ROBOT FOOD DELIVERY AT GEORGE MASON UNIVERSITY

Danny Anthes
Director of Technology Services
Main Campus located in Fairfax, Virginia
Remote campuses in:
• Arlington
• Manassas
• Front Royal (partnership with SI)
• International campus in Songdo

Student Information
• 34,000 students
• 6,200 beds

Top R1 research institution with 104.7 million in research

80% students employed within 6 months of graduation
Daniel Anthes
Director of Technology Services
Auxiliary Enterprises / University Life

<table>
<thead>
<tr>
<th>Division of Auxiliary Enterprises</th>
<th>Division of University Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divisional Support</td>
<td>Divisional Support</td>
</tr>
<tr>
<td>Mason Card</td>
<td>Housing and Residence Life</td>
</tr>
<tr>
<td>Physical Security</td>
<td>Mason Recreation</td>
</tr>
<tr>
<td>Print Services</td>
<td>Career Services</td>
</tr>
</tbody>
</table>
STARSHIP OVERVIEW VIDEO
December 10
Got the “go-ahead”

Requirement that it integrate with Campus Funds
- Atrium Integration
- Shibboleth (by extension)

Go live by January 22
The Paperwork...

- MNDA signed shortly after the 10th
- Started emailing with developers
- No meetings scheduled until December 17th

- Review Atrium integration and Shibboleth
  - Atrium was easy to understand

- Shibboleth
  - How to explain Shibboleth...
  - Huge learning curve
  - Campus Expert on vacation
BARRIERS TO DEVELOPMENT

Developers in Estonia
- Large time difference, 7 hours

Coordination for calls
- 3 way calls between Atrium, Starship and Mason
- Pass along the understanding of how this all worked

Winter break, vacations...
- Atrium
- Mason Card
- Central IT
Campus partners
- Police and Safety
- Risk Management
- Facilities
- Parking

Word started to leak ahead of time (Reddit)
LOCATIONS

Opening Locations
• Dunkin Donuts
• Blaze Pizza
• Second Stop (Convenience store)
• Starbucks

Training staff
• Equipment
• Process

Student adjustment to the robots
• High Empathy
GOING LIVE

Students had an immediate love
- Hype had already been building

Many news outlets picked this up

Videos
- George Mason University Robots Delivering Food And Drinks On Campus
- George Mason University Robots Delivering Food And Drinks On ...
- Mason's Robots

Presidents Council discussions
ADJUSTMENTS AFTERWARD

Missed Requirements

- Mapping sales to stores
  - Creating individual store entries
- Tenders and tax exemption
ADDING ADDITIONAL VENUES

Moved quickly to add new locations
• Steak and Shake
• One Stop (Second convenience store)
• Garbonzo
• Akeno Sushi
• Subway

Adjustments based on numbers
• Late night Pizza delivery (dining hall)

More on the way
• Chick-Fil-A...
  • Student wanting/demanding

Posted by u/BigGMan24601 1 month ago

Chic-fil-a and Starship?

I feel like I have been patient, but I would really like to know what "coming soon" means for Starship. Does anyone have any inside information on when chic-fil-a will join Starship? I would just walk to get it, but I am in Potomac and none of my classes are close to it either. It is also cold af outside so that adds to my list of obstacles blocking me from that tasty chicken.
Currently seeing $12,000 orders per week
First week saw about 200 orders per day

Subway saw 200 orders first day

Learning students habits
- Dunkin Donuts leading sales
- More breakfast orders
  - 1500 more breakfast orders
- Will be adding late night pizza delivery

**The Robots Are Here: At George Mason University, They Deliver Food To Students**

April 7, 2019 · 3:13 PM ET
• Delivery fee
  • 1.99 delivery charge
• Percentage of transaction (like UberEats)
Planning
• Started with 12 Starship Robots
• Increased to 19 before the start of the semester
• Current at 36, with more on the way

Growth:
• Another 15 coming to bring us to 50
• Limited by the number of robots
Robot Technology

- **Artificial Intelligence**
  - Very hands off

- **Mapping**
  - Finding obstacles
  - Adjusting paths

- **Road**
  - Radar checking
  - Crossing guard

- **People Detection**
  - People following
  - Support Cane
Robots are smart

- Cameras
  - Visual
  - Infrared
- Radar
  - Car detection
- GPS
- Low-jack

- Fallback of Human intervention
ON-SITE OPERATIONS

Storage/Maintenance Space
- Room needed at about 1,000 sq/feet
  - Used for monitoring, repair, and housing
- Student driven jobs
  - 10 Student Staff jobs
- Monitored from Starship central
- Sodexo
  - Adding 20 part time jobs
PEOPLES INTERACTION

- People are helping
  - Not much interference
  - But now late-night...
- Construction barriers
- Sidewalk changes
SALE BREAK DOWN

Lost no sales

Freshmen leading the charge
Followed closely by Faculty/Staff Housing

Rain/Snow we see a doubling of sales

Dunkin Donuts leading with sales
Late night we see Blaze Pizza up-tick
Generating studies

- **School of Business**
  - Impact on sales
  - Adding jobs
- **Physiology**
  - High empathy
  - Naming
- **Soon Anthropology**
  - Emotional reaction
  - Cute versus business
Future state

- Adding third party vendors (non-Sodexo)
  - Panda Express
  - Manhattan Pizza
  - Panera, maybe?

- Adding more robots
  - 36 -> 50 in the next few weeks

Adding further services

- Print Delivery
- Packages
- Etc...
QUESTIONS?

Danny Anthes
danthes1@gmu.edu