



Notre différence  
est de croire  
au pouvoir  
de la data depuis

**30** ans

DATA.  
CONNAISSANCE CLIENT.  
ACTIVATION MARKETING.

**CARTEGIE**  
GROUPE

# Le Groupe CARTÉGIE : 30 ans d'expérience

Groupe français et indépendant



10 % DU C.A.  
RÉINVESTIS  
EN RECHERCHE  
**CULTURE DE  
L'INNOVATION**



BIG  
DATA  
**LAB**  
By GROUPE CARTÉGIE



2013  
LANCEMENT DU  
PROGRAMME DE  
CROISSANCE EXTERNE  
**2017**  
DERNIERE ACQUISITION

# Le Groupe CARTÉGIE : un partenaire global

Nous mobilisons les expertises data et connaissance client pour faire avancer les entreprises.

Nous créons des synergies nouvelles pour mieux adresser vos cibles.

Nous tirons parti d'une data efficiente pour déployer des dispositifs innovants.

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**POUR UNE DATA INTELLIGENTE,  
ACTIVE & CRÉATIVE**



DATA  
EXPERTISES

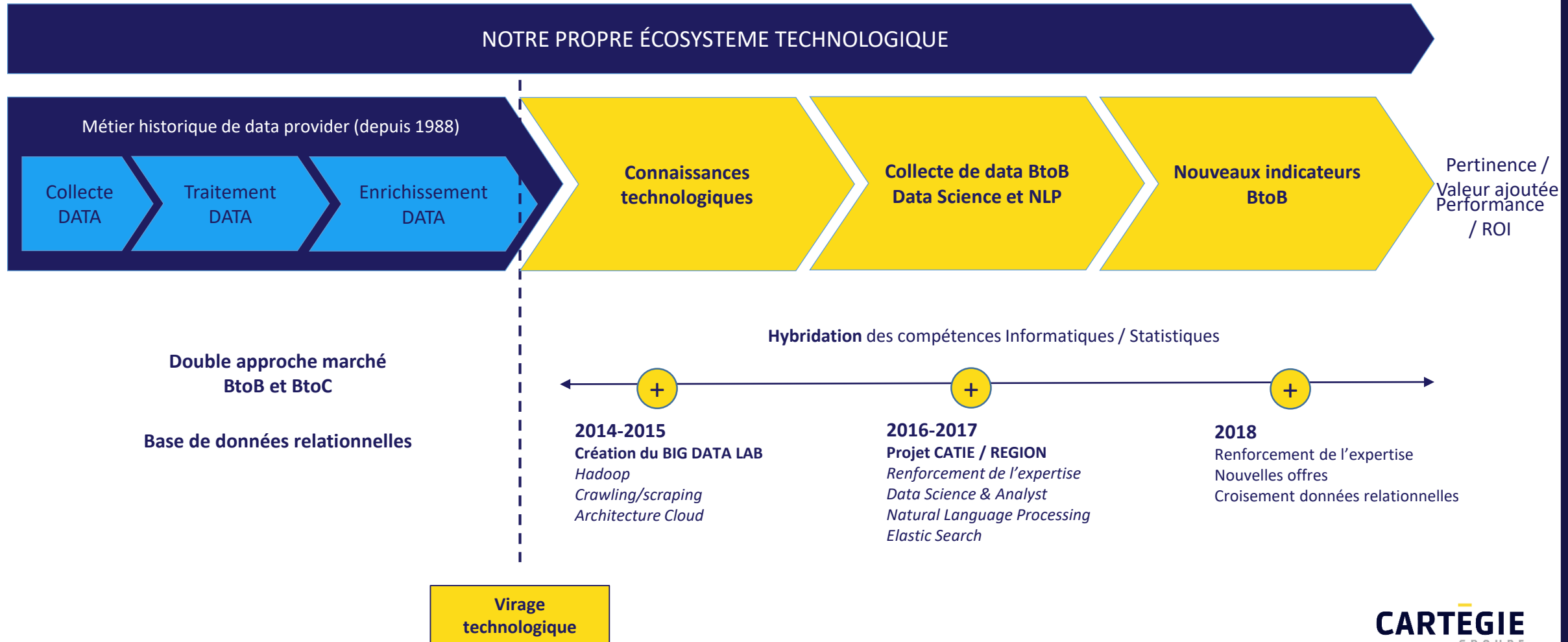


CONNAISSANCE  
CLIENT



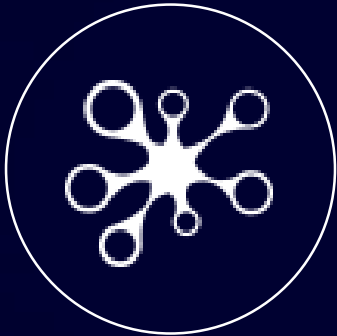
ACTIVATION  
MARKETING

# Un virage technologique Pour mieux exploiter, collecter, interroger, faire parler la data



# LA GENESE DU PROJET

## *Collecte Nouvelles Données B2B*



Multiplication  
des informations  
sur les entreprises,  
générées par le boom du  
numérique



De nouveaux acteurs,  
marché de la donnée B2B  
en pleine mutation  
(explosion Open Data)



BIG DATA :un virage  
obligatoire pour les  
acteurs de la donnée



Nécessité d'acquérir  
expertise et expérience  
dans le domaine du Big  
Data à travers un  
accompagnement à forte  
valeur technologique

# SITES E-COMMERCE



# Objectifs du projet :

## Disposer d'un fichier complet des sites e-commerce en France

### OBJECTIFS

- Augmenter la valeur de l'entrepôt BtoB du Groupe CARTÉGIE
- Développer de nouvelles offres toujours plus pertinentes en termes de marketing opérationnel pour nos clients

### ETAPES

- Acquérir les informations pour alimenter les traitements de classification
- Stocker et mettre en forme ces informations
- Définir et développer les méthodes appropriées

**Parsing / Cloud**

**Machine Learning**

# Disposer de la matière première : Crawling de masse





# Des règles a priori

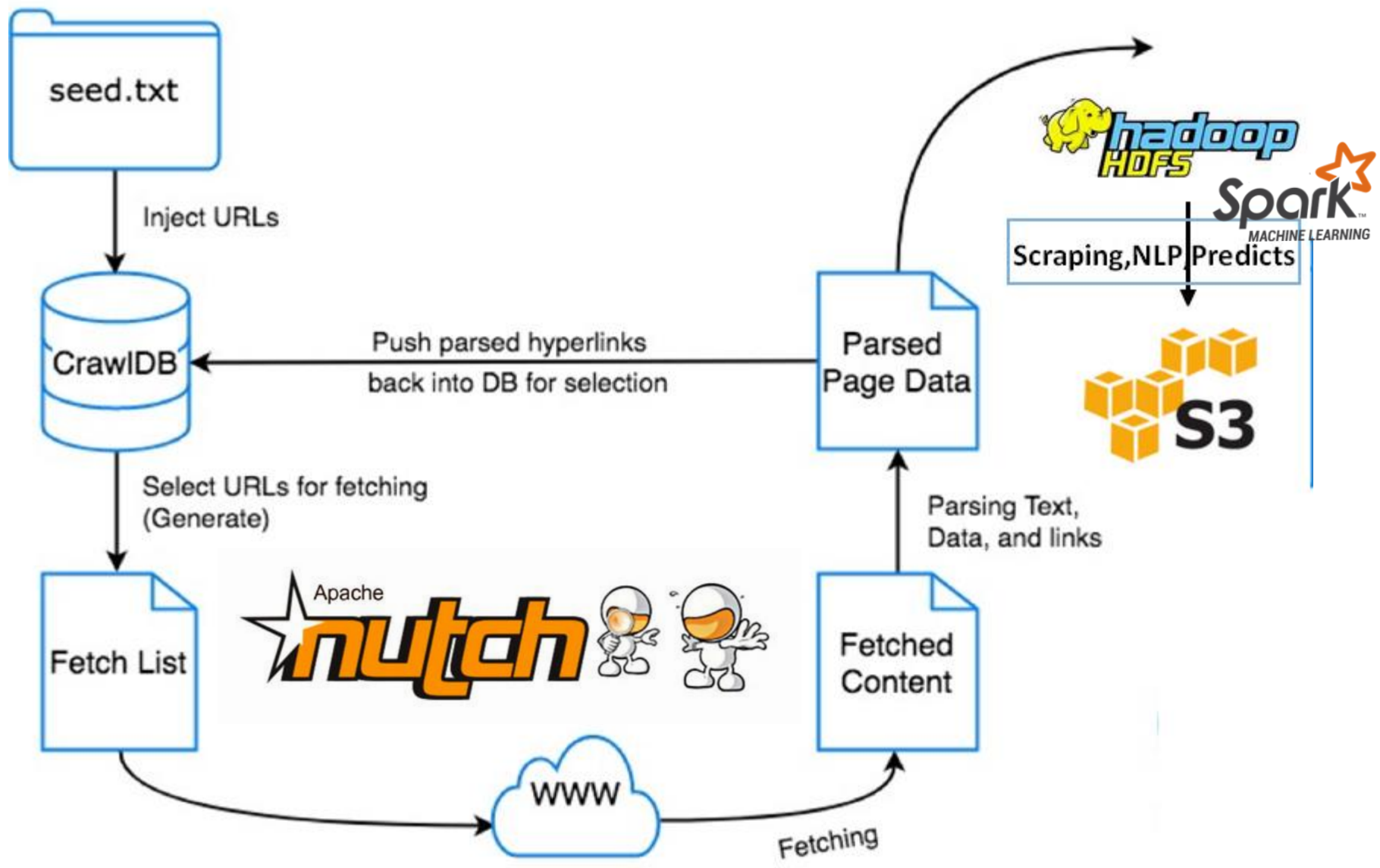


- **Cibler** les sites web B2B
- **Limiter la profondeur** de recherche dans les sites
- Langue française
- **Prioriser** les pages à contenus pertinents
- Focus sur le **texte** (corpus, PDF)

Internet c'est grand...  
Où on va?  
Où on s'arrête?  
Le Web français c'est quoi?



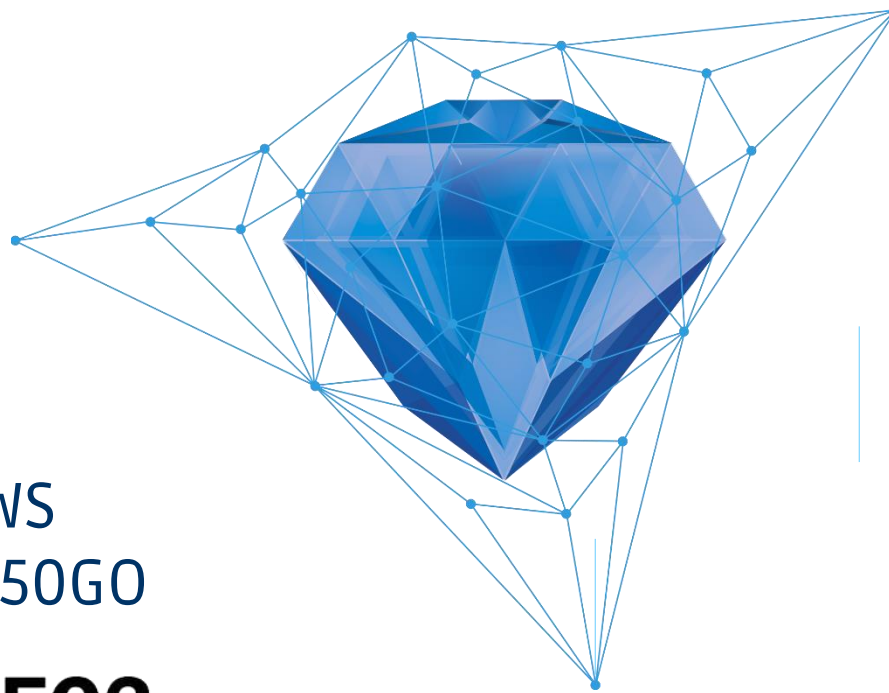
- Crawler open source – java
- 
- Map/Reduce Hadoop
- Nombreux paramètres
- Modifié par le BDL :
  - **Scoring/ranking adhoc**
  - **Plugin de détection de langue**
  - **CrawlDB orientée métier**



# Résultats

**3 045 961 246  
URL**

**100 NŒUDS /  
MACHINES SUR AWS  
(8GO RAM, 2 CPU, 50GO  
SSD)**



**737 430 062  
PAGES CRAWLÉES  
20 To  
TELECHARGÉ  
6,8 To  
TEXTE ANALYSÉ**

# Traiter la donnée collectée sur les sites web

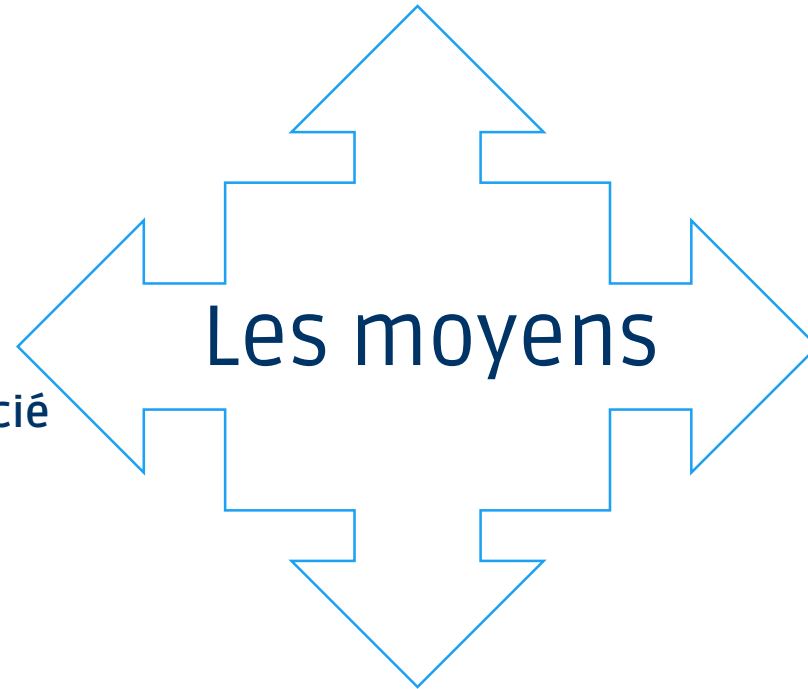
## Détection des sites e-commerce

---

# A l'issue du crawl et du parsing

**1 million**

de sites web avec SIRET associé  
+ contenu web



Qualification manuelle

**400** sites e-commerce

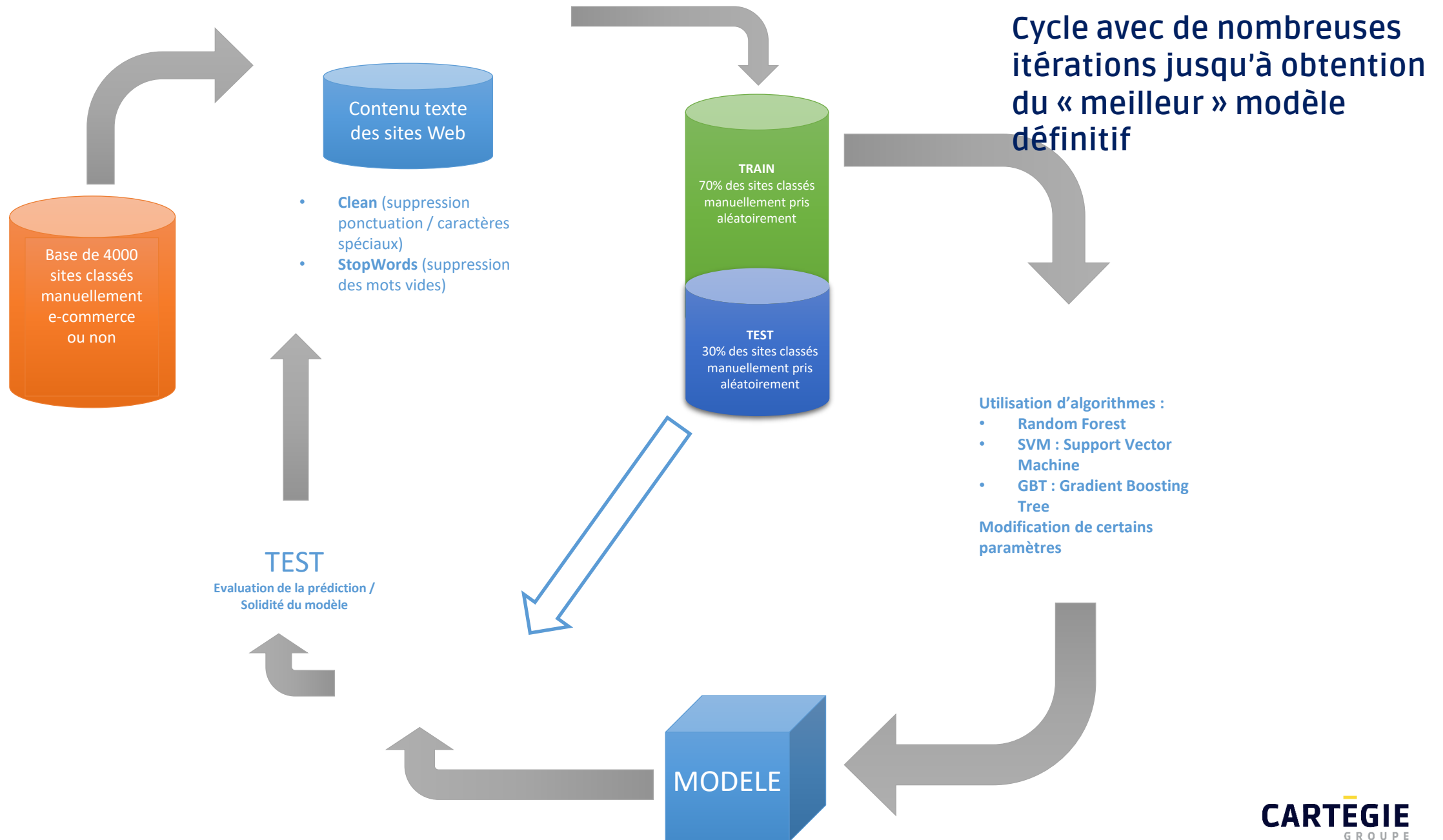
« certains »

**3 600** sites e-commerce

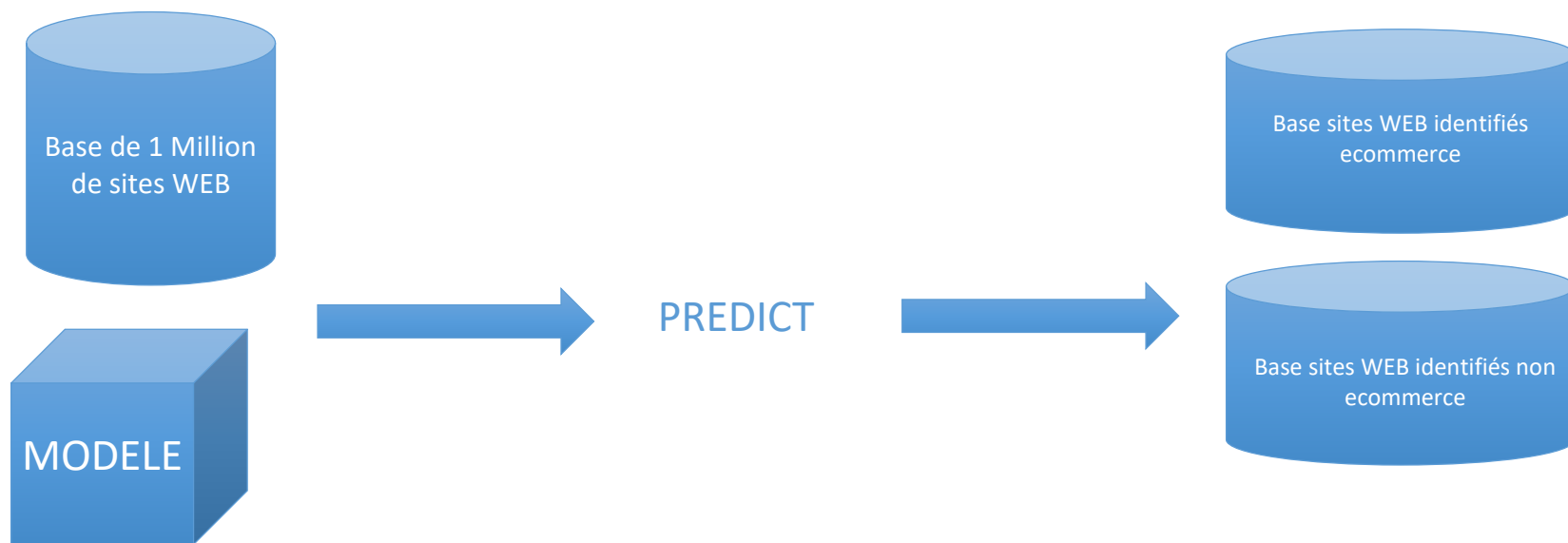
« non certains »

## algorithmes de Machine Learning

afin d'identifier automatiquement les sites e-commerce et non e-commerce sur ces 1 million de sites









### Contenu texte des sites Web

- **Clean** (suppression ponctuation / caractères spéciaux)
- **StopWords** (suppression des mots vides)

NOUVEAUTÉS

DÉCO MARINE

NAVIGATION

DÉCO MAISON

LUMINAIRES

MAQUETTES

OISEAUX & POISSONS

PHARES

### Accueil

Contact

Albums photos

Qui sommes nous ?

### Boutique

Nouveautés

Déco Marine

Navigation

Déco maison

Luminaires

Maquettes

Oiseaux & Poissons

Phares

Déjà client ? Entrez votre e-mail et mot de passe :

Votre E-Mail

.....

OK

Première visite ?

Enregistrez-vous

Boutique en ligne de décoration marine. Découvrez de nombreux objets de décoration sur le thème de la mer. Boussoles, sextants, maquettes de bateau, luminaires, art de la table, oiseaux et poissons du bord de mer.



Décoration marine. Retrouvez nous aussi à Saint Malo 3 rue saint vincent dans notre magasin. Décoration thème mer, décoration marine, maison du bord de mer. Tout un large choix d'articles de décoration.

LA BOUTIQUE EN LIGNE



ENTREMERETPLAGE.FR

Bienvenue sur notre boutique en ligne de décoration marine. Au fil du temps la boutique, viendra s'agréments de nouveaux articles. N'hésitez pas à vous inscrire sur l'onglet newsletter ou à revenir nous voir. Bonne visite, Marie et Frédéric.

Actualités et nouveautés. Restez informés en nous rejoignant sur Facebook

J'aime

Partager

413



NOUVEAUX ARTICLES : DÉCORATION DE LA MAISON, LUMINAIRES, MAQUETTES, OISEAUX ET POISSONS

- NOUVEAUTÉS
- DÉCO MARINE**
- NAVIGATION
- DÉCO MAISON
- LUMINAIRES
- MAQUETTES
- OISEAUX & POISSONS
- PHARES

- Accessoires de bureau
  - Ancre et Poulie
  - Animaux marins
  - Art de la table
  - Boîtes à clés
  - Boîtes et Coffrets
  - Casque de Scaphandrier
  - Cendriers
  - Crochets et Patères
  - Jeux de société
  - Matelotage
  - Miroirs Hublots
  - Plaques de portes
  - Voiliers et Barques
- Accueil
  - Contact
  - Albums photos
  - Qui sommes nous ?
- Boutique**
  - Nouveautés
  - Déco Marine
  - Navigation
  - Déco maison
  - Luminares
  - Maquettes
  - Oiseaux & Poissons
  - Phares

de décoration marine. Découvrez de nombreux objets de décoration sur le thème de la mer. Maquettes de bateau, luminaires, art de la table, oiseaux et poissons du bord de mer.



Pancartes bois peintes

Saint Malo, Bienvenue chez nous ...  
Tout une gamme de pancartes en bois.  
Décoration ou cadeau assuré.

Attention stock limité !

Décoration marine. Retrouvez nous aussi à Saint Malo 3 rue saint vincent dans notre magasin . Décoration thème mer, décoration marine, maison du bord de mer. Tout un large choix d'articles de décoration.

Déjà client ? Entrez votre e-mail et mot de passe :

Votre E-Mail

.....  OK

Première visite ?  
[Enregistrez-vous](#)



Bienvenue sur notre boutique en ligne de décoration marine. Au fil du temps la boutique, viendra s'agréments de nouveaux articles. N'hésitez pas à vous inscrire sur l'onglet newsletter ou à revenir nous voir. Bonne visite, Marie et Frédéric.

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J'aime Partager 413



**NOUVEAUX ARTICLES : DÉCORATION DE LA MAISON, LUMINAIRES, MAQUETTES, OISEAUX ET POISSONS**

# Nettoyage des données

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <meta name="generator" content="Oxatis (www.oxatis.com)" />
5 <meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1" />
6 <meta http-equiv="Content-Language" content="fr" />
7 <title>Décoration Marine saint malo, Maquettes de Bateau, Luminaires, Deco Mer</title>
8 <meta name="description" content="Boutique en ligne de décoration marine.Entre Mer et Plage &#224; Saint Malo. Maquettes,Bateaux,Lampes
9 <meta name="robots" content="index, follow, all" />
10 <meta http-equiv="Pragma" content="no-cache" />
11 <meta http-equiv="Expires" content="-1" />
12 <link rel="StyleSheet" type="Text/css" href="DesignCss/shared.css?v=43">
13 <link rel="StyleSheet" type="Text/css" href="DesignCss/bootstrap-grid.css?v=3">
14 <link rel="StyleSheet" type="Text/css" href="DesignCss/147000/411/style.css">
15 <style type="text/css">IMG.BlackBox { border-color: #000000; }</style>
16 <script type="text/javascript" src="javascript/jquery/jquery-1.6.1.min.js"></script>
17 <script type="text/javascript" src="javascript/jquery/jquery-ui-1.8.12.custom.min.js"></script>
18 <LINK REL="SHORTCUT ICON" HREF="http://www.entremeretplage.oxatis.com/Files/103086/favicon.ico">
19 <meta name="google-site-verification" content="u74h5hm3M9LN2ntzJ7wTO2Lbv0qmvj01fstNBx7cHlg" />
20 <script>
21   (function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){
22     (i[r].q=i[r].q||[]).push(arguments)},i[r].l=1*new Date();a=s.createElement(o),
23     m=s.getElementsByTagName(o)[0];a.async=1;a.src=g;m.parentNode.insertBefore(a,m)
24   })(window,document,'script','//www.google-analytics.com/analytics.js','ga');
25
26   ga('create', 'UA-51322511-1', 'entremeretplage.fr');
27   ga('send', 'pageview');
28
29 </script>
30
```

# Nettoyage des données

Données brutes extraites par le crawler : texte d'une page et zoom sur les éléments du menu

www.entremeretplage.fr → 1.0 Décoration Marine saint malo, Maquettes de Bateau, Luminaires, Deco Mer OK  
Votre panier : 0,00 € Accueil Compte Nouveautés Déco Marine Accessoires de bureau Ancre et Poulie  
Animaux marins Art de la table Boîtes à clés Boîtes et Coffrets Casque de Scaphandrier Cendriers Crochets  
et Patères Jeux de société Matelotage Miroirs Hublots Plaques de portes Voiliers et Barques Navigation  
Barres à roue Boussoles Calendriers perpétuel Cloches de bord Cloches de table Compas pointes sèches

www.entremeretplage.fr → 1.0 Décoration Marine saint malo, Maquettes de Bateau, Luminaires, Deco Mer OK  
Votre panier : 0,00 € Accueil Compte Nouveautés Déco Marine Accessoires de bureau Ancre et Poulie  
Animaux marins Art de la table Boîtes à clés Boîtes et Coffrets Casque de Scaphandrier Cendriers Crochets  
et Patères Jeux de société Matelotage Miroirs Hublots Plaques de portes Voiliers et Barques Navigation  
Barres à roue Boussoles Calendriers perpétuel Cloches de bord Cloches de table Compas pointes sèches  
Cornes de brume Horloges Longues vue et Téléscopes Loupes Sablier Sextants Sifflets de Bosco Sphère et  
Globe Déco maison Art de la table Entretien Figurines Filet de pêche Lampes coquillage Lampes Phares  
Matelotage Objets déco Oiseaux mobile Pancartes en bois décoratives. Photophores & Bougeoirs Plaques metal  
decoratives Luminaires Appliques Extérieures Lampes coquillage Lampes Phares Lampes à poser  
Suspensions Lampes en applique Lampes à pétrole Maquettes Enfants Galions Sous Marin Chalutier  
Voiliers Oiseaux & Poissons Mobiles oiseaux Poissons Phares Tous les phares Belgique Calvados  
Charente Maritime Côtes d'Armor Finistère ille et Villaine Loire Atlantique Manche Morbihan Nord Pas de  
Calais Seine Maritime Somme Vendée Accueil Contact Albums photos Qui sommes nous ? Boutique  
Nouveautés Déco Marine Navigation Déco maison Luminaires Maquettes Oiseaux & Poissons Phares Déjà client

Bateau. Le monde des maquettes de bateau, voiliers, vieux gréements, bateaux de pêche, livra, voiliers  
historiques, maquettes de prestige, mais aussi Combi surf, Hydravions. Décoration marine. Retrouvez nous  
aussi à Saint Malo 3 rue saint vincent dans notre magasin . Décoration thème mer, décoration marine,  
maison du bord de mer. Tout un large choix d'articles de décoration. Bienvenue sur notre boutique en ligne  
de décoration marine. Au fil du temps la boutique, viendra s'agréments de nouveaux articles. N'hésitez pas  
à vous inscrire sur l'onglet newsletter ou à revenir nous voir. Bonne visite, Marie et Frédéric.  
Actualités et nouveautés. Restez informés en nous rejoignant sur Facebook NOUVEAUX ARTICLES : Décoration de  
la maison, luminaires, maquettes, oiseaux et poissons Pomme de toulaine pm d:8 Pomme de toulaine petit  
modèle. Fabrication artisanal en chanvre naturel 14,00 € Détails Porte clés Pomme de toulaine Porte clés,  
Pomme de toulaine. Fabrication artisanal en chanvre naturel 9,00 € Détails Baderne longue L: 60 cm Baderne  
longue, 60 cm env. Fabrication artisanal en chanvre naturel 36,00 € Détails Baderne ronde d: 30 cm env.  
Baderne ronde, d: 30 cm env. Fabrication artisanal en chanvre naturel 29,00 € Détails Bigoudène Bigoudène  
en céramique. 22,00 € Détails Plaque en metal phare Ar-men AR-MEN Plaque en métal du phare Ar-men 18,00 €  
Détails Plaque en metal phare Les Poulains LES POULAINS Plaque en métal du phare Les Poulains 18,00 €  
Détails Lampe en céramique " Oursin " Lampe en céramique " oursin " 48,00 € Détails TOUTE LA BOUTIQUE EN  
LIGNE, C'EST ICI ! Miroir Hublot Miroir Hublot ouvrant en laiton à fixer. Diamètre 20 cm.  
Autres dimensions à découvrir. Miroir Hublot 32,00 € Coffret bois Jolie coffret en bois et laiton.  
Boite à bijoux ou à trésors Autres tailles et formes. Coffret bois 15,00 € Boussole Laiton Boussole  
en laiton avec chaînette. Décoration ancre de marine. Boussole 21,00 € Cloche de bord Cloche de

# Nettoyage des données

## Exemple de l'utilisation de l'algorithme : Données nettoyées

```
www.entremetplage.fr → 1.0 → WrappedArray(decoration, marine, saint, malo, maquettes, bateau, luminaires, deco, mer, ok, votrepainier, devisemonnaie, accueil, compte, nouveutes, deco, marine, accessoires, bureau, ancre, poulie, animaux, marins, art, table, boites, clés, boites, coffrets, casque, scaphandrier, cendriers, crochets, pateres, jeux, societe, matelotage, miroirs, hublots, plaques, portes, voiliers, barques, navigation, barres, roue, boussoles, calendriers, perpetuel, cloches, bord, cloches, table, compas, pointes, seches, cornes, brume, horloges, longues, vue, telescopes, loupes, sablier, sextants,
```

```
www.entremetplage.fr → 1.0 → WrappedArray(decoration, marine, saint, malo, maquettes, bateau, luminaires, deco, mer, ok, votrepainier, devisemonnaie, accueil, compte, nouveutes, deco, marine, accessoires, bureau, ancre, poulie, animaux, marins, art, table, boites, clés, boites, coffrets, casque, scaphandrier, cendriers, crochets, pateres, jeux, societe, matelotage, miroirs, hublots, plaques, portes, voiliers, barques, navigation, barres, roue, boussoles, calendriers, perpetuel, cloches, bord, cloches, table, compas, pointes, seches, cornes, brume, horloges, longues, vue, telescopes, loupes, sablier, sextants, sifflets, bosco, sphere, globe, deco, maison, art, table, entretien, figurines, filet, peche, lampes, coquillage, lampes, phares, matelotage, objets, deco, oiseaux, mobile, pancartes, bois, decoratives, photophores, bougeoirs, plaques, metal, decoratives, luminaires, appliques, exterieures, lampes, coquillage, lampes, phares, lampes, poser, suspensions, lampes, applique, lampes, petrole, maquettes, enfants, galions, marin, chalutier, voiliers, oiseaux, poissons, mobiles, oiseaux, poissons, phares, phares, belgique, calvados, charente, maritime, cotes, armor, finistere, ille, villaine, loire, atlantique, manche, morbihan, nord, calais, seine, maritime, somme, vendee, accueil, contact, albums, photos, boutique, nouveutes, deco, marine, navigation, deco, maison, luminaires, maquettes, oiseaux,
```

```
large, cnoix, articles, decoration, bienvenue, boutique, decoration, marine, rii, temps, boutique, viendra, agrementer, articles, hesitez, inscrire, onglet, newsletter, revenir, voir, bonne, visite, marie, frederic, actualites, nouveutes, restez, informez, rejoignant, facebook, articles, decoration, maison, luminaires, maquettes, oiseaux, poissons, pomme, touline, pm, pomme, touline, petit, modele, fabrication, artisanal, chanvre, naturel, devisemonnaie, details, porte, clés, pomme, touline, porte, clés, pomme, touline, fabrication, artisanal, chanvre, naturel, devisemonnaie, details, baderne, longue, cm, baderne, longue, cm, env, fabrication, artisanal, chanvre, naturel, devisemonnaie, details, baderne, ronde, cm, env, baderne, ronde, cm, env, fabrication, artisanal, chanvre, naturel, devisemonnaie, details, bigoudene, bigoudene, ceramique, devisemonnaie, details, plaque, metal, phare, ar, men, ar, men, plaque, metal, phare, ar, men, devisemonnaie, details, plaque, metal, phare, poulains, poulains, plaque, metal, phare, poulains, devisemonnaie, details, lampe, ceramique, oursin, lampe, ceramique, oursin, devisemonnaie, details, toute, boutique, miroir, hublot, miroir, hublot, ouvrant, laiton, fixer, diametre, cm, dimensions, decouvrir, miroir, hublot, devisemonnaie, coffret, bois, jolie, coffret, bois, laiton, boite, bijoux, tresors, tailles, formes, coffret, bois, devisemonnaie, boussole, laiton, boussole, laiton, chainette, decoration, ancre, marine, boussole, devisemonnaie, cloche, bord, cloche, bord, laiton, potence, corde, tresse, differents, modeles, disponible, cloche, bord, devisemonnaie, lampe, cargot,
```

# Préparation des données

Exemple de l'utilisation de l'algorithme : Données vectorisées

label	Parsetext	Vecteur
0	Array("a", "b", "c")	(3,[0,1,2],[1.0,1.0,1.0])
1	Array("a", "b", "b", "c", "a")	(3,[0,1,2],[2.0,2.0,1.0])





# Préparation des données

Exemple de l'utilisation de l'algorithme : Données sélectionnées

ID	Features	Ecommerce	SelectedFeatures
7	[0.0, 0.0, 18.0, 1.0]	1.0	[1.0]
8	[0.0, 1.0, 12.0, 0.0]	0.0	[0.0]
9	[1.0, 0.0, 15.0, 0.1]	0.0	[0.1]

# Préparation des données

Features (fictives):

monsieur voix penser quel arriver maison devant coup beau  
connaître devenir air mot nuit sentir eau vieux sembler moins  
tenir

**20 mots suffisent pour effectuer la  
prédiction!**

# Préparation des données

Exemple de l'utilisation de l'algorithme : Données sélectionnées

```
(1.0, [280.0,22.0,14.0,29.0,20.0,16.0,37.0,16.0,32.0,7.0,6.0,6.0,3.0,2.0,0.0,2.0,1.0,2.0,3.0,4.0])
(0.0, [0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [104.0,100.0,4.0,9.0,1.0,18.0,47.0,8.0,8.0,3.0,3.0,7.0,9.0,0.0,7.0,7.0,1.0,10.0,0.0,2.0])
(0.0, [117.0,5.0,3.0,0.0,0.0,55.0,6.0,0.0,8.0,28.0,0.0,8.0,9.0,0.0,0.0,8.0,0.0,1.0,0.0,2.0])
(0.0, [9.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(1.0, [85.0,66.0,17.0,26.0,501.0,31.0,11.0,23.0,12.0,18.0,14.0,7.0,6.0,0.0,22.0,11.0,5.0,0.0,4.0,2.0])
(1.0, [994.0,370.0,77.0,174.0,74.0,31.0,10.0,92.0,41.0,45.0,127.0,22.0,8.0,0.0,31.0,33.0,35.0,0.0,4.0,10.0])
(1.0, [849.0,170.0,171.0,77.0,174.0,26.0,8.0,42.0,15.0,14.0,11.0,29.0,0.0,0.0,0.0,0.0,9.0,3.0,0.0,12.0,9.0])
(0.0, [14.0,3.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [35.0,23.0,17.0,0.0,1.0,1.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,1.0,0.0,0.0])
(0.0, [58.0,0.0,2.0,0.0,0.0,6.0,3.0,0.0,0.0,0.0,2.0,0.0,10.0,0.0,0.0,1.0,0.0,2.0,0.0,1.0])
(0.0, [209.0,4.0,0.0,0.0,0.0,34.0,4.0,0.0,1.0,0.0,0.0,3.0,4.0,0.0,0.0,0.0,0.0,1.0,0.0,1.0])
(1.0, [2393.0,75.0,71.0,22.0,124.0,12.0,44.0,66.0,0.0,0.0,22.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [39.0,3.0,0.0,0.0,0.0,2.0,5.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,4.0,0.0,0.0,0.0,2.0])
(0.0, [18.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(1.0, [19.0,17.0,12.0,31.0,5.0,5.0,21.0,7.0,1.0,25.0,1.0,0.0,2.0,0.0,60.0,3.0,4.0,0.0,3.0,1.0])
(0.0, [101.0,1.0,0.0,0.0,0.0,0.0,18.0,0.0,1.0,0.0,0.0,0.0,0.0,0.0,2.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [9.0,4.0,1.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [8.0,1.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(1.0, [939.0,46.0,13.0,12.0,41.0,17.0,56.0,33.0,17.0,11.0,8.0,6.0,25.0,1.0,0.0,7.0,11.0,1.0,5.0,2.0])
(0.0, [25.0,27.0,0.0,0.0,0.0,0.0,0.0,2.0,0.0,0.0,0.0,0.0,2.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [54.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [21.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,1.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [14.0,1.0,1.0,0.0,0.0,0.0,3.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [11.0,15.0,0.0,0.0,11.0,5.0,1.0,0.0,2.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,1.0,0.0,0.0,0.0])
(0.0, [12.0,11.0,0.0,3.0,0.0,0.0,4.0,0.0,4.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [7.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [33.0,3.0,1.0,0.0,0.0,2.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [477.0,1.0,0.0,3.0,0.0,54.0,0.0,4.0,0.0,0.0,0.0,2.0,0.0,0.0,0.0,0.0,0.0,1.0,0.0,0.0,0.0])
(0.0, [52.0,0.0,0.0,0.0,0.0,2.0,0.0,0.0,0.0,0.0,0.0,0.0,1.0,4.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [6.0,110.0,37.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [6.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,1.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [20.0,2.0,1.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,2.0,0.0,0.0,0.0,0.0,2.0,0.0,0.0,0.0,0.0])
(1.0, [329.0,79.0,58.0,55.0,192.0,19.0,3.0,27.0,3.0,29.0,4.0,3.0,0.0,0.0,1.0,27.0,5.0,0.0,4.0,1.0])
(1.0, [16.0,22.0,3.0,11.0,30.0,12.0,152.0,0.0,1.0,8.0,31.0,0.0,0.0,0.0,0.0,32.0,0.0,0.0,2.0,2.0])
(0.0, [3.0,2.0,8.0,2.0,0.0,0.0,4.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(0.0, [36.0,26.0,2.0,6.0,0.0,0.0,6.0,0.0,0.0,0.0,0.0,0.0,3.0,3.0,0.0,1.0,0.0,0.0,0.0,0.0,0.0])
(1.0, [1447.0,122.0,103.0,18.0,2.0,18.0,40.0,46.0,18.0,47.0,14.0,7.0,30.0,0.0,4.0,9.0,3.0,0.0,2.0,5.0])
(0.0, [28.0,1.0,0.0,0.0,0.0,2.0,0.0,0.0,0.0,0.0,0.0,1.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(1.0, [80.0,26.0,1.0,3.0,20.0,2.0,0.0,1.0,0.0,0.0,0.0,1.0,0.0,3.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0])
(1.0, [117.0,40.0,40.0,75.0,40.0,52.0,50.0,89.0,64.0,37.0,9.0,44.0,3.0,0.0,8.0,25.0,8.0,1.0,6.0,8.0])
```

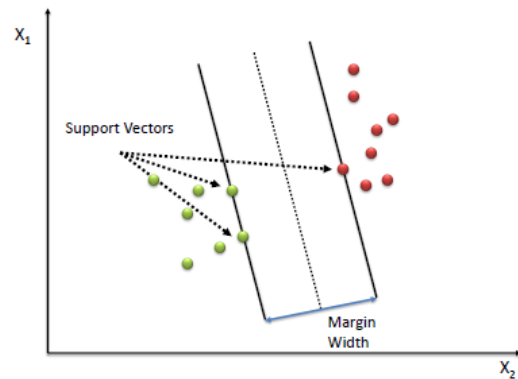


Utilisation d'algorithmes :

- Random Forest
- SVM : Support Vector Machine
- GBT : Gradient Boosting Tree

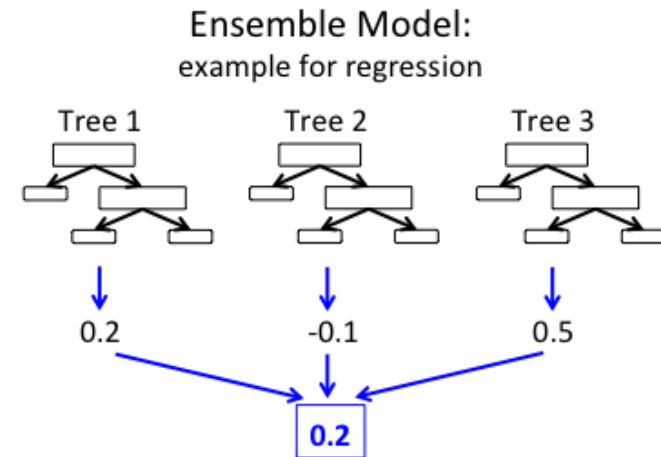
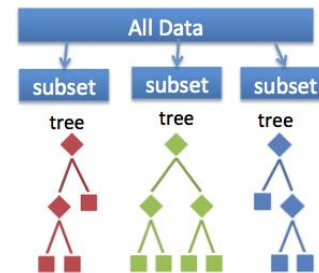
Modification de certains paramètres

# 3 algorithmes utilisés dans cet apprentissage supervisé

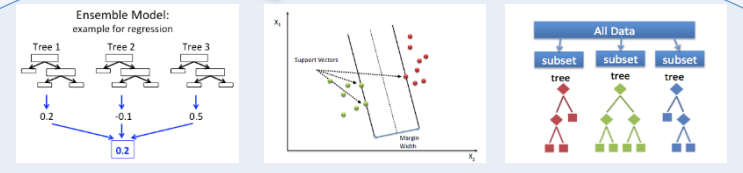


**SVM**

## Random Forest

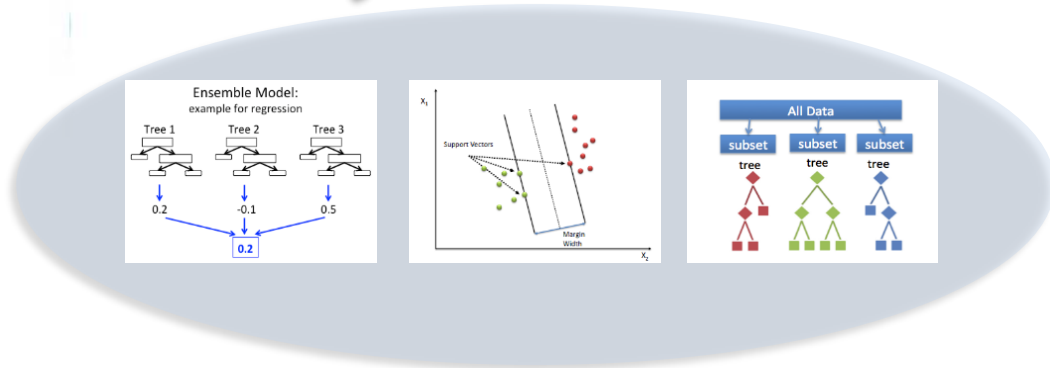
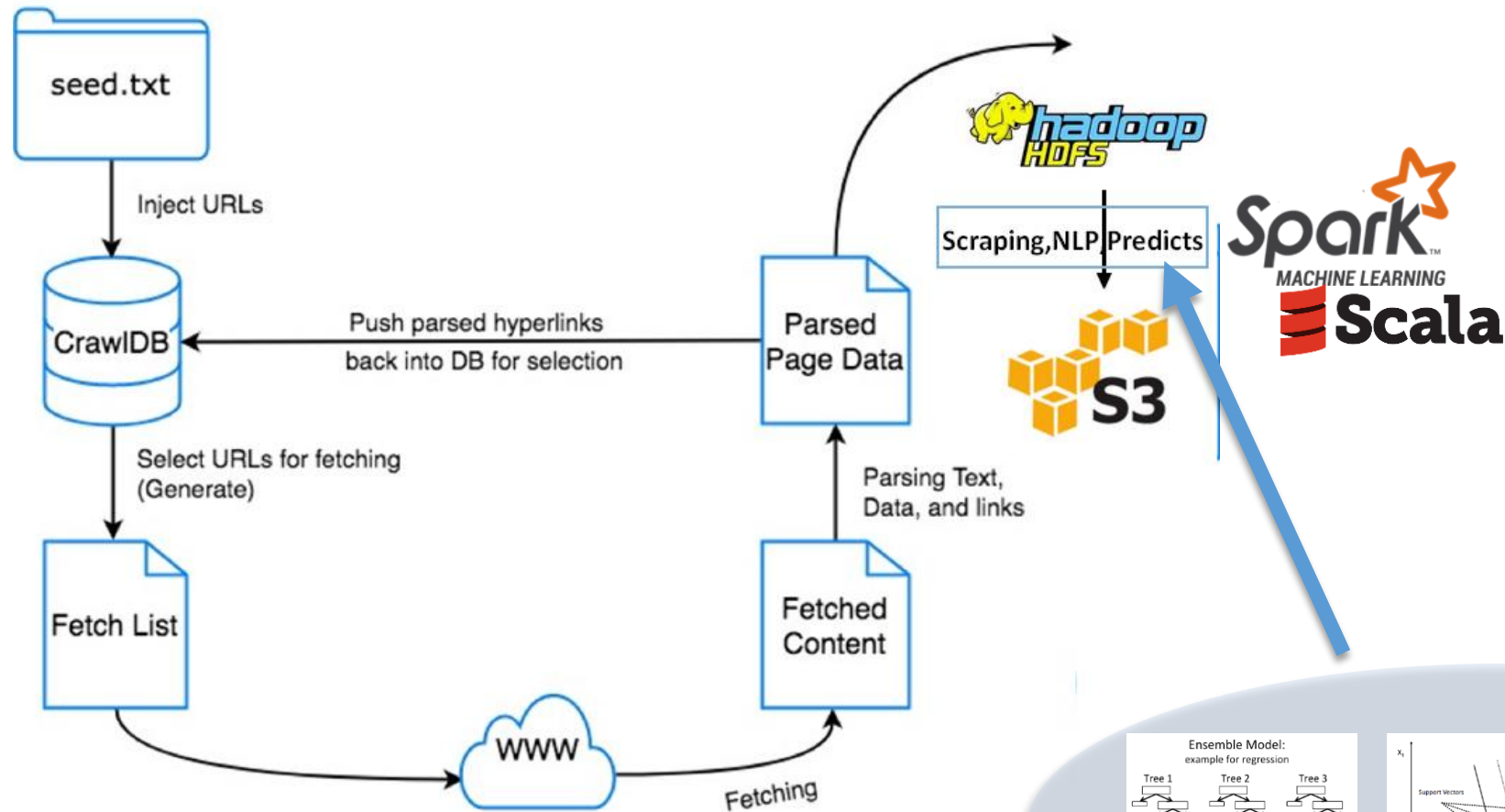


**Gradient Boosting Tree**



**Vote majoritaire  
ou somme = 3**

**Prédiction (erreur  
7%)**





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