ARTIFICIAL INTELLIGENCE IN PROJECT MANAGEMENT

Why you should not go without it

An essay by Thomas Schlereth, CEO of Can Do and Michael Fenske



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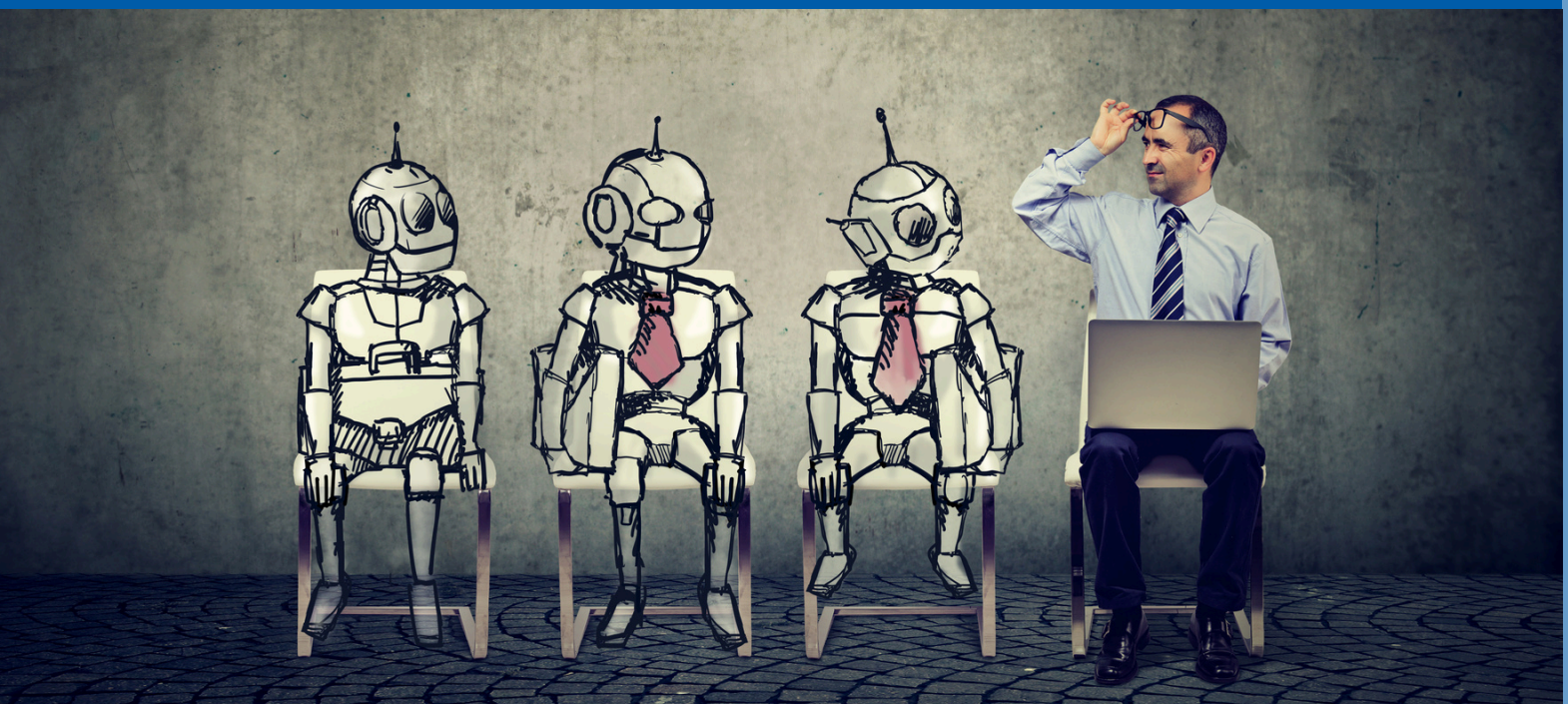
AI OR NO AI?

Artificial intelligence, often abbreviated as AI, is a familiar term, but what exactly does it mean? Where is the line between intelligently programmed algorithms and real AI? There is no single definition of AI, but it can be roughly divided into "strong" and "weak" AI.

At Can Do, we don't want to overwhelm you with technical details. Instead, we will briefly explain why we talk about artificial intelligence when it comes to one of the most important features of our project management software. Can Do can look at your project management from a human perspective, without relying on rigid data. This applies both to the input of imprecise data such as milestones and to rough future forecasts. Can Do AI also makes recommendations for action based on object models and their interpretation.

Can Do AI is capable of learning. As it monitors projects in real time and makes recommendations, it uses data and experience from previous projects. The more it is used, the better it gets.

In addition, Can Do is equipped with the Watermodel® algorithm, which mimics the behaviour of human organisations. To distinguish this specialised algorithm from Can Do's general 'human' capabilities, we refer to the former simply as an algorithm and the latter as artificial intelligence.



1 WHY AI IS USEFUL IN PROJECT MANAGEMENT

They still exist - the project managers who plan their projects on their shirtsleeves, using a spreadsheet or other programmes that have been misused for other purposes. It may work for a start-up, and it may naively emphasise the agile nature of the projects, but it won't work for long. Here are a few reasons why artificial intelligence in project management is not just "nice to have", but often indispensable:



1.1 People are no projects – and vice versa

The realisation that people make mistakes is nothing new. And that's not a bad thing. On the contrary, agile project management in particular is designed to use human factors as a strength for project progress. But when it comes to managing and controlling projects, tools are needed that both understand and contain the human aspect. An AI such as Can Do is capable of recognising human patterns, learning from them and suggesting appropriate real-world outcomes and recommendations. However, control over the planning always remains with the user. Can Do is therefore an advisor and does not take control of projects.



1.2 Companies grow – projects too

If you work in a small company with a handful of projects, a Kanban board and a spreadsheet are often enough. But it is not the goal of a company to stay small and unbiased. Therefore, project management should be able to grow with the company thanks to appropriate tools. Can Do offers an AI that is able to scale its capabilities. From single, manageable projects to huge multi-project portfolios.



1.3 Human planning is never exact – it doesn't have to be

Who can predict the results of their work months in advance? When people plan for the future, it's not a prophecy, it's just an individual assessment. Can Do offers the possibility of capturing such imprecise assumptions in the software, mapping them and incorporating them into the project forecast. This makes the forecasts more realistic. A pleasant side-effect is that user acceptance increases because they are not forced to specify a false precision.

2 AI IN PROJECT MANAGEMENT: WHAT DOES IT MEAN IN PRACTICE?

Why is it so difficult to plan people in projects - and does it have to be chaos every day? The daily grind of project management is often enough to make you tear your hair out. But why is reliable planning and effective resource allocation so difficult? Is it really so bad if projects are influenced by human aspects? And why is "roughly" more realistic than "exactly"? We look at the challenges of project management, planning and how we can simplify resource management with our own Watermodel® algorithm and the ability to plan imprecisely.

2.1 Challenges in project management

Some challenges in the daily project business can almost be neglected as "background noise"; others require already advanced project skills to cope with them. And then there is the biggest and least controllable challenge – the human...

2.1.1 Obvious challenges

This can be understood as aspects that are clear to everyone in project management when planning in a coordinated way with several people.
This includes:

A common time must be found when everyone has enough free working time. This is difficult enough with meetings. Also, the right people have to be available - people with the right skills to get the job done.

Another important component is the interdependence of work. Some people cannot start their work until others have finished theirs. Everything together is framed by conditions such as time and quantity. One cannot work endlessly on something with any amount of effort, but must complete one's task within a c ertain, but imprecise, period of time. This time and/or amount of work is often predetermined, mostly by people who cannot even estimate the amount and time of a task.

2.1.2 Increased Challenges

The next level of influence is not so obvious:

People in companies are sometimes just not there. They are on paid leave, parental leave or sick. Some of these absences are predictable, such as summer holidays. Others are difficult or impossible to predict, such as accidents or illness.

Another problem is that the work task may change between the planned time and the start time. This can be caused by a client who has changed his mind, for example. Or new knowledge may have been gained in the meantime that affects the originally planned work.

In such cases, the original plan has to be adjusted, which may mean that the entire work chain has to be changed. Such a change in plans can be as costly as the original planning.

2.1.3 The biggest challenge: the human

People are not "programmed" to be able to predict the future accurately. Because they don't have to and haven't had to for a very long time.

In very early times, people - hunter-gatherers - lived from day to day (agile, so to speak). Later - in the age of agriculture and livestock farming - it was the seasons that dictated a very rough planning. The essential necessity of temporary planning was shaped by temperatures and daylight.

In the industrial age they operated on piecework and planned just like that: the dictates of the clock, the number of pieces to be produced and the time for each individual work step. This was not so difficult, even without a computer.

The time required for a work step was known, the processes were always the same, and there was always light. The work sequence, the delivery of parts and the automation could be optimized further and further and in more and more detail. The activities were monotonous for the individual, but predictable and measurable for the company.

But even back then, there was work that was not subject to this model - namely research and development. Work could not be and was not done on a piecework basis. Other aspects such as creativity and coincidence were decisive in these "projects", which brings us to today's times.

Even if this does not apply across the board and to absolutely all projects and companies, we can state that piecework-like routines are rarely encountered. In many cases, each piece of work in a project is unique.

This work has never been done before. That means they are difficult to predict, both in terms of the time required and the amount of work or even the general feasibility.

Today, people no longer work in a factory, in one repetitive step as they used to. They are not specialized in one aspect anymore but due to increased qualification they can perform many completely different or even completely new types of work.

With this qualification and the universal use of labor, the actual human factor comes more to the fore: most people want stimulating work which, in this context, equates to variety. This pursuit varies from person to person and is influenced or overlaid by non-work-related interests (example: work-life balance).

In the age of information, intellectual activities and concepts such as creativity, dynamism and ideas make a job seem valuable. And the best among the employees want to be challenged and encouraged, but not overwhelmed.



3 AI AND PROJECT PLANNING: THE BEST WAY TO GO

Project planning is one area of project management where an AI can demonstrate its capabilities in a particularly impressive way. That's especially true when project management creates an optimal environment for AI with so-called hybrid planning. This is a combination of waterfall, rolling and agile planning.

3.1 Rolling planning

Is it reasonable to assume that future events are harder to predict the further they are in the future? The answer is partly yes. Recurring events such as Ramadan, eclipses or Christmas can be predicted fairly accurately. But when will the administrator be done with the installation?
They usually don't know.

Take a look at your electronic calendar. It is based on the principle that events in the distant future are difficult to predict or are currently unknown. As a result, the calendar is filled with a large number of precisely planned appointments for the next few days and perhaps a few weeks. Then the entries become fewer and fewer. It is punctuated by predictable dates, such as holidays, and controllable, fixed dates, such as vacations.

The above principles can be extended to include a derivation of precision: the further in the future an event is, the fewer details can be planned. From this we can derive the planning process of rolling planning (very simplified): in the short term I can plan precisely and in the long term I can plan imprecisely or roughly.

Applied to project management, this means that work packages in the near future (a few days or weeks) are planned in detail - but still imprecisely, because they are based on the planner's knowledge and assumptions. The further ahead the planning, the more work is grouped together (trades, phases, epics). This summary is then extracted into more detailed tasks when the planner is "closer" in time.

Therefore, a plan is rough at the beginning, i.e., has few planning objects, and becomes more and more detailed over time. For example: at the beginning of the project, the plan consists of 10 planning objects, at the end of the project it´s 2,000.

In rolling planning, a "wave of detail" is constantly pushed ahead until the project goal is reached. This is a realistic approach, as it corresponds to the human way of thinking.

Practical experience shows that planning does not become more realistic the more detailed it is. Nevertheless, they do exist, these huge detailed plans, some of which plan a project to the exact day over a period of years. However, they are not based on reasonable assumptions, but often arise from the planner's fear of forgetting something. Or they simply represent wishful thinking. Always remember: Just because something is listed in detail in the project plan it does not guarantee it will actually happen.

3.2 Agile Planning

Agile planning is an extreme variant of the method described above. It finds great approval especially in the IT sector. It was built from the realization that most IT projects were completed late, became more expensive and / or did not meet expectations in the past. Therefore, the planning was adjusted to the fact that such projects are subject to a certain degree of unpredictability.

If a project and the work it contains are not predictable, it is only logical to "drive on sight". Working from day to day or from Sprint to Sprint. You are finished when you are finished - whenever.

This method is not as bad as it sounds, but it must be reflected critically. After all, there are IT projects (and other projects, for example in the construction industry) that could be planned and implemented successfully. And when justified criticism is expressed at projects, we all tend to say it is caused by human error of another person. This is superficial and wrong: most of the time there are different factors that influence or disrupt the project. To many of those involved from the very beginning it is clear that the most projects cannot and will not go as planned. Economic constraints, lack of preparation time and influences by less qualified people make a really good and realistic planning obsolete from the beginning.

Of course, engineers can accurately predict a project like Stuttgart 21 or Berlin Airport - or at least 80% to 90%. But this would mean an extreme planning effort. Furthermore, planning would have to be carried out within certain tolerances, which is contrary to other decision-makers and the classic budget planning of state-owned or commercial companies.

Unfortunately, no contract is awarded on the basis of a (realistic) quote of "between eight and ten million". Instead, the lowest quote wins the contract.

It makes perfect sense to plan only what is predictable. After all, the plan for a project should reflect the future, not just wishful thinking. However, that future can also include not knowing and simply trying to see if it will work.

In the IT industry, this task can be solved more quickly than in other projects. This is what distinguishes an agile, cloud-based IT industry from most other industries in "old" industrialised countries such as Germany. The perfectionism sought in industries such as construction, automotive or mechanical engineering is fundamentally rooted in the fact that such problems cannot be solved quickly, cheaply or easily. This is why agile working has developed and established itself in the IT industry - but not in other industries.

As sensible as they may seem:
Agile working and agile project planning are sometimes not possible, even if management postulates this in order to demonstrate its own modernity.



3.3 Ideal combination: Hybrid planning

But if neither rolling nor agile planning can serve as a standard tool for all project planning cases, what then?

The new approach of hybrid planning could provide a way out of this dilemma. It combines two planning techniques:

1. **On a rough level, planning is done classically, rolling.**
2. **In detail, planning is agile.**

Combined with the ability to plan imprecisely, even at a coarse level, we are already very close to realistic and probabilistic planning that reflects people's level of knowledge.

This method of planning sounds complicated, but it is not.

Traditional long-term planning, with its milestones, phases and budgets, is an - imprecise - wish list formulated from a rough perspective. During the actual implementation, detailed planning takes place (within the framework of sprints). However, the framework of rough planning still exists.

This simply takes into account the human factor at different, quasi vertical and horizontal planning levels. At the strategic level, wishful thinking that is not unrealistic is described as inaccurate. Example: "The project will be finished in the 4th quarter". At the operational level, which has a high level of detail, work is planned for only two weeks (one sprint) or a little longer (2-3 sprints). In this way, the different perspectives of the "strategic" managers and the "detail-oriented" project team members are combined and complement each other in a goal-oriented way.

Take a look at the Can Do software

BOOK LIVE DEMO



Agile work is dynamic, constantly adapting to changing knowledge and circumstances - everything is in flux. Strategic planning, on the other hand, looks at the 'big picture', assumes a long time horizon and is highly imprecise.

Classic		Agile		Hybrid
Plannability	+	Flexibility	=	Dynamic
Structure		Change		Customization
Responsibility		Freedom		Motivation
Constancy		Movement		Orientation
Control		Nonchalance		Security

The hybrid planning technique takes the best of both worlds and accommodates the thinking and actions of all stakeholders. It is applicable to most, but not all, project challenges.



4 AI AND PROJECT PLANNING: HERE'S HOW IT WORKS

Having outlined the environment in which AI project management algorithms work best, let's highlight other helpful aspects of algorithms:

4.1 Algorithms transform data into information

The first point is that it's very difficult to predict the dimensions of a future job. It is very easy in the relatively simple environment of a factory or when planning a vacation. For example, the vacation ends when it is over. The quality of the vacation plays a very minor role in the planning.

But it is quite different with projects such as a new design step in mechanical engineering, the development of a computer program, or the predictability of a management decision. We have to admit that there are things we cannot predict - but we are not completely blind or unaware. What we cannot predict exactly, but at least approximately, is the work, its duration and therefore the time and effort required. We do not know exactly how long it takes to develop a computer program, but it is clear that it is neither a minute nor 1,000 years.

But we can estimate an interval, an imprecise value for start, end, duration and effort. We don't say "this will take exactly 46 hours", but we estimate "30 to 60 hours". That's the interval.

Something that is a daily information routine for a human is not so easy for a computer and the software to process. There is not just one value to calculate (46 hours), but several (30, 31, 32, 33, etc.). Because of this imprecise information in an interlinked schedule, the dates for the end of the work and therefore for the start of the following work become imprecise. The start is not exactly on 06/03, but sometime between 06/03 and 07/01.

This creates a dangerous combination for the algorithm. The work package could start on 06/03 and last 30 days, or on 06/04, or on 06/05 and last 30 days, or 31 days, and so on.

This way, the possible combinations do increase exponentially. If there are several dependencies in a project plan, with other work in other projects, it can quickly increase exponentially, which sooner or later is devastating for the machine. This is of no help in practice. An example to illustrate this:

From all possible combinations the algorithm calculates whether there is a problem for a project or not. For example: among 100,000 combinations, it finds problems in 70,000 combinations, i.e., in 70% of all cases. Although this is mathematically correct, it assumes that all combinations have the same probability of occurring (as with dice). However, such a homogeneous distribution of probabilities is not close to reality.

In order to have a more realistic outcome, a filter is placed over the results. This filter, which makes the algorithms work easier, corresponds to the well-known Gaussian Normal Distribution.

4.2 Gaussian Normal Distribution for project probabilities

The scenario described above assumes an equivalent probability within the estimated interval. This means that for a simple work package estimated with an effort of 5 to 10 days, each case, i.e., 5 or 6 or 7 etc., is equally probably.

However, this is not the case in practice. The probability that the development of a computer program takes one minute is just as small as the probability that it takes 1,000 years. It is the same with the work package. In reality, the endpoints of the interval of 5 days and 10 days are not very realistic. The midpoint, i.e., 7.5 days, is more likely.

It is also possible that the duration is outside the interval, for example 3 days or 12 days. This could be extended almost infinitely, up to the case that the work package is not done at all (zero days) or runs into eternity. However, such considerations only lead to even greater complexity and can be ignored.

Exceptions are the so-called Demands, i.e., whole projects in the future, with no clear decision being made so far. The possibilities here are actually between 0% (guaranteed not to be realized at all) and 100%.

In our case ("5 to 10 days"), the Gaussian standard normal distribution would measure each work interval between the plan (estimate) and the reality (how long it actually took) and derive a confidence level. In a centralised computer system, all work packages initially recorded as 5-10 days would be compared and measured against the reality that occurred.

It might turn out that most packages with these parameters actually took 7.5 days. This allows a conclusion to be drawn about all future 5-10 day packages, namely that they are likely to take 7.5 days. But it is also possible that the most common case is not 7.5 days, but 9 days.

Statistically, this is all logical and can be applied to comparable intervals. But is it true?

Unfortunately, no: it is an approximation that is heavily influenced by the people who work and estimate the effort required. There are those who are optimistic and those who tend to play it safe. The latter estimate 5 to 10 days, but tell the project planner 8 to 10 days, 10 to 15 days and so on..

The same principle applies to planners: an employee's estimated time is often presented as "exaggerated" and planned shorter. The employee knows this and deliberately overestimates because his estimate will be cut anyway. The planned value is therefore not a purely technical or empirical result, but rather a result of human feelings.

However, modern simulation software can handle such models. Multiple, combinatorial simulations have proved to be the best way. This means that every case of the interval is calculated. The method works as follows:

First, it's assumed that the parcel will take 5 days, then it's checked: is there a problem - yes or no. Then everything is calculated again, this time with 6 days. Once again: Is there a problem - yes / no?

Each problem found is then weighted with its probability. In our example, the problem is less likely with 5 days than with 7 or 8 days. The result is not the expected duration (that would be a coincidence), but a percentage defined as risk between 0% (all cases work) and 100% (no case works). The result provides information for the project manager to evaluate.



With an assumed risk of 75%, for example, he can also take into account the reliability of the person, the work steps themselves and other environmental influences that the computer cannot know about - and therefore cannot evaluate. Or he can simply take the risk.

Combining mathematics with human experience and perception is an ingenious solution. Unfortunately, the algorithm still has one problem: the sheer volume of data. With all the possible combinations, we are dealing with exponential growth.

This is particularly noticeable in resource planning: If two work packages are planned imprecisely and in parallel with the same resource, all possible combinations have to be calculated. Let's take the following scenario as a mental exercise:

A package starts sometime in week 23 (yes, even the start of a job or project can be imprecise) and lasts 5 - 10 days. Mr Smith is scheduled for 30% of his time. The parallel running package starts between week 23 and week 25 and lasts 4 to 6 weeks. In this package, Mr Smith is scheduled at 80%. Will Mr Smith be able to complete both packages?

The answer is yes: he can organise his work in these two packages in such a way that he gets both jobs done on time and without overloading. I have to admit that I had Can Do calculate this for me because it would have taken too long to do it manually. And we are only talking about two packages for one resource. Let's imagine a portfolio of 200 projects. All of them are imprecise and whole departments are scheduled. Now it's time to do the maths.

A computer program can help by allowing the planner to enter imprecise values. The computer calculates all possible combinations and determines a probable risk of a problem occurring, such as a missed deadline. Such a risk, determined by an algorithm, can be between 0% (nothing is guaranteed to happen) and 100% (everything goes wrong).

For estimates between 40% and 60%, the information obtained is not so clear for the planner. Either the human or the AI must continue to consider and ultimately decide whether it is worth intervening - or not.



Do you want to learn more about AI in PM?

TO THE BLOG ARTICLE

4.3 And again: the human and its influences

Although we can represent the planning of processes and the calculation of probabilities and risks as mathematical models and thus hand them over to an algorithm: The human impact in these scenarios cannot be underestimated, as has been pointed out several times.



All parties involved in a project and its planning have their own interests which are completely different from each other.

The overall goal of delivering a great project within the constraints of the framework is often not the primary motivation of the people involved. Among other things, the company's error culture and the experience and professionalism of the project managers play an important role. Sometimes project specialists simply don't care about the overall goal of the project and the benefits to the business.

Even managers sometimes don't care what kind of pressure people are under on projects. They just don't want to get into trouble with senior management or other stakeholders - or simply score points with them.

Basically, there are two poles in this situation:

The senior project manager wants to get the project done with as little effort, cost and time as possible. The project team members want to complete their tasks on time, correctly and professionally, without being under constant stress.

This scenario and the above considerations can be smoothed by the software. Most importantly, the employee's personal assessment can be incorporated into the planning, creating trust. Even if employees cannot make a binding and precise commitment, this is taken into account in the planning. They are taken seriously.

It is often said that imprecise planning is closer to reality. This is certainly true, but overall it creates a better basis of trust and professional respect between the parties involved. Because of the risk assessment and its probability described above, the personal assessment of managers and employees in the current project becomes important again. If the risk is 75%, a (good) project manager will point this out to the employee and ask: "Can you still do it?

How this complex software calculates the risk is not really important to people. The machine points out a situation early on and triggers a human assessment of the people in the game. This shows how the quality of the project and the interaction between people is improved.

In the past, there was a factory mentality of an all-knowing manager who was followed by his subordinates with unconditional obedience and compliance, but that doesn't work anymore. Especially in a global economy with a shortage of skilled labour. But the pure, free and relaxed life of highly qualified specialists is not the reality either.

The truth is probably somewhere in the middle. Which brings us back to Carl Friedrich Gauss and his standard normal distribution.

4.4 Can Do Watermodel®

Can Do has a specially programmed algorithm that simplifies resource management in particular (skill-based if desired). Especially in multi-project management. We'll show you how task organisation works - and how it can be significantly improved with Watermodel®.

4.4.1 Task organization of individual people

People do not work like machines, nor do they work on piecework in our knowledge and service society. Employees in companies are highly qualified and have many skills, so they can be used for a wide variety of tasks.

Project management is a way of working that is primarily goal-oriented. This is expressed in terms of deadlines, however imprecise, and quantities. Milestones in projects represent partial goals.

Both of these conditions are shaping project planning today, as is the use of modern planning software. Managers need to rethink, and microplanning in particular has changed significantly.

The goal set by the project management for the entire project is broken down into partial goals, i.e. milestones. This refinement also takes place in the work packages of the people in a project. The work to be done has a start, an end and an estimated workload. From this work, an employee has several in parallel in their personal planning. This can happen in a single project, but also across projects. In addition, the person has to manage non-project related work - such as basic staff utilisation, meetings, etc.

The detailed organisation is the responsibility of the individual. So they decide when and how much work to do. They only have to adhere to the planning framework.

These people do not prepare a detailed work plan for a week or more. Their personal calendar doesn't say: write a concept for 1.5 hours on Monday, then talk to colleagues (30 minutes), then work through emails (21 minutes), etc.

To exaggerate, the employee works from day to day, ideally without taking into account higher-level planning. They then set their priorities and often their work intensity.

The most important point for the planner, however, is that the employee must be able to complete all the work, assuming good personal organisation. If they cannot keep up with the targets set in the plan, there will be deviations. Worse still, if this happens regularly, people don't believe in the objectives and don't take them seriously. They run after a goal that can never be achieved and eventually ignore it.

This is the result of a top-down disruption of the entire planning of a company. The board releases (or orders) unrealistic projects, the project manager passes this impossible work on to the team members who are always behind schedule. If a project deviates significantly or even fails, the project team members are blamed for not meeting expectations.

People should only be used to capacity, and perhaps a little more. Otherwise, planning is pointless. Therefore, the project manager or line manager needs to know at the time of planning whether a team member will be able to complete the task in real time.

Using averages for a work package is misleading. An employee who is supposed to work on a text for 5 days, but does not spend more than 20 hours in total, will not work on the text for exactly 4 hours every day. If he has a day off, the software will show him as overloaded, even though he can easily manage the package with some organisation of his own.

Some solutions help themselves by increasing the "flight level". In other words, they no longer look at the workload for a week, but for a month. If the employee has 160 hours of availability per month and is scheduled for 150 hours in total, then it works. Anyone who plans like this is unfortunately stuck in the past of piecework. Project plans are not based on months or quarters, but on individual work packages or phases, which are correspondingly shorter and must also be completed on time. As a result, a periodic view of staffing levels is of limited value.

Another popular fallback strategy for project planners is to simply plan roughly. Many work packages are grouped into one planning element, and then staffing is planned.

The more detailed work steps are simply documented and the details are left to the employees. Of course, this does not change the reality at all, except that the employee(s) are not only carrying out parts of the project, but also planning it themselves.

An important insight into how work is organised: The detailed organisation of how a person manages parallel tasks is complex and dynamic. Especially because people themselves do not know exactly.

4.4.2 Planning with Watermodel®

The Can Do planning software includes a sophisticated algorithm that can easily handle the complexity and dynamics of work planning and organisation.
The process is called "Watermodel®" because work for people is dynamic and moving, like water in a pool.

Watermodel® simulates all possible work arrangements within the limits - every single one of them. When the algorithm finds the variants that work for the employee out of thousands of combinations, the system remains silent. There is no need to warn the project manager, because he can do it himself. But the situation is volatile. A single feedback from the employee on a work package changes everything, and it has to be re-simulated whether the employee is still able to organise his tasks.

In larger companies, this can become extremely complex, as several people may be assigned to work on a single work package. In addition, there are often a lot of packages with a lot of resource assignments. Depending on the company and the industry, the number can run into the millions. However, the Can Do software with Watermodel® also manages these calculations in real time.

To add to the enormous complexity, there is another factor to consider:
The planning objects used for the calculation are not predictable, they can be imprecise. Therefore, it is not known when exactly the work package will start, how long it will take or how much work will be done.

The algorithm has no choice but to combine every possibility of how a work package might run with every other variant of every other work package. Thousands of combinations turn into billions. The algorithm does this in real time.

It would be impossible for a human to plan a project. Therefore, planning people in projects is almost impossible for humans.

The scenario can be taken further if the planner's requirement is not personal but generic planning. This means that a team of people is assigned to the project rather than a single person, which is more common in long-term planning. The algorithm has to calculate every possible combination of people with each other and the corresponding possible work shares. This is mathematically possible, but in the case of large portfolios you would probably have to wait several thousand years for the result, so further algorithms are connected upstream. These first analyse sample situations and then trigger suitable dynamic algorithms that solve the problem in segments. Each of these algorithms is specialised. The result can then be determined in real time again.

4.5 Risk assessment with AI

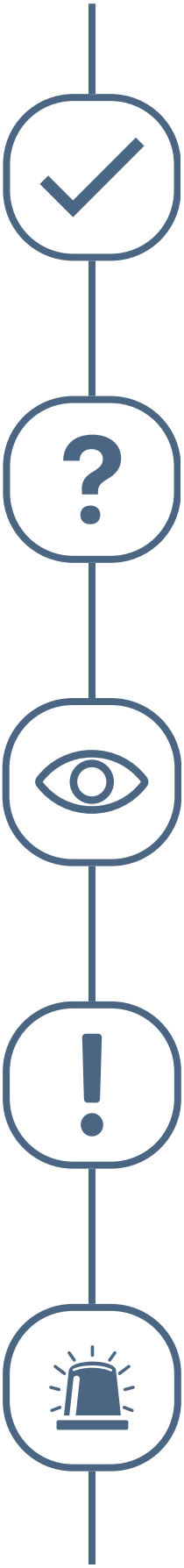
The interaction of so many work packages running in parallel and the cross-project risk assessment is overwhelming for humans. This is where artificial intelligence can help.

The system analyses the project risk in terms of its negative impact and the extent of the risk. To do this, all situations that could lead to a conflict are considered and weighted horizontally, i.e. on the time axis into the future, and vertically, i.e. in the detailed project planning. The result is a recommendation as to whether something needs to be changed in the planning or whether the project can continue as it is. Even if a resource is mathematically guaranteed to be overloaded, the AI may recommend that the problem be ignored. The AI assumes that people in the project recognise the importance of work and projects, and adjusts their detailed behaviour accordingly.

There are fewer and fewer alerts where the AI recommends immediate intervention. This allows the project manager to focus on these issues and not be distracted by trivial risks. This is the main task of any AI.

The AI will tell you how to react:

Ignore
Computational overload, but no problem



Observe
All is well for now, but a problem could develop

Strictly observe
The problem is becoming more acute, but could still be solved

Intervene
The project cannot be handled in this way, measures are required

Intervene immediately
The project success is acutely endangered and counter-measures must be taken

5 WHERE DOES AI HAVE ITS LIMITS?

With all that AI can do for project management and resource planning, the question arises: When AI detects problems in planning, can it not simply solve them itself, rather than "just" making suggestions? The sobering answer: not yet, unfortunately.

5.1 Cascade effects and other disasters

The AI (or a simple algorithm) can very well calculate a constellation of work and people that solves the overload problem. However, this could lead to a complete rescheduling of all projects. And since we are talking about computers, this could very well happen once per second.

If a work package with 5 assigned resources is postponed by one day, this can cause a cascade effect that may cause up to 50 other projects and hundreds of scheduled jobs to be adjusted.

This may still be possible in a project with an exclusive set of resources. But it is impossible in the case of cross-project scheduling, such as holiday planning. An example: The AI might think it makes sense to postpone employees' holidays by three months. But this is impractical and would have a very negative impact on the acceptance of the AI.

Most of the time, the AI does not have all the information it needs to determine a solution. Projects consist of deadlines, costs and, above all, quality - in other words, content. The AI cannot decide whether a planned operation can be realised with less effort and an acceptable loss of quality.

5.2 Human aspects and other uncertainties

Can Do's AI knows human behaviour, learns its patterns and can simulate them to a certain extent. However, human solutions to specific problems are still unknown to the machine. Encouraging and motivating employees and focusing their attention on the important work to achieve the goal has been difficult or impossible for software to implement.

Therefore, the project manager or Scrum team must design a solution themselves. However, the software can provide strong support.

The feasibility of this solution depends on two main aspects of equal importance. Firstly, the solution must be realistic from a technical point of view, i.e. in terms of content, especially when it comes to reducing the workload of a job.

Furthermore, the solution itself must be feasible, i.e. will it really solve the problem if we reduce the amount of work in a work package by 30% or postpone the work package? The AI can also perform this evaluation task. The user simply enters the solution into the software.

As everything is calculated in real time, they can see immediately whether the problem has been solved or whether a new one has arisen. It's a collaboration between human and machine evaluation, a "trial and error" approach.

5.3 Real time and other inaccuracies

When the software works in real time, it is a great help. The change is simply added to the project plan. If the risk disappears, all is well and the solution can work. If not, an alternative or more advanced solution must be developed.

Real-time processing also means that the data available to the software must be reasonably up-to-date and realistic. A project manager has few or no options for identifying and solving problems if the team doesn't enter the actual progress of the work into the computer until the end of the month. The AI's simulation is based on data that is not up-to-date. Therefore, the result of the algorithms and the AI will not be as robust.

This is why companies need to put a lot of emphasis on project staff updating their work progress and workload on a daily basis, if possible.

But at least on a weekly basis. Only then can the project manager use the software to anticipate future risks and take preventive action.

Interestingly, the people who are most overworked and stressed are also the ones who update their data the least. It is a logical interaction that leads to an endless loop of problems.

The same correlation can be seen at management level. The projects of those project managers who do not stick to their plans, or who simply ignore the risks that the machine reveals, according to the principle of hope, also cause the most problems. They disrupt other projects through their project mismanagement. However, it is not uncommon for these project managers to complain about the challenges they themselves have created.

6 SUMMARY: HYBRID PM AND AI – THE DREAM TEAM

At Can Do, we adhere to the principle of hybrid project management combined with powerful AI. Hybrid PM or Hybrid Planning means: The teams work agile and the project itself is planned classically (waterfall, rolling, milestones, phases, etc.). There is also a division of labour in project planning, based on individual preferences. On a broad level, the planning is classic; in detail, it is agile. Because Can Do's AI can handle imprecise statements about the future ("sometime in Q4"), planning with Can Do becomes more imprecise the further it is into the future. This makes the combination of hybrid PM and AI very similar to the human view: "The project has to be ready by winter, our kick-off is Wednesday at nine."

Here is a brief overview of what Can Do's Artificial Intelligence and hybrid structures mean for your project planning:

- The human factor is taken into account at both the vertical and horizontal levels of planning.
- The different perspectives and planning objectives of strategic management and project teams are harmonised.
- Deviations from the original project plan are responded to immediately with skill management suggestions from the AI.
- Project planning is adjusted to the actual doable workload of the employees.
- Can Do's proprietary Watermodel® algorithm simulates all possible work arrangements and skill distributions within the project boundaries. From this, the AI issues a warning and recommended action if the success of the project is at risk.
- AI can track an unlimited number of parallel work packages and assess risks across projects.
- AI-based risk assessment also takes into account the potential for people to adapt.

7 CONCLUSION: AI CAN'T DO EVERYTHING BUT IT CAN DO A LOT

Artificial intelligence in project management is an excellent approach to making project planning more realistic and skill management more practical. But: An AI makes its decisions independently of humans - and for this reason it needs to be contained by humans. Otherwise, the algorithm would postpone "employee training" for a year. Human solutions, characterised by the human interpretation of flexibility, creativity and pragmatism, are largely alien to it anyway.

It is still up to the human to assess whether deviations in the time, cost or quality of a project are feasible. Can Do's AI will always try to work within fixed constraints (which humans can redefine). It still does this very well.

Summary

Identifying suitable project staff is a two-step process:
The project manager knows what skills he needs for his project. The project manager knows what skills he needs for the project, so he asks the head of department, who then assigns suitable people to the project. The pre-requisite for this is that sufficient capacity is available in his department. To determine this, it is necessary to know the exact workload of the department and its employees. In addition, in a multi-project environment, all requests made to the department must be taken into account. Finally, base loads, holidays and absences must be included in the workload picture. Only by taking a holistic view of resources is it possible to make a reliable statement about capacity utilisation.

Want to take a look at the system directly tailored to your use case?

BOOK LIVE DEMO

You are not sure yet and want to discuss the requirements with a sales representative first?

TALK TO SALES MEMBER



Thomas Schlereth
Managing Director

Can Do GmbH
Implerstr. 26, 81371 Munich, Germany

Mobile	+49 (0) 171 33 94085
E-Mail	thomas.schlereth@can-do.de
LinkedIn	Thomas Schlereth
Web	can-do.de/en

With the help of artificial intelligence, we make sure that planning mistakes, incalculable risks and projects that run out of time are a thing of the past

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