



Aligning AI & Business Strategy for Maximum Buy-In

AI Design Guide

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Artificial Intelligence Design Guide

AI Design Guide + Worksheet

This AI Design Guide and Worksheet will help you navigate the process of identifying critical assumptions to inform feasibility and utility of an AI project.

Based on thousands of hours developing and scaling AI solutions, the example worksheet found on page 17 and 18 is inspired by best practices combining thought leadership in Data Science, Human-Centered Design, and AI Ethics.

The AI Design Guide and Worksheet consists of three parts: Overview, Methods, and Risk Management. Each part includes questions you should ask, with illustrated examples. A blank worksheet template on page 19 and 20 is provided for your use.

Whether trying to develop requirements for a custom, in-house AI solution, or evaluating a 3rd party AI solution, this worksheet will help you:

1. Succinctly communicate the value proposition, and why using AI makes sense.
2. Self-assess the feasibility of a project before engaging outside help.
3. Communicate requirements that will help vendors or internal data science teams maximize the value of solutions.

“Among AI leaders, 72% expect to see AI driving revenue growth in the next 5 years.”

- Forbes

What Exactly is AI?

The field of AI is the science and engineering of making machines smarter, amplifying what humans can do. **AI is software that:**

- Augments and automates tasks; typically thought of as human-like 'seeing', 'listening', 'understanding', and 'creating'
- Can recognize and react to complex patterns, at scale, and sometimes imperceptible to humans
- Learns, improves, and adapts to changing patterns over time



Why should your organization be using AI?

Automate - In our day-to-day, there are many 'boring' or repetitive tasks that steal time from more advanced and specialized pursuits. Example: recognizing and tagging key themes in customer feedback.

Reduce human error - Humans make mistakes from time-to-time, especially when it comes to complex and time-consuming tasks. Example: spell-check.

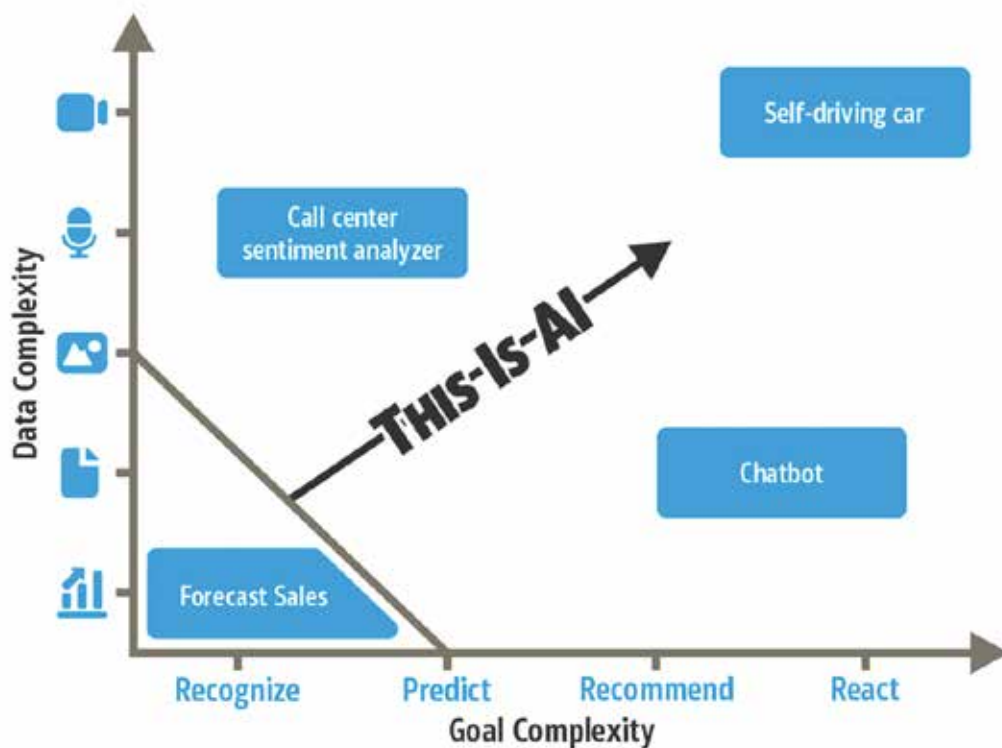
Reduce risk - In some cases, certain tasks may be dangerous or prone to bias. Example: evaluating ad copy for potential racial or gender bias.

Increase availability - Even the most productive humans can't and shouldn't work 24 hour days. Example: chat bots who are available 24/7.

Increase speed - It would take a human several hours to review an hour's worth of recorded customer service calls and summarize key themes. Example: AI that can 'listen' to this same content in almost real-time.

Where does AI Begin?

AI can be confusing because, at times, it is hard to draw a line between where analytics end and AI begins. This graphic will provide you some clarity.



Understanding AI

AI is one of the most widely talked about yet poorly understood terms in organizations. Having a poor definition is a key contributor to this problem.

AI has four broad goals: detecting patterns, predicting and categorizing, recommending, and reacting intelligently. While many of these goals overlap with analytics, it comes down to the complexity of the data on which AI is being used.

For example, making a financial forecast based on a series of transactions would hardly be considered AI, while simply detecting a face in an image is largely considered an application of AI.

Overview

The core of AI is the intelligent automating or augmenting of tasks. What task are you intending to support? How is the task accomplished today, and by whom? An appropriately scoped project addresses a specific task or workflow. When addressing multiple tasks or workflows, this may require scoping out multiple projects.

“AI embedded in analytics and other marketing software will free up more than a third of data analysts in marketing organizations by 2022, enabling them to focus their time on business priorities instead of spending time on manual processes.”

- Gartner



Stakeholder Goals

In context of the task, what is the stakeholder trying to accomplish? What are explicit and implicit goals? For example, when a Customer Experience Manager is analyzing customer feedback, they are looking for broad themes to prioritize improvement efforts. However, if responding to feedback, perhaps they need the most critical comments highlighted and prioritized.

Stakeholder Pains

What about the task is difficult or tedious? Conversely, what parts of the task does the stakeholder enjoy?

As you think about the task you have in mind, consider these questions:

1. If you were to teach someone how to accomplish the task, what steps would you outline?
2. What are the most time-consuming steps in the task?
3. What steps in the task are most error-prone?
4. Which steps in the task have the most consistent or routine process?
5. What information would make the task easier?
6. How often is the task repeated?



Justification for AI

Before investing time in framing a specific solution - determine if this project is suitable for AI? Ask yourself these five questions:

1. Will it require personalization at scale?
2. Will it involve natural language understanding?
3. Will it need to assess images or other multimedia assets?
4. Will it depend on evolving and dynamic inputs?
5. When performing the task, do sufficiently trained subject matter experts consistently follow best practice?

The Business Case

Can you quantify the impact that the solution will have? Are you reducing the effort it takes to accomplish a task, or improving the efficacy at which a task is completed? Will the task increase your capacity to serve or influence customers?

Explicitly stating the business case makes it easy to identify measurable KPI's by which to judge the success of the project. These metrics are important to monitor throughout a pilot – observing no changes (or unexpected changes) could indicate opportunities to pivot or refine.

Automate or Augment

Before investing time in framing a specific solution - determine if this project suitable for AI? If so, is the goal to automate or assist a human with a task?



Automate

- Is the cost of error low?
- Can quality control happen?
- Is the task routine and requires little subject matter expertise?
- Is the task considered tedious or disliked by stakeholders?

Augment

- Does the task require deep subject matter expertise?
- Does the task require a decision from a subject matter expert?
- Does quality control need to be part of the process?
- Do stake holders enjoy the task or feel accountability to participate in the task?

The Customer Experience Manager

Today, the voice of the customer is understood by reviewing surveys captured after transactions or customer service interactions. The Customer Experience Manager looks for systemic trends by sales region for improvement opportunities.

Target Stakeholder: Customer Experience Manager

Stakeholder Goals

- Identify patterns and opportunities to improve from survey results
- Highlight example comments to illustrate voice of the customer

Stakeholder Pains

- Too many responses to review all in detail
- Searching for key words to identify trends misses opportunities!

Business Case

- Companies that improve net promoter scores retain customers
- Understanding customer needs at scale requires hundreds of hours of manual effort

Success KPI's

- Net promoter score
- Customer retention
- Effort reduction - for the customer experience manager

Justification for AI

- Application involves natural language categorization at scale
- The volume of comments is too large to articulate every case

Automate or Augment

- AI will augment the stakeholder by automatically categorizing survey responses

Example Worksheet Overview

Customer Experience Example: Part 1

To understand the importance of AI, we will take a look at an example centered around a Customer Experience Manager. Part 2 of the example can be found on page 12 and Part 3 on page 16. A complete work through of this Customer Experience example is shown on pages 17 and 18.

Methods

This section importantly helps to quantify feasibility. It is okay if some of these fields are question marks. In fact, identifying which of these assumptions you are not sure about will help you ask the right questions when working with a data scientist or vendor.

AI Problem Type

Which of these categories of AI problems best exemplifies your project?

Problem Type	Description	Examples
Clustering	Can I separate these observations, and how? Are there groups that were previously unknown?	Customer segmentation; image sorting; anomaly detection
Classification	How can I categorize this situation?	Lead scoring; categorizing customer feedback
Regression	What value should I expect?	Predicting sales; sentiment analysis; intelligent pricing
Recommender Systems	What items or actions should I pursue?	Basket analysis; crossselling; recommender systems
Generative Output	Does this require creative output?	Chatbots; object outline detection in videos and images; summarization of information

Knowing the general type of problem that you are solving helps guide discussions on feasibility and complexity. It also helps you think about the type of data needed. For example, if you are looking at a classification problem, this indicates that you will need a rich set of example data with relevant labels.



Inputs and Outputs

Should the AI solution provide likelihoods and value estimates, or should it provide labels and categories as output? Clearly stating the expected output of the AI solution will help determine other aspects of integration that may be required.

Conversely, what inputs is the solution expecting? If you are working with pre-trained models, what data are they expecting, and are there any formatting requirements? For example, does a natural-language-understanding solution expect comments only in English.

Data Quality

At this point in the project planning, you do not need specific data quality measures. However, you do want to identify potential data quality issues to investigate relating to your key inputs and outputs.

Data are the fuel that AI depends on to learn and function. The questions here will help you identify data requirements and preparedness to explore a specific solution. If you are unsure where data lives, or if you are unable to access it, this is okay. Knowing that you have unknowns will help you frame conversations with data scientists and vendors.

Data Sources

Are you working with an existing data set? If so...

1. Who owns the data?
2. Are there any features or labels that will need to be obtained?
3. Will you need to create new data?
4. If so, how are you planning to collect it?
5. How will you keep your dataset current?

Example Methods

Customer Experience Example: Part 2

Here we look at the methods that can be used. The third part can be found on page 16. A complete work through of this Customer Experience example scenario is shown on pages 17 and 18.

Types of Example Methods

Building on our example about systemic trends by sales region, it is important to consider the methods we can use to address our pain points and goals.

AI Problem Type

- Clustering
- Classification

Inputs (Features)

- English comments from customer survey and any associated net promoter score

Outputs (Labels)

- Customer service topics that apply to a given comment

Data Sources

- Qualtrics survey platform
- Salesforce

What's Missing

- Labels to categorize example survey responses

Risk Management

Now that you have identified some basic requirements, in describing the data and the general approach the solution might take, it's time to highlight potential risks. When consequences are seemingly unpredictable, it's especially critical to set up appropriate safeguards to protect individuals within and outside of your organization. Knowing the risks will help you create checkpoints throughout the course of the project.

When designing an AI solution, there are four primary categories of harm to assess. Some, all, or none of these may apply to your given circumstance. Knowing which do apply, will inform mitigation efforts as you pilot and scale your solution.

Type of Harm	Description	Examples
Physical or Emotional	A risk of potentially offensive output or resulting in physical risk	Automated chatbot makes incorrect purchase on behalf of customer
Disproportionate Failure	When a solution fails more often for one group of individuals than others	Poor facial recognition for people of color; worse voice recognition for feminine voices
Denial of Opportunity	When a solution results in fewer opportunities for one group vs. another	Using AI to prioritize credit card offers that disproportionately exclude people of color
Reinforcing Stereotypes	When a solution could potentially reinforce stereotypes	Using AI to select ads, resulting in minorities being targeted with low-income offers

Possible Biases

If all AI models must be trained to some capacity on source data, then we should be wary of our new AI systems learning from the mistakes of our past. It is important to ask yourself who your data represents, and more importantly, who does it miss? Here are three potential sources of bias to consider. It is okay if you create more questions than having answers at this stage – knowing that you have questions will help guide your plans.

Type of Bias	Description	Example
Biased Training Data	When data potentially over-represents one group over another or contains incorrect representations of a group	Using publicly available data (e.g., tweets) to train a model may include stereotyped or politically incorrect viewpoints
Proxy Variables	Features in your dataset that are not directly protected statuses, like gender and race, but are strongly correlated	Purchase history that includes feminine hygiene products will strongly correlate with gender
Biased Labels	When labels used to categorize your data unfairly miss or over-represent specific groups	Hiring a non-native English speaker to categorize customer feedback – they may mis-classify certain comments

Interested in learning more about possible biases?

[Read Now](#)

Cost of Errors

What happens if you over or underestimate? If you have an AI solution to identify leads, what is the cost of a missed opportunity? What does it cost to target a lead that is not a fit? Are there intangible costs like mistrust in the system? Knowing these costs will help guide decisions when fine-tuning the performance of your solution.

Personally Identifiable Information and Applicable Regulations

What personally identifiable information might exist within your dataset? If you are bound by regulations like GDPR or CCPA, it is important to factor this into your solution design.

Error Type	Examples
Quantitative Error	A sales model that overestimates or underestimates potential revenue
False Alarm	A lead scoring model that frequently identifies customers not likely to buy as prospects
Missed Opportunity	A lead scoring model that frequently misses customers that are likely to buy
Fail to yield result	A recommender system that makes no recommendations or a search that yields no results
Return too many wrong results	A recommender system that consistently provides generic, non-personalized items

Examples of Risk Management

Customer Experience Example: Part 3

This information completes our Customer Experience Example. Continue to page 17 and 18 to see how this information can be compiled into an easy-to-understand worksheet.

Mitigating Risks and Errors

To round out the example we have been building upon, here are the risks we may encounter and want to mitigate.

Potential Harm

- Potential disproportionate failure to identify topics in foreign languages

Potential Biases

- Few responses from satisfied customers; 25% of comments are in a foreign language

Potential Errors

- Mistrust in system may result in lack of adoption; Resources spent on addressing incorrect issues

Cost of Potential Errors

- Missed opportunity to improve

Personally Identifiable Information

- Customers may leave contact information in responses; Customers may refer to specific employees by name

Applicable Regulations

- Labels to categorize example survey responses

Customer Experience Example Worksheet - Page 1

Whether you are working with an internal team or looking for a 3rd party to build or implement your AI solution, this worksheet can be shared with your team to align business and technical goals. Read through this example, then fill out your own on page 19 and 20.

Project Name: Customer Experience Scenario

Target Stakeholder(s): Customer Experience Manager

Part 1: Overview

Description: Today, the voice of the customer is understood by reviewing surveys captured after transactions or customer service interactions. The Customer Experience Manager looks for systemic trends by sales region for improvement opportunities.

Stakeholder Goals: Identify patterns and opportunities to improve from survey results Highlight example comments to illustrate voice of the customer	Stakeholder Pains: Too many responses to review all in detail Searching for key words to identify trends misses opportunities!	Justification for AI: Application involves natural language categorization at scale The volume of comments is too large to articulate every case
Business Case: Companies that improve net promoter scores retain customers Understanding customer needs at scale requires hundreds of hours of manual effort	Success KPIs: Net Promoter Score Customer Retention Effort reduction - for the Customer Experience Manager	Automate or Augment: AI will augment the stakeholder by automatically categorizing survey responses

Customer Experience Example Worksheet - Page 2

Part 2: Methods

AI Problem Type:

Clustering
Classification

Inputs (Features):

English comments from customer survey and any associated net promoter score

Outputs (Labels):

Customer service topics that apply to a given comment

Data Sources:

Qualtrics survey platform
Salesforce

What's Missing:

Labels to categorize example survey responses

Part 3: Risk Management

Potential Harm:

Potential disproportionate failure to identify topics in foreign languages

Potential Biases:

Few responses from satisfied customers;
25% of comments are in a foreign language

Potential Errors:

Mistrust in system may result in lack of adoption; Resources spent on addressing incorrect issues

Cost of Potential Errors:

Missed opportunity to improve

Personally Identifiable Information:

Customers may leave contact information in responses; Customers may refer to specific employees by name

Applicable Regulations:

Labels to categorize example survey responses



AI Design Worksheet - Page 1

Whether you are working with an internal team or looking for a 3rd party to build or implement your AI solution, this worksheet can be shared with your team to align business and technical goals.

Project Name:

Target Stakeholder(s):

Part 1: Overview

Description:

Stakeholder Goals:	Stakeholder Pains:	Justification for AI:
Business Case:	Success KPIs:	Automate or Augment:



AI Design Worksheet - Page 2

Part 2: Methods

AI Problem Type:		Inputs (Features):
Outputs (Labels):	Data Sources:	What's Missing:

Part 3: Risk Management

Potential Harm:	Potential Biases:	Potential Errors:
Cost of Potential Errors:	Personally Identifiable Information:	Applicable Regulations:



Experiencing Barriers to Scaling AI?

From false starts to measuring the success of a pilot, the art of implementation is challenging. Having the right strategy in place can mean the difference between adoption and abandonment. That is why building and scaling AI solutions to empower humans is our number one priority.



A Few of the Ways We Can Help

Now that you have identified some basic requirements in describing the data and the general approach the solution might take, it's time to highlight potential risks. When consequences are seemingly unpredictable, it's especially critical to set up appropriate safeguards to protect individuals within and outside of your organization. Knowing the risks will help you create checkpoints throughout the course of the project.

AI Discovery

Enables our clients to scale AI by focusing on the humans involved and what they need. We frame AI challenges by asking questions that go beyond what the AI will do and get at the core of how it will be used.

AI Ideation Session

Empowers a small, but diverse, group of executives from core business functions, teaching them AI best practices and how to recognize and activate internal resources for success.

AI Advisory Services

Provides the leadership and project-level support of in-house AI, without the usual burdens.

How is Pandata Different?

Pandata empowers innovative organizations to **plan, design, and scale** AI solutions. Gaining valuable insights from your customers and workforce – to help you make better informed business decisions – is how we help humans.

“AI is opening entire new frontiers in customer experience and success by applying NLP, sentiment analysis, automation, and personalization to customer relationship management.”

– Forbes



Your team of human experts includes:

Data Scientist: A data guru that can design and build artificial intelligence to solve business challenges

Data Analyst: A creative problem-solver with quantitative, business, and data skills

Data Engineer: A software engineer who brings data solutions together, at scale

You, the AI Translator: A champion with a business background and working knowledge of AI concepts and processes

We bring our core values into every aspect of our work

This is what makes Team Panda Unique:

Approachability: We serve every client with empathy and without jargon; their team and needs are regarded as our own.

Pursuit of Knowledge: We keep utilization rates lower to encourage ongoing education so we can stay at the forefront of data science advancements.

Navigating Ethics: We ask difficult questions to safeguard our clients and society against unintended consequences. We conduct ourselves with the intent to always use data science to do good and give back to our community.

Taming Uncertainty: We thrive when presented with complex problems that have unclear solutions. Recognizing when a pivot is needed, we hold steadfast to evolving client needs and deadlines.



Uncovering opportunities

“Using Pandata’s Perception Intelligence solution, we’re now able to consistently quantify customer feedback with hard numbers and uncover improvement opportunities across the enterprise. We gain tremendous insight from our own data and are able to channel our efforts to those areas that are most important to the customer.”

Brad Fischer, *Vice President, Customer Experience & Distribution Services, Parker Hannifin*

Commitment to ethics

“It’s not overly difficult to find competent people and it’s fairly easy to find people that will say “yes” to every question. In a broad environment, finding competent people that are genuine in their interest, commitment, and presentation is exceedingly rare. This is what we liked most about working with the Pandata team.”

Christopher Mitchell, *Chief Financial Officer & Operations Officer, Sequoia Reinsurance Services*



Need a hand getting started with – or scaling – your AI initiatives?

We have helped many organizations on their journey to AI success. It’s as simple as reaching out to hello@pandata.co.

As a special offer for those who have downloaded this guide, we are offering \$100 off our course AI and Data for Beginners, curated and taught by Pandata founder, Cal Al-Dhubaib, for the Marketing AI Institute. [Register here](#) and use code **aldhubaib100**.



Delivering AI Solutions
that are Approachable, Ethical,
and Always Built for Humans

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