Application Development For Historical Image Analysis

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Background

- The national library of Australia has a large collection of historical images to be digitalized and published online.
- Digitalized images need to be tagged so they can be discoverable by search algorithms.
- Image tagging is currently done manually. The process is reliable but slow and costly.
- The library is exploring artificial intelligence technology to help tag images.

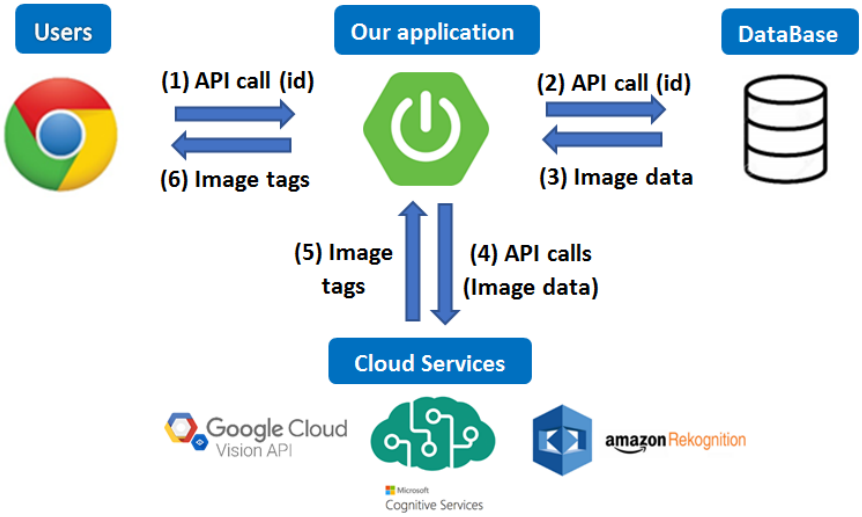
Project Scope

Develop a web service application using spring framework, which will

① allow library staff to use cloud image recognition service to tag images.

② inform users on the reliability of the tags being generated.

Workflow Layout



Product specifications

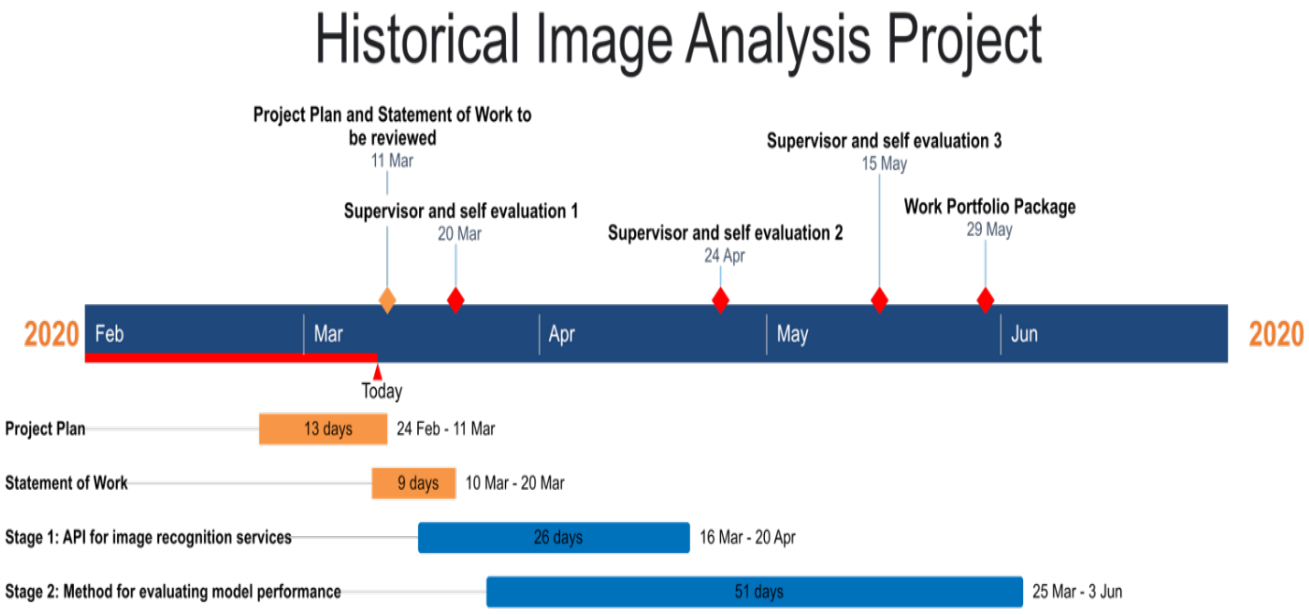
A web service prototype

Product title	A web service prototype for image analysis
Purpose	To produce a functional implementation of a web services for historical image analysis
Composition	• Spring Web MVC • Maven build script
Derivation	• Internal discussion • Existing web services at NLA
Development skills required	• Skills in software development • Skills in programming languages such as java and python
Quality criteria	• The service will accept a valid PID and a list of services to send the image to • The service will reject an invalid PID or service with a 404 error and a meaningful error message • The service will return results in JSON format • The service is connected to cloud-based image recognition services • The service will ensure that rate limits are not exceeded.
Acceptance criteria	Demonstration of a working prototype or a proof of concept
Acceptance responsibilities	Project manager, project supervisor and software team

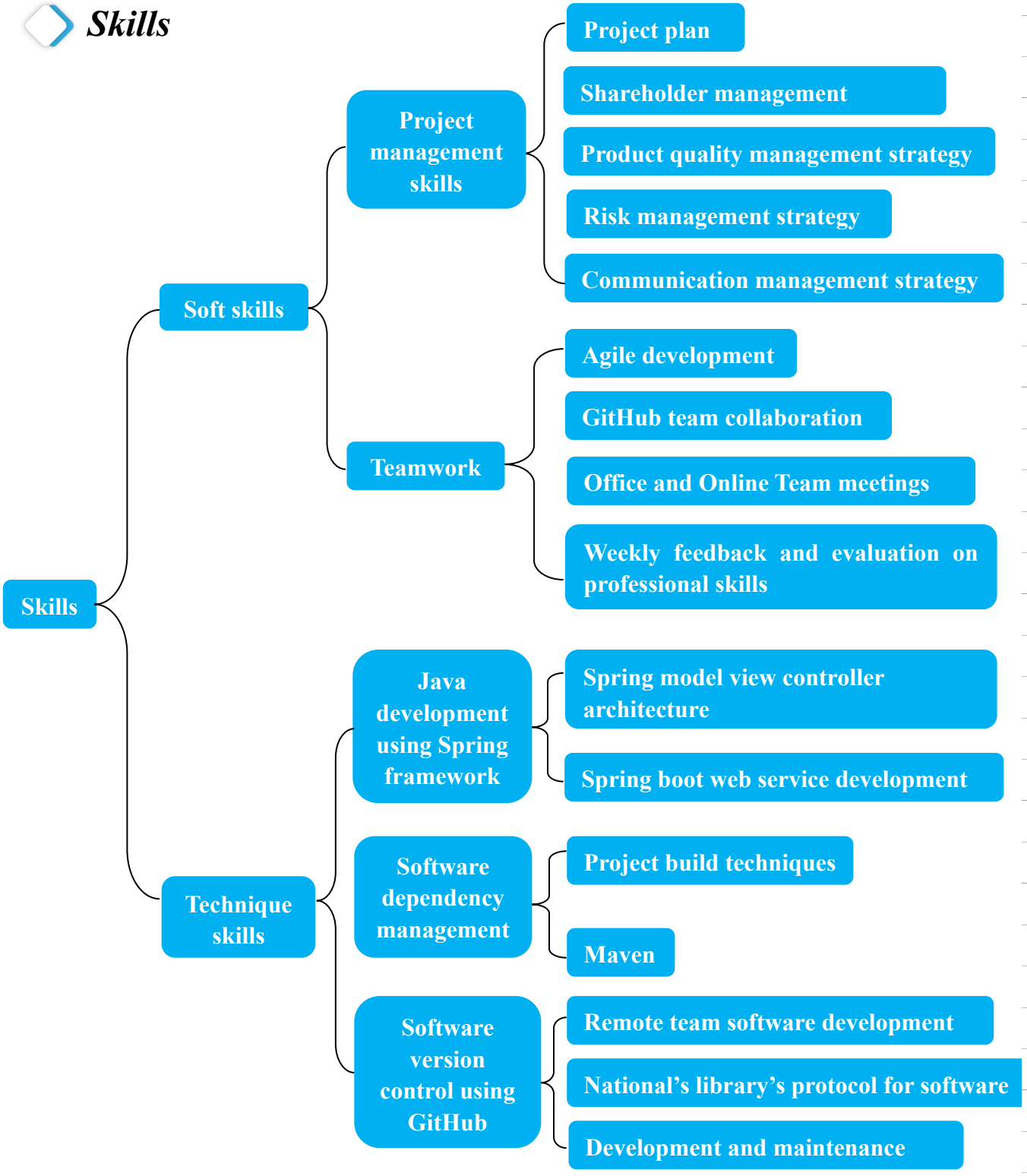
A system to evaluate image recognition model

Product title	A System for image recognition model evaluation
Purpose	To produce a functional implementation of a system to evaluate image recognition models
Composition	• Spring Web MVC • Maven build script
Derivation	• Internal discussion • Existed evaluation tools
Development skills required	• Software development • Deep learning • Java and Python
Quality criteria	• System will return scores for each model • System will return a recommended model based on the scores
Acceptance criteria	Demonstration of a working prototype or a proof of concept
Acceptance responsibilities	Project manager, project supervisor and software team

Project timeline



Skills


Skills
Soft skills
Project management skills
Project plan
Shareholder management
Product quality management strategy
Risk management strategy
Communication management strategy
Teamwork
Agile development
GitHub team collaboration
Office and Online Team meetings
Weekly feedback and evaluation on professional skills
Technique skills
Java development using Spring framework
Spring model view controller architecture
Spring boot web service development
Software dependency management
Project build techniques
Maven
Software version control using GitHub
Remote team software development
National's library's protocol for software
Development and maintenance

Software development Experience

- ✧ I was involved in the software development project in National library and gained a better understanding of a life cycle of a commercial software product from development to deployment to future maintenance.
- ✧ I was closely involved in the code review process and learned professional coding skills from other developers in the IT department of the library.

Impact

The web service prototype promises fast and cheap image tagging services

Table: Cost estimation for prototype

Image labeling services		Cost per image	Time per image
Human labeling		$ 2	30 - 60 second
Cloud services	Google vision	$0.0025 – $0.005	0.5 second
	Microsoft Azure	$0.00137	0.5 second
	AWS Rekognition	$0.0015	0.5 second