UNIVERSITATEA DIN BUCUREȘTI

VIRTUTE ET SAPIENTIA

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Course 6
Requirements Analysis and Design Definition

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Agenda

Functional Decomposition

User Stories

Functional decomposition

Definition and scope

Inputs of functional decomposition

Key points

Outputs of functional decomposition

Definition and scope of functional decomposition

Functional decomposition "helps manage complexity and reduce uncertainty by breaking down processes, systems, **functional** areas, or deliverables into their simpler constituent parts and allowing each part to be **analyzed** independently."

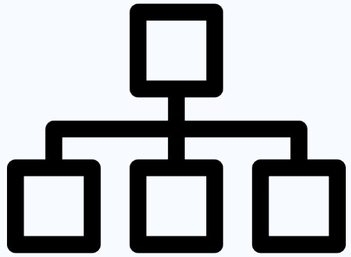
"A Guide to the Business Analysis Body of Knowledge (BABOK® Guide) v3."

Conceptual model of the **full** work to deliver a new business solution

Provides a consistent view of the **functional scope**, but not necessarily the entire scope of work

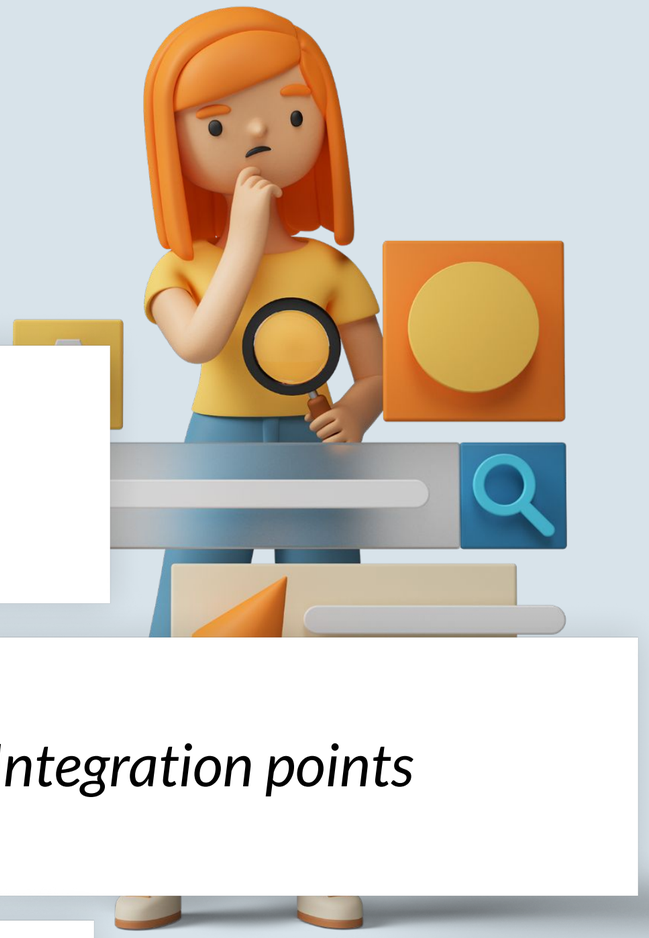
Assists **estimating** in that estimates can be made for smaller chunks of work

The inputs of functional decomposition



- Tender documentation / Project brief
- Market/Domain research
- Interface / document analysis
- Interviews and Requirements workshops

Key points of functional decomposition



- *Goals and objectives*
- *Features and Functionalities*
- *Identifying Roles*
- *Identifying Entities*
- *Integration points*
- *Reports*
- *Implied features*

Set the goals and objectives

The first thing to do is set the goals and objectives:

- identify and set up what are the **expected goals and the objectives**.
- **align the audience expectations**
- **focus the effort** for functional breakdown and building the roadmap towards these goals

Usually, these are stated as opportunities or problems for the company:

Problem: it’s hard for Romanian workers to find jobs abroad

Goal: publish job openings across Europe in a manner that makes them easy to access & comprehend

Set the goals and objectives

Here are a few example questions to get you started in setting the goals of your functional decomposition:

- What do you expect to achieve with launching this app/system?
- What do you want your customers to remember the app for?
- Do you have some specific requirements for this app, specific capabilities or characteristics other apps don’t have?
- What is the desired launch date of the first version?
- What devices do you want to support for your users?
- Who will you target with the new app? Will only private persons use the app or will you have business users?

Identify the features and functionalities

Features are the “tools” used within a system, by the users of the system to enable them to complete a set of tasks or actions.

Functionalities are how those features actually work to provide you with a desired outcome.

When identifying features consider

Different perspectives:

- *Process driven*
- *Data driven*

Use questions like:

- *What does the business need?*
- *What does each user need in order to use the system properly?*

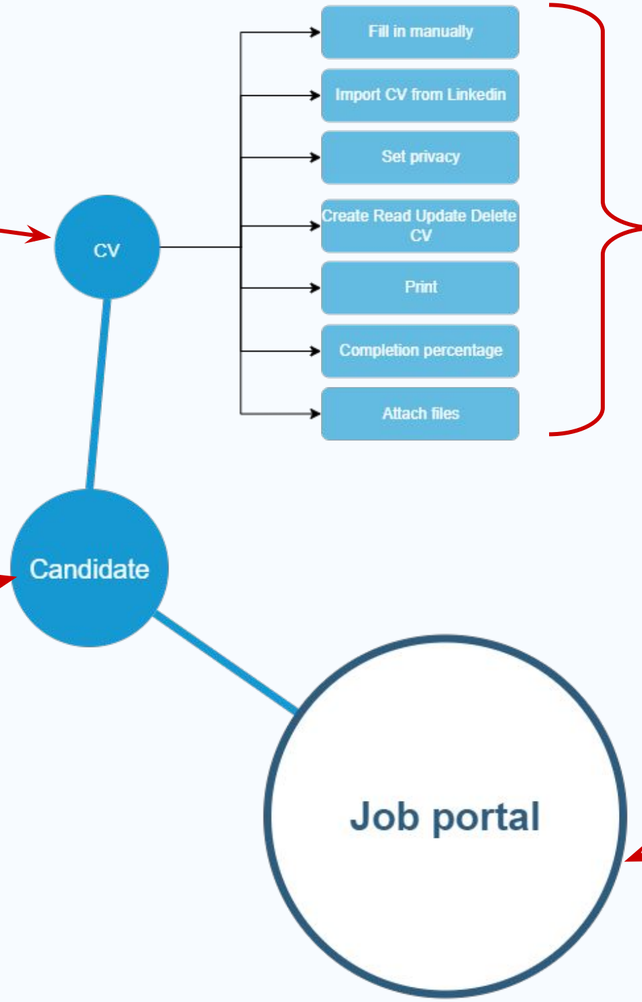
Feature & functionalities example

A feature of the system for a type of user

One of the types of users for your system

A set of functionalities for the CV feature

The system you are looking to build



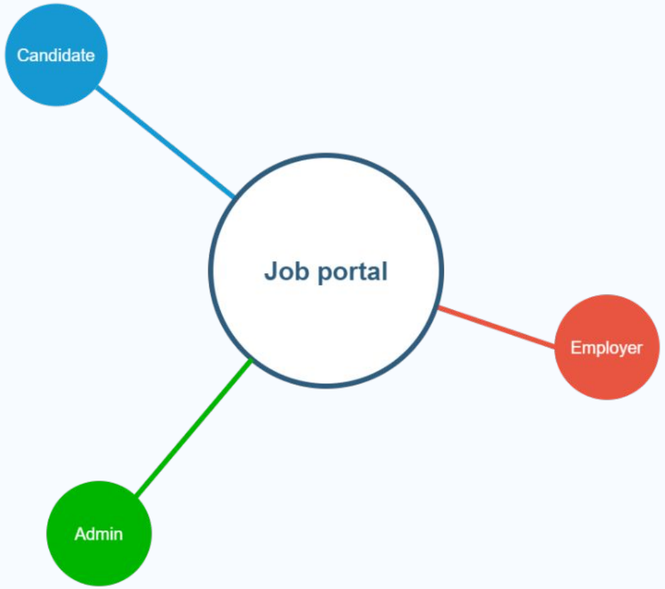
Discover the users and their roles

The **roles, permissions and end users** that will interact with the system determine to a large extent the level of complexity that will govern the system you are building.

It's important to know from the beginning an estimation for:

- *Number of users*
- *Geographical position*
- *Working hours*

- *Different roles*
- *Permissions in the system*



Determine the entities

Any singular, identifiable and separate object in your system's domain is considered an entity of that system. While working on functional decomposition, consider the types of people (users), places, things and concepts, attributes and relationships, important for business.

The CRUD pattern can help you identify your entities:

Determine the entities

CREATE
From external systems
Manually

READ
Each user may have different views of data

UPDATE
Flow updates, entity lifecycle
Automatic updates

DELETE
Logical delete
Physical delete

	Create	Read	Update	Delete
Department	Manually	List view Detail view Organizational chart	Manually	Physical
Employee	Who and How?	Who and How?	Who and How?	Who and How?
Project	Who and How?	Who and How?	Who and How?	Who and How?

Identify the integration points

Integration points are points at which information or documents are exchanged between your system and other systems.

Here are some clues to identify integration points:

- Internal systems that the client is currently using and might be communicating with the new one
- **External systems**
- **Different types of data sources** that might be integrated using e.g. an API, excel/csv file; an initial database that should incorporated into the system, feeds, etc.

Discuss required reports

Represent aggregation of data in different shapes.

- Does the client need reports?
- If yes, how many and what's their complexity?

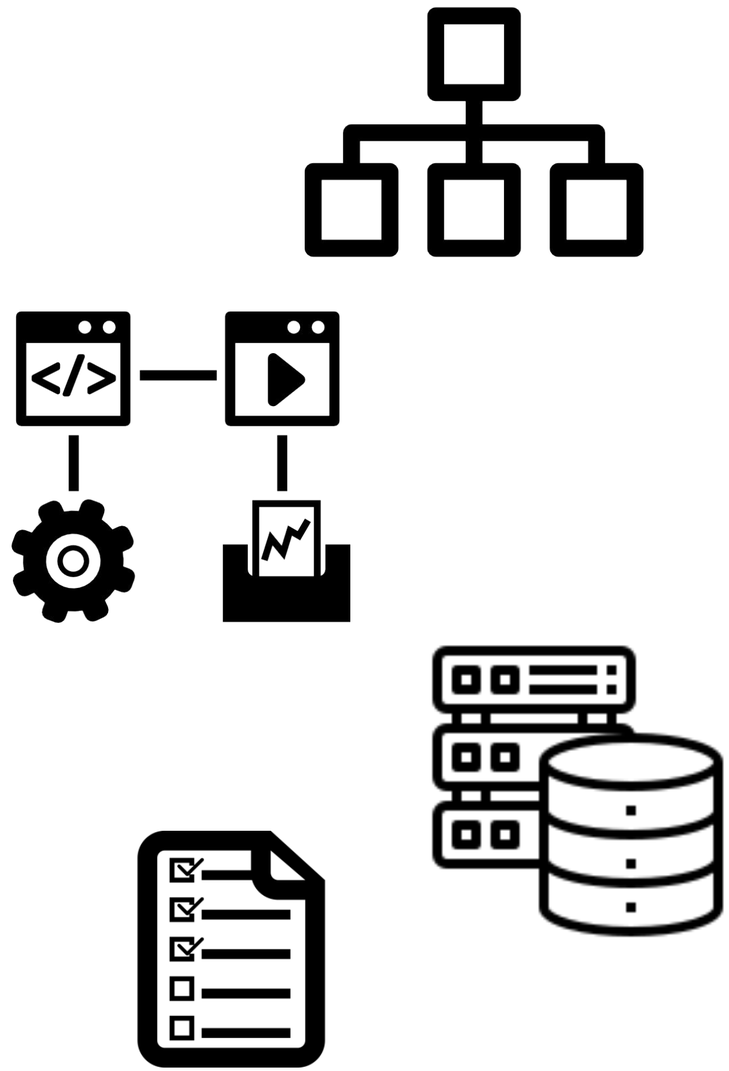
Consider the following when determining reports complexity:

- Do they imply data aggregation or are just a simple export?
- Number of records present in database

The outputs of functional decomposition

The main outputs of this process might be:

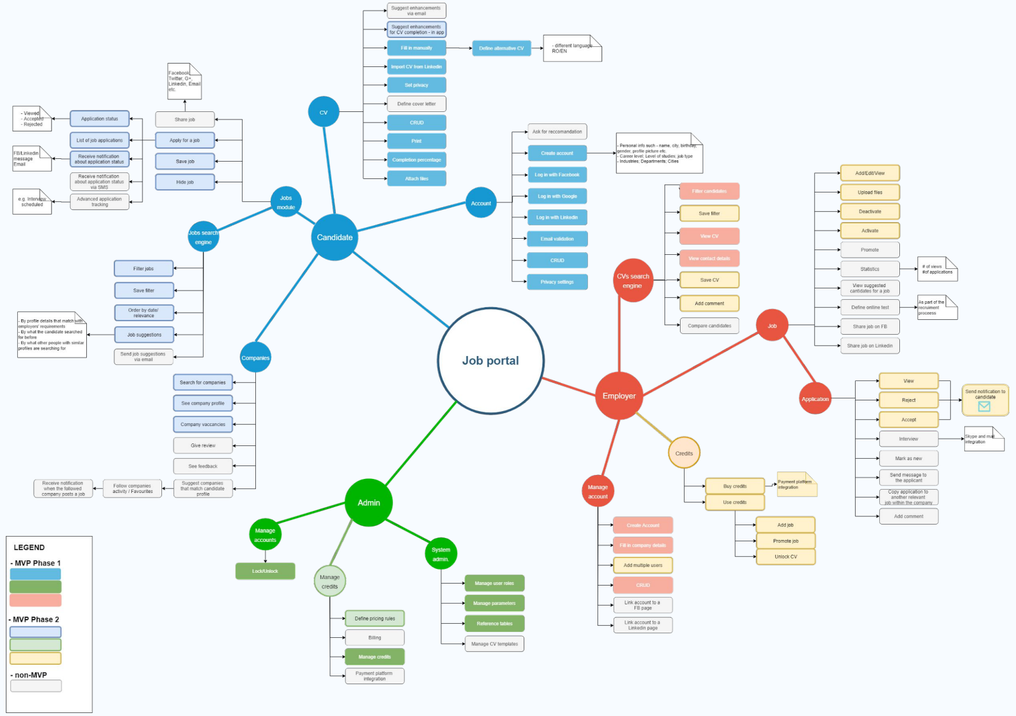
- Functionalities list (mind maps, diagrams, tables)
- Assumptions and limitations

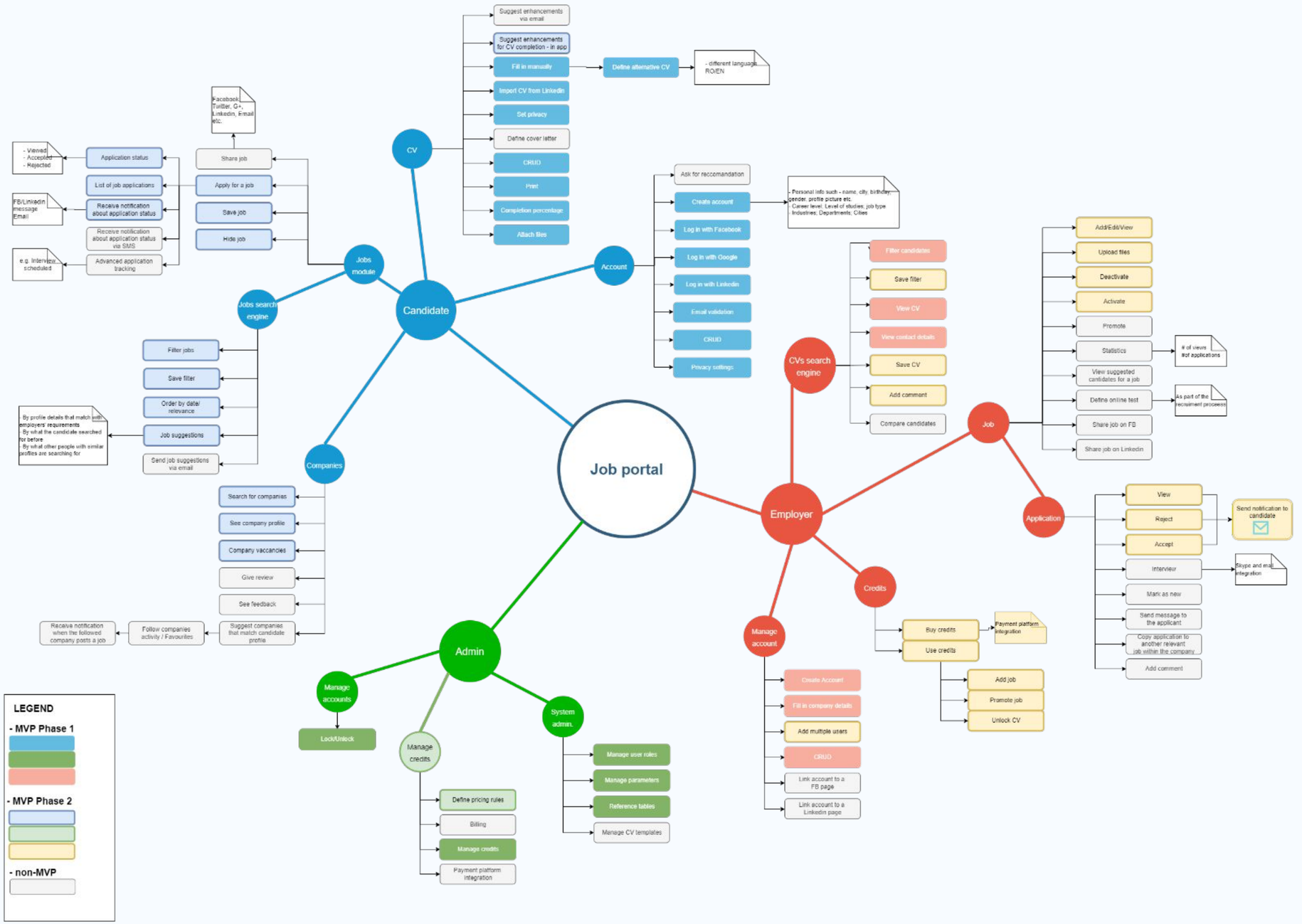


Functionalities list

One of the most used outputs after a functional decomposition is the Functionalities list.
It can be presented in a visual format (e.g. using a mind map or other suitable diagram format) or listed as a table.

Perspective	Module	Description	Functionality	Implementation priority
Candidate	Candidate account	First focus of the project is for the candidates to create accounts on the platform, so that a solid database can be built. By creating an account, a candidate can build a CV and get in touch with employers, so this is the first step in finding a job. Attribute categories of the Candidate Account A. Personal information (e.g. name, gender, phone, address, profile picture, skype ID) B. Professional details (e.g. Career level, Level of studies) C. Desired job criteria (e.g. Country, Location, Departments, Industries, Job type, Salary)	*Create an account using a valid email address* For this kind of authentication, an email validation is required	Phase 1
			Log in with Facebook At the log in, the candidate will have the option to import some details from the Facebook account	Phase 1
			Log in with Google At the log in, the candidate will have the option to import some details form the Google account	Phase 1
			Log in with Linkedin At the log in, the candidate will have the option to import some details form the Google account	Phase 1
			Email validation	Phase 1
			Edit profile	Phase 1
			View profile	Phase 1




Job portal
Candidate
CV
Suggest enhancements via email
Suggest enhancements for CV completion - in app
Fill in manually
Define alternative CV
- different language: RO/EN
Import CV from LinkedIn
Set privacy
Define cover letter
CRUD
Print
Completion percentage
Attach files
Account
Ask for reccomandation
Create account
- Personal info such - name, city, birthday, gender, profile picture etc.
- Career level, Level of studies, Job type
- Industries, Departments, Cities
Log in with Facebook
Log in with Google
Log in with LinkedIn
Email validation
CRUD
Privacy settings
Jobs module
Application status
- Viewed
- Accepted
- Rejected
List of job applications
Receive notification about application status
FB/Linkedin message Email
Receive notification about application status via SMS
e.g. Interview scheduled
Advanced application tracking
Share job
Facebook, Twitter, G+, Linkedin, Email etc.
Apply for a job
Save job
Hide job
Jobs search engine
Filter jobs
Save filter
Order by date/ relevance
Job suggestions
- By profile details that match with employers' requirements
- By what the candidate searched for before
- By what other people with similar profiles are searching for
Send job suggestions via email
Companies
Search for companies
See company profile
Company vaccancies
Give review
See feedback
Suggest companies that match candidate profile
Follow companies activity / Favourites
Receive notification when the followed company posts a job
Employer
CVs search engine
Filter candidates
Save filter
View CV
View contact details
Save CV
Add comment
Compare candidates
Job
Add/Edit/View
Upload files
Deactivate
Activate
Promote
Statistics
# of views
#of applications
View suggested candidates for a job
Define online test
As part of the recruitment processes
Share job on FB
Share job on LinkedIn
Application
View
Reject
Accept
Send notification to candidate
Interview
Skype and mail integration
Mark as new
Send message to the applicant
Copy application to another relevant job within the company
Add comment
Credits
Buy credits
Payment platform integration
Use credits
Add job
Promote job
Unlock CV
Manage account
Create Account
Fill in company details
Add multiple users
CRUD
Link account to a FB page
Link account to a Linkedin page
Admin
Manage accounts
Lock/Unlock
Manage credits
Define pricing rules
Billing
Manage credits
Payment platform integration
System admin
Manage user roles
Manage parameters
Reference tables
Manage CV templates
LEGEND
- MVP Phase 1
- MVP Phase 2
- non-MVP

User stories

What is a user story ?

What is a story’s lifecycle?

What makes a good story?

Quiz

What is a user story?

What is a user story?

Why are user stories used?

What is the anatomy of a user story?

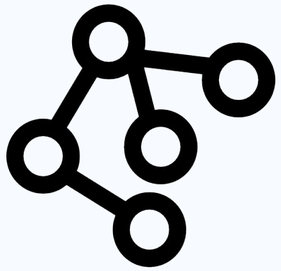
Definition

A user story is a short, explicit expression stating what a specific user needs from a system in order to achieve some goal.

It is a way to specify requirements keeping in mind:

- ***who** the user is*
- ***what** the user needs*
- ***why** the user needs that specific system function*

The anatomy of a story



User stories are generally written using a handful of simple patterns.
Here is the most popular pattern.

As a <type of user > I want <some feature, capability of the system> so that <I achieve some goal>.

A specific type of user with a specific, identifiable job

A capability, function or feature that is required for the system to support the user

The goal the user is looking to achieve, or the value they are looking to derive using the system

A few story examples

For a company’s presentation website

As a content administrator, …

… I want to control all content that is published on the site so that we are sure of the quality & correctness of the information presented to our visitors.

As a content editor, …

… I can add new content on the site & update existing one so that our visitors are engaged by the accuracy & freshness of the information available to them.

As website visitor, …

…I can quickly and easily find the specific content I am looking for, so I don’t get lost in the site, get frustrated & leave soonest.

What is the lifecycle of a user story?

Themes, Epics, Stories

Epic

- *Big scope*
- *Unspecific information*

Story

- *Clear, smaller scope*
- *Information specifies a user's need*

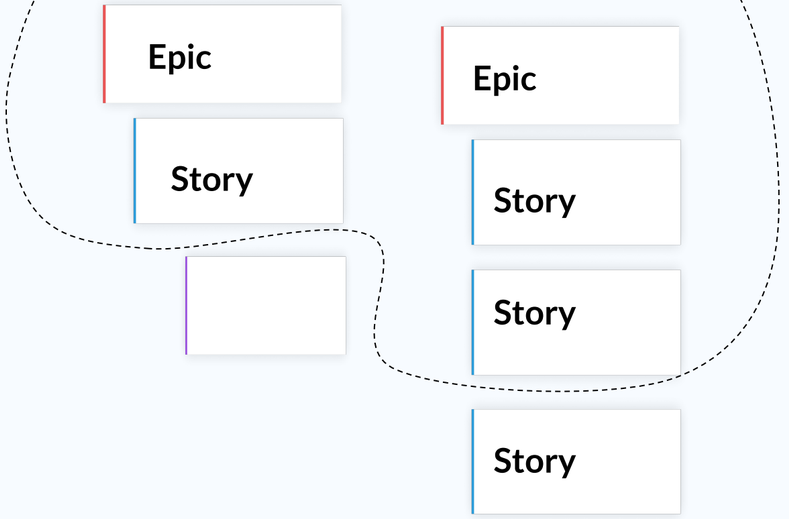
Task

- *Very small scope*
- *One step of a sequence to achieve the goal of a story*

Level of detail

Scope

Theme



Epics, stories, themes - an example

As a **content administrator**, I want to **control all content** that is published on the site so that we **are sure of the quality & correctness of the information** presented to our visitors.

- As a content administrator, I want to have a list of content items awaiting publication, so that I can review them.
- As a content administrator, I want be notified when a new content item has been submitted for publication, so I know when I have a new review task.
- As a content administrator, I want to be able to refer a content item back to the creator for revision.
- As a content administrator, I publish in bulk content items that I’ve reviewed.
- As a content administrator, I want recurring & standardized types of content to be automatically published without me having to personally review them since they present little risk.
- As a content administrator, I want to be able to rate authors, so that in time, my reviewing process becomes more efficient.

From epics to stories & tasks

Product owner/Business Analyst

Defines epics

Product owner/Business Analyst

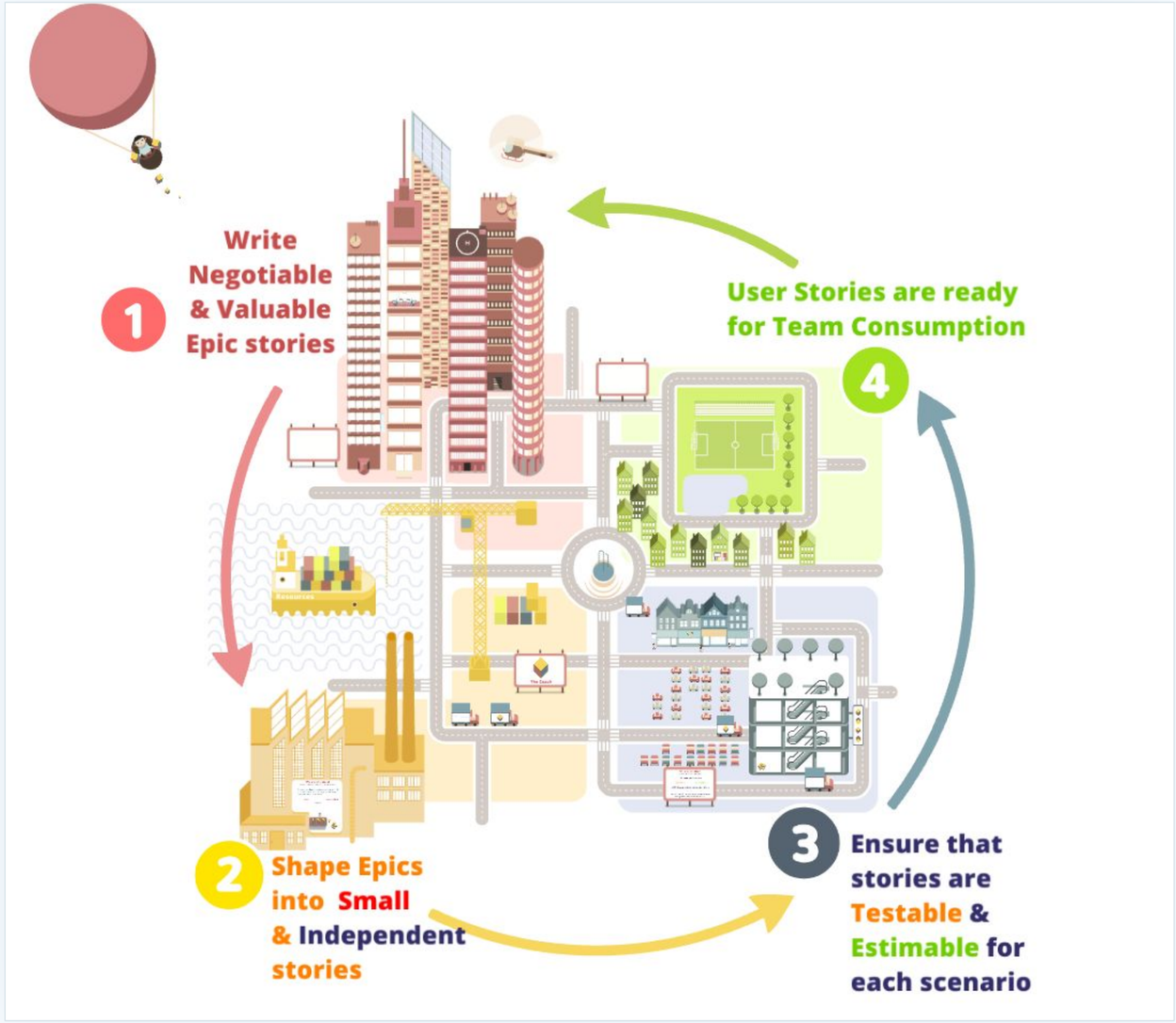
Drafts stories

The team, the BA & PO, system analyst

Discuss, split & detail stories

The team

Implements functionality required by the stories



What makes a story a good user story?

INVEST in good user stories

Splitting user stories

Acceptance criteria

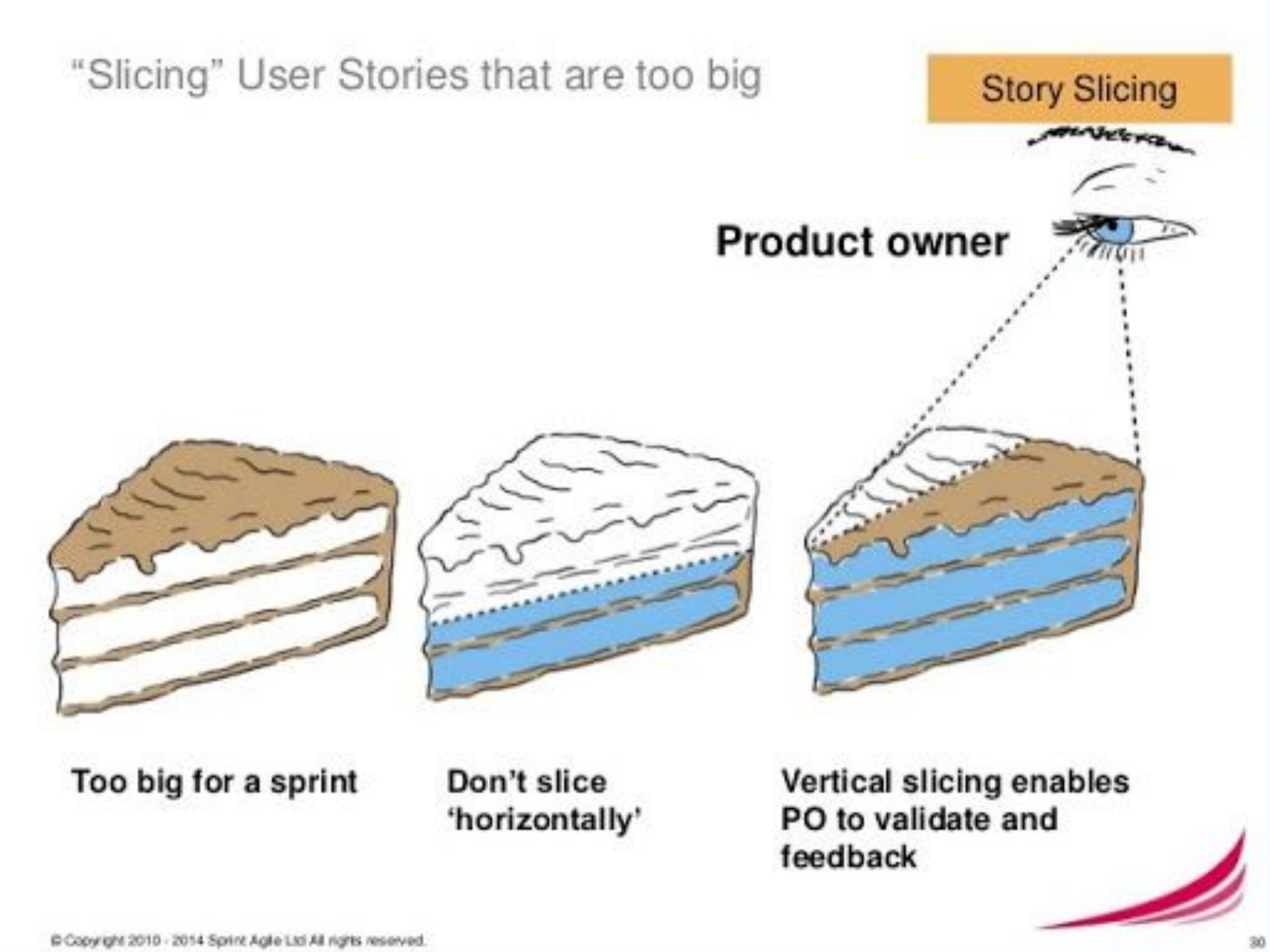
INVEST in user stories

A pidgin language is a **simplified language**, usually used for trade, that allows people who can't communicate in their native language to nonetheless work together. **User stories act like this.**

Bill Wake *-INVEST in Good Stories, and SMART Tasks*

I	independent	A good story is independent
N	negotiable	A good story leaves room for negotiation
V	valuable	The story clearly states what is the value to the user
E	estimable	It contains just enough detail to estimate correctly
S	small	Is is small enough that it can be done in one iteration
T	testable	The resulting functionality is testable; it can be explicitly verified

Vertical vs. horizontal splitting



Vertical slice is a shorthand for "a work item that delivers a valuable change in system behavior such that you'll probably have to touch multiple architectural layers to implement the change." When you call the slice "done," the system is observably more valuable to a user.

This is in contrast with a **horizontal slice**, which refers to a work item representing changes to one component or architectural layer that will need to be combined with changes to other components or layers to have observable value to users.

Splitting steps

1. Understand **why the input story is not satisfactory** in order to prepare for splitting

2. Choose and **apply a Splitting Pattern** depending on workflows/operations/ infrastructure/business rules/complexity and others

3. **Evaluate the split** to make sure all the new stories are satisfactory

How can you split?

Once you've decided your story is too big and should be split, there are a few patterns that can help you do a proper vertical slice.

WORKFLOW

Your story describes a complex workflow

1. Do a **simple version as a 1st story** ; enhance in next stories.

2. Define the first story to cover **the beginning & end of the flow**; enhance in next stories.

OPERATIONS

Your story hides operations in wording like 'manage...', 'configure...' etc.

Create **1 story for every action** included in 'manage':
- '**C**reate...', '
- '**R**ead...',
- '**U**pdate…'
- '**D**elete ….'

INTERFACE

Your describes a complex user interface

Define the **simplest possible version of the UI** & create the 1st story; add stories to enhance the simple UI.

How can you split?

And three more patterns …

RULES

Your story achieves one goal using different business rules

1. Group business rules; create **1 story per rule group**

2. Create **1 story per business rule**

DATA

Your story does the same kind of thing for different kinds of data

Split the story across **data boundaries** & prioritize.

Start with one data set & enhance in next stories.

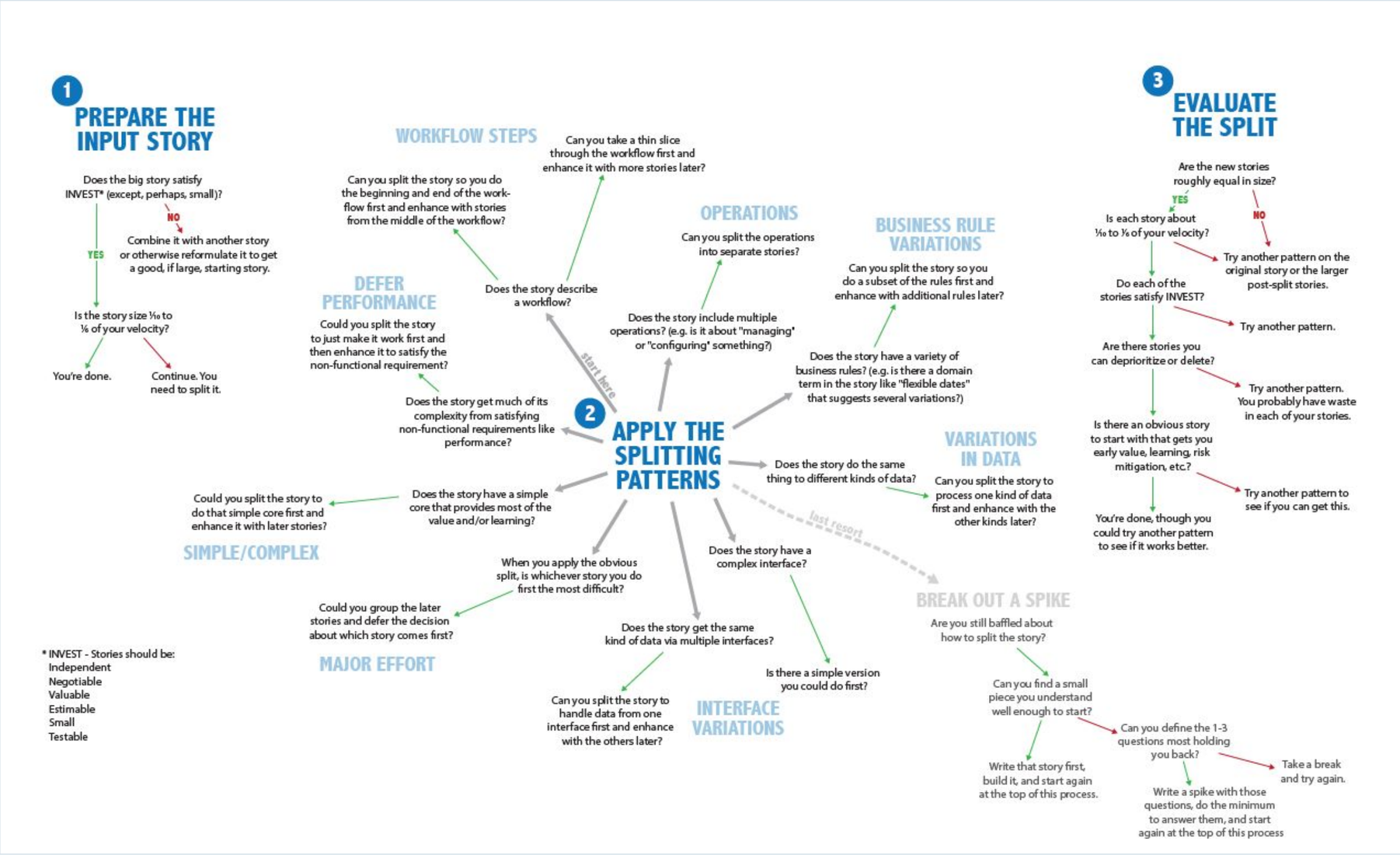
PERFORMANCE

Your story requires great performance

Split into: **'make it work' &' make it fast'** stories.

How can you split?

Richard Lawrence & Peter Green



What are acceptance criteria?

Acceptance criteria are the **conditions** that a software product or **a functionality of the product must meet in order to be accepted by the user**, or in order to bring the desired value to that user.

Acceptance criteria must:

- *have clear **pass** or **fail** results*
- *convey the intent but not the final solution; **'what'** not 'how'*
- *be **independent** of the implementation*
- *have the right granularity: provide **just enough detail** to be useful*
- *describe the system's reaction to both proper (**positive)** & improper use (**negative**)*

Positive and negative acceptance criteria

Acceptance criteria must describe what the interactions between the user & system should be both when everything goes according to plan, and when something goes wrong

Positive scenarios for acceptance criteria

Positive scenarios describe positive, expected actions the user takes to achieve their goal. They are the correct actions to take as a user so that you would obtain the desired results from your interaction with the system.

Negative scenarios for acceptance criteria

Negative scenarios describe how the system should react, how it should help the user take corrective action when they use the system in unexpected or incorrect ways. For example, when the data the user provides is incomplete or incorrect.

Acceptance criteria vs. Test cases

Acceptance criteria must NOT be formulated as test cases. Be careful to describe how the system and user interact so the use is able to achieve their goal.

Acceptance criteria = **what** needs to be done to achieve the users goal

Test cases = **how** it should be done to meet the user's expectations

- **Test cases** are **developed later,** during the development stage.
- They are **scenarios** which are **derived from acceptance criteria**.
- **Each acceptance criteria can have one or more acceptance tests**.

Gherkin language for acceptance criteria

Gherkin is a domain specific language that provides a recognizable pattern for writing structured acceptance criteria.

Gherkin acceptance criteria are structured in 5 main elements:

- *A **SCENARIO** that provides a label for the behaviour you are about to describe*
- *A **GIVEN** statement that describes the initial state - the starting point for your scenario*
- *A **WHEN** statement that introduces a specific action the user takes*
- *A **THEN** statement that describes the result obtained by performing the action (or the final state)*
- *An **AND** (or **BUT**) statement that allows you to add more conditions to describe the initial or final states*

An example of a story with acceptance criteria

As a **content administrator**, I want **to have a list of content items awaiting publication**, so that **I know what I need to review and in what order.**

Scenario title

Initial state

User action

End state (outcome)

AC1: The content administrator checks the content items to be reviewed
GIVEN content items have been submitted for review & publication
WHEN the content administrator checks the list of items
THEN all submitted content items are listed in order of submission

A positive scenario

AC2: Empty state: No content items are submitted for publication
GIVEN that no content items have been submitted for the content administrator's attention
WHEN the content administrator checks
THEN some friendly message is displayed letting the administrator know there is no review work pending

A negative scenario