

THE GOOD, THE BAD, AND THE UGLY... DIAGRAMS

Iancho Dimitrov

 linkedin.com/in/iancho

 @iandim

 iancho.d@gmail.com

Let me tell you a story...

My context & motivation

Agenda

1. Why care
2. What makes a diagram effective
3. Practical tips – we'll "refactor" a diagram
4. Creating from scratch – step by step process

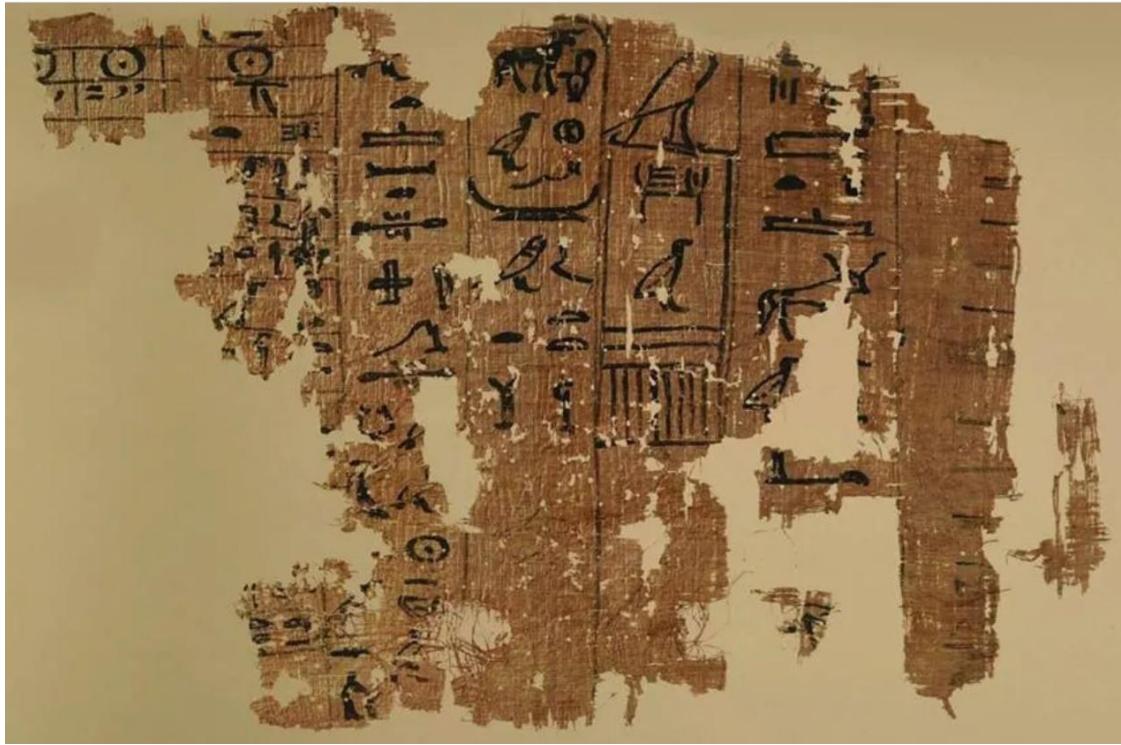
Feedback – thanks in advance!!



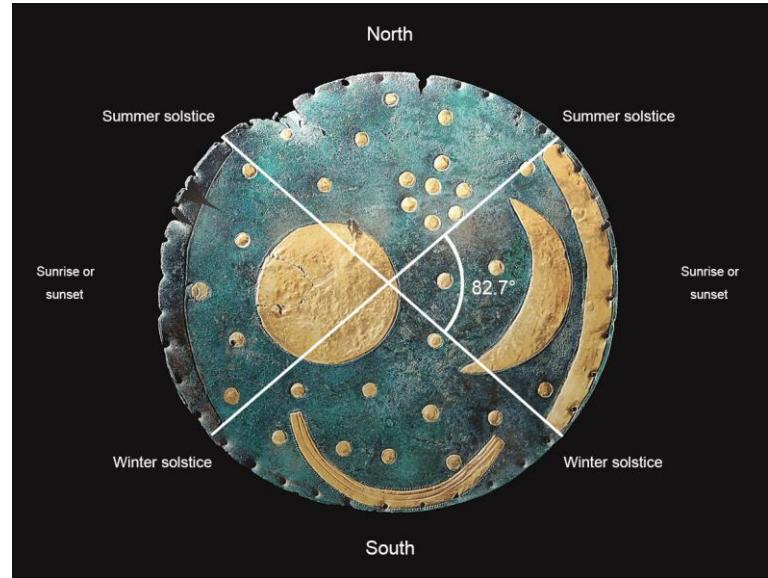
bit.ly/Diagrams2025

Diagrams have been
around for a while...

The Egyptians (2 500 BC)



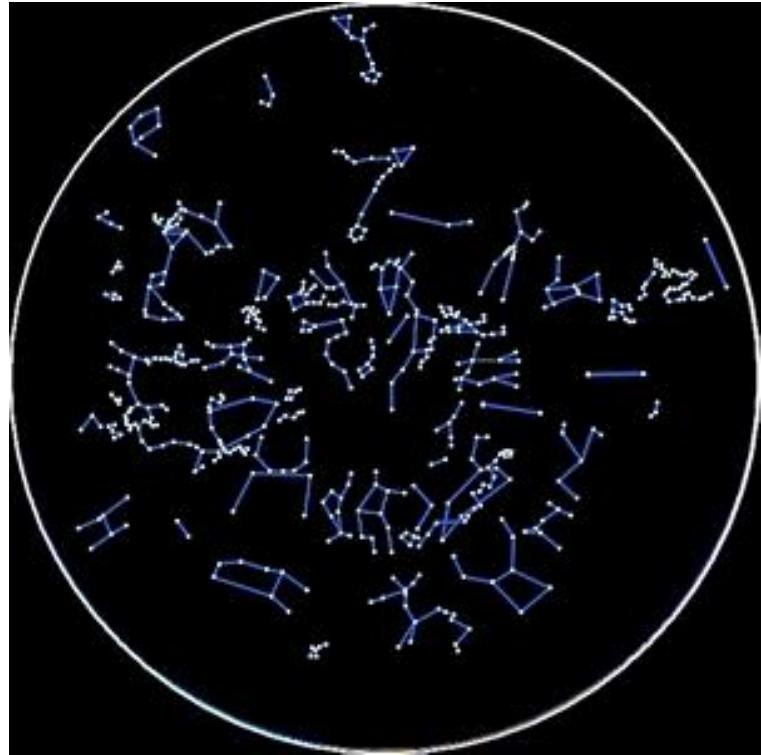
European Bronze Era – Nebra Sky Disk (1 700 BC)



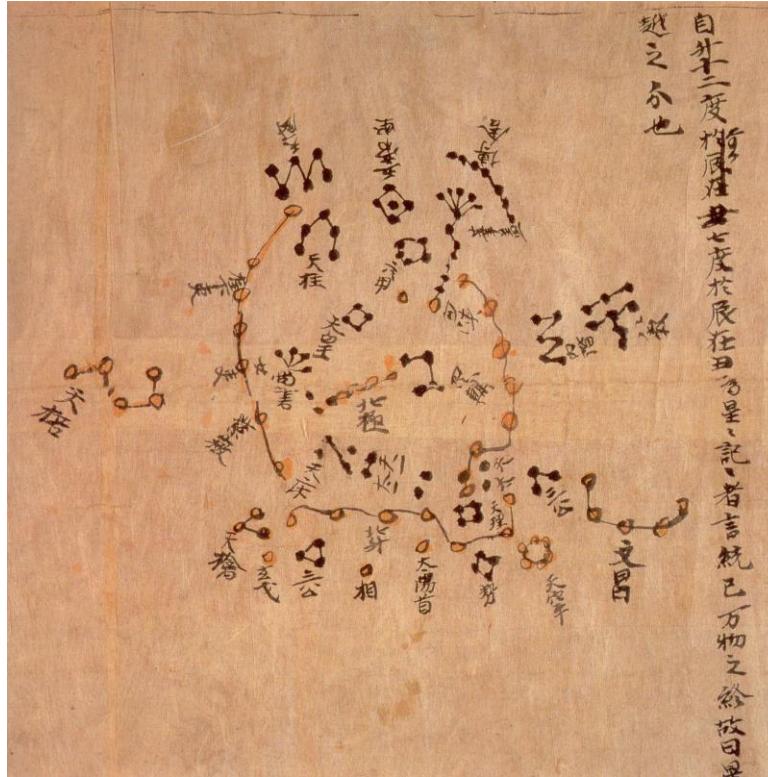
The Babylonians – World Map (600 BC)



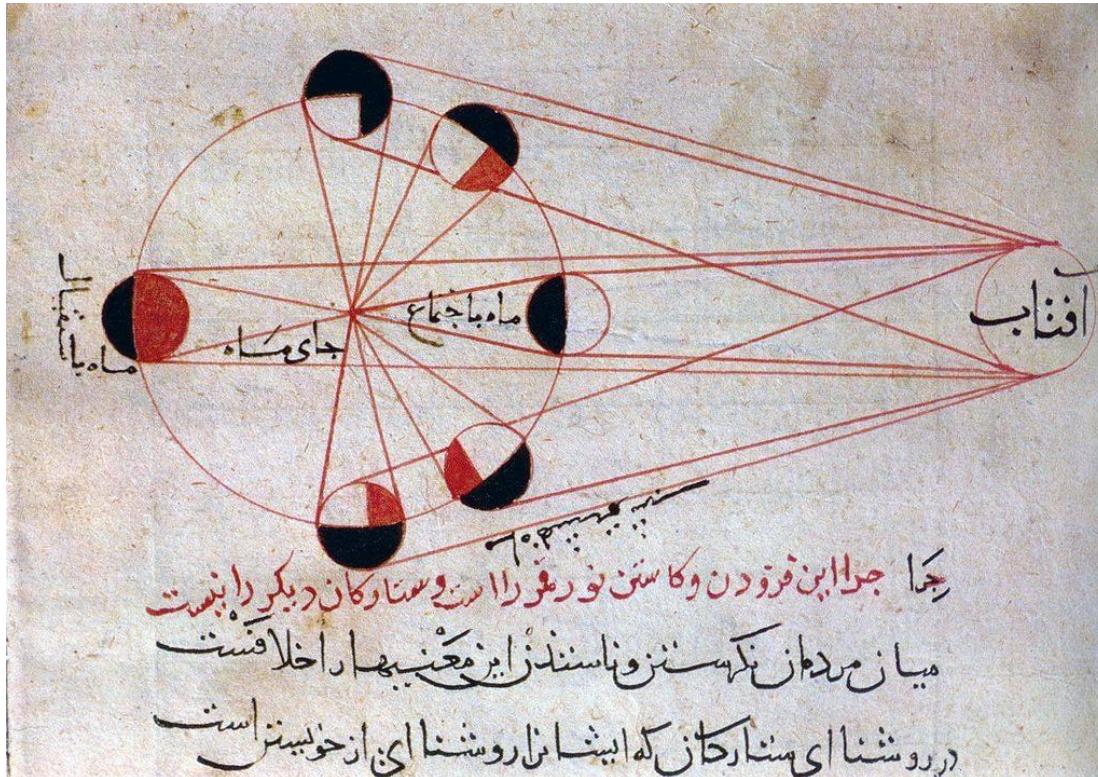
Egyptians – Dendera Zodiac (50 BC)



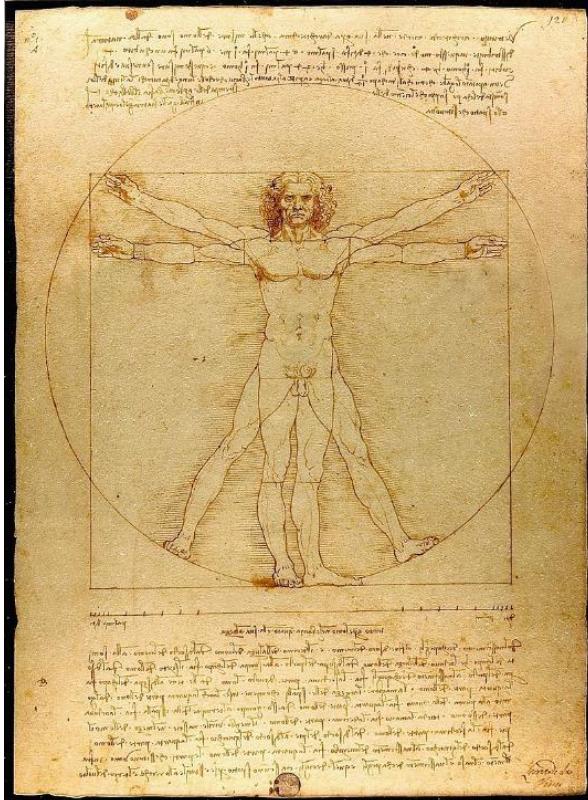
China – Dunhuang Star Map (649-684)



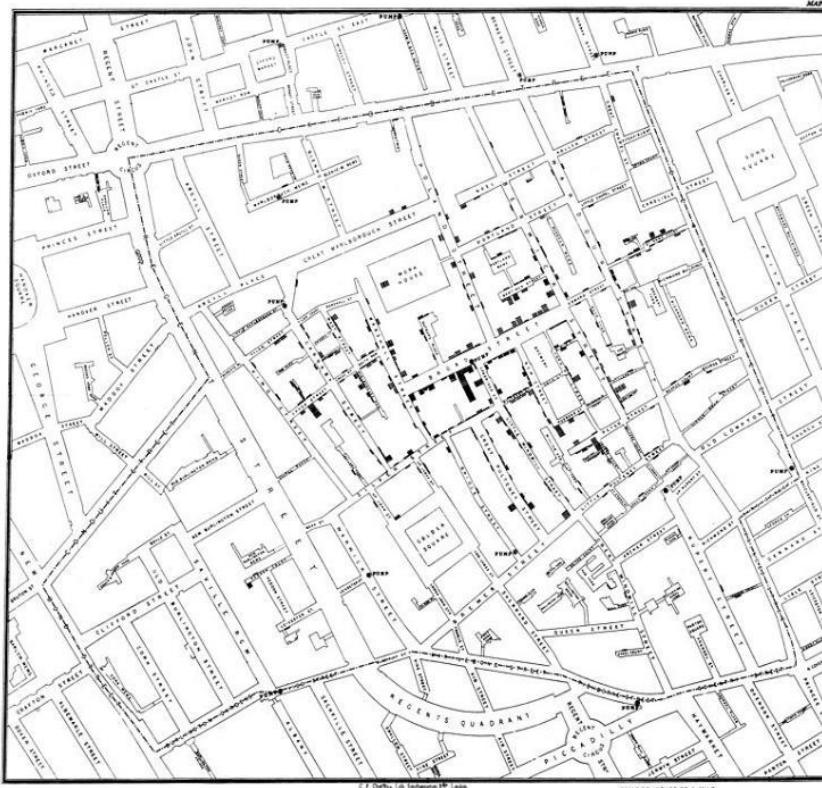
Abu Rayhan al-Biruni, Iran – Lunar Eclipse (1019)



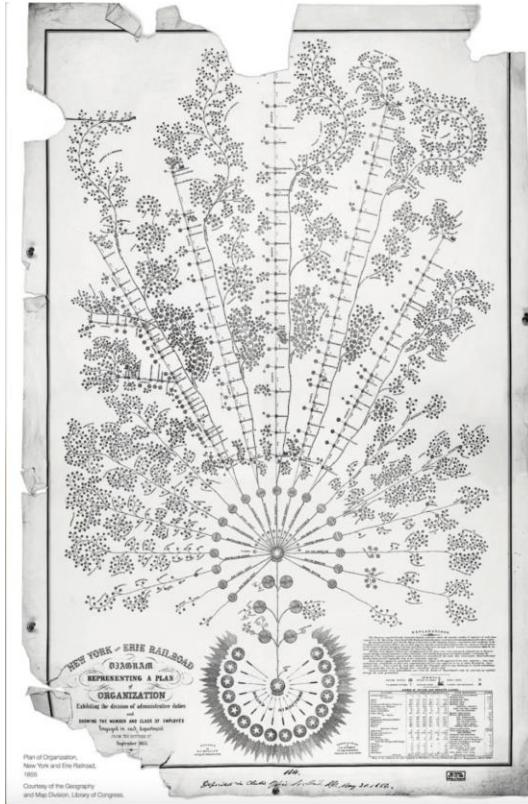
Leonardo da Vinci - The Vitruvian Man (1490)



London Cholera Outbreak Map (1854)



First Org Chart – NY Railroad Company (1855)

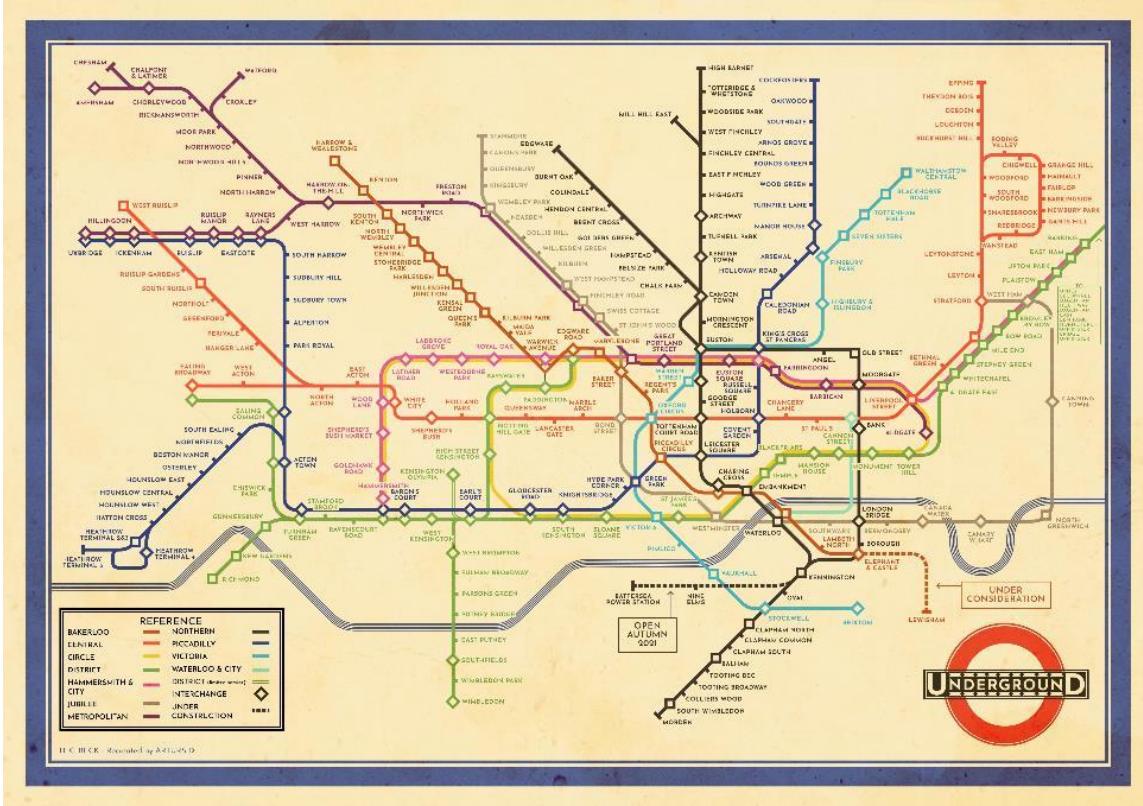


Mendeleev's Periodic Table of the Elements (1871)

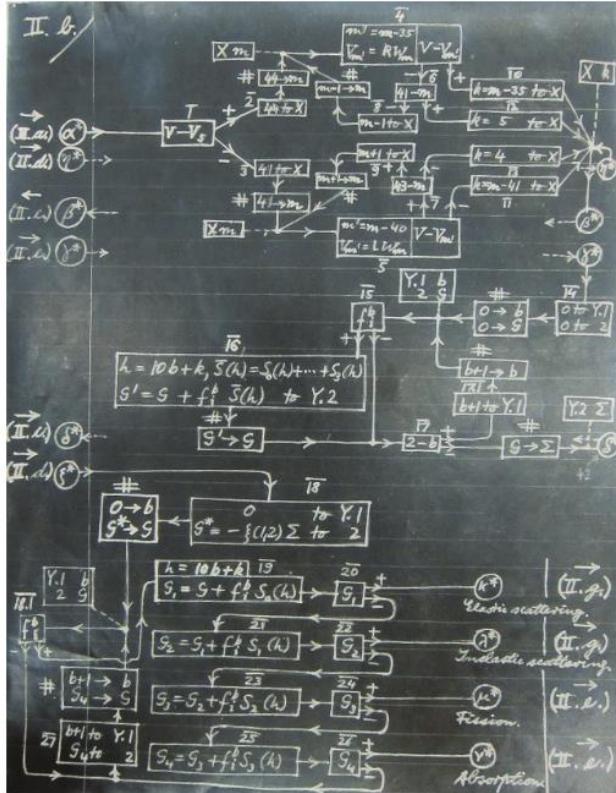
Mendeleev's Periodic Table of the Elements (1871)

Reihen	Gruppe I. R ⁺ O	Gruppe II. R ⁰	Gruppe III. R ⁻ O ²	Gruppe IV. RH ⁴ R ⁰ ²	Gruppe V. RH ³ R ² O ³	Gruppe VI. RH ² R ³ O ²	Gruppe VII. RH R ² O ¹	Gruppe VIII. R ⁻ O ⁴
1	H=1							
2	Li=7	Be=9,4	B=11	C=12	N=14	O=16	F=19	
3	Na=23	Mg=24	Al=27,3	Si=28	P=31	S=32	Cl=35,5	
4	K=39	Ca=40	—=44	Ti=48	V=51	Cr=52	Mn=55	Fe=56, Co=59, Ni=69, Cu=63.
5	(Cu=63)	Zn=65	—=68	—=72	As=75	Se=78	Br=80	
6	Rb=86	Sr=87	?Yt=88	Zr=90	Nb=94	Mo=96	—=100	Ru=104, Rh=104, Pd=106, Ag=108.
7	(Ag=108)	Cd=112	In=113	Sn=118	Sb=122	Te=125	J=127	
8	Cs=133	Ba=137	?Di=138	?Ce=140	—	—	—	— — — —
9	(—)	—	—	—	—	—	—	— — — —
10	—	—	?Er=178	?La=180	Ta=182	W=184	—	Os=195, Ir=197, Pt=198, Au=199.
11	(Au=199)	Hg=200	Tl=204	Pb=207	Bi=208	—	—	— — — —
12	—	—	—	Th=231	—	U=240	—	— — — —

London Underground Map (1931)



ENIAC – The First Software Flowchart (1947)





Diagrams and Canada – did you know?

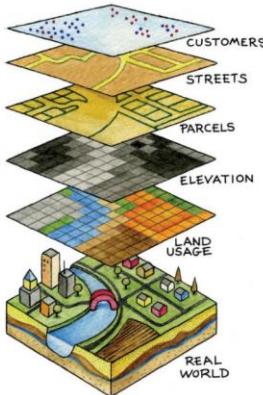
World's First Interactive Whiteboard (1991)



- SMART Technologies, Calgary
- touch-sensitive large display
- draw and interact with digital content

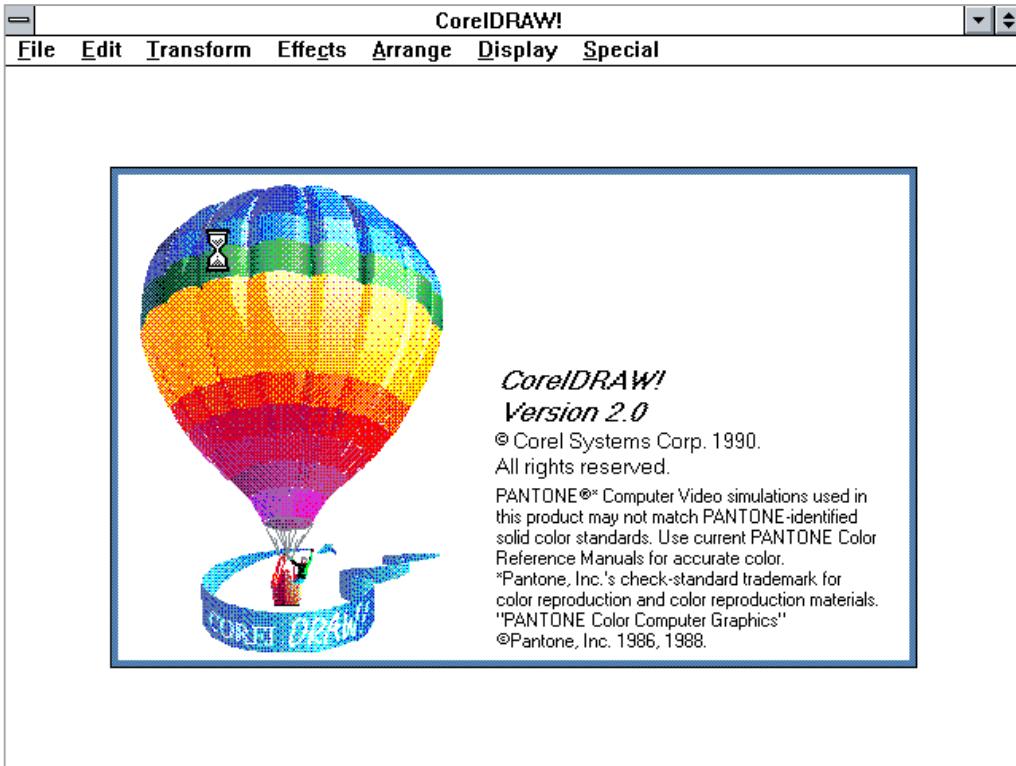
The First Geographic Information System (1960s)

Geographical Information System (GIS)



- Dr. Roger Tomlinson – “the father of GIS”
- coined the term – and built the first one, for Canada Land Inventory, Canada Gov.

CorelDRAW: Pioneering Graphics Software (1989)



- Corel Corporation, Ottawa
- helped bring diagramming into the PC era
- introduced features like combining text and shapes

Why care about diagrams?

The Good Diagrams

“Diagrams are a powerful tool for communicating ideas and **understanding complex systems**.

- Scott McCloud

The Good Diagrams

A picture is worth 1 000 words,
...and a good diagram can be worth 1 000 pictures.

- Anonymous

The Good Diagrams

A simple line or a complex visualization – the diagram's ultimate goal is always the same: **to clarify.**

- Nigel Holmes

The Good Diagrams



**APOLLO 13
SURVIVAL**

Apollo 13

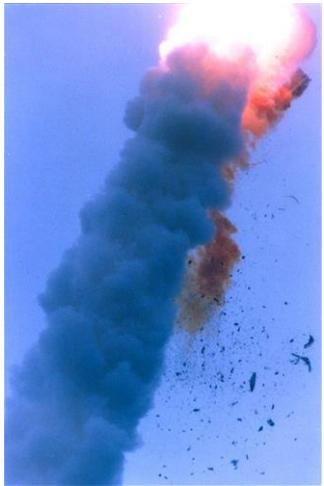
1970



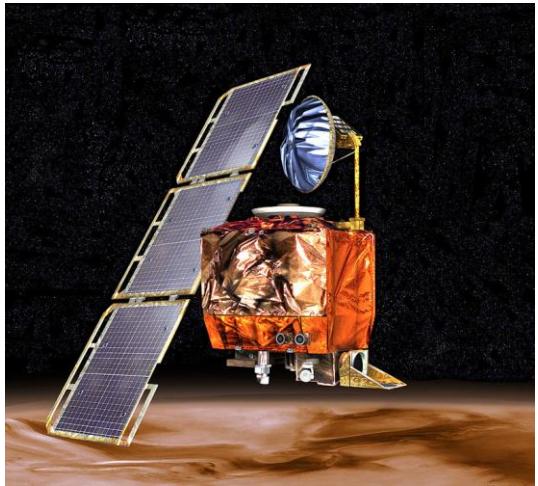
**Buliding Empire
State Building**

1930 - 1931

The Bad Diagrams



Ariane 5
1996

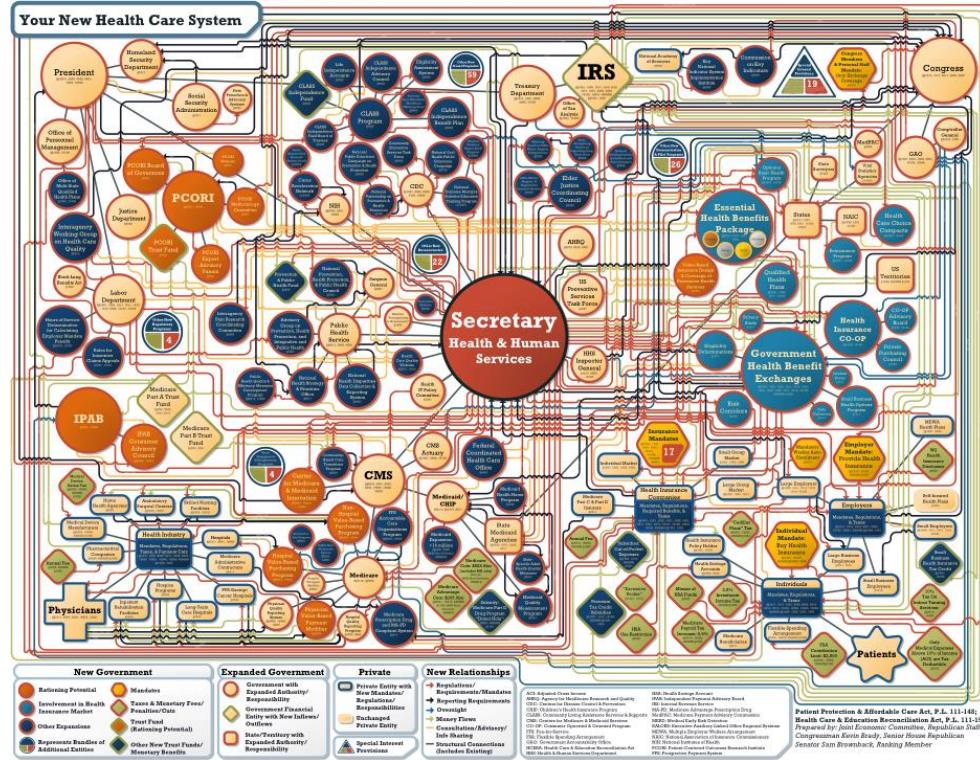


Mars Climate
Orbiter
1999

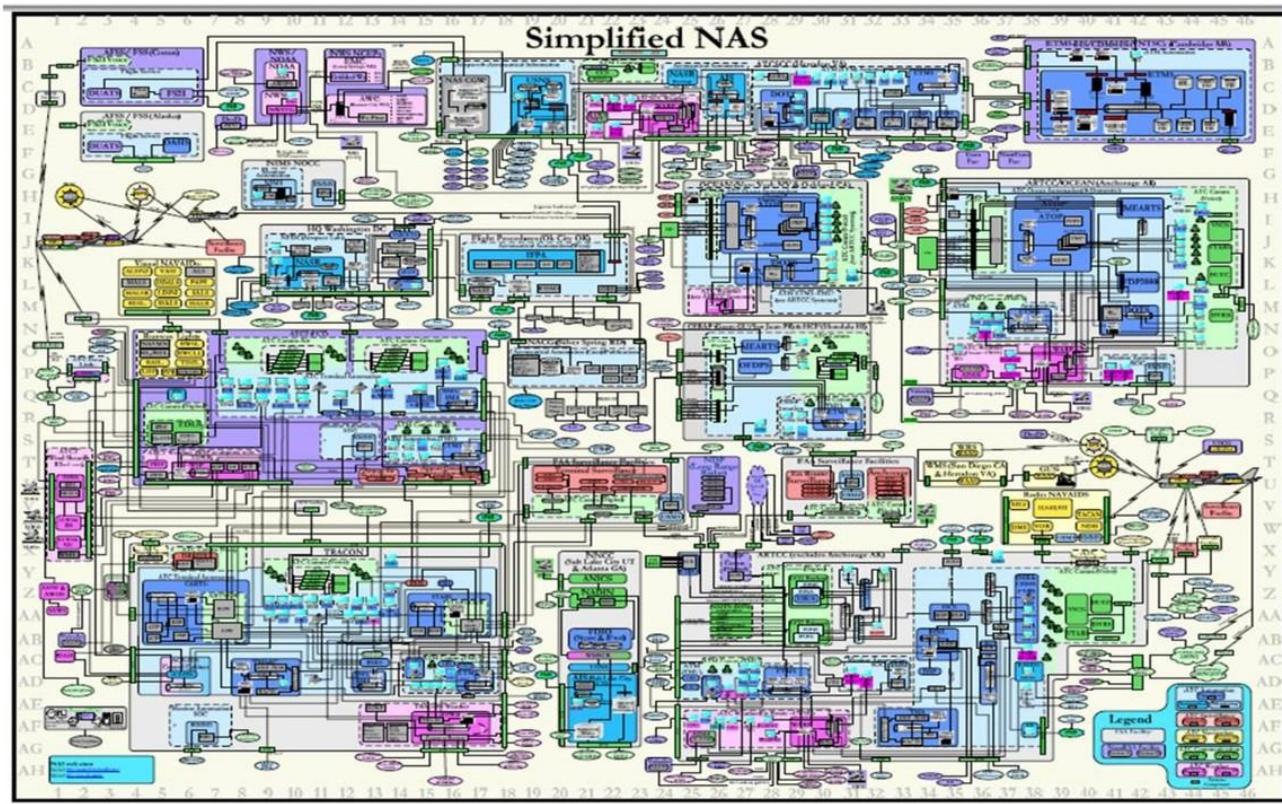


Fukushima nuclear
disaster
2011

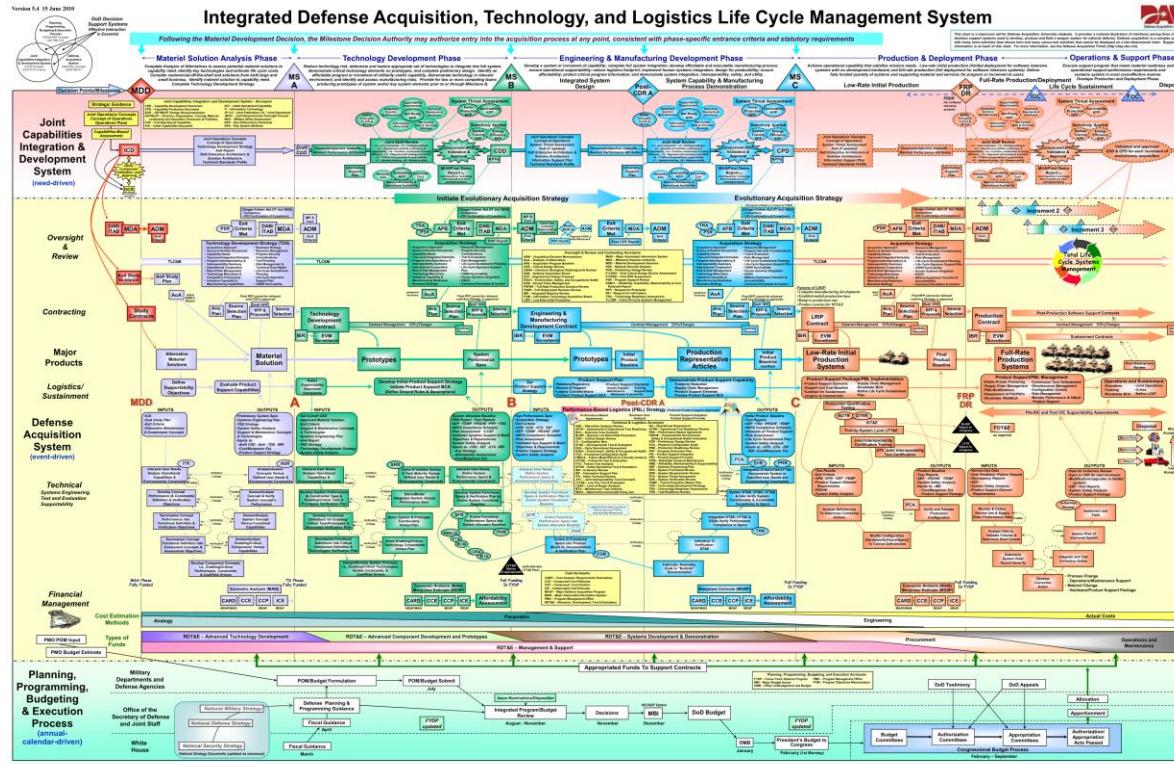
The Ugly Diagrams



The Ugly Diagrams



The Ugly Diagrams



The Ugly Diagrams

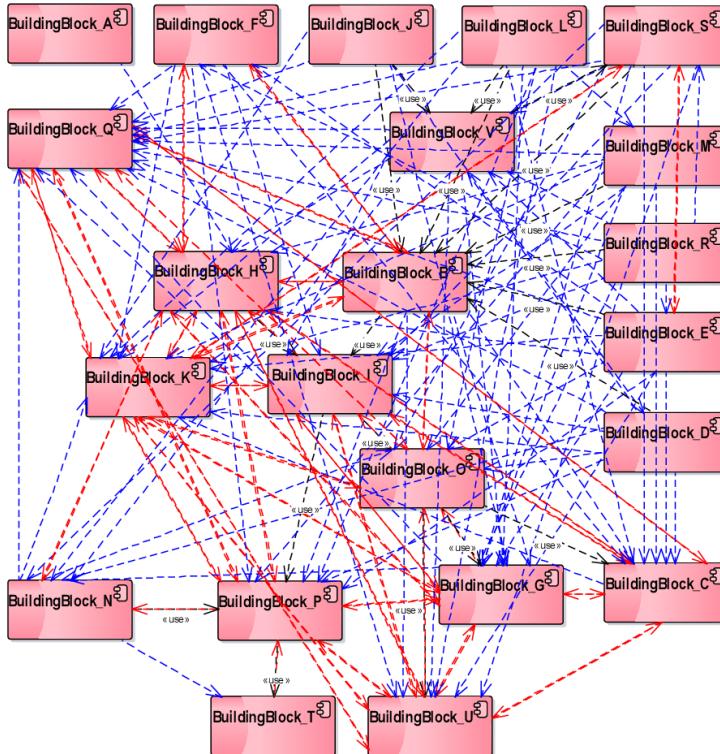


Figure 2 – Building Block Dependencies Inside The Codebase

Bad Source Code and Ugly Diagrams have 1 thing in common:



**... both are better served with
tomato sauce, Parmesan and parsley :)**

But still... why should
we really care?

It's raining diagrams in the software world

1. **Requirements** – processes, functional requirements, wireframes, etc.
2. **System/Solution Design**
3. **Software Architecture, Deployment Architecture, CI/CD**
4. **Testing** – automated testing frameworks architecture, test cases, etc.
5. **Data** – data structures, relations, domain models, etc.
6. **Project organization** – org. charts, relations, presentations

It's good for you – personally

1. **Self-support for Problem Solving** – creating a diagram for a complex system or process helps not only your audience, but yourself also. Helps you think critically, systematically and with a comprehensive view.
2. **Improved Communication** – less assumptions for you using other team members' and project stakeholders' artifacts and vice versa
3. **'Sell' your ideas** more easily and successfully
4. **Transferrable skill** – both vertically and horizontally!
5. **You'll need to create diagrams** – sooner or later in your career, no matter what!

All that said, looks like
it's clear
why we should care...

...and then, I saw a Tweet

(or should I say – a Xweet?! ...or “an Ex” 😊)

Sean Spriggs ✅
@seanspriggens

ChatGPT image recognition vs "Crazy Pentagon PowerPoint Slides!"

(h/t @jonsToKes 😊)

The diagram appears to represent the "Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System." It's a complex flowchart detailing the various stages, processes, and decision points involved in defense acquisition and life cycle management, from a high level breakdown.

1. Phases of the Lifecycle

- Master System Acquisition (MSA)**: Before initiating the acquisition process, there's a decision point called Master Development Decision (MDD). Following this, the MSA phase begins.
- Technology Development Phase**: This phase seems to focus on refining the initial requirements and defining how they are met and value.
- Engineering & Manufacturing Development Phase**: Here, the focus is on the detailed design and development of the system.
- Production & Deployment Phase**: This phase involves the actual production of the system and its deployment to operational units.
- Operations & Support Phase**: After deployment, this phase ensures that the systems are supported and maintained throughout their operational life.

2. Key Components

- Joint Capabilities Integration & System**: Driven by the needs and integrates various capabilities.
- Overall Review**: Various points for oversight and decision-making to ensure the system remains on track.
- Contracting**: Various contracting points and strategies across the life cycle.
- Major Products**: Details various products outcome at different stages.
- Logistics Readiness**: Focuses on ensuring the system is ready for post-production.
- Advanced Acquisition Initiatives**: Various initiatives across the life cycle.
- Selection & Business Requirements**: Requirements that need to be met during the selection process.
- Financial Management**: Financial planning and budgeting aspect of the acquisition.
- Planning, Programming, Budgeting, & Execution Process**: Controller-driven processes for planning and budgeting.

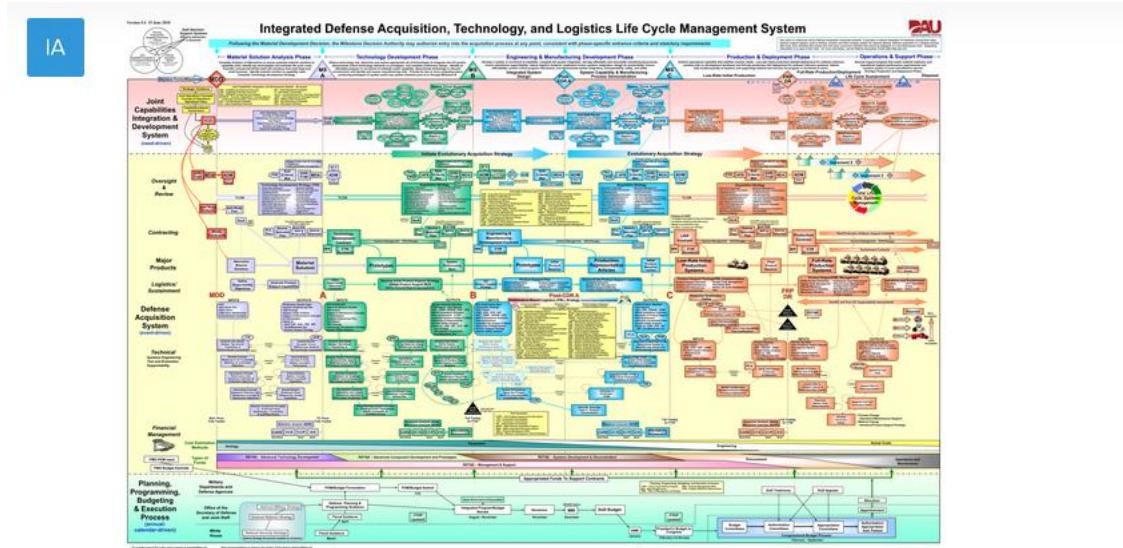
3. Evolutionary Acquisition Strategy

The diagram also mentions an evolutionary approach to acquisition, which allows for iterative development and refinement.

4. Flow Indicators

The diagram uses arrows and lines to indicate flow, decisions, and transitions from one phase to the next.

Last edited 12:39 AM · Sep 27, 2023 · 2.1M Views



analyze diagram



Certainly! This diagram depicts the "Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System." The system appears to be a comprehensive representation of the various phases, processes, and reviews associated with defense acquisition, technology development, and logistics management. Here's a more detailed breakdown:

breakdown:

1. Title & Overview:

- The diagram title indicates its purpose: to provide an integrated overview of defense acquisition, technology development, and logistics lifecycle management.
- There's a note stating that following the "Material Development Decision," the "Milestone Decision Authority" may authorize entry into the acquisition process at any point.

2. Phases:

- **Material Solution Analysis Phase:** The beginning phase where potential material solutions are analyzed.
- **Technology Development Phase:** Focuses on the development of technologies crucial for the project's success.
- **Engineering & Manufacturing Development Phase:** Transition from technology to a viable product.
- **Production & Deployment Phase:** Production, deployment, and assessments of the developed product or system.
- **Operations & Support Phase:** Covers the operations, maintenance, and eventual disposal of the product or system.

3. Key Milestones & Points:

- **MDD (Material Development Decision):** Entry point into the acquisition lifecycle.
- **Milestones A, B, and C:** Significant decision points throughout the lifecycle. Each

Regel

IA

describe in detail each phase



Of course! The Integrated Defense Acquisition, Technology, and Logistics Life Cycle Management System divides the acquisition process into distinct phases. Each phase encompasses specific tasks and objectives to progress a defense project from concept to completion. Here's a more detailed description of each phase:



1. Material Solution Analysis Phase:

- **Purpose:** This phase focuses on assessing potential solutions to meet the capability needs documented in approved requirement documents. It determines which solution is the most suitable in terms of effectiveness and affordability.
- **Key Activities:**
 - Analyzing potential material solutions to determine their feasibility, achievability, and affordability.
 - Conducting cost-benefit analyses to compare potential solutions.
- **Outcomes:** By the end of this phase, a preferred material solution is identified, and there's enough data about its feasibility and affordability to make a decision about moving forward.

2. Technology Development Phase:

- **Purpose:** The objective of this phase is to reduce technology risk, determine the

Regen

Recreate my session?

“Prompt engineering tips –
how to use ChatGPT
for decoding bad diagrams”

...but decided to stick to the
original plan

“How to create diagrams that
don’t need decoding by ChatGPT” ☺

Agenda

1. Why care
2. What makes a diagram effective
3. Practical tips – we'll "refactor" a diagram
4. Creating from scratch – step by step process

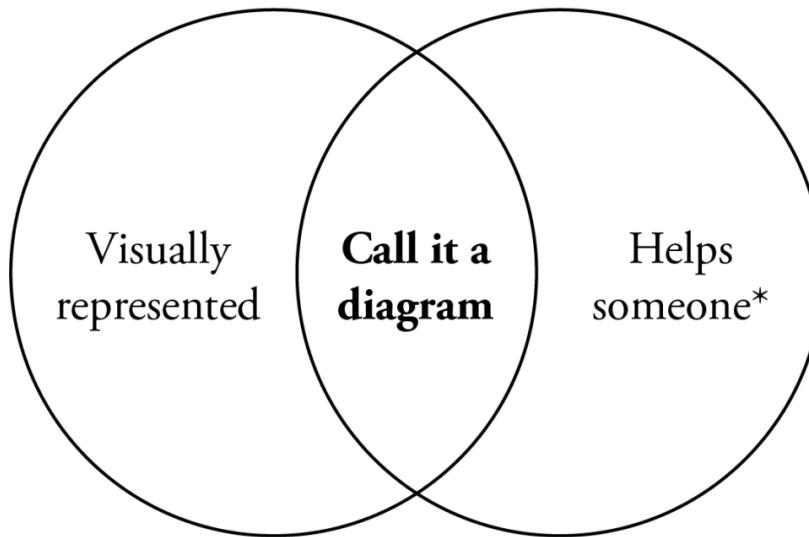
So... what is a diagram?

Define: Diagram

A **visual representation** (using shapes, lines and symbols) of objects, systems, concepts - **organized and connected** in a way aiming to **explain in an understandable** manner **complex** ideas, structures and processes to a certain **target audience**.

Diagram (n.)

a visual representation that helps someone*



* *you are someone*

STUCK?

Diagrams Help.



* you are someone

Abby Covert

Author of How to Make Sense of Any Mess

Stuck?
Diagrams Help.
by
Abby Covert,
J. Benevento

Characteristics of an effective diagram

Characteristics of an Effective Diagram

1. Purposefulness

Has clear intention and objective.

Effectively conveys its intended message or information to its target audience.

2. Clarity

Easy to understand at a glance* (not necessarily everything).

Free from ambiguity*, not causing confusion*.

Essential elements are highlighted, non-essential ones are minimized.

3. Simplicity

Minimal complexity, only as needed. Uncluttered, no information overload.

Prioritizes ease of understanding of the core message or information.

Characteristics of an Effective Diagram

4. Consistency

Consistent design elements, text formatting, labeling, annotating, etc.!
...so it's easy to compare and understand different parts of the diagram.

5. Readability

Easily readable text!
Only terms and acronyms understandable by the target audience!

6. Logic

Everything – an object, relation, color, font, etc. – should be there in its form for a reason and should make sense. No room for interpretation should be left!

Characteristics of an Effective Diagram

7. Visual Appeal (“nice to have”- but at least, should not be appalling 😊)

Use colors, shapes, symbols, images, alignment, etc. design elements - to make it feel good to see the diagram, to enhance understanding and to make the information more memorable.

8. Hierarchy

A clear hierarchy of elements – using position, grouping, size, color, and other design elements – to show the relative importance of the elements.

9. Accurate Relationships

Should represent accurately the relationships between different elements or concepts being depicted.

Agenda

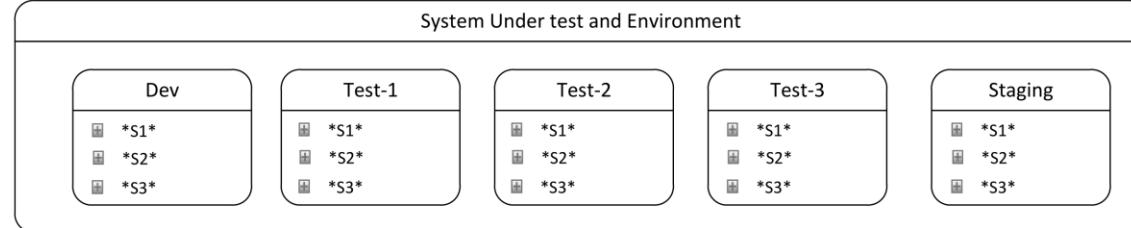
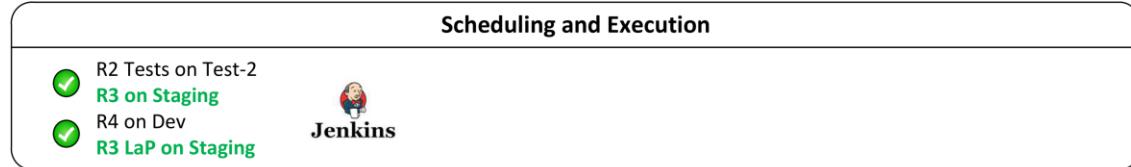
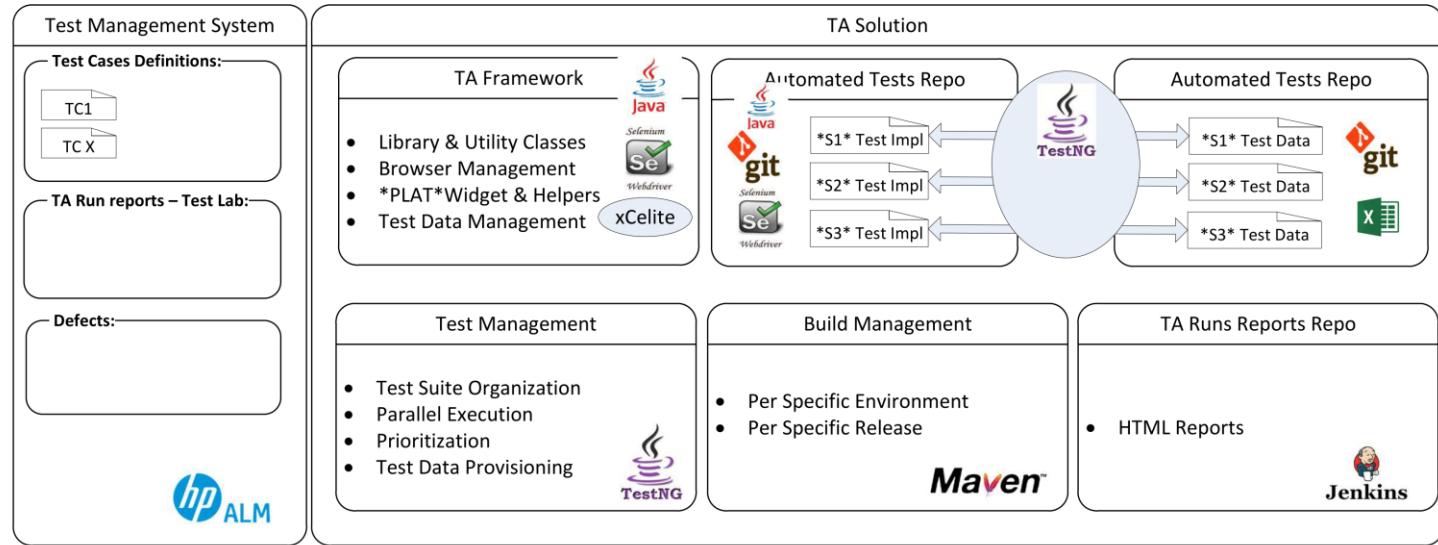
1. Why care
2. What makes a diagram effective
3. Practical tips – we'll "refactor" a diagram
4. Creating from scratch – step by step process

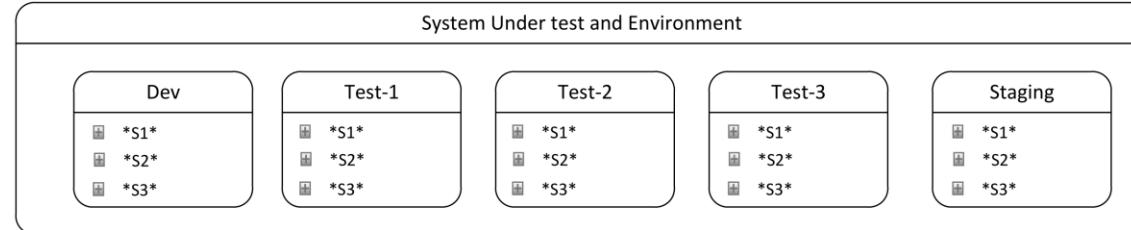
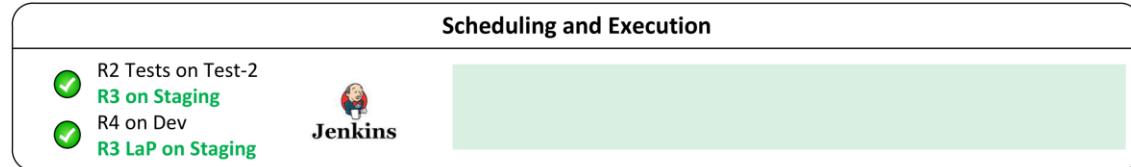
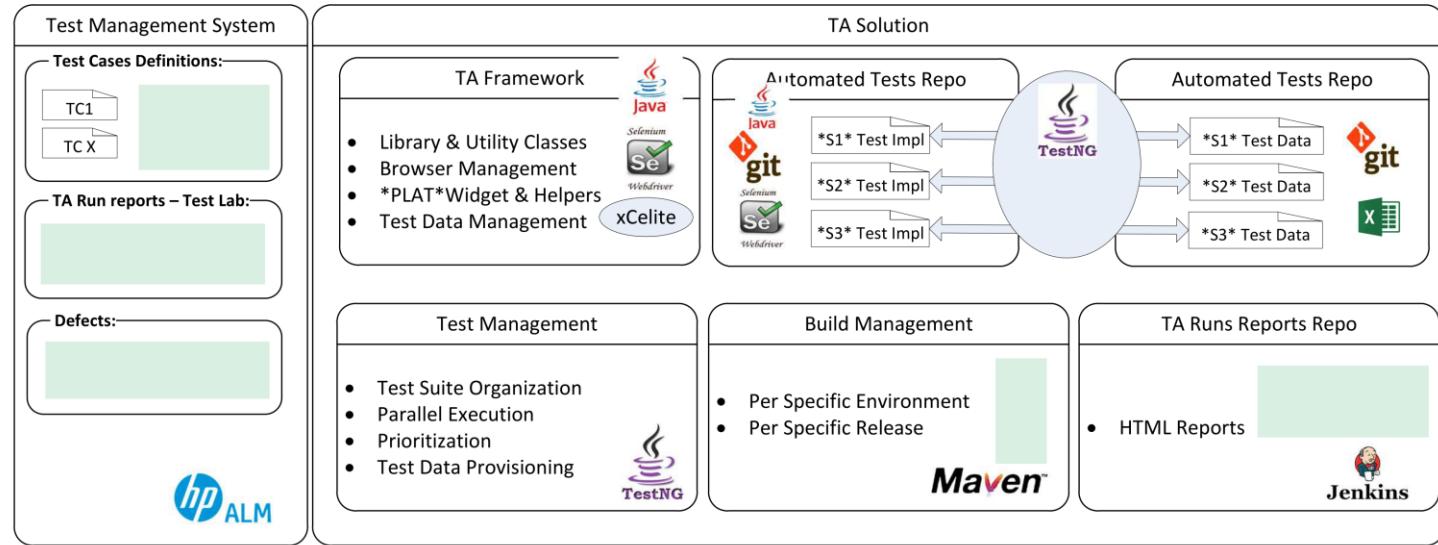
Practical Tips

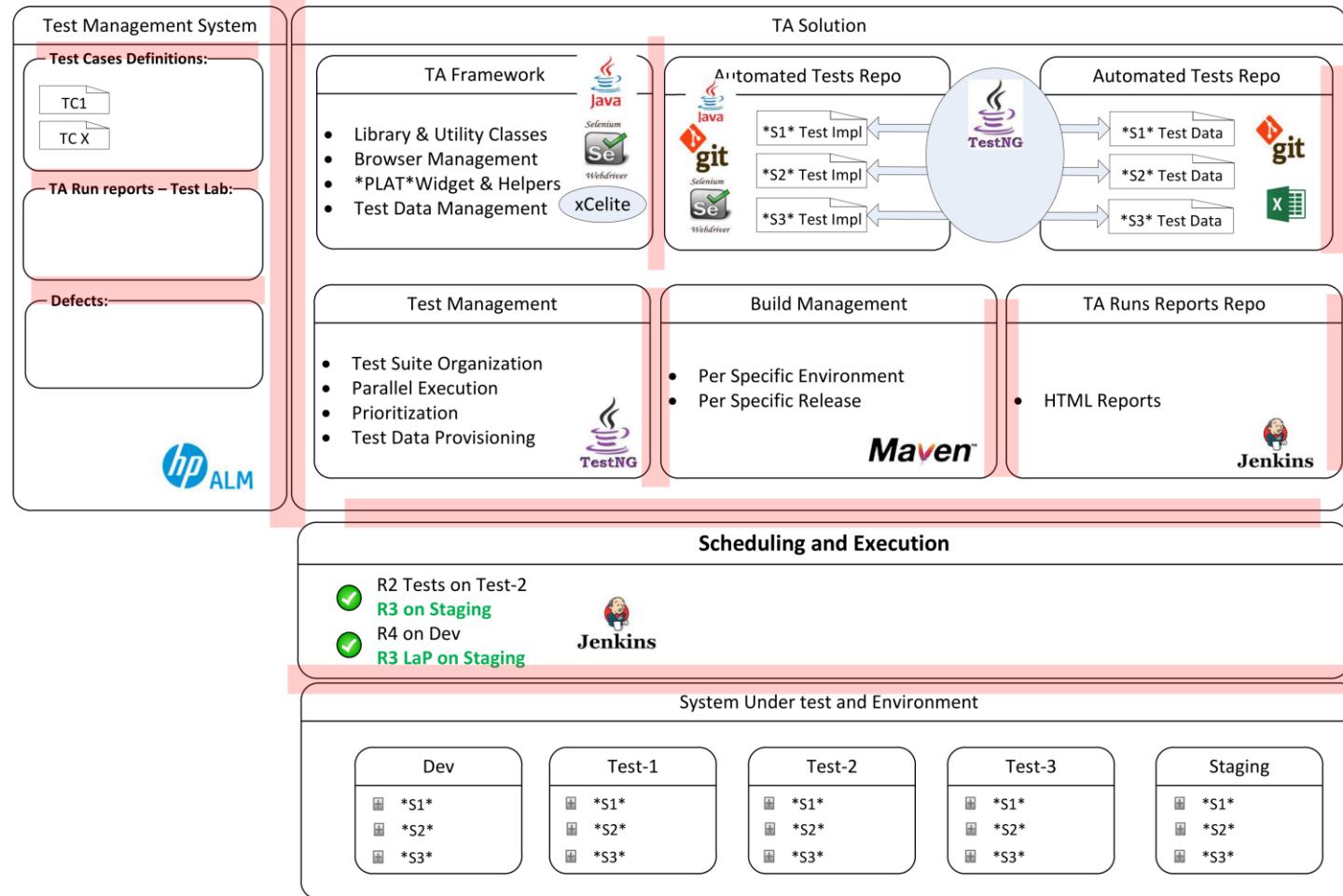
1. White Space

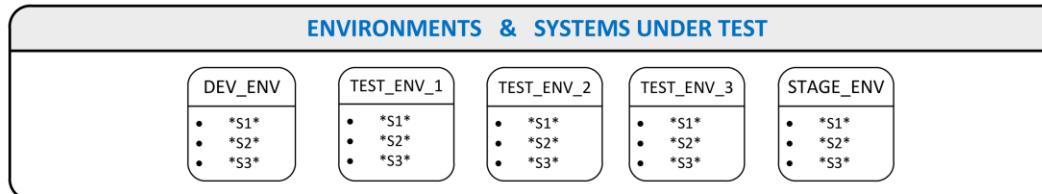
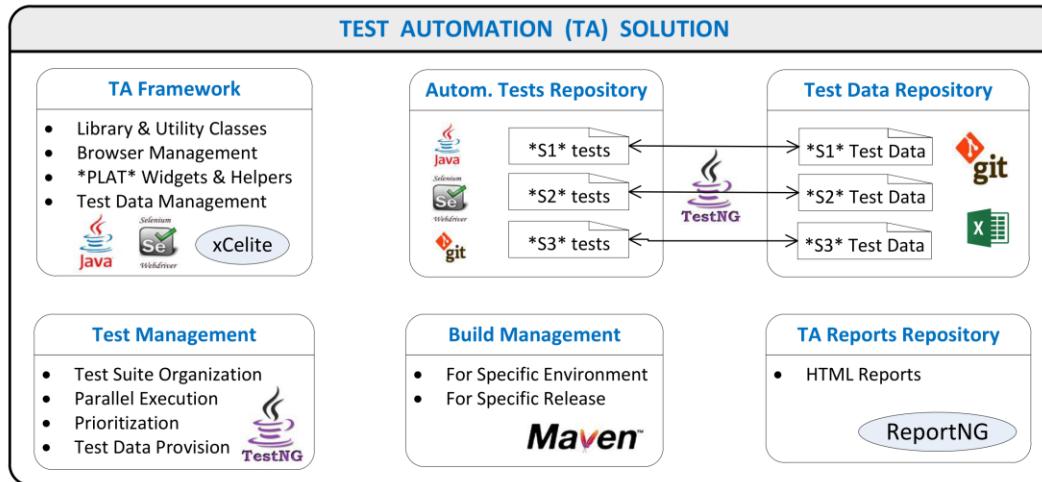
Your best friend and also your enemy.

Use it wisely – for achieving distinction, but not allowing a scattered layout.









Practical Tips

1. White Space

Your best friend and also your enemy.

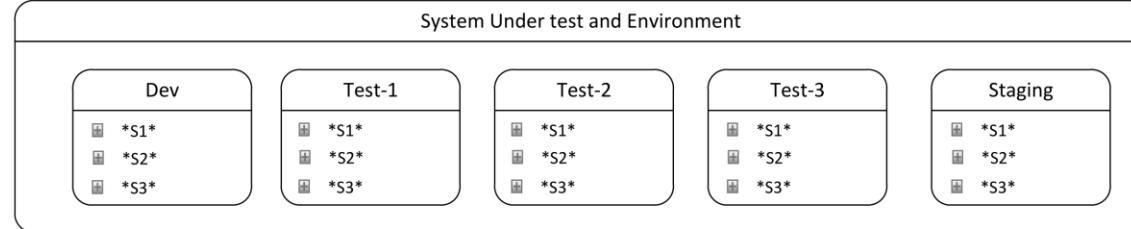
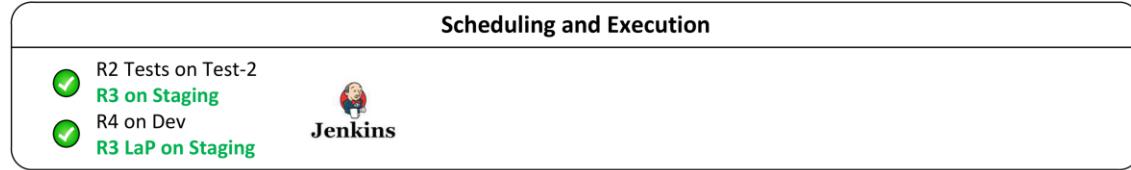
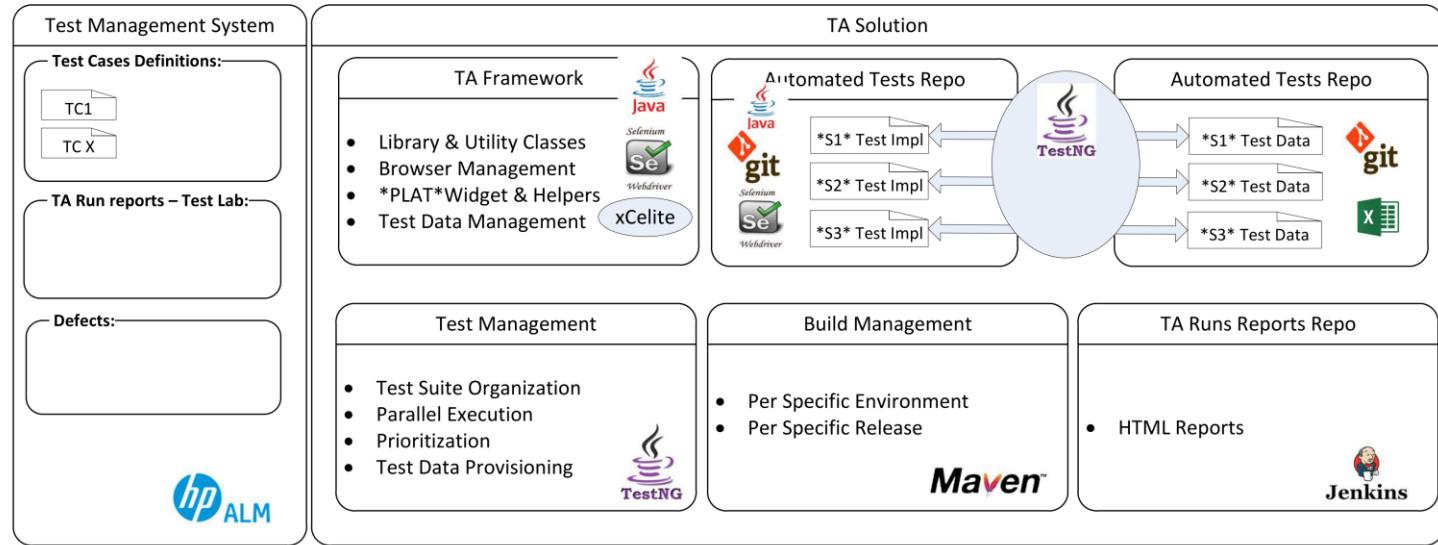
Use it wisely – for achieving distinction, but not allowing a scattered layout.

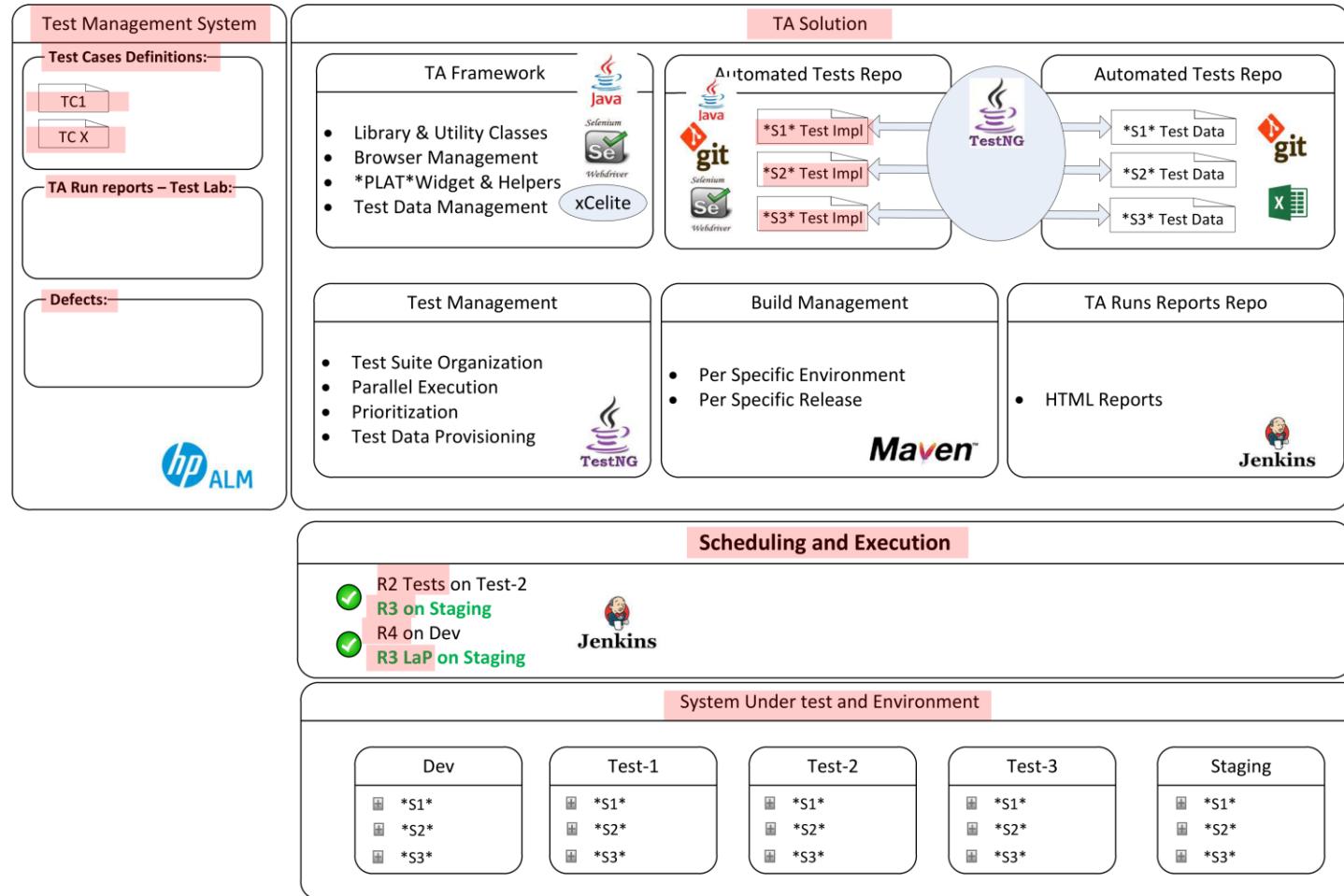
2. Labeling and Annotations

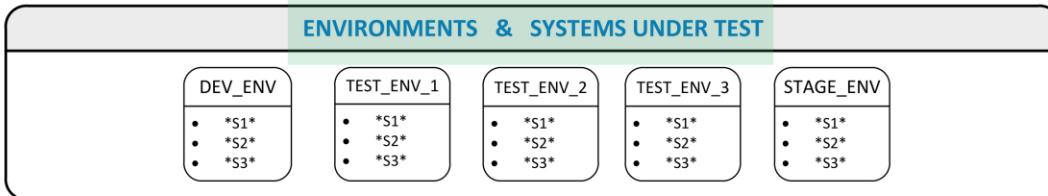
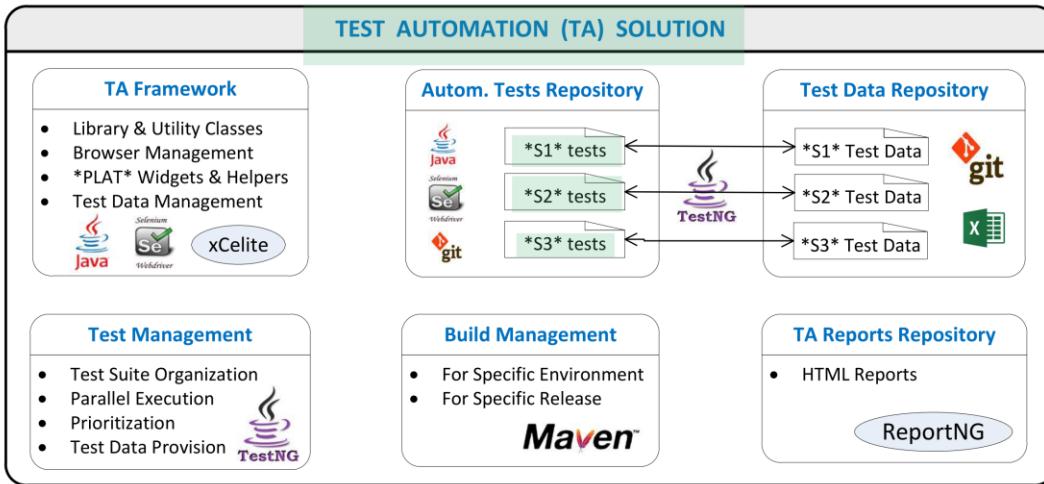
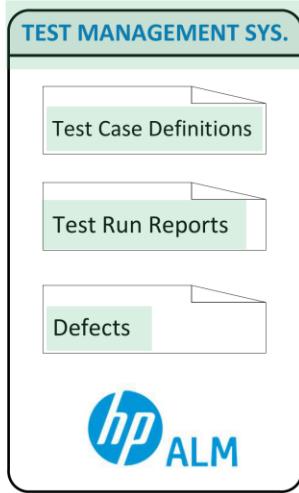
Fonts – as big as possible.

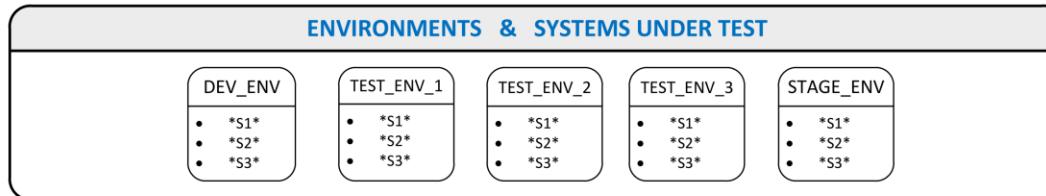
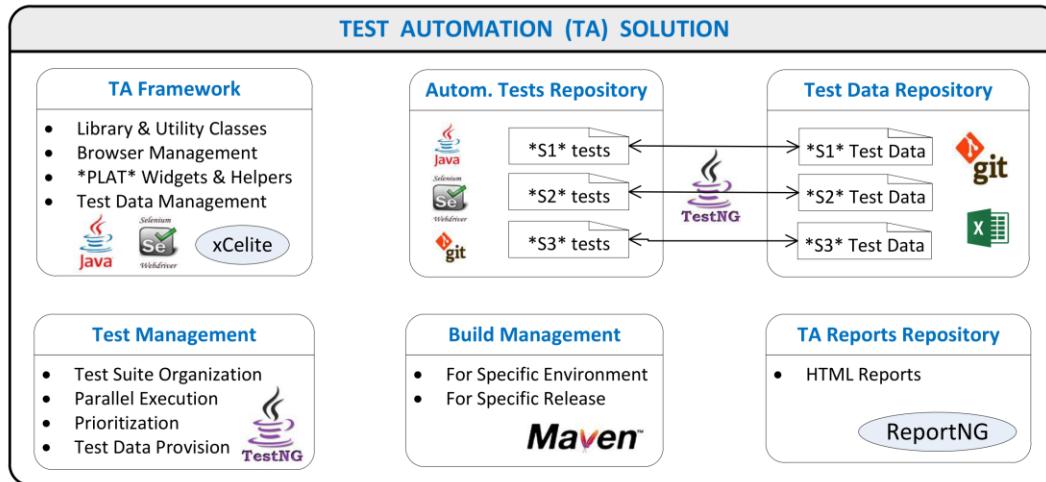
Avoid abbreviations and acronyms.

Be brief and concise – but explicit! (it's a challenge)









Practical Tips

1. White Space

Your best friend and also your enemy.

Use it wisely – for achieving distinction, but not allowing a scattered layout.

2. Labeling and Annotations

Fonts – as big as possible.

Avoid abbreviations and acronyms.

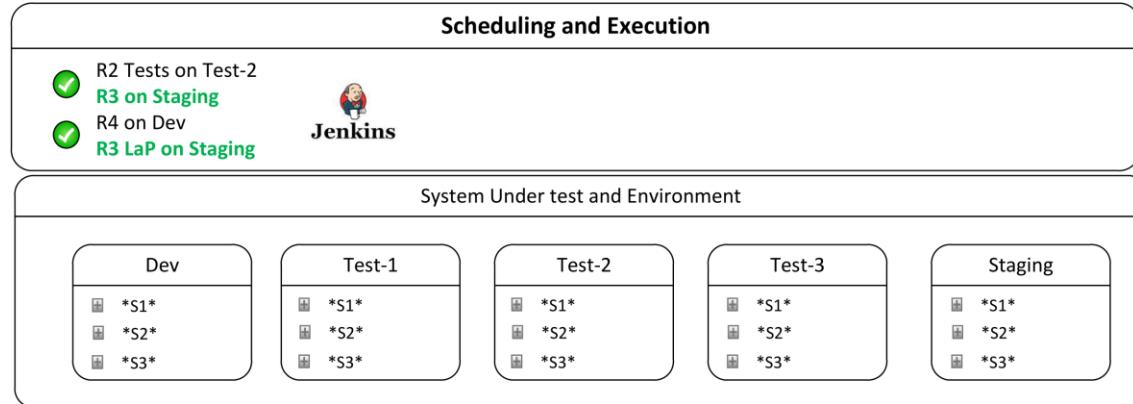
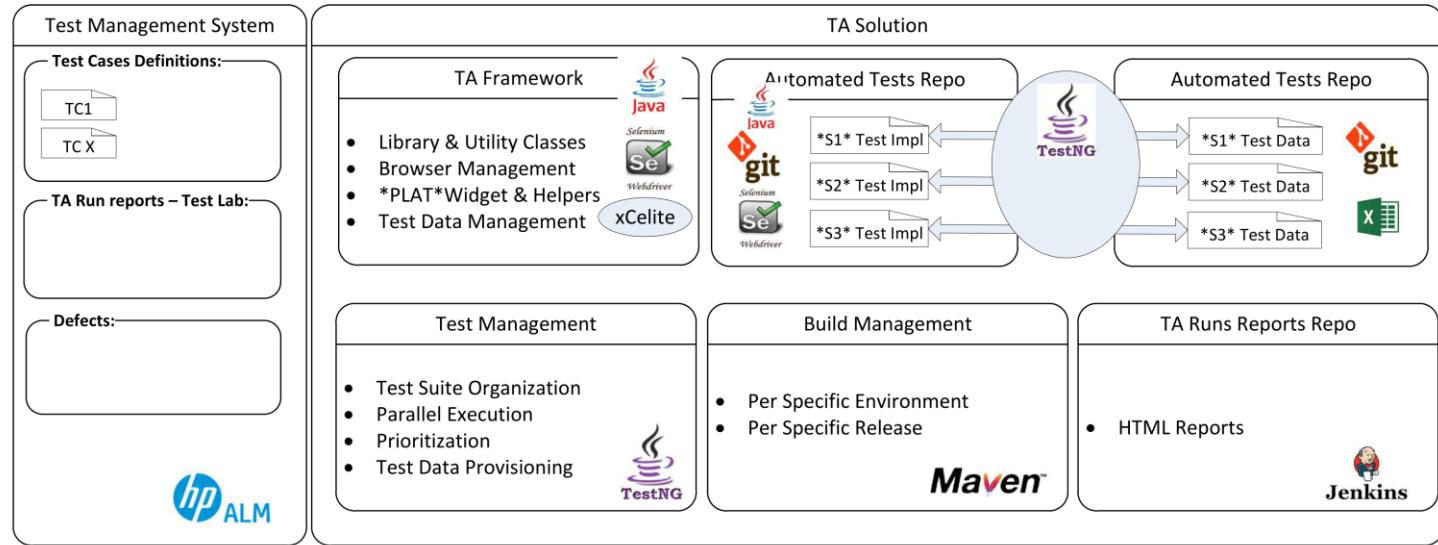
Be brief and concise – but explicit! (it's a challenge)

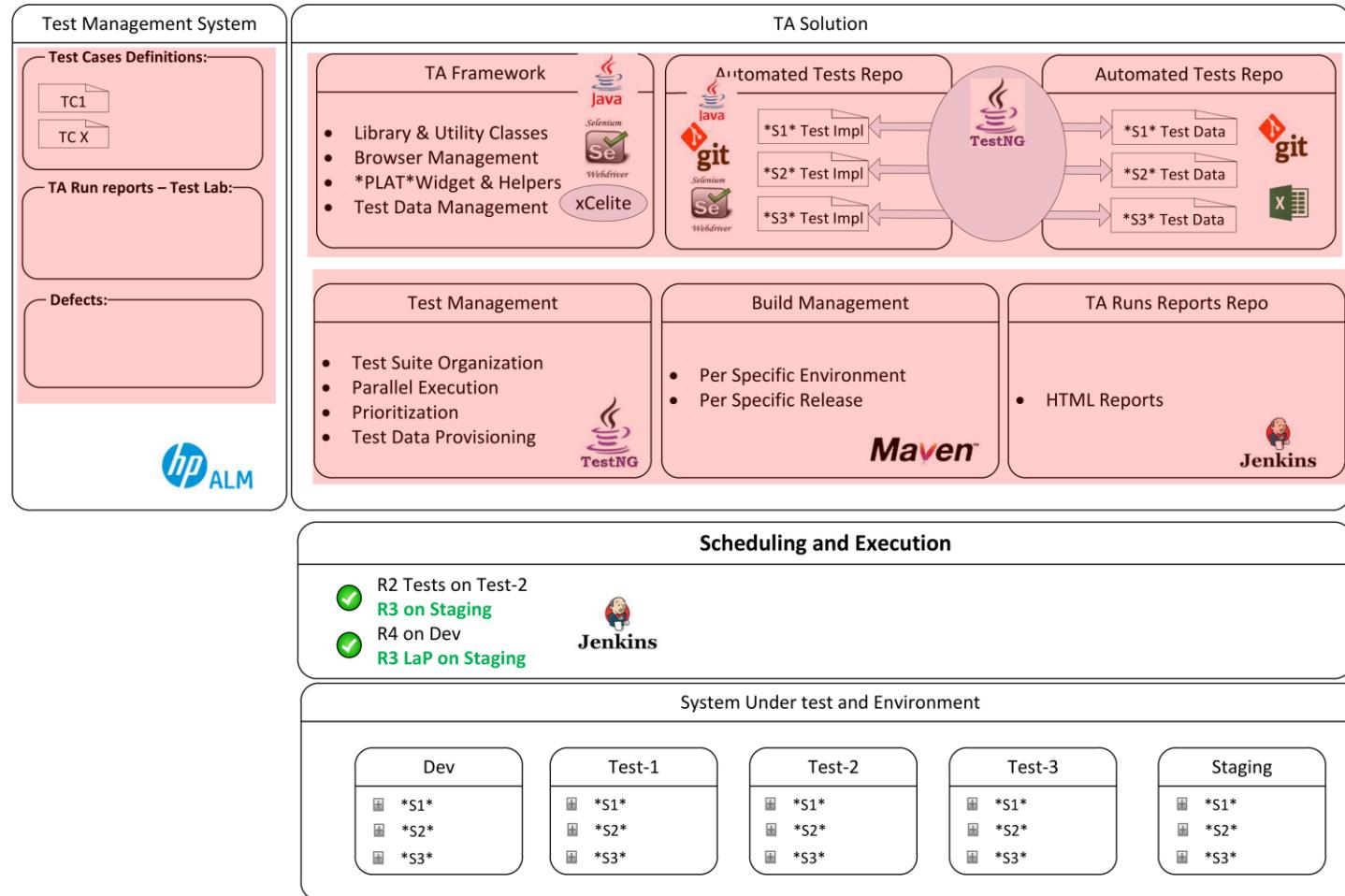
3. Size of Elements

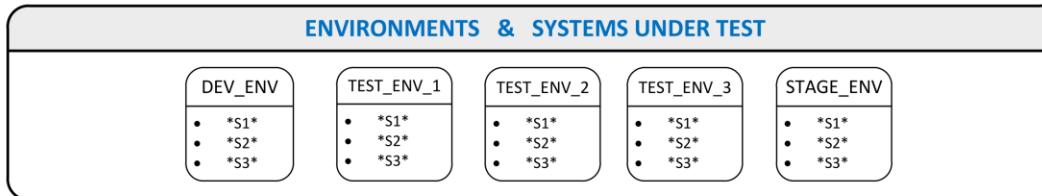
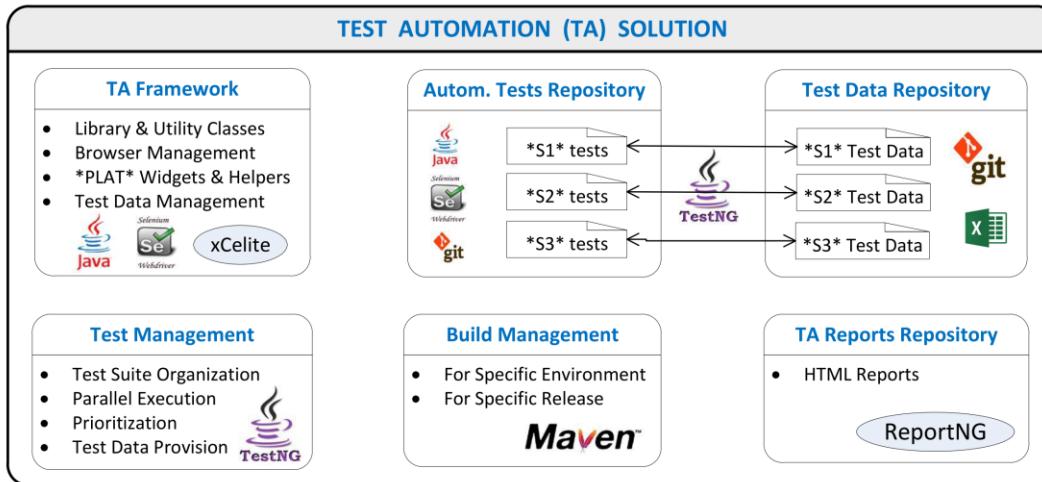
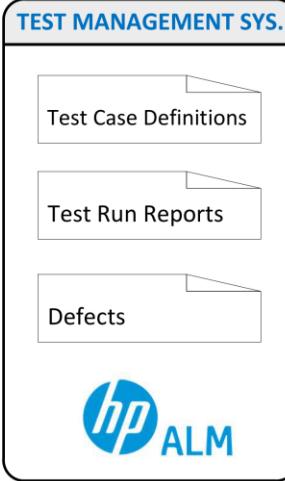
Not bigger than needed.

Plays a critical role in conveying the relative importance of different elements.

Helps for readability.



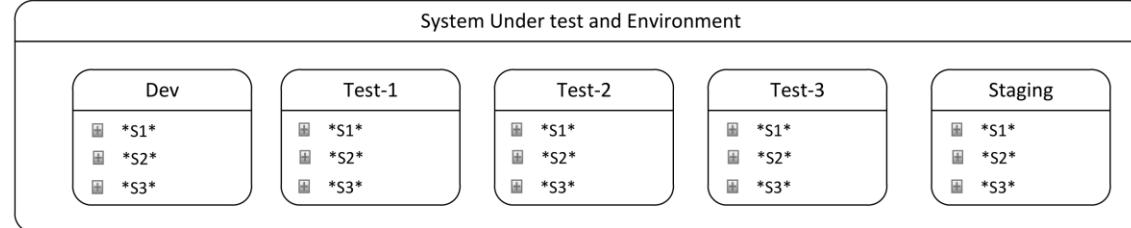
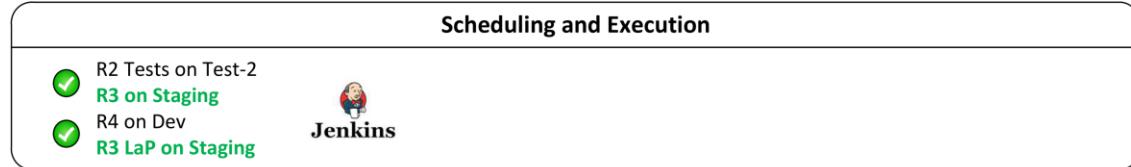
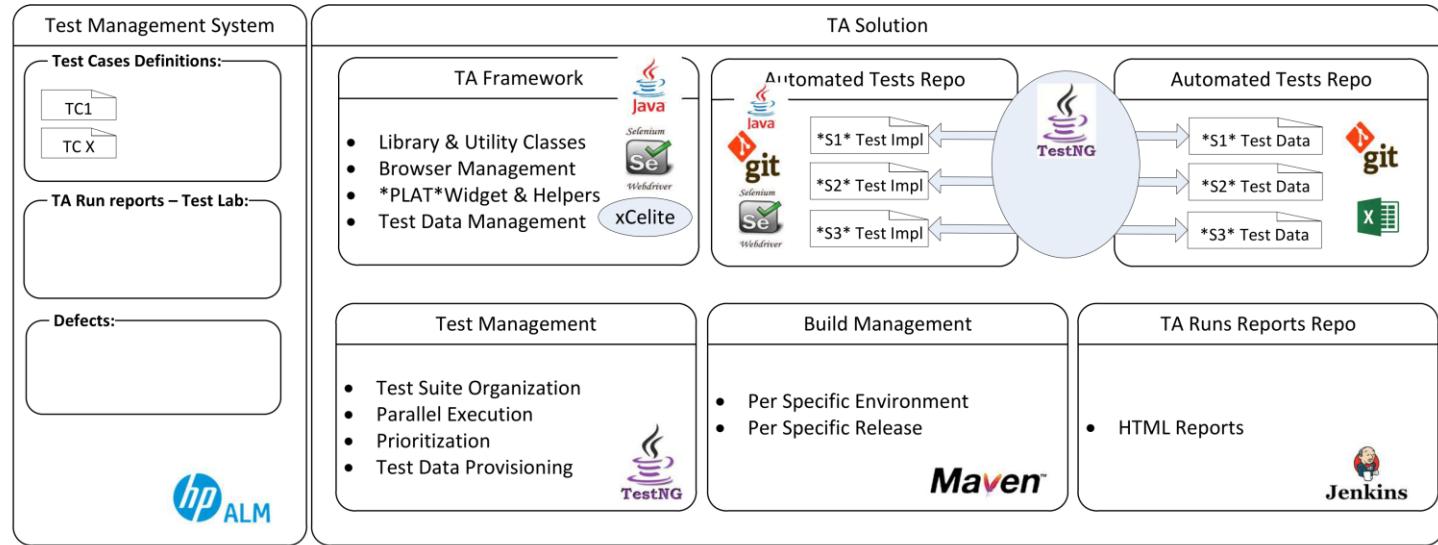


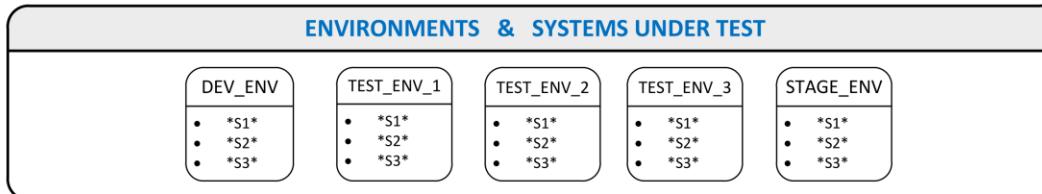
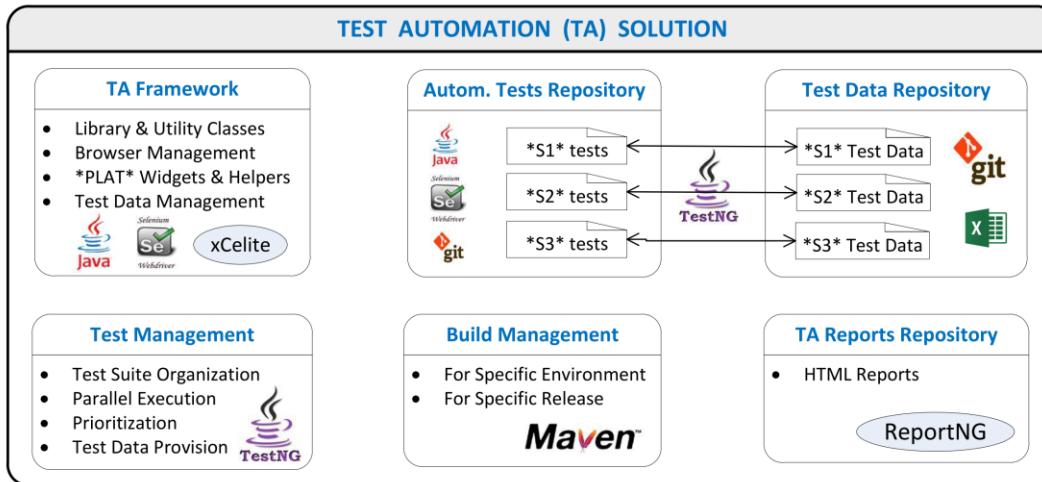


Practical Tips

4. Lines – Borders of Elements & Relations/Arrows

Thicker vs. Thinner, different colors, dotted, dashed.
Don't forget you can use them to convey a message.





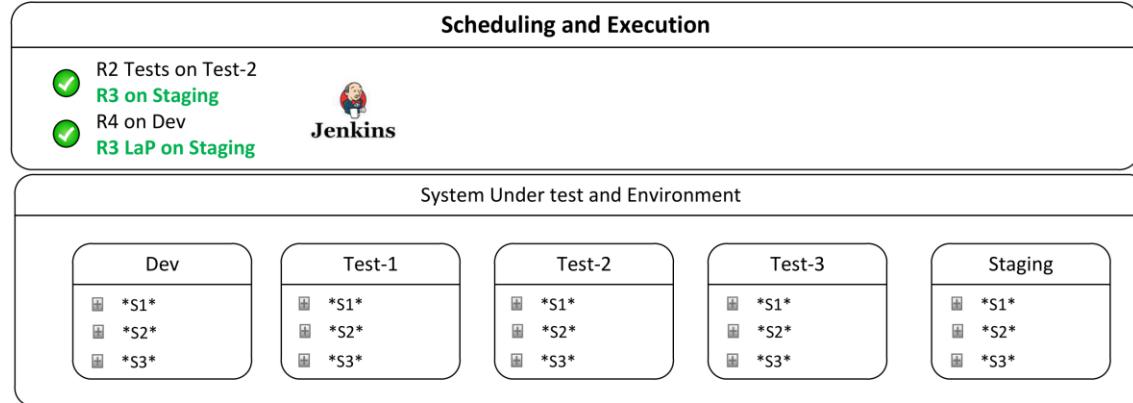
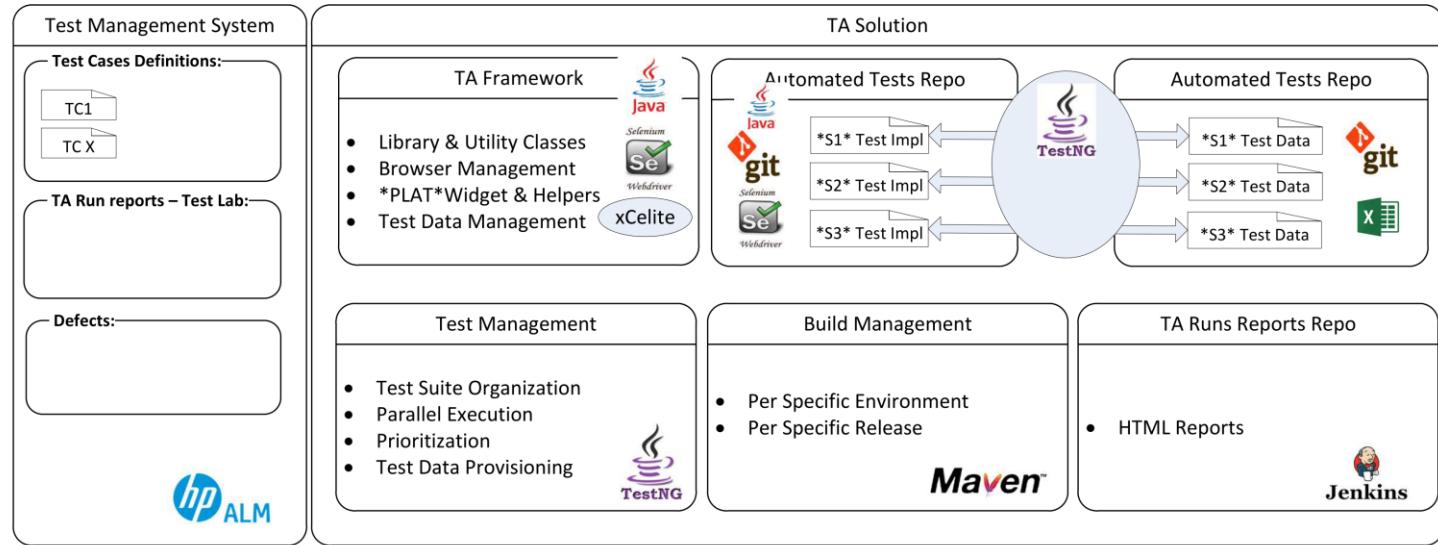
Practical Tips

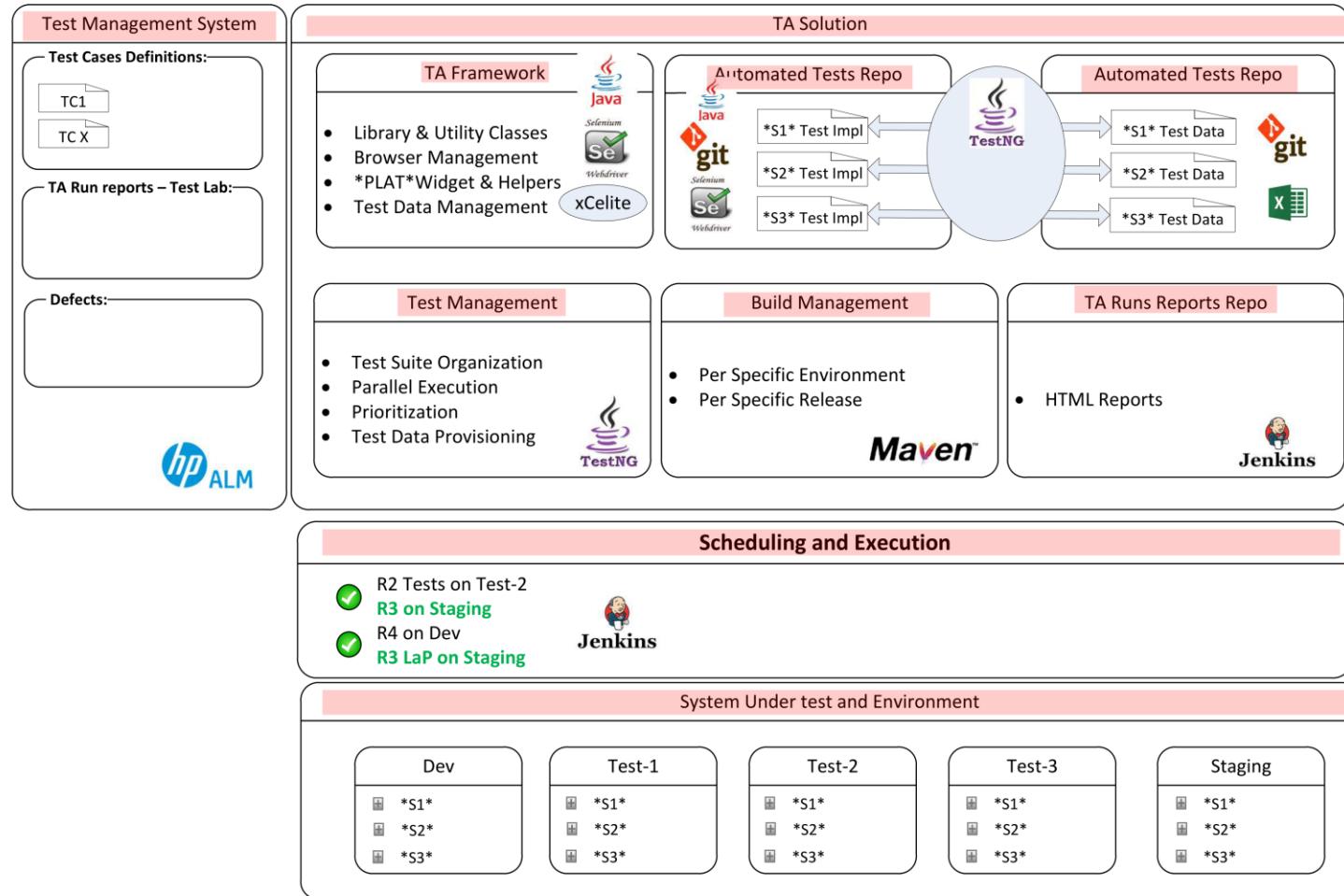
4. Lines – Borders of Elements & Relations/Arrows

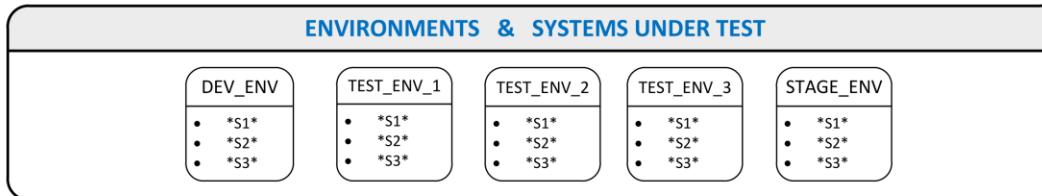
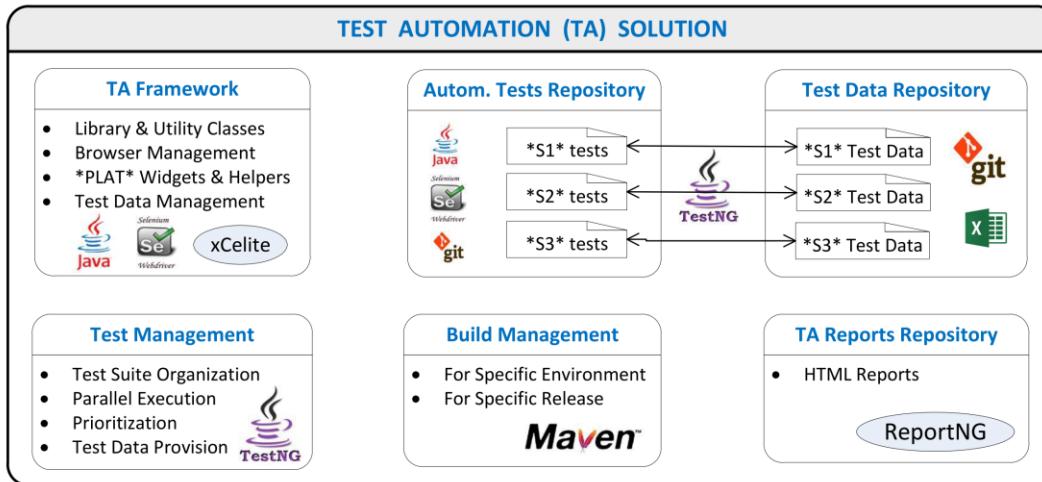
Thicker vs. Thinner, different colors, dotted, dashed.
Don't forget you can use them to convey a message.

5. Color – Background, Font

Don't forget you can use them to convey a message.
Don't use many colors just for the sake of having colors in the diagram.







Practical Tips

4. Lines – Borders of Elements & Relations/Arrows

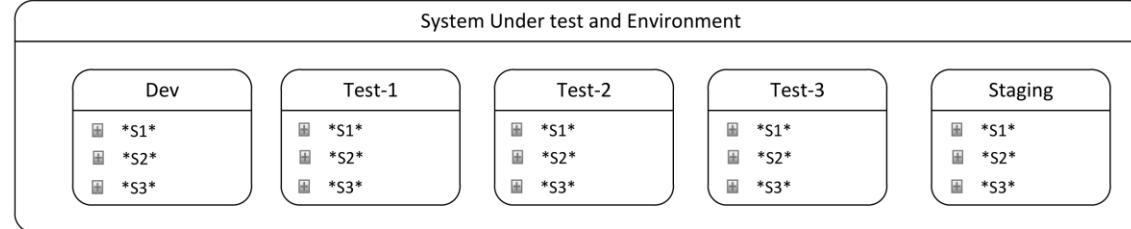
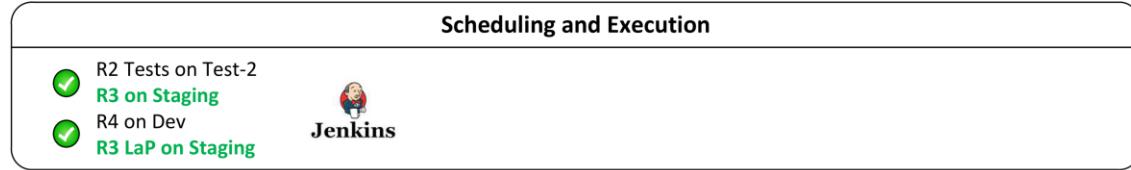
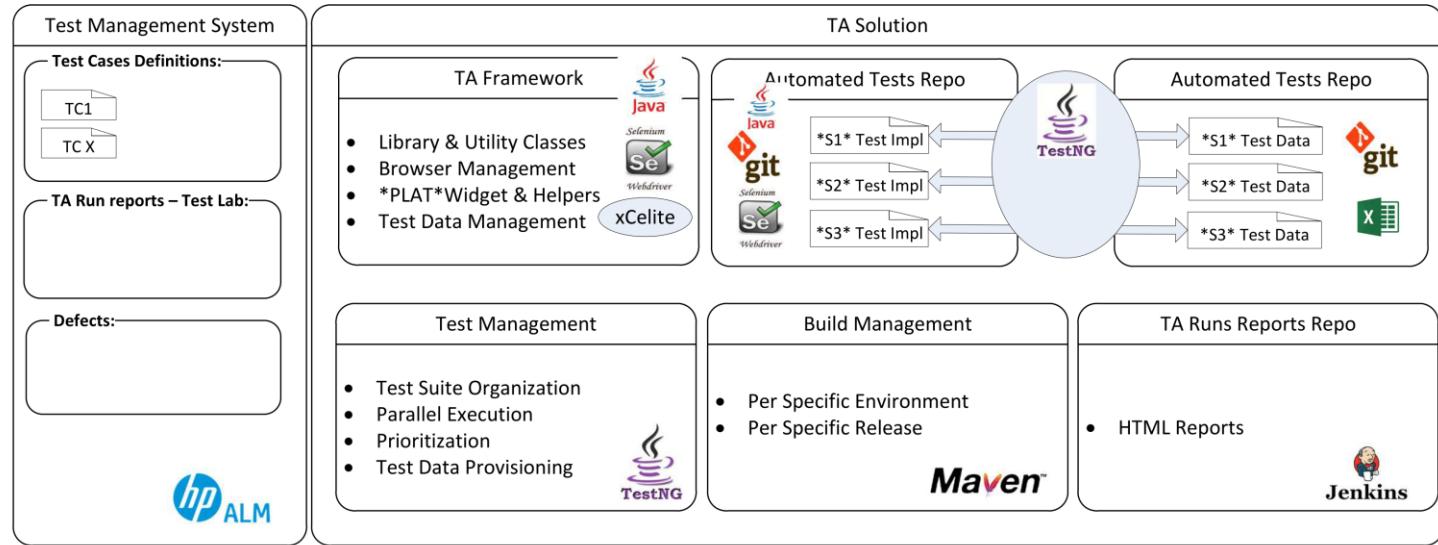
Thicker vs. Thinner, different colors, dotted, dashed.
Don't forget you can use them to convey a message.

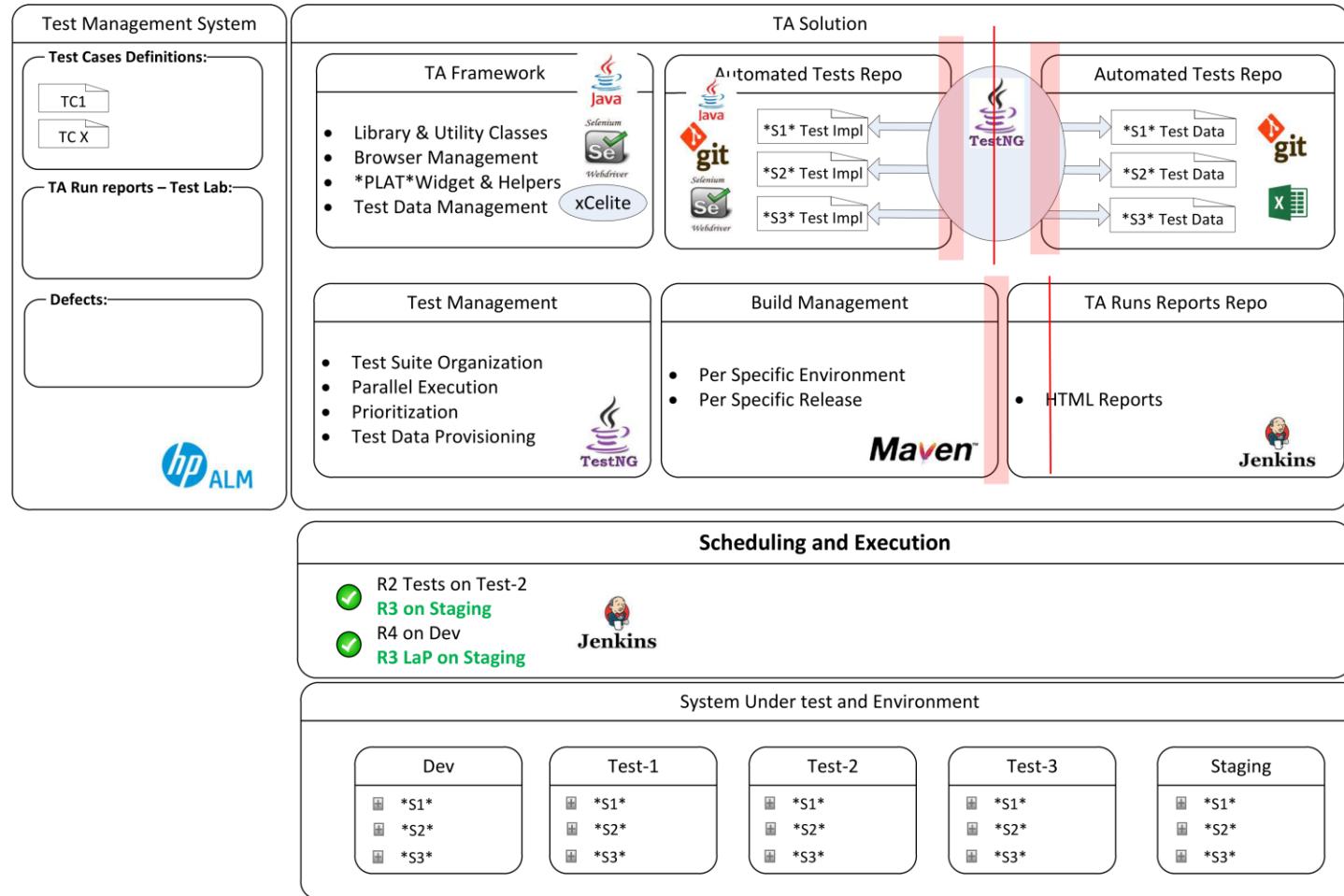
5. Color – Background, Font

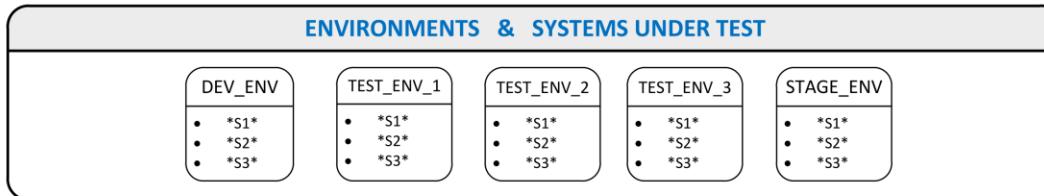
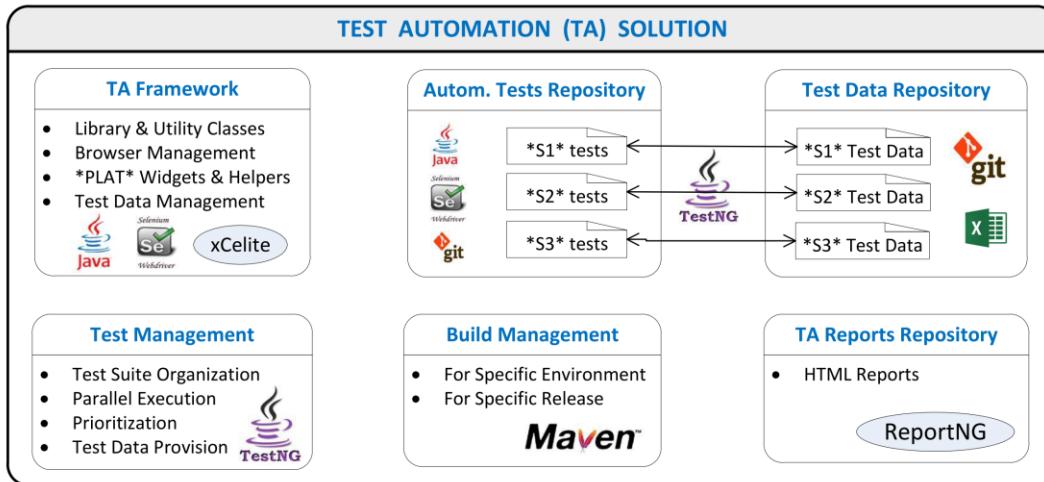
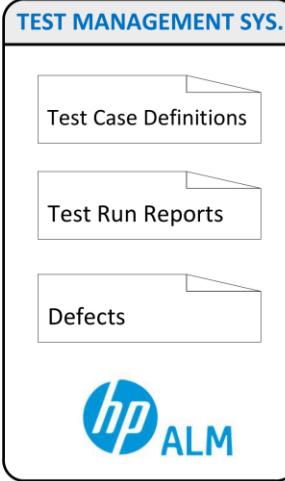
Don't forget you can use them to convey a message.
Don't use many colors just for the sake of having colors in the diagram.

6. Alignment of Elements

Horizontal and vertical.







Practical Tips

7. Every Element, Every Detail – Should be with a Purpose

Nothing should be there if it doesn't add value to the purpose and to the effectiveness of the diagram.

The same is valid for every design decision (color, type of arrow, etc.)

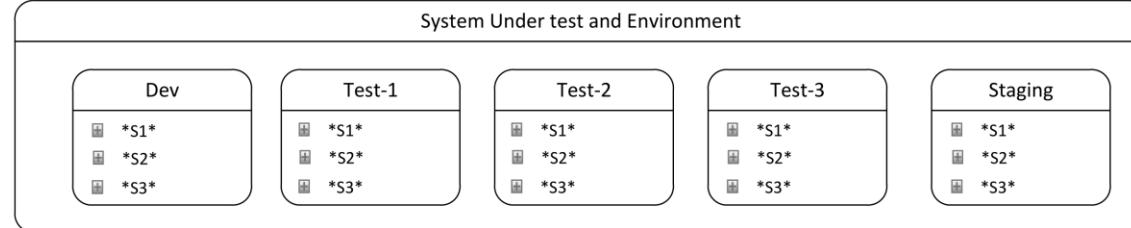
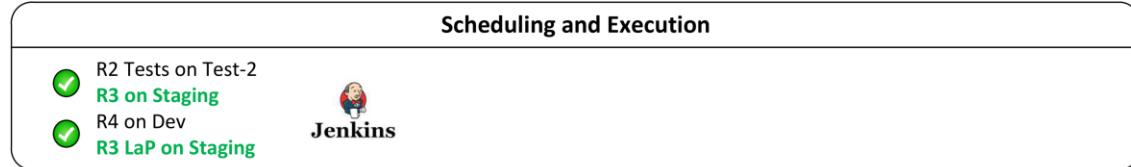
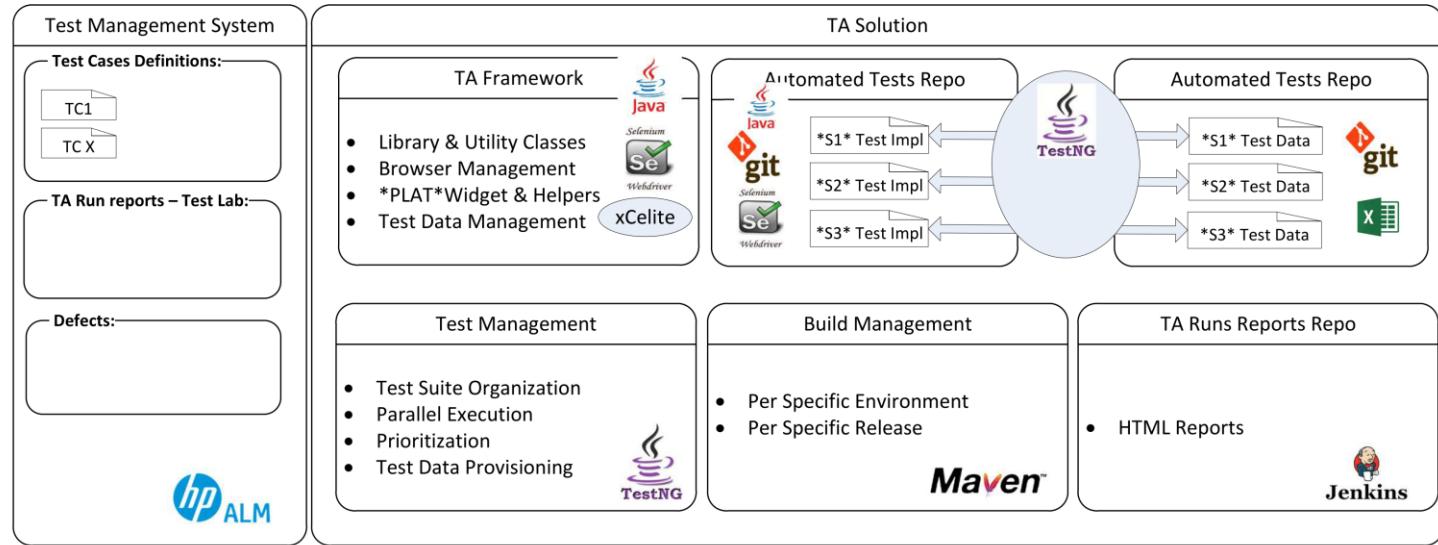
8. Symbols and Images

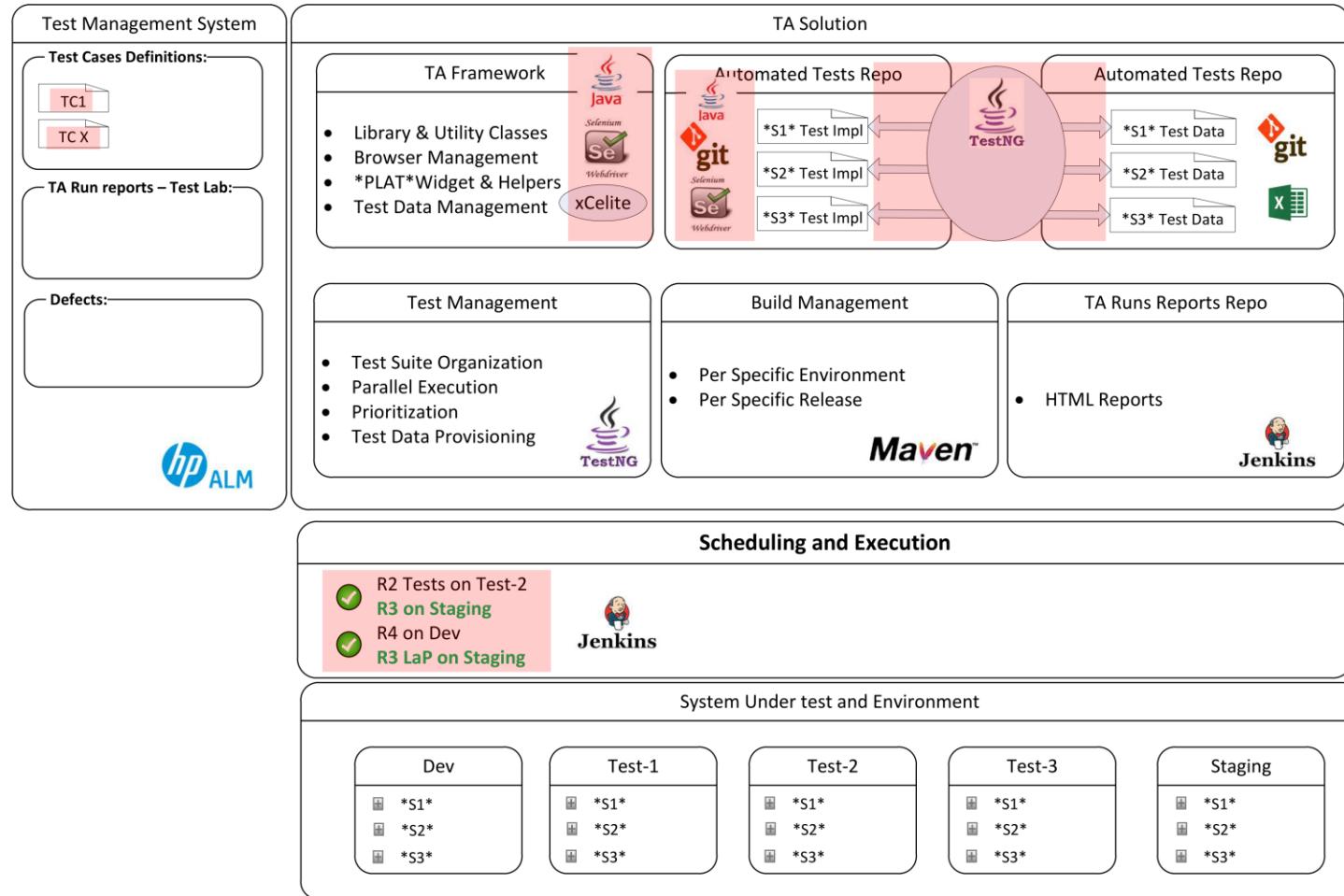
Much more easily comprehensible and memorable.

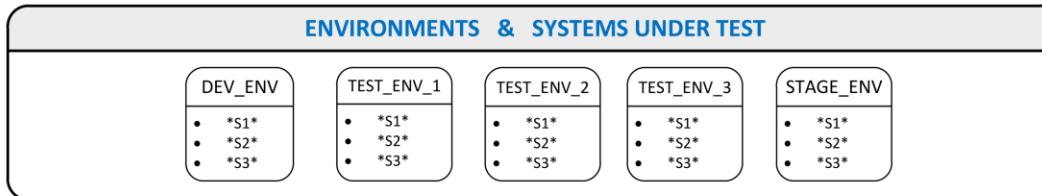
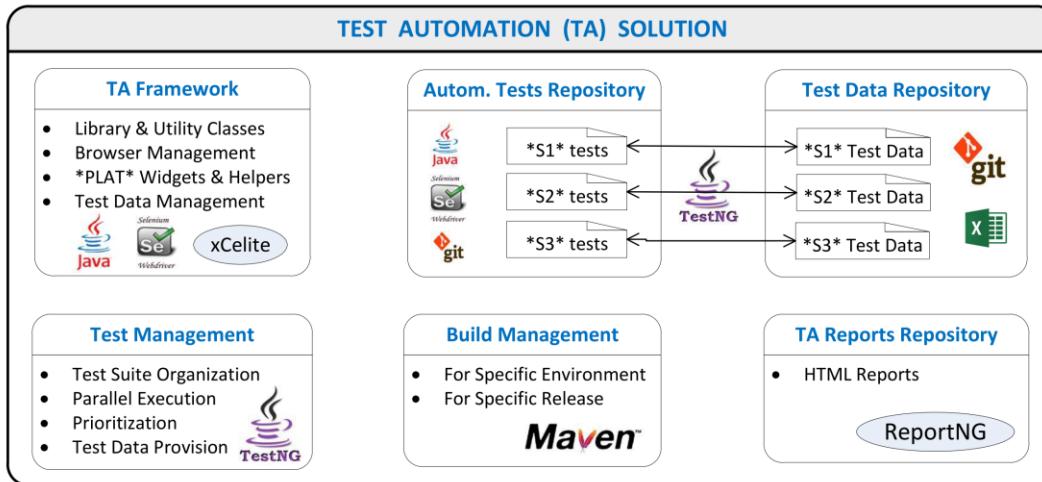
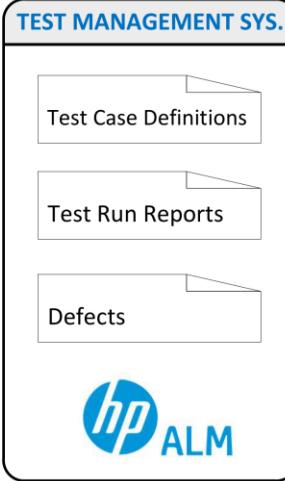
Strike a balance – don't clutter the diagram with such.

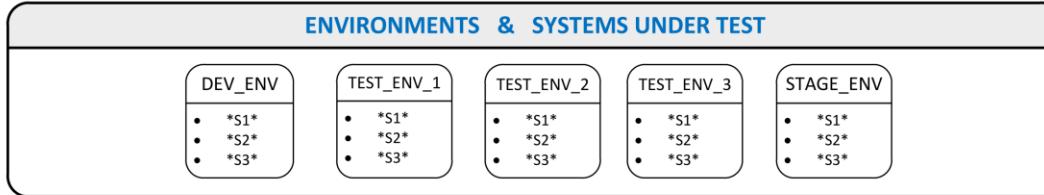
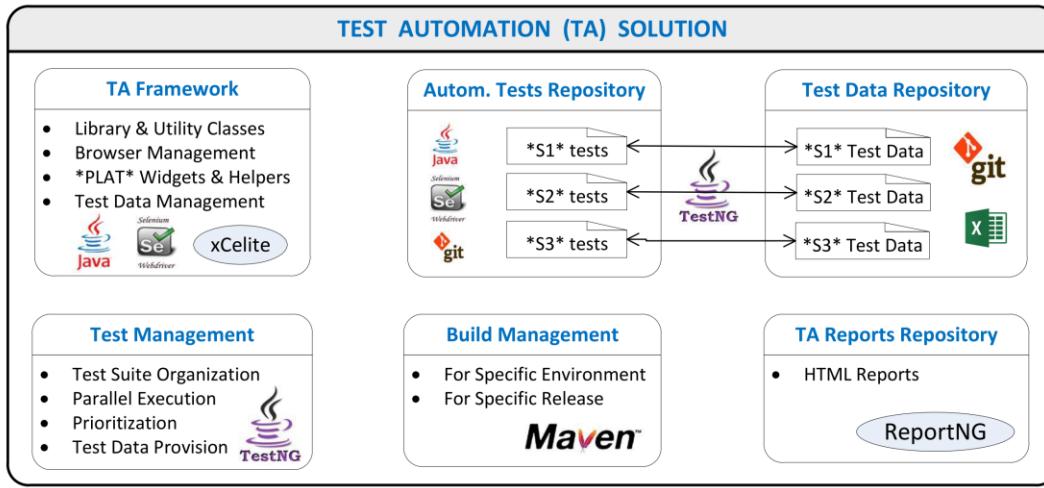
9. Final review – check the characteristics!

Purpose & Target Audience – Always keep them in mind!

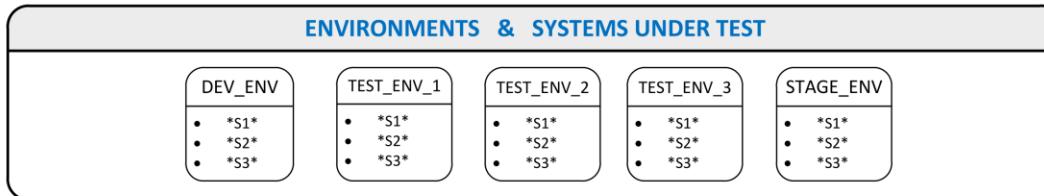
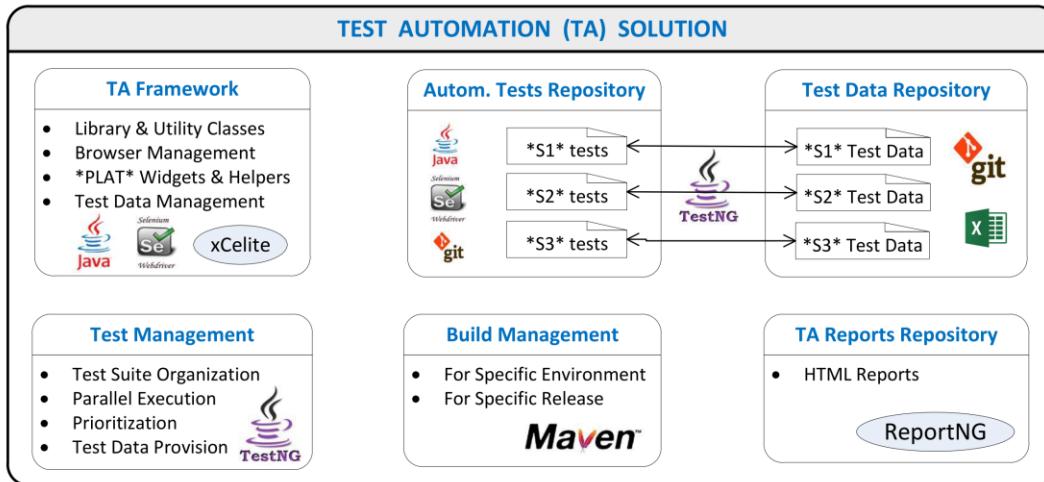
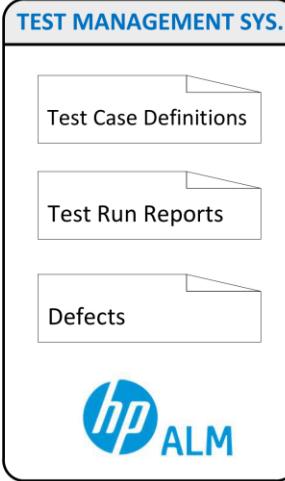








- 1) Purposefulness
- 2) Clarity
- 3) Simplicity
- 4) Consistency
- 5) Readability
- 6) Logic
- 7) Visual Appeal
- 8) Hierarchy
- 9) Accurate Relationships



Agenda

1. Why care
2. What makes a diagram effective
3. Practical tips – we'll "refactor" a diagram
4. Creating from scratch – step by step process

Creating an Effective Diagram from Scratch

1. Define Purpose

Explanation or Reference? What is the main object/system/process/etc. you will be visualizing?

2. Define Target Audience

What is the profile or profiles of the people you are preparing it for?
What do you assume they know? What do you assume they don't know?

3. List the Items to be Included

Before starting to draw, list the items you will need to include.
List what else you'd need to include (e.g. relations, flows, etc.)

Creating an Effective Diagram from Scratch

4. Choose Type of Diagram

Based on the purpose of the diagram, its object and target audience – consider what type of diagram to create.

5. Consider & Determine High-level Layout

Having in mind the items you'd need to present, logical grouping and volume in each group, flows, etc. – consider what layout would work best (which items/groups to be on the left/right and top/bottom part of the page).

6. Start Drawing /yes, not sooner... just like with programming ☺ /

Add visual elements. Don't focus initially on detailed labeling and annotation.

When done with all visual elements, label and annotate fully.

Creating an Effective Diagram from Scratch

7. Review (use a checklist) & Refine

Go through a checklist – and see if the diagram can be optimized for clarity, consistency, etc. important characteristics of an effective diagram.

Look at the purpose definition once again – and check if it fulfills it.

8. Get Feedback & Refine

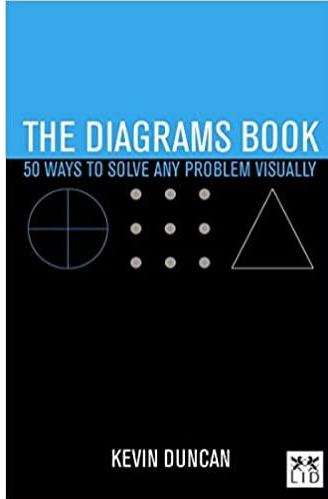
Get feedback from a representative of the target audience for this diagram – check if they can easily get the main message you wanted to convey with the diagram.

Consider any refinements you could do based on the feedback.

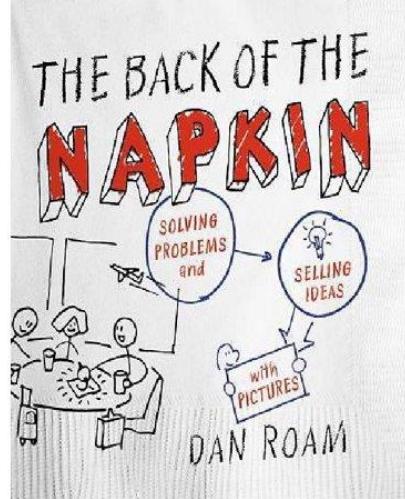
9. Finalize & Save :)

Name, version and date the diagram properly – and store it in the proper place.

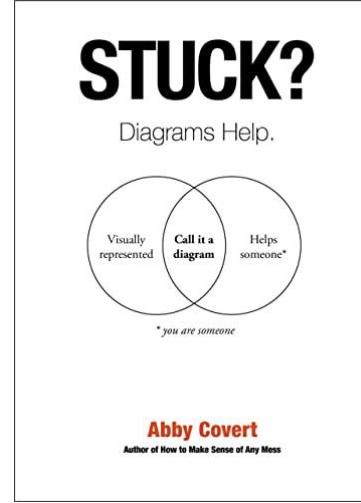
Resources



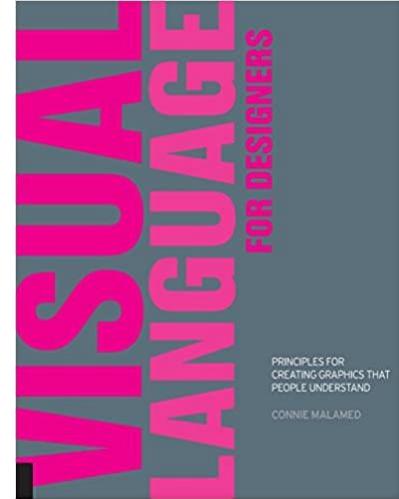
The Diagrams Book: 50 Ways to Solve Any Problem Visually
Kevin Duncan



The Back of the Napkin: Solving Problems and Selling Ideas with Pictures
Dan Roam



Stuck? Diagrams Help.
Abby Covert,
Jenny
Benevento



Visual Language for Designers:
Principles for Creating Graphics that People Understand
Connie Malamed

Online Video Courses

Modeling for Software Architects (2 h 37 min)

<https://www.oreilly.com/library/view/modeling-for-software/9781491935835/>



Software Architecture Fundamentals—Diagramming and Documenting Architecture (0 h 17 min)

<https://www.oreilly.com/library/view/software-architecture-fundamentalsdiagramming/0636920342540/>

Visual Communication: Creating Engaging and Effective Technical Diagrams (1 h 39 min)

<https://www.pluralsight.com/courses/engaging-effective-diagrams-visual-communication>



PLURALSIGHT

Picturing Architecture: UML (The Good Bits) and More (1 h 2 min)

<https://www.pluralsight.com/courses/picturing-architecture-uml>

Blogs

Lucidchart Blog | Category: IT and Engineering

<https://www.lucidchart.com/blog/category/it-and-engineering>

Gliffy Blog

<https://www.gliffy.com/blog>

Draw.io Blog

<https://drawio-app.com/blog/>

Diagramming Tools

Cacoo

<https://nulab.com/cacoo/>

Createley

<https://createley.com/>

Draw.io / Diagrams.net

<https://app.diagrams.net/>

Edraw Max

<https://www.edrawmax.com/>

Gliffy

<https://www.gliffy.com/>

Lucidchart

<https://www.lucidchart.com/>

Omnigraffle

<https://www.omnigroup.com/omnigraffle>

Pencil Project (Open Source)

<https://pencil.evolus.vn/>

Visio

<https://www.microsoft.com/en-ca/microsoft-365/visio/flowchart-software>

yEd Graph Editor

<https://www.yworks.com/products/yed>

Next Steps

Play & Exercise for hands-on experience

- ✓ **Practice with different tools**

Try working with different diagramming tools, such as Visio, Omnigraffle, or Gliffy. This will help you get familiar with different tools and techniques.

- ✓ **Draw flow charts**

Often used in software engineering. Try creating flow charts for simple processes – either imaginary or in the context of your current project.

- ✓ **Visualize data**

Experiment with visualizing data sets – by creating bar charts, line graphs, or pie charts

Play & Exercise for hands-on experience

✓ **Wireframes**

Try creating wireframes for a sample imaginary website or app – or ones in the context of your current project.

✓ **Study & evaluate existing diagrams**

Check the architecture, process and other diagrams available in your project.

Analyze them from the perspective of your newly acquired knowledge – and learn from the good and the bad parts you'll see there.

✓ **Create diagrams in your project**

Either engage with tasks for diagram preparation in your project – or if there are no such, then you identify diagrams that could be very useful, and create them.

Experiment with your new skills!



...as appetite comes with eating!



MERCI BEAUCOUP
FOR YOUR ATTENTION ☺!

Iancho Dimitrov



iancho.d@gmail.com



linkedin.com/in/iancho



@iandim

Feedback – thanks in advance!!



bit.ly/Diagrams2025