A song of types and errors

or how I found myself leading teams of Scala developers

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Agenda

- « War stories »
- Some tips and tricks
- Really poor metaphors
- SPOILERS


Bay of Ice
BLAZEWATER BAY
IRON ISLANDS
The Shiverin
The Narrow Sea
The Sunset Sea
WESTEROS

WINTER
IS
COMING

The life and career of a mainstream developer


A Lannister
always pays
his debts


A developer
always pays
his debts


A developer
always pays
his debts
technical


A developer
always pays
others debts
technical

Pros and Cons of a mainstream job

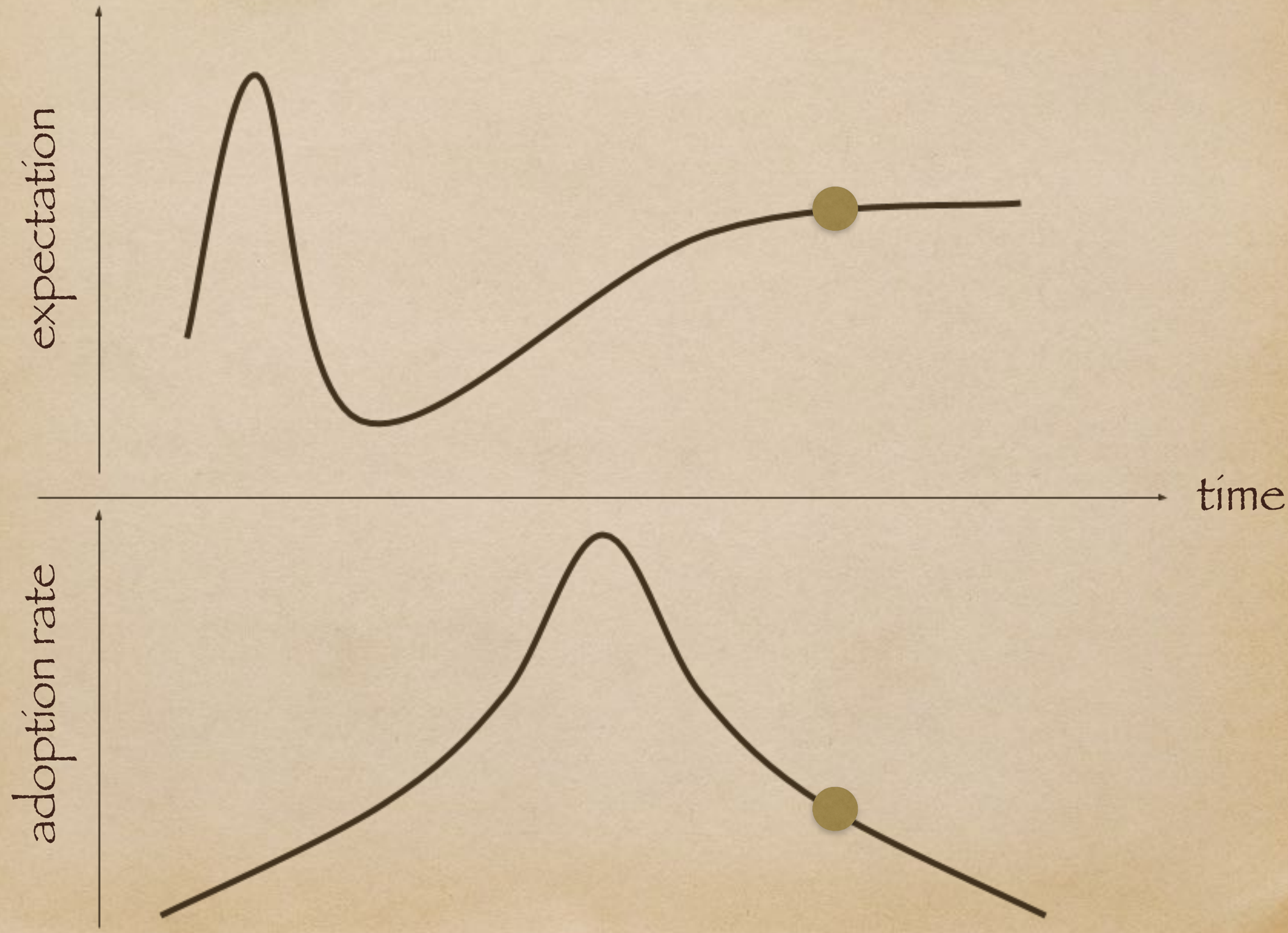
Pros

- easy to quit a boring job
- no big pressure to get better

Cons

- easy to fall into a boring job
- the « I've seen everything » feeling

Using a mainstream technology



Embracing the New

Searching for a <shiny new job>

- By definition, not many jobs available
- Create your own <shiny new tech> job
- Find or create your local user group
- Go to conferences, connect with people (gitter, IRC, ...)
- Be patient...

The ??? syndrome

The impostor syndrome

S*** getting real

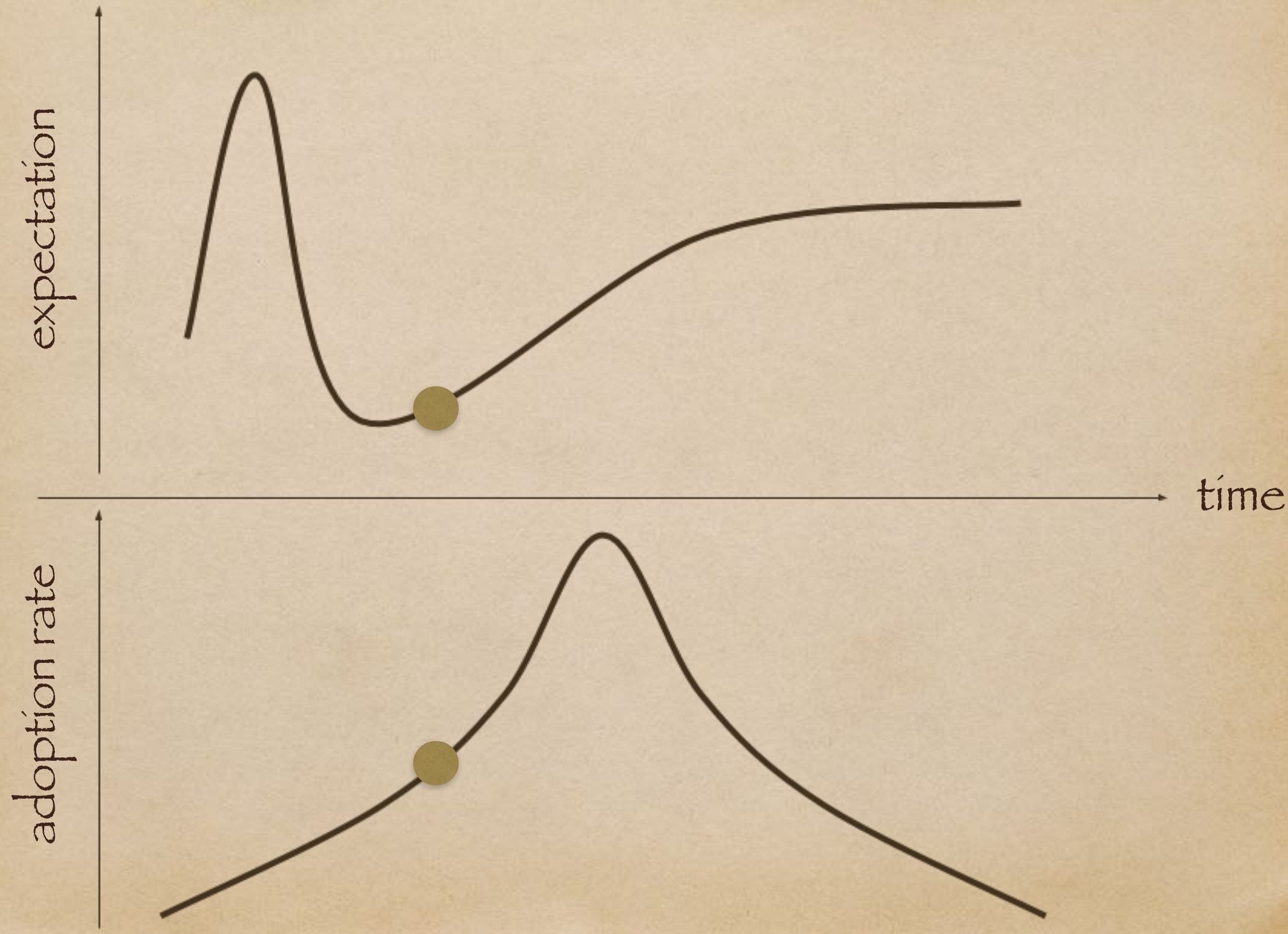
What have I done ?

You
know
nothin'

<your name here>

Mistakes awaiting to be made

adopting a <shiny new tech>



You know nothin'

Valentín

The noob paradox

- I know ~~nothing~~ just enough to glimpse at what I dunno
- The few I know already gives me tremendous power


Hic sunt dracones

Enemy #1

« overcleverness »

overcleverness

(that's not an actual word)

- « hubris » (not the framework) applied to programming
- abusing language features *you* don't master *yet*

Lesser enemies

- Lack of time to learn
- Lack of knowledge diffusion

Shameful code, please disregard

```
def handleStartSignUp = StackAction { implicit request =>
  startFormEnhanced.bindFromRequest.fold (
    errors => {
      BadRequest(startSignUpTemplate(errors, pharmacy, request))
    },
    userData => {
      val id = PatientIdentity.buildPatientId(PatientIdentity.buildPatientSocialId(userData.userName, pharmacyId
      if(pharmacy.users.contains(id)){
        val f = startFormEnhanced.fill(userData).withError(FormError(NickName, Messages(UserNameAlreadyTaken)))
        BadRequest(startSignUpTemplate(f,pharmacy, request))
      } else {
        // check if there is already an account for this email address
        use[InMemoryUserService].findInPharmaByEmailAndProvider(
          pharmacy,
          userData.mail,
          providerId) match {
          case Some(user) => {
            // user signed up already, send an email offering to login/recover password
            mailerUtil.sendAlreadyRegisteredEmail(pharmacy, user)
          }
          case None =>
            //Here we want to create the account and lock it thanks to a token
            val patientSId = PatientIdentity.buildPatientSocialId(userData.userName, pharmacyId)
            val patientId = PatientIdentity.buildPatientId(patientSId)
            val pw: PasswordInfo = Registry.hashers.currentHasher.hash(userData.password)
            val e1 = PatientSignedUp(pharmacyId, userData.userName, userData.firstName, userData.lastName, userD
            val e2 = PasswordChanged(pharmacyId, patientId, PasswordInfoForEvent(pw.hasher, pw.password, pw.salt
            val e3 = PatientTokenProvided(pharmacyId, patientId, Token(UUID.randomUUID().toString), TokenDuratio
            EventService.send(pharmacyId, PatientCreated(Seq(e1, e2, e3)))
        }
        Redirect(onHandleStartSignUpGoTo).flashing(Success -> Messages(ThankYouCheckEmail), Email -> userData.ma
      }
    }
  )
}
```

Slightly less shameful code...

```
def confirmOrder = SecuredBasketAction {
  implicit request: SecuredBasketRequest[AnyContent] =>
    val ph = request.pharmacy
    val pid = ph.id
    val bid = request.basketId
    val result: SimpleResult \/ SimpleResult = for {
      u             <- request.user                          \/>     Forbidden
      form          =  acceptCGV.bindFromRequest()
      accept        <- form.value                            \/>     BadRequest(cgvTe
      basket        <- ph.orders.get(bid)                    \/>     NotFound
      fees          <- ph.deliveryFees(basket)               \/>     InternalServerEr
      payzenData    <- \/.fromEither(PayzenService.prepareData(basket2Payzen(request
      prices        =  PricesSealed(pid, bid, Basket.retrievePrices(basket, ph.catal
      reg           =  OrderRegistered(pid, bid, PatientIdentity.buildPatientId(u.id
      revision      <- \/.fromEither(EventService.send(ph.id,BasketCheckout(Seq(pric
    } yield RedirectAfterSend(revision, orderConfirmationRoute)
    result.toEither.merge
}
```

Lesson #1 :

Code review is not enough

- The notion of good code changes over time
- => today's acceptable code is tomorrow's bad code

Getting better at The Game

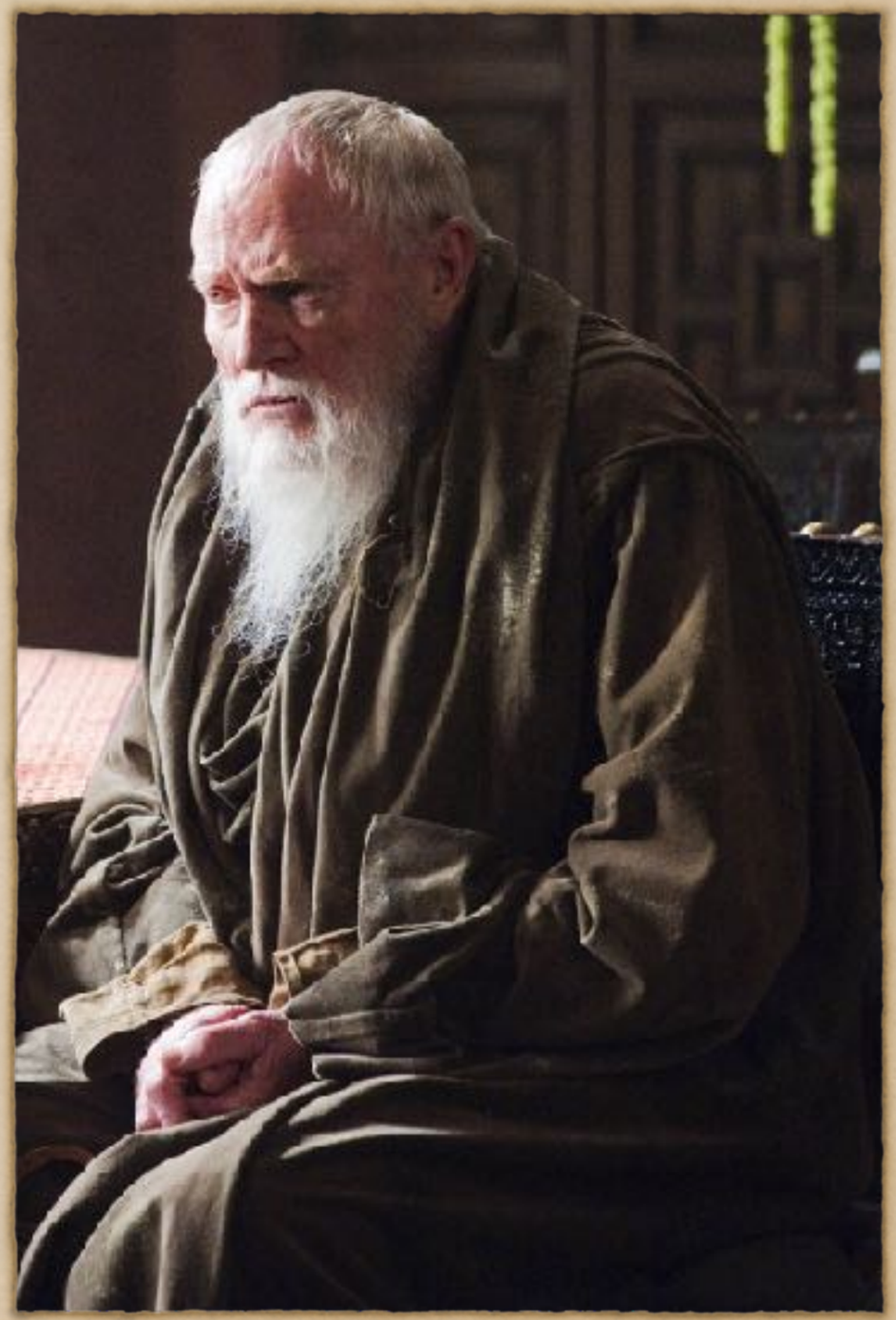
The aim of FP

- Less boilerplate
- Less bugs
- Productivity +++

Taming dragons

Step 1

Thinking hard



Writing down the problem

- validate JSON paylaod => `JsResult[X]`
- validate form => `Form[X]`
- service method => `Future[Option[X]]`, `Future[Either[Err, X]]`, `Future[X]`, ...
- in the end we want `Future[Result]`

Step 2

Searching the Web

Learning with no time to learn

- Gather « knowledge sources »
- Map concepts/libraries to notions/usages
- When a problem arises reverse the mapping
- Learn in depth only when needed

Epiphany : Monad Transformers

- What I needed to learn was monad transformers

- All the previous types can be shovelled down to a `EitherT[Future, Result, X]`

- With a unique monad transformer, I can finally get my single for-comprehension

Monad-transformers FTW

```
def addOrUpdateQuote(providerId: BSONObjectID, jobId: BSONObjectID) = P
  implicit request =>
    for {
      quote       <- request.body.read[Quote]                ?| BadRequest
      user        <- userService.findById(providerId)        ?| NotFound
      _           <- user.individual.flatMap(_.birthDate)    ?| Conflict
      _           <- handle(AddOrUpdateQuote(user, quote))   ?| InternalSe
    } yield NoContent
}
```

https://github.com/Kanaka-io/play-monadic-actions

Step 3

Refactor everywhere

Step 4

Profit

Living like impostors

Plot twist

I am not dead

BTW, you know nothin'

The leader's tools

- Improved tooling
- Project skeletons
- Pair programming

Improving on code review

1. Define a set of written (best) practices
2. When a file is modified, enforce practices during review (in the whole file)
3. Revise practices with the team as everyone gets better
4. Repeat from 1.

Brace yourselves

<shiny new tech>
is coming

Keeping in touch

- @ValentinKasas / @ParisScalaUG
- https://github.com/vil1

Q & A