Validation continue des exigences et de l'implémentation

méthode et techniques

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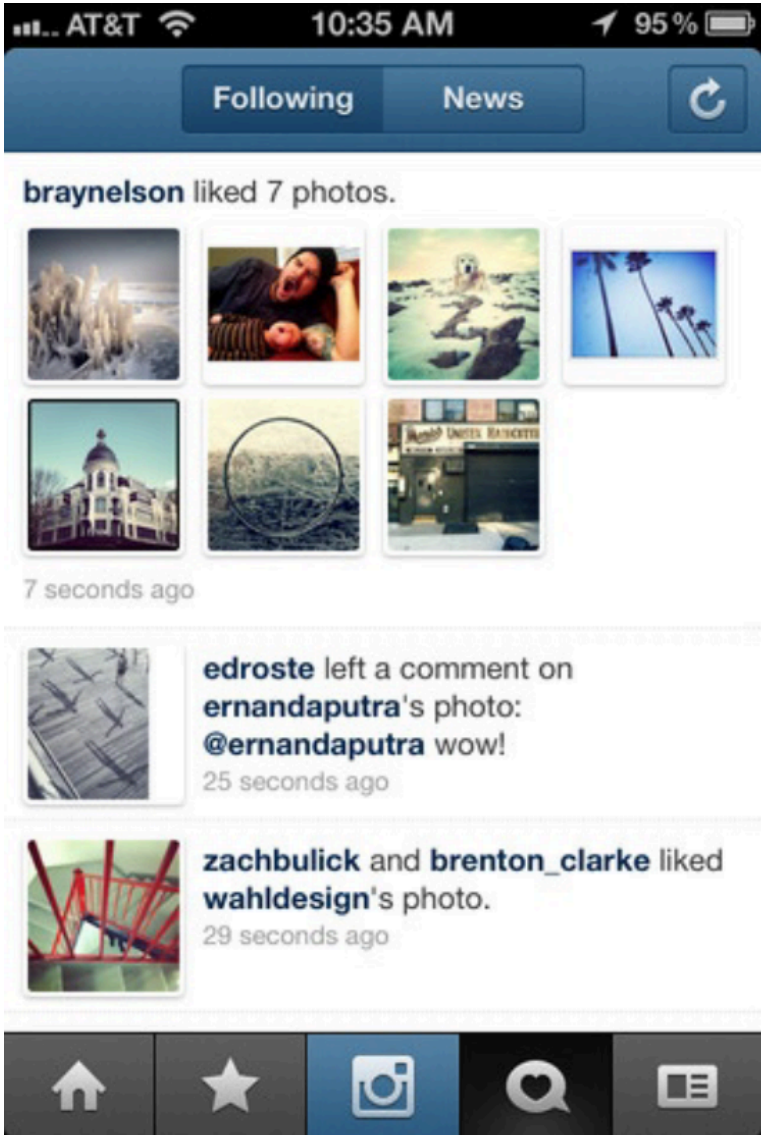
Material

http://mathieuacher.com/teaching/PDL/

Deux projets:
Un succès
Un échec
Des défils

Instagram Story



Instagram Story

« Instagram is an app that **only took 8 weeks** to build and ship, but was a product of over a year of work. »

http://www.forbes.com/sites/limyunghui/2012/04/09/inspiring-insights-by-instagram-ceo-kevin-systrom-the-man-who-built-a-1-billion-startup/

Instagram Story

« While I was there working in marketing, I started doing more and more engineering at night on simple ideas that helped me learn how to program **(I don’t have any formal CS degree or training) »**

http://www.forbes.com/sites/limyunghui/2012/04/09/inspiring-insights-by-instagram-ceo-kevin-systrom-the-man-who-built-a-1-billion-startup/

Instagram Story

« We spent 1 week prototyping a version that focused solely on photos.
It was pretty awful. So we went back to creating a native version of Burbn. We actually got an entire version of Burbn done as an iPhone app, but it felt cluttered, and overrun with features. It was really difficult to decide to start from scratch, but we went out on a limb, and basically cut everything in the Burbn app except for its photo, comment, and like capabilities. What remained was Instagram. »

http://www.forbes.com/sites/limyunghui/2012/04/09/inspiring-insights-by-instagram-ceo-kevin-systrom-the-man-who-built-a-1-billion-startup/

Instagram Story

« So 8 weeks later, we gave it to our friends, beta tested, bug fixed, etc. and this Monday we decided it was ready to ship. »

http://www.forbes.com/sites/limyunghui/2012/04/09/inspiring-insights-by-instagram-ceo-kevin-systrom-the-man-who-built-a-1-billion-startup/

Instagram Story

« Who is responsible for Instagram's UI design?

For better or for worse, I've done most of the pixel pushing in our app. ;) »

http://www.forbes.com/sites/limyunghui/2012/04/09/inspiring-insights-by-instagram-ceo-kevin-systrom-the-man-who-built-a-1-billion-startup/

Instagram Story

- 30+ millions d'utilisateur en 2 ans
- 25k inscriptions le premier jour
  - « best & worst day of our lives so far »
  - « favicon » cause des milliers d'erreurs 404
    - « 404-ing on Django, causing tons of errors »
- Un seul serveur au lancement
  - Moins puissant qu'un MacBook Pro
- La suite: passage à l'échelle, cloud (EC2) et ingénierie du logiciel

https://speakerdeck.com/mikeyk/scaling-instagram
http://zoompf.com/blog/2012/04/instagram-and-optimizing-favicons

Instagram Story

- Sur la trentaine de composants, 4 seulement ont été écrits à partir de zéro
  - App iOS, App Android, Android Push Notification Service et Redis Query analyzer

node2dm

Fabric

Instagram Story (key lessons)

- Sélection et intégration de multiples librairies

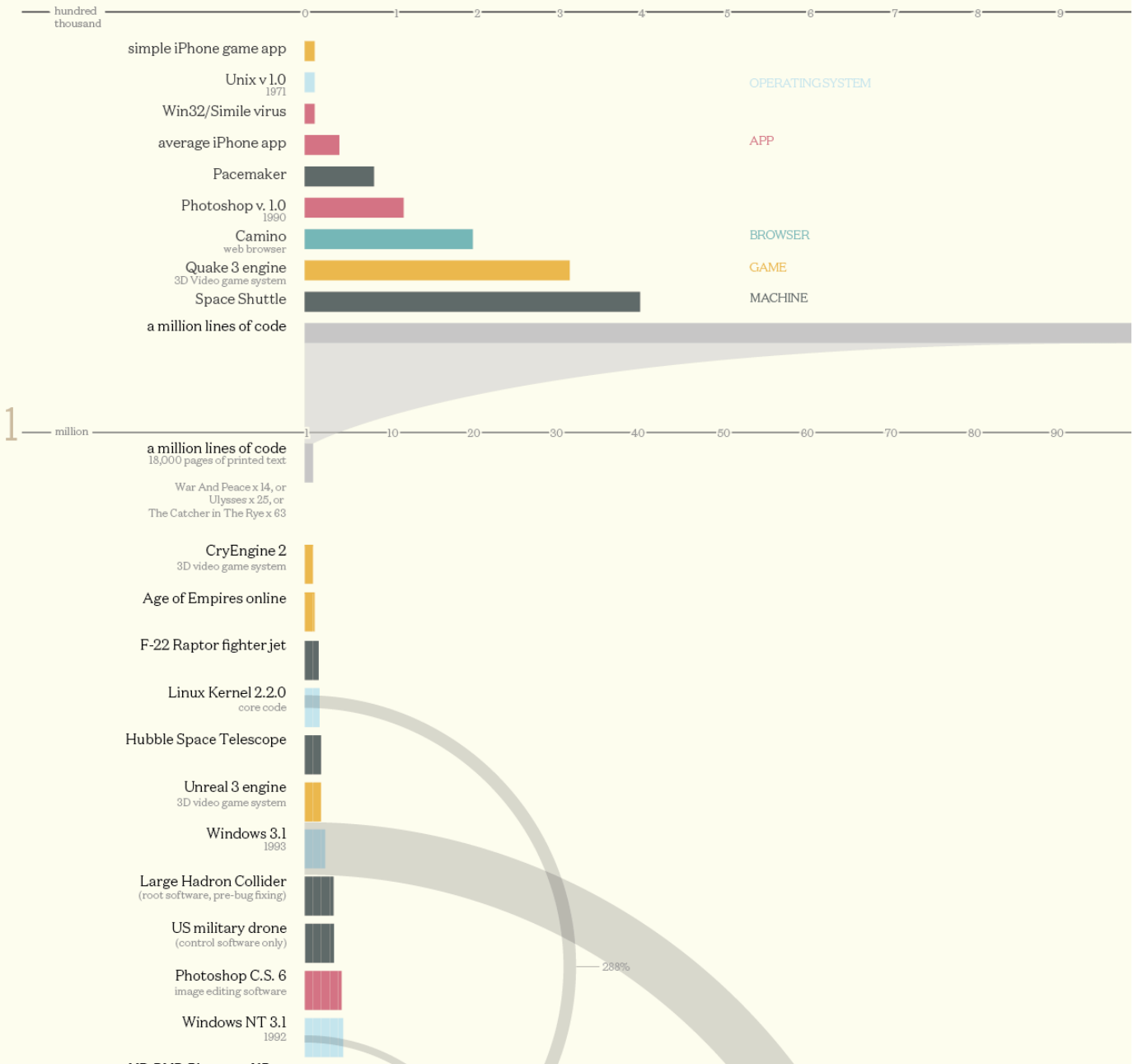
- Open source community
  - Apprendre, partager, demander, répondre, etc.
- Auto-apprentissage
  - « Product guys » sont maintenant à même de rivaliser…

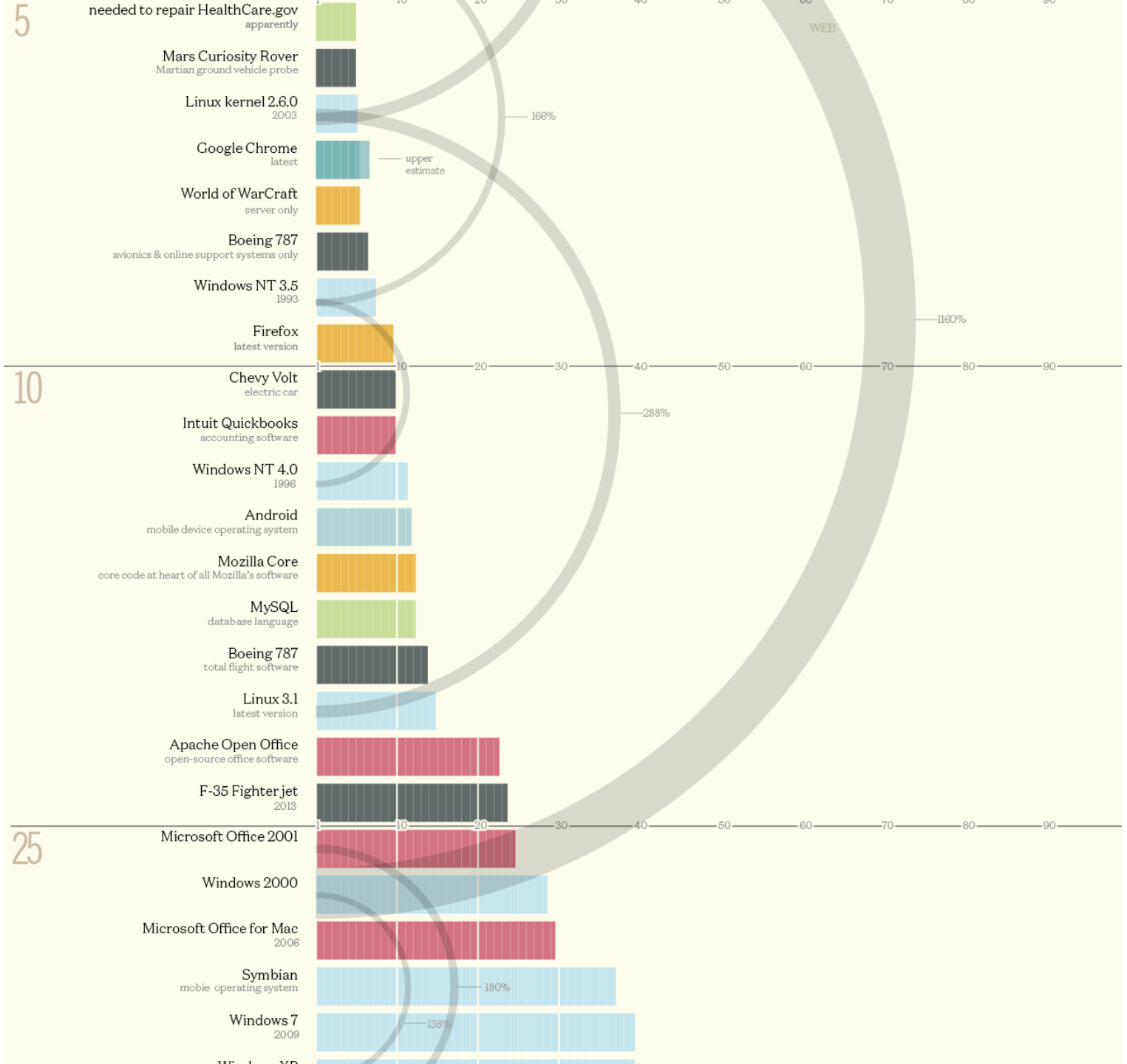
- Agilité, développement incrémental

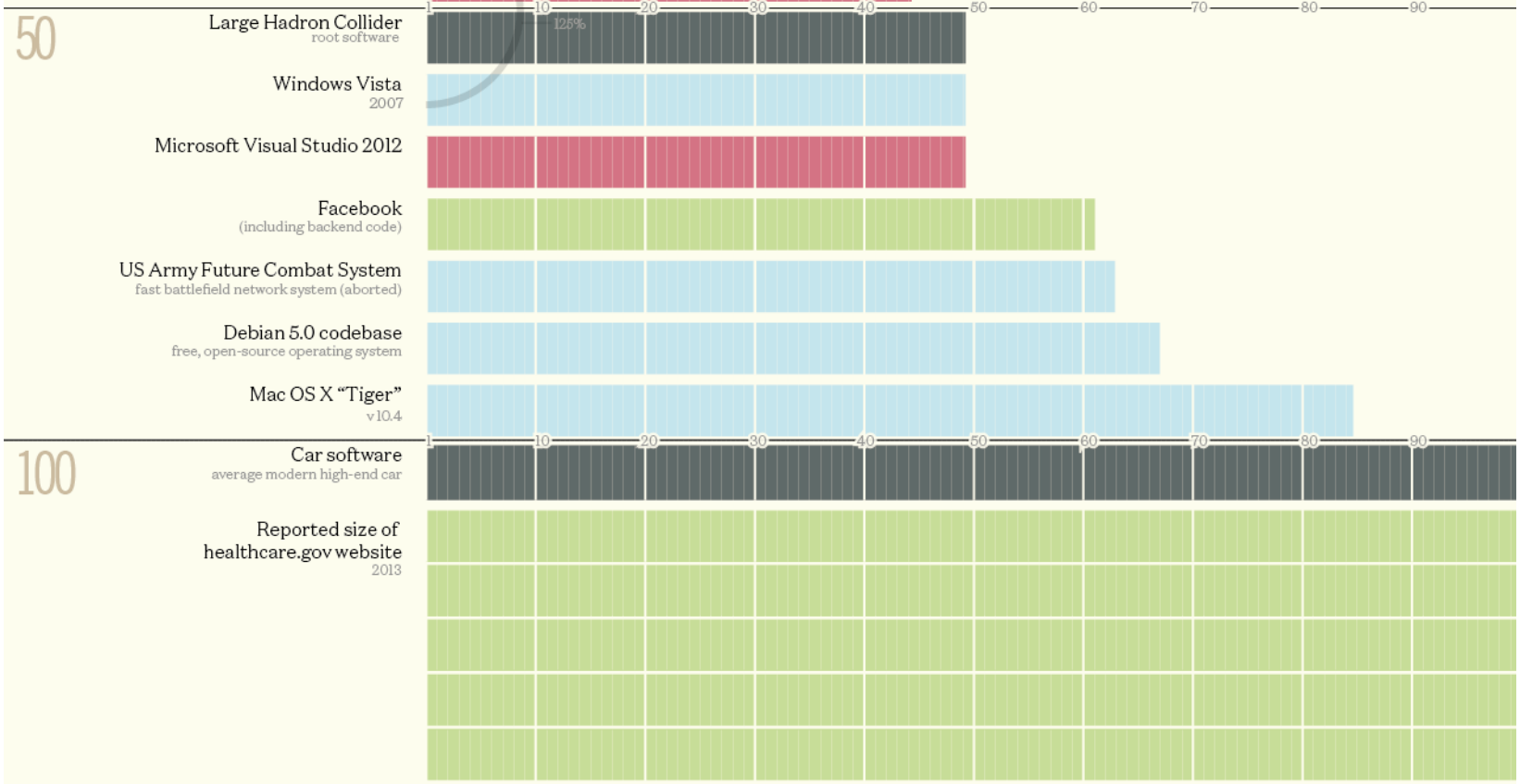
http://instagram-engineering.tumblr.com/

Codebases

Millions of lines of code




5
needed to repair HealthCare.gov
apparently
Mars Curiosity Rover
Martian ground vehicle probe
Linux kernel 2.6.0
2003
Google Chrome
latest
upper estimate
World of WarCraft
server only
Boeing 787
avionics & online support systems only
Windows NT 3.5
1993
Firefox
latest version
10
Chevy Volt
electric car
Intuit Quickbooks
accounting software
Windows NT 4.0
1996
Android
mobile device operating system
Mozilla Core
core code at heart of all Mozilla's software
MySQL
database language
Boeing 787
total flight software
Linux 3.1
latest version
Apache Open Office
open-source office software
F-35 Fighter jet
2013
25
Microsoft Office 2001
Windows 2000
Microsoft Office for Mac
2008
Symbian
mobie operating system
Windows 7
2009
1 10 20 30 40 50 60 70 80 90
WEB
166%
1160%
288%
180%
138%



concept & design: David McCandless

informationisbeautiful.net

research: Pearl Doughty-White, Miriam Quick

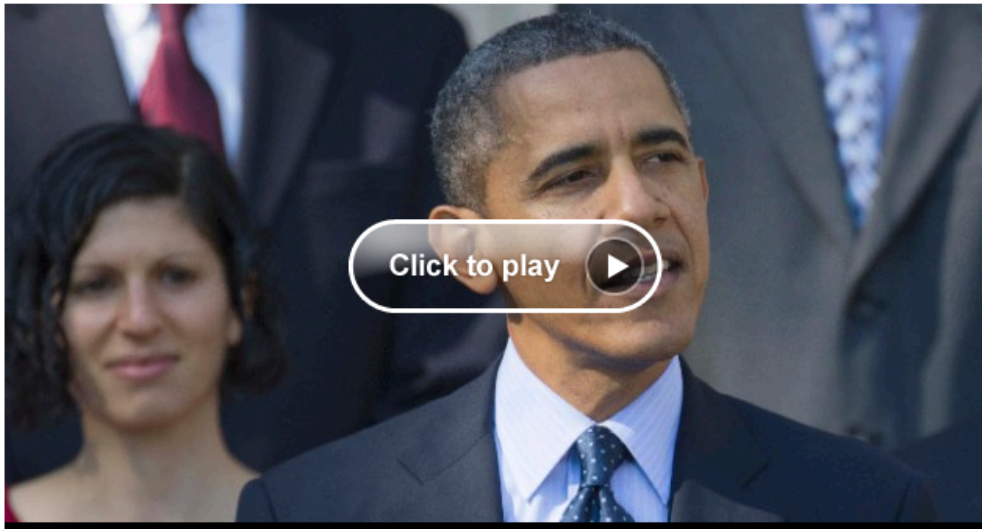
work in progress

v 0.62 // Oct 2013

sources NASA, Quora, Ohloh, Wired & press reports
note some guess work, rumours & estimates
data bit.ly/KIB_linescode

Report: Healthcare website failed test ahead of rollout

By **Ed Payne, Matt Smith** and **Tom Cohen**, CNN
October 23, 2013 -- Updated 0103 GMT (0903 HKT)



Report: Obamacare site failed early test

STORY HIGHLIGHTS

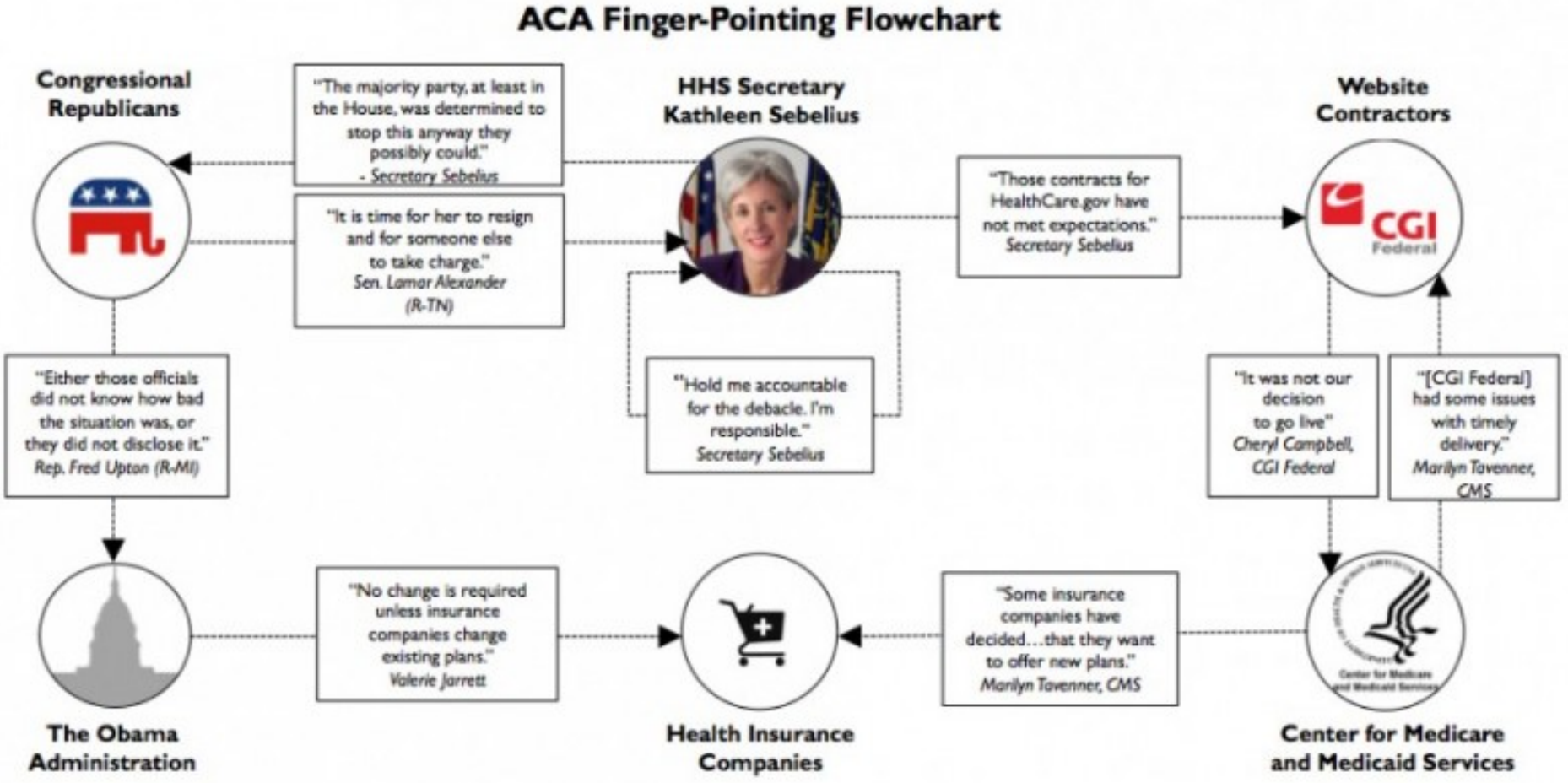
- **NEW:** Top White House official part of "tech surge" on Obamacare
- Obamacare "is not failing" despite website woes, White House spokesman says
- Obama says HealthCare.gov problems are "going to get fixed"
- Secretary Sebelius expected to testify at a congressional hearing next week

Washington (CNN) -- The President's healthcare sign-up web page was supposed to handle tens of thousands of people at once. But in a trial run days before its launch, just a few hundred users flatlined the site.

Despite the problems, federal health officials pushed aside the crash cart and rolled out HealthCare.gov on October 1 as planned, The Washington Post reported.

The result? The website crashed shortly after midnight as a couple thousand people tried to start the process, two people familiar with the project told the Post.

Requirements engineering/ Management problem



http://www.washingtonpost.com/blogs/wonkblog/wp/2013/11/01/thirty-one-things-we-learned-in-healthcare-govs-first-31-days/

Thirty-one things we learned in HealthCare.gov's first 31 days

Scalability problem

Technical problems (e.g., inaccurate data, cancellation failures)

Testing issues

http://www.washingtonpost.com/blogs/wonkblog/wp/2013/11/01/thirty-one-things-we-learned-in-healthcare-govs-first-31-days/

10. HealthCare.gov didn't have enough testing before going live.

This became clear in a series of Congressional hearings, where federal contractors testified that end-to-end testing only began in the final weeks of September, right before the Oct. 1 launch. When pressed on how much time would have been ideal for testing, one contractor told lawmakers that "months would have been nice."

http://www.washingtonpost.com/blogs/wonkblog/wp/2013/11/01/thirty-one-things-we-learned-in-healthcare-govs-first-31-days/

1 succès, 1 échecs

- 1 succès:
  - réutilisation: sélection et intégration de multiples librairies
  - agilité, développement incrémental: les exigences ne sont pas fixes; sorties d'un produit qui correspond aux attentes des utilisateurs
- 1 échec:
  - problèmes dans la communication et l'élicitation des exigences
  - pas de test

Votre projet = succès + !échec

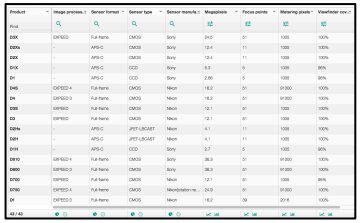
Votre projet

- Réutilisation: sélection et intégration de multiples librairies
- Agilité, développement incrémental: les exigences ne sont pas fixes; sorties d'un produit qui correspond aux attentes des utilisateurs
- Communication et élicitation des exigences avec le client; modélisation
- Test

Votre projet

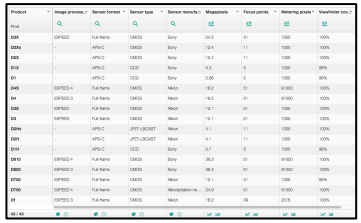
Projet #1
VIZ

Java OpenCompare



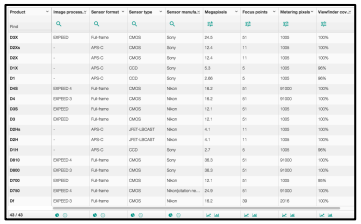
Projet #2
FORMS

Java OpenCompare



Projet #3
SUMMARIZER

Java OpenCompare

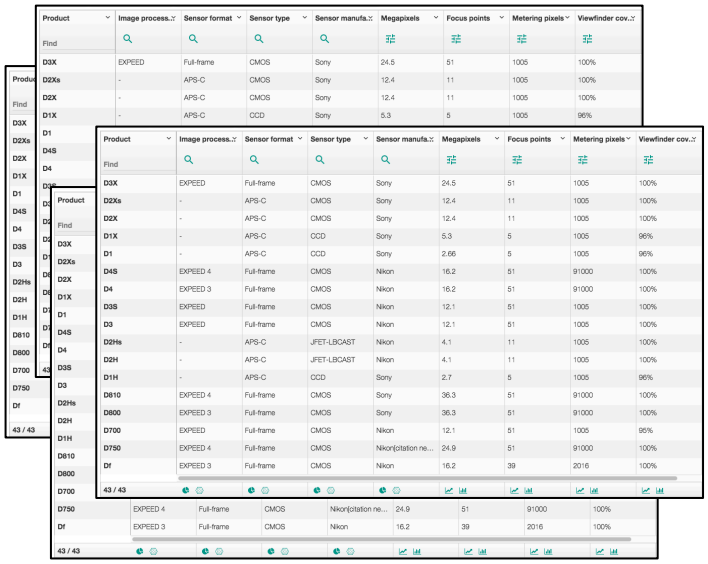


3 Projets et des risques

- Activités similaires:
  1. Eliciter et valider des exigences
  2. Développement Java pour traiter des données
  3. Génération de HTML/CSS/JavaScript
  4. Travail collaboratif
- **Risques** similaires. Exemples:
  1. Implémenter des fonctionnalités inutiles ou qui ne correspondent pas aux besoins du client
  2. Le programme Java est incapable de traiter certains types de données
  3. Le HTML généré ne permet pas à la feuille de style CSS ou au JavaScript de fonctionner correctement
  4. Une modification dans 1, 2, et 3 ne permet pas à un membre du groupe de correctement contribuer

Implémenter des fonctionnalités inutiles ou qui ne correspondent pas aux besoins du client

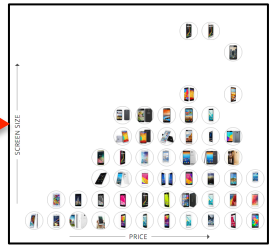
Code (paramétrisation, complétude du traitement)



Java

Choix technologique (framework)

Interface-homme machine (disposition, interactions)



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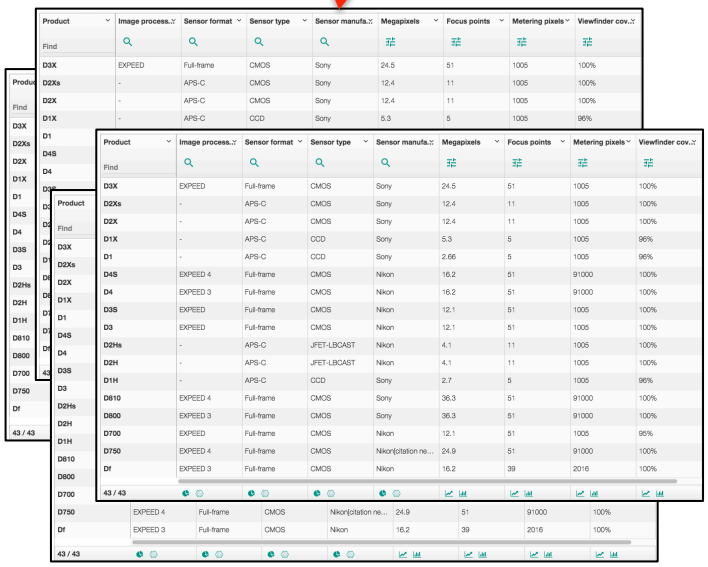

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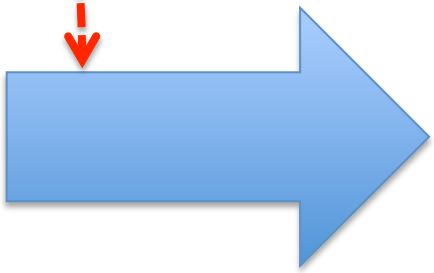
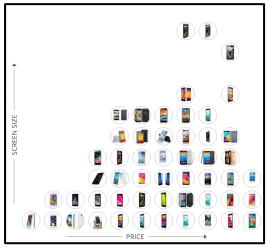
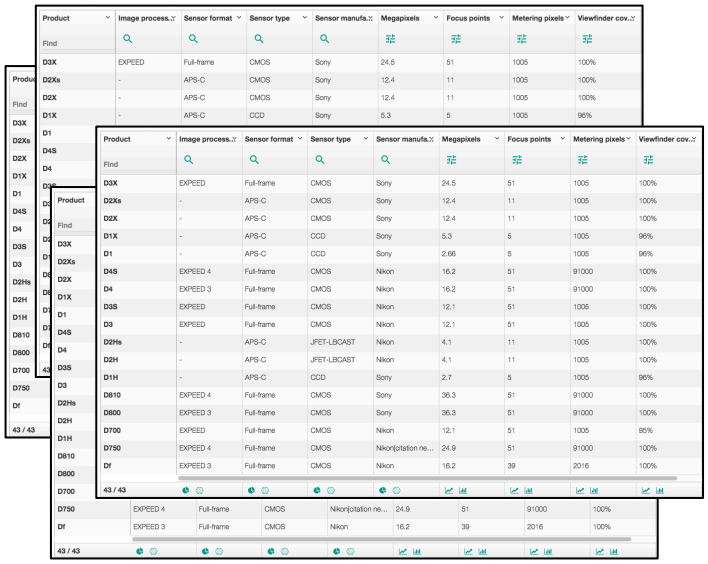
D2Xs	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D2X	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
D1	-	APS-C	CCD	Sony	2.66	5	1005	96%
D4S	EXPEED 4	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D4	EXPEED 3	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D3	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D2H	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D1H	-	APS-C	CCD	Sony	2.7	5	1005	96%
D810	EXPEED 4	Full-frame	CMOS	Sony	36.3	51	91000	100%
D800	EXPEED 3	Full-frame	CMOS	Sony	36.3	51	91000	100%
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon[citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%
43 / 43								





Le HTML généré ne permet pas à la feuille de style CSS de s'appliquer; ou au JavaScript!



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D2X	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
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D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D3	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D2H	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D1H	-	APS-C	CCD	Sony	2.7	5	1005	96%
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D800	EXPEED 3	Full-frame	CMOS	Sony	36.3	51	91000	100%
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	96%
D750	EXPEED 4	Full-frame	CMOS	Nikon[citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%

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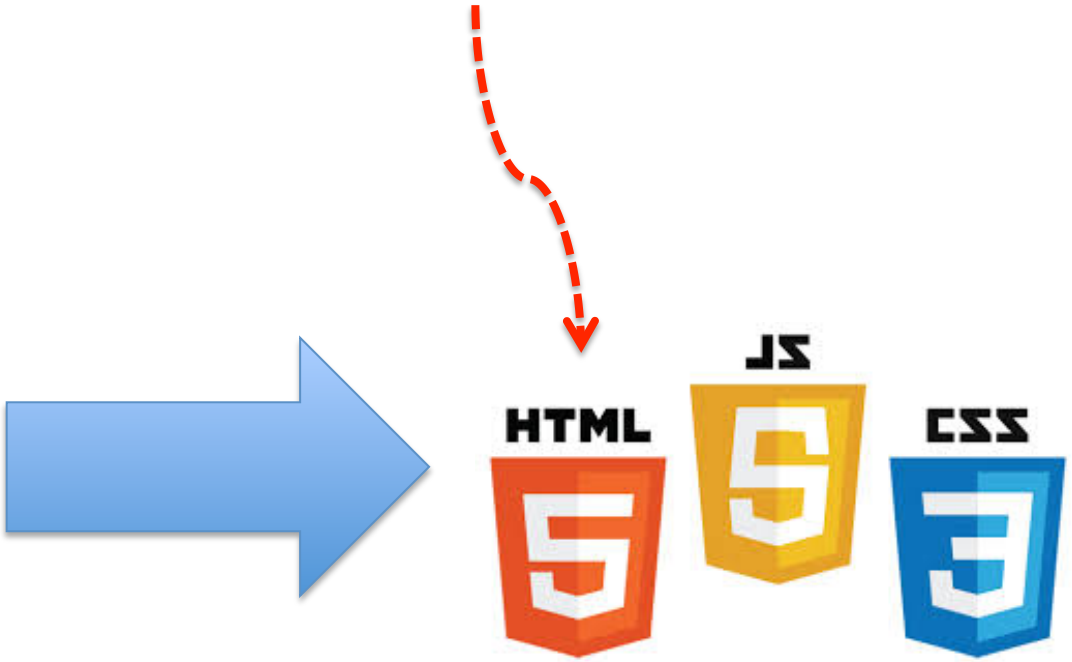
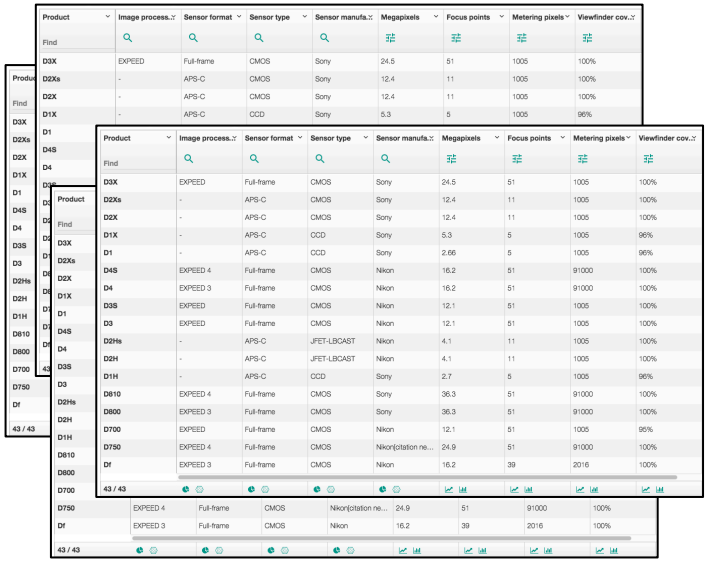



```
<div class="featur">
F1
</div>
```

```
.feature {
    font-color: red;
}
```

```
document.getElementsByClassName("feature");
```

Travail collaboratif et itératif: difficile! (multi-persons, multi-versions)



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D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D3	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
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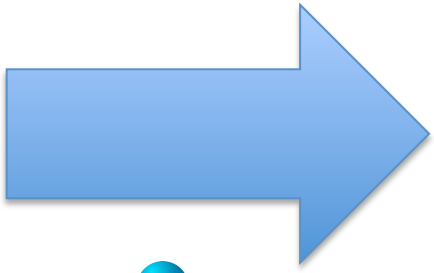
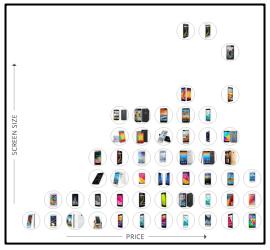
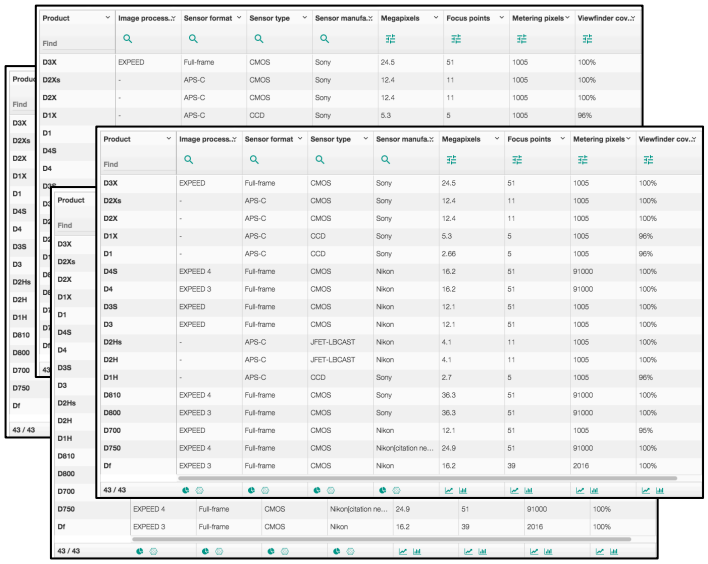


Où est la source de l'erreur?
(1) est-ce une erreur concernant les hypothèses sur les données en entrée? (precondition)
(2) ou est-ce une erreur dans le code Java?



Comment fait-on ?



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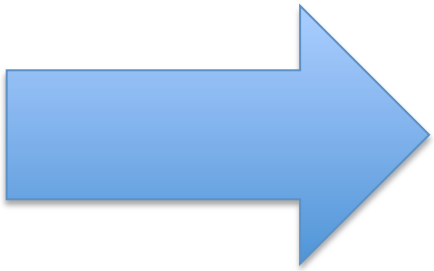
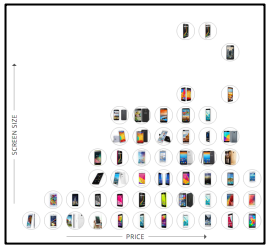
43 / 43								





Réponses

- Valider l'implémentation (tester)
- Valider les exigences et l'implémentation à chaque itération
  - Sortie de "release" avec procédure de tests automatisée (git + Jenkins + Junit + PhantomJS)
  - Validation de chaque release avec le client
- Eliciter et modéliser les exigences/besoins avec le client

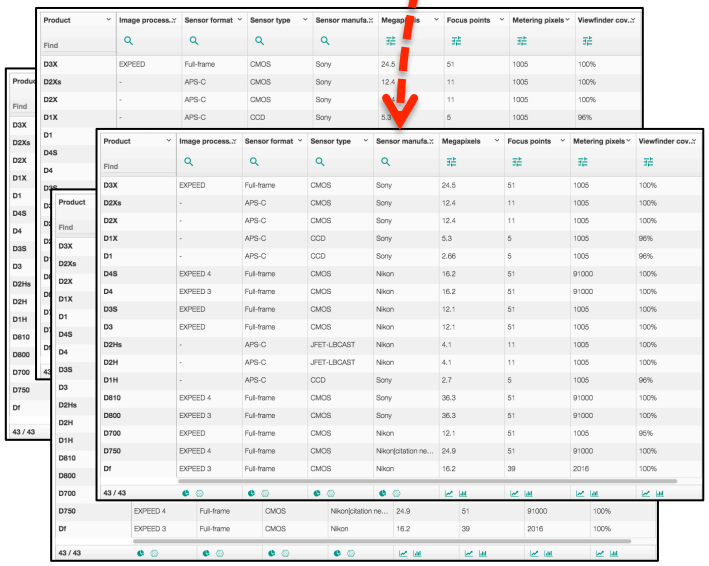
Valider l'implémentation (tests automatisés)

Tests

(sur les entrées)

(sur la transformation)

(sur la sortie)



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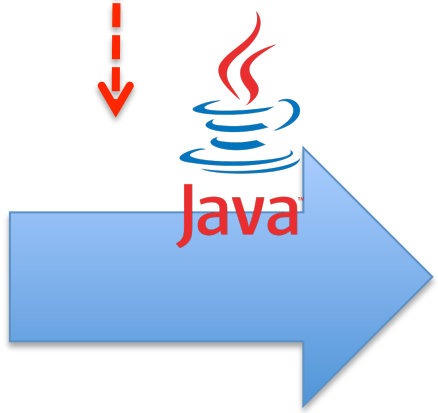
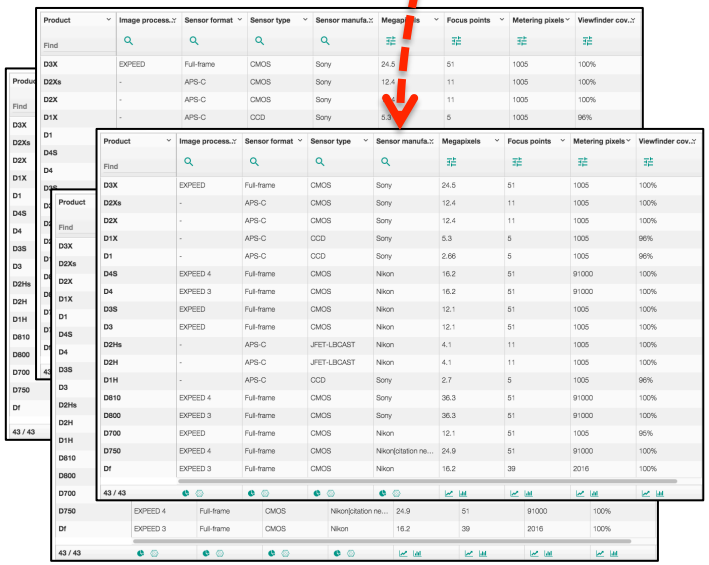
D3X	EXPEED	Full-frame	CMOS	Sony	24.5	51	1005	100%
D2Xs	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D2X	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
D1	-	APS-C	CCD	Sony	2.66	5	1005	96%
D4S	EXPEED 4	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D4	EXPEED 3	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D3	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D2H	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D1H	-	APS-C	CCD	Sony	2.7	5	1005	96%
D810	EXPEED 4	Full-frame	CMOS	Sony	36.3	51	91000	100%
D800	EXPEED 3	Full-frame	CMOS	Sony	36.3	51	91000	100%
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon|otation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%
43 / 43								



Tests

(sur les entrées)



Product	Image process..	Sensor format	Sensor type	Sensor manufa..	Megapixels	Focus points	Metering pixels	Viewfinder cov..
D3X	EXPEED	Full-frame	CMOS	Sony	24.5	51	1005	100%
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D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
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D4S	EXPEED 4	Full-frame	CMOS	Nikon	16.2	51	91000	100%
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D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
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D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D2H	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
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D810	EXPEED 4	Full-frame	CMOS	Sony	36.3	51	91000	100%
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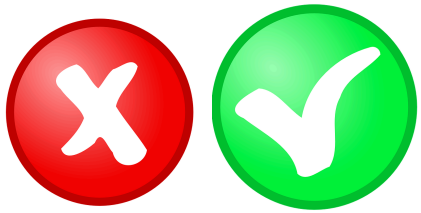
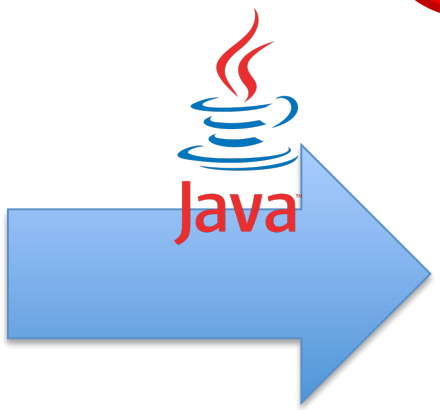
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon|citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%

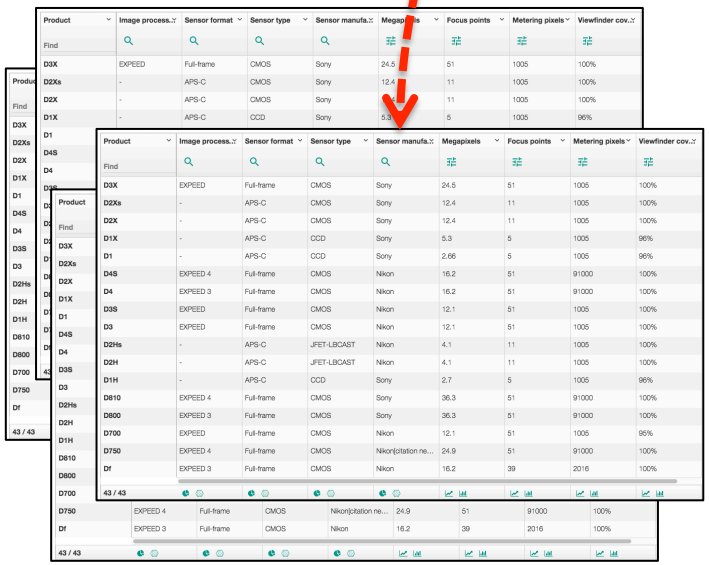
43 / 43





Tests

(sur les entrées)



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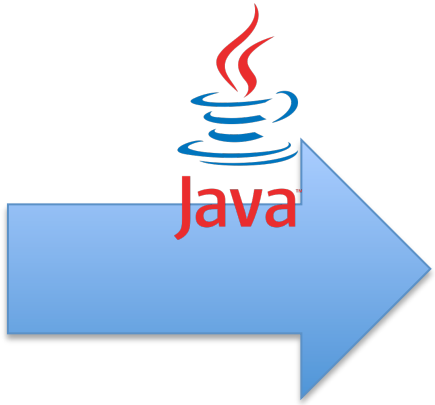
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon|citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%
43 / 43								

RuntimeException….



Tests

(sur les entrées)

Product	Image process...	Sensor format	Sensor type	Sensor manufa...	Megapixels	Focus points	Metering pixels	Viewfinder cov...
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D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon[citation ne...	24.9	51	91000	100%
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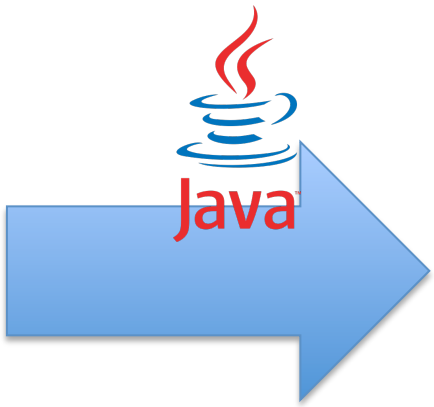
43 / 43								



Tests

(sur les entrées)

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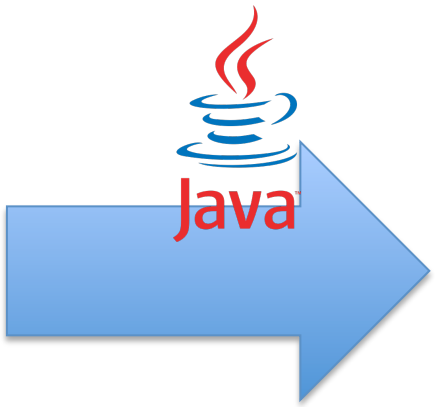
43 / 43								

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<div>
<ul><li>…</li></ul>
</div>
```

Manual testing is a terrible idea

non reproducible; error-prone; time-consuming

Product	Image process.	Sensor format	Sensor type	Sensor manufa.	Megapixels	Focus points	Metering pixels	Viewfinder cov.
Find								
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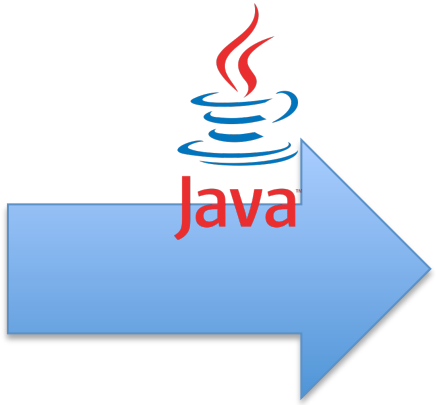
43 / 43								

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<div>
<ul><li>…</li></ul>
</div>
```

You can start with some values/ inputs and then (manually) observe

Product	Image process...	Sensor format	Sensor type	Sensor manufa...	Megapixels	Focus points	Metering pixels	Viewfinder cov...
Find								
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D750	EXPEED 4	Full-frame	CMOS	Nikon[citation ne...	24.9	51	91000	100%
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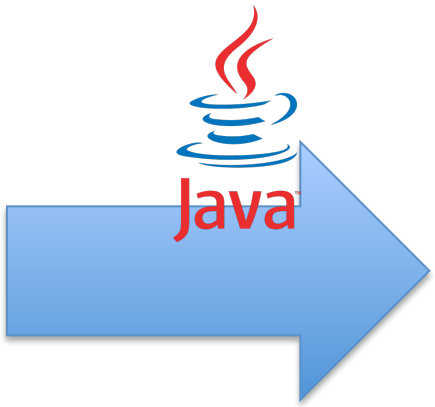
43 / 43								




```
<div>
<ul><li>…</li></ul>
</div>
```

But manual testing is a terrible idea

non reproducible; error-prone; time-consuming

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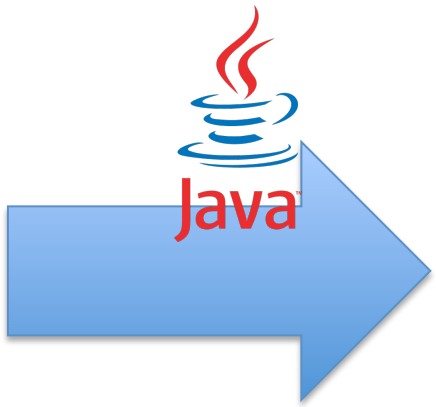
43 / 43								

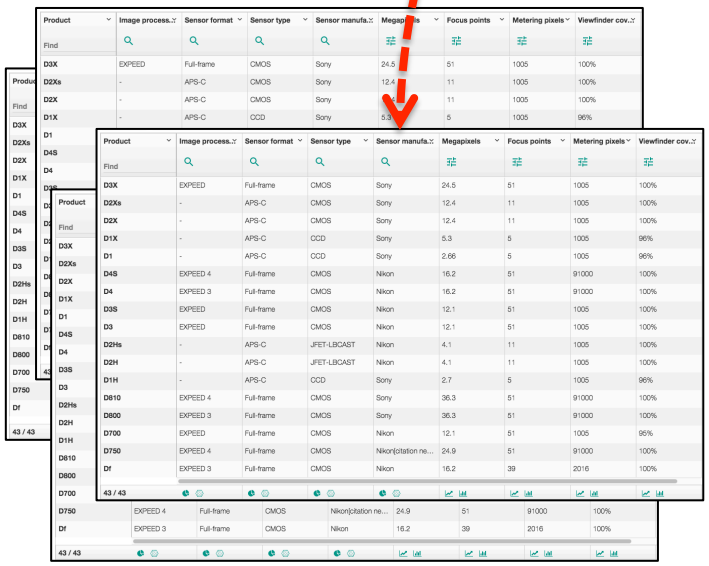



```
<div>
<ul><li>…</li></ul>
</div>
```

Whenever you are tempted to type something into a print statement or a debugger expression, write it as a test instead.

Tests

(sur les entrées)



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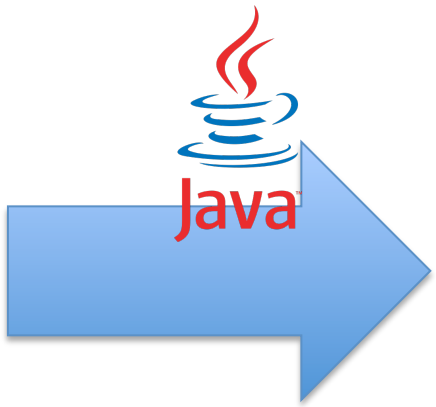
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%

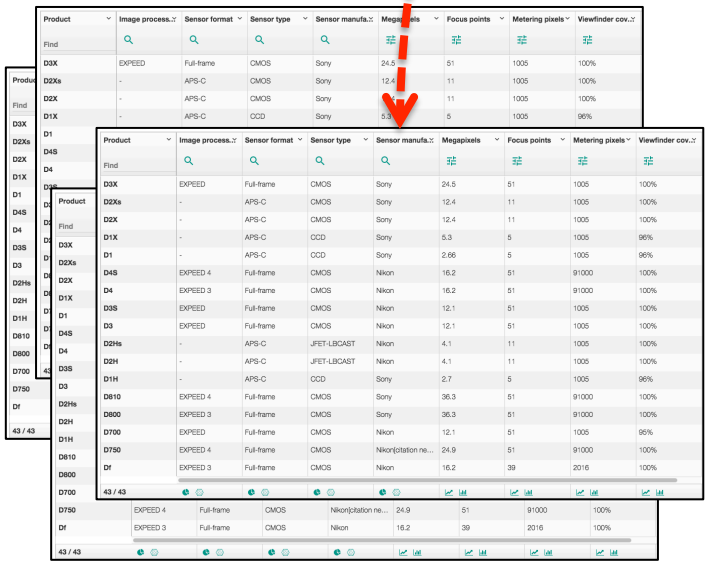
43 / 43

Observer par des assertions (vérification de propriétés)



Tests automatisés

(sur les entrées)



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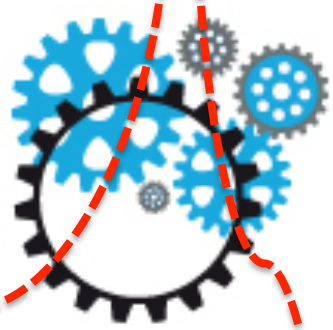
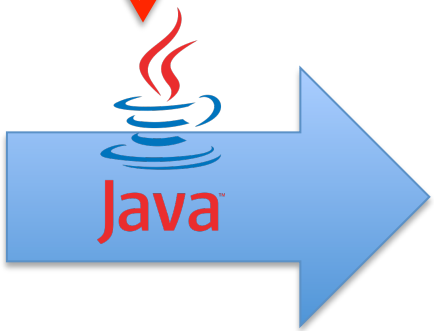
43 / 43								

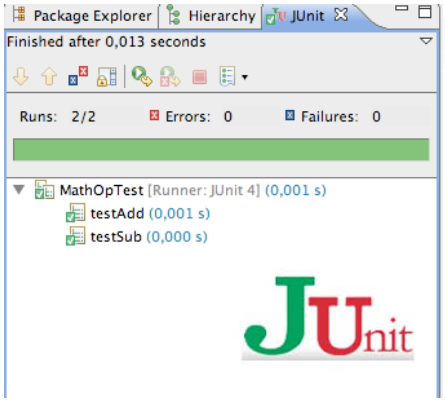


(sur la transformation)

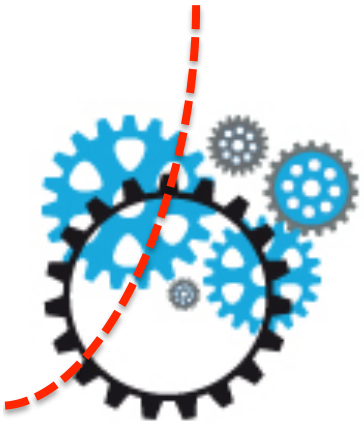
(sur la sortie)

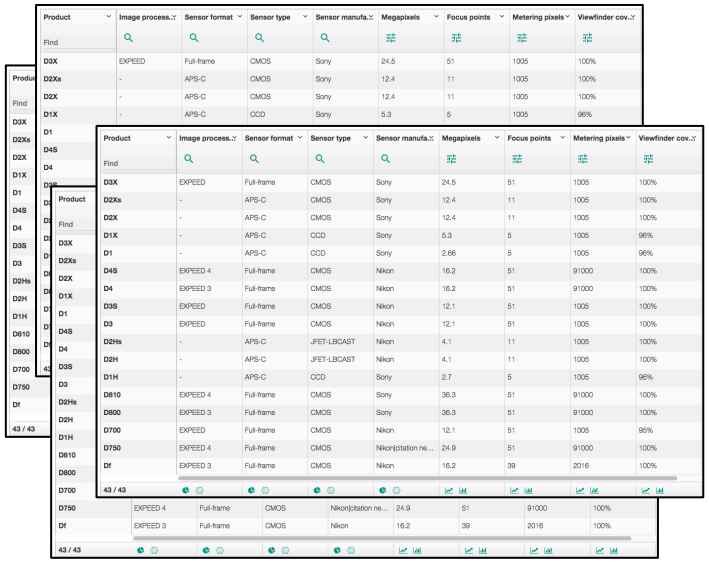


Tests automatisés

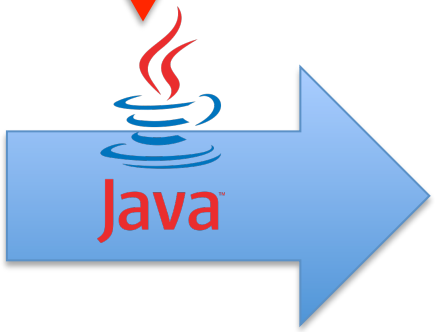



```java
// Tests adding a product to the cart.
public void testProductAdd() {
     Product book = new Product("Refactoring", 53.95);
     _bookCart.addItem(book);

     assertTrue(_bookCart.contains(book));

     double expected = 23.95 + book.getPrice();
     double current = _bookCart.getBalance();

     assertEquals(expected, current, 0.0);

     int expectedCount = 2;
     int currentCount = _bookCart.getItemCount();

     assertEquals(expectedCount, currentCount);
}
```



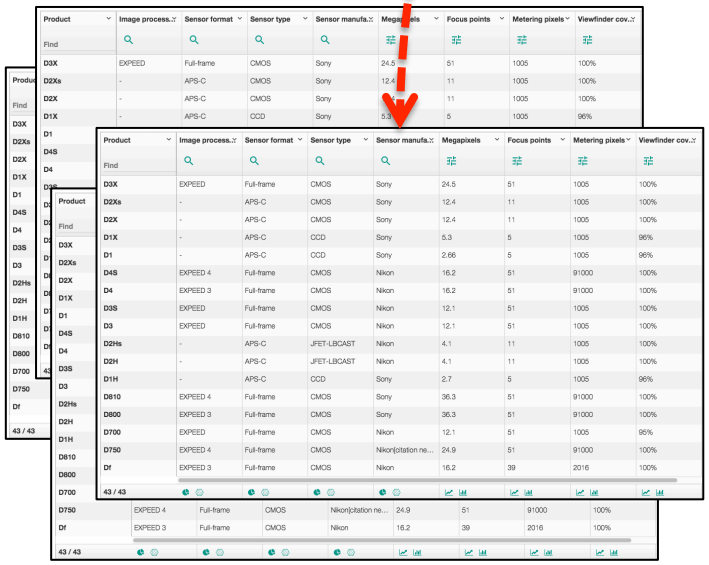


(sur la transformation)



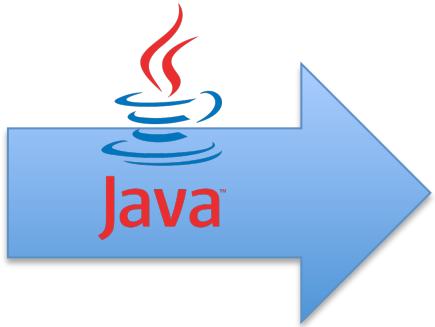
Tests automatisés

(sur les entrées)

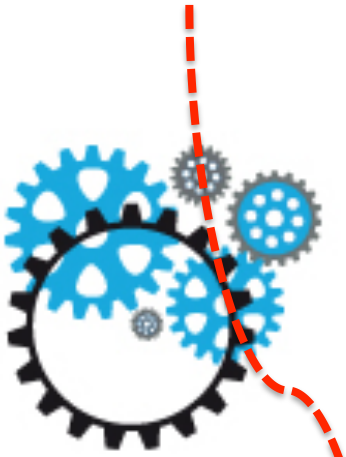


Product	Image process..	Sensor format	Sensor type	Sensor manufa..	Megapixels	Focus points	Metering pixels	Viewfinder cov..
Find								
D3X	EXPEED	Full-frame	CMOS	Sony	24.5	51	1005	100%
D2Xs	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D2X	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
D1	-	APS-C	CCD	Sony	2.66	5	1005	96%
D4S	EXPEED 4	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D4	EXPEED 3	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D3	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D2H	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D1H	-	APS-C	CCD	Sony	2.7	5	1005	96%
D810	EXPEED 4	Full-frame	CMOS	Sony	36.3	51	91000	100%
D800	EXPEED 3	Full-frame	CMOS	Sony	36.3	51	91000	100%
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon|citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%
43 / 43								

(sur la sortie)



Tests automatisés

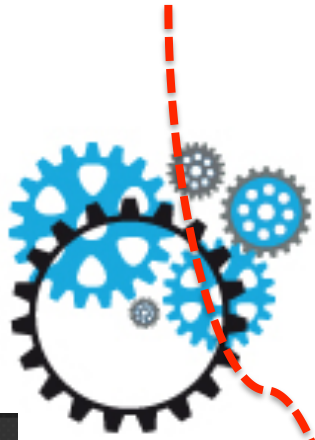


(sur la sortie)


```
@Test
public void homePage() throws Exception {
    final WebClient webClient = new WebClient();
    try (final WebClient webClient = new WebClient()) {
        final HtmlPage page = webClient.getPage("http://htmlunit.sourceforge.net");
        Assert.assertEquals("HtmlUnit - Welcome to HtmlUnit", page.getTitleText());

        final String pageAsXml = page.asXml();
        Assert.assertTrue(pageAsXml.contains("<body class=\"composite\">"));

        final String pageAsText = page.asText();
        Assert.assertTrue(pageAsText.contains("Support for the HTTP and HTTPS protocols"));
    }
}
```

http://htmlunit.sourceforge.net/gettingStarted.html

Tests automatisés



(sur la sortie)

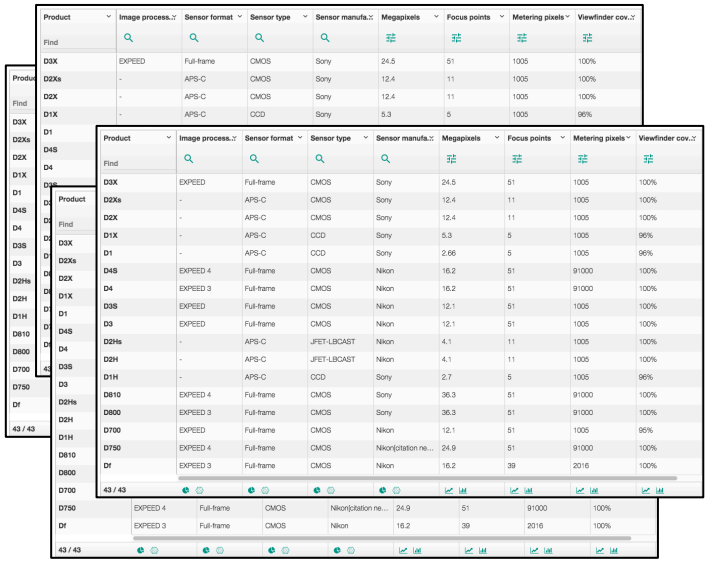

```
// googletesting.js
casper.test.begin('Google search retrieves 10 or more results', 5, function suite(test) {
    casper.start("http://www.google.fr/", function() {
        test.assertTitle("Google", "google homepage title is the one expected");
        test.assertExists('form[action="/search"]', "main form is found");
        this.fill('form[action="/search"]', {
            q: "casperjs"
        }, true);
    });

    casper.then(function() {
        test.assertTitle("casperjs - Recherche Google", "google title is ok");
        test.assertUrlMatch(/q=casperjs/, "search term has been submitted");
        test.assertEval(function() {
            return __utils__.findAll("h3.r").length >= 10;
        }, "google search for \"casperjs\" retrieves 10 or more results");
    });

    casper.run(function() {
        test.done();
    });
});
```

http://docs.casperjs.org/en/latest/testing.html

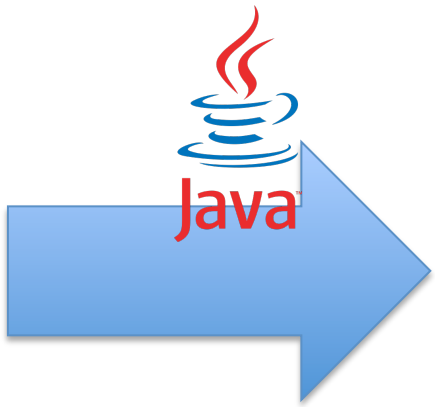
Tests automatisés

(concevoir un ensemble de données en “input” pertinent pour le test et couvrant un maximum de cas)

(vérifier des assertions « génériques » ou bien produire la sortie attendue puis comparaison aka « diff »)



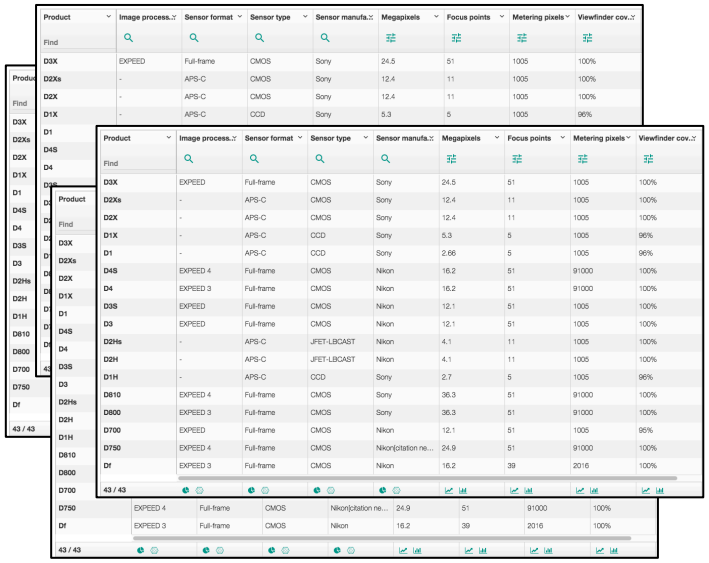
Product	Image process..	Sensor format	Sensor type	Sensor manufa..	Megapixels	Focus points	Metering pixels	Viewfinder cov..
Find								
D3X	EXPEED	Full-frame	CMOS	Sony	24.5	51	1005	100%
D2Xs	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D2X	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
D1	-	APS-C	CCD	Sony	2.66	5	1005	96%
D4S	EXPEED 4	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D4	EXPEED 3	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D3	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D2H	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D1H	-	APS-C	CCD	Sony	2.7	5	1005	96%
D810	EXPEED 4	Full-frame	CMOS	Sony	36.3	51	91000	100%
D800	EXPEED 3	Full-frame	CMOS	Sony	36.3	51	91000	100%
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon[citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%
43 / 43								



Tests automatisés

NE PAS TESTER VOTRE SOLUTION SUR UNE SEULE MATRICE!

(vérifier des assertions « génériques » ou bien produire la sortie attendue puis comparaison aka « diff »)



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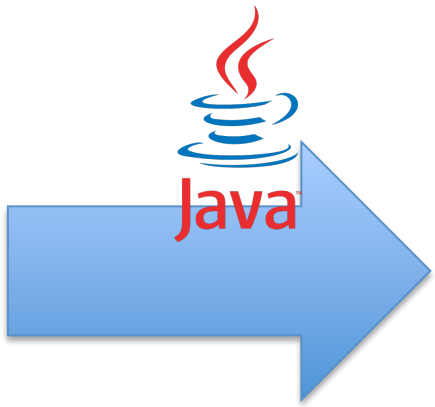
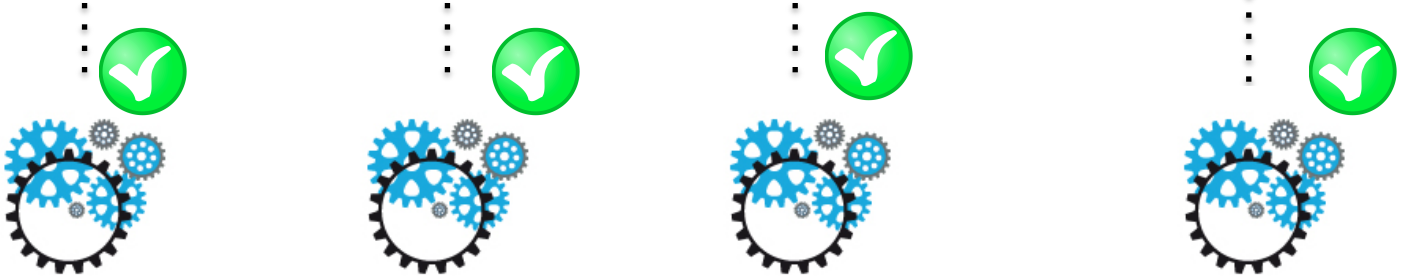
D2X	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
D1	-	APS-C	CCD	Sony	2.66	5	1005	96%
D4S	EXPEED 4	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D4	EXPEED 3	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D3	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D2H	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D1H	-	APS-C	CCD	Sony	2.7	5	1005	96%
D810	EXPEED 4	Full-frame	CMOS	Sony	36.3	51	91000	100%
D800	EXPEED 3	Full-frame	CMOS	Sony	36.3	51	91000	100%
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon[citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%
43 / 43								



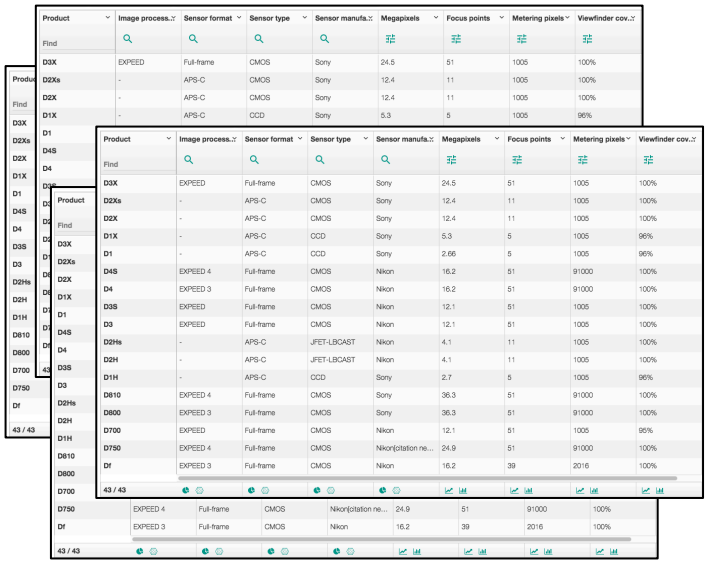
SP (sprints; implémentation)



Execute the tests before/after each commit
Don’t break (no regression)
Continuous validation

Modéliser les exigences

Modéliser les exigences



Product	Image process.	Sensor format	Sensor type	Sensor manufa.	Megapixels	Focus points	Metering pixels	Viewfinder cov.
D3X	EXPEED	Full-frame	CMOS	Sony	24.5	51	1005	100%
D2Xs	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D2X	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
D1	-	APS-C	CCD	Sony	2.66	5	1005	96%
D4S	EXPEED 4	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D4	EXPEED 3	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D3	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D2H	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D1H	-	APS-C	CCD	Sony	2.7	5	1005	96%
D810	EXPEED 4	Full-frame	CMOS	Sony	36.3	51	91000	100%
D800	EXPEED 3	Full-frame	CMOS	Sony	36.3	51	91000	100%
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon[citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%

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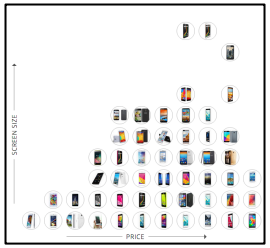
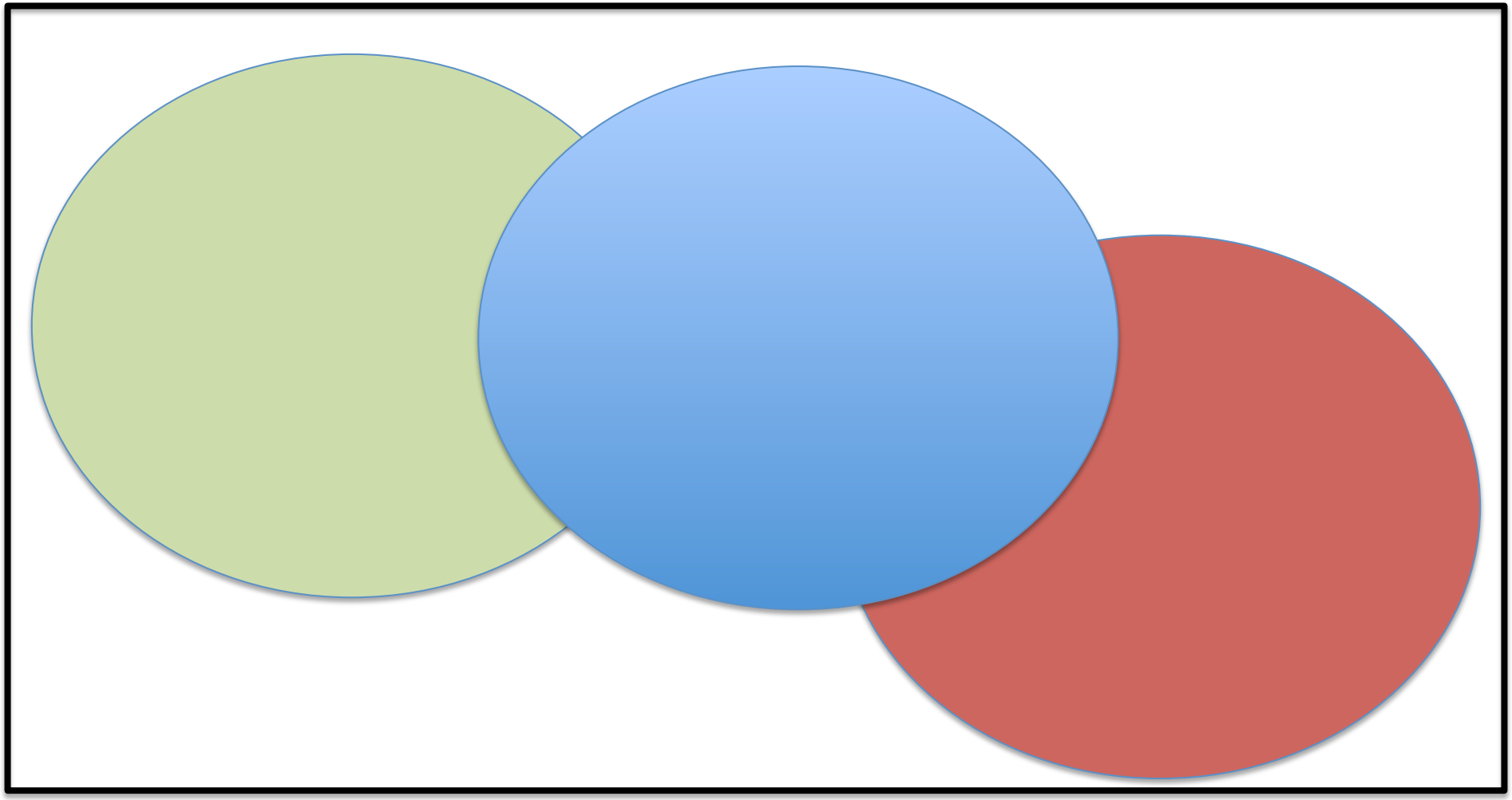
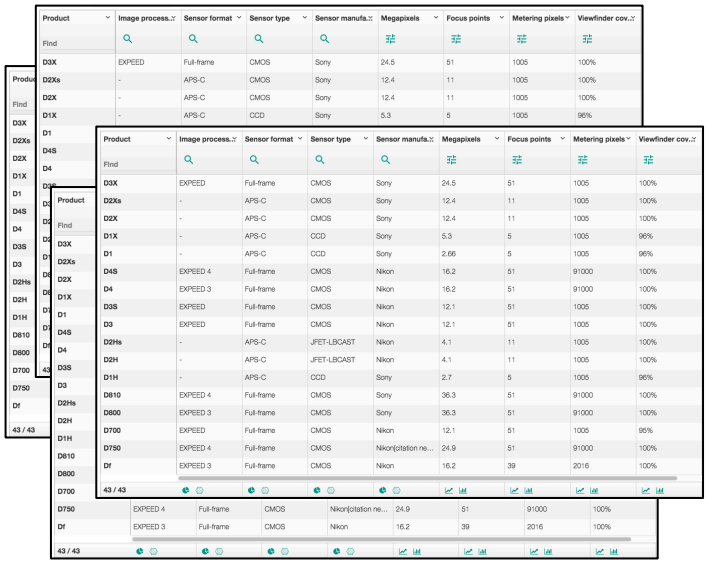


Implémenter des fonctionnalités inutiles ou qui ne correspondent pas aux besoins du client => **Modéliser les exigences**



(à côté de la plaque?)

Modéliser les exigences



Product	Image process.	Sensor format	Sensor type	Sensor manufa.	Megapixels	Focus points	Metering pixels	Viewfinder cov.
D3X	EXPEED	Full-frame	CMOS	Sony	24.5	51	1005	100%
D2Xs	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D2X	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
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D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon[citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%

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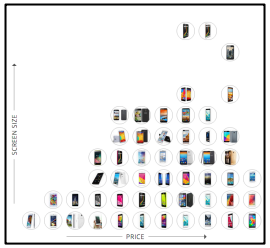
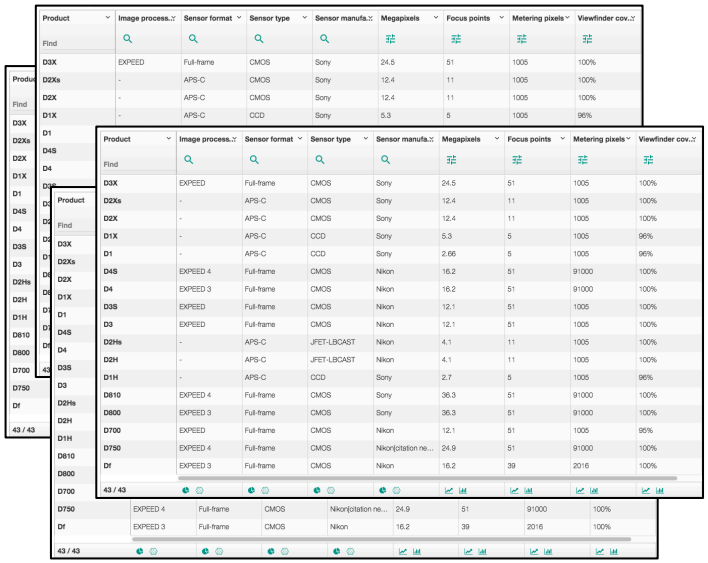


Expliciter
Documenter
Communiquer avec le client

Modéliser les exigences



Product	Image process.	Sensor format	Sensor type	Sensor manufa.	Megapixels	Focus points	Metering pixels	Viewfinder cov.
D3X	EXPEED	Full-frame	CMOS	Sony	24.5	51	1005	100%
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Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%

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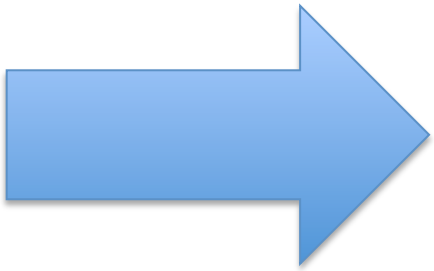
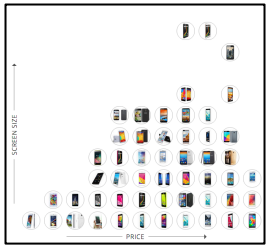
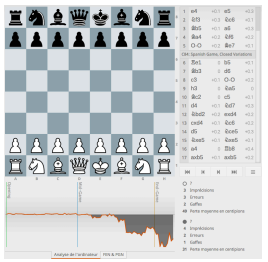
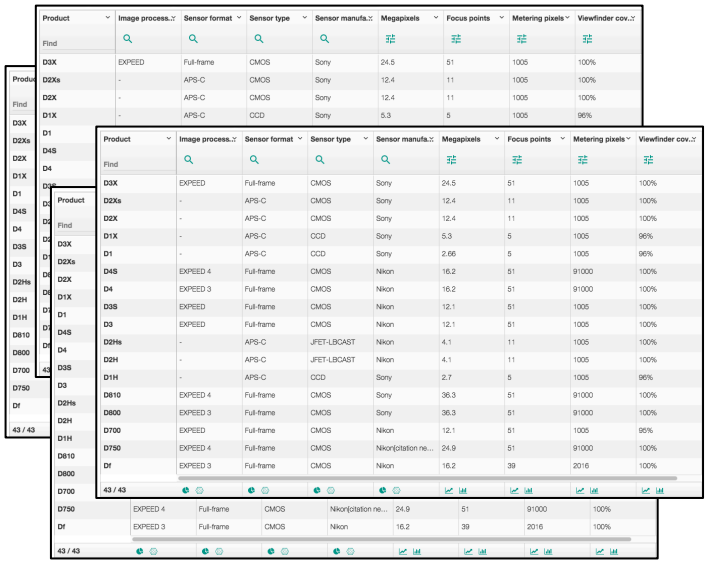






Délimiter
Approche défensive
“Contrat”

Comment modéliser les exigences?



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D750	EXPEED 4	Full-frame	CMOS	Nikon[citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%

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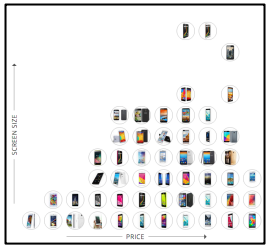

Modélisation UML

- Modélisation selon 4 points de vue principaux :
  - Aspects statiques du système *(le QUI?)*
    - » Description des objets et de leurs relations
      - Modularité, contrats, relations, généricité, héritage
    - » Structuration en paquetages
  - Vision utilisateur du système *(le QUOI?)*
    - » Cas d'utilisation
  - Aspects dynamiques du système *(le QUAND?)*
    - » Diagramme de séquences (scénarios)
    - » Diagramme de collaborations (entre objets)
    - » Diagramme d'états-transitions (Harel)
    - » Diagramme d'activités
  - Vision implantation *(le OU?)*
    - » Diagramme de composants et de déploiement

Modélisation UML

- Modélisation selon 4 points de vue principaux :
  - Aspects statiques du système *(le QUI?)*
    - » Description des objets et de leurs relations
      - Modularité, contrats, relations, généricité, héritage
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    - » Cas d'utilisation
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    - » Diagramme de séquences (scénarios)
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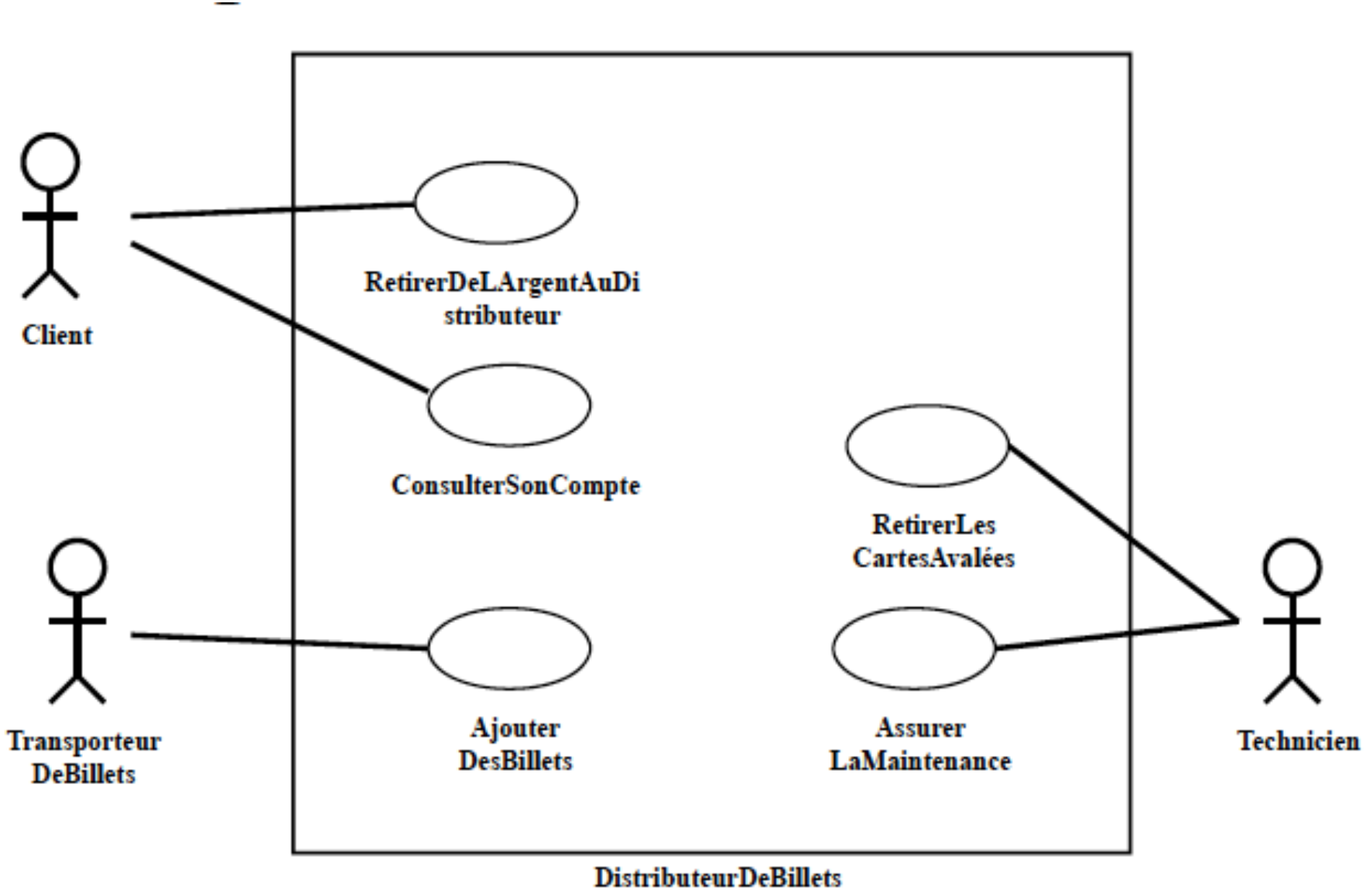
    - » Diagramme d'états-transitions (Harel)
    - » Diagramme d'activités
  - Vision implantation *(le OU?)*
    - » Diagramme de composants et de déploiement

"A use case is a sequence of transactions in a system whose task is to yield a measurable value to an individual actor of the system." [– Jacobson et al., 1995]


Client
Banque Centrale
Transporteur DeBillets
Technicien
DistributeurDeBillet


Client
RetirerDeLArgentAuDistributeur
ConsulterSonCompte
Transporteur DeBillets
Ajouter DesBillets
RetirerLes CartesAvalées
Assurer LaMaintenance
Technicien
DistributeurDeBillets

- Pour chaque cas d 'utilisation
  - choisir un identificateur représentatif
  - donner une **description textuelle simple**
  - la fonction réalisée doit être comprise de tous
  - préciser ce que fait le système, ce que fait l'acteur
  - pas trop de détails, se concentrer sur le **scénario "normal"**

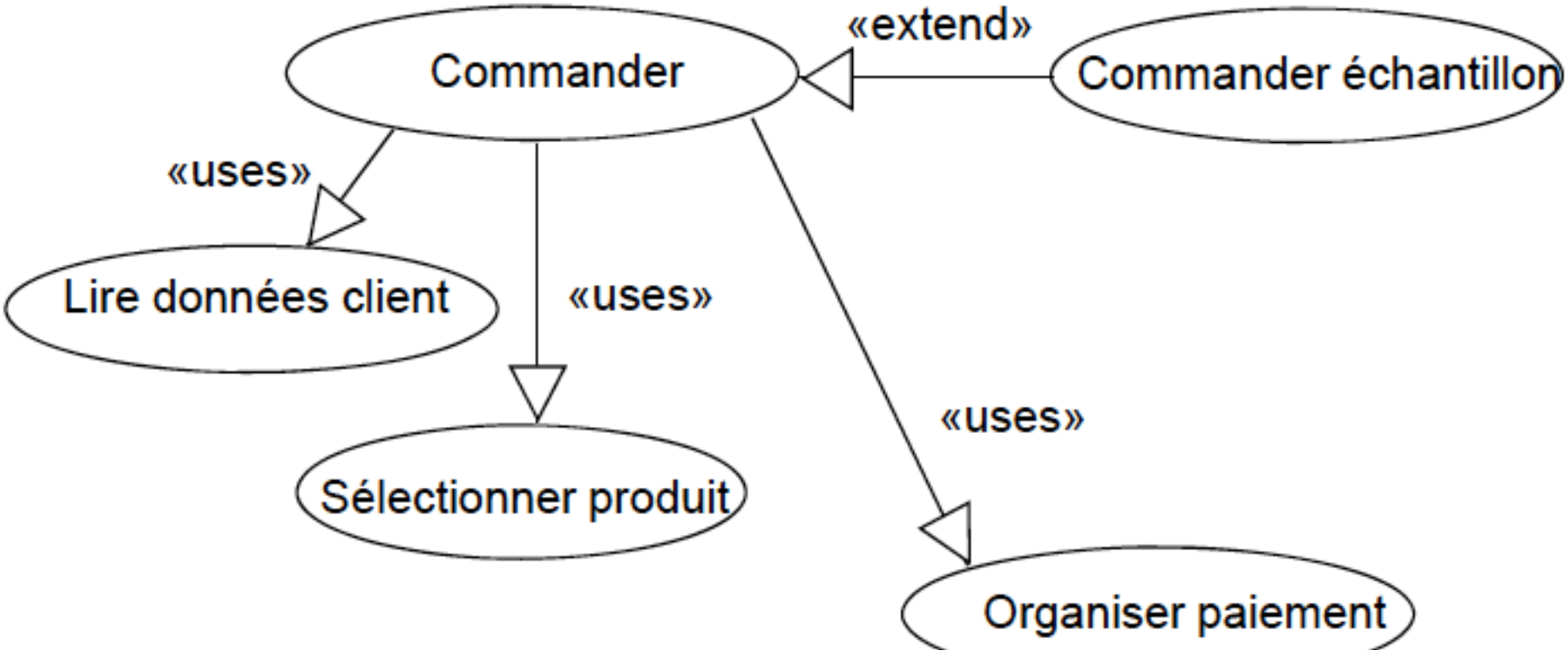
Retirer DeLArgent AuDistributeur

Lorsqu'un *client* a besoin de liquide il peut en utilisant un distributeur retirer de l'argent de son compte. Pour cela :
- le *client* insère sa carte bancaire dans le distributeur
- le *système* demande le code pour l 'identifier
- le *client* choisit le montant du retrait
- le *système* vérifie qu 'il y a suffisamment d 'argent
- si c 'est le cas, le *système* distribue les billets et débite le compte du client
- le *client* prend les billets et retire sa carte

Uses: refine the case by use of other cases

Extends: specialization of another use case

Relations sur les *use-cases* : notation



Modélisation UML

- Modélisation selon 4 points de vue principaux :
  - Aspects statiques du système *(le QUI?)*
    - » Description des objets et de leurs relations
      - Modularité, contrats, relations, généricité, héritage
    - » Structuration en paquetages
  - Vision utilisateur du système *(le QUOI?)*
    - » Cas d'utilisation
  - Aspects dynamiques du système *(le QUAND?)*
    - » Diagramme de séquences (scénarios)
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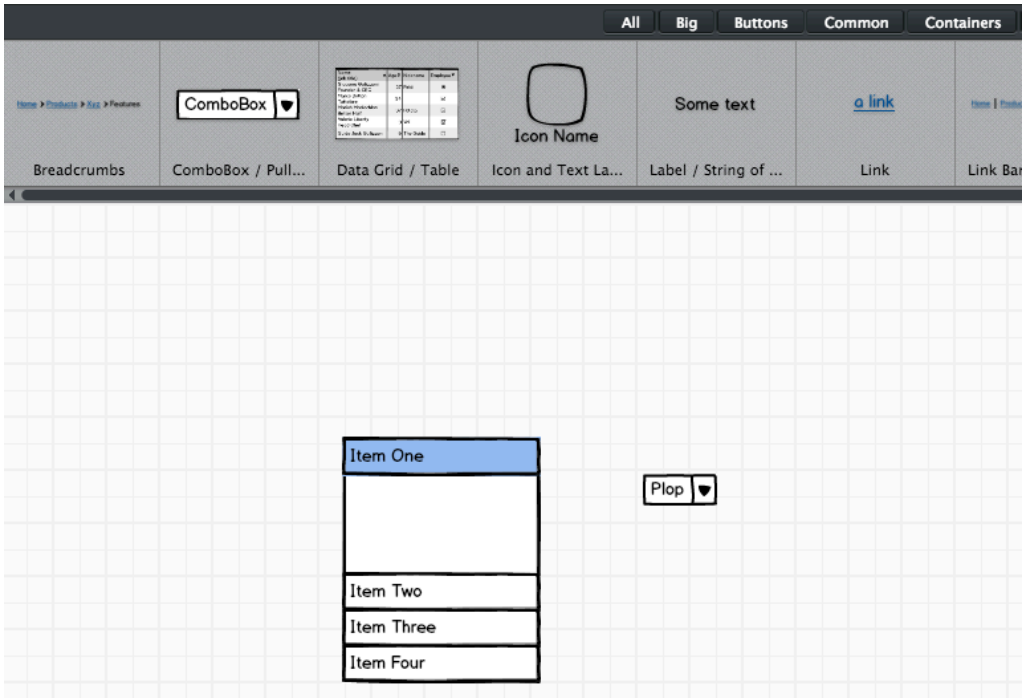
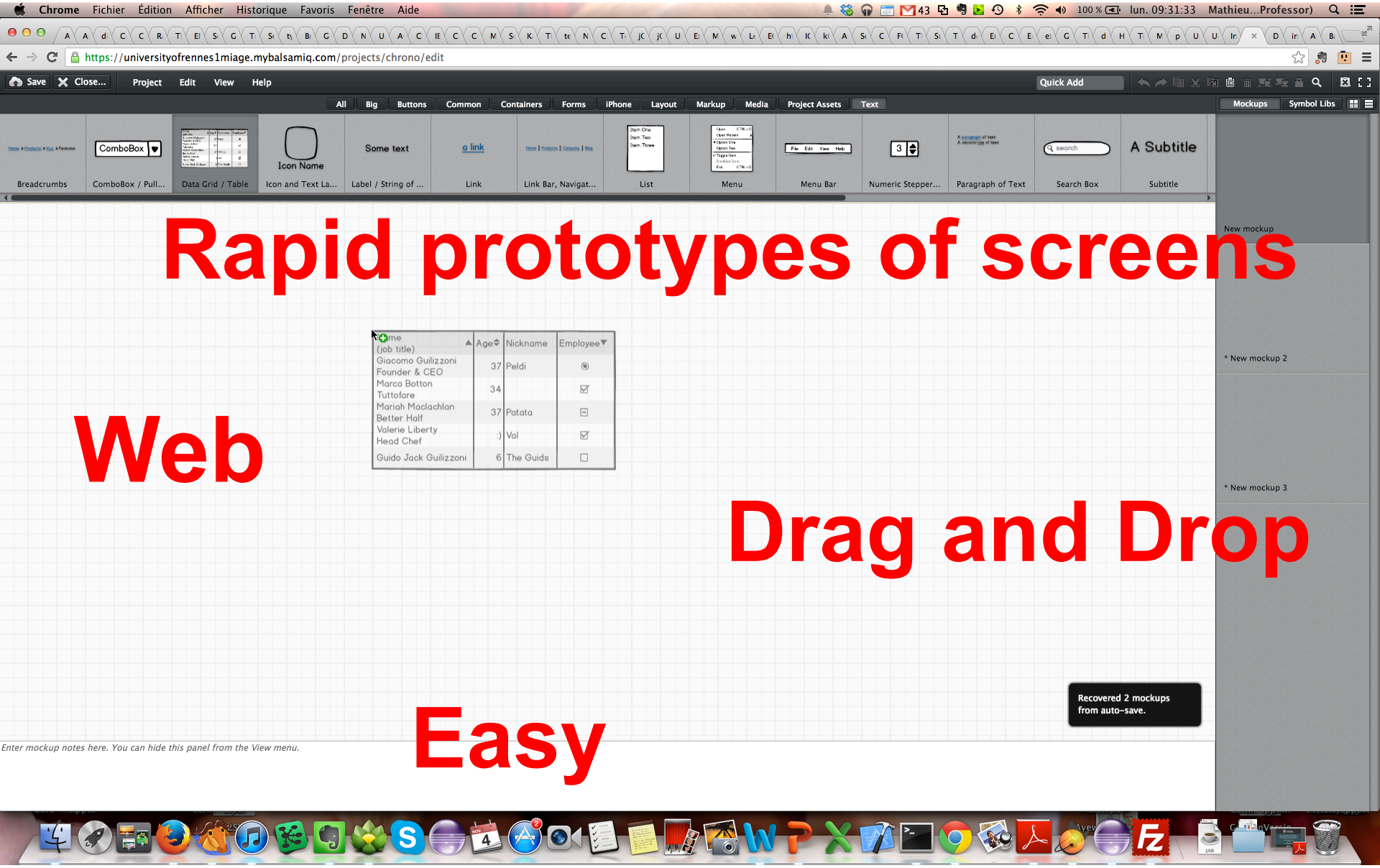
    - » Diagramme d'activités
  - Vision implantation *(le OU?)*
    - » Diagramme de composants et de déploiement

Prototyping UI

- Intuitive, not cheap
- Iterative
- Exploration
- Focus on purpose
- Modeling
  - Forget technology a few seconds



https://universityofrennes1miage.mybalsamiq.com/



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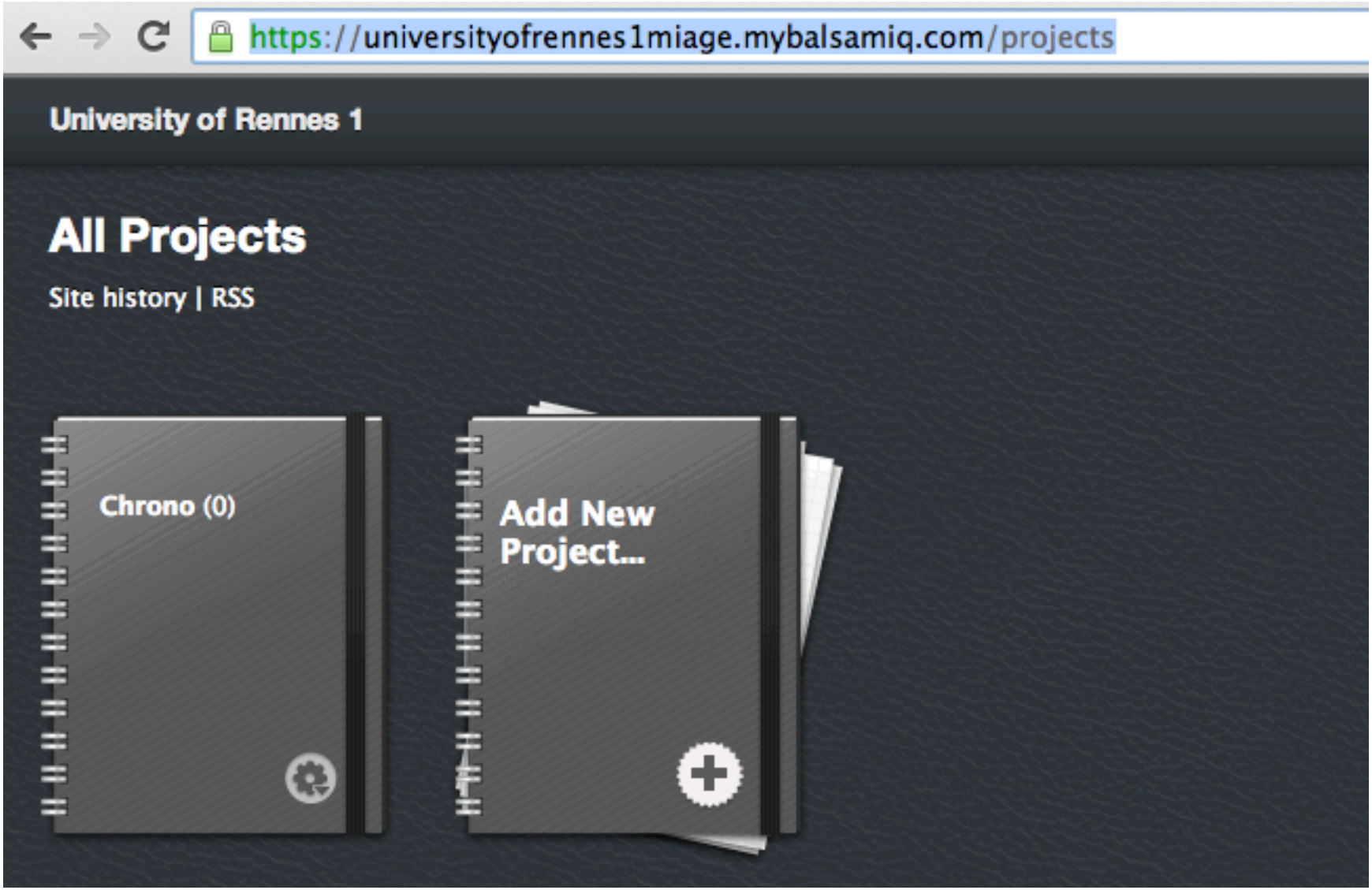

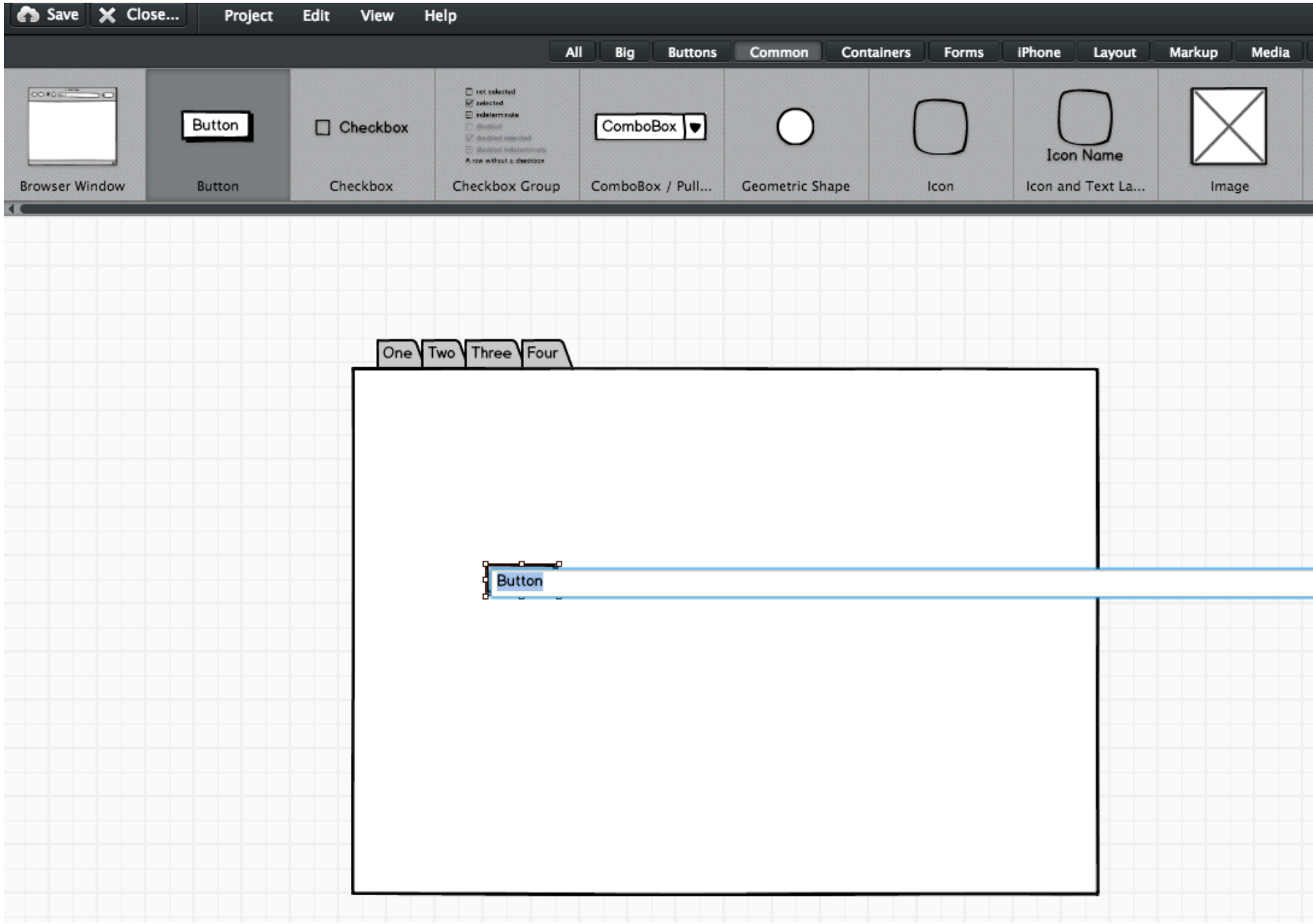
Save
Close...
Project
Edit
View
Help
All
Big
Buttons
Common
Containers
Forms
iPhone
Layout
Markup
Media
Browser Window
Button
Checkbox
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ComboBox / Pull...
Geometric Shape
Icon
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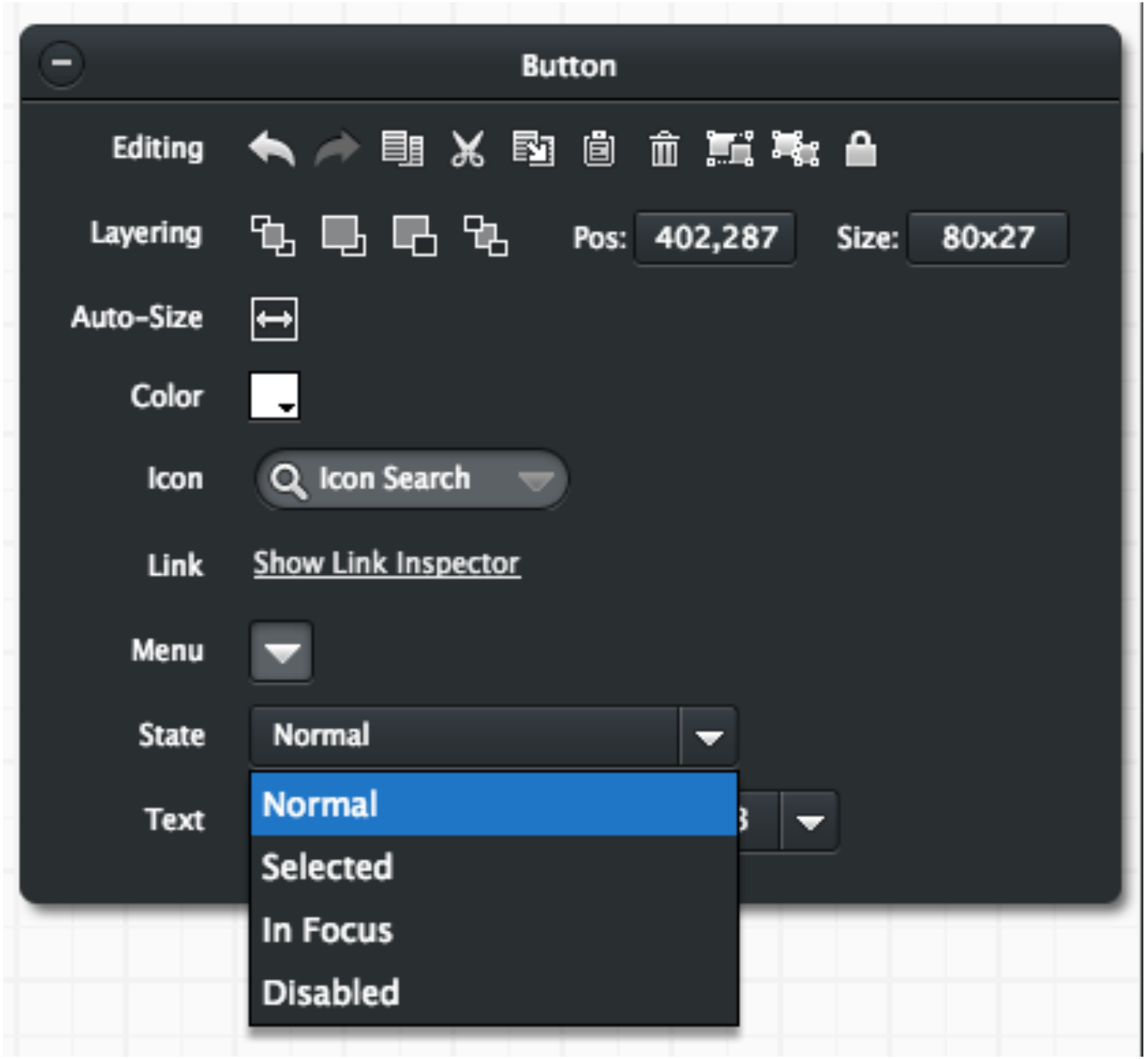
Image
One
Two
Three
Four
Button


Button
Editing
Layering
Pos: 402,287
Size: 80x27
Auto-Size
Color
Icon
Icon Search
Link
Show Link Inspector
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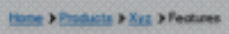
Disabled

All | Big | Buttons | Common | Containers | Forms | i

Accordion

Alert Box

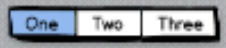

Arrow / Line



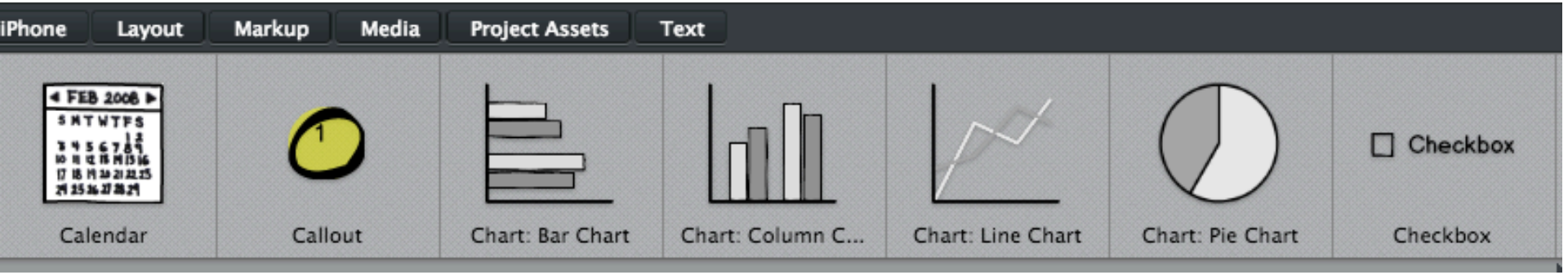
Breadcrumbs


Browser Window

Button



Button Bar / Tab ...


iPhone
Layout
Markup
Media
Project Assets
Text
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Calendar
Callout
Chart: Bar Chart
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Chart: Line Chart
Chart: Pie Chart
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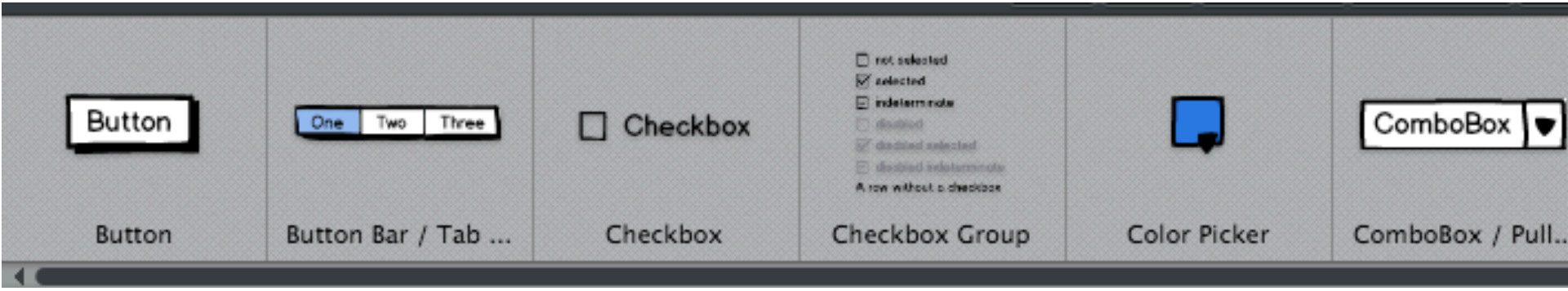
Checkbox


Button
One
Two
Three
Checkbox
not selected
selected
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disabled
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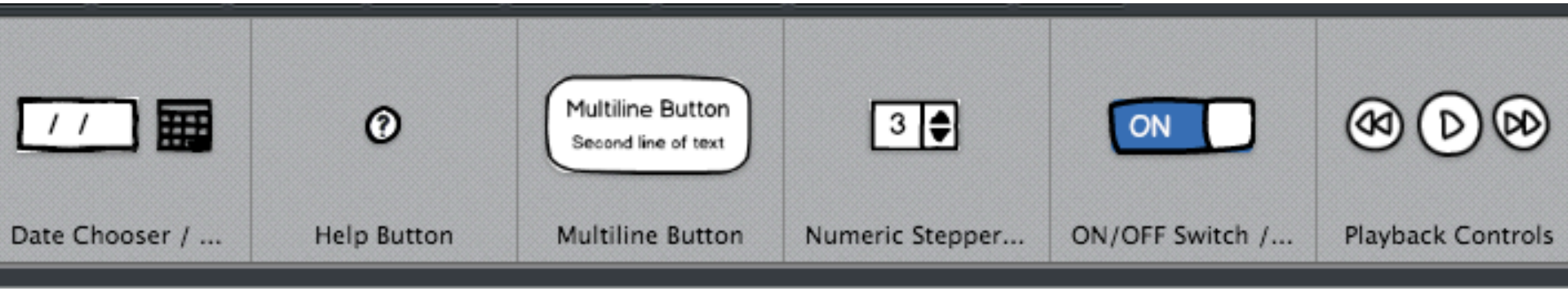
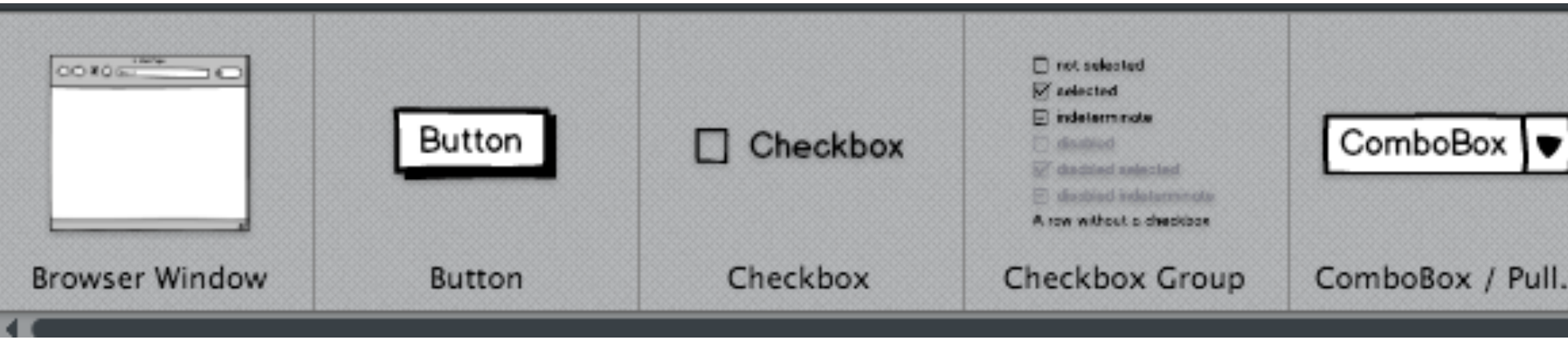
A row without a checkbox
ComboBox
Button
Button Bar / Tab ...
Checkbox
Checkbox Group
Color Picker
ComboBox / Pull..


/ /
Multiline Button
Second line of text
3
ON
Date Chooser / ...
Help Button
Multiline Button
Numeric Stepper...
ON/OFF Switch /...
Playback Controls


Button
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disabled indeterminate
A row without a checkbox
ComboBox
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Data Grid / Table
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Button
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Three
Checkbox
not selected
selected
indeterminate
A row without a checkbox
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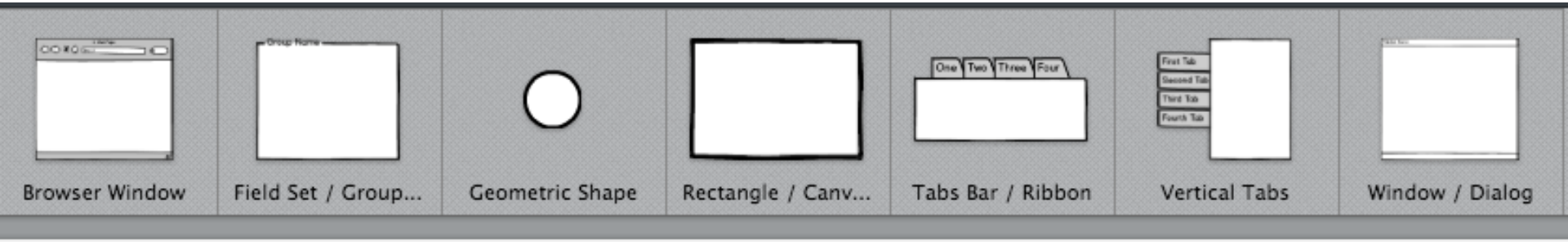
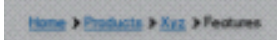
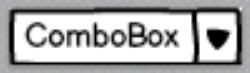
Color Picker
ComboBox / Pull...
Date Chooser / ...
Field Set / G


Group Name
One
Two
Three
Four
First Tab
Second Tab
Third Tab
Fourth Tab
Browser Window
Field Set / Group...
Geometric Shape
Rectangle / Canv...
Tabs Bar / Ribbon
Vertical Tabs
Window / Dialog

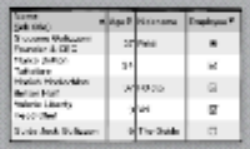
All | Big | Buttons | Common | Containers



Breadcrumbs



ComboBox / Pull...



Data Grid / Table

Icon and Text La...

Some text

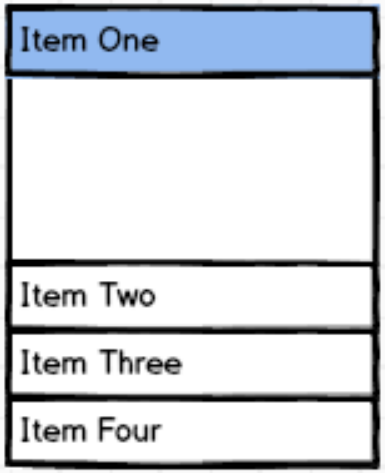
Label / String of ...

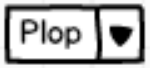
a link

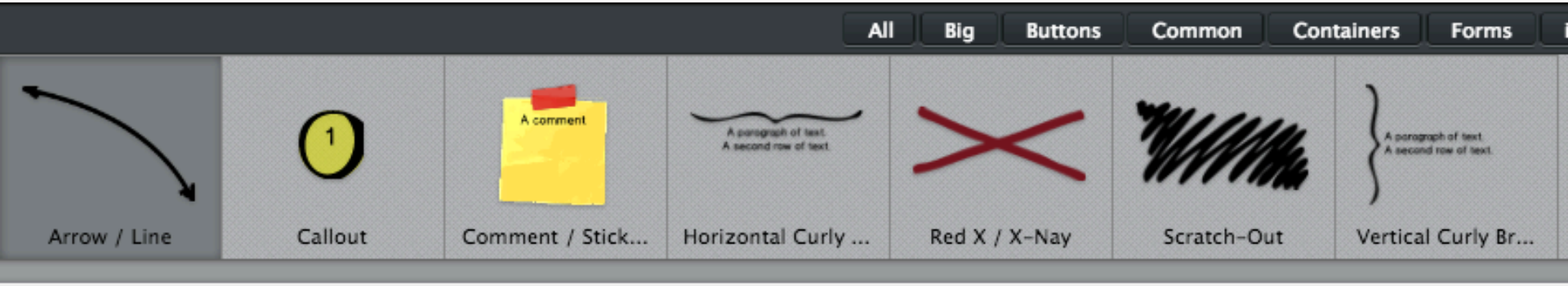
Link

Home | Produ

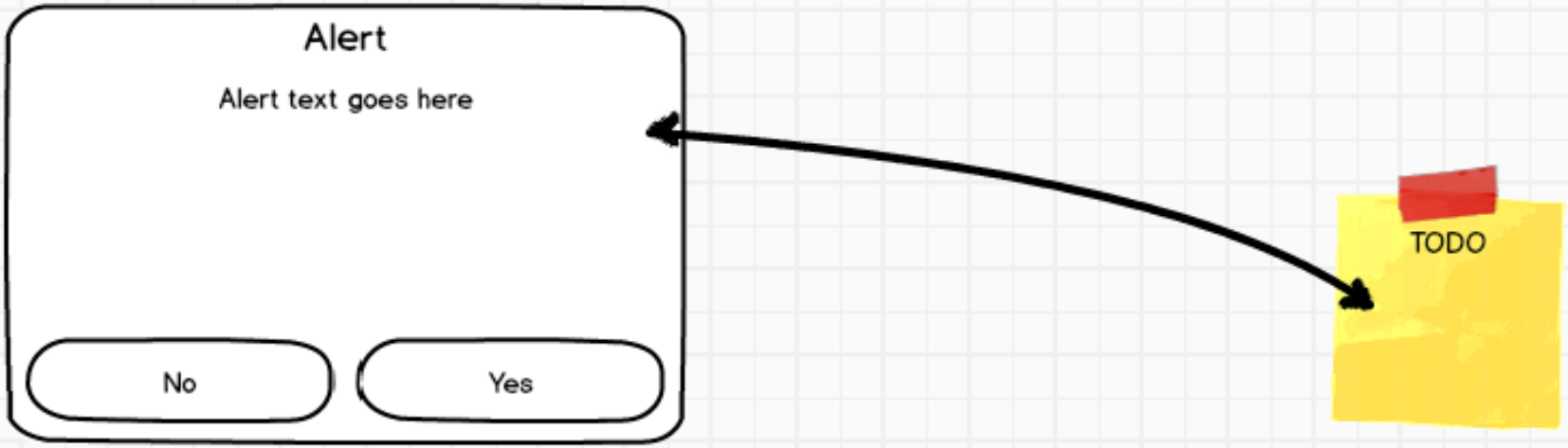
Link Ba

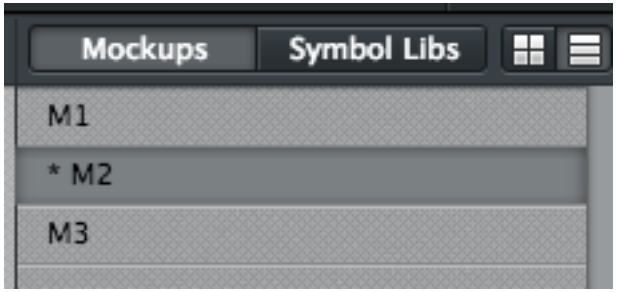




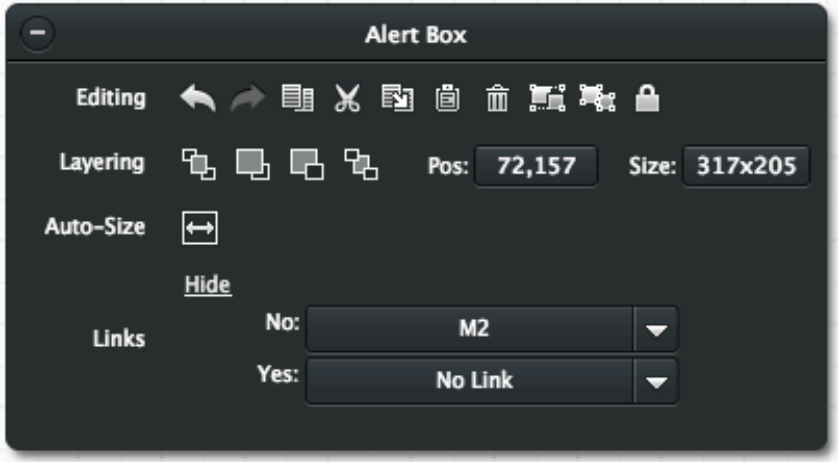


Collaborative





Interaction between Mockups



Modélisation UML

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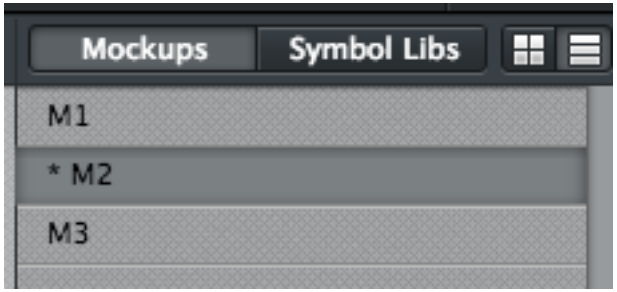

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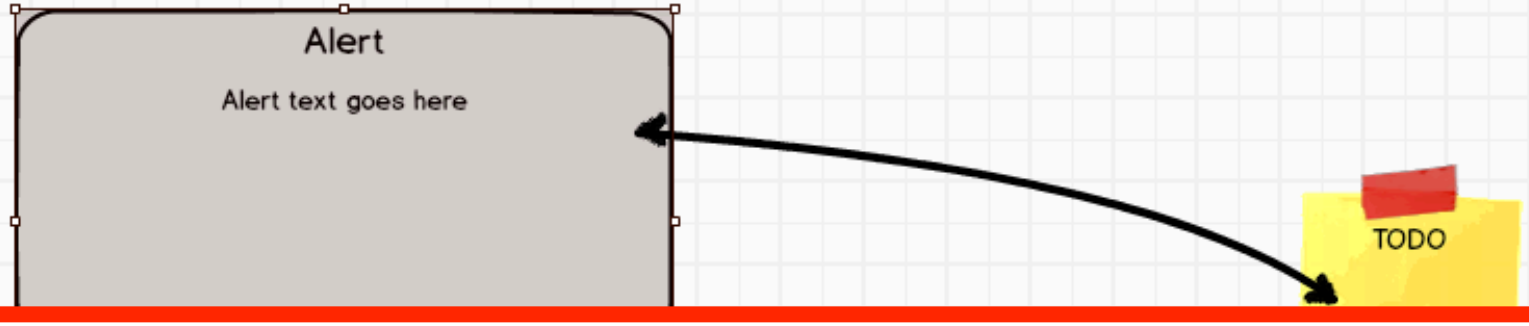

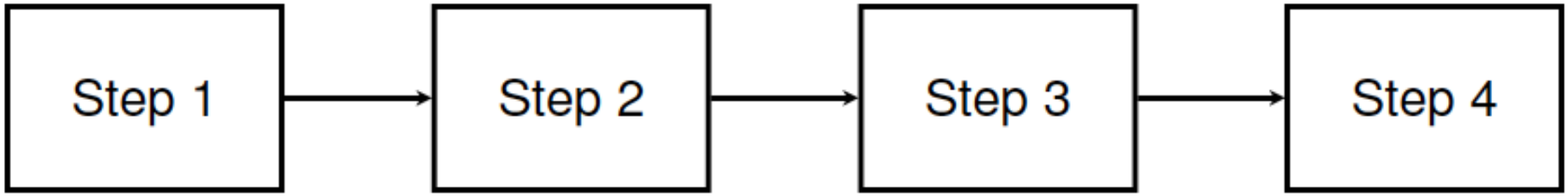

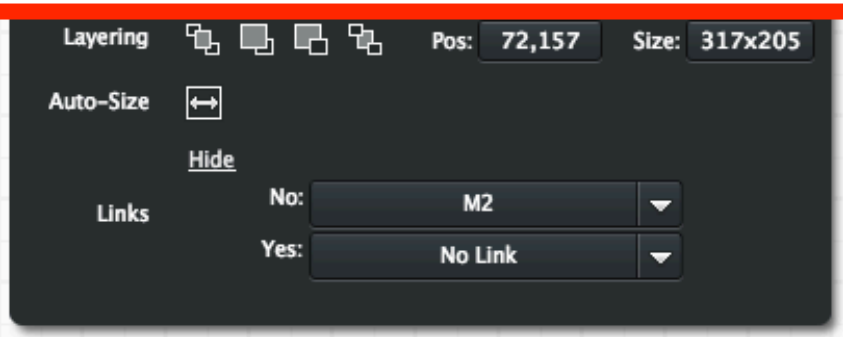

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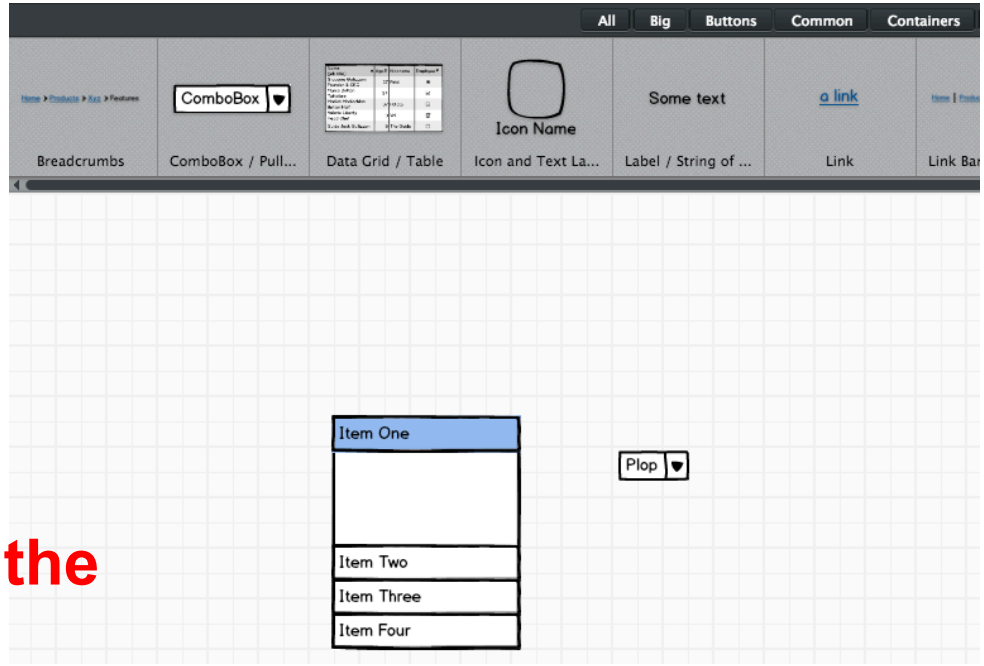
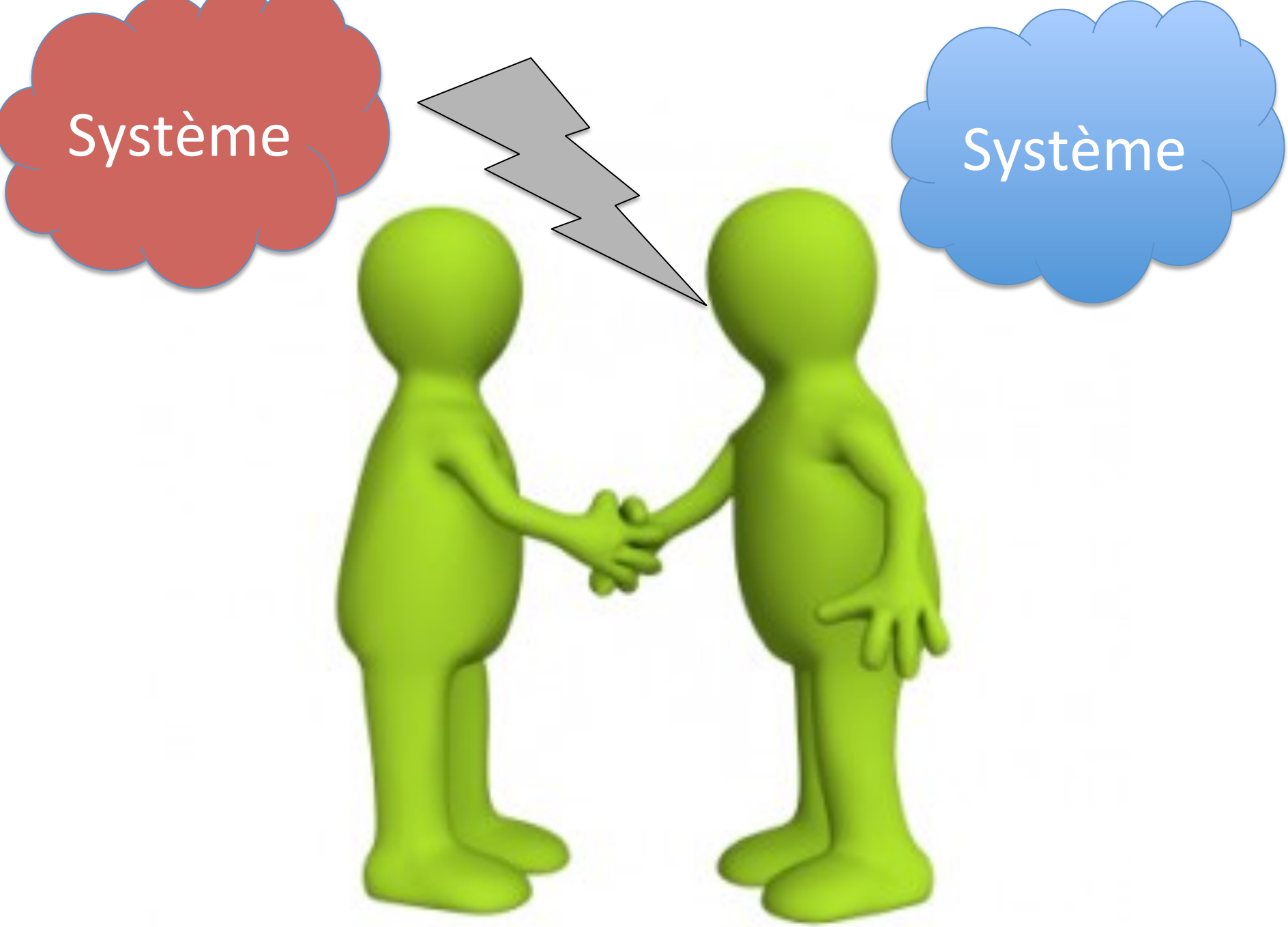
UML diagrams



Complementary!

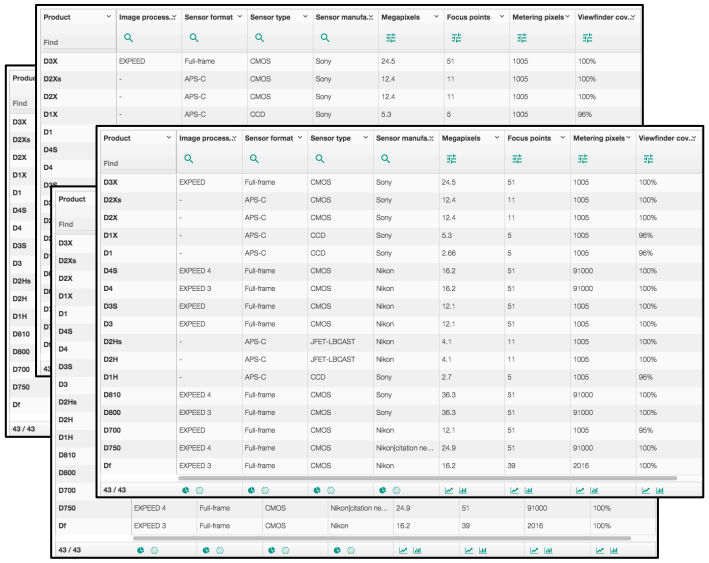
Focus on some aspects of the system/requirements

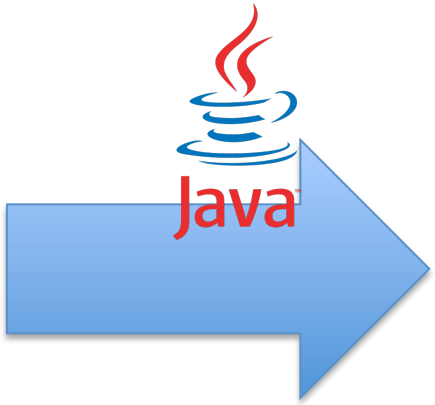
Valider les exigences et
l'implémentation
à chaque itération
avec le client


Système
Système

Validation par le client et/ou des utilisateurs

“la visualisation est inadaptée pour cette caractéristique”
“il manque l’auto-complétion sur cette partie du formulaire”
“le résumé est trop verbeux”

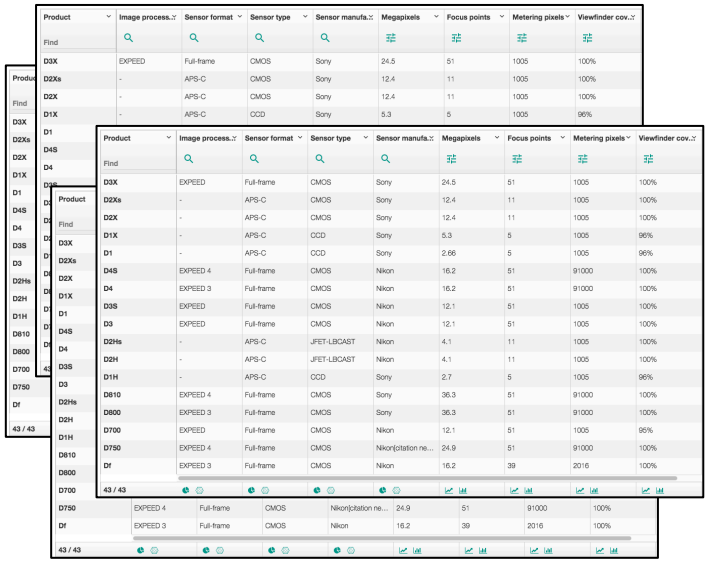


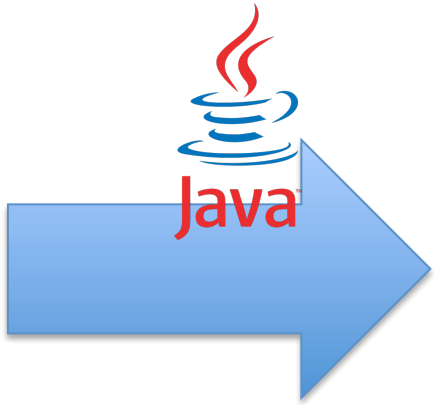


Validation par le client (sampling)

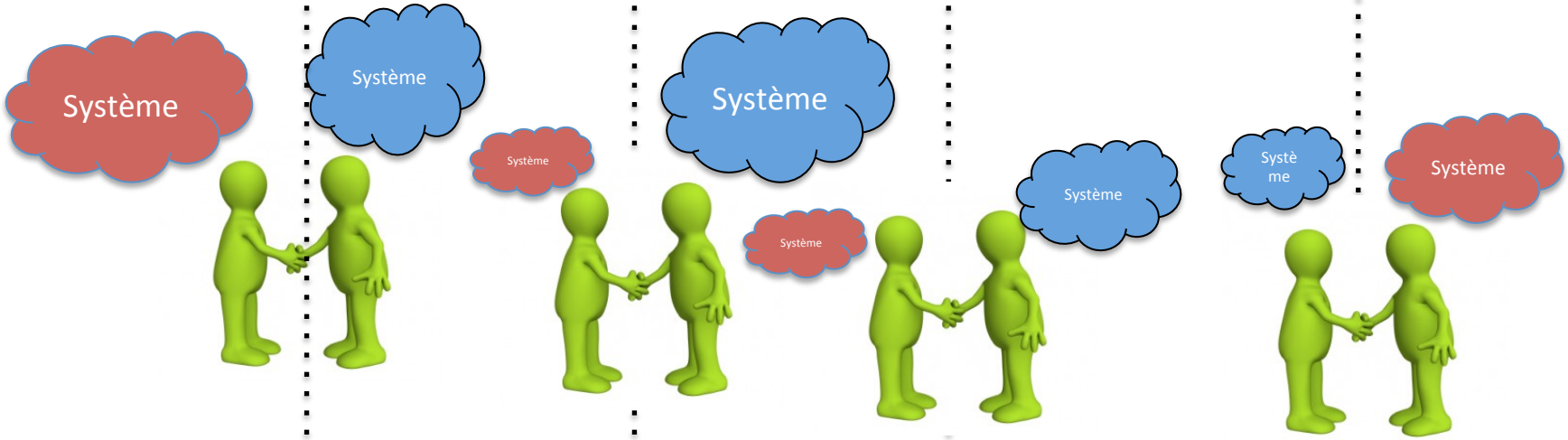
“la visualisation est inadaptée pour cette caractéristique”
“il manque l’auto-complétion sur cette partie du formulaire”
“le résumé est trop verbeux”

NE PAS TESTER VOTRE SOLUTION SUR UNE SEULE MATRICE!

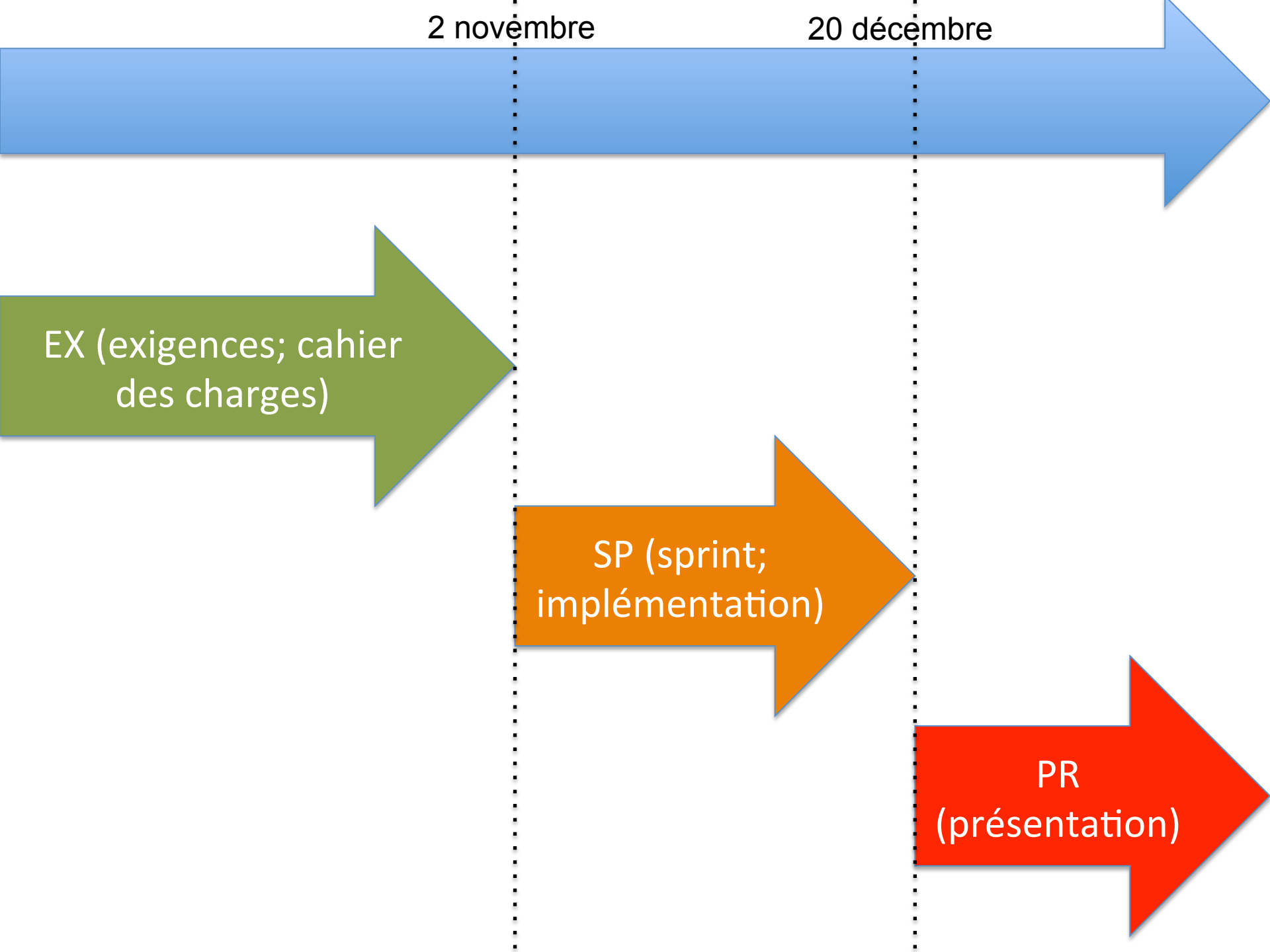




EX (exigences; cahier des charges)



Valider à chaque itération avec le client: montrer les modèles, expliquer les choix technologiques, etc.


2 novembre
20 décembre
EX (exigences; cahier des charges)
SP (sprint; implémentation)
PR (présentation)

2 novembre

20 décembre

La date de rendu pour ce document est le **2 novembre 2016**

Attention : le livrable EX implique de *dores et déjà développer une solution logicielle* ; ce travail est indispensable pour pouvoir discuter avec le client des exigences, des choix technologiques, et de valider avec lui certains prototypes.

Il est nécessaire de sortir des « releases » de votre solution logicielle à fréquence régulière pour démontrer votre solution au(x) client(s).

Aussi le travail d'implémentation doit commencer dès le lancement du projet PDL[2] ; c'est absolument nécessaire pour la réussite même de EX.

Le cahier des charges étant rendu le 2 novembre, il est possible qu'au cours de l'avancée du projet certains éléments de votre document (fonctionnalités, choix techniques, etc.) évoluent. Vous expliquerez et justifierez ce changement lors de soutenance (cf PR ci-dessous).

EX (exigences; cahier des charges)

SP (sprint; implémentation)

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2 novembre

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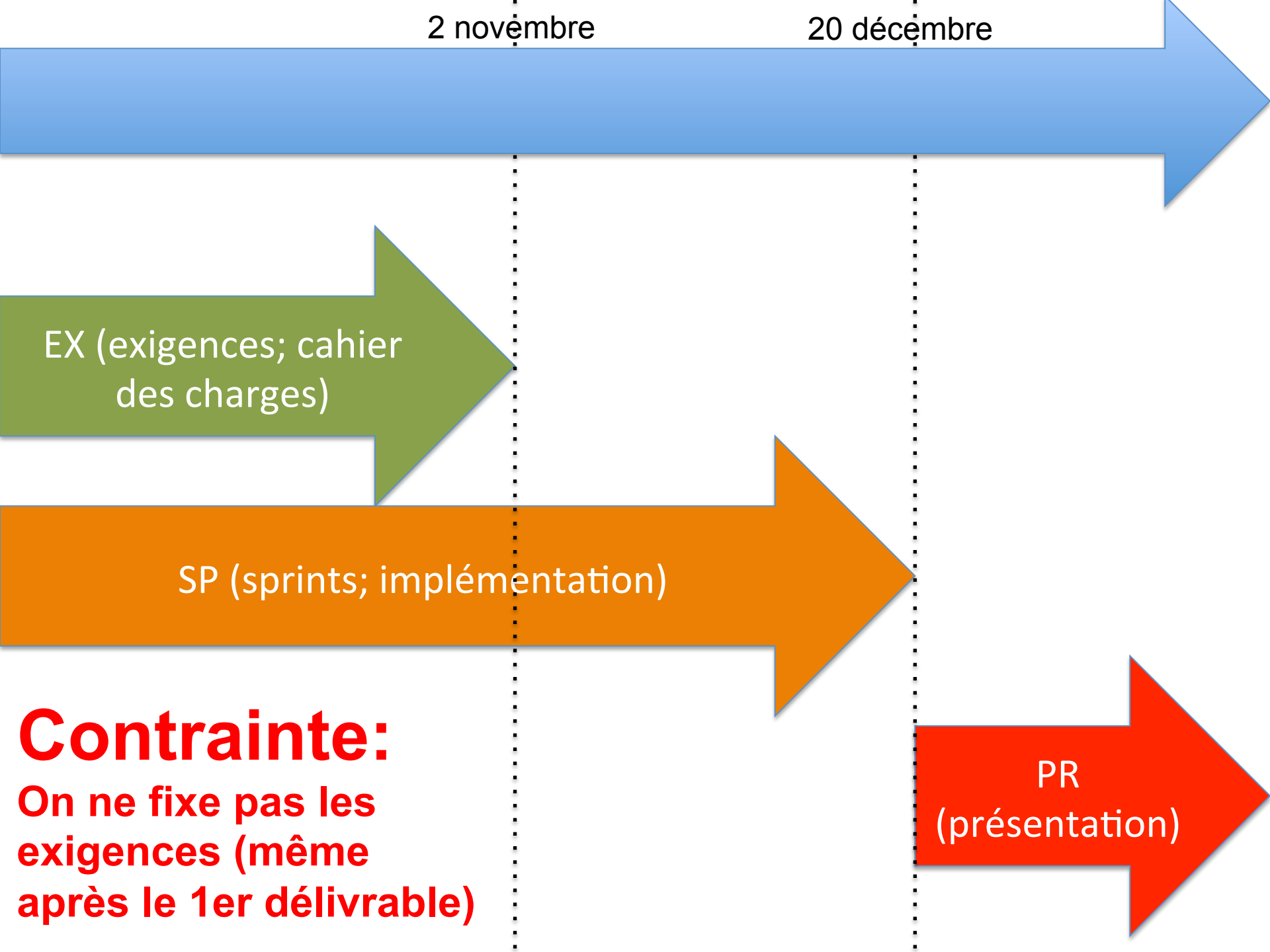
EX (exigences, cahier des charges)

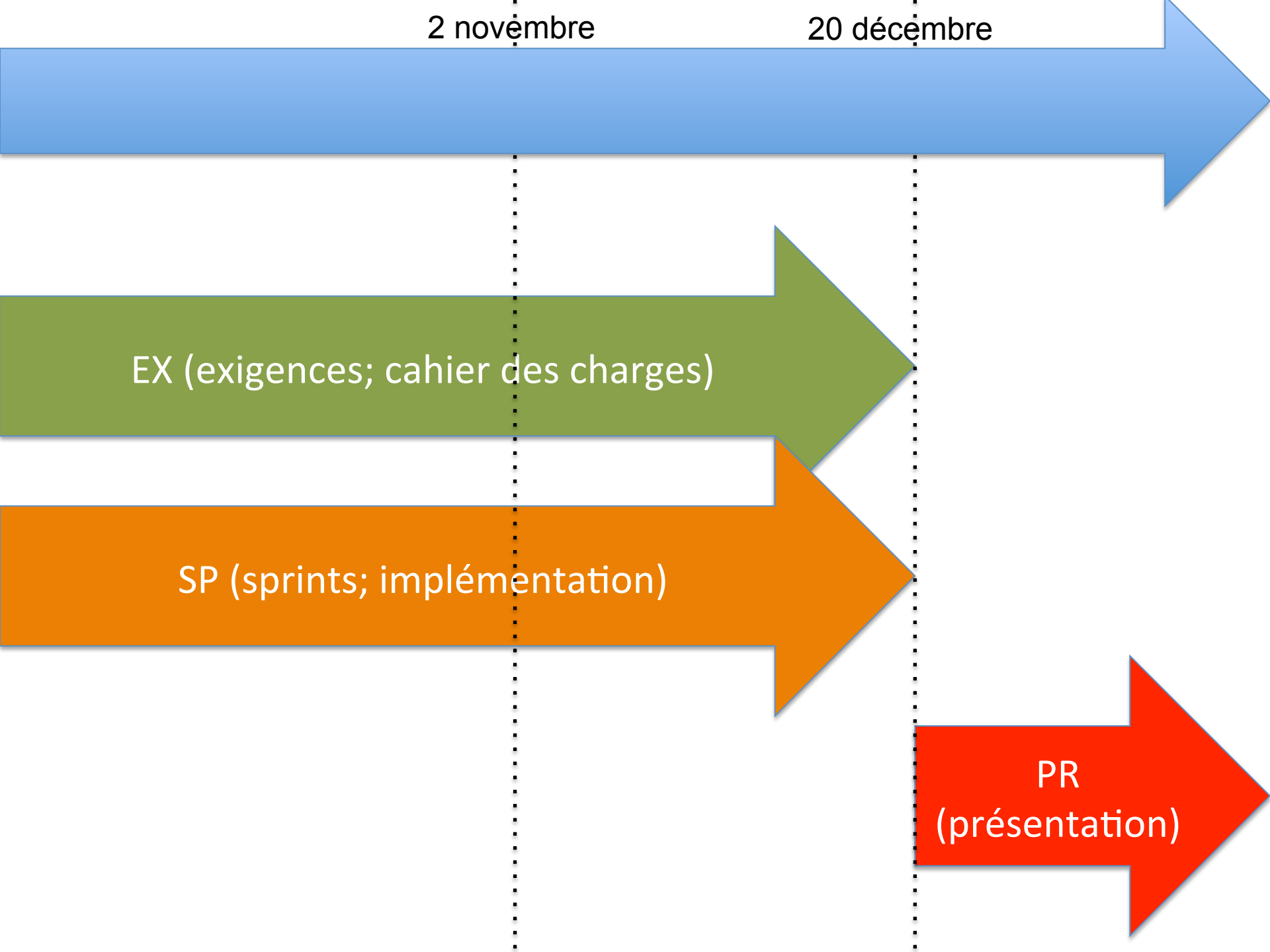
SP (sprint; implémentation)

PR (présentation)

NON!

Aucune validation = catastrophe


2 novembre
20 décembre
EX (exigences; cahier des charges)
SP (sprints; implémentation)
PR (présentation)
Contrainte:
On ne fixe pas les exigences (même après le 1er délivrable)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EX (exigences; cahier des charges)
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PR
(présentation)

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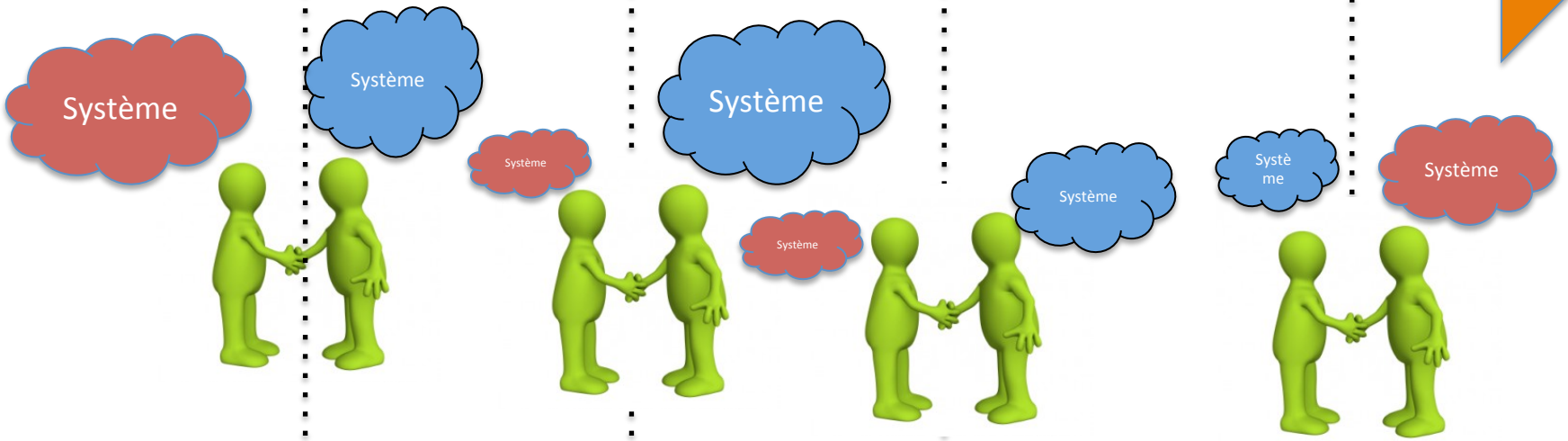
Il est nécessaire de sortir des « releases » de votre solution logicielle à fréquence régulière pour démontrer votre solution au(x) client(s).

Aussi le travail d'implémentation doit commencer dès le lancement du projet PDL^2 ; c'est absolument nécessaire pour la réussite même de EX.

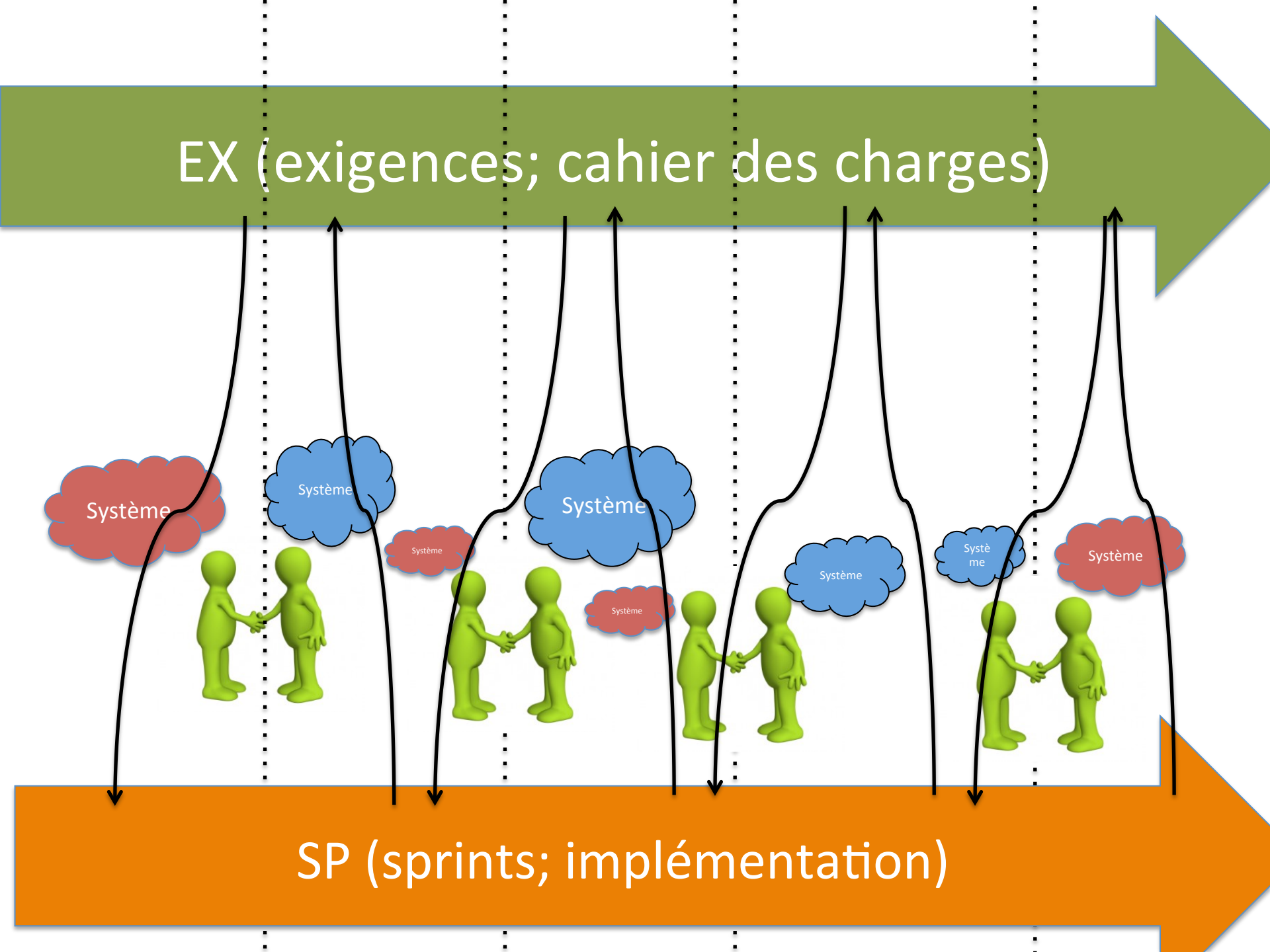
Le cahier des charges étant rendu le 2 novembre, il est possible qu'au cours de l'avancée du projet certains éléments de votre document (fonctionnalités, choix techniques, etc.) évoluent. Vous expliquerez et justifierez ce changement lors de soutenance (cf PR ci-dessous).

EX (exigences; cahier des charges)

SP (sprints; implémentation)



Valider à chaque itération avec le client: montrer les exigences et l'implémentation (le « produit » en action)


EX (exigences; cahier des charges)
Système
Système
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Système
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Système
Système
Système
SP (sprints; implémentation)

La date de rendu pour ce document est le **2 novembre 2016**

Attention : le livrable EX implique de *dores et déjà développer une solution logicielle* ; ce travail est indispensable pour pouvoir discuter avec le client des exigences, des choix technologiques, et de valider avec lui certains prototypes.

Il est nécessaire de sortir des « releases » de votre solution logicielle à fréquence régulière pour démontrer votre solution au(x) client(s).

Aussi le travail d'implémentation doit commencer dès le lancement du projet PDL^2 ; c'est absolument nécessaire pour la réussite même de EX.

Le cahier des charges étant rendu le 2 novembre, il est possible qu'au cours de l'avancée du projet certains éléments de votre document (fonctionnalités, choix techniques, etc.) évoluent. Vous expliquerez et justifierez ce changement lors de soutenance (cf PR ci-dessous).

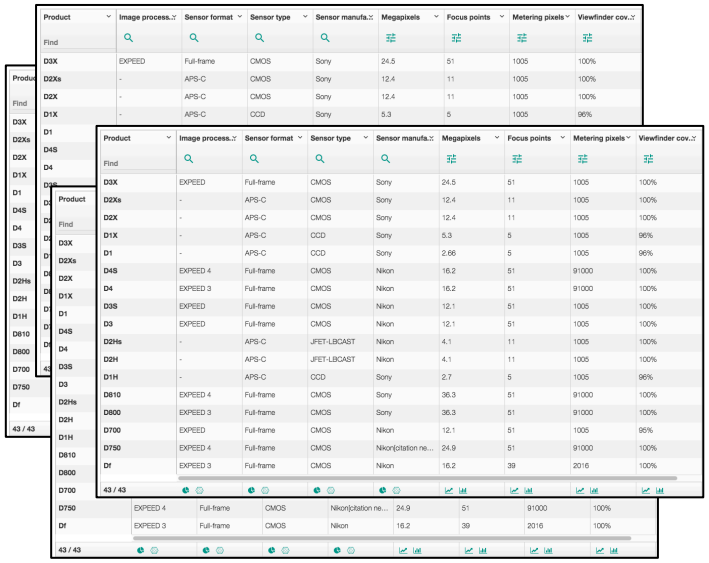
Conclusion

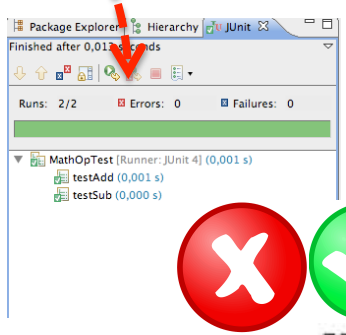
En résumé

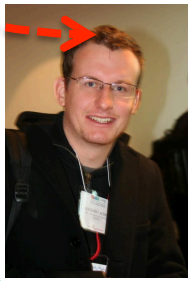
- Modéliser les exigences/besoins avec le client de manière continue (EX)
- Valider l'implémentation par le test (SP)
- Valider les exigences et l'implémentation à chaque itération avec le client ou des utilisateurs
  - Montrer le "produit" en action permet de raffiner les exigences
- Conséquence: sorties fréquentes de "release"
  - Solution: procédure de tests automatisée (git + Jenkins + Junit + PhantomJS)

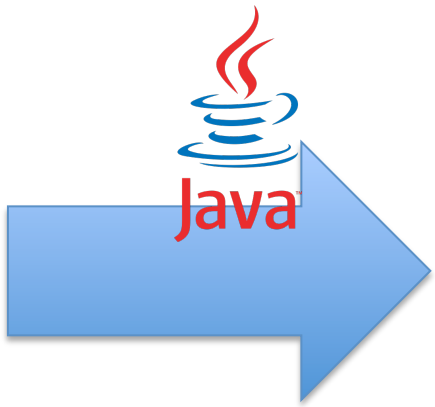
#1 tests automatiques (exhaustif)
#2 validation par le client/des utilisateurs (sampling)

NE PAS TESTER VOTRE SOLUTION SUR UNE SEULE MATRICE!

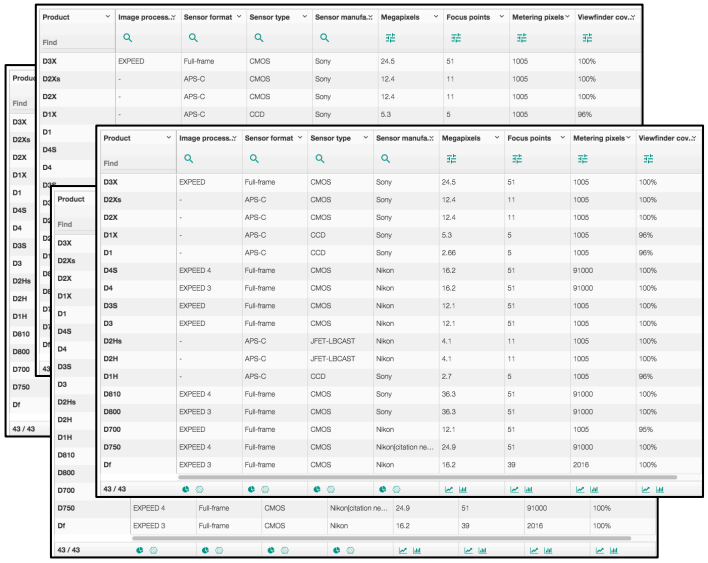








Travail collaboratif et itératif (multi-persons, multi-versions)



Product	Image process.	Sensor format	Sensor type	Sensor manufa.	Megapixels	Focus points	Metering pixels	Viewfinder cov.
D3X	EXPEED	Full-frame	CMOS	Sony	24.5	51	1005	100%
D2Xs	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D2X	-	APS-C	CMOS	Sony	12.4	11	1005	100%
D1X	-	APS-C	CCD	Sony	5.3	5	1005	96%
D1	-	APS-C	CCD	Sony	2.66	5	1005	96%
D4S	EXPEED 4	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D4	EXPEED 3	Full-frame	CMOS	Nikon	16.2	51	91000	100%
D3S	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D3	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	100%
D2Hs	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D2H	-	APS-C	JFET-LBCAST	Nikon	4.1	11	1005	100%
D1H	-	APS-C	CCD	Sony	2.7	5	1005	96%
D810	EXPEED 4	Full-frame	CMOS	Sony	36.3	51	91000	100%
D800	EXPEED 3	Full-frame	CMOS	Sony	36.3	51	91000	100%
D700	EXPEED	Full-frame	CMOS	Nikon	12.1	51	1005	95%
D750	EXPEED 4	Full-frame	CMOS	Nikon(citation ne...	24.9	51	91000	100%
Df	EXPEED 3	Full-frame	CMOS	Nikon	16.2	39	2016	100%

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