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Artificial Intelligence in Maintenance Planning: Optimizing Strategies and Resources

James Reyes-Picknell
Principal Consultant



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Agenda

Planning concepts

Plan example – manually generated by the class

Generative AI - overview

Demo of planning tool – AI generates the plan

Comparison of the manual and the AI plans

Live “tryout” session

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Plans

- Forward looking
- Sequence of steps
- Describes “what” to do with “how” (if it matters), and how long
- Include all resources (who, parts, tools, documents, standards, procedures, safety, permits, etc.)
- Write once, save, modify, re-use

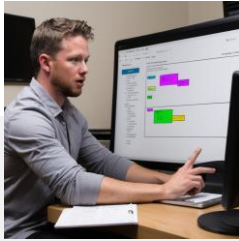


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Planning is a first step to efficient execution of work



Plan

What, who, how and with what – for each job to be done



Prepare

Make sure everyone and everything needed is available before the job is “ready” to be scheduled



Schedule

Add the work that is “ready” into a time frame considering urgency (priority) and criticality

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Creating any plan (e.g.: building a house)

1. What is the sequence of steps?
2. How long does each step take?
3. What materials are needed for each step?
4. What tools or equipment are needed for each step?
5. What trade skills (and how many) are needed for each step?
6. Can some of the steps proceed in parallel?



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Standard Job Work Planning Sheet

Standard Job ID _____

For: Equipment # _____

Equipment Name: _____

Information collected for Work Order #: _____

Standard Job Title: _____

Description of work (describe what work is being done, include steps if needed):

Trades Required:

Trade	How many?	How long? And When
Mechanic		
Welder		
Electrician		
Instrumentation		
Laborer		

Application Parts List:

Add to list:

Part #	Part name / description	Quantity needed for job

Delete from list (not nec

List any tools required that are not part of your standard tool bag / kit:

Here's a standard job planning template that I give to clients

It is editable and can be customized to match your preferences

Complete form on screen

We'll fill in your details here.

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Let's look at our plan

Does it have every detail of activities that are needed for job execution?

Does it have time estimates for each activity?

Does it define all the needed resources?

What's missing?

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Add to list:		
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Delete from list (not needed):

List any tools required that are not part of your standard tool bag / kit:

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We include information needed to support scheduling

Scheduling is used to keep our workers busy doing what they do best



Understanding
“Traditional” AI

Artificial intelligence (AI) uses computer systems to mimic human intelligence and perform tasks. These systems rely on algorithms and data to make autonomous decisions, learn from previous experiences, and adapt to new situations. Traditional AI has proven useful in various domains, including problem-solving, decision-making, and automating complex processes.

All in all, traditional AI’s strength lies in **analyzing and interpreting existing data**. While it can identify trends and patterns that might suggest new applications or solutions, it does not possess the ability to conceive entirely new ideas from scratch.



Understanding “Generative” AI (GenAI)

Generative AI is a branch of AI that focuses specifically on **generating new content**, such as images, text, or music in response to our prompts.

Unlike traditional AI systems, which are programmed with specific rules and algorithms, generative AI systems are trained on large datasets. They learn to form new content by identifying patterns and creating new variations based on those patterns. This allows generative AI systems to create original, creative content.

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“Traditional” AI vs GenAI

Generative AI has the potential to revolutionize any field where **creation and innovation are key**.

On the other hand, traditional AI continues to excel in task-specific applications. It powers our chatbots, recommendation systems, predictive analytics, and much more.

For planning we need creativity – GenAI

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AIJobPlanner™ - Build a World-class, Best-in-class Job Plan in 3 Easy Steps

Step 1: Input Information and Generate a Plan

1) Type in a detailed description of the work to be completed

Pick your language

Plan Requirements

Work Information

Description: removing, replacing, and aligning a 100-hp, 600-volt, 3-phase electric motor to a horizontal pump in a chemical plant. Include a list of parts needed and cost for parts, which trade skills and estimated hours and costs to complete, how long the steps will take, what special tools are required, and a cost estimate for each activity.

Equipment Description: ITT Gould CHG series pump and 600VAC, 3-phase electric motor

Asset Data

Asset Number: 66663863
Make: ITT Gould
Model: 3879
Remaining Useful Life: 10
In Service Date: Transfer Pump
Safety: 600
Voltage: 600
Phase: 3

Nameplate

Nameplate Template: [Select]

Safety Info

Lock Out / Tag Out: ☐ Confined Space: ☐
Permit: ☐ Zero Energy: ☐
Safety Procedures: ☐ Balancing Standards: ☐
Fallwork Standards: ☐ Lubricant Standards: ☐
Alignment Standards: ☐

Pick or Generate a Plan (View All Plans)

Generate New Plan

Premium Template
Description: The blade is dull and needs sharpening.
Equipment Description: Zamboni 552AC Machine
Title: Sharpen Zamboni 552AC Blade
Updated: 10.0h ago

Premium Template
Description: Flippers are unresponsive.
Equipment Description: Electromechanical Pack Machine
Title: Fix Flip Machine
Updated: 36.4h ago

Premium Template
Description: Coils are getting stuck in the slot.
Equipment Description: Snack Wrapping Machine
Title: Repair of Coin Mechanism in Snack VFF
Updated: 53.6h ago

2) Provide equipment specifications

3) Provide guidance on safety

4) Click on "Generate"

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Step 2: Edit Your Plan if Necessary

AI Job Planner

Crear | **Editar** | Configuración de usuario | Configuración de la organización | Cierre de sesión | Español

Editar Plan

Título: Reemplazar Sello Mecánico

Descripción	REEMPLAZAR SELLO MECÁNICO DE BOMBA CENTRÍFUGA	Número de Activo	BOMBA CENTRÍFUGA NO. 1
Clase de Activo	Bomba	Requisitos De Trabajo Seguro	BLOQUEO ELÉCTRICO, DESENERGIZADO
Descripción Del Equipo	Por Jackson 6 x 4 bomba centrífuga horizontal 200 hp	Información Adicional De Seguridad	
Horas Totales Estimadas De Trabajo	0	Horas Totales Estimadas De Plano De Producción	0
Duración Total Estimada Del Trabajo En Horas	0		

Tareas

Título De la Tarea: Preparación y Medidas de Seguridad

Descripción De la Tarea	Asegúrese de que el sistema de la bomba esté completamente aislado y bloqueado para evitar un arranque accidental. Verifique que se use todo el equipo de seguridad necesario y que el área de trabajo esté preparada con las herramientas y materiales adecuados. Confirme que el bloqueo eléctrico esté activado y el equipo desenergizado.	Horas De Trabajo Estimadas	1.0
Horas De Plano De Producción Estimadas	0.5	Duración Estimada Del Trabajo En Horas	1.5

Información Adicional

KIRs

KIR Acciones

Edit Your Plan

- Scroll down to see all tasks, activities and requirements.
- Make adjustments as required.

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Step 3: Export to AI Job Planner

Crear

Editar

Configuración de usuario

Configuración de la organización

Cierre de sesión

Español

Generar

Planes guardados

Plantillas personalizadas

Memoria

Regenerate Plan

Sello Mecánico de Bomba (Español)
Asset Number: BOMBA GENTJ Actualizado hace 15 days

Repair Guide
Title: Blue Yeti Nano
Microphone Repair Plan
Meta Equipment Description: equip=Actualizado hace 60 days
Trade

Oil Change Plan (English (Canada))
Description: Oil change on BMW Actualizado hace 64 days

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Print or Export Your Plan

Editar Plan

Español

Editar Entradas

Exportar Plan

Copiar Plan

Ver historial

Borrar plan

Editor Visual

Markdown

Autoguardar

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Horas Totales Estimadas De Trabajo	0	Horas Totales Estimadas De Poro De Producción	0
Duración Total Estimada Del Trabajo En Horas	0		

Tareas

Título De La Tarea: Preparación y Medidas de Seguridad

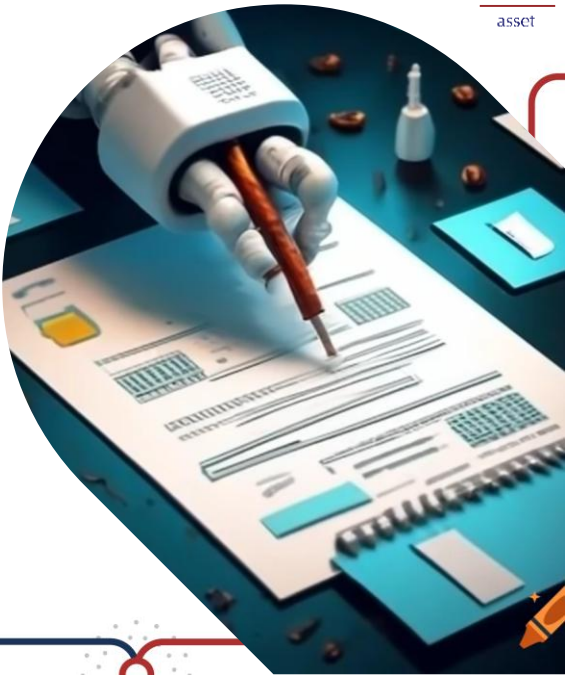
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Let's generate a plan using an AI planning tool (AIJobPlanner.net)

On Screen Demo



How does the human intelligence version compare to the AI version?

- Did the AI miss any steps?
- Did it add any unnecessary steps?
- Did it sequence the steps correctly?
- Did it list the tools and materials needed?
- Did it have realistic timing estimates?
- Would it take long to edit it?
- Which would be faster for day-to-day planning?



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You try it now! Getting started

- Use your own laptop ...
- Navigate to: aijobplanner.net
- Sign up (free version)
- Click on “organization details” to see the various subscription options
- For this class we have enabled the “professional” subscription capabilities in the free version
 - Professional capability will be kept “live” for you for 2 weeks
- You can choose the language you want to work in in the upper right corner of the screen

Tu logo

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Tell the system what you want done ...

Tu logo

Work Information (**mandatory**)

Description of the work you want done is needed

Tell the system "what you want to do" – the more descriptive you are, the better the results

Equipment details (**mandatory**)

This is "what" you are working on – again, more detail produces better results

Optional details

Can add in extra requirements

Asset Details of the equipment (nameplate info)

Safety requirements

Job site visit checks

Is work a PM, Permit requirements, Relevant Standards, Interference work items

Upload technical manuals, old work orders, procedures, standards, etc. in upper right corner

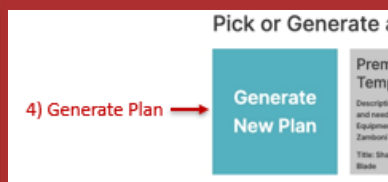
PDF format is "readable"

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Generate your plan



You can watch the progress of the AI

It looks at the documents you uploaded first

Then it goes to the internet for relevant related information

When complete, you can edit as you see fit (saves automatically)

Export to PDF (editable)



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How did it do?

Speed?

Accuracy?

Could you use the output as a draft?

Would it make you more productive?

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If you think it can help, then what needs to change in your organization to allow it?

IT or other barriers?

Business process inefficiency?

Poor understanding of planning?

Supervisory discipline?

Operations discipline?

Training (in what)?

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500%

Faster

From 5 to 8 plans a week
To 40 or more.

Typical draft plan from the tool
requires just a couple of minutes
to generate

Editing is roughly half an hour for
a moderately complicated plan

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80%+

Accuracy

Draft plans are intended to be
edited

Planners are still needed to
review the outputs and add any
details missed

So far, we are hearing that the
plans are well in excess of 80%
accurate

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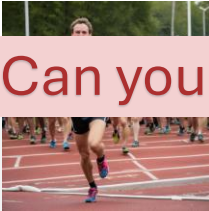
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Conceptos

Can your organization use any of this?



Speed

Minutes vs hours



Accuracy

80% plus, not perfect but excellent starting point



Productivity

Increased planner productivity
Translates into increased worker productivity

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iGracias!

James Reyes-Picknell

James@consciousasset.com

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BREVE ENCUESTA

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