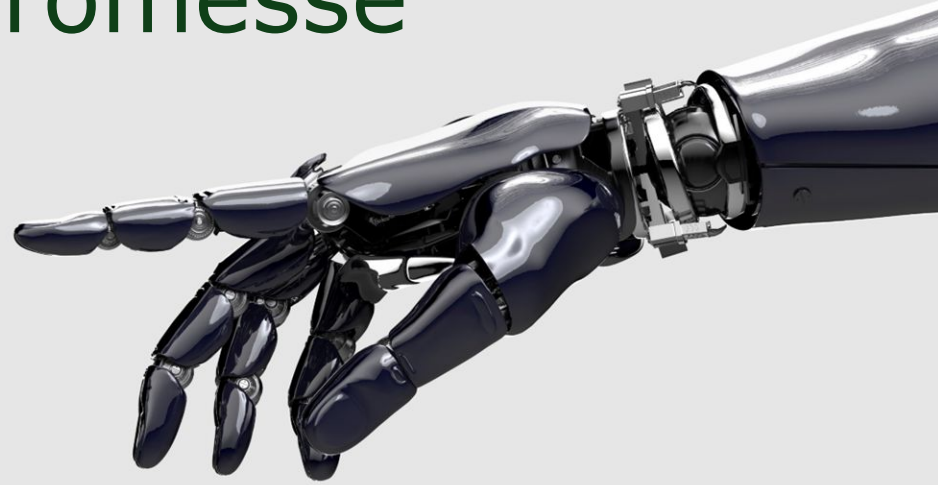
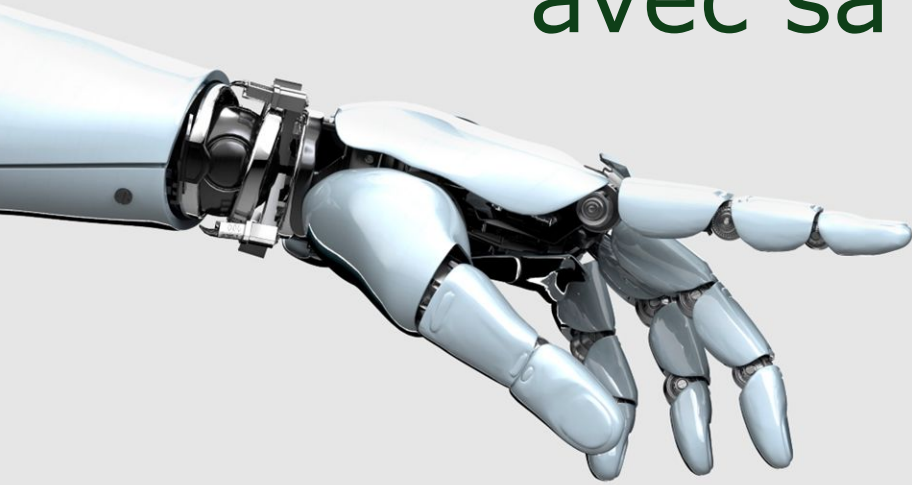


The background is a dark green, atmospheric landscape featuring a mountain range. A complex, glowing green circuit board pattern is overlaid on the mountain, symbolizing the integration of nature and technology. Several translucent, realistic-looking bubbles are scattered across the top and bottom edges of the frame.

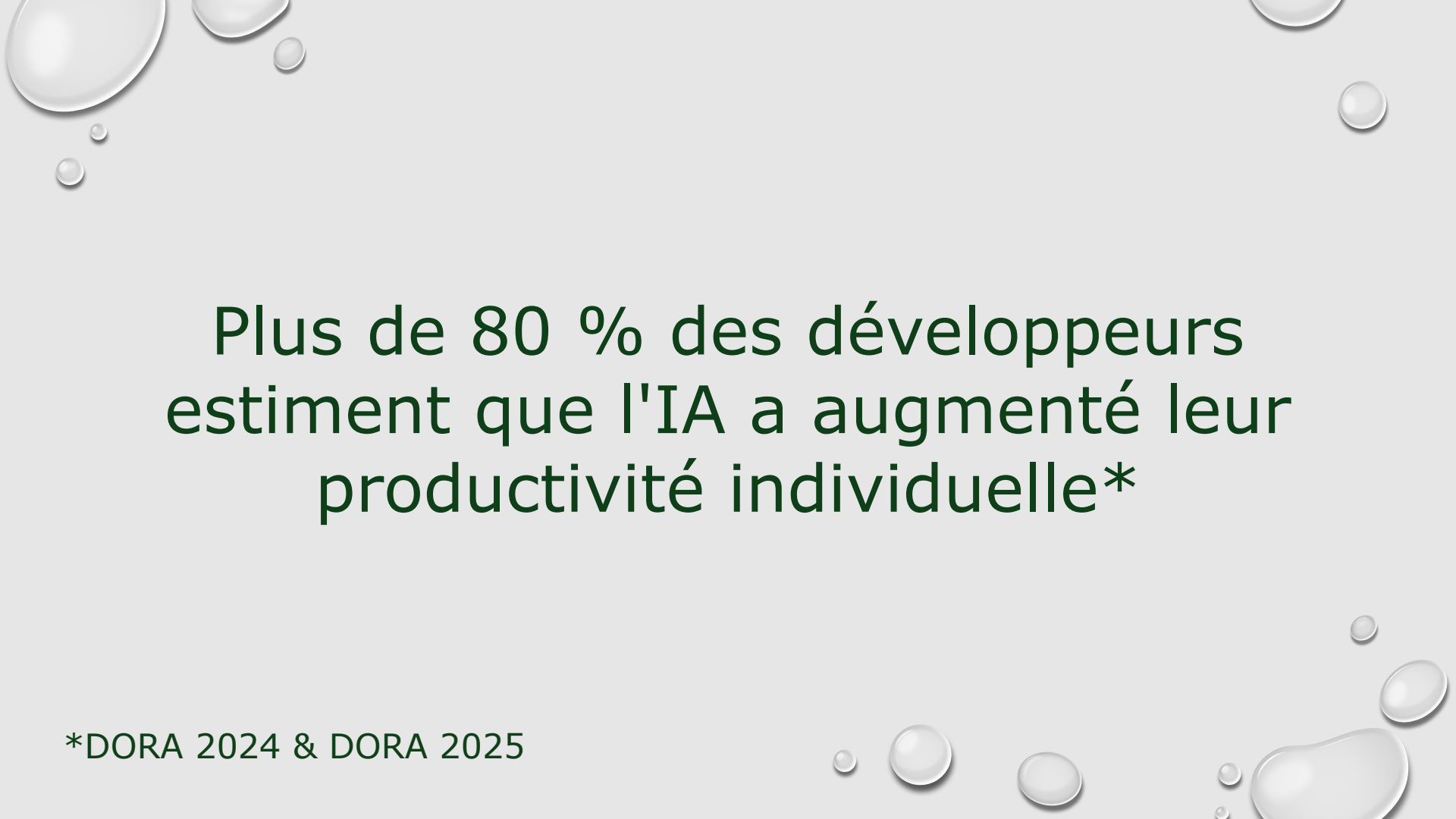
Quand la vélocité explose
avec l'IA, place au
"Harness Engineering" !

Dorra Bartaguiz
arolla

L'IA arrive
avec sa promesse



d'augmenter la vitesse !



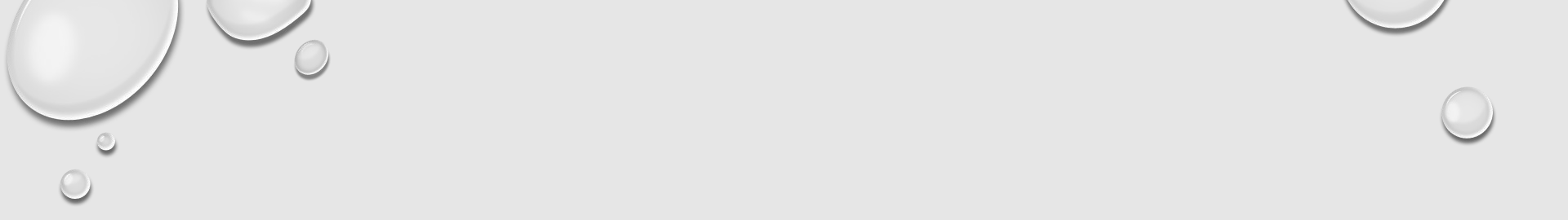
Plus de 80 % des développeurs
estiment que l'IA a augmenté leur
productivité individuelle*

*DORA 2024 & DORA 2025

Vitesse = risque !

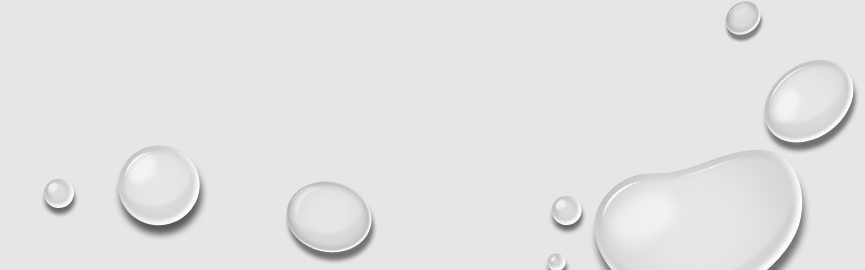
6/1/2010

FLM



Le temps de développement
s'est réduit

La review reste le goulot



Goulot : La review de code !

2008 : Robert C. Martin, Clean Code
"Indeed, the **ratio of time spent** reading vs. writing is well over **10:1**. We are constantly reading old code as part of the effort to write new code."

2024 : Adam Tornhill & Markus Borg
"Refactoring vs Refuctoring"

2015 : R. Minelli, A. Mochi et M. Lanza "I Know What You Did Last Summer: An Investigation of How Developers Spend Their Time"

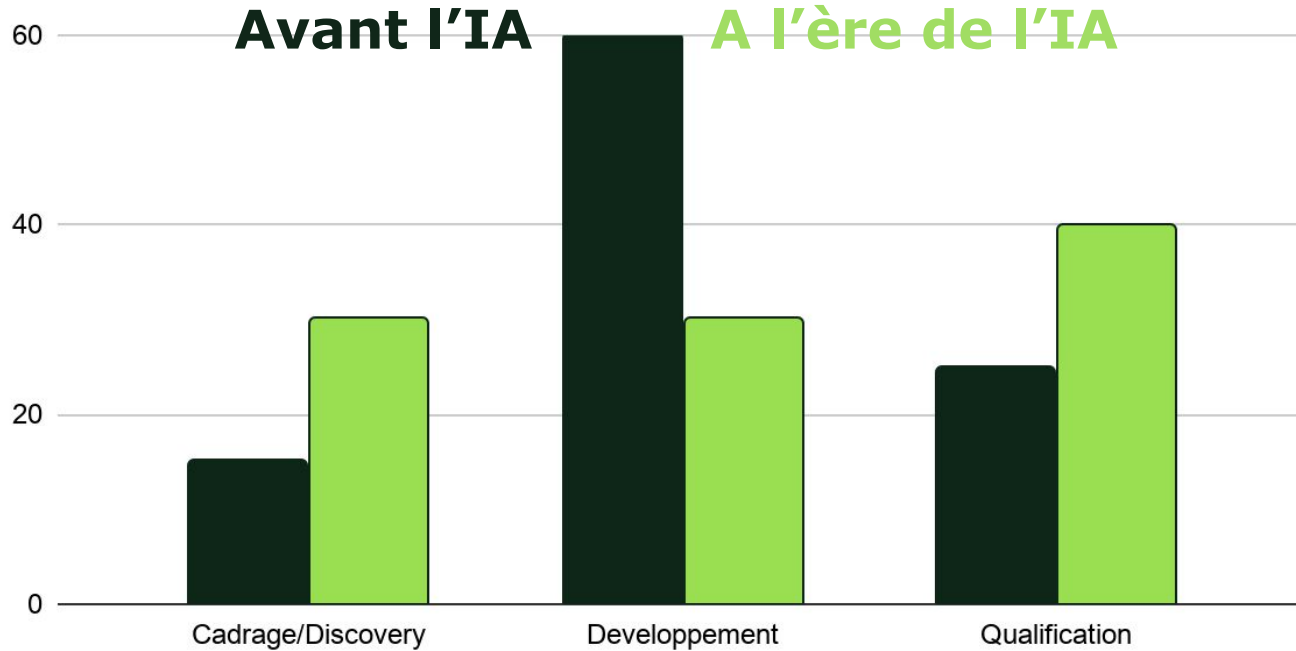
Les devs passent environ **70 % de leur temps** à comprendre et lire le code, contre seulement **5 % à l'éditer/écrire** (le reste étant dédié à la navigation et aux interactions d'interface).

La *code base* demeure le goulot d'étranglement à l'ère de l'IA qui accélère la génération syntaxique mais alourdit la charge de relecture et de vérification.

Répartition du temps en pourcentage du life cycle d'un besoin

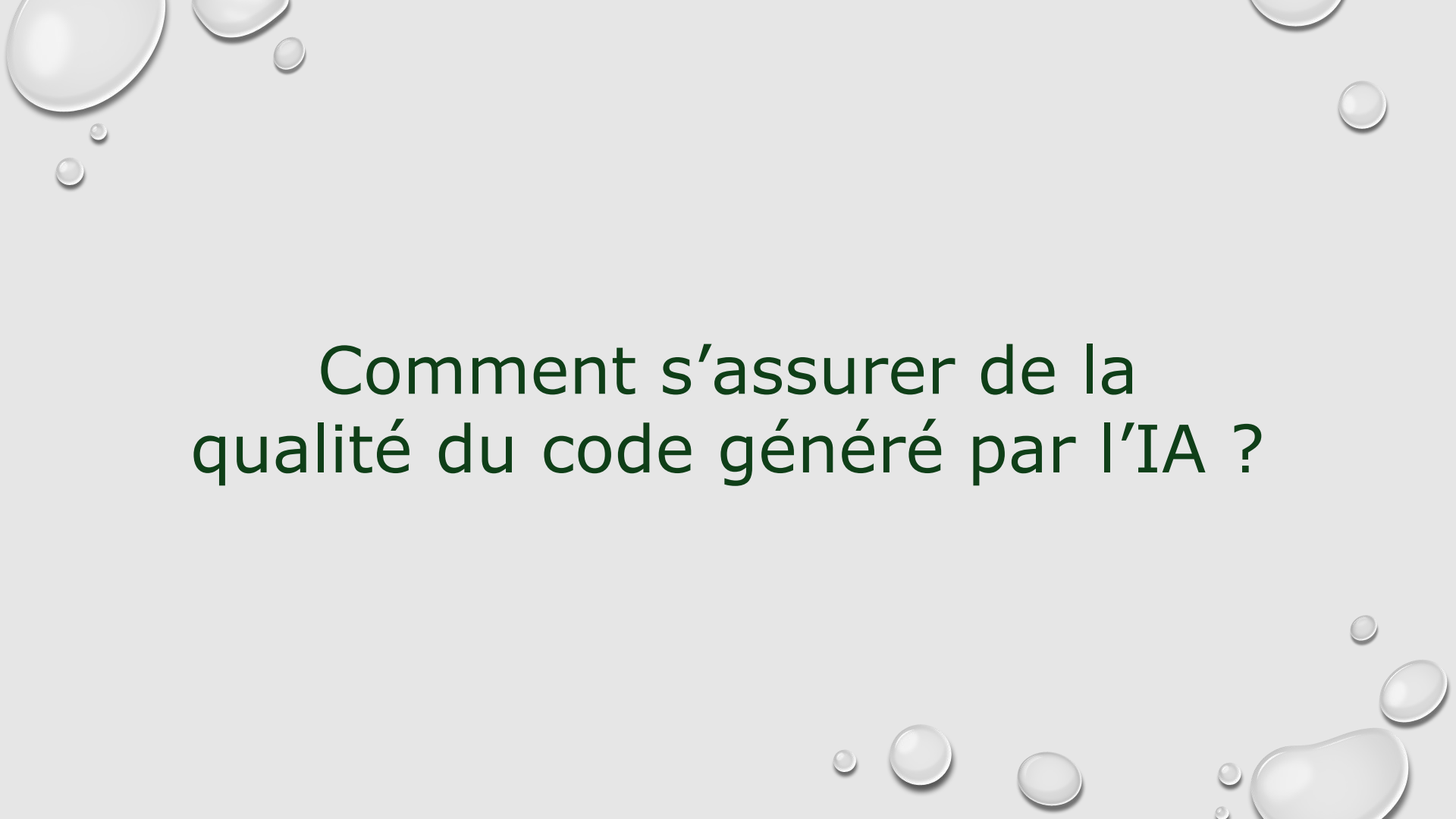
■ COCOMO de Barry Boehm

■ Répartition illustrative d'après les études McKinsey

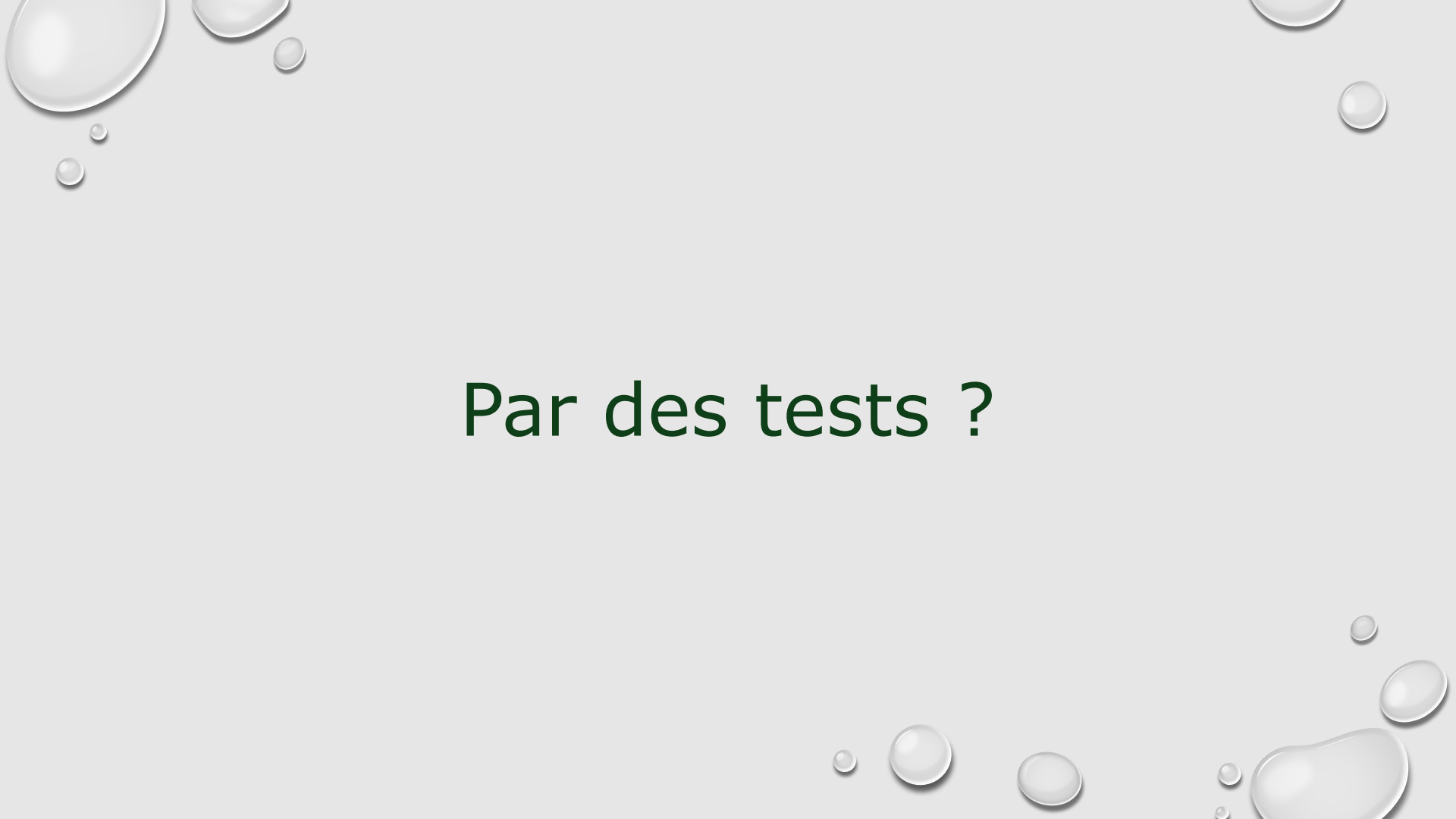


*Barry Boehm (Université de Californie du Sud) "Software Cost Estimation with COCOMO" - 2000

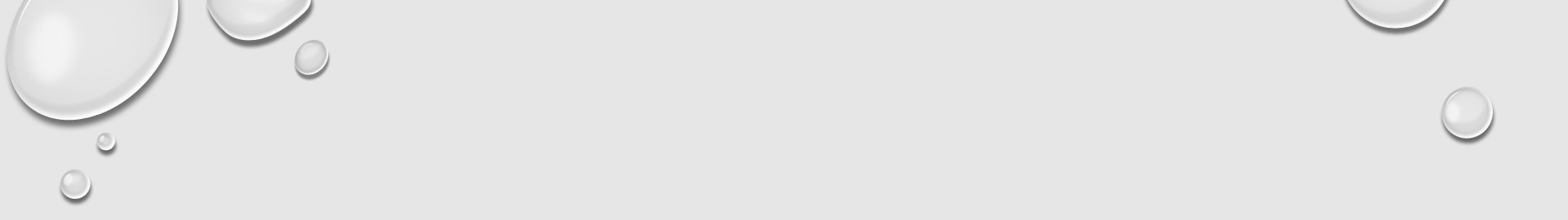
*McKinsey & Company (Unleashing developer productivity with generative AI et Unlocking the value of AI in software development) - 2023/2025

The image features a light gray background with several realistic water droplets of varying sizes. These droplets are positioned in the corners: top-left, top-right, and bottom-right. Each droplet has a highlight and a shadow, giving it a three-dimensional appearance.

Comment s'assurer de la
qualité du code généré par l'IA ?

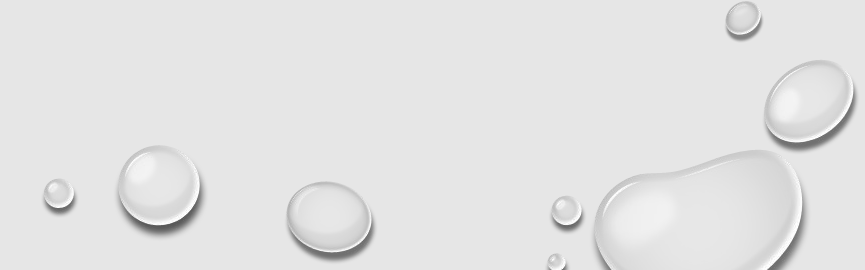
The image features a light gray background with several realistic water droplets of varying sizes. These droplets are positioned in the corners: top-left, top-right, and bottom-right. Each droplet has a highlight and a shadow, giving it a three-dimensional appearance.

Par des tests ?



Les tests qui sont générés par IA ?

Haha!





Voyons un
cas réel

Invitation pour dépistage

Calculez la date d'invitation en fonction de l'éligibilité à un type de dépistage, de la date de naissance et de la date du jour.

La date d'invitation est calculée en :

- utilisant le jour de naissance et l'année en cours,
- ajoutant le mois de naissance au nombre de mois associé au type de dépistage.

Exemple :

Date de naissance : 15/03/1980

Aujourd'hui 01/01/2023

Pour le dépistage de l'utérus, le nombre de mois est de 32

Donc l'invitation est au 17/11/2025 (15/11/2025 étant un samedi)

Invitation pour dépistage

Vérifiez la date de l'invitation :

- si elle n'est pas valide, reportez-la au prochain jour ouvrable valide
- si elle est antérieure à la date d'aujourd'hui, utilisez l'année suivante
- si elle tombe un jour férié, reportez-la au jour ouvrable suivant
- si elle tombe un samedi ou un dimanche, reportez-la au lundi suivant

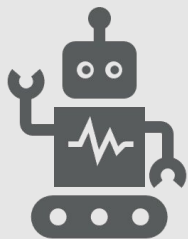
Exemple :

Date de naissance : 15/03/1980

Aujourd'hui 01/01/2023

Pour le dépistage de l'utérus, le nombre de mois est de 32

Donc l'invitation est au 17/11/2025 (15/11/2025 étant un samedi)



Génère moi ce besoin !

Voyons la qualité
du code et tests
générés



Code review



response : Code coverage 100%

My check : Global code coverage 33%

Domain code coverage 95%

(ScreeningType & InvitationCalculator)

Hierarchy	Covered (Blocks)	Not Covered (Blocks)
screeninginvitation.dll	86	174
{ } Global Classes	0	3
{ } ScreeningInvitation	86	171
ScreeningType	8	0
InvitationCalculator	49	3
ScreeningInvitationApp	29	168
screeninginvitation.tests.dll	211	2

Code review

```
public class InvitationCalculator
{
    private static readonly HashSet<DateTime> PublicHolidays = new
    {
        new DateTime(2023, 1, 1),    // New Year's Day
        new DateTime(2023, 12, 25),  // Christmas
        new DateTime(2023, 12, 26),  // Boxing Day
    };

    6 references | Dorra Bartaguiz, 1 day ago | 1 author, 1 change
    public static DateTime CalculateInvitationDate(DateTime dateOf

    2 references | Dorra Bartaguiz, 1 day ago | 1 author, 1 change
    private static DateTime GetValidDate(int day, int month, int y

    1 reference | Dorra Bartaguiz, 1 day ago | 1 author, 1 change
    private static DateTime AdjustForHolidaysAndWeekends(DateTime

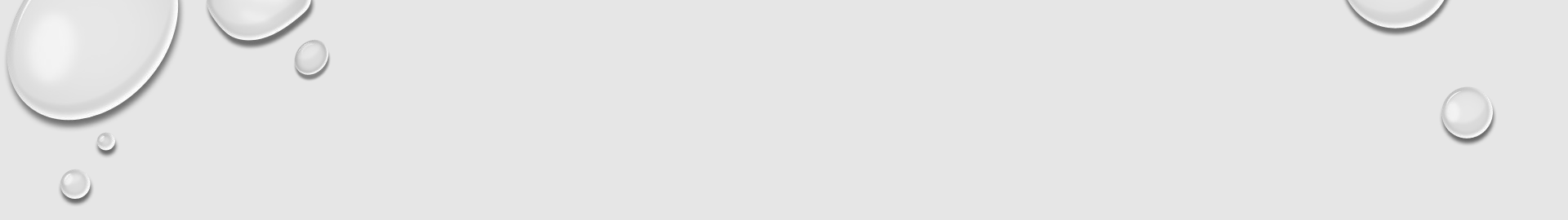
    1 reference | Dorra Bartaguiz, 1 day ago | 1 author, 1 change
    private static bool IsPublicHoliday(DateTime date)...

    1 reference | Dorra Bartaguiz, 1 day ago | 1 author, 1 change
    private static bool IsWeekend(DateTime date)...

    3 references | Dorra Bartaguiz, 1 day ago | 1 author, 1 change
    public static void AddPublicHoliday(DateTime holiday)...
```

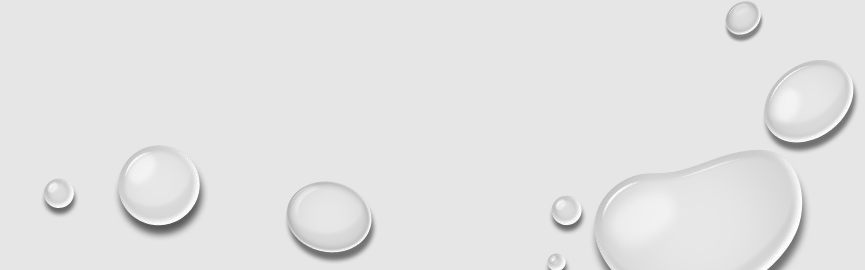
Identified smells

- Hard-coded configuration of Screening types, Holidays...
- Static methods
- SRP violation
- Thread unsafe
- Silent failures, handling exceptions
- Magic values (numbers, dates)
- Generic naming
- High coupling
- Data mutability



Quid des tests générés ?

Mutation testing



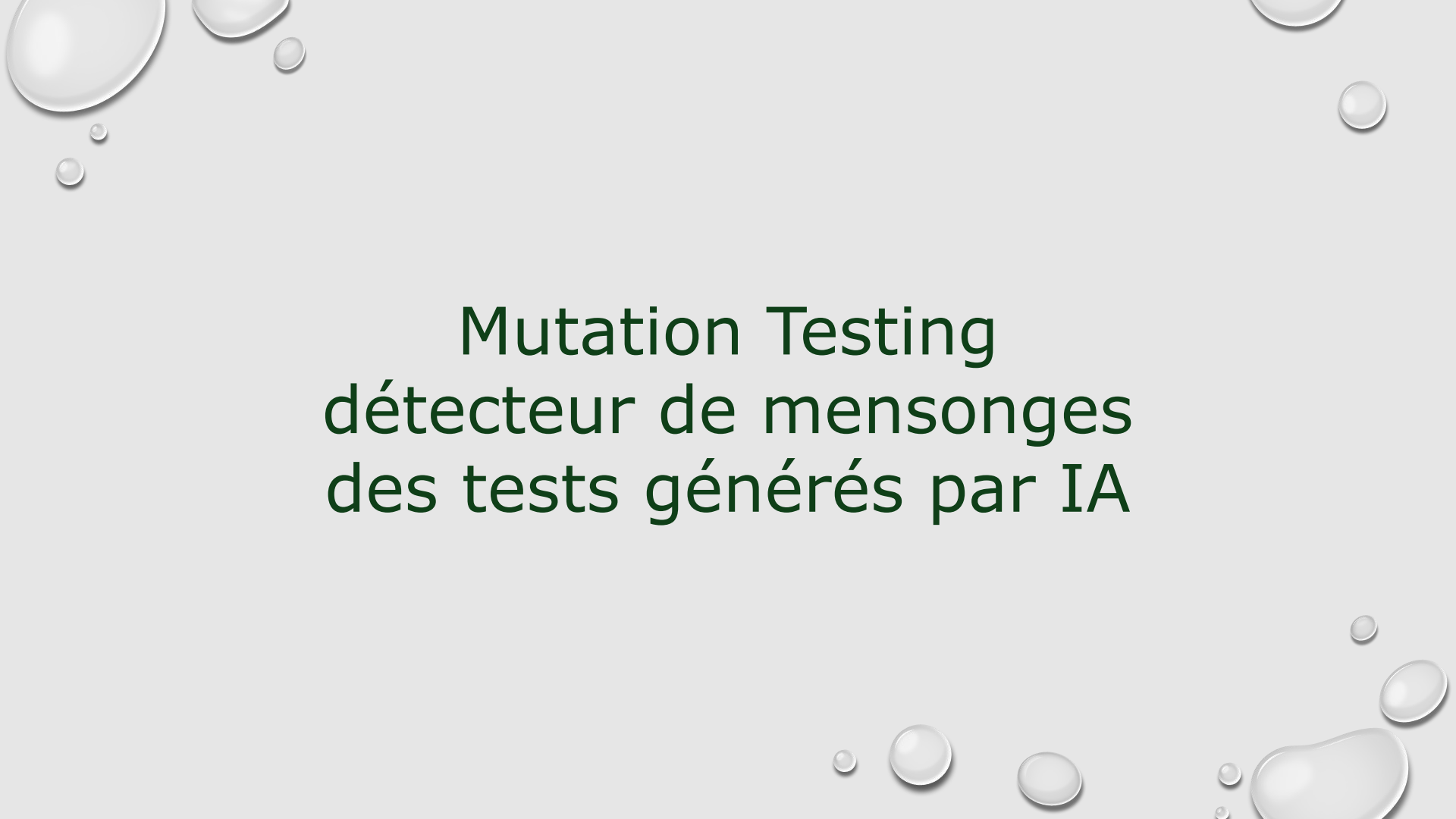
Mutation testing : bad score 13.82%

```
Command Prompt
[22:56:15 INF] Found project C:\Users\dorra\source\repos\ScreeningInvitation\ScreeningInvitation\ScreeningInvitation.csproj to mutate.
[22:56:15 INF] Analysis complete.
[22:56:15 INF] Building solution ScreeningInvitation.slnx.
[22:56:15 INF] Building project ScreeningInvitation.slnx using dotnet build ScreeningInvitation.slnx -c Debug --property :Platform="Any CPU" (directory C:\Users\dorra\source\repos\ScreeningInvitation.)
[22:56:39 INF] Number of tests found: 33 for project C:\Users\dorra\source\repos\ScreeningInvitation\ScreeningInvitation\ScreeningInvitation.csproj. Initial test run started.
[22:56:49 INF] 176 mutants created
[22:56:49 INF] Capture mutant coverage using 'CoverageBasedTest' mode.
Hint: by passing "--open-report or -o" the report will open automatically and update the report in real-time.
[22:56:50 INF] 3 mutants got status CompileError. Reason: Mutant caused compile errors
[22:56:50 INF] 122 mutants got status NoCoverage. Reason: Not covered by any test.
[22:56:50 INF] 21 mutants got status Ignored. Reason: Removed by block already covered filter
[22:56:50 INF] 146 total mutants are skipped for the above mentioned reasons
[22:56:50 INF] 30 total mutants will be tested

100.00% | Testing mutant 30 / 30 | K 20 | S 9 | T 1 | ~0m 00s | 00:00:24

Killed: 20
Survived: 9
Timeout: 1

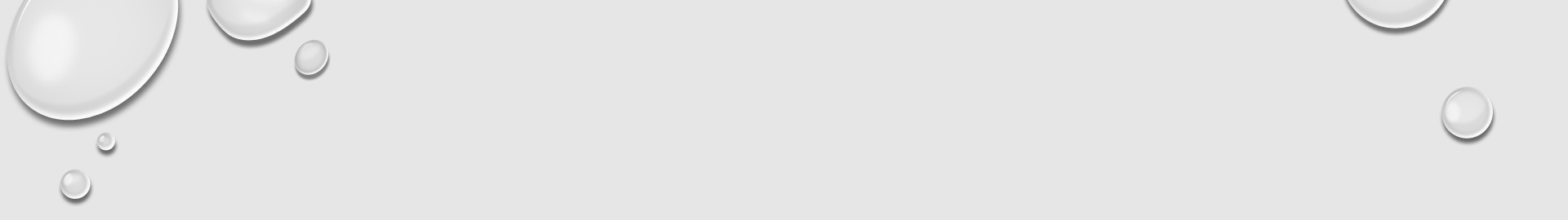
Your html report has been generated at:
C:\Users\dorra\source\repos\ScreeningInvitation\StrykerOutput\2026-04-14_22-56-06\reports\mutation-report.html
You can open it in your browser of choice.
[22:57:15 INF] Time Elapsed 00:01:08.8752998
[22:57:15 INF] The final mutation score is 13.82 %
```

The slide features a light gray background with several realistic water droplets of varying sizes in the corners. In the top-left corner, there are three droplets of different sizes. In the top-right corner, there are two droplets. In the bottom-right corner, there is a cluster of four droplets, including one large one and three smaller ones. In the bottom-center area, there are three more droplets of varying sizes.

Mutation Testing détecteur de mensonges des tests générés par IA

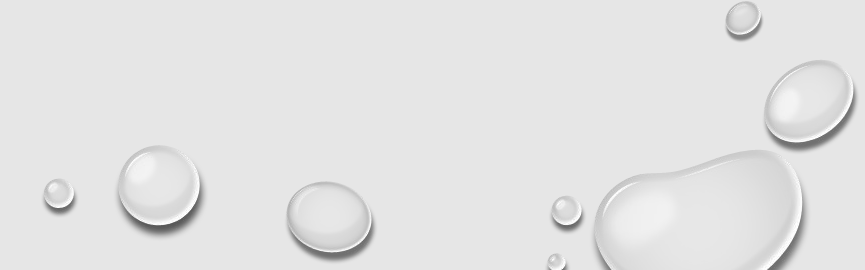


Sans rigueur,
c'est un rideau
de fumée qui
valide les
erreurs de l'IA



Place au Harness Engineering

Youhou!

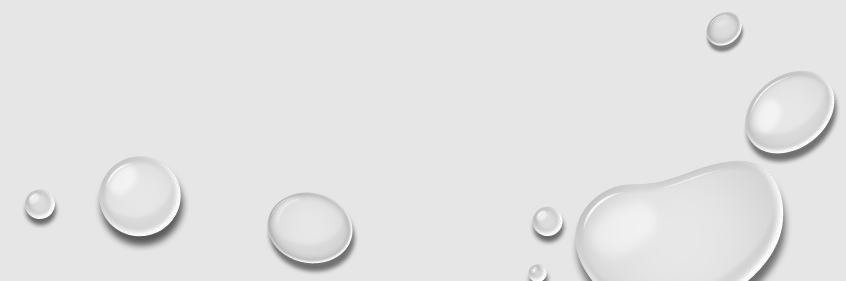




Harness

=

Tout ce qu'on ajoute autour du modèle
pour **espérer** un meilleur résultat de
génération



The image features a light gray background with several realistic water droplets of varying sizes in the corners. The top-left corner has a large droplet and a few smaller ones. The top-right corner has a medium-sized droplet and a small one. The bottom-right corner has a large, irregular droplet and several smaller ones. The bottom-left corner is mostly empty, with a few very small droplets near the center.

AI Agent
=
Model + Harness

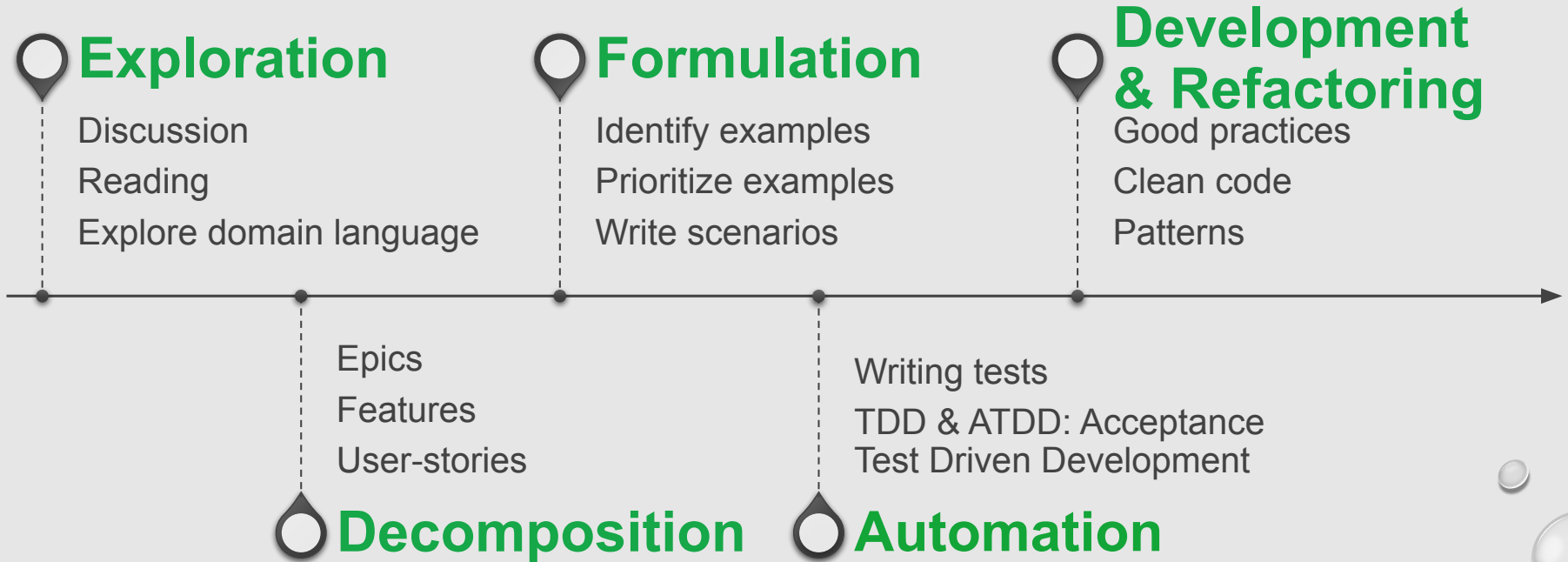


Améliorer le
déterminisme
des agents ?

The slide features a light gray background with several realistic water droplets of varying sizes in the corners. In the top-left corner, there are three droplets of different sizes. In the top-right corner, there are two droplets. In the bottom-right corner, there is a cluster of four droplets, including one large one and three smaller ones. In the bottom-center area, there are three more droplets of different sizes.

Les pratiques Craft & Shift-left

Software Development Life Cycle - SDLC



Invitation for screenings

Exploration



Discussion

Reading

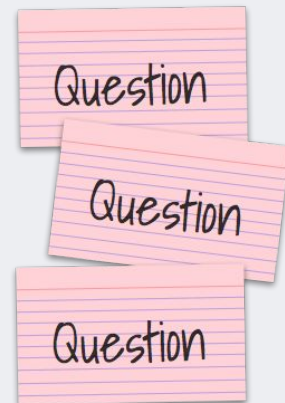
Explore domain language

Definitions ?

- eligibility for a screening type
- type of screening
- screening
- invitation for screening
- valid working day
- public holiday

Invitation for screenings

Example Mapping Workshop



Ask for
another idea

Epics
Features
User-stories

Decomposition

Invitation for screenings

GitHub Copilot Chat

Consider that you are in an example mapping workshop. Decompose this need into rules and for each ru

Consider that you are in an example mapping workshop. Decompose this need into rules and for each rul, identify at least 2 border examples et 2 nominal examples.

> 1 reference

GitHub Copilot

> 1 reference

I'll decompose the invitation date calculation requirements into rules with concrete examples for your mapping workshop.

Rules Decomposition with Examples

Rule 1: Calculate Base Invitation Date

Add day and month of birth to the screening-specific months offset in the current year

Nominal Examples:

1. Birthday: 15/03/1980 | Today: 01/01/2023 | Screening: Uterine (2 months) → Base date: 15/05/2023
2. Birthday: 20/06/1985 | Today: 15/04/2023 | Screening: Breast (6 months) → Base date: 20/12/2023

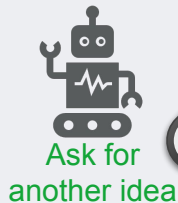
Border Examples:

1. Birthday: 31/01/1990 | Today: 01/01/2023 | Screening: Type with 1 month → Base date: 31/02/2023 (invalid month) → Adjust to 28/02/2023
2. Birthday: 29/02/2000 | Today: 01/01/2024 | Screening: Type with 0 months → Base date: 29/02/2024 (leap year valid)

Invitation for screenings

AI identified rules

- Rule 1: Calculate base invitation date, handles invalid dates like 31/02
- Rule 2: Adjust for past dates, add year if needed
- Rule 3: Adjust for weekends, Saturday/Sunday → Monday
- Rule 4: Adjust for public holidays, next working day
- Rule 5: Apply adjustments in correct sequence



Epics
Features
User-stories

Decomposition

Invitation for screenings

Formulation

Identify examples
Prioritize examples
Write scenarios



Number of months for uterine screening is 2,
Birth date of August 25, 1993,
Today's date of May 23, 2023,
=> The invitation date is October 25, 2023.

Given the number of months for uterine screening is 2

When I calculate today, May 23, 2023, the invitation date for a birth date of August 25, 1993

Then the invitation date is October 25, 2023

Invitation for screenings

Invitation for screenings

Calculate base invitation date

Calculate invitation date with invalid month

Adjust for past dates, add year if needed

Adjust for weekends

Adjust for public holidays, next working day

Adjust adjustments in correct sequence

Examples | 12

Birthday: 15/03/1980 | Today: 01/01/2023 | Screening: Uterine (2 months) → Base date: 15/05/2023

Birthday: 31/01/1990 | Today: 01/01/2023 | Screening: Type with 1 month → Base date: 31/02/2023 (invalid month) → Adjust to 28/02/2023

Birthday: 15/03/1980 | Today: 01/09/2023 | Screening: Uterine (2 months) → Base: 15/05/2023 (past) → Result: 15/05/2024

Birthday: 18/02/1950 | Today: 01/01/2023 | Screening: Type with 1 month → Saturday 18/03/2023 → Result: 20/03/2023 (Monday)

Birthday: 06/01/1950 | Today: 11/02/2026 | Screening: Type with 3 months → Monday 06/04/2026 (Easter monday/Pâques) → Result: 07/04/2026 (Tuesday)

Birthday: 25/02/1950 | Today: 16/09/2021 | Screening: Type with 10 months → Saturday 25/12/2021 (Christmas + Weekend) → Need to check holiday first, then weekend rules interaction → Result: 27/12/2021 (Monday)

Birthday: 20/06/1985 | Today: 15/04/2023 | Screening: Breast (6 months) → Base date: 20/12/2023

+

Birthday: 10/12/1975 | Today: 15/12/2023 | Screening: Generic (1 month) → Base: 10/01/2023 (past) → Result: 10/01/2024

Birthday: 18/02/1950 | Today: 01/01/2023 | Screening: Type with 1 month → Sunday 19/03/2023 → Result: 20/03/2023 (Monday)

+

Birthday: 29/02/2000 | Today: 01/01/2024 | Screening: Type with 0 months → Base date: 29/02/2024 (leap year valid)

+

Birthday: 01/01/1980 | Today: 02/01/2023 | Screening: Type with 0 months → Base: 01/01/2023 (one day past) → Result: 01/01/2024

Birthday: 31/12/1980 | Today: 31/12/2023 | Screening: Type with 0 months → Base: 31/12/2023 (today is boundary) → Result: 31/12/2024

Invitation for screenings

Test strategy

Generate tests from identified examples

- Acceptance tests
- Unit tests
- E2E tests
- Other complex techniques



Generate tests

Writing tests

TDD & ATDD: Acceptance
Test Driven Development

Automation

TDD as a Controlling practice

With AI, **TDD** is no longer just
a development **practice** .
It's a tool for **controlling** an
unpredictable agent.

TDD as a Controlling practice



“Teams that know how to **test properly** will adapt better to AI agents.”

Kent Beck

Invitation for screenings

Development & Refactoring

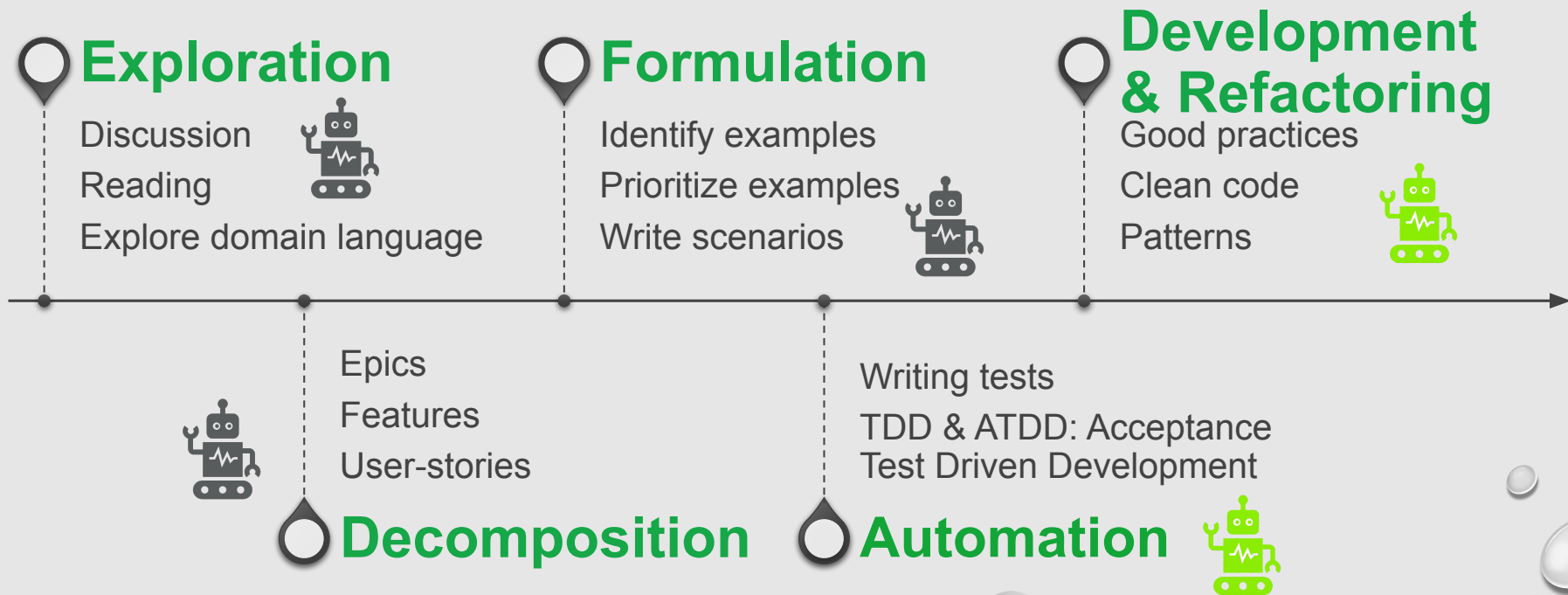
Good practices
Clean code
Patterns



Code & architecture smells:

- Clean code
- Composition vs Inheritance
- Architectural patterns : Hexa, CQRS...
- DDD tactical patterns : Value Objects, Entities, Services, Repositories...

Vos heuristics et workflows sont les skills de demain





Les Baby Steps
seules
ne suffisent pas

The background is a light gray color. In the top-left corner, there are several water droplets of varying sizes, some overlapping. In the top-right corner, there are also a few droplets. In the bottom-right corner, there is a larger cluster of droplets, including one that is quite large and irregular in shape. In the bottom-center area, there are a few more small droplets.

Travailler le harness & Shift-left

The image features a light gray background with several realistic water droplets of varying sizes. These droplets are positioned in the corners: top-left, top-right, and bottom-right. Each droplet has a highlight and a shadow, giving it a three-dimensional appearance.

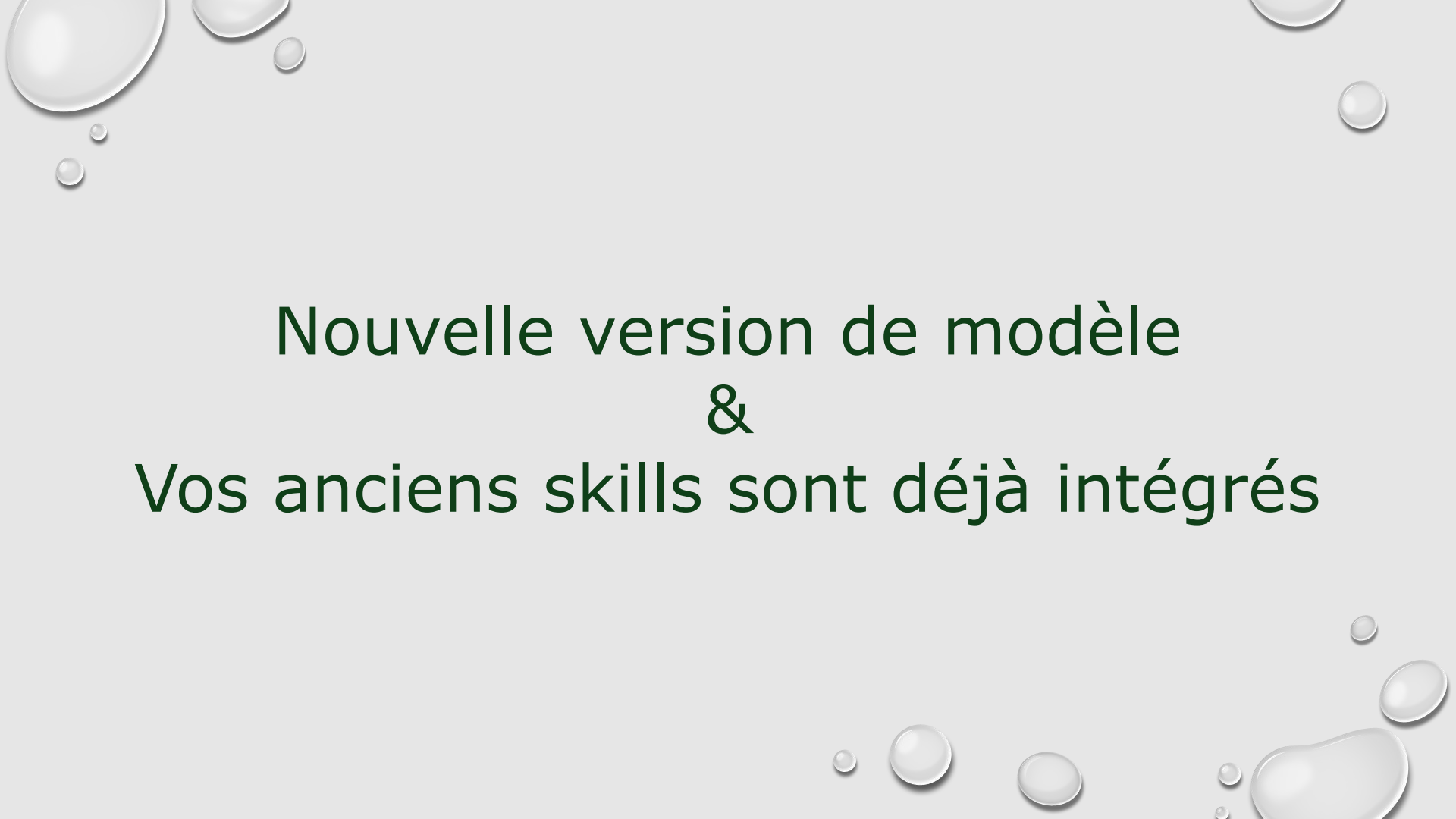
Les skills !

Les frameworks populaires se basent sur les pratiques craft

- Superpowers
- Matt Pocock skills
- Impatient Programming
- Les devs AXA ont créé leur propre framework "Skraft"

Talk de Cyrille et Olivier à Devoxx 2026

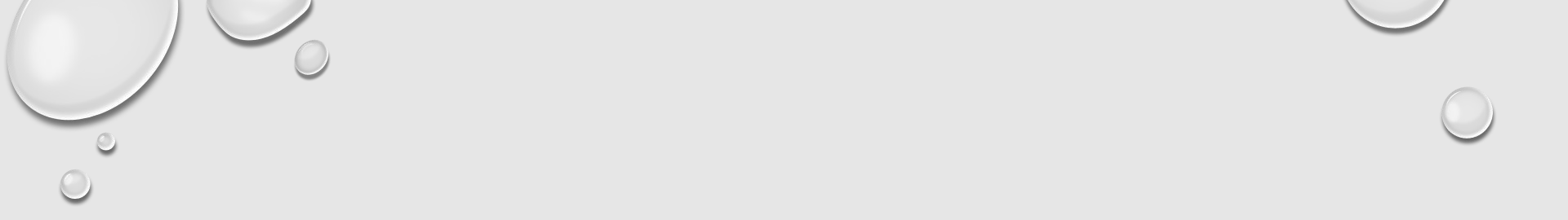


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Nouvelle version de modèle
&
Vos anciens skills sont déjà intégrés

La vie d'un
produit
ne s'arrête pas
au
SDLC*

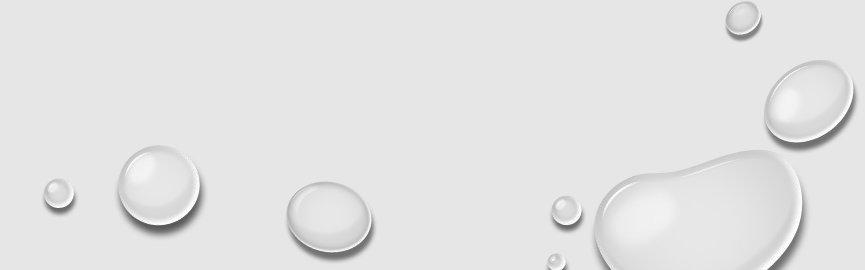
*Software Development Life Cycle



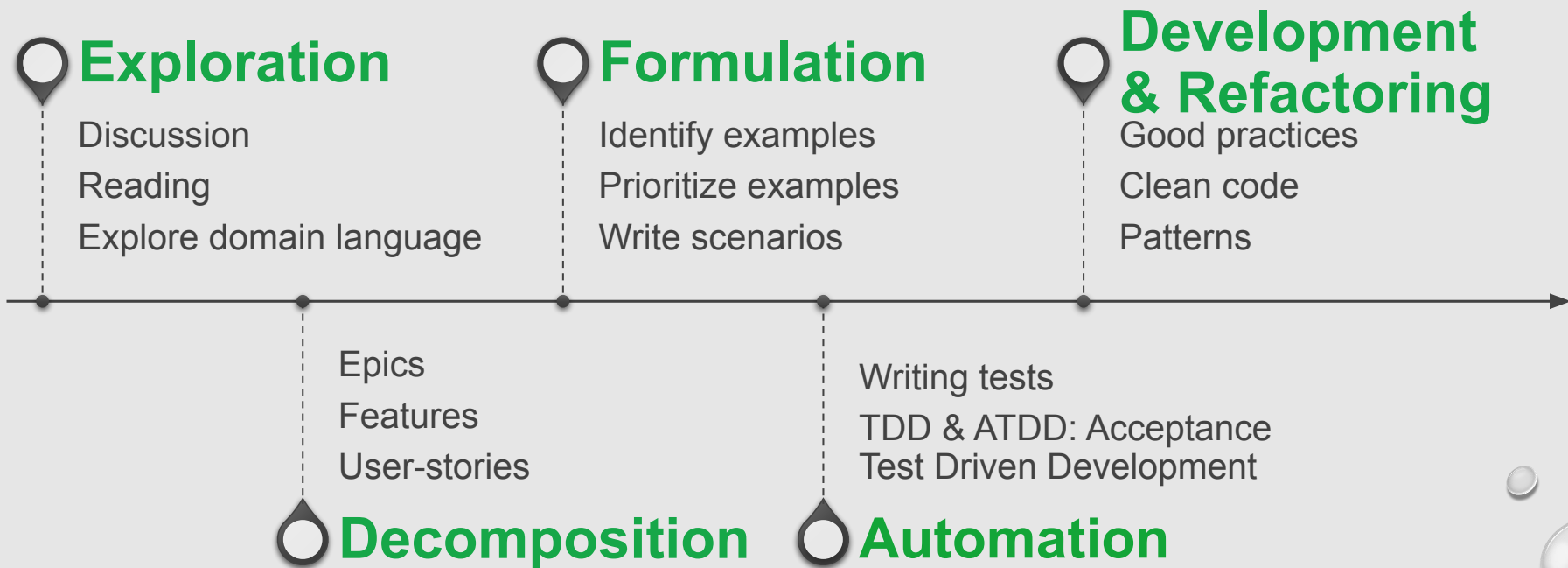
Product Development Life Cycle

PDLC au delà du SDLC*

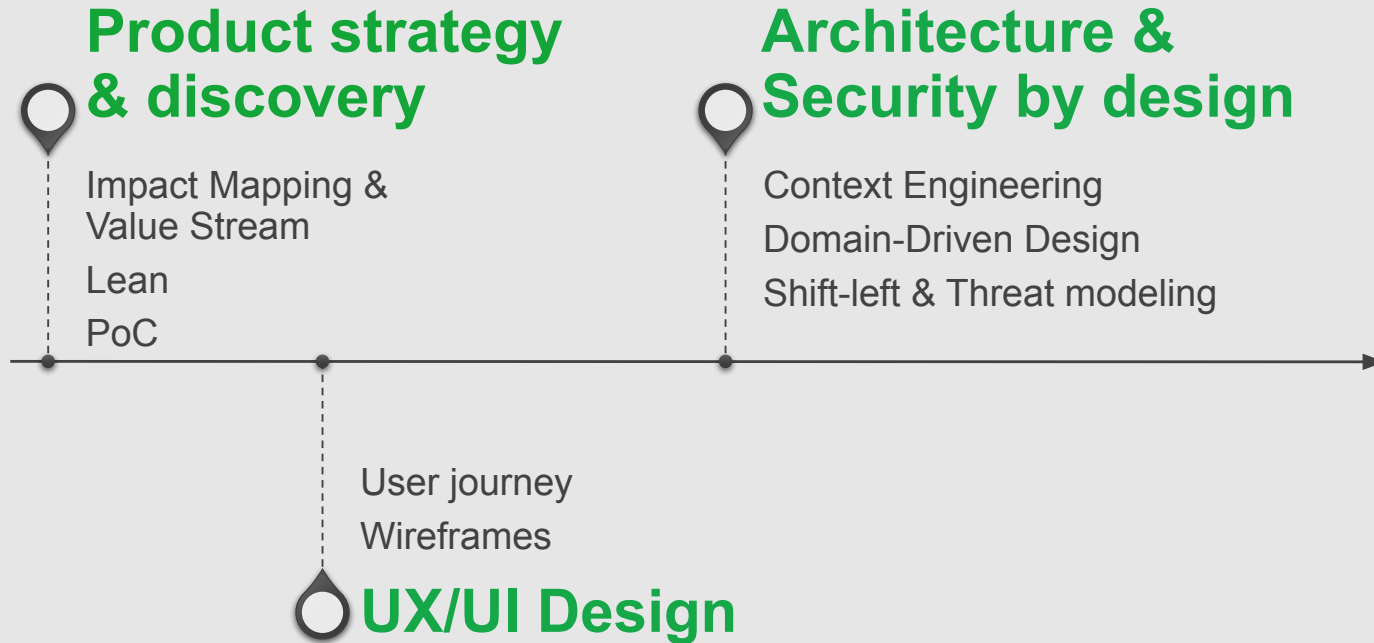
*Software Development Life Cycle



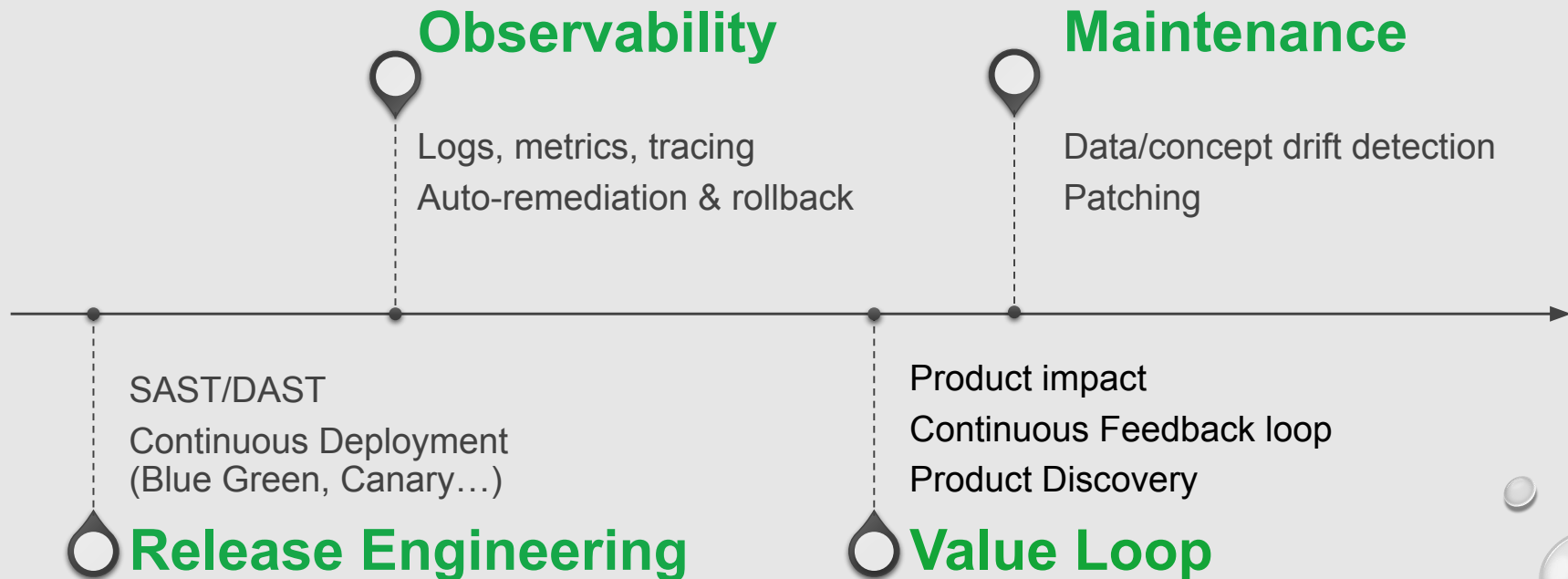
Development Team



Product Development Life Cycle - PDLC

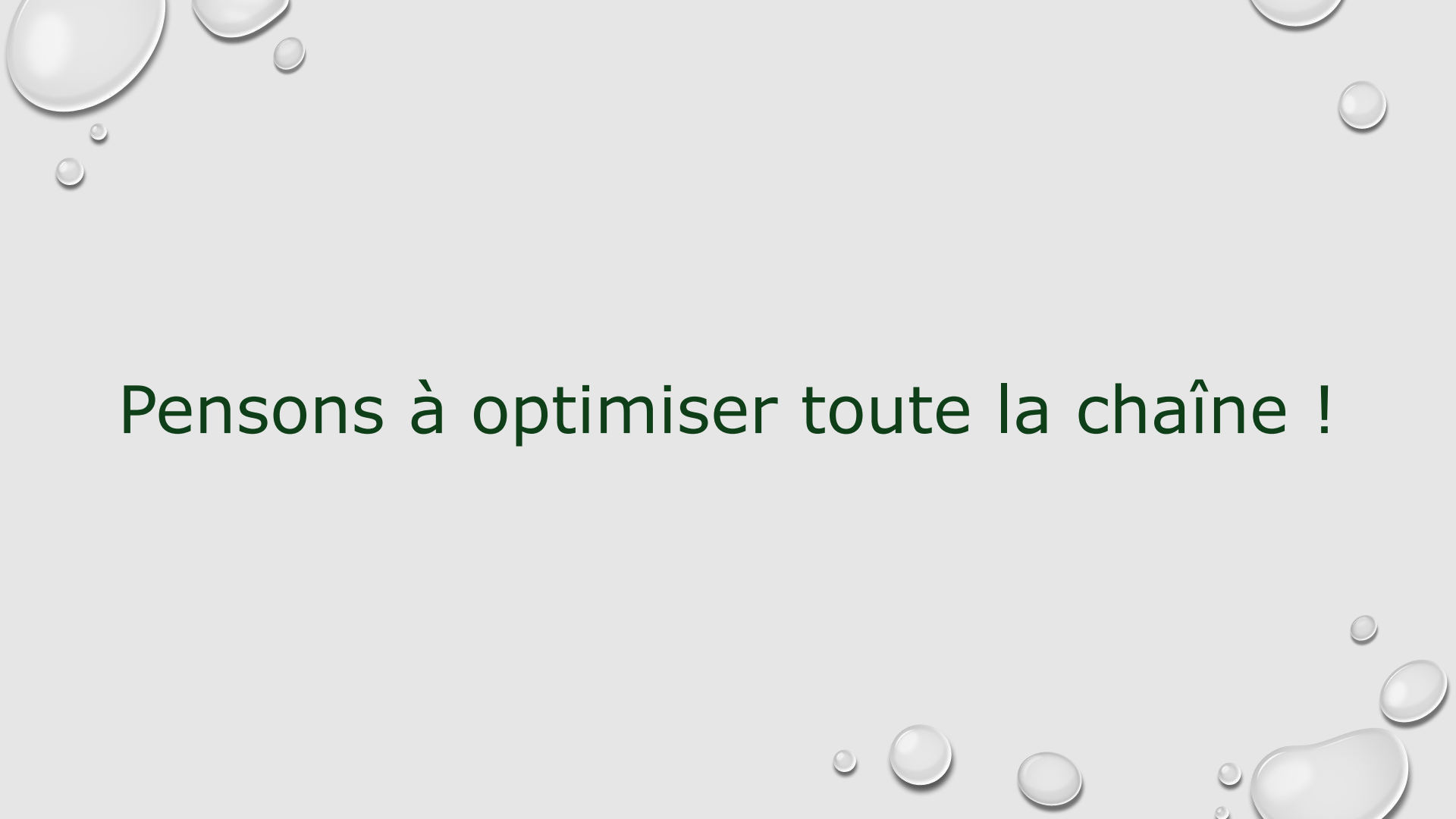


Product Development Life Cycle - PDLC





Équiper
uniquement l'
équipe de
développement
crée un goulot
d'étranglement

The image features a light gray background with several realistic water droplets of varying sizes. These droplets are positioned in the corners: top-left, top-right, and bottom-right. Each droplet has a highlight and a shadow, giving it a three-dimensional appearance.

Pensons à optimiser toute la chaîne !

Pensons à un workflow d'agents spécialisés

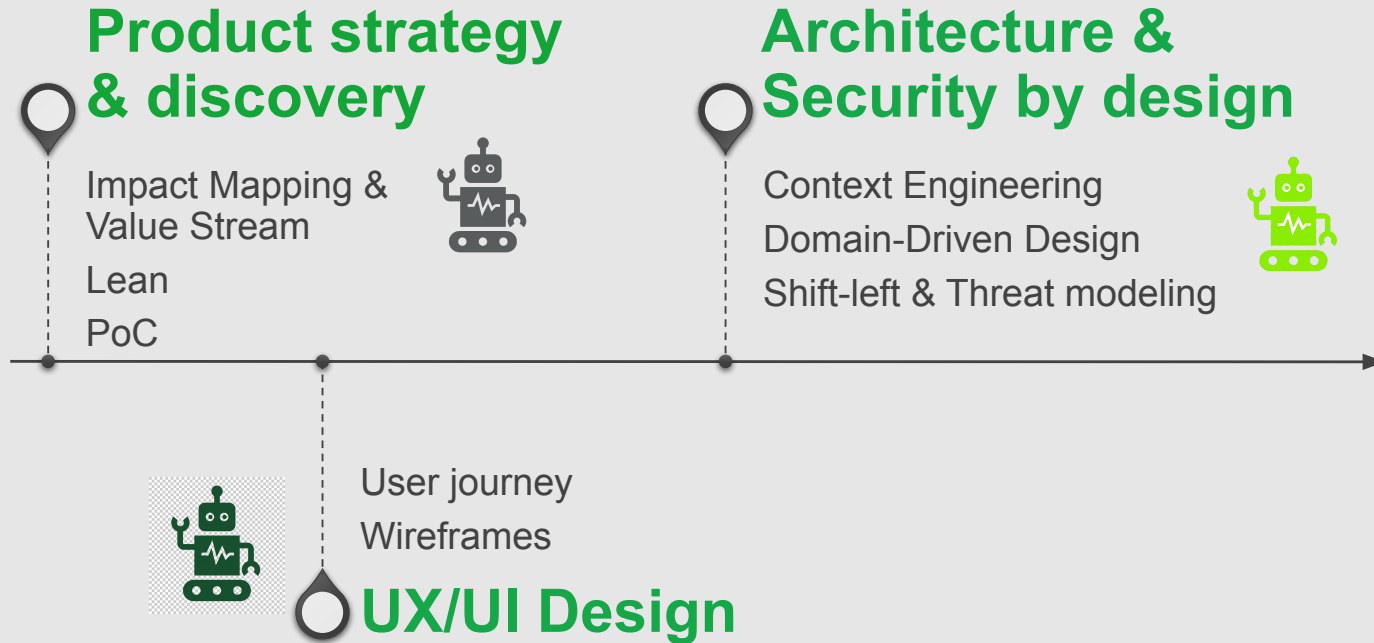
Agent métier

Agent tech

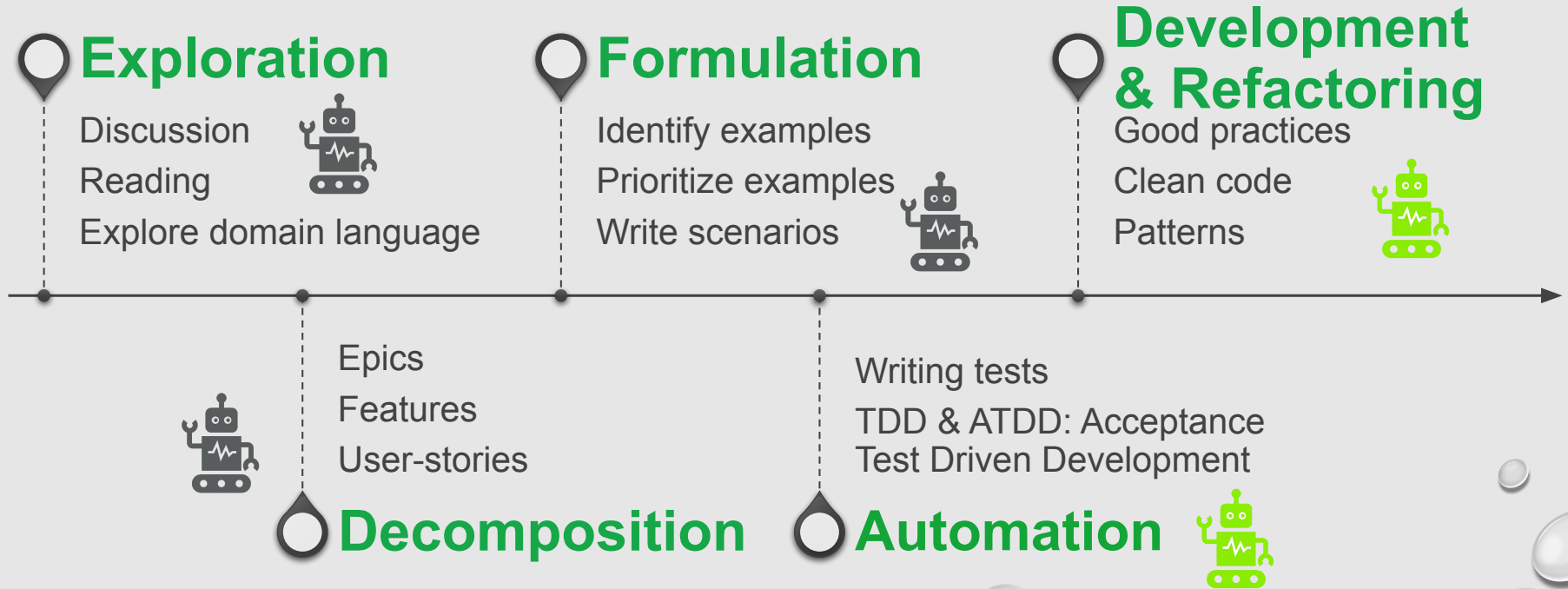
Agent UX/UI

...

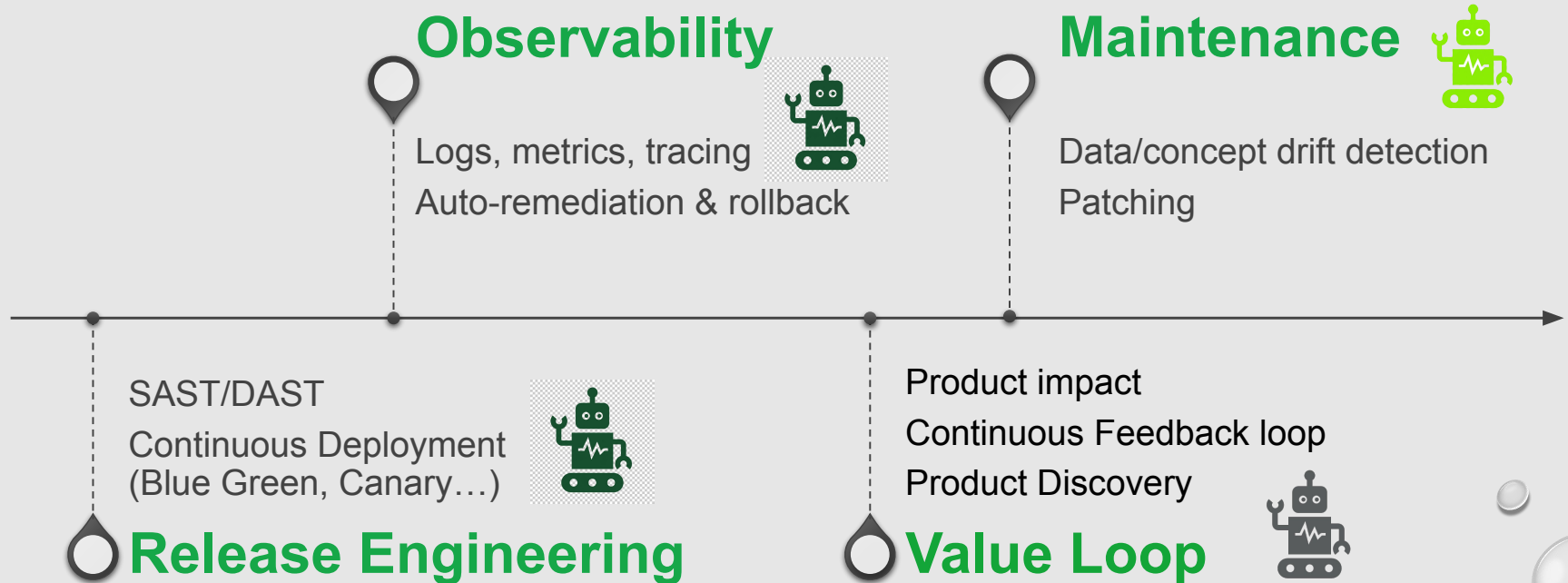
Product Development Life Cycle - PDLC



Product Development Life Cycle - PDLC



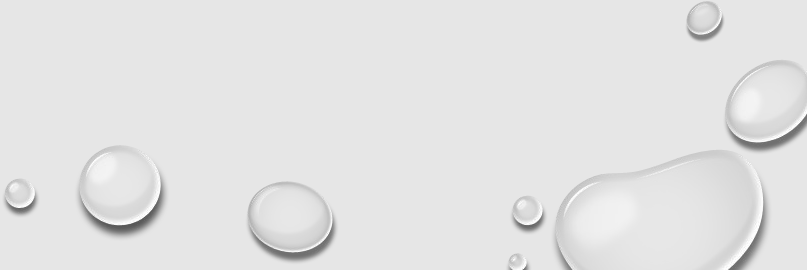
Product Development Life Cycle - PDLC

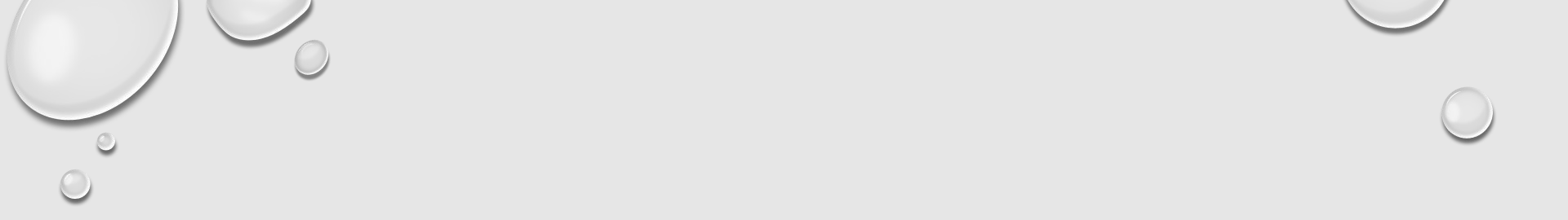




Les agents de plus en plus autonomes

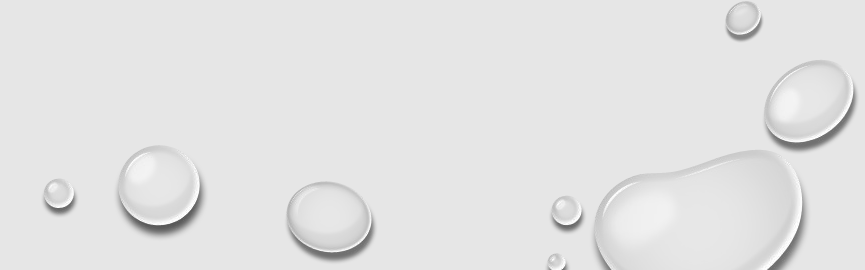
Garde-fous pour détecter
les boucles infinies ou
les stagnations de raisonnement





Loop Engineering

Boucle d'autonomie des agents





Software factories

=

Loop Engineering

+

Harness Engineering

+

Supervision humaine



The image features a light gray background with several realistic water droplets of varying sizes in the corners. The top-left corner has a large droplet and a few smaller ones. The top-right corner has a medium-sized droplet. The bottom-right corner has a large, irregular droplet and several smaller ones. The bottom-left corner is mostly empty, with a few very small droplets near the center.

Agentic Organization

Dorra Bartaguiz - CTO arolla

Agentic software crafters - Conseil et Formation

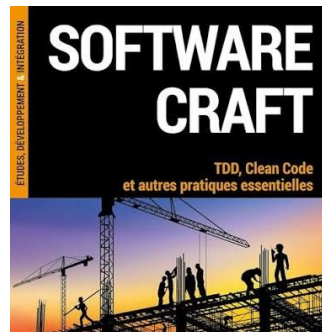


◆ Dorra BARTAGUIZ //

CTO Arolla, co-author "Software Craft" Dunod editions, coach, spe...

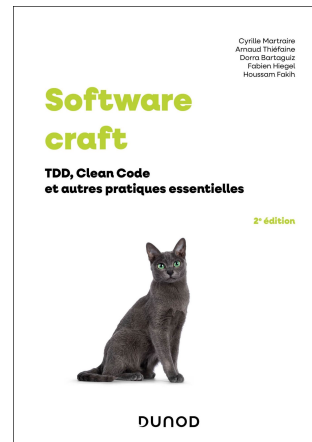


TECH
rocks member



Cyrille Martraire
Arnaud Thieffaine
Dorra Bartaguiz
Fabien Hiegel
Houssam Fakih

DUNOD



Software craft

TDD, Clean Code
et autres pratiques essentielles

2^e édition



DUNOD

MERCI !



 Dorra BARTAGUIZ //
CTO Arolla, co-author "Software
Craft" Dunod editions, coach, spe...



Quand votre vélocité explose
avec l'IA, place au craft et
au "Harness Engineering" !

arolla