

ENTERPRISE SCHEDULING WITH HASKELL

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skedge.me

SKEDGE.ME

- Cloud-based scheduling platform
- Branded customer experience
- Flexible business workflow
- Deep integration
 - Backend-systems
 - In-store workflow (iPad, etc.)
- Clients
 - Sephora
 - Tiffany
 - Stanford
 - FBI
 - ...

SEARCH

SEPHORA

3 FREE SAMPLES
WITH ANY PURCHASE

- MAKEUP
- SKINCARE
- FRAGRANCE
- HAIR
- NAILS
- BATH / BODY
- TOOLS / BRUSHES
- MEN
- GIFTS
- SALE
- TRENDS
- ADVICE
- TV
- BRAND

about sephora > store locations, events & classes > union square > reservations

MAKE A RESERVATION

LOCATION:

SEPHORA UNION SQUARE
45 E. 17th Street
New York
New York
10003

change store

SELECTED SERVICE:

CUSTOM MAKEOVER
Personalize your complete, full-face makeover in this dedicated session with an expert artist.
More Info

CHANGE SERVICE:

- ☒ CUSTOM MAKEOVER - 45m
- ☐ PERSONAL BEAUTY CONSULTATION - 1h 30m

FIND AN AVAILABLE APPOINTMENT

09/22/2013

SUN SEP 22	MON SEP 23	TUE SEP 24
MORNING	MORNING	MORNING
AFTERNOON	AFTERNOON	AFTERNOON
12:30 PM	EVENING	EVENING
1:15 PM		
1:30 PM		
1:45 PM		
2:00 PM		
2:15 PM		
2:30 PM		
EVENING		

NEXT STEP

give feedback now

about sephora > store locations, events & classes > union square > reservations

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NEXT STEP

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PROBLEM

- 43,000 lines of Groovy on Grails
- Major, intractable bugs
 - Timezones
 - Recurring events
 - Notifications
 - Double-booking
- Poorly documented
- Bad performance
- Inflexible

ARCHITECTURE

	General-purpose				Client-specific		
	Appointments	People	Notifications	...	BuyNLarge	AcmeU	...
Biz	Business rules enforcement						
Sec	Authorization						
DB	ADTs, CRUD, caching, validation						
RawDB	ACID transactions, no side effects, automatic retries						
IO	Basic Haskell - unsafe side effects; anything goes						

ARCHITECTURE

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Sec							
DB							
RawDB							
IO							

SECURITY

- Roles by client
 - Basic: Owner, Staff, Customer
 - BuyNLarge: Leadership, District Manager, Store Manager, Sales Associate, Customer
 - AcmeU: Admin, Faculty, Staff, Teaching Assistant, Student

SECURITY

- Verbs by component
 - Appointment: Book, Join, Reschedule, Cancel, Delete
 - People: Create, Read, Update, Delete
 - Notifications: Send, Edit, Cancel, etc.
 - BuyNLarge Reports: Run District Report, Run Store Report

SECURITY

```
class Policy role verb where
```

```
  isAuthorized :: role -> verb -> DB Bool
```


SECURITY

```
instance Policy BNLEnvironment BNLEnvironment where
  isAuthorized BNLEnvironment _ = return True

isAuthorized (BNLEnvironmentManager env) a = case a of
  BNLEnvironmentManager env' -> return (env == env')
  BNLEnvironmentStoreManager store -> return (storeEnvironment store == env)
  isAuthorized (BNLEnvironmentStoreManager store) a = case a of
    BNLEnvironmentStoreManager store' -> return (store == store')
    _ -> return False
  isAuthorized _ _ = return False
```

SECURITY

	General-purpose				Client-specific		
	Appointments	People	Notifications	...	BuyNLarge	AcmeU	...
Standard							
BuyNLarge							
AcmeU							
...							

SECURITY

instance Policy BNLRole AppointmentVerb where

isAuthorized r = isAuthorized \$ case r of

BNLLeadership -> StandardAdmin

BNLDistrictManager _ -> StandardStaff

BNLStoreManager _ -> StandardStaff

BNLCustomer -> StandardCustomer

SECURITY

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Standard							
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AcmeU							
...							

QUICK-AND-DIRTY IMPORTER

- Limited set of inputs
- “End-user” is our developers
- Thrown away when job is done

QUICK-AND-DIRTY IMPORTER

- 1400 lines of Haskell
- Never refactored
- Lots of partiality
- Lots weirdly-specific, huge functions
- Leans heavily on type system

QUICK-AND-DIRTY IMPORTER

```
importService :: EventNotificationPolicy -> (Maybe Bool
-> Map (Ref ThingField) FieldProperties) -> (Maybe Bool
-> Map (Ref AttendeeField) FieldProperties) -> Ref
ThingField -> Ref ThingField -> Ref ThingField -> Ref
ThingField -> Ref AttendeeField -> Ref AttendeeField ->
Ref ServiceField -> Ref ServiceField -> Ref ServiceField
-> Ref Role -> Ref Role -> Ref Role -> Ref (Constraint
(Ref Thing)) -> (Text -> Ref Thing) -> (Text -> Ref
Thing) -> (Text -> Maybe (Ref AttendeeField,
CustomAttendeeField)) -> S1.Service -> DB (Ref
Sk.Service)
```


LIBRARIES

- Javascript: 9 libraries
- Haskell: 71 libraries + 87 dependencies

LIBRARIES

- Haskell libraries tend to be
 - Easier to find
 - Easier to vet
 - Higher quality

ANNOYANCES

- Cyclic module dependencies with hs-boot files are unwieldy - avoid
- Scalability above 4 cores is limited - apparently fixed in GHC 7.8
- Idle GC can cause issues - disable
- Debugging production issues without stack traces is hard - consider using profiling

RESULT

- 8,200 lines of Haskell
- No persistent bugs
- Greatly improved performance and flexibility
- Used daily by thousands of people