

# Case Study: The Autodesk Virtual Assistant

River Hain  
Solutions Analyst

Yizel Vizcarra  
Conversation Engineer



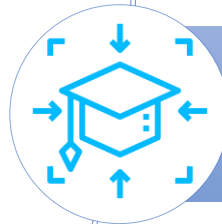
# Agenda



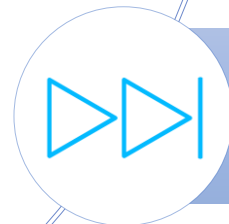
Why Autodesk went conversational



How Autodesk went conversational



What we learned along the way



What's next

# Autodesk Company Goals

## Customer Centric Company

Thinking from the outside in.



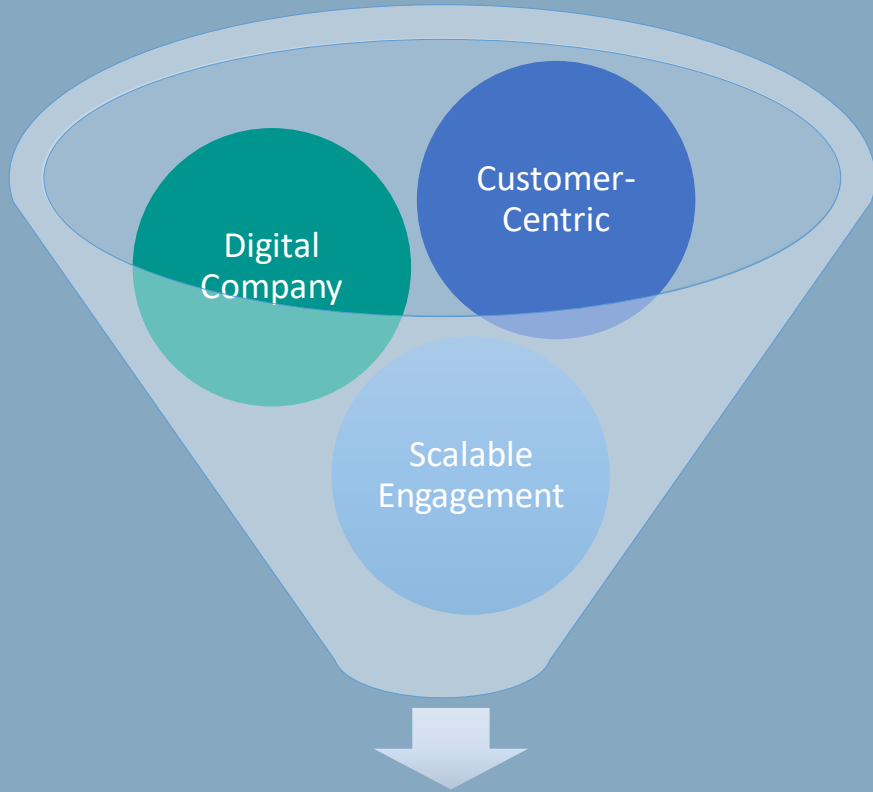
## Digital Company

Being sentient: conscious and responsive without interruption, all the time.



## Scalable Engagement

Solutions are able to grow and adapt to meet changing customer needs.



Handle growing engagement volume without increasing headcount



Generate new insights through data for better decision-making



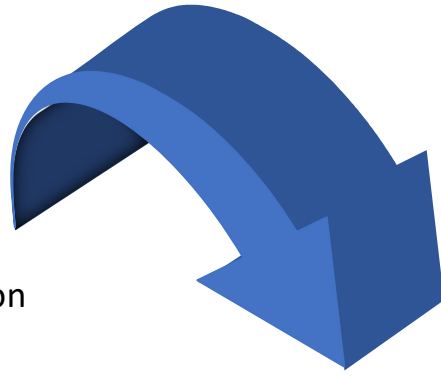
Provide best possible answer with least customer effort



Positively represent and promote Autodesk brand

## Customer Centric.

- User-centered design
- Personalization
- Reduced Customer Effort
- Customer Lifetime Value
- Emotional brand connection



## Digital Company.

- Omni-channel presence
- 24/7/365 availability
- Self-help solutions
- Improved customer satisfaction
- Seamless experience(s)



## Scalable Engagement.

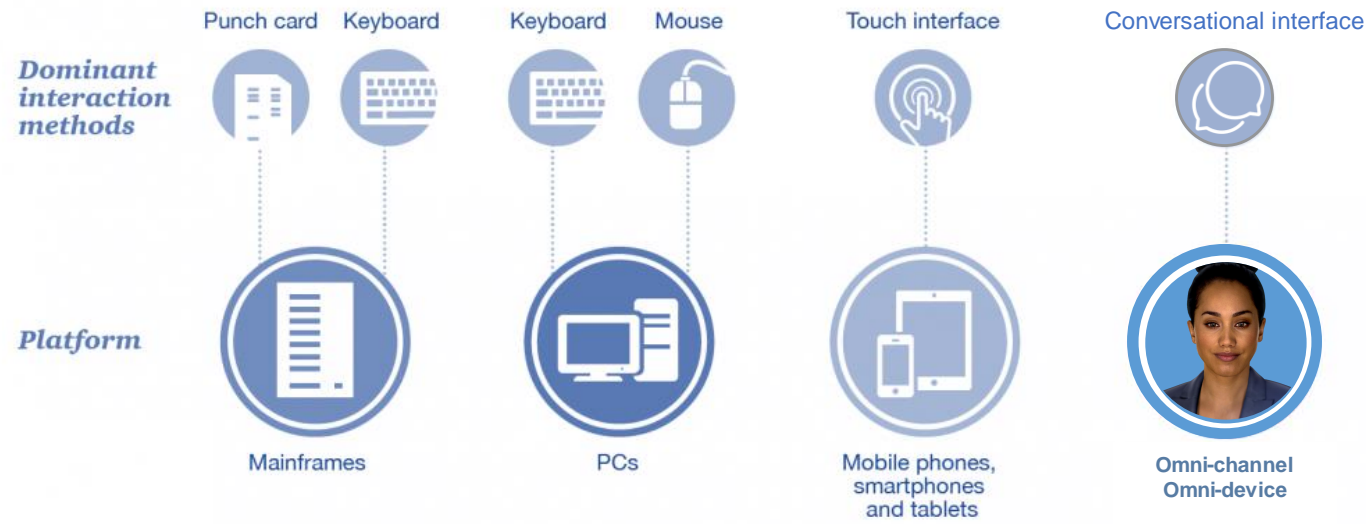
- Adaptive frameworks
- Personalization
- Optimize internal processes
- Non-linear cost-to-volume



## Technology Breakthroughs

- NLP
- Dialog Frameworks (design)
- STT/TTS
- Messaging platforms
- Etc.





**Dialog System** Computer system intended to simulate conversation between a user and a system, with a coherent intuitive structure

**PRIMARY BENEFIT**



**INTUITIVE EXPERIENCE**

- Natural language input/ output
- Conversational UI
- Multimodal input/output

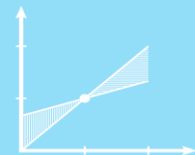
**ADDITIONAL BENEFITS**



**ADAPTIVE EXPERIENCE**



**INTUITIVE CONFIGURATION**



**NON-LINEAR COST**



**FEATURE FLEXIBILITY**



**FEATURE MODULARITY**



**24/7/365 AVAILABILITY**

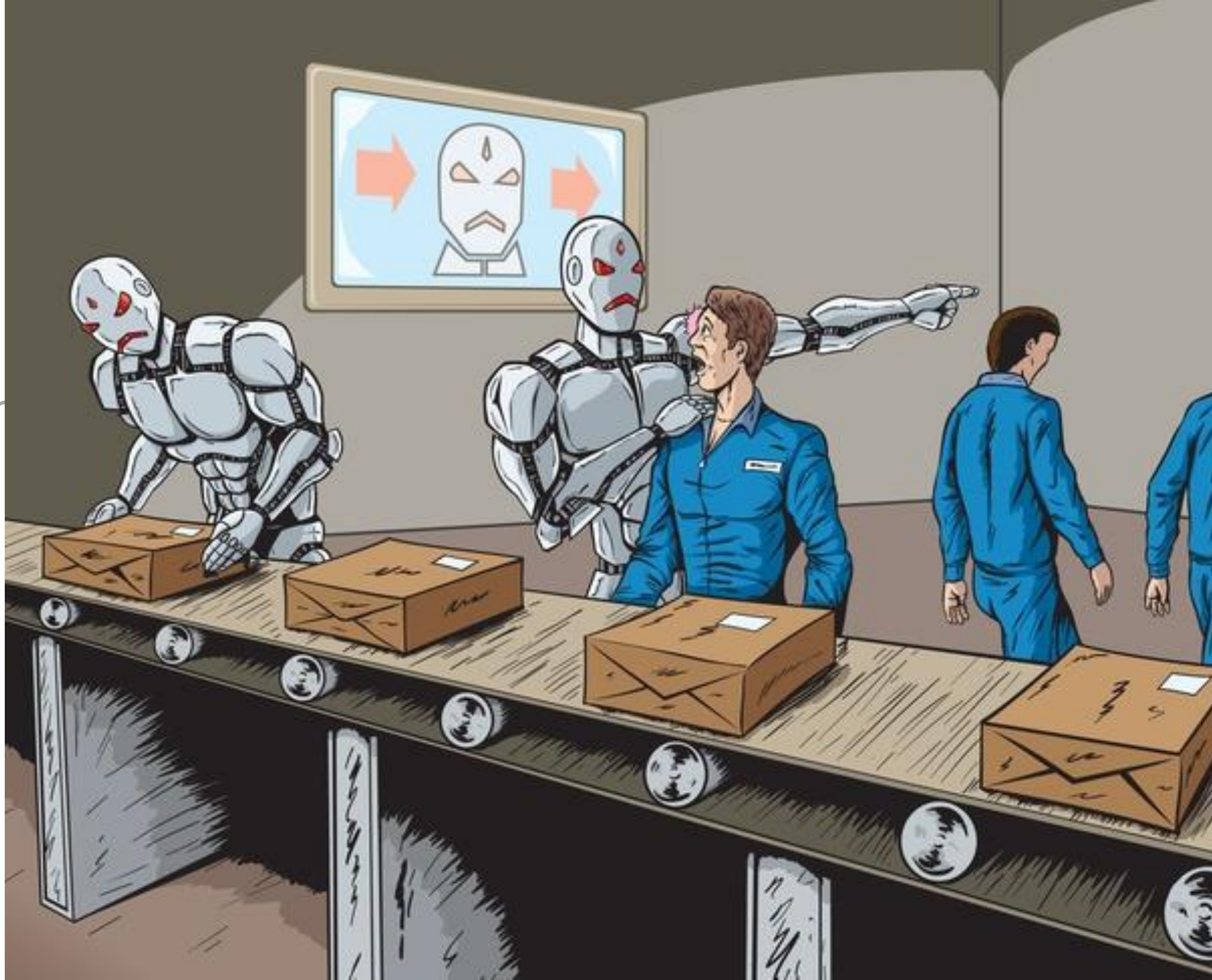


**HIGHLY INTEGRATEABLE**



# AVA Overview

*“AI will cr*



*million.”*





86 x

More customers helped  
per day



< 4 Min.

Solve time for customer  
transactions



86%

Customer satisfaction for  
transactions



November 16, 2017

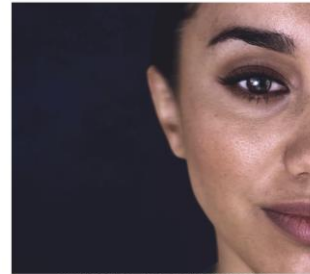
**FAST COMPANY:** Are you ready for bots to read your face?



**VentureBeat**

May 20, 2018

**HOT OFF THE PRESS:** How Autodesk's assistant Ava attempts to avoid uncanny valley



**THE WALL STREET JOURNAL.**  
WebReprint

April 30, 2018

**HOT OFF THE PRESS:** Digital Assistants Start to Get More Human



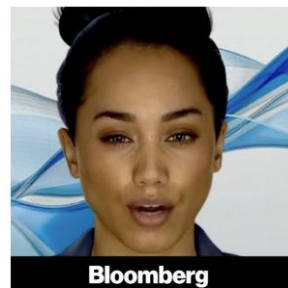
November 26, 2017

**NEWSHUB:** Soul Machines develops a Digital Human



May 16, 2018

**VIDEO:** Meet the Kiwi actress whose latest role is playing one of the first digital human beings



**Bloomberg**

June 2, 2018

**VIDEO:** Bloomberg Technology - Meet Ava, Autodesk's New Virtual Assistant



**GETTING EMOTIONAL WITH TECH**  
ROLE OF EMOTIONAL INTELLIGENCE WHEN WORKING WITH A.I.

March 21, 2018

**VIDEO:** Meet Ava, Your Personal Assistant



November 15, 2017

**FAST COMPANY:** Autodesk's AVA is built to be a font of empathy



November 16, 2017

**COMPUTERWORLD:** Soul Machines gives Autodesk chatbot a human face



November 15, 2017

**HOT OFF THE PRESS:** Soul Machines Partners with Autodesk to launch AVA at Autodesk University 2017



November 16, 2017

**NATIONAL BUSINESS REVIEW:** Soul Machines partners with Autodesk to create digital employee

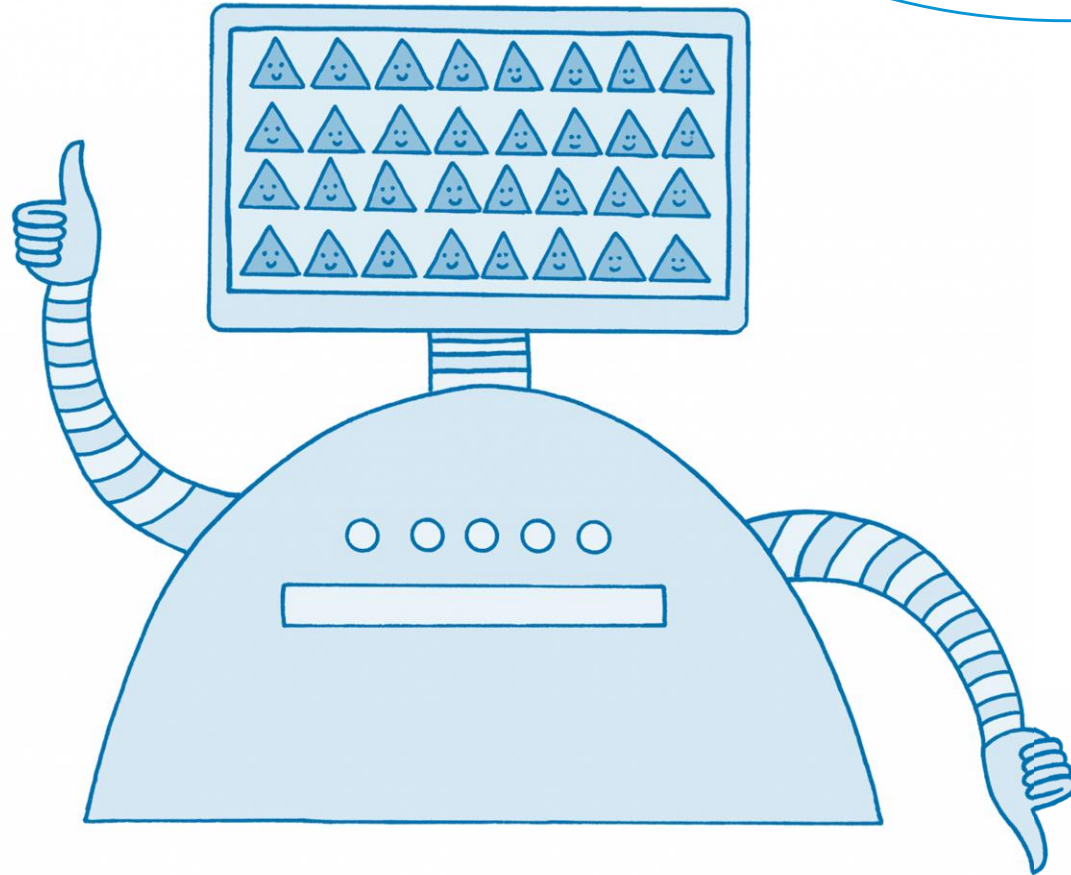
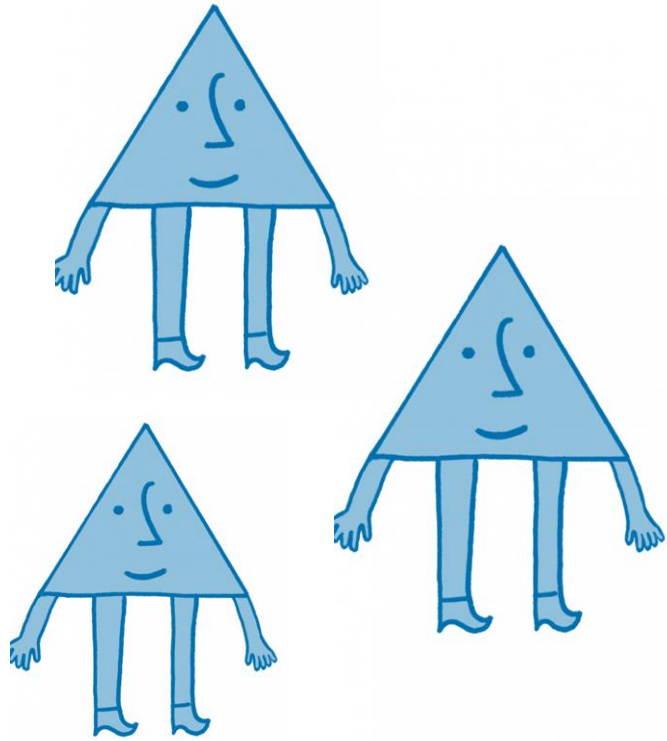


November 12, 2017

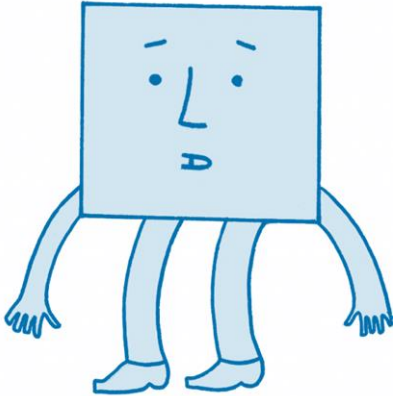
**Bringing AI to Life:** IBM Watson and Soul Machines

Learnings

Your team matters.



Decisions affect everyone...even ones made by algorithms.



Failures = Opportunities

## Improve the system

A screenshot of the Autodesk help center interface. At the top left is the Autodesk logo. Below it is a user profile picture of a woman. On the right, there is a "Start over" button. The main content area shows a search bar with the text "If you have any other questions, please ask them here to help:". Below the search bar is a blue button that says "I am seeing Error 44 when I try to run AutoCAD". The article content includes the text "Here is the troubleshooting document I've found" and a section titled "Error: 'The maximum number of exports allowed by the system has been reached'". Underneath, it says "Issue" and "When you try to export a license using the License Transfer Utility, the following error message is displayed:" followed by a code block: 

```
The maximum number of exports allowed by the system has been reached.  
Error reference:44  
Export Request Failed
```

 Below the code block is a "See solution" link. Further down, there is a "See Also" section with two links: "Activate & Register Online" and "Activate & Register Manually". To the right of this section is a "Did this help?" button with thumbs up and down icons. At the bottom of the article content is a "No, it wasn't helpful." button. Below this is a feedback form with the text "I am sorry this was not helpful. To help prevent this from happening again, would you mind telling me why this was not helpful?". There are four buttons for feedback: "I tried the solution, but it did not work" (highlighted in blue), "You did not understand my inquiry", "The article was not for my issue", and "No, please contact an agent". At the very bottom of the page is a text input field with the placeholder "Enter your response here...(English only, please)" and a "Submit" button with a right arrow. Below the input field is a rating bar that says "AVA made it easy to handle my request: ★ ★ ★ ★ ★".

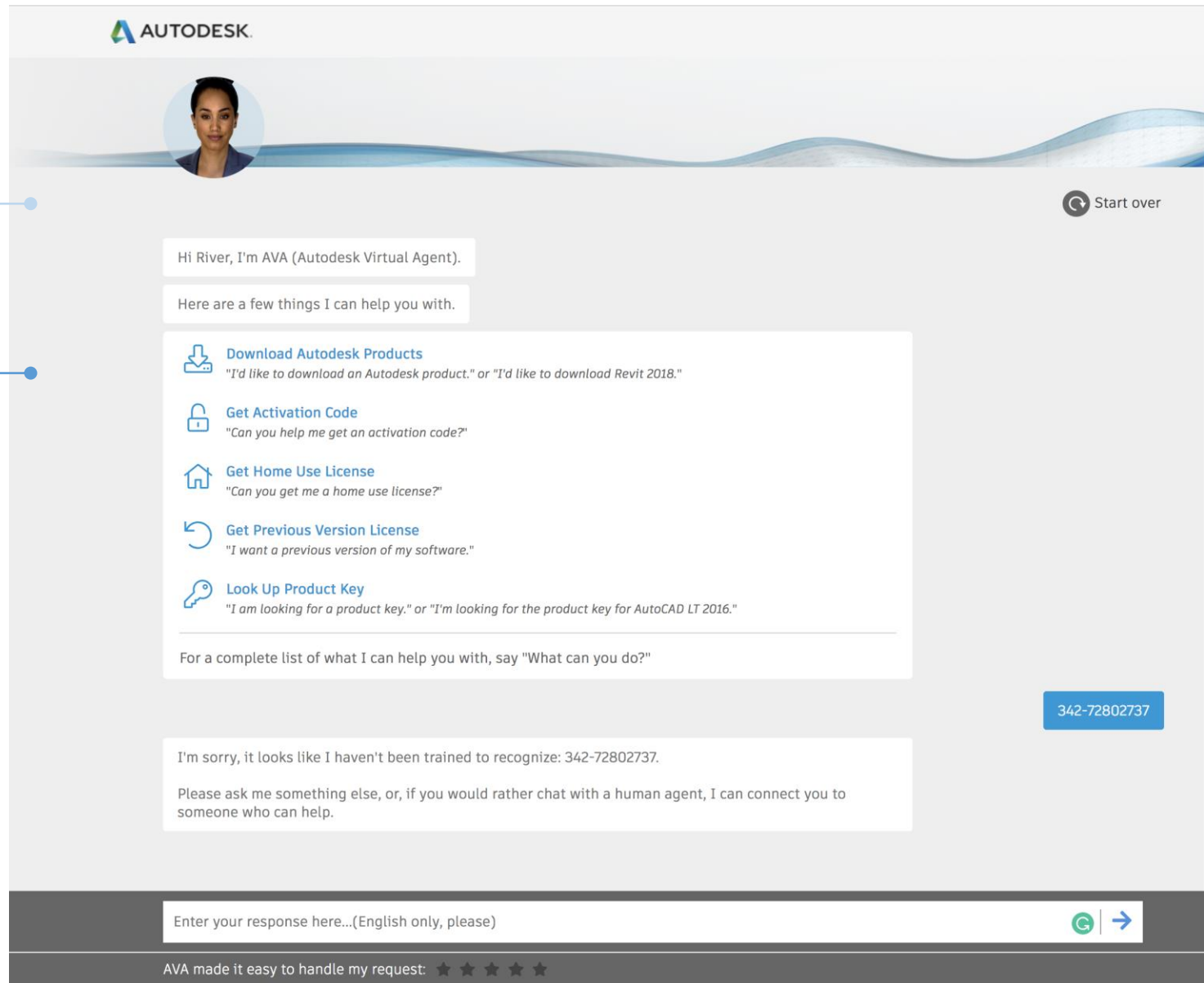
“There is no failure. Only feedback.”

– Robert G. Allen

Improve the system



Learn new expressions



AUTODESK

Start over

Hi River, I'm AVA (Autodesk Virtual Agent).

Here are a few things I can help you with.

- Download Autodesk Products**  
"I'd like to download an Autodesk product." or "I'd like to download Revit 2018."
- Get Activation Code**  
"Can you help me get an activation code?"
- Get Home Use License**  
"Can you get me a home use license?"
- Get Previous Version License**  
"I want a previous version of my software."
- Look Up Product Key**  
"I am looking for a product key." or "I'm looking for the product key for AutoCAD LT 2016."

For a complete list of what I can help you with, say "What can you do?"

342-72802737

I'm sorry, it looks like I haven't been trained to recognize: 342-72802737.

Please ask me something else, or, if you would rather chat with a human agent, I can connect you to someone who can help.

Enter your response here...(English only, please)

AVA made it easy to handle my request: ★ ★ ★ ★ ★

“Failure is simply the opportunity to begin again, this time more intelligently.”

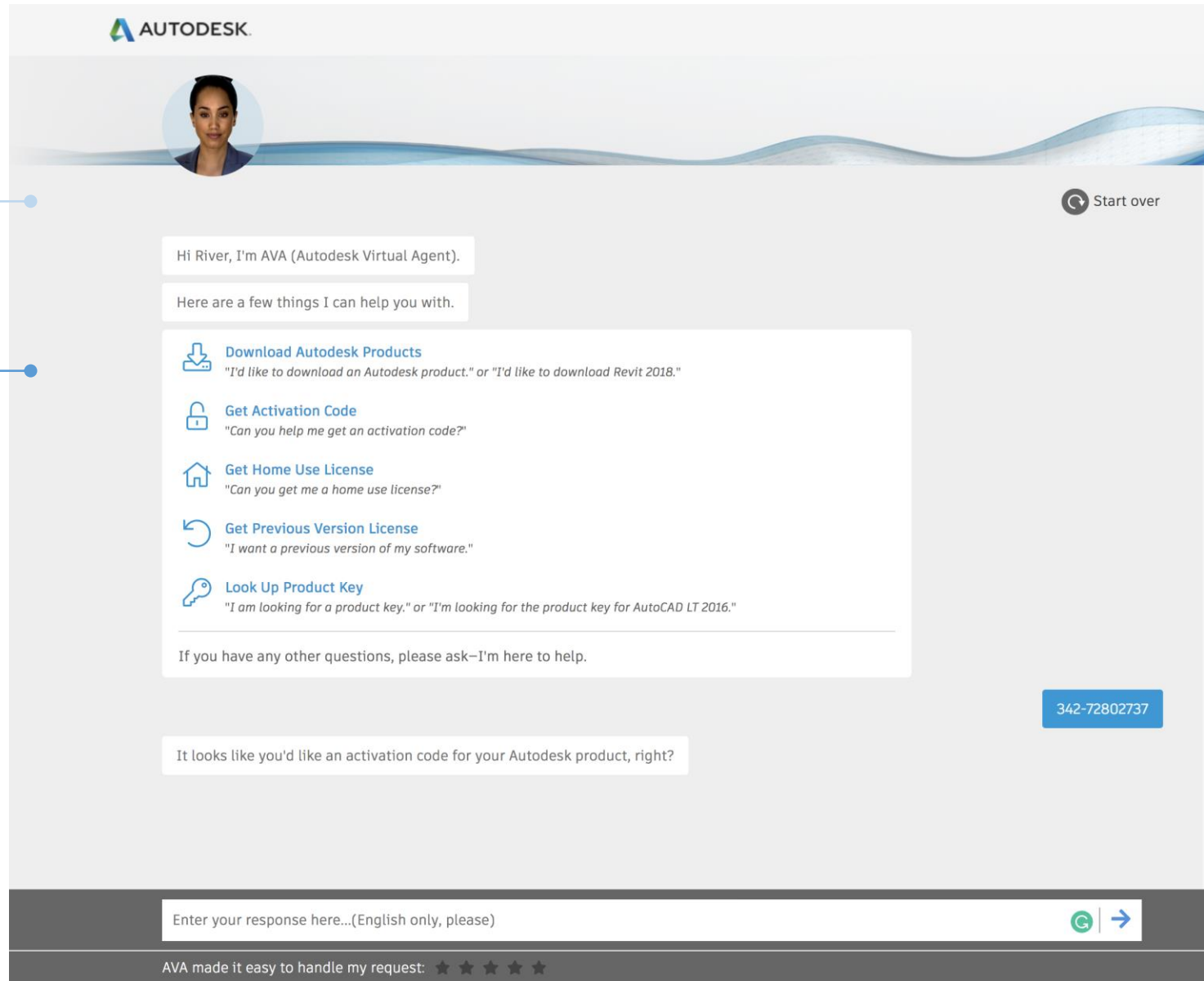
– Henry Ford



Improve the system



Learn new expressions



**AUTODESK.**

Hi River, I'm AVA (Autodesk Virtual Agent).

Here are a few things I can help you with.

- Download Autodesk Products**  
"I'd like to download an Autodesk product." or "I'd like to download Revit 2018."
- Get Activation Code**  
"Can you help me get an activation code?"
- Get Home Use License**  
"Can you get me a home use license?"
- Get Previous Version License**  
"I want a previous version of my software."
- Look Up Product Key**  
"I am looking for a product key." or "I'm looking for the product key for AutoCAD LT 2016."

If you have any other questions, please ask—I'm here to help.

342-72802737

It looks like you'd like an activation code for your Autodesk product, right?

Enter your response here...(English only, please)

AVA made it easy to handle my request: ★ ★ ★ ★ ★

**“Failure is simply the opportunity to begin again, this time more intelligently.”**

– Henry Ford

Improve the system



Learn new expressions



Foster the relationship



**AUTODESK** River Hain

Can you get me a nome use license?

- Get Previous Version License**  
"I want a previous version of my software."
- Look Up Product Key**  
"I am looking for a product key." or "I'm looking for the product key for AutoCAD LT 2016."

For a complete list of what I can help you with, say "What can you do?"

Error when downloading

I can most immediately help you if you have an error code ready. Do you have an error code?

Yes

Great, what error code? e.g. 'Error 10', 'error 32', etc.

Error 57

Sorry, I don't know that one yet. However, I have created a ticket for one of our analysts to review **Error 57** and determine if it's something that I can be trained to help with moving forward.

Ticket Number: 1074-000001 Incident Ticket		
Message:	Customer Error	
Error Code:	57	
Error Message:	Customer	
Error Category:	Download & Installation	
Created:	10/04/2016 10:00:00 AM	
Date:	Time:	Assigned:
10/04/2016	10:00 AM	1000

In the mean time, let's open up a case for you. Please submit the form provided to chat with a human agent.

Chat with Agent

Please fill out the following information:

First Name \*  
River

Last Name \*  
Hain

Email \*  
river.hain@autodesk.com

Country  
Select

Is this an existing issue  
No

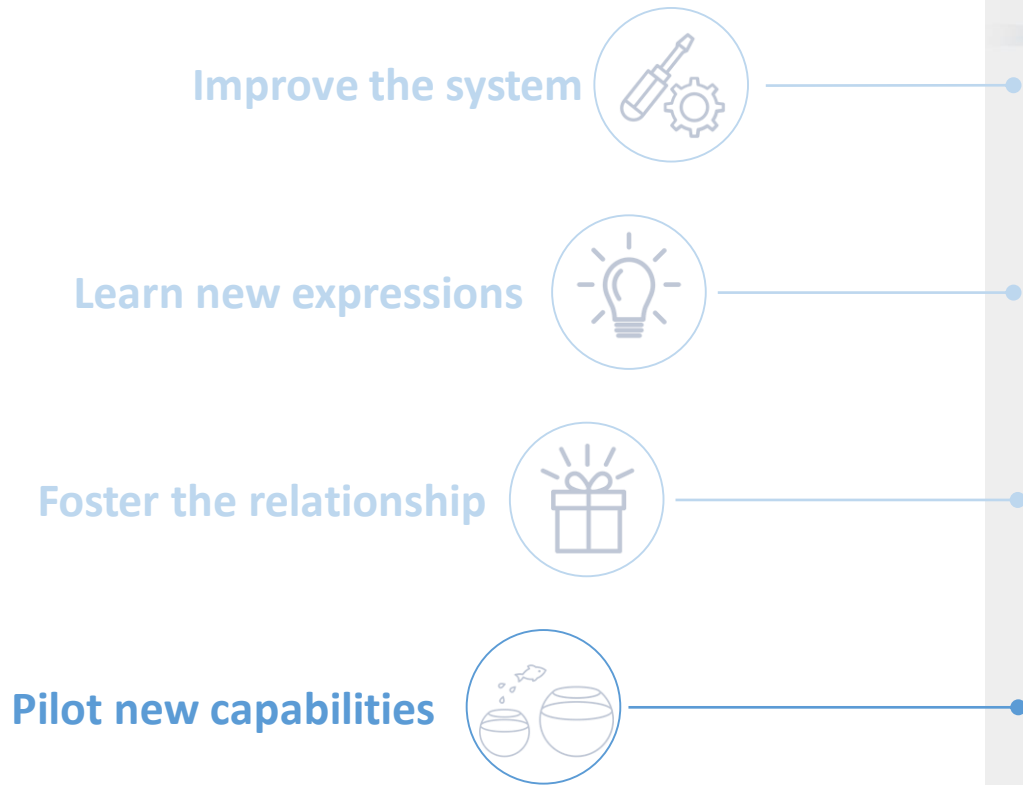
CANCEL SUBMIT

Enter your response here...(English only, please)

AVA made it easy to handle my request: ★ ★ ★ ★ ★

“Every failure carries with it the seed of a greater or equal benefit.”

– Napoleon Hill



AUTODESK

Start over

Get Previous Version License  
"I want a previous version of my software."

Look Up Product Key  
"I am looking for a product key." or "I'm looking for the product key for AutoCAD LT 2016."

For a complete list of what I can help you with, say "What can you do?"

I am using Inventor 2018 and want to know if it's possible to export a flat metal sheet face pattern in .dwg or .dxf format? Also, can I save this as my preferred export format?

I am sorry, but I unfortunately haven't been trained to respond to this yet.

However, based on what you told me, I was able to retrieve several customer support articles that I think you might find to be helpful.

- How to export a part face in dwg or dxf format ?  
Nov 01 2014 - In Inventor part (ipt) or assembly (iam) how is it possible to export a specific face in dwg or dxf format? Can the format version also be selecte...  
Support
- About Export of Faces and Sheet Metal Flat Patterns  
Jul 25 2018 - In the sheet metal environment, Export Face As is available for both the flat pattern and the folded part. Use Save Copy As to export sheet metal f...  
Help
- Save As Export Options Reference  
Jul 25 2018 - CATIA V5 Export Options (\*.CATPart, \*.CATProduct) Version Select the file format version (10 through V5-6R2014) for export. IGES File Export Option...  
Help

Was this helpful?

Yes No

Enter your response here...(English only, please)

AVA made it easy to handle my request: ★ ★ ★ ★ ★

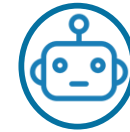
**“You miss 100% of the shots you don’t take. – Wayne Gretzky”**  
– Michael Scott

Fail fast; iterate quickly.



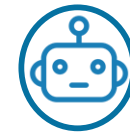
*Help me, I am getting an error when I try using a polyline...*

*I'm sorry, I don't recognize that....*

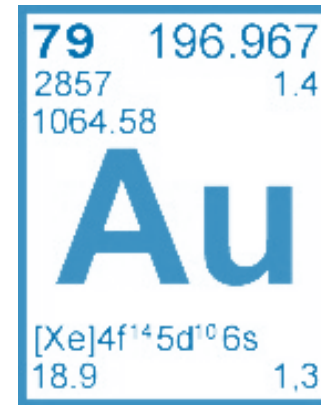


*Is this a joke?*

*I love telling jokes! What do you call a fake noodle? An impasta.*

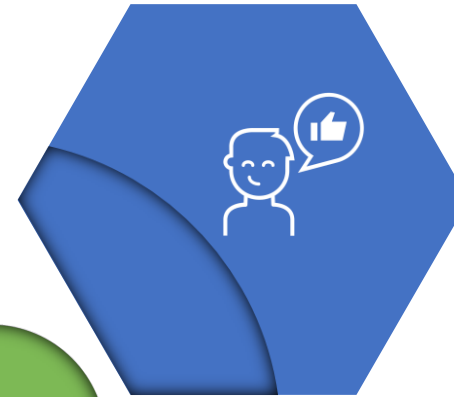


Feedback =



## Quantitative

Exists as multitude or magnitude.  
Measured in terms of quantity not quality.



## Qualitative

Subjective or descriptive in nature.  
Measured in terms of quality not quantity.

## Implicit

Assumptive in nature. Implied or understood  
though not directly expressed.



## Explicit

Concrete in nature. Fully and clearly  
expressed, leaving nothing implied

FEEDBACK

All have the *potential* to be valuable

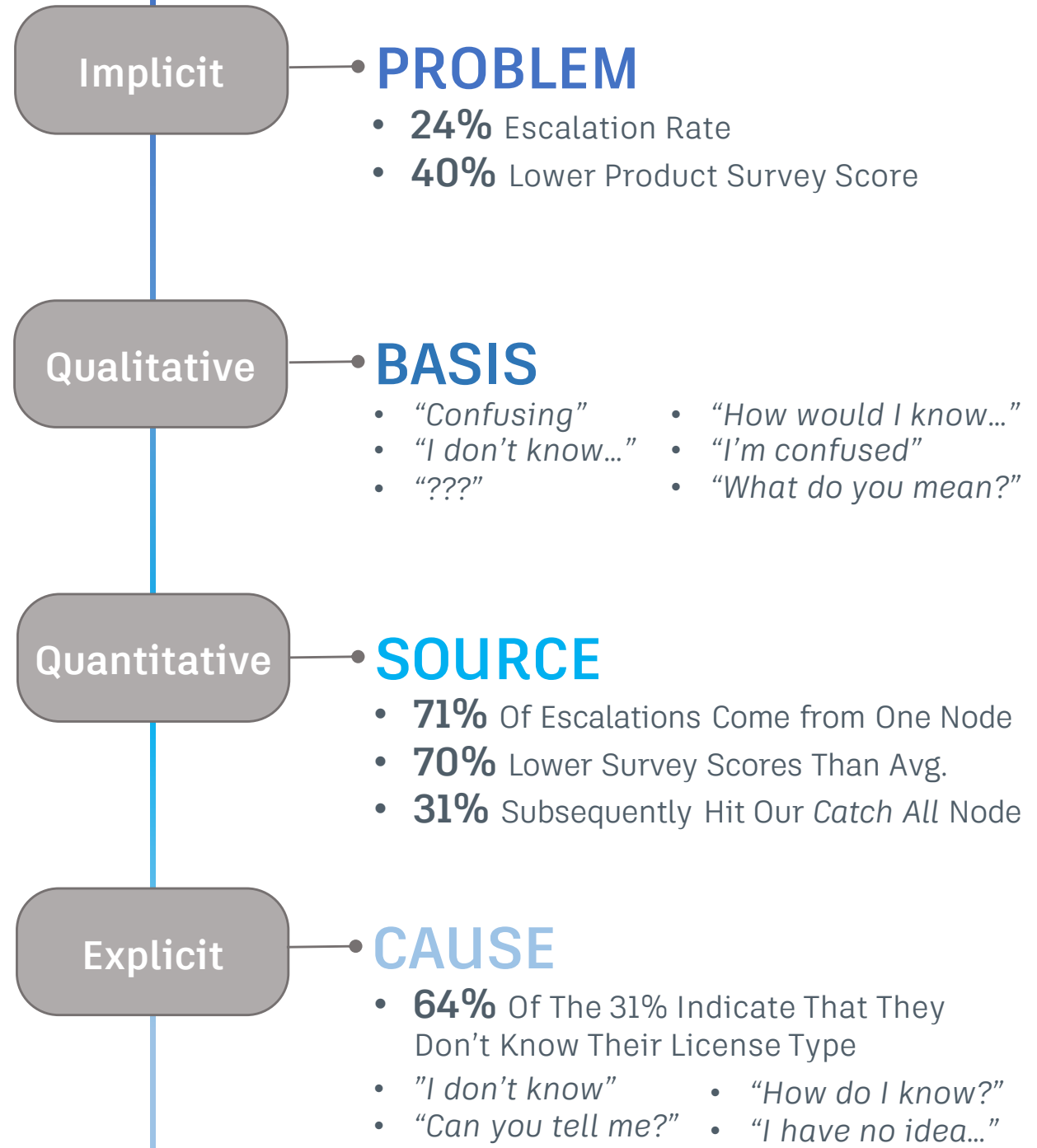
All require supporting processes for value to be *realized*

<b>TYPE:</b> Problem
<b>Basis:</b>
<b>Source:</b>
<b>Cause:</b>

<b>TYPE:</b> Problem
<b>Basis:</b> Confusion
<b>Source:</b>
<b>Cause:</b>


<b>TYPE:</b> Problem
<b>Basis:</b> Confusion
<b>Source:</b> License Type Node
<b>Cause:</b>

<b>TYPE:</b> Problem
<b>Basis:</b> Confusion
<b>Source:</b> License Type Node
<b>Cause:</b> Users don't know their License Type





Set your expectations.

HI, I'M AVA  START OVER

Hi, this is AVA (Autodesk Virtual Agent). Good afternoon!


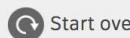
Here are some things I can help you with:

- Managing your Autodesk Account
- Downloads and upgrades
- Activation & registration
- Installing and configuring your product
- License management

Ask me a question and I'll do my best to help!

5:23 PM





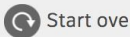
Hi Yizel, I'm AVA (Autodesk Virtual Agent).

I specialize in Autodesk customer service and I will do my best to help you.

For example, you could ask me: 'Can you help me get an activation code?' or 'I am looking for a product key.'






Enter your response here...(English only, please) 




 

Hi Yizel, I'm AVA (Autodesk Virtual Agent).

Here are a few things I can help you with.

-  **Download Autodesk Products**  
"I'd like to download an Autodesk product." or "I'd like to download Revit 2018."
-  **Get Activation Code**  
"Can you help me get an activation code?"
-  **Get Home Use License**  
"Can you get me a home use license?"
-  **Get Previous Version License**  
"I want a previous version of my software."
-  **Look Up Product Key**  
"I am looking for a product key." or "I'm looking for the product key for AutoCAD LT 2016."

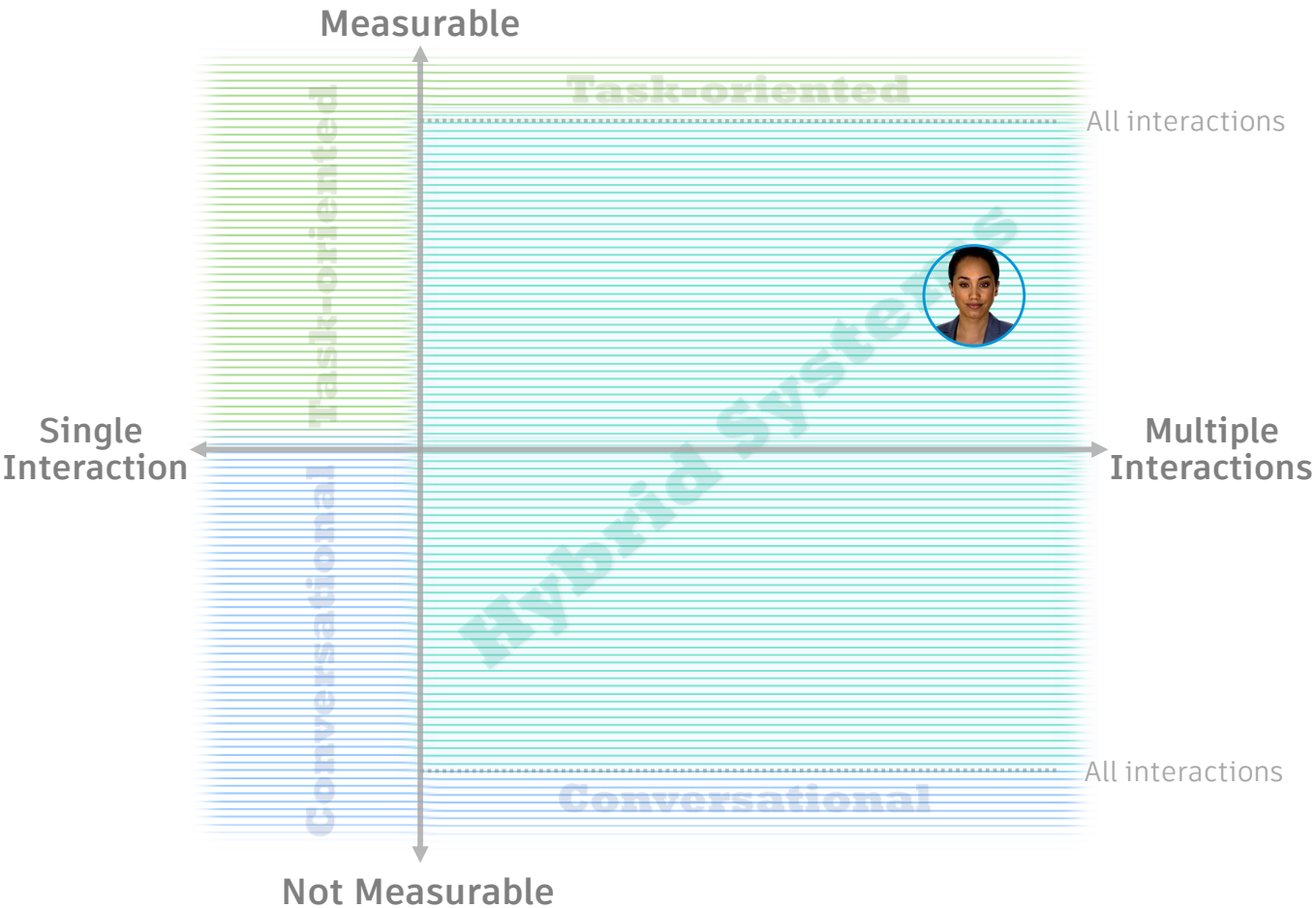
If you have any other questions, please ask—I'm here to help.

Enter your response here...(English only, please) 

Align system architecture  
with the use case at hand.

# Dialog System Selection

Based on **scope** of system, **measurability** of outcome(s), and anticipated **variance** in interactions



## TASK-ORIENTED

Optimized for **confined, measurable**, and often times **low-variance** interactions that are **goal-oriented**.



## CONVERSATIONAL

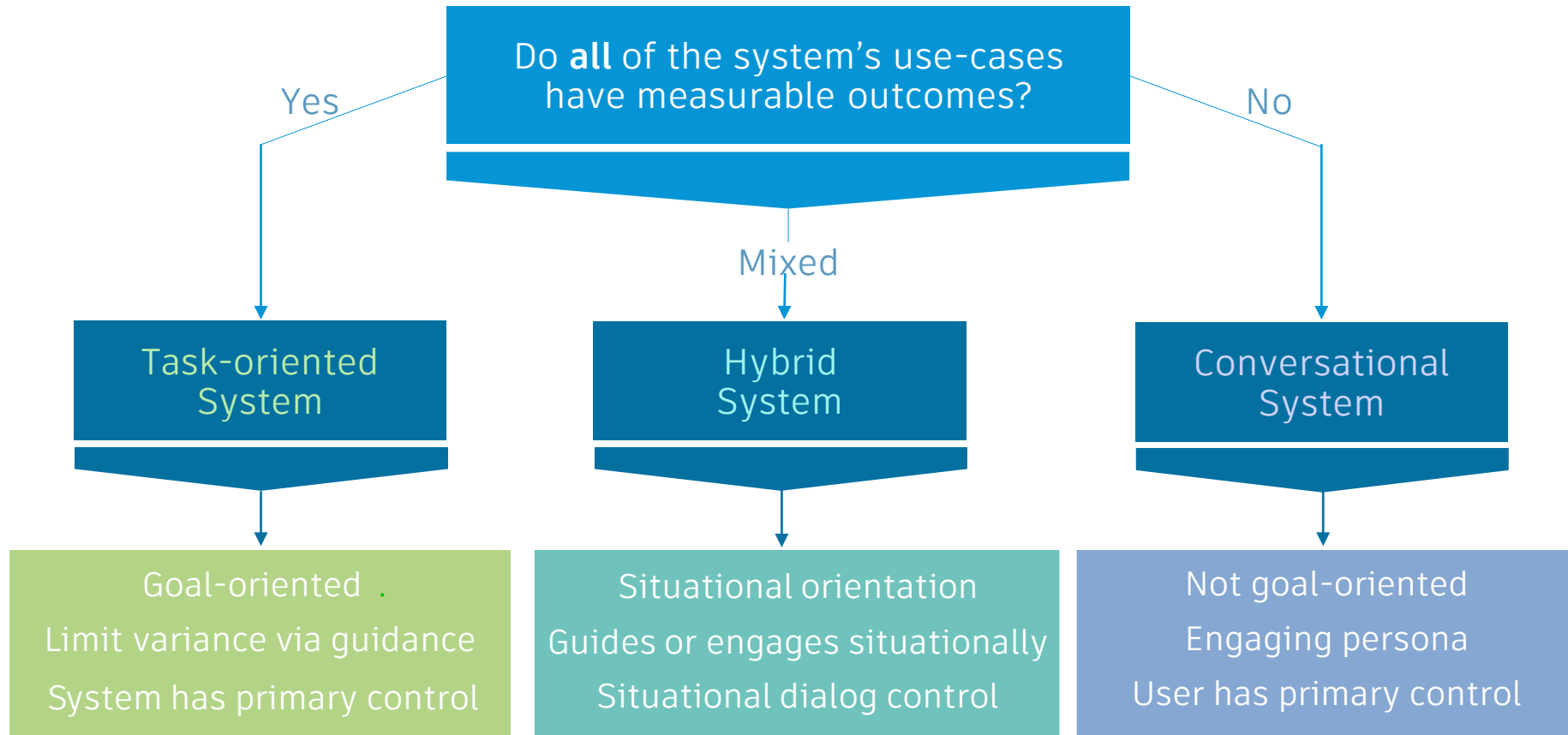
Optimized for **open-ended, non-measurable**, and often times **highly variant** interactions that have **no defined end-state** (not goal-oriented).



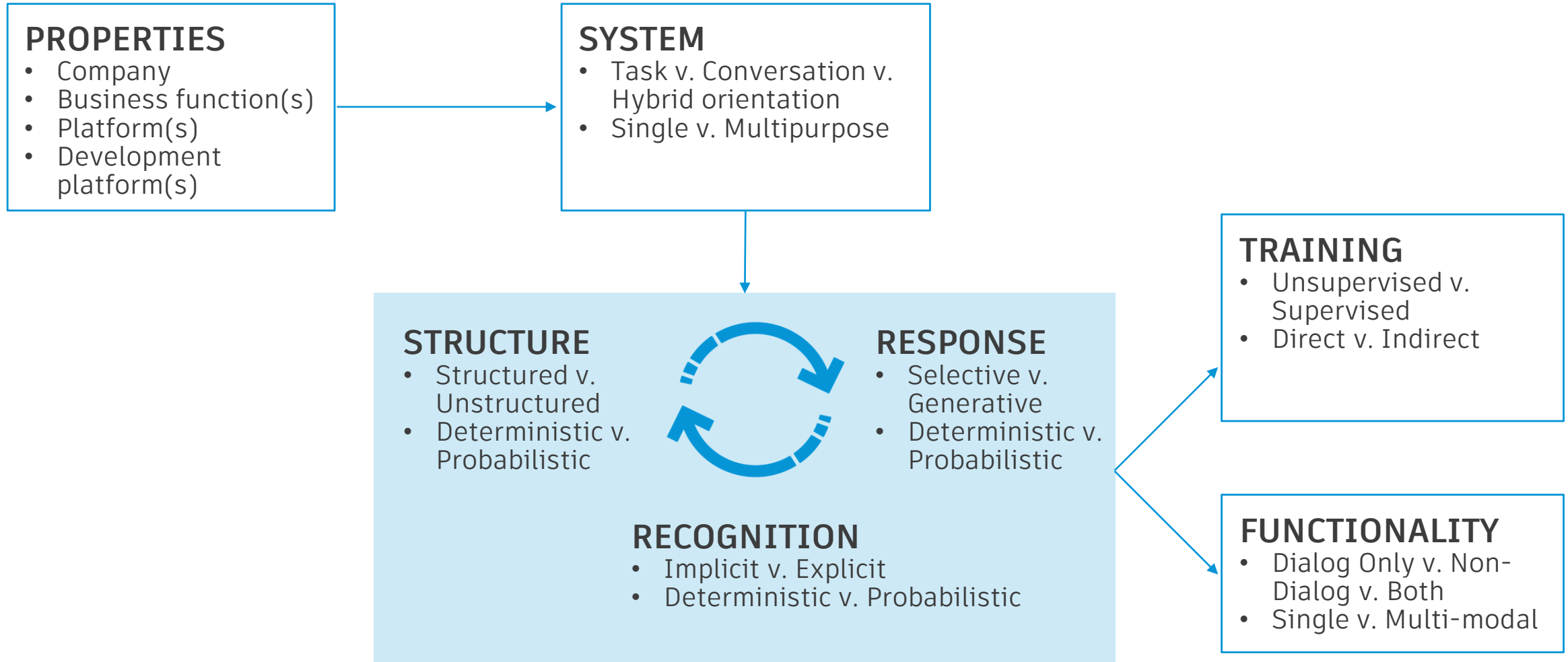
## HYBRID

Optimized for **multi-faceted** interactions that entail **both measurable and non-measurable** interactions, and **both variant and low-variance** interactions that are **situationally oriented**.

# Dialog System Selection



# Dialog System Components



Information hierarchy is  
key.



- Important information first
- Bullets points, headers, lists, & images
- Gestalt laws of grouping



- Important information last
- Less than 12 second recordings
- Use real estate wisely

Simplicity





Take risks...smart ones.



Market & UX research



Stakeholder management



Cross-functional collaboration



Technological limitations



Scalability & process



Analytics & reporting



⌘ Loading Your Experience

*“...sleek, easy, innovative, enjoying the experience...”*

*“...distracting, mesmerizing...”*

*“Very curious, don’t know how comfortable I am.”*

*“She’s intimidating but I trust Autodesk.”*

*“...less trustworthy because no reason for camera & mic.”*



Market & UX research



Stakeholder management



Strategic partnerships



Goal alignment



Scalability & process



Monitoring & reporting

# Beta Results: A *Perceived* Better Experience

	SOUL MACHINES AVA	STANDARD AVA	DIFFERENCE
VOLUME (Monthly Convos)	1,256	2,438	
PREFERRED METHOD (when preference selected)	53%	47%	+6%
EASE OF USE %	51%	13%	+38%
AVG. SUCCESS RATE (reached solution node)	60%	54%	+6%
AVG. ESCALATION RATE	12%	12%	0%
% "ACHIEVED GOALS"	89%	49%	+40%
% "WOULD USE AVA AGAIN IN THE FUTURE"	81%	52%	+29%
% POSITIVE EXPERIENCE (our version of CSAT)	77%	50%	+27%

## CUSTOMER FEEDBACK

- 92% of users say Soul Machines AVA is "More Engaging" than Standard AVA
- 85% of users say Soul Machines AVA is "More Effective" than Standard AVA

"Very clear and direct audio instructions"

"Let her talk about more!"

"I wish Ava was able to help with more stuff..."

"She only offers video chat sometimes"

"I expected Ava to be able to engage in small talk, but it did not respond well to phrases outside of what it was anticipating..."

Build trust through  
transparency.



*"I'm a virtual agent (not a human)."*  
- AVA



What's Next?



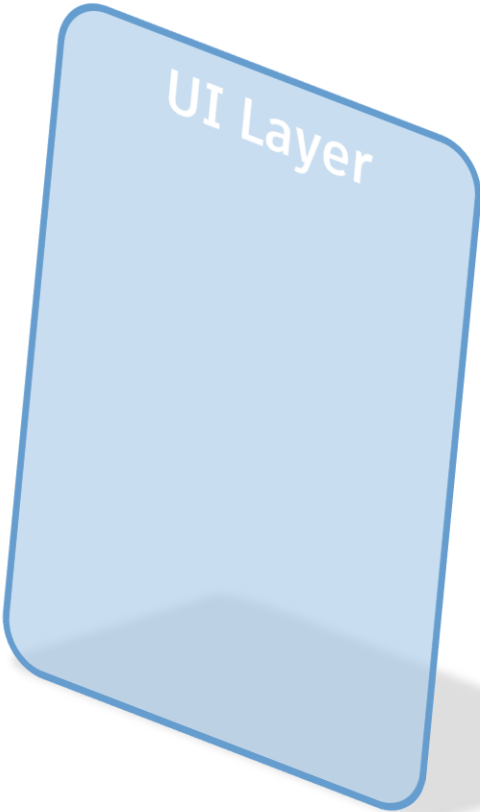
Front-end: AVA Conversational Interface

Back-end: Dialog System Architecture(s)



**Front-end: AVA Conversational Interface**

**Back-end: Dialog System Architecture(s)**



QεA