



EF Take Home Task

Ideation

(It's quite difficult for me to form a belief with little information. For all these ideas I present here, I actually dug around quite a bit. For simplicity I only post the most relevant news pieces.)

Idea #1

News:

Amazon launches CodeWhisperer, a GitHub Copilot-like AI pair programming tool

At its re:Mars conference, Amazon today announced the launch of CodeWhisperer, an AI pair programming tool similar to GitHub's Copilot that can autocomplete entire functions based on only a comment or a few keystrokes. The company trained the system, which currently

 <https://techcrunch.com/2022/06/23/amazon-launches-codewhisperer-its-ai-pair-programming-tool/>



Council Post: AI Writing Assistants: Are They Worth Using In 2022?

Shane Barker is a digital marketing consultant who specializes in sales funnels, targeted traffic and website conversions. What is an AI writing assistant? As artificial intelligence (AI) technology evolves, we're seeing its usage across different industries. One of the

 <https://www.forbes.com/sites/forbescoachescouncil/2022/06/24/ai-writing-assistants-are-they-worth-using-in-2022/?sh=6775df303d30>



Big language models have gained a lot of popularity, but finding the right application is still challenging. CodeWhisperer, GitHub Copilot, and Jasper are good examples of applying large language models to help end users. There will be more tractions in the direction of applying the technology to serve end users.

Hypothesis: I believe these new products show the technological foundation is mature enough, and the customer interest in AI writing tools is at historical high. However, I also believe that the current tools are too intrusive and disrupt the writing experience of users too much.

Foreseeable Reaction: More investors' interest in AI writing assistance solutions. More customers are willing to try something different for their writing experience. More research output and infrastructures built in the direction of language model applications.

Problem Cause by Constraint: Current AI writing tools require writers to format their thoughts and words in specific formats to help them. This might be desirable for specific use cases (e.g., writing short marketing ads for a specific product), but does not address the problem of writers who just want "general assistance".

Customer: Daily Writers

Proposed Solution: An AI writing tool that blends in traditional writing experience. Writers do not need to copy and paste things into a box, or fill out a form to generate content. Instead, the AI writing tool only shows up naturally when the user wants assistance. For example, Alice wants to inquire about a product, so she opens the email editor and puts down "ask them about the product". The AI assistant identifies the intention and writes a full email with a formal tone asking about the product.

Key Difference vs Competitors: Current AI writing assistants are software that writers have to go through their API to use it. Our AI writing assistant identifies when the writer needs help and talks to the writer using language itself.

Slogan: Write with peace of mind.

Idea #2

News:

Council Post: How Digital Twins Can Help Supply Chains Survive Disruption

Alex Koshulko is a leading supply chain planning expert with over ten years of experience. Ph.D. CEO and Co-founder of GMDH Streamline . How can digital twins improve supply chain visibility? Advanced supply chain players strive for real-time supply chain execution.

F <https://www.forbes.com/sites/forbestechcouncil/2022/06/21/how-digital-twins-can-help-supply-chains-survive-disruption/?sh=997512e68005>



<https://www.bloomberg.com/news/newsletters/2022-06-24/supply-chain-latest-food-shortages-and-ukraine-harvest-problems>

Boeing expects supply chain problems to last through most of 2023

DOHA, June 22 (Reuters) - Boeing (BA.N) expects supply chain problems to persist almost until the end of 2023, led by labour shortages at mid-tier and smaller suppliers, partly due to the faster-than-expected return of demand, its chief executive said on Wednesday.

🌐 <https://www.reuters.com/business/aerospace-defense/boeing-expects-supply-chain-problems-last-through-most-2023-2022-06-22/>



Prime Minister Trudeau announces Canadian support to address global food security crisis

Global food insecurity has been increasing dramatically over the past several years, and it is now being further and directly exacerbated by Russia's illegal invasion of Ukraine. Countries around the globe, including many Commonwealth member states, are experiencing the impacts on global and

👑 <https://pm.gc.ca/en/news/news-releases/2022/06/23/prime-minister-trudeau-announces-canadian-support-address-global-food>



COVID-19 and the Ukrainian war had a huge impact on global supply chains and inevitably led to the global chip shortage and the recent food crisis. These crises exposed the weaknesses of the existing system, and industry leaders have been responding to the challenges by improving the efficiency and robustness of all aspects of the system.

Hypothesis: I believe these crises agitated the industry and forced the industry to upgrade the current supply chain related systems in response to future problems.

Foreseeable Reaction: Industry leaders will recruit in-house teams to address the supply chain challenges. Small businesses with limited budgets, having experienced the disruption or fearing the prominent problems, will seek services to help them make better predictions and optimize pipelines.

Problem Cause by Constraint: Small business owners could not afford an in-house customized solution for their supply chain related predictions and management. They are more likely to adopt an existing solution that is offered at a low price as well and has the most essential functions.

Customer: Small business owners

Proposed Solution: An AI-first supply chain information platform built for small business owners. The platform provides real-time information for local labor market, local resources pricing and availability. Moreover, the platform uses big data and machine learning to make predictions about such information in the near future, and given the user's business configuration, could optimize short-term resource acquisition based on such predictions.

Slogan: Be the most informed business owner.

Idea #3

News and Background:

Same as Idea #2

Hypothesis: I believe manufacturers have experienced massive disruptions both from their suppliers and customers. The market for manufacturing management will favor solutions that can make predictions and respond to crisis in real-time. Medium sized manufacturers may want a more all-around solution such as building a digital twin.

Foreseeable Reaction: New factories built will embrace aggressive digitization.

Problem Cause by Constraint: Lack of specialty in creating digital twins and heavy upfront investment to build one from scratch.

Customer: Medium-to-large-sized manufacturers

Proposed Solution: An AI-first manufacturing management platform that creates a digital twin of any factory. This digital twin will (1) track all factory statuses in real-time (2) simulate factory activities in high fidelity (3) optimize factory design based on gathered data.

Slogan: Your factory in your full control.

(Hidden Slogan: Real world Factorio!)

Building a MVT for Idea #3

(A little bit of background research)

Eliminating bottlenecks from production - Visual Components

Author: Visa Noronen | Image: Eino Ansio Read the original article (in Finnish) AGCO needed to expand its diesel engine factory in Nokia. The Linnavuori factory manufactures around 30,000 diesel engines a year, mainly for use in agricultural machinery. The

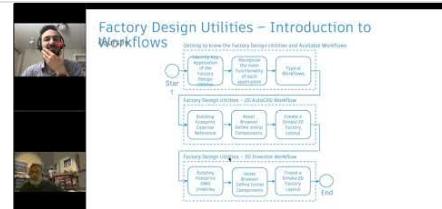
👉 https://www.visualcomponents.com/resources/case_studies/eliminating-bottlenecks-from-production/



Learn factory layout planning and design (Oct 2020)

Shape your production facility layout from scratch or based on existing conditions. Watch the Oct 2020 recording of our Mechanical Engineer community virtual...

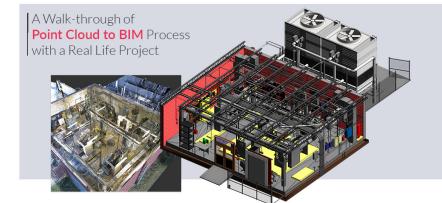
👉 <https://www.youtube.com/watch?v=Gq9sQCPCIag>



A Walk-through of Point Cloud to BIM with Real Life Project

When we talk about Scan to BIM, we talk about a process and series of steps that we implement to get an actual representation of the existing conditions of a project. We may question its applicability and who can use this process.

👉 <https://www.united-bim.com/walk-through-of-point-cloud-to-bim-process/>



Prime Design: Factory Plant Layout and Design (Design, Validate, Visualise...)

A view from a recent full line design we completed for a customer in China. This is one of the creative aspects of what we do and where it all began for Prime Design in 1992. Factory Plant Layout and Design is fundamentally about exploring what you need in your factory,

 <https://www.primedesignprojects.com/Factory-Plant-Layout-and-Design-Design-Validate-Visualise-p5/>



 https://cdn2.hubspot.net/hubfs/268676/docs/Guide_to_good_factory_planning_eBook.pdf

Our intuition tells us that the recent supply chain disruptions will drive the manufacturers to build factories that are not only efficient, but also could response to unexpected events in real-time.

Traditional factory planning uses an extremely abstracted representation of the factory and optimize the layouts using the abstraction. Optimizing based on abstract models of equipments and task forces could yield good results if the production goes perfectly. However, random or unexpected events do happen in the production and traditional factory planning could not factor in these ad-hoc events. Additionally, the process abstraction reduces fidelity and overtime error accumulates and lead to inaccurate predictions. As a result, factory built based on traditional factory planning methods are inherently fault-intolerant.

We address these problems by building a digital twin factory. In addition to perfect events that traditional methods could simulate, the digital twin could also simulate accidents, such human errors and machine faults, and the ripple effects of these unexpected events. Moreover, once the digital twin is built, it is synchronized with the physical factory, and inconsistency of the models are automatically corrected. In other words, the digital twin factory can report more accurate statistics, have more realistic simulations, make better predictions, and perform better optimizations.

In this demo we show how to convert a traditional factory into a simulated environment, and how to optimize the simulated environment with AI.

Deliverables

[presentation.key](#) : KeyNote presentation

[presentation_with_notes.pdf](#) : (slightly) annotated presentation

[main.py](#) : demo source code

The Dream Team

The general idea is to find the most talented people and pay them at the top of the market. For engineers and researchers, the best ones are so much more productive than an average one. Talents like that could easily justify the extra 50% ~ 200% salary compared to the market average.

<u>Aa</u> Role	# Salary	# Quantity	☰ Responsibilities	☰ Acquisition Strategy
<u>CEO</u>	50,000	1	Aquire talent; Attract and manage funding; handle public relations; interview new employee;	From EF or another event, or pick from a friend of mine. Preferably have experience in both academia and industry.
<u>CTO</u>	50,000	1	Have a clear tech vision (what to use and what to do); Manage the tech team and lead the product development; Lead research.	Me, take it for granted
<u>Product Manager</u>	110,000	2	Salesperson; Reach out to potential customers; Understand competitors.	Experienced personnel referred by an investor
<u>Accountant (Part-Time)</u>	70,000	0.25	Managing financial data.	Job ads.
<u>Digital Twin Engineer</u>	140,000	3	Convert physical assets into 3D virtual assets; Model dynamic behaviors (e.g., human workers); Build efficient simulated environment;	Passionate and top-performing developers fresh out of college. Job ads and cold calls.
<u>AI Researchers</u>	160,000	3	Optimize all aspects of the digital manufacturing process.	Passionate and top-performing graduate students studied AI. Could be referred by the professors I know. Could also be picked from my classmates at U of A.
<u>Full-stack Developer</u>	140,000	2	Manage databases; Handle physical & twin synchronization; Build website; Build metrics dashboard; Built research infrastructures.	Passionate developer who worked in big companies. Job ads.
<u>Assistant</u>	80,000	1	Manage daily business for managers; Should be extremely reliable.	Job ads. Past experiences do not matter much. Could be employers referring their most reliable friend.
<u>Equipment Technician</u>	100,000	1	Understand the equipments we deal with; Setup fake factories in physical world for testing.	Experienced factory technicians who have dealt with a wide range of equipments. Job ads. We will work with factories in the future for sure and we will snatch their best technician if possible 😊