Parking Management Redesign @ MIT - SAP and so much more

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Agenda

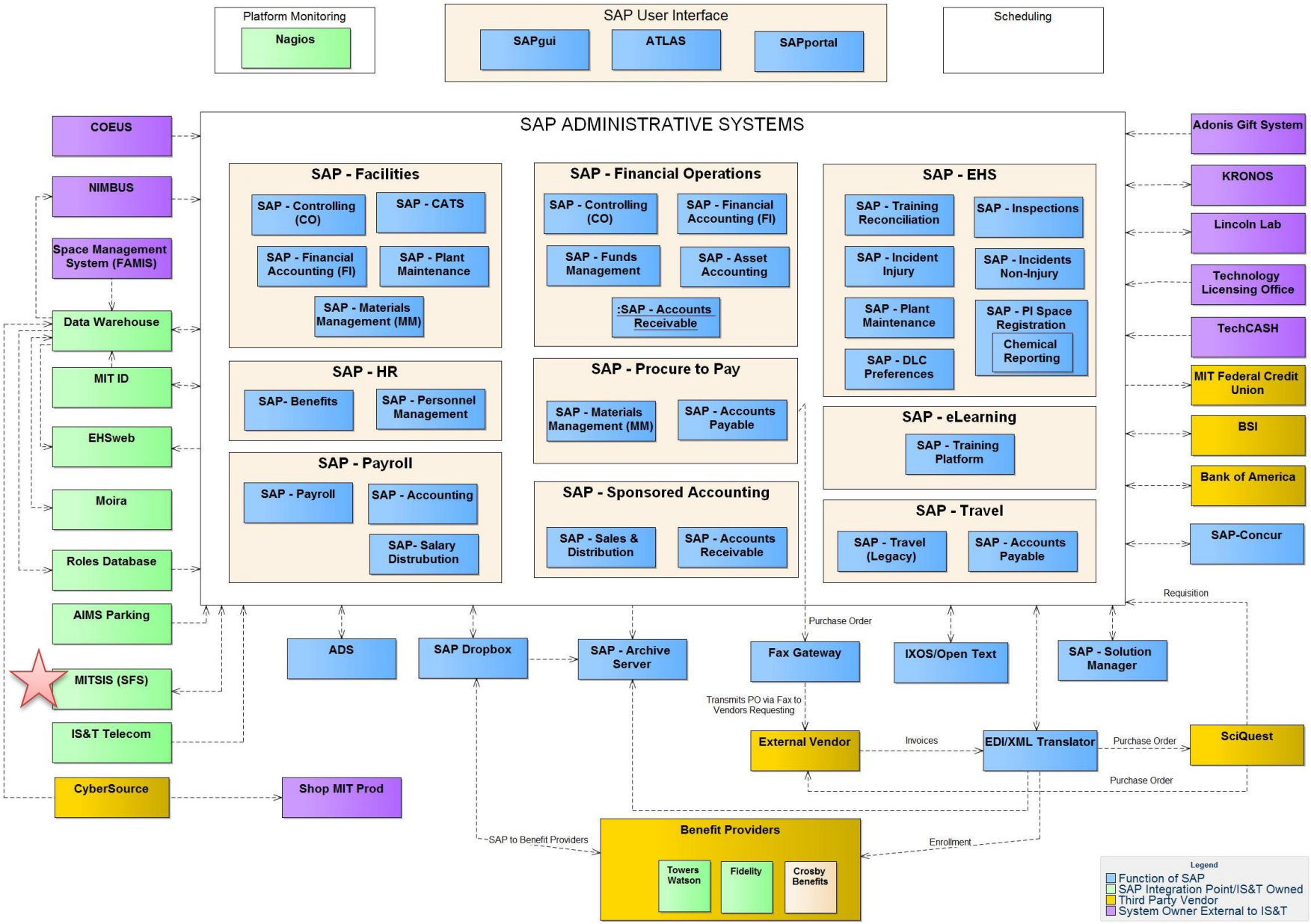
- About MIT
- Background
- Project Drivers
- Architecture & Integration
- Project Resources & Timeline
- Lessons Learned
- Next Steps
- Q&A

A Bird's Eye View of MIT's Campus

MIT @ a Glance

- History
  - Incorporated by the Commonwealth of Massachusetts in 1861
- Motto
  - *Mens et manus* – "Mind and Hand"
- Employees
  - Approximately 12,707 (including faculty)
- Faculty
  - Professors (all ranks): 1,056
  - Other teaching staff: 911
- Selected Honors (MIT Community, Current and Former)
  - 90 Nobel Laureates
  - 59 National Medal of Science winners
  - 29 National Medal of Technology and Innovation winners
  - 75 MacArthur Fellows
- Students, Academic Year 2018-2019
  - Total: 11,574
  - Undergraduate: 4,602
  - Graduate: 6,972

SAP @ MIT integrates with… a lot



Parking - Background

- Approximately 8,000 permitted parkers on campus – faculty, employees, students, alumni, volunteers, vendors, etc.
  - MIT's urban campus makes parking a scarce resource.
  - Complex and ever-evolving business process for management.

- Migrated from custom software solution to SaaS product (AIMS Parking) in May 2016.
  - 80/20 rule – off-the-shelf product meets 80% of your needs at much lower cost.

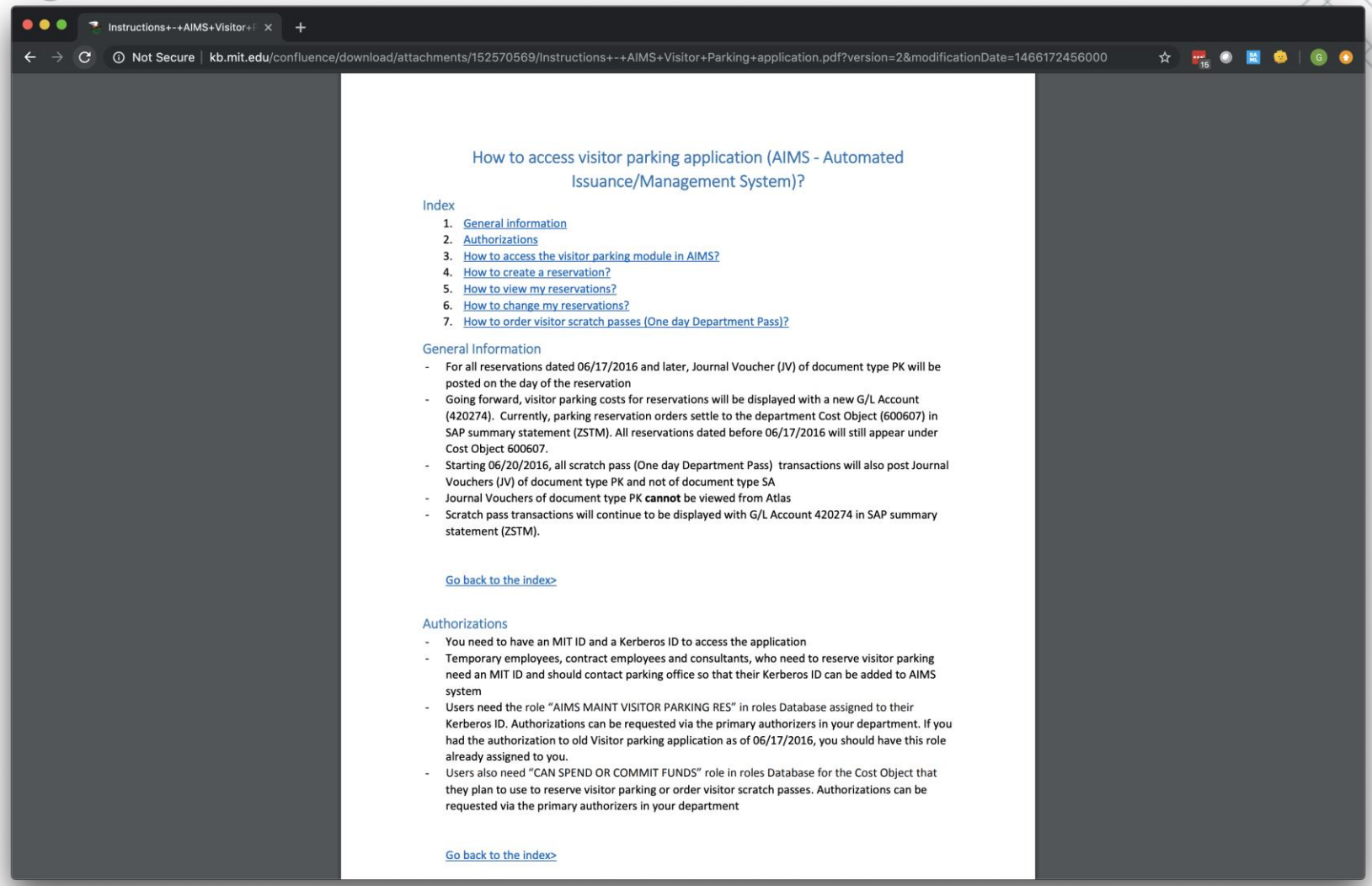
- Reality check in 2017: How well was it really working?

Project Drivers – Pain Points

- SaaS solution didn't mesh well with MIT's decentralized nature.
  - Designed for the needs of a commercial parking garage; popular with central office, but not with academic units.
  - No support for departmental coordinator role:
    - No roll-up reporting at departmental level.
    - Cumbersome process for reviewing individual user parking records for non-global admin.

- Existing business process required yearly renewal and distribution of physical parking stickers.
  - Manual work for every parker, every year.
  - Manual enforcement process: walk around lots and look for stickers.

So many instructions…



How to access visitor parking application (AIMS - Automated Issuance/Management System)?

Index

1. General information
2. Authorizations
3. How to access the visitor parking module in AIMS?
4. How to create a reservation?
5. How to view my reservations?
6. How to change my reservations?
7. How to order visitor scratch passes (One day Department Pass)?

General Information

- For all reservations dated 06/17/2016 and later, Journal Voucher (JV) of document type PK will be posted on the day of the reservation
- Going forward, visitor parking costs for reservations will be displayed with a new G/L Account (420274). Currently, parking reservation orders settle to the department Cost Object (600607) in SAP summary statement (ZSTM). All reservations dated before 06/17/2016 will still appear under Cost Object 600607.
- Starting 06/20/2016, all scratch pass (One day Department Pass) transactions will also post Journal Vouchers (JV) of document type PK and not of document type SA
- Journal Vouchers of document type PK **cannot** be viewed from Atlas
- Scratch pass transactions will continue to be displayed with G/L Account 420274 in SAP summary statement (ZSTM).

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Authorizations

- You need to have an MIT ID and a Kerberos ID to access the application
- Temporary employees, contract employees and consultants, who need to reserve visitor parking need an MIT ID and should contact parking office so that their Kerberos ID can be added to AIMS system
- Users need the role "AIMS MAINT VISITOR PARKING RES" in roles Database assigned to their Kerberos ID. Authorizations can be requested via the primary authorizers in your department. If you had the authorization to old Visitor parking application as of 06/17/2016, you should have this role already assigned to you.
- Users also need "CAN SPEND OR COMMIT FUNDS" role in roles Database for the Cost Object that they plan to use to reserve visitor parking or order visitor scratch passes. Authorizations can be requested via the primary authorizers in your department

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Project Drivers – Pain Points

- Minimal system integrations, particularly with student systems, i.e. enrollment, housing.
- No automated determination of eligibility rules for different types of permits.
- Frequent billing irregularities, and slow billing process due to many manual processes - 4-6 weeks after close of billing period for charges to be posted.
- Minimal enforcement of business process at system level:
  - New permit types created on-the-fly.
  - No data integrity enforced with identity systems for MIT ID # database and ID card system.

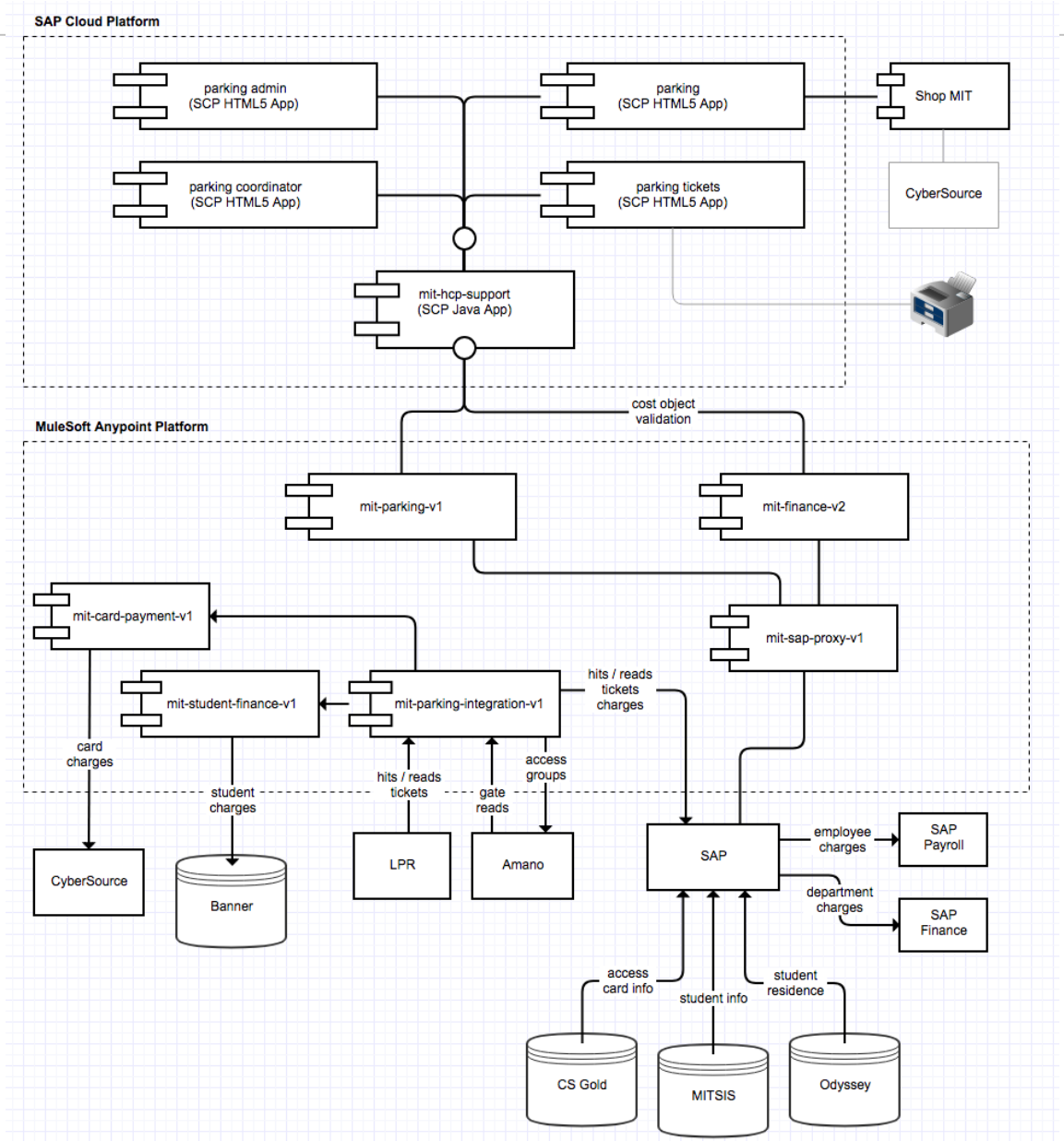
Project Goals

- Provide a system that better meets MIT's needs!
  - Support for central office / departmental coordinator split roles & responsibilities.
  - Integrated with all campus systems for automated eligibility determination.
  - Same look and feel / UX as other campus administrative applications.
  - Eliminate yearly renewal process and physical parking stickers.
- Standardize business processes and ensure data integrity.
- Align with MIT's technology architecture direction and investments: SAP ECC, SAP Cloud Platform, Mulesoft IPaaS, SAP HANA Data Mart.

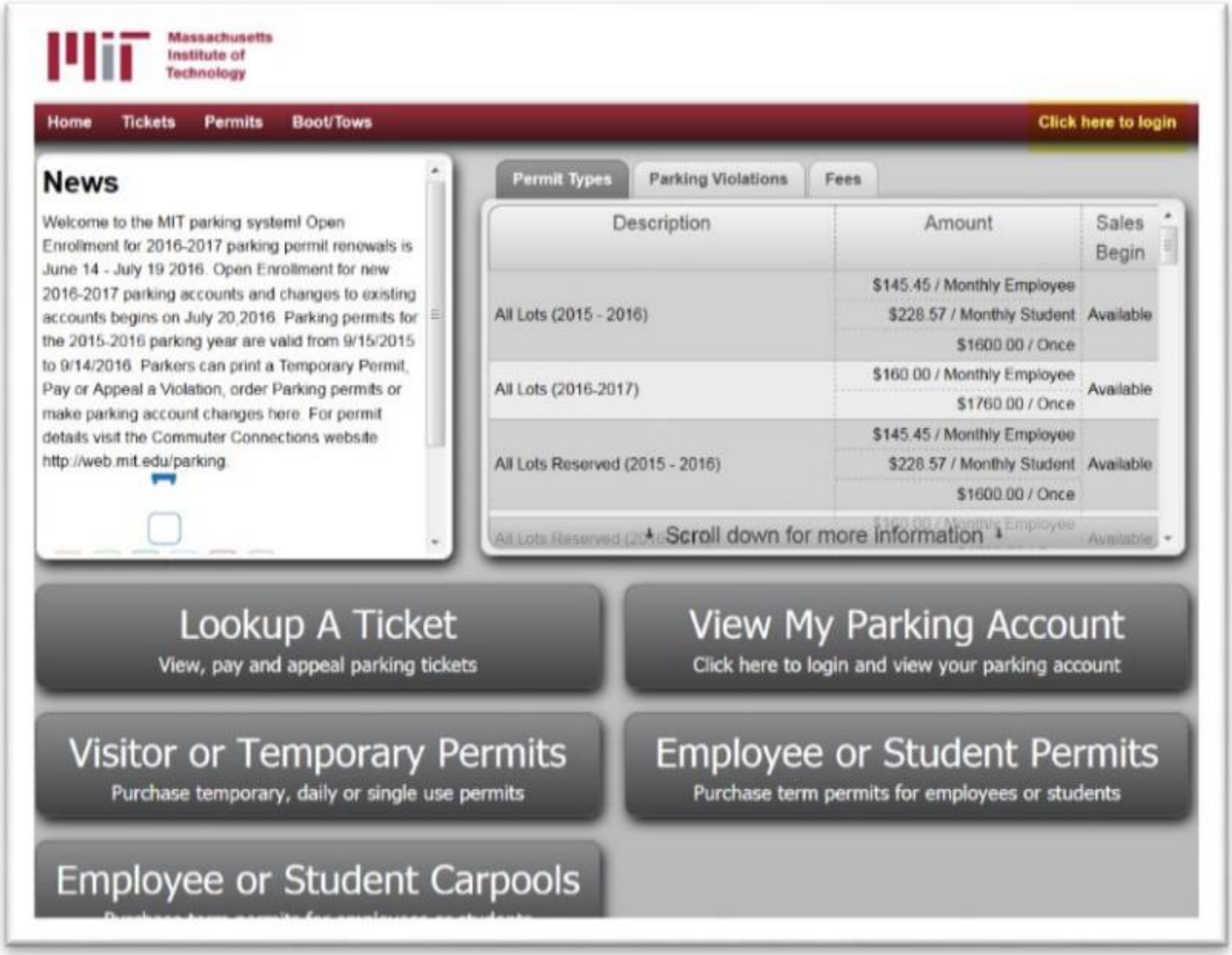
System Components

- Web front end – Fiori / SAPUI5 web application hosted in SAP Cloud Platform.
- Middleware / API management – Mulesoft Anypoint hosted in AWS (MIT consumes as PaaS).
- Backends / transactional systems:
  - SAP ECC (primary SoR, payroll deduction, accounting, etc.)
  - MIT Roles DB (AuthZ)
  - MIT Moira (Identity Management)
  - MITSIS (SIS / student enrollment)
  - OdysseyHMS (housing management)
  - Banner (student finance)
  - CSGold (MIT ID card)
  - Cybersource (CC payment processing)
- Reporting – MIT Data Warehouse / SAP Data Services / Cognos.
- Physical access control & enforcement – Genetec Security Center, **LPR (license plate recognition) vehicle.**

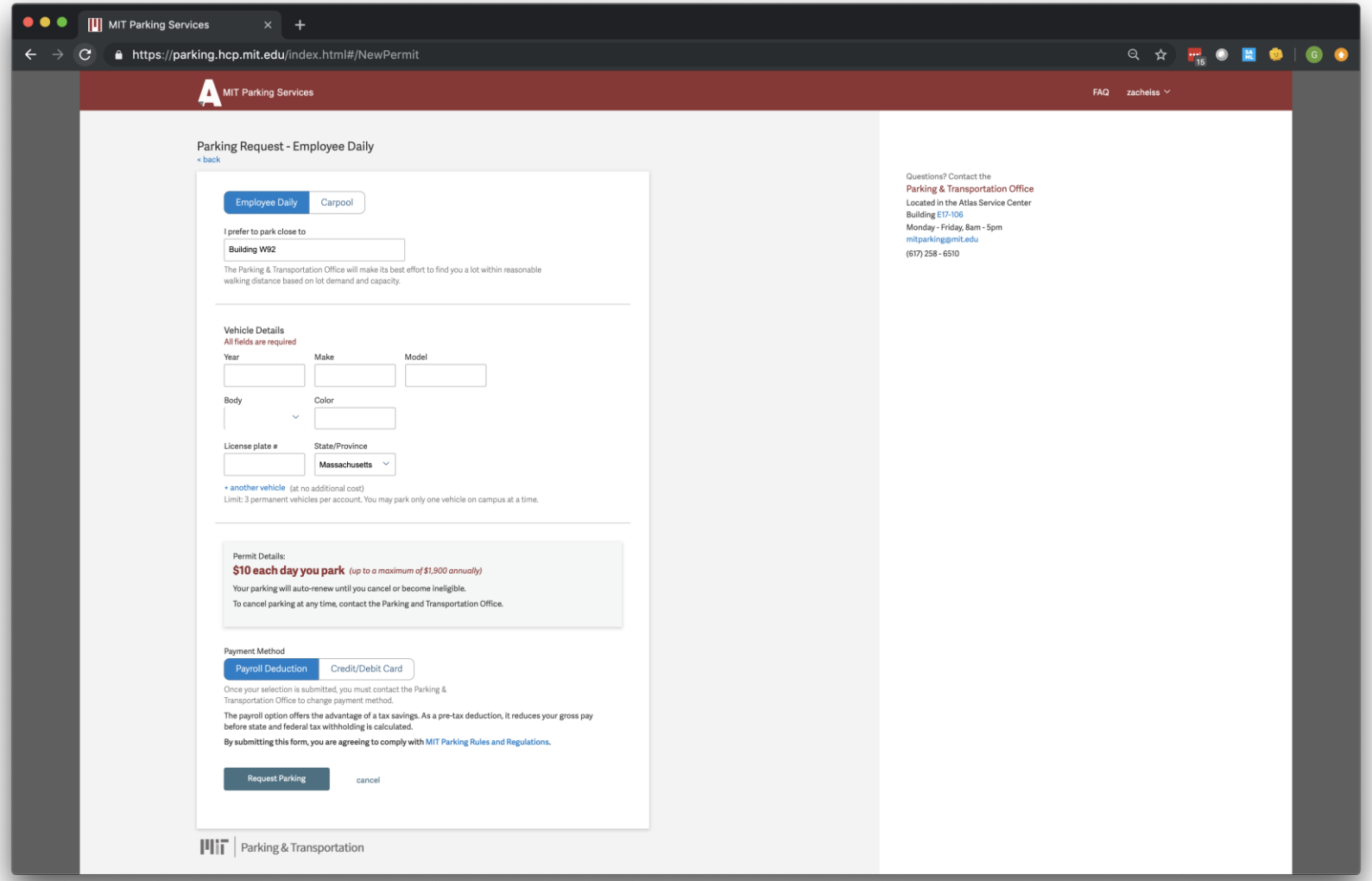
Parking Redesign - Architecture



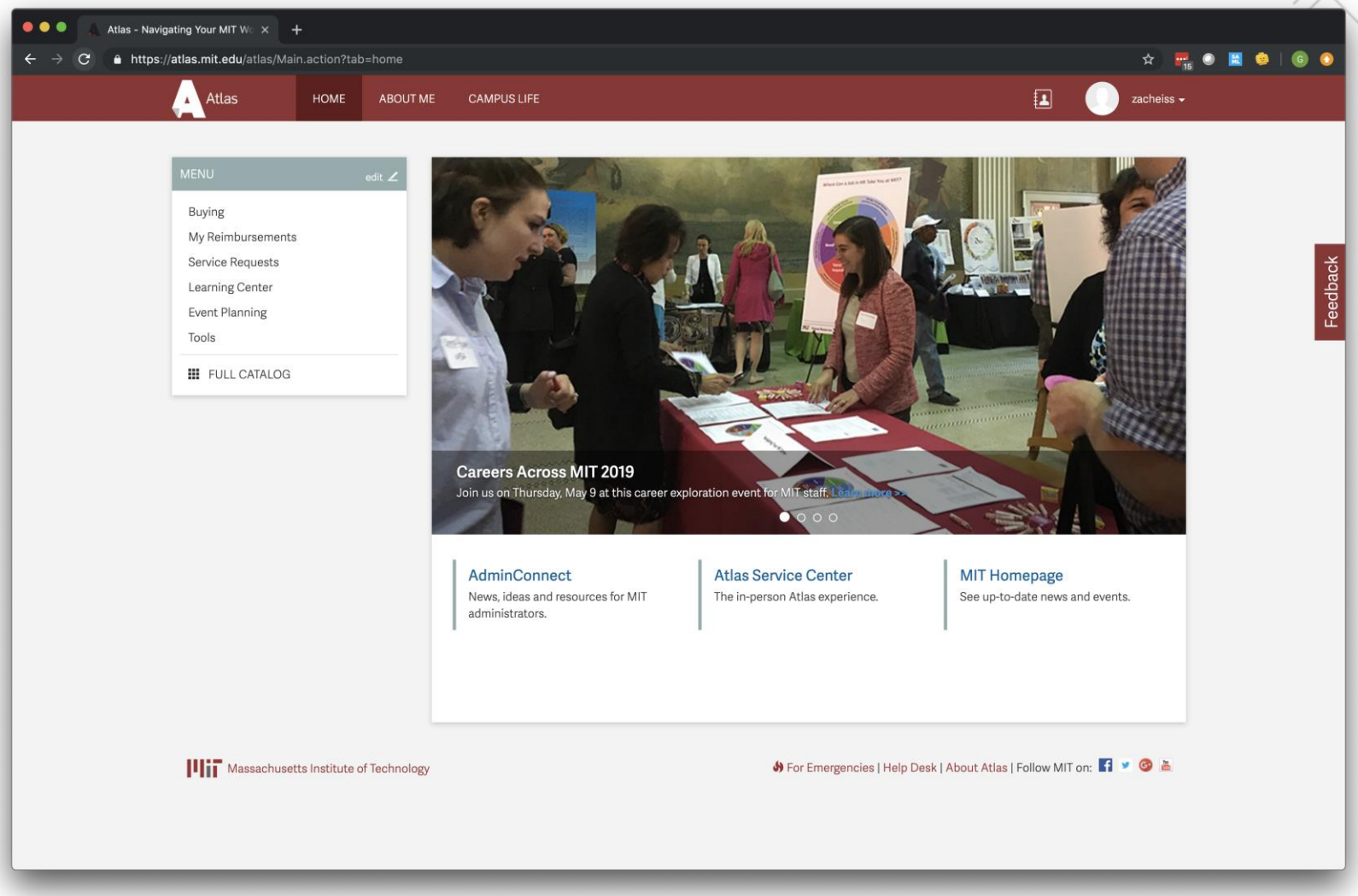
Parking - Before



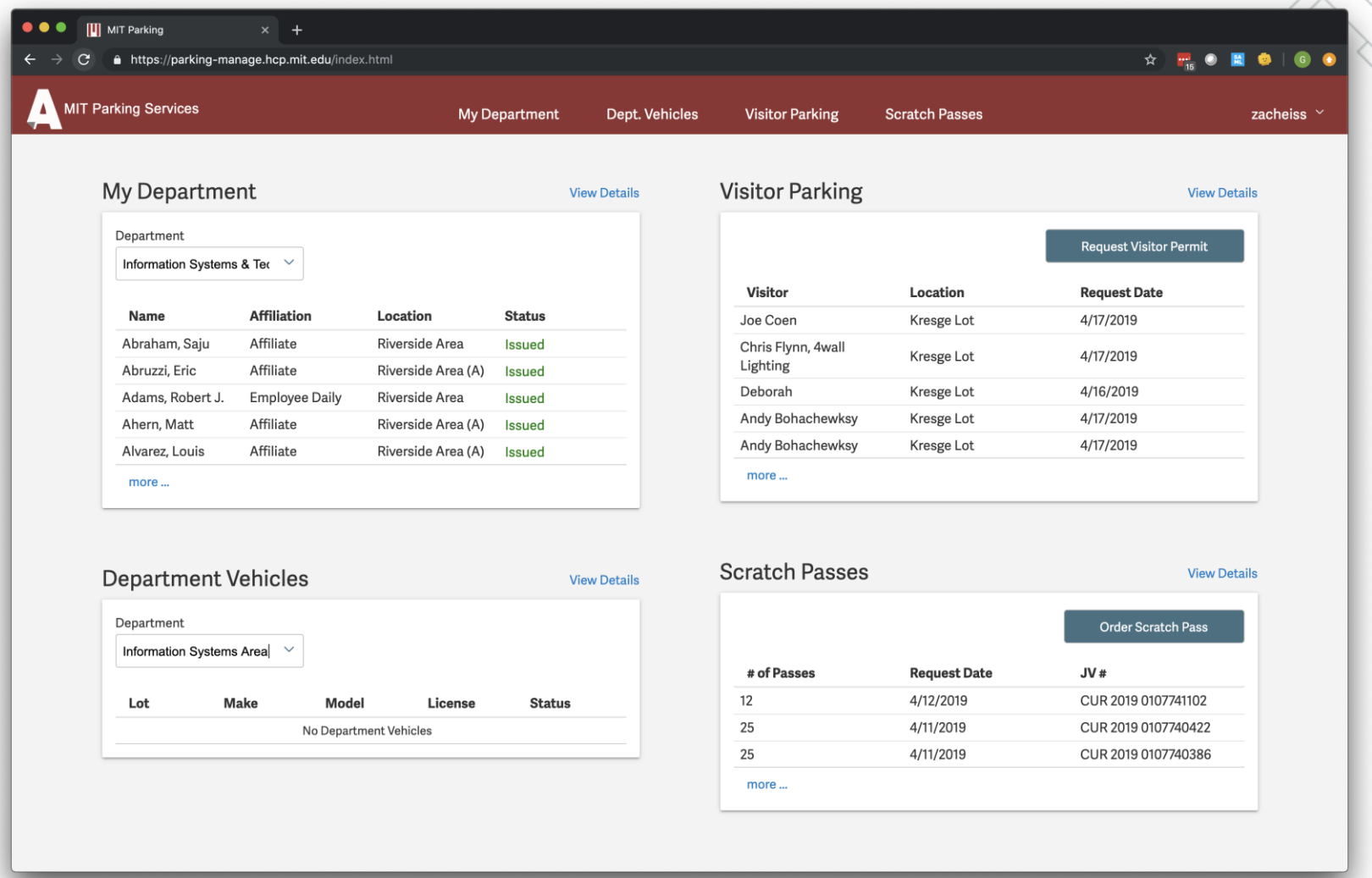
Parking - After



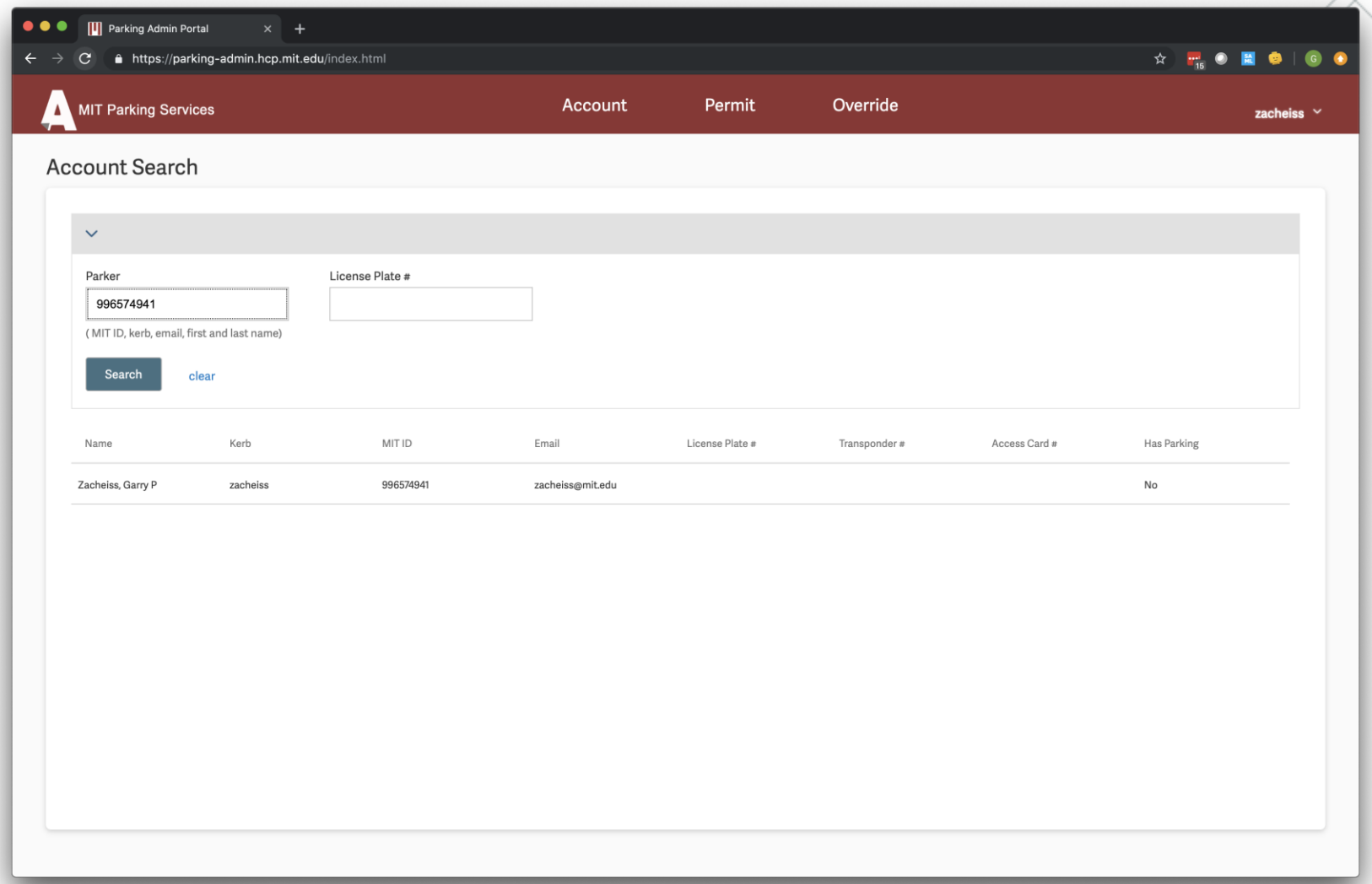
Admin Portal



Parking – Departmental View



Parking – Central Admin View



What about “cloud first”?

- Moving away from a SaaS platform to a custom application may seem like a step backwards…

- Serving the community’s needs has to come first!

- New systems involved no new on-premises components; leveraged existing cloud investment:
  - Web UI (SCP)
  - Mulesoft (AWS)
  - SAP ECC (HANA Enterprise Cloud)
  - Other systems of record (VMware VMC)

Project Staffing and Timeline

- Staffing (software development):
  - Project Manager
  - Business Systems Analyst
  - Architect
  - UX / Graphic design services
  - 2 Developers (HTML/CSS/JS, Java, ABAP)
  - 1 QA Engineer (part-time) – emphasis on performance testing
  - 1 Business Intelligence Engineer (part-time)
  - 1 report writer (part-time)
  - Cast of thousands: Subject Matter Experts, SAP BASIS, etc.

- Timeline:
  - Kickoff: December 2017
  - Go-Live: September 2018

Lessons Learned

- Project went live in Fall 2018 – Success!
- SAP doesn't lock you into a single-vendor IT ecosystem.
  - Supports being part of a heterogeneous technology landscape.
  - SAP enabled flexibility, didn't hinder it.
- Make the right foundational investments.
  - Investments in Cloud Platform, integration platform, and HANA Data Mart all paid off in speed of project implementation.
- No technology strategy is one-size-fits-all; know your business and your community.
- You can **never** ask enough questions about the business process – edge cases are everywhere!

Next Steps

- Completed post go-live “hypercare” period for phase 1 deliverables.
- Phase 2 underway:
  - LPR cameras for gated lots.
  - Reporting / analytics enhancements.
  - Self-service access to lot capacity?
- SAP Cloud Platform and Mulesoft continue to be incorporated into all future custom software development efforts.
  - Upcoming: enhanced sick / vacation time tracking and reporting for exempt employees.

Questions?

Thank you