long way from their origins as single-site organizations, and are now often distributed across multiple sites, managed either internally by the company or by outsourcers.
One of the direct consequences of these changes has been an increase in the need for multi-skilled, versatile hotline agents.

Human resources management in general, and HR planning in particular, is clearly now a job for specialists.

Contact centers must reconcile the sometimes divergent expectations of different company departments (Sales and Marketing, Finance, Human Resources, etc.) as well as the company's customers, in order to rapidly deliver a high standard of service:

Sales and Marketing : maximize the quality of service provided to customers ;

Finance department : minimize costs and maximize profits ;

Human Resources : maximize employees' skills while complying with staffing constraints and preventing unnecessary turnover through fair treatment and consideration for employees' preferences.

Just as the contact center has become a key part of an enterprise's strategy, and essential to its success, the center's employees in turn play a crucial role in performance.

The planning process raises a range of issues with significant, near-immediate consequences:

Legal issues, due to the need to implement and comply with current legislation and the enterprise's internal regulations…

Social issues, because planning affects and interacts with employees' everyday working lives; intelligent planning helps employees fit into the organization by taking their skills and constraints into consideration more effectively, while also protecting investments in training…

Economic issues, addressed by reducing the costs associated with organizational mismatches (over-staffing, under-staffing, high turnover, etc.), inadequate quality of service and missed sales.

Organizational issues, tackled by professionalizing the planning process and streamlining the time devoted to this often labor-intensive task.

Planning activities focus on the triptych formed by the company, its employees and its customers. These three elements are essential and inseparable. The challenge is to strike the right balance between the three. The «right balance» is when the planning process satisfies customer expectations, meets the needs of employees and achieves the company's objectives, in environments that can vary according to the contact center's purpose, sector of activity and geographical location, within Europe or elsewhere…

Some figures about French Customer Contact Centers.

3 500 call centers

80% internalized

HR Costs = 70%

More than 280 000 people employed

77% Open-ended Contracts

2 Overview of the planning process

The planning process is simple but meticulous:

Requirement definition and forecasting : Predicting the activity required for the various tasks that must be carried out in order for the contact center to operate smoothly. This information is expressed as a volume for a given granularity (1 minute, 5 minutes, 15 minutes, 30 minutes, hour, day, week or month).

Sizing : The workload that must be covered by employees' work planners is then calculated, based on the activity forecast and a productivity assessment. Accurately estimating this workload and the corresponding coverage is the cornerstone of successful planning. Appropriate sizing helps to ensure that an enterprise is profitable. The number of hours required (generally expressed in FTE) for each task (and competency) and each granularity increment is determined at this stage.

Identification of Human Resources : This stage involves making not only strategic choices in terms of the composition of staff teams (concerning contract types, recruitment policy and skills), but also operational management decisions, taking performance and availability factors into consideration, as well as individual employees' personal preferences and the need to ensure fair treatment.

Resources allocation and optimization : This is the stage most often neglected by businesses not equipped with automated planning solutions. It involves matching an appropriate number of employees and the right skills to each task. The planner is also optimized in terms of workload coverage and profitability during this phase.

Publication, follow-up and analysis : During this stage, the results are distributed to the contact center's agents (as individual and team planners) and to the enterprise's various departments (workload coverage per task – number of hours required, shortages, surpluses, etc.)

Before beginning the planning process, the contact center's management team must thoroughly understand the enterprise's overall organization, and identify, comprehend and be able to analyze its customer interactions. They must be able to identify all the tasks arising out of the various customer contacts, each of which will require a particular skill set. Optimized planning for a contact center requires a reliable activity forecasting process that makes it possible to achieve the objectives set by the enterprise's various management tiers.

Planning is a cross-departmental process with strategic, tactical and operational aspects. It has implications not just for the contact center, but also for the enterprise more widely. This process has many participants, including the marketing, HR, IT and finance departments, as well as the planning department, the center's agents and their team managers.

Each employee has a role to play in the planning process, to an extent that varies according to the timescale being considered.

Forecasts are a useful tool for defining the workforce required in order to handle volumes of multi-channel activity that vary over time. They help to coordinate the annual, weekly and daily planners, and, by extension, the long-term (annual to quarterly), medium-term (monthly or period-based), short-term (a few weeks) and even intraday forecasts.

Strategic : Long-term dynamic forecasting is closely connected with budget considerations. The forecast must reflect the sales and marketing business plan as well as emerging trends. This forecast, which must be regularly reviewed and adjusted, provides a basis on which to define new tasks, the recruitment plan, agents' job profiles, the training schedule, etc.

Tactical : Medium-term forecasting involves calculating the volumes of each activity (i.e. incoming calls, outgoing calls, emails, correspondence, etc.) required over a four-week period. Historical data from the CTI or ACD solution or another third-party system can be used to build up a demand profile and identify any atypical days (attributable to school vacations, unusual weather conditions or an advertising campaign, for example). It then becomes possible to deduce trends, seasonality and any correlation between flows, and to exclude any non-representative isolated events caused by endogenous or exogenous factors, such as a marketing campaign or unusually high or low rainfall. The forecast must then be adjusted by including the margin effects caused by known events.

Operational : Short-term (most often weekly) planning is generally based on the forecast work volumes and historical activity data. This activity history, once adjusted by applying variables to reflect changing circumstances, can be used to calculate a distribution law and a daily demand function or a chart representing the end customer's behavior. A productivity law (in many cases the Erlang C formula) can then be applied to this daily forecast as part of the activity sizing process.

Daily management involves identifying any deviations between the calculated and actual situations, with a view to making corrections by adjusting the back-office's contribution to the center's activity, or changing certain times.
Clearly, the various levels of forecasting form an ongoing, dynamic process that can be constantly improved with the ultimate goal of accurately modeling the actual annual, monthly or daily activity volumes, and where possible even representing the activity at the various planning granularities (hour, ½ hour, ¼ hour, 5 minutes or 1 minute).

The more accurately the forecast reflects reality, the more it will help managers achieve their objectives:

→ Satisfy customers by enhancing the quality of service

→ Satisfy agents by reducing the stress caused by productivity boosting initiatives and frequent changes to scheduled working times

→ Satisfy financial and budget requirements.

In conclusion, good forecasting is conducive to more pleasant working conditions, tighter financial control and improved customer satisfaction.

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Sizing consists in estimating the staffing levels (expressed in full-time equivalents) required in order to process the forecast volume of each task at each granularity increment.

The degree of precision can be enhanced by calculating fixed and mobile workloads, based on various parameters (activity, productivity, presence, expectations, etc.). A fixed, variable or Erlang productivity factor can be applied to the activity forecast, depending on the circumstances.

With all types of activity forecast, certain parameters, such as the absenteeism rate or «tasks requiring at least x people» must be included in order to adjust the FTE requirements.

Erlang formulae are widely used to determine how many agents are needed in order to handle a particular number of incoming calls. These formulae incorporate factors such as average call lengths and quality of service targets.

$$Pw = \frac{\frac{A^N}{N!}\,\frac{N}{N-A}}{\sum_{i=0}^{N-1}\frac{A^i}{i!} + \frac{A^N}{N!}\,\frac{N}{N-A}}$$

Explanation of the Erlang C formula

The Erlang distribution formula is a continuous probability law that uses a Poisson process to model the number of simultaneous telephone calls.
For a given level of telephony traffic, measured in terms of the number and length of incoming calls, the Erlang C formula can be used to specify the staffing level required in order to deliver a specified quality of service. This quality of service target is expressed as: Percentage of calls taken within a waiting period of X seconds.
This excellent method is used to solve problems involving random processes.
The following chart shows a comparison of the staffing level calculated using Erlang C against the level obtained by applying an «average productivity» method. The chart shows that when the number of calls is high, Erlang C advocates a lower staffing level than the average productivity method. This is because productivity is highest in this situation. Conversely, productivity is lowest when there are only a few calls per time unit.

Productivity calculations based on the Erlang queuing model do not make allowance for versatile agents, which tends to result in over-staffing. This bias therefore needs to be corrected by introducing a parameter representing the degree of versatility. The following chart shows the workload calculation :

Orange : Workload calculated by applying the Erlang formula to the various queues separately, and then combining the results.

Gray : Workload calculated using Erlang C, assuming that agents be versatile and able to cover all tasks.

Blue : Workload calculated by applying the Erlang formula to all the queues separately and then adjusting the result by applying a factor representing the contact center's versatility.

In the example above, the blue curve yields a gain of approximately 5% of the total staffing level.

Erlang C offers an excellent productivity calculation method for contact centers, as long as an adjustment factor representing staff versatility at the site is included.

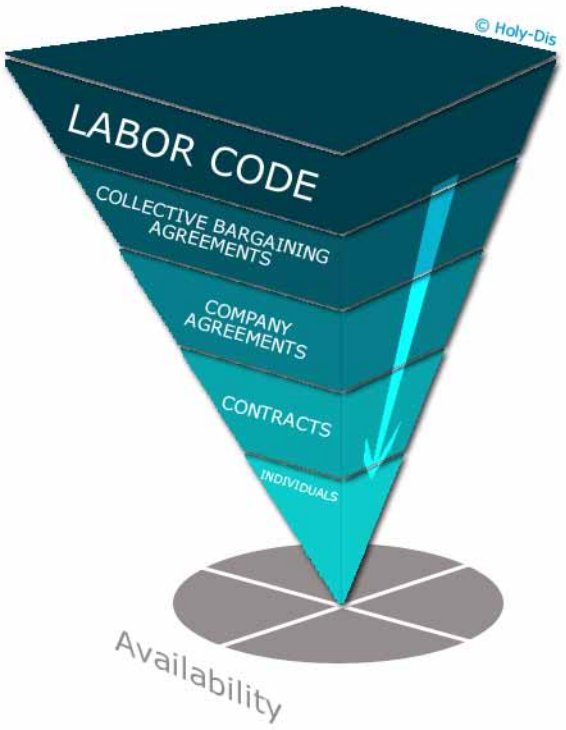
This aspect mainly relates to the operational management of the center's agents.

This primarily involves administrative management of staff teams with various degrees of intervention, depending on the information concerned.
Activities include updating personal details, shift changeovers, updating employees' task versatility information, producing contract riders and managing employee arrivals and departures.
On another level, any time constraints relating to a new type of contract must be incorporated, as well as any changes to the time amplitude for a particular task, following the launch of a seasonal campaign, for example.
Other activities include logging absences attributable to statutory working time reductions, paid vacations, sick leave and maternity leave, for example, and approving employees' requests for scheduling modifications (to suit their personal preferences).

Many factors must be taken into account when producing a work planner, including :

statutory provisions governing working conditions collective bargaining agreements company regulations personal preferences skills seniority fair treatment, customary practices and absences by agents.

The actual availability of all employees can be ascertained by considering these various levels (cf. funnel diagram below).



This aspect involves assigning appropriate staffing (in terms of employee numbers, skills and availability) to handle the forecast activity for each task.

Employee work schedules must not only comply with the planning rules but also provide optimum coverage of the personnel requirement.
At this stage, certain tactical choices must be made in terms of adapting availabilities, whether by modifying contracts and juggling between contracts with fixed, cyclical, variable and freely chosen working hours.

Various coverage modes can be used to optimize the workload coverage and fine-tune the solution to fit the existing organization:

standard type : a competent employee assigned to a task provides «one employee» coverage for that task;

function type : at a given time, a versatile employee assigned to a parent task and one of its subtasks simultaneously provides «one employee» coverage for both tasks;

simultaneous type : task coverage in situations where one task can be included in another.

When assigning resources, in addition to reconciling the personnel availability and activity sizing aspects, a whole range of rules and/or constraints must be taken into consideration. These concern:

Working hours profile :
→ Positioning of meal breaks in a particular time slot during the day
→ Start and end of the working day at specific times
→ Schedule library
→ Fixed and cyclical schedules
→ Special worked days
→ Identical worked days
→ Similarity of schedules for a group of employees
→ Positioning of short breaks, etc.

Capacity of the contact center :
→ Surface area and agent positions
→ Technology

Task distribution :
→ Maximum permitted number of tasks per work period and per week
→ Balanced distribution of tasks between agents over a particular period
→ Minimum and maximum task lengths, etc.

Workload coverage :
→ Weight of one task relative to another
→ Weight of a particular time of day relative to another, etc.

Fairness :
→ Nature and stressfulness of tasks
→ Rest days and unsociable hours (night shifts, bank holidays, etc.)

All of these rules and constraints can be defined at various levels, such as the contact center team or a particular site or country, for example.

Ultimately, optimizing the planner consists in minimizing any periods of over-staffing and under-staffing for each task. Numerous levers exist for adapting and adjusting the situation:

Response to over-staffing (surplus)
→ Optimize break positioning
→ Encourage staff to take vacations or statutory working time reduction leave
→ Organize training
→ Adapt the types of defined-hours contracts, etc.

Response to under-staffing (shortage)
→ Encourage versatility of agents
→ Prioritize tasks
→ Enhance productivity, etc.

Employee work schedules must not only comply with the planning rules, but also provide optimum coverage of the personnel requirement.

At this stage, the individual daily, weekly or periodic planners must be distributed to the contact center's agents within the legally-required time.

In recent years, paper-based distribution has been superseded by SMS, email and/or publication on an Intranet site.

Introducing collaborative tools facilitates communication between the planning department, managers and agents while channeling and simplifying the workflow.

This type of communication helps employees to understand and therefore adopt the planning process by raising awareness of the concepts of fluctuating activity levels, seasonality and the impact of absences.

Involving contact center agents in the production of their own planners (by taking into consideration their personal preferences and requests for leave or shift swaps) encourages them to act responsibly and be aware how their choices affect the requirement coverage situation. This approach also significantly enhances productivity.

Managers require dashboards to help them analyze performance by team, by agent, by skill and by flow.

These dashboards will be analyzed on a daily, weekly and monthly basis in order to compare quality of service with HR performance. This information can be used to:

→ Increase the standard of workflow forecasting

→ Seek the causes of any dysfunctions

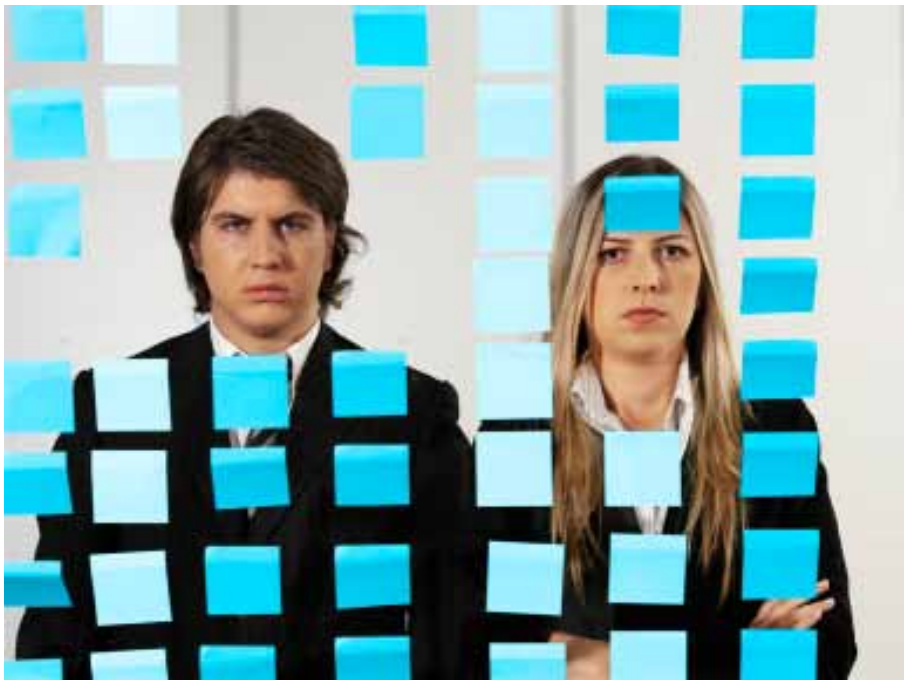
→ Adapt staffing levels, in both qualitative and quantitative terms

→ Enhance HR performance

→ Reduce costs

→ Improve working conditions

Managers monitor the actual activity for each task on a day to day basis and respond to any deviations (due to unplanned external events), as well as checking compliance with scheduled working hours (identifying employees arriving late, unplanned absences, etc.); this lets them adjust schedules if they see fit, and identify levers for improving planning in the future.



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3 Amusing illustration

Creating a planner is actually a combinatory logic problem. We can illustrate this by considering the example of Sudoku, a brainteaser that is very popular in Asia and has swept across Europe in recent years! Sudoku puzzles feature a grid of 81 cells set out in 9 rows, 9 columns and 9 boxes. The principle is simple: fill in the missing numbers in the grid so that each row, column and box contains each number from one to nine, once and once only.

Now imagine that:
The numbers represent the employee numbers of a company's workers, with the numbers already in position being the employees with fixed schedules, and those still to be placed representing the employees with variable schedules;
The columns represent work periods (C1: morning, C2: afternoon, C3: evening);
The rows represent tasks that must be performed (R1: Front office, R2: After-sales, R3: Back office);
The boxes represent working days.

Illustration 1 / Simple constraints

Let us look at the hypothetical example of an insurance company branch office with nine multidisciplinary employees and few specific constraints. The team works to nine-day planners, each day is split into three periods, there are three tasks to be performed and, importantly, the workload remains constant throughout the day, and from one day to the next … The only constraints that need to be taken into account relate to the fair distribution of tasks and periods.

Furthermore, company tradition has it that two employees have fixed schedules: Claire (employee no. 1) and Anthony (employee no. 2). Claire works mornings the first three days, afternoons the following three days and evenings for the last three days of the nine-day period; Anthony works afternoons the first three days, evenings the next three days and mornings on the final three days. They handle all three tasks, however. The manager has to find the correct combination of employees, periods and tasks. In this scenario, with very few constraints, there are no fewer than 1.71705E+18 acceptable permutations!

The diagram shows one such combination that meets the requirements of this illustration.

1	2	5	8	9	4	7	3	6
6	9	3	1	2	7	8	5	4
7	4	8	6	5	3	1	2	9
3	1	2	4	8	6	9	7	5
9	5	7	3	1	2	4	6	8
4	8	6	5	7	9	3	1	2
2	3	1	9	6	8	5	4	7
5	7	9	2	4	1	6	8	3
8	6	4	7	3	5	2	9	1

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Illustration 2 / Average constraints

C Now let us assume that the insurance company office has to implement some recent changes to the applicable collective bargaining agreement. An employee who works evenings can no longer start their following day the next morning (although an industry agreement states that this rule can be waived once per nine-day period).
Furthermore, the office's environmental policy also imposes a restriction relating to car-sharing: whenever possible, employees 3 and 4 should have the same hours.

Each day has its own constraints. When the constraints that apply on a particular day have been identified, they can be selectively transferred to other days in a procedure known as «constraint propagation». The number of possible solutions is gradually reduced. As the number of constraints increases, the number of acceptable solutions decreases, making it increasingly difficult to find one… Such is the intrinsic challenge of constraint-based planning!
Why not try solving these two grids? You will see for yourself that grid 2 takes much longer to solve than grid 1.

1	2	3	8	5	6	9	7	4
7	9	4	1	2	3	8	5	6
8	6	5	7	9	4	1	2	3
3	1	2	4	8	9	7	6	5
5	7	6	3	1	2	4	8	9
4	8	9	6	7	5	3	1	2
2	3	1	9	6	7	5	4	8
9	5	8	2	4	1	6	3	7
6	4	7	5	3	8	2	9	1

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Illustration 3 / Severe constraints

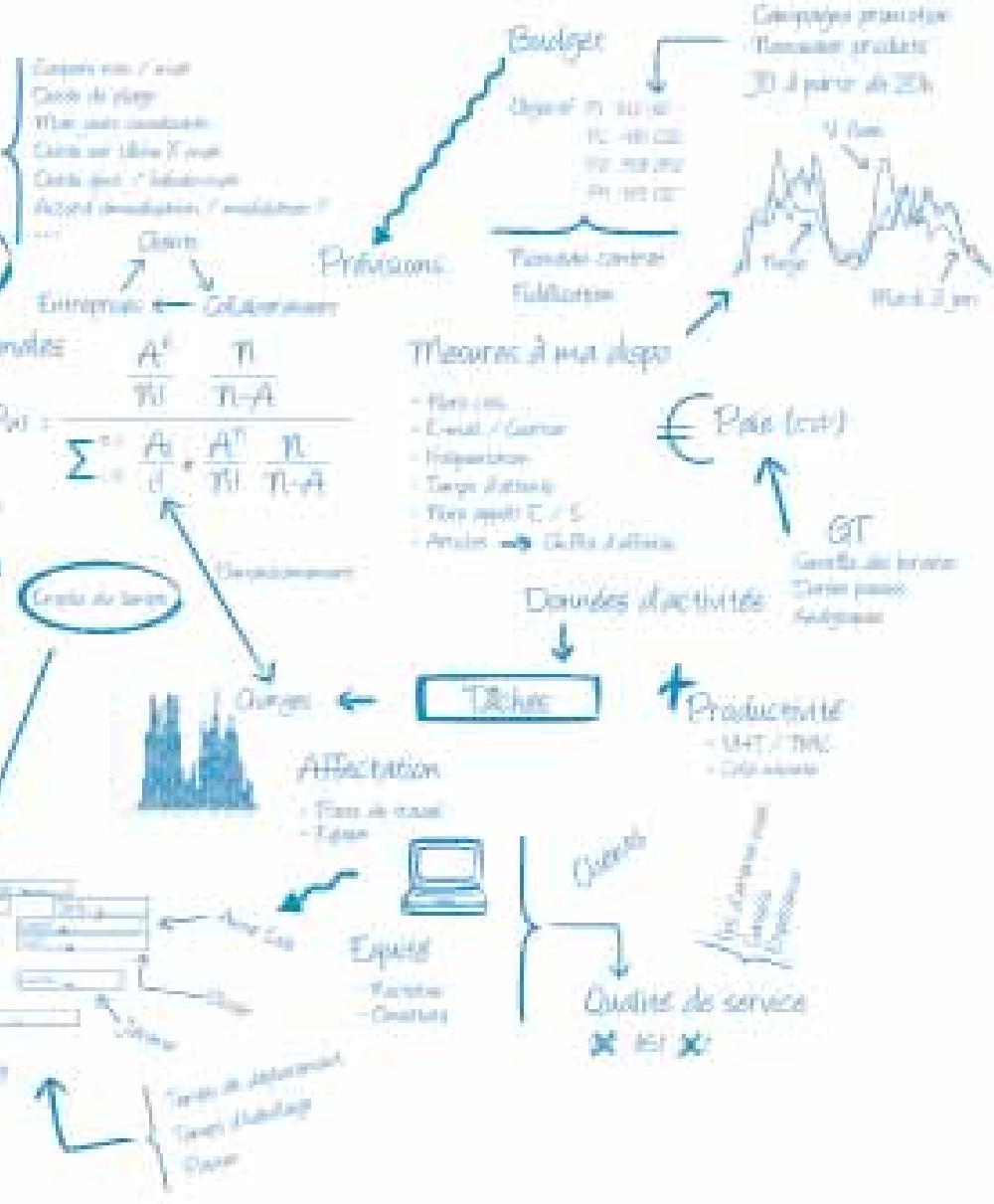
Now add up to 30 different employment contracts; up to 70 tasks; a fluctuating and highly seasonal business model; collective bargaining agreements containing restrictive legacy perks and arrangements; a mix of fixed, cyclical and variable schedules; constraints affecting individual employees, of which some are known and recurrent while others are of an extraordinary nature; compliance with flexi-time and annualized hours agreements; optimized timing of employee training courses, etc.
This is a non-exhaustive list of constraints frequently encountered by planning departments. Planning is anything but child's play, and managers require the assistance of IT solutions with the necessary functionality and computing power to automate the processes involved.

There are no fewer than 1.71705E+18 acceptable permutations!

Pour la planifi

cation optimisée...

... faites appel à des experts.



4 The need for a software-guided process

Manually producing an optimized HR planner is practically impossible, due to the complexity of the applicable management rules, the existence of billions of possible permutations and the limited time available.

In order to comply with all the constraints and ensure that customers receive satisfactory quality of service without overrunning the budget, the contact center must be equipped with a Workforce Management Software solution featuring a powerful optimization engine that calculates employee working hours in accordance with statutory requirements and the principles of fair treatment. In addition, purchasing this type of application should not be viewed as a cost, given that a positive return on investment is achieved within months.

The solution facilitates communication and problem-free exchanges with employees as well as the departments involved in the planning process. To get the full benefit of the solution's capabilities, enterprises should opt for an appropriate package of training and support services when the solution is introduced.

A specialized unique solution rather than one module from any all-purpose software.

About Holy-Dis

A major figure in scheduling optimization and workforce management in any critical environment, Holy-Dis elaborate and implement their solutions in a variety of sectors such as Contact Centres, retail business, catering and supply activities…
Thanks to a strong commitment in customer satisfaction and to a thorough knowledge of their target sectors, Holy-Dis is in a position to help their clients achieve significant savings in productivity and general expenditure: "the right person in the right place at the right moment".

5 What makes a good planner?

Planning managers need an in-depth understanding of the contact center's environment and organization, and more generally, be familiar with the workings of the enterprise and its business activities and workforce, not forgetting any internal and external factors that might affect the work planners they produce.
Planning managers also require up-to-date knowledge of the regulatory framework and any collective bargaining agreements in force at the company, although they do not need to be specialists in such issues.

They must be totally familiar with the mechanisms relating to the specifics of the contact center whose activity and resources they are responsible for planning. It should come as no surprise that many planners have a background in Production, as a good understanding of the enterprise's core business is the key to anticipating its production requirements.

These skills enable planners to make the right choices when they have to decide between :

→ satisfying the company's customers

→ satisfying the planner's superiors

→ satisfying the employees whose work they plan.

Good planning is the key to finding the right balance between these three criteria, and vice versa. Planners must also be aware of the importance of their cross-departmental role in the contact center, as they often act as an interface between the employees and the human resources department, and between Production and the management team. Because of this, they cannot simply be operators blindly following a process.

Their position within the contact center makes the planning manager (or planning team) a key player, with a role that is instrumental in maintaining a harmonious relationship between customers, employees and the enterprise.

This position regularly raises the question whether the planning manager should report to Production or to Human Resources. These two departments do not necessarily have the same obligations with respect to the management team, and any case not the same objectives. For example, ensuring customer satisfaction while maintaining tight control over wage costs is no mean feat, but that does not prevent reconciling these two goals from being one of the main challenges for the planning manager!

In practical terms, a planning manager must master the planning process and be able to implement it using software that helps to optimize the enterprise's activities and human resources.
They have a managerial role and must be at ease handling figures and be capable of analyzing as well as summarizing data.

They are also responsible for communicating HR requirements, monitoring procedural changes in the field in order to include them in the workforce management process, propose solutions to improve forecasting and planning, analyze discrepancies between forecast and actual situations, deducing whether additional staffing will be necessary in future, scheduling training sessions and other events, and observing the effects of vacations and statutory working time reduction leave.

Planning managers also play an important role in maintaining a positive atmosphere in the workplace and preventing staff conflicts. In this respect, they must be a good listener with excellent interpersonal skills, and be able to understand issues relating to many different areas including production, HR constraints, profitability and productivity targets.

In most cases, it happens that the person in charge of scheduling operations comes from the Production Department. Thus, a keen knowledge of the work involved in that department will help to anticipate the requirements in terms of how many staff is needed.

What are the qualities required to achieve successful task scheduling?

Be able to offer alternative solutions

Have strong communication skills

Be able to carry out analysis and have ability to synthesize

Maintain a relaxed work atmosphere

Have a high capability to listen and understand co-workers.

Have recognized management skills

Be familiar with the process of timetable elaboration and with tools of activity forecast

6 Terminology

Coverage:	Ratio between the volume of activity to be processed (expressed in hours or FTEs) and the allocated resources
Fixed workload:	Number of employees in each time slot in a working day
Flexi-time:	Working time arrangements that take employees' preferences into consideration
FTE:	Full-time equivalent
Forecasts:	Estimated volume of activity for each task
Mobile workload:	Number of hours in each time slot in a working day
Outsourcer:	Service provider with call-handling infrastructure and personnel qualified to make and receive calls
Productivity:	Ratio between a quantity of activity carried out and the time required in order to do so
Requirement:	Workload expressed as a number of employees or a number of hours
Shortage:	Uncovered requirement, expressed in hours (under-staffing)
Surplus:	Excess hours relative to the requirement (over-staffing)
Workflow:	Approval circuit for employee requests

Tell about your own experience

Do not hesitate to communicate on your experience and let us know about your point of view regarding our approach of optimized scheduling in call centres : Send an email on : marketing@holydis.com.

To know more about Holy-Dis and their solutions, visit www.holydis.com HolyDis website

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