

System and Software Architecture Description (SSAD)

Soccer Data Web Crawler

Team 02

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Version History

Date	Author	Version	Changes made	Rationale
2014/10/09	YZ,PK	1.0	<ul style="list-style-type: none">• SSAD for Soccer Data Webcrawler Draft	<ul style="list-style-type: none">• Initial draft of Soccer Data Web crawler
2014/12/01	ZZ,TS	2.0	<ul style="list-style-type: none">• Updated SSAD	<ul style="list-style-type: none">• Final draft of Soccer Data Web crawler
2014/12/08	ZZ	2.1	<ul style="list-style-type: none">• Update use case diagram	<ul style="list-style-type: none">• The previous use case diagram is wrong

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1. Introduction

1.1 Purpose of the SSAD

The purpose of this SSAD document is to document the object-oriented analysis and design of the soccer data WebCrawler project. The SSAD is used by Team 02 as reference to the system and software architecture of the Soccer Data WebCrawler. The development of Soccer Data WebCrawler should be faithful to the architecture specified in the SSAD. In addition, this SSAD document along with Technical Manual is will be used the maintainer of the soccer data WebCrawler and SporTech B.I. LLC to help understand the structure of the software after it is delivered.

1.2 Status of the SSAD

This document is currently version 2.0, it is the final draft version. The current version of the SSAD is in the Transition Readiness phase. At this point, all the models are completely described for the product.

2. System Analysis

2.1 System Analysis Overview

The primary purpose of the soccer data web crawler is to develop a web crawler based web application that can crawl sport websites for key statistical soccer data and upload the data into the company's database, so that the web crawler can be integrated with other SporTech applications to help soccer organizations improve their performance. The web crawler can crawl public websites for structured data, check for data duplicates and ingest the data into the PostgreSQL database. The web crawler can also crawl social media websites (including Facebook and Twitter) and ingest that. The web crawler also allows STBI contractors to add/delete/edit the specific website(s) or specific player(s) and frequency of crawler refreshes for each website via the contractor UI.

2.1.1 System Context

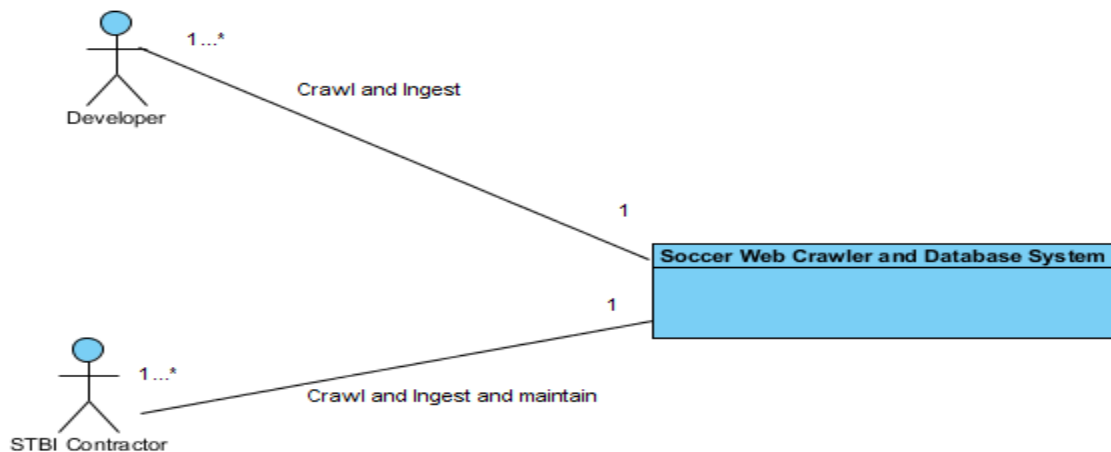


Figure 1: System Context Diagram

Actor	Description	Responsibilities
Developer	Team 02	Crawl and ingest the data from websites and Facebook API and Twitter API
STBI contractor	Developers hired by SporTechBI to design the remainder of the system	Crawl and ingest the data from new websites and Facebook API and Twitter API. STBI contractors must also maintain the existing system

Table 1: Actors Summary

2.1.2 Behavior

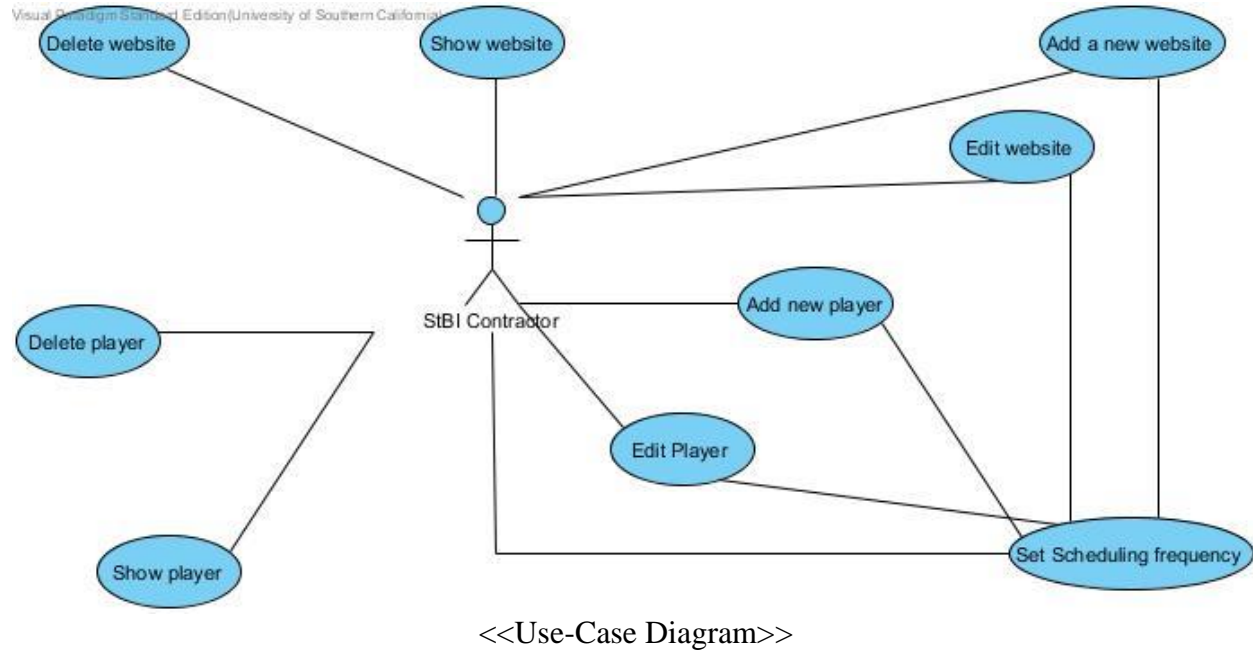


Figure 2: Process Diagram

2.1.2.1 Capability Add a new website

2.1.2.1.1 Process Add a new website

Add new website Details		
Use Case ID	UC01	
Super Use Case	UC09	
Primary Actor	STBI Contractor	
Brief Description	Add a new website to website crawl list.	
Flow of Events		Actor Input
		System Response
	1	STBI contractor clicks the website tab
	2	The system shows the crawl list of all websites.
	3	STBI contractor clicks on the New website tab.
	4	The system shows the

			attribute list of a website.
	5	STBI contractor adds the attributes for the website.	
	6		The system adds the player to the website crawl list.
Post-conditions	The website is added to the player crawl list.		
Assumptions	The website to be added does not already exist in the website crawl list.		

Table 2: UC1 Description

2.1.2.2 Capability: showing the website

2.1.2.2.1 Process: showing the website

Show Website			
Use Case ID	UC02		
Primary Actor	SporTechBI Contractor		
Brief Description	Showing the website from crawl list.		
Preconditions	The website must exist in the crawl list.		
Flow of Events		Actor Input	System Response
	1	STBI contractor clicks on websites tab	
	2		A crawl list of website is displayed.
	3	STBI contractor clicks on show tab	
	4		The website's details are displayed.
Post-conditions	The website's details are displayed.		

Table 3: UC2 Description

2.1.2.3 Capability Edit the crawling attribute(s) for a website.

2.1.2.3.1 Process Edit the crawling attribute(s) for a website.

Edit website details

Use Case ID	UC3		
Primary Actor	STBI Contractor		
Brief Description	Edit the crawling attribute(s) for a website.		
Preconditions	The website must exist in the website crawl list.		
Flow of Events		Actor Input	System Response
	1	STBI contractor clicks the Websites tab.	
	2		The system shows the crawl list of all websites.
	3	STBI contractor clicks the edit tab for a certain website.	
	4		The system shows the attribute list of a website.
	5	STBI contractor edit the attribute he wants to change and click update website.	
	6		The system shows the updated attributes of a website in the website crawl list.
Post-conditions	The attributes of the website is updated.		

Table 4: UC3 Description

2.1.2.4 Capability: Add a new player

2.1.2.4.1 Process: Add a new player

Add New Player			
Use Case ID	UC04		
Super Use Case	UC09		
Primary Actor	STBI Contractor		
Brief Description	Add a new player to player crawl list.		
Flow of Events		Actor Input	System Response
	1	STBI contractor clicks the Players tab.	
	2		The system shows the crawl

			list of all players.
	3	STBI contractor clicks on the New Player tab.	
	4		The system shows the attribute list of a player.
	5	STBI contractor adds the attributes for the player.	
	6		The system adds the player to the player crawl list.
Post-conditions		The player is added to the player crawl list.	
Assumptions		The player to be added does not already exist in the player crawl list.	

Table 5: UC4 Description

2.1.2.5 Capability: Showing the player

2.1.2.5.1 Process: Showing the player

Table 6: UC5 Description

Show Player Details			
Use Case ID	UC05		
Primary Actor	SporTechBI Contractor		
Brief Description	Showing the player from crawl list.		
Preconditions	The player must exist in the crawl list.		
Flow of Events		Actor Input	System Response
	1	STBI contractor clicks on players tab	
	2		A crawl list of players is displayed.
	3	STBI contractor clicks on show tab	
	4		The player's details are displayed.
Post-conditions	The player's details are displayed.		

2.1.2.6 Capability: Edit the crawling attribute(s) for a player.

2.1.2.6.1 Process: Edit the crawling attribute(s) for a player.

Table 7: UC6 Description

Edit Player			
Use Case ID	UC06		
Primary Actor	SporTechBI contractor		
Brief Description	Edit the crawling attribute(s) for a player.		
Preconditions	The player must exist in the player crawl list.		
Flow of Events		Actor Input	System Response
	1	STBI contractor clicks the Players tab.	
	2		The system shows the crawl list of all players.
	3	STBI contractor clicks the edit tab for a certain player.	
	4		The system shows the attribute list of a player.
	5	STBI contractor edit the attribute he wants to change and click update player.	
	6		The system shows the updated attributes of a player in the player crawl list.
Post-conditions	The attributes of a player is updated.		

2.1.2.7 Capability: Deleting the website

2.1.2.7.1 Process: Deleting the website

Table 8: UC7 Description

Delete Scenario		
Use Case ID	UC7	
Secondary Actor(s)		
Brief Description	Deleting the website from crawl list.	
Preconditions	The website must exist in the crawl list.	
Flow of Events		Actor Input
	1	STBI contractor clicks on Websites tab.
	2	
	3	STBI contractor clicks on Delete tab.
	4	
	5	STBI contractor clicks on OK.
	6	
		System Response
		A crawl list of websites is displayed.
		An alert box stating "Are you sure?" is displayed.
		The website is deleted from the crawl list.
Post-conditions	The scheduler will not launch crawler for this website.	
Alternative flow and Exception	The STBI contractor wants cancel the website delete	
Alternative: Cancel Delete		Actor Input
	1	STBI Contractor clicks on Cancel button in the alert box
	2	
		System Response
		The system maintains its website crawl list as is.

2.1.2.8 Capability: Deleting the website

2.1.2.8.1 Process: Deleting the website

Table 9: UC8 Description

Delete Player			
Use Case ID	UC8		
Primary Actor	SporTechBI Contractor		
Brief Description	Deleting the player from crawl list.		
Preconditions	The player must exist in the crawl list.		
Flow of Events		Actor Input	System Response
	1	STBI contractor clicks on players tab.	
	2		A crawl list of players is displayed.
	3	STBI contractor clicks on Delete tab.	
	4		An alert box stating "Are you sure?" is displayed.
	5	STBI contractor clicks on OK.	
	6		The player is deleted from the crawl list.
Post-conditions	The scheduler will not launch crawler for this player.		
Alternative flows and exceptions	The STBI contractor wants cancel the player delete		
Alternative: Cancel Delete		Actor Input	System Response
	1	STBI Contractor clicks on Cancel button in the alert box	
	2		The system maintains its player crawl list as is.

2.1.2.9 Capability: Schedule player crawl list/website.

2.1.2.9.1 Process: Schedule player crawl list/website.

Table 10: UC9 Description

Set Sechuler			
Use Case ID	UC9		
Primary Actor	SporTechBI Contractor		
Brief Description	Schedule player crawl list/website.		
Preconditions	Atleast player crawl list must be scheduled or atleast one website must be scheduled in the website crawl list		
Flow of Events		Actor Input	System Response
	1	STBI contractor clicks the Players/Websites tab.	
	2		The system shows the crawl list of all players/websites.
	3	STBI contractor clicks on the New/Edit Player/website tab.	
	4		The system shows the attribute list of a player/website.
	5	STBI contractor adds/edits the schedule attribute for the player/website.	
	6		The system adds the player/website to the scheduling list.
Post-conditions	The player/website data is crawled according to the attributes set.		

3. Technology-Specific System Design

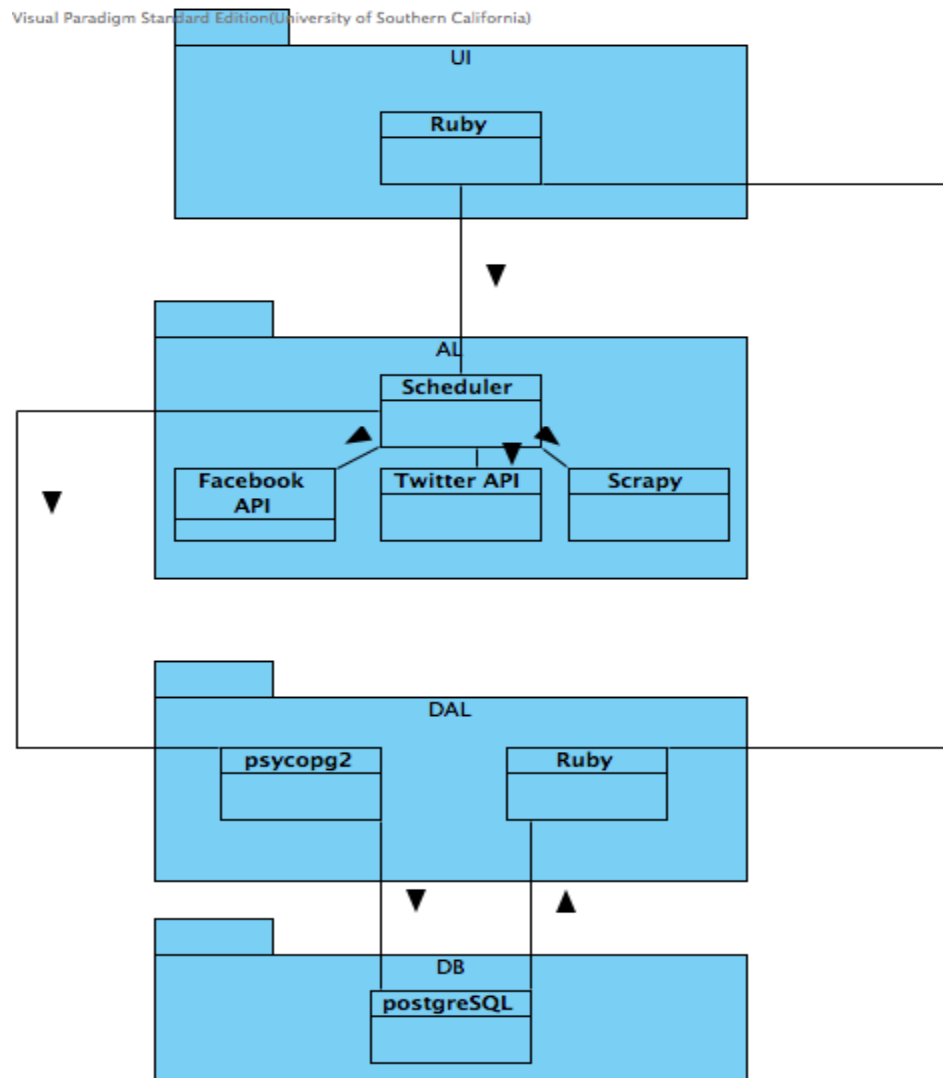


Figure 3: Technology Specific Diagram

3.1 Design Overview

3.1.1 System Structure

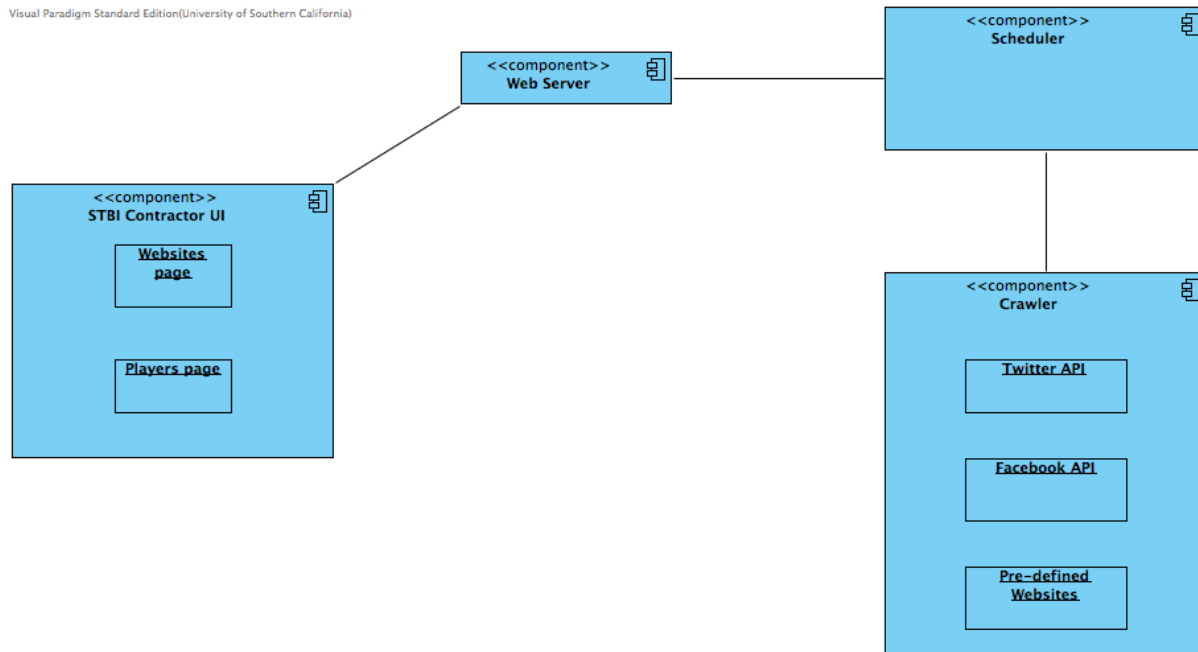


Figure 4: Software Component Class Diagram

Software Component	Description
STBI Contractor UI	The STBI Contractor UI consists of website page and player page, which will provide STBI Contractor a UI to add, delete, edit website or player to the database.
Web Server	Now the website is hosted on Amazon EC2, and the STBI Contractor will merge the website to STBI's production server.
Scheduler	The scheduler will schedule the running of script to run according to the predefined frequency.
Crawler	Crawler will gather data from a predefined set of websites, Facebook and Twitter.

Table 11: Software Component Description

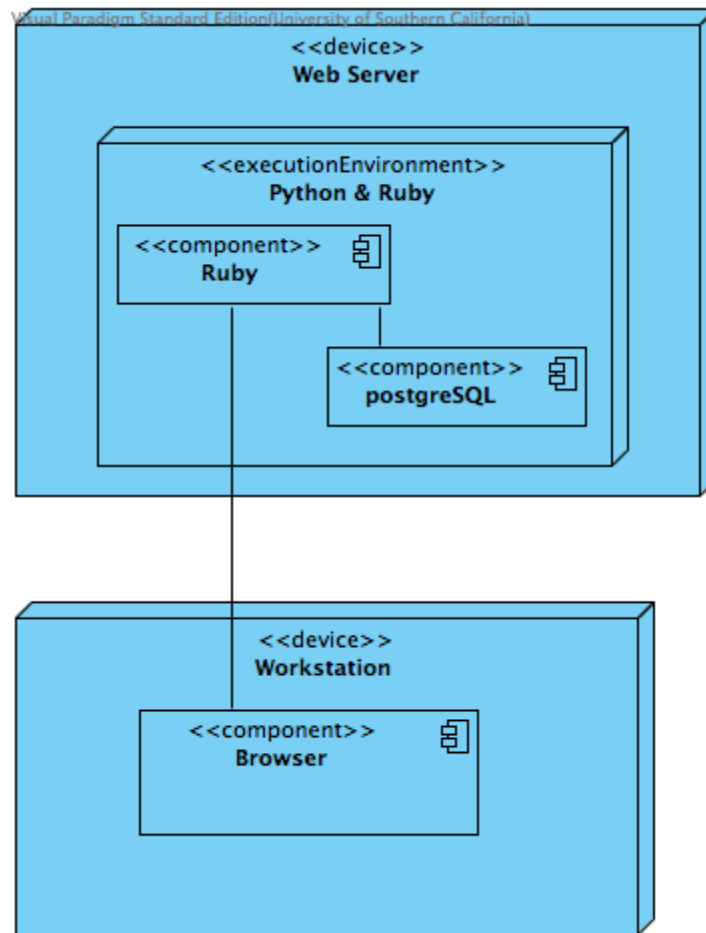


Figure 5: Deployment Diagram

4. Architectural Styles, Patterns and Frameworks

Table 12: Architectural Styles, Patterns, and Frameworks

Name	Description	Benefits, Costs, and Limitations
Client-server	We have implemented the server side of the system, and we provide a STBI contractor UI as client side for STBI contractor.	Benefits: Centralization, Accessibility, Proper Management Limitations: Not robust, Congestion in Network