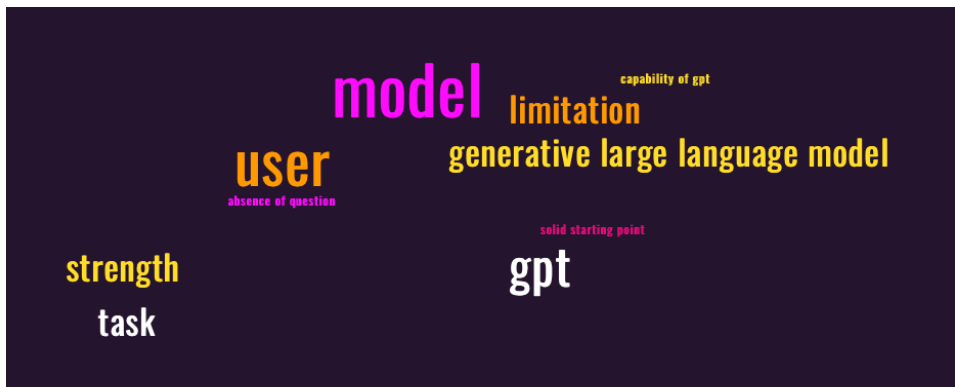


Decomposing big goals into manageable tasks with chatGPT

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You have big plans: setting up a workshop; planning your next conference trip; or even learning a new language. But sometimes it's difficult to figure out how to actually get there. What's a good plan? Or even what is a sketch for how to start. In this short article, we explore the potential for advances in AI in particular generative large language models (e.g. ChatGPT, HuggingChat, BARD, etc) to help. People typically have trouble decomposing big plans into manageable subgoals.

People estimated (%) vs Problem

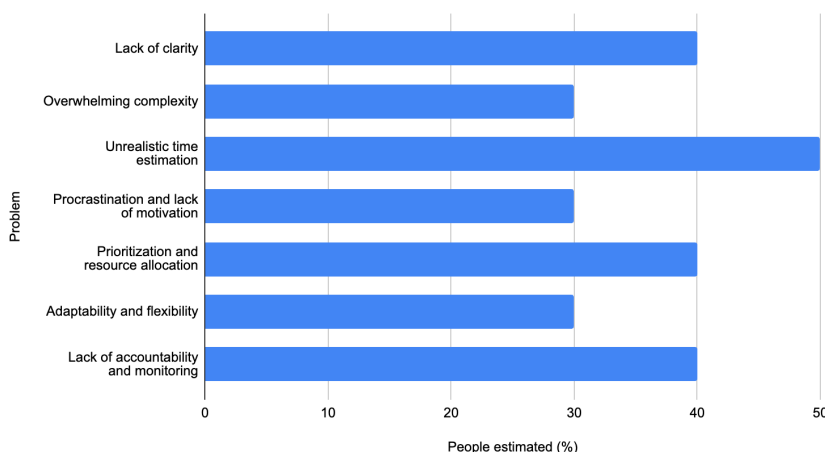


Fig. 1. Typical problems people experience when breaking down goals into plans. Prompt: What are the main problems people experience when planning a large goal into actionable tasks?

We look at different **goal types** and show examples of how different models work. We provide a first look at how to prompt these models to get actionable breakdowns of tasks.

Event Planning

When planning an event for example, a workshop, conference or even travel, generative AI can help. In particular, they are effective for setting out the overall structure of the steps that need to be performed and identifying where you need to fill these things. For example, here is the *prompt* and the resulting plan given for organising a hackathon focused on leveraging Large Language Models (LLMs) for Knowledge Engineering tasks.

Plan a hackathon about using LLMs for knowledge engineering tasks? Give me a day by day breakdown of tasks and what to do for those days. Provide that as a list with timings.

Day 1 - Saturday: Introduction & Team Formation

8:00 AM: Registration opens

9:30 AM: Welcome address by event organizers

10:00 AM: Icebreaker activity to facilitate networking among participants

10:45 AM: Presentation on the basics of LLMs and their applications in knowledge engineering

12:00 PM: Break for lunch

1:00 PM: Pitch session where attendees present ideas for potential projects and form teams accordingly

3:00 PM: Workshop on data preparation and preprocessing techniques for working with LLMs

6:00 PM: Dinner

7:30 PM: End of Day 1

Day 2 - Sunday: Project Development

9:00 AM: Start of Day 2

9:05 AM: Introductory remarks and overview of schedule for the day

9:15 AM: Teams dive into project development work

12:00 PM: Break for lunch

1:00 PM: Coaches arrive to provide guidance and support for teams

3:00 PM: Lightning talks from each team to share progress made so far and seek feedback

5:00 PM: Tea break

5:30 PM: Final push to complete prototypes before end of Day 2

9:00 PM: Dinner

10:00 PM: End of Day 2

Day 3 - Monday: Demo Showcase & Wrap-up

9:00 AM: Start of Day 3

9:05 AM: Remarks from event organizers

9:10 AM: Demos begin; each team presents their final prototype to all attendees

12:00 PM: Feedback sessions for each team by coaches and other experts

1:00 PM: Lunch

2:00 PM: Awards ceremony recognizing top teams and individual contributors

3:00 PM: Departure and end of hackathon!

Timing suggestions might vary based on location but this should give you a general idea of how things could go. Good luck planning your event! Let me know if you need further assistance.

In this prompt specifically ask for a plan with respect to time (e.g. days, and timings). There is also a distinction between asking for the plan for the event in particular and getting ready to prepare an event. For example, you can ask for the steps to go about organising an event rather than the structure of the event itself. For example, here is the prompt to organise a workshop also on the topic of large language models:

My goal is to organize a workshop training a bank in the MLOps aspects of using LLMs, focusing on aspects like security, monitoring, and change management. Can you decompose this goal into sub-goals and tasks? Please ask clarification questions about specific aspects of the goal as needed.

Notice here that the prompt asks for specific sub-goals and tasks.

Reiterating in general, these models provide an solid way to get started in giving overall agendas for events and also reminding of important points to consider in such a plan. However, they do tend to produce large plans and it's necessary to inform the model of the specific context and give it direction.

Learning

When trying to learn a new skill, just asking the open question "how do I learn this?" to a model will produce a decent overview of tasks to perform, from reading up on things to watching movies and using apps. To get to a more actionable plan, prompting the model to write a sequential plan of actions, setting constraints on how much time you have, which things are feasible for you etc, gets you a lot closer. It will produce a concrete schedule that you can actually follow. Then, in a third iteration, you can tweak and tune that by reacting to specific parts. For example, in its plan for learning Japanese the model suggested connecting with the local Japanese community. Simply talking back, you can say that you cannot, and the model will provide alternatives.

An alternative approach is to use examples. If you ask for a learning plan similar to X, where you can copy X from online somewhere, and set some constraints, you will also get there.

Performing Research

When diving into a new area of research, it's often confusing where to get started and how to quickly get oriented in an area you are not familiar with. From the first deep dive you want to move to the core topics that are important to experts in the research area and being able to identify recent trends in the field.

When we ask an LLM like GPT to break this type of goal into sub-goals and tasks. We can start with a prompt like.

User: I am researching what is the state of the art in [topic, e.g. cheap autonomous drones]. How do I achieve this goal?

GPT 3.5 will decompose this into a fairly long list of sub-goals and tasks, using it's general knowledge of how to do research, and some superficial knowledge of the topic at hand:

To research the state of the art in cheap autonomous drones, you can follow these steps:

Define your research objectives: Determine the specific aspects you want to focus on, such as the current technologies used in cheap autonomous drones, their features, capabilities, limitations, and any recent advancements. Clarify your goals to guide your research effectively.

Conduct a literature review: Start by searching for scientific papers, articles, conference proceedings, and industry reports related to cheap autonomous drones. Online databases, academic journals, research institutions, and technology-focused publications are valuable sources. Explore recent publications to ensure you gather up-to-date information.

Join online communities and forums: Engage with online communities and forums dedicated to drones and autonomous systems. Platforms like Reddit, specialized drone forums, and social media groups can provide insights into the latest discussions, trends, and advancements in the field. Participate in relevant conversations, ask questions, and connect with experts and enthusiasts.

Explore industry websites and blogs: Visit websites of drone manufacturers, technology companies, and startups involved in the development of autonomous drones. They often publish articles, blog posts, and press releases highlighting their latest advancements, product features, and innovations. Keep an eye on company blogs and news sections to stay informed about new developments.

Attend conferences and events: Look for conferences, workshops, and exhibitions related to drones, robotics, and autonomous systems. These events provide opportunities to network with professionals, researchers, and industry leaders. Attend presentations and keynote speeches, participate in discussions, and take note of any cutting-edge technologies or breakthroughs showcased during the events.

Follow academic research and institutions: Stay updated with the work of academic institutions and research labs specializing in autonomous systems, robotics, and drone technology. Monitor the publications and websites of universities or research organizations conducting research in these areas. Subscribe to relevant newsletters or mailing lists to receive updates on their latest findings.

Consult specialized publications: Explore magazines, online publications, and blogs that focus on drones, robotics, and emerging technologies. They often cover the latest trends, market insights, and advancements in autonomous drone technology. Examples of such publications include DroneLife, sUAS News, DroneDJ, and IEEE Spectrum.

Review patents and intellectual property databases: Search patent databases like the United States Patent and Trademark Office (USPTO) or the European Patent Office (EPO) to identify recent patents related to autonomous drone technology. Examining patents can give you insights into novel techniques, inventions, and research efforts in the field.

Engage with experts: Reach out to experts in the field, either through email or social media platforms. Polite and concise inquiries about their work or their insights on the state of the art in cheap autonomous drones can yield valuable information. Many researchers and professionals are open to sharing their expertise and knowledge.

Stay updated on emerging trends: Regularly follow news and technology websites that cover emerging trends and breakthroughs in the drone industry. These sources often provide insights into the state of the art, market dynamics, and the latest developments in autonomous drone technology.

Remember to critically evaluate the information you gather, consider multiple sources, and cross-reference information to ensure accuracy. The field of autonomous drones is rapidly evolving, so staying up to date with recent publications and advancements is crucial for accurate research.

An interesting aspect of using GPT as an assistant in this context is that it does not ask questions, so the further refinement of these tasks or sub-goals requires further initiative of the user, e.g.

How do I define my research objectives?

To which GPT again answers with a similar (8-10 bullet point list), this can feel rather boring and does not give the feeling of a real dialogue. After a short interaction we've left my general goal and we are chatting about generalities of breaking down tasks.

As a contrast, we have also posed the same question to GPT-4:

To achieve your goal, you will want to conduct research across a variety of channels and keep several factors in mind to evaluate the state of the art in cheap autonomous drones.

Here are some steps you can take:

Review the Literature: Check out scholarly articles and scientific publications about autonomous drones. Websites such as Google Scholar, IEEE Xplore, and ACM Digital Library are excellent starting points.

Check Out Industry Publications: Look at industry publications like drone magazines and technology reviews. Websites like DroneLife, Unmanned Aerial, and UAV Coach can provide information on the latest trends in autonomous drones.

Company Websites and Product Reviews: Visit websites of companies that manufacture and sell autonomous drones. Check out their product descriptions, specifications, and features. Also, read product reviews to understand how well these products perform in real-world conditions. Some major players in this field include DJI, Parrot, Autel Robotics, and Yuneec.

Attend Webinars, Conferences, and Trade Shows: If possible, attending webinars, conferences, and trade shows focused on drones can give you an inside look at new technology and trends, and allow you to network with industry professionals.

Patent Search: Conduct a patent search. This could give you a good indication of where the cutting edge of the technology is, as patents often reflect the latest developments. You can use the Google Patents search tool or the United States Patent and Trademark Office (USPTO) database for this purpose.

Join Online Communities and Forums: There are several online communities where people share information and discuss the latest developments in autonomous drone technology. Websites like Reddit, StackExchange (for technical questions), and specific drone forums could be very useful.

Remember, when researching "cheap" drones, you'll need to have a clear definition of what constitutes "cheap." The price range for drones is extensive, with very basic models costing less than \$100, while high-end, feature-rich models can cost several thousands of dollars. It's essential to set a clear budget limit in your research and seek out drones within that price range.

Also, evaluate drones not just on their cost but also their features and capabilities, such as flight time, range, camera quality, navigation and control systems, obstacle avoidance, payload capacity, weather resistance, and more. Lastly, consider legal and regulatory aspects in different jurisdictions since they can affect the use and operation of drones.

It seems that GPT-4 is more specific and knowledgeable about domain specific tools that can be used. It still does not initiate dialog to ask clarifying questions like a good coach would do.

Changing Behaviour

Behavior changing refers to the process of intentionally modifying one's actions, reactions, and habits to achieve desired outcomes or personal growth. It involves consciously replacing old patterns with new ones that align with one's goals, values, and aspirations. People often strive to change various behaviors in their lives, depending on their circumstances and goals. However, there are several common behaviors changes that many individuals desire such as health-related behaviors, time management and productivity, interpersonal skills etc. In order to access LLM knowledge in this area we can start with a prompt as follows:

User: I have a very busy schedule. How can I integrate light exercise to my daily schedule?

We start by simply stating the situation and directly asking for recommendations to change it. LLM replies with an introductory sentence and a five-point list written in an expert tone that could be found on a web page providing advice on health and fitness. And, it concludes with the same expert tone. The conclusion is a reminder and a bit of advice, both in a knowledgeable tone.

HuggingChat: While maintaining a busy schedule might make finding dedicated workout times tricky, there are ways to squeeze in low-impact physical activity throughout the day to boost your overall health and wellbeing:

1. Take frequent breaks at work: Stand up, stretch, or pace around during brief respites between tasks, or use a standing desk to promote movement throughout the working hours. Even just shifting your weight or moving your arms and legs back and forth can contribute to better blood flow and mental clarity.
2. Incorporate incidental walking: Rather than driving or taking public transport wherever possible, walk briskly to nearby destinations or engage in active transport options (biking, skateboarding). This incremental increase in daily step count benefits both cardiovascular and skeletal health.
3. Perform household chores efficiently: Instead of dawdling through routine activities, turn cleaning, cooking, or yard work into functional workouts. For example, squat when doing laundry, sweep vigorously, or race against the clock while completing tasks. The extra energy expended adds up quickly!
4. Do quick bodyweight exercises: Fit short bursts of strength training into breaks throughout the day, using no equipment except your own bodyweight. Examples include planks, lunges, mountain climbers, sit-ups, and chair dips. Brief sets of these movements target multiple muscle groups, helping build lean mass and strength.
5. Find creative solutions: Adapt your surroundings to accommodate easy physical activity. Place objects higher so that reaching for them involves lifting your hands overhead, park farther away from entrances, or play energetic video games that double as exercise. Little adjustments accumulate, leading to noticeably increased motion throughout your days.

Remember that every little bit counts toward overall health improvement and sustained momentum in pursuing regular physical activity. Incorporating slight changes now can pay off long term in improved stamina, resilience, and quality of life.

General tips on using these models

Here are some general tips to ensure the results of ChatGPT will be the most useful.

1) Provide as much context as possible about your goal. Describe your current situation. For example: "I would like to learn how to play Chess. I am a complete beginner. I can spend around 2-2.5 hours once a week on that"

2) Ask GPT explicitly to provide you output in the format that you want. E.g.: "I need you to provide me with a weekly step-by-step plan of actions for the next three months."

3) If you want to learn something, ask for specific references, like books or websites.

4) Iterate through results. Whenever something is not to your liking, ask GPT to change it. Be specific. Explain why you don't like it, and tell explicitly what should be changed. E.g.: "In week 1 you suggest a book to read, but I only have 2-2.5 hours. Can you split this book into chapters that I should read week by week?"

5) When you're done going through the text, ask GPT once again to regenerate the whole advice, incorporating all previous suggestions.

Conclusion¹

Generative large language models, such as ChatGPT, HuggingChat, and BARD, show promise in assisting with decomposing big goals into manageable tasks. Our exploration of various goal types, including event planning, learning, research, and behavior change, has revealed both strengths and limitations in the capabilities of these models.

These language models offer a solid starting point by providing overall agendas and reminding users of important considerations when planning events or pursuing personal goals. However, they tend to produce extensive plans that require user intervention for refinement and adaptation. In particular, the apparent absence of question-asking capabilities of GPT limits the development of a dynamic and interactive dialogue.

While GPT 3.5 and GPT 4 demonstrate their usefulness in generating insights, GPT 4 shows greater specificity and domain-specific knowledge. However, the models' responses often lack the nuance and personalized guidance that a human coach or domain expert can provide.

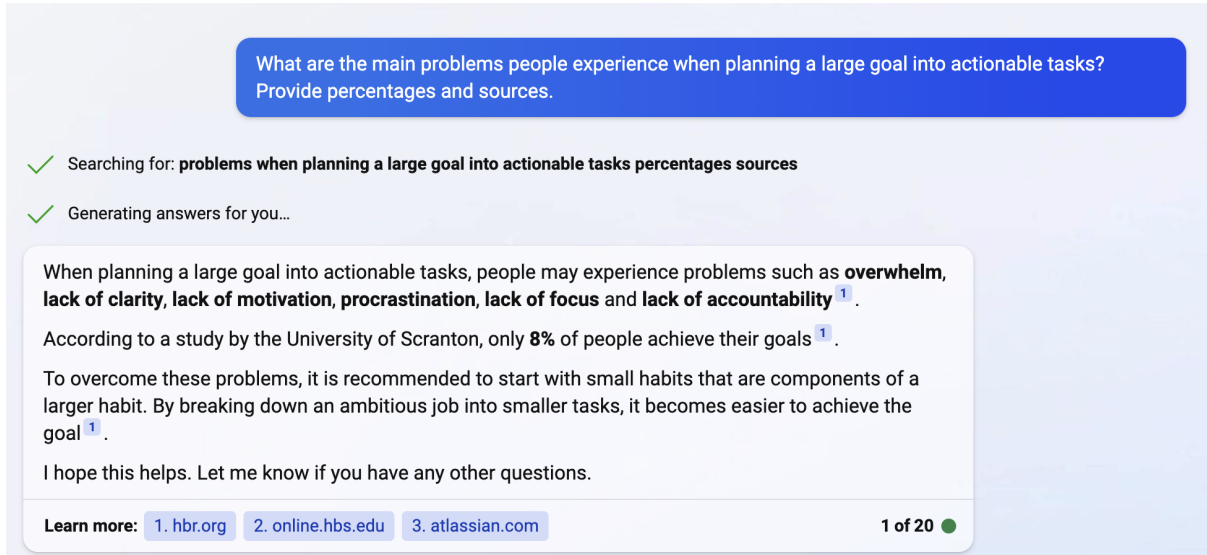
To overcome these limitations, users should provide specific context and direction to guide the models' outputs. Iterative conversations with the models, accompanied by clear feedback and requests for modifications, can lead to more satisfactory results. Users should also be prepared to ask follow-up questions and seek clarification on specific sub-goals and tasks.

In conclusion, generative large language models can serve as valuable assistants in goal decomposition, offering initial insights and structuring complex endeavors. However, they should be used as complementary tools rather than replacements for human expertise. By leveraging the strengths of these models and actively engaging in iterative interactions, users can gain clarity, define actionable plans, and make progress toward their goals faster.

¹ Generated by GPT-4 based on the draft which was fully written by the authors.

Appendix

Bing research



What are the main problems people experience when planning a large goal into actionable tasks? Provide percentages and sources.

✓ Searching for: **problems when planning a large goal into actionable tasks percentages sources**

✓ Generating answers for you...

When planning a large goal into actionable tasks, people may experience problems such as **overwhelm, lack of clarity, lack of motivation, procrastination, lack of focus and lack of accountability**¹.

According to a study by the University of Scranton, only **8%** of people achieve their goals¹.

To overcome these problems, it is recommended to start with small habits that are components of a larger habit. By breaking down an ambitious job into smaller tasks, it becomes easier to achieve the goal¹.

I hope this helps. Let me know if you have any other questions.

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Data

As part of writing this, we collected a small data set:

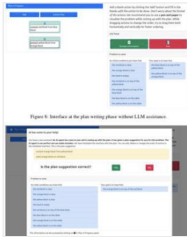
https://docs.google.com/spreadsheets/d/1FFK5GqVluO8_ENglUSj3ycwGHWLI52OGazYbZSF3hls/edit#gid=0

Related Research

In the academic literature there has been a lot of attention for this topic. Here's a small overview:

<https://search.zeta-alpha.com/?q=Planning+Abilities+of+Large+Language+Models>

Large Language Models (LLMs) have limited ability to autonomously generate executable plans with the best model (GPT-4) having an average success rate of ~12% across the domains^[1]. However the results in the heuristic mode show more promise with LLM-generated plans able to improve the search process for underlying sound planners^[1]. Additionally external verifiers can help provide feedback on the generated plans and back-prompt the LLM for better plan generation^[1]. Further research has explored the extent to which LLMs can be used for plan generation the most effective pre-training data and the effectiveness of fine-tuning or prompting for plan generation^[2]. LLM+P is a framework that incorporates the strengths of classical planners into LLMs allowing for the generation of correct (or optimal) plans for solving a problem in natural language^[3]. However experiments on a diverse set of benchmark problems show that LLM+P is able to provide optimal solutions for most problems while LLMs fail to provide even feasible plans for most problems^[4]. Results on GPT-3 Instruct-GPT3 and BLOOM showcase subpar performance on reasoning tasks that are more involved than any of the previously established benchmarks^[5].



1. [On the Planning Abilities of Large Language Models -- A Critical Investigation](#)

25 May 2023 | [Karthik Valmeekam](#), [Matthew Marquez](#), [Sarath Sreedharan](#) & [et al.](#) (1)

Our findings reveal that LLMs' ability to generate executable plans autonomously is rather limited, with the best model (GPT-4) having an average success rate of ~12% across the domains. **However, ... more**

31 1

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