

Devil-bot Chatbot

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Our Team

Duke HR



Emily Hughes

Duke Registrar



Jacqueline Cruz

Duke OIT



Edna Zhang

Team Leads



Mark McCahill



Brady Kim



Mitchell Negus



Ayoub Mahdar



Isabel Valls

Team Goals



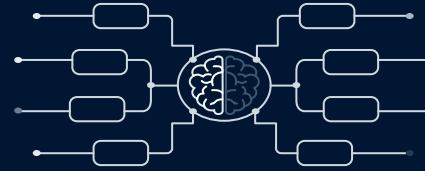
Address the consumer's
questions before an
employee has to



Leveraging Microsoft and
IBM AI technology to build
Chat-bot

How Does the Chat-bot Work?

- Software that can automatically communicate with users
- Uses patterns to develop responses

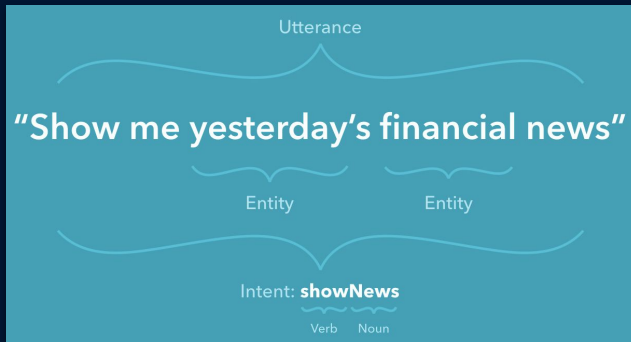


Technology Implemented

- Applies NLP (Natural Language Processing)
- Analyzes intents and entities used to answer a question
- Implements data to identify how to answer
- Multi-turn conversation

IBM Watson Assistant Chatbot

- **Detects intent from an utterance**
 - Intent: user's goal or purpose
 - Utterance: what the user says
- **Also looks for entities**
 - Entity: specific word of significance
- **Checks nodes and delivers response**



I want to order food

#setTimer

false

#orderFood

true

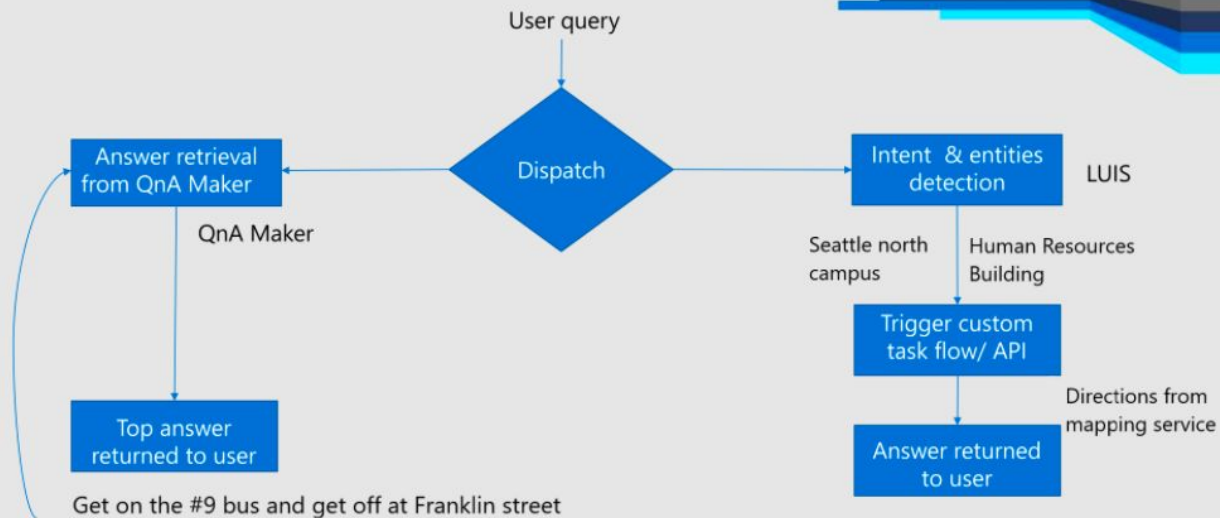
What can I get you?

#checkWeather

false

Microsoft Azure bot

Use QnA Maker & LUIS together



IBM Watson vs. Microsoft Azure

IBM Watson

- **Pros:** Easy integration for calling external services (webhook), intents, entities, and dialog at one place, advanced NLP
- **Cons:** Slow maintenance, difficulty with importing knowledge base

Microsoft Azure

- **Pros:** QnA Maker is easy to navigate & update, more customizable
- **Cons:** Difficult deployment, difficult integration with additional Azure services



01

Duke Registrar

Jacqueline Cruz & Mitchell Negus

Duke Registrar Chatbot

About the Registrar

- Manages a variety of academic services
- Drop/add, final exam schedules, transfer credit, grade changes, DukeHub

Goals

- Handles a high volume of requests
- Provides a personalized experience
- Offers friendly, round-the-clock support

Undergraduate

Faculty

Graduate

Staff

Professional



Duke Registrar Chatbot

Current Status

- Finished user and stakeholder testing
- Users can leave feedback
- Chatbot can write to a database

Next Steps

- Pricing and cost analysis
- Moving into production
- Documentation to transfer bot ownership



02

Duke OIT

Edna Zhang & Ayoub Mahdar

Duke OIT Chatbot

About Office of Information Technology

- Manage Duke's technology
- Provide services and applications to students and faculty

Goals

- Cope with staff shortage during the COVID-19 pandemic
- Bridge between website and Live Chat/phone/email



Duke OIT Chatbot

Current Status

- Completed multiple rounds of user testing with stakeholders & IT analysts
- Addressed accessibility
- Handled redirection to DHTS service desk

Next Steps

- Moving into production
- Documentation for chatbot maintenance



03

Human Resources

Emily Hughes & Brady Kim

Duke Human Resources Chatbot

About Human Resources

- A department of Duke that aids employees of Duke
- Information on disability benefits to retirement plans

Goals

- Answers a variety of user questions
- Presents a swift and simple interface
- Provides support anytime of the day
- Alleviates pressure on the HR staff

Duke Human Resources Chatbot



Current Status

- Implemented Watson Discovery search to update bot automatically
- Completed user testing
- Added new intents and rephrased questions

Next Steps

- Documentation for transfer of bot
- Link SQL database and chatbot by questions asked and answers provided
- Discuss future implementation with stakeholders

Watson Discovery

Data

Private data +
web crawl



Ingestion

Convert
and enrich

Clean and
normalize

Storage

Indexed
into a
collection



Query

Explore
data for
insights



Output

Infuse
Watson
Assistant
with AI



Watson Discovery

HRIC Chat-bot

What is DukeWELL?

I searched my knowledge base and found this information which might be useful:

DukeWELL | Human Resources

Payroll Time Away From Duke Workplace Health & Safety International Definitions Forms Benefits Forms Manager Forms You are here Home Health & Wellness *DukeWELL* *DukeWELL* My Health Web...

[See more](#)

DukeWELL Care Management What i...

DukeWELL provides supplemental care support services at no additional cost for beneficiaries of select healthcare plans, including Duke Select & Duke Basic. DukeWELL care managers work...

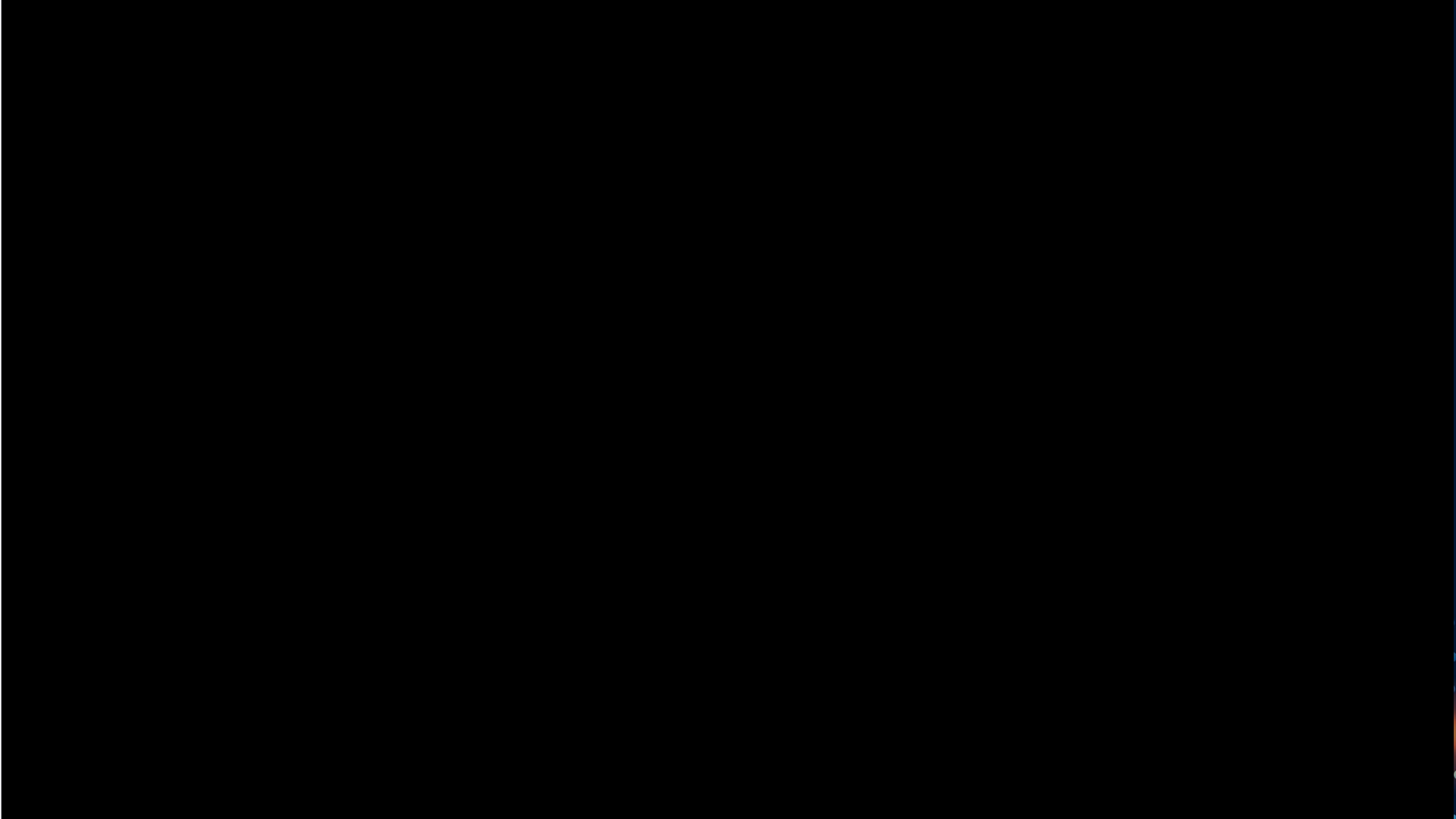
[See more](#)

Skip to main content Duke@Work Ab...

These include: *DukeWELL* *DukeWELL* provides supplemental care support services at no

Type something...





Have questions?
Talk with our OIT chatbot.

Office of Information Technology

IT STATUS ●
- [active incidents](#)
- [scheduled maintenance](#)

ABOUT ▾ WHAT WE DO HELP



What can we help you with?



Duke OIT

Yes. Log in to duke.zoom.us, and select Settings > Meeting. Under Other, Schedule Privilege displays users who may schedule on your behalf. Click the + to assign scheduling privileges to a user, who must have a Duke Zoom account. In the Assign scheduling privilege window, type the user's NetID email.

Read more about scheduling privileges [here](#).

Need further assistance?

Thanks

Thank you for chatting with me today. Was your problem resolved?

Yes

No

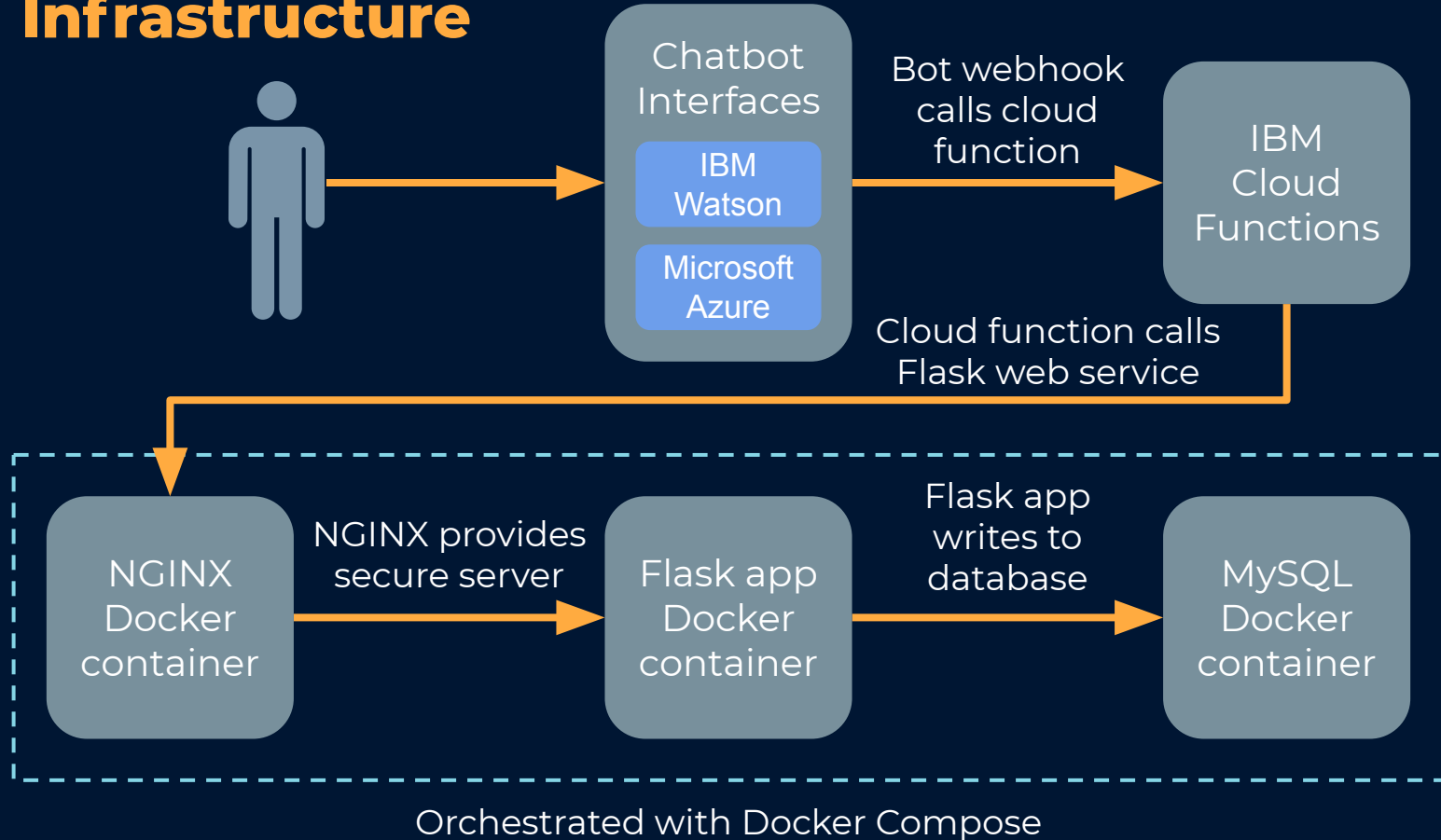
Yes

Thank you! I'm glad I helped. Bye!

Type something...



Infrastructure

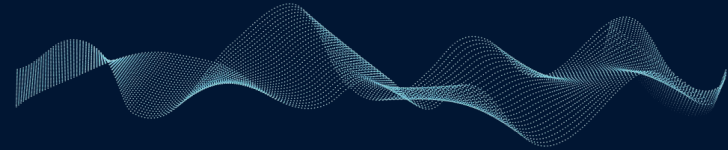


Business Case Analysis

Our project has reached a point where we are analyzing the cost-benefit of implementing them.

Metrics

- Swift response to user
- Improved user experience
- Increase personnel efficiency



Process

- Estimate volume capabilities of bot
- Total time saved for staff
- Costs of bot support

Example: OIT Service Desk LiveChat

Method 1

Data mining: ~8000
LiveChats collected
over 2 months

LiveChat transcript
analysis to estimate
bot coverage

Method 2

Method 3

Bot could
immediately send
~7% to DHTS

Prioritize adding
intents not in bot
knowledgebase

Method 4

Chat-bot Care & Feeding

	Site Visits/Month	% Bot Users	Bot Users/Month
Registrar	43,300	15%	6,495
OIT	100,000	1%	1,000
HR	147,130	15%	22,070

Chat-bot Care & Feeding

Registrar

Total Cost Estimate:
\$954/month

OIT

Total Cost Estimate:
\$184/month

HR

Total Cost Estimate:
\$3,124/month

- Watson Assistant Plus @ \$140/month for 1000 monthly active users + \$14/100 additional active users
- Flask Web Server Cost:
 - Lower- \$527.91/year and \$44/month
 - Upper- \$831.23/year and \$69.27/month
- Staff time for bot base maintenance is **not** included in the cost estimates

Registrar, OIT, HR Projects



Automate routine
questions and
answers



Relay difficult
questions to a
human



Improve the
chatbot on an
ongoing basis

What we learned



docker

NGINX



Flask

Docker



Compose



THANK YOU!

REGISTRAR'S OFFICE

Frank Blalark
Chris Derickson

OFFICE OF INFORMATION TECHNOLOGY

Paula Batton
Rodney Cozart

HUMAN RESOURCES

Jacky Labonte
Jennifer Frazier
Bill Marchese

IBM SPONSORS

James Jushchuk
Anand Singh