Web-based Decision Support System for Characters Selection in Game Genshin Impact with SAW Method

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Abstract— **Genshin Impact is a game that has lots of amazing playable and time-limited characters. Many F2P players are in a dilemma most of the time, and can't choose the characters they should draw. This research's aim is to design and develop a web-based decision support system capable of ranking the best characters based on five combat roles to help F2P fans or player to select the best character, using the SAW (Simple Additive Weighting) method. SAW is capable of choosing the desired criteria (DPS, Heal, Shield, Buff, and Elemental) and each of their weight. The purpose of the recommendation is for Genshin Impact fans to be able to make a decision on who they should pull-based. The Result of this research is that the Characters will be ranked on each of their combat roles criteria using website as a form of implementation. The highest ranked for criteria DPS is Eula, Heal is Hu Tao, Shield is Iito, Buff is Eula, and Elemental is Eula. The prototype website used for this research has been validated by being tested using User Acceptance Tests by some players of Genshin Impact.**

Index Terms- **Decision Support System; Prototype methods; Simple Additive Weighting; Web-Based Information System.**

I. INTRODUCTION

Genshin Impact is a newly developed game that was launched by Mihoyo, a Video Games company from Shanghai, China. Genshin Impact is a multiplatform video game that attracts players with excellent character designs, engaging storytelling, and the depth of the world of Teyvat, the world inside Genshin Impact. Since its release in September 2020, Genshin Impact's fans have continued to grow, as according to website Sensor Tower in its article titled "Genshin Impact Generates $2 Billion on Mobile in First Year" [1] and followed with its article titled "Genshin Impact Generates $3.7 Billion on Mobile in First Two Years" [2]. As the story progresses, the characters have also increased, bringing the total of up to 46 characters in version 2.4 and are still increasing [3]. Their combat roles can be categorized into DPS (characters meant to deal damage), and Support (characters that can upgrade, shield, heal, or create elemental advantages.

Image 1. Genshin Impact Limited-Time Character Banner

Image 1 above is the screenshot from inside the game of Genshin Impact, it is the screenshot of one of limited-time character banner that is showing at that moment, and the above is Tartaglia or can be known as Childe. In the game, there are two ways to get characters, one if Genshin Impact give the character for free (which is incredibly rare) or two, by player to "pull" the character from that banner. It can be seen from the image above, that there are buttons in the rightdown corner button "Wish x1" and "Wish x10",

when player "Wish", there are chances player might get that character, and "Pull" is another term that fans used to call the action of "Wish" or clicking that button. Because this banner is using a gacha system, there are chances that player might not get Tartaglia, and he is one the character that can only be get or "Wish" or "Pull" from limited-time banner only. The term "comes home" means that players managed to get Tartaglia as their teams member, or their "Wish" is successful.

But to be able to pull in a banner, player must use what is called "Intertwined Fates" it is a pink ball that can be seen in the top-right corner or at the Wish buttons. Then to get that pink ball players need to buy it using currency called "Primogems", that can be seen in the top-right corner beside the pink ball (in the image 1 there are 1290 Primogems). Primogems or free Primogems is given only on special occasions and quite rare, except if players want to buy it with real money. Therefore making it almost impossible for Free-to-Play or little spender players to pull every banner and get all of the characters (up until version 2.4 there are 46 characters), unless they are very lucky. Nevertheless, a F2P or little spender player sometimes can cross the line. For example case from website msn.com titled "18-Year-Old Daughter's 6-Week Genshin Impact Gacha Spree Hands Dad a $20,000 Credit Card Bill" [4].

All of Genshin Impact's characters have their own unique ability and special talents. But for this project, none of them will be included, and instead will be limited to only using attributes or stats from character's trials as data for calculating the rankings, and will be using one player who has been playing since the game was released to determine the criteria and weight.
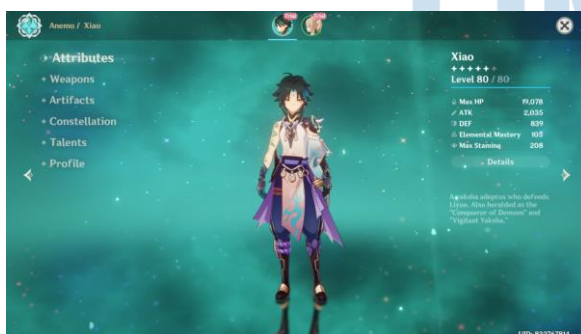

Image 2. Genshin Impact Character Trial

Image 2 above is the screenshot of Xiao's attributes as Character Trials, and a more detailed attributes can be seen by clicking button "Details". Players can use the stats from Character Trials as references when building their characters, and from this screenshots of every Character Trials that have appear up until version 2.4 is what will be used as the data in this project.

This project is aimed especially at Free-to-Play or Little Spender players, showing five rankings of characters, from five combat roles namely DPS, Heal, Shield, Buff, and Elemental, and their own calculation. Based on the previous research [5][6][7][8][9] for calculating criteria and weights, web-based is the best way that can be used as an implementation.

Simple Additive Weight (SAW). Therefore is a method that requires decision-makers to determine a set of criteria for a set of alternatives, and weight to measure the criteria's priority for ranking the alternative [10]. Whereas to build a character, the player must choose or prioritize on the stats that best suit the character's role by applying the right Artifacts and Weapons onto the said character. Therefore, for this project, SAW method is best suited as it can weight each chosen criteria and prioritize the most suited stats on each role.

The purpose of this research is to help provide some insight for F2P players with limited Primogems to choose which characters should the players choose, by ranking the characters using the data from in-game Characters Trial as a base, and showing the ranked recommendations through a platform that is web-based.

II. THEORETICAL BASIS

A. Decision Support System

A decision support system is a system that assists users in making decisions, using programs to help solve certain problems, through making choices that are as accurate as possible according to the method chosen so that it becomes a solution to solving the problem [11]. These computerized programs capable of calculating which decision to be made according to the weight or criteria or alternative that is chosen, and that calculation then is implemented inside either into a program or system, or website [6].

B. Simple Additive Weighting

Simple Additive Weighting (SAW) is a decision support system method that can calculate what choices to make based on the criteria and weight of the preferred choice to get the most accurate alternative or solution [12]. In general, these are the steps of SAW method:

1. Determine Criteria and Weight

2. Assess Benefit & Cost

3. Create Decision Matrix

4. Normalization

$$r_{ij} = \frac{x_{ij}}{\max x_{ij}} \qquad r_{ij} = \frac{\min x_{ij}}{x_{ij}} \qquad (1)$$

Max for benefit and min for cost. This formula is to obtain normalized matrix R.

5. Ranking

$$V_i = \sum_{j=1}^{n} w_j r_{ij} \qquad (2)$$

V_i is the end result and $w_j r_{ij}$ means w for weight multiple by normalized criteria weight from the previous equation and the total is V_i.
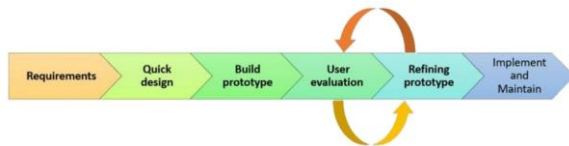
C. Prototype

Fig. 1. Prototype Model [13]

Figure 1 above is the prototype method model, protype is a framework with a development process that involves its users. This method consists of six steps, namely requirements, rapid design, prototyping, user evaluation, prototype refinement, implementation, and maintenance [13].

D. Previous Studies

Similar research has been done before, and became the reference for this project. Some of them are titled "The Implementation of Simple Additive Weighting (SAW) Method in Decision Support System for the Best School Selection in Jambi" [5]. This study used the SAW method as the best school decision-making method in Jambi Province. Other research uses the same method in determining employee bonuses at PT Mayatama Solusindo, and implements this method on a website [6]. The SAW method has also been used as a decision support system in determining the nutritional status of toddlers [7]. Research [8] also uses the SAW method for gaming mobile selection. Meanwhile, research [9] used a different decision support system method, namely TOPSIS, but it was also successfully applied to a website design.

III. METHOD

A. Data Collection Technique

This project acquired data are by observation, literature study, and interview. Observation was done by gathering data from inside the game Genshin Impact. Literature study is using other journals as references for the flow of SAW, and the formula. Lastly, Interview is used to determine a criteria and weight from Genshin Impact fans, to get feedback, and testing the website.
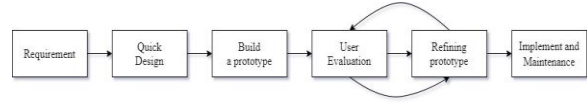
B. System Development

Fig. 2. Flowchart of Prototype

Figure 2 above is the flowchart for prototype methodology that will be used in this project and for developing the system [13]:

1. Requirement

   The first step is to collect information about the decision support system requirements, namely knowing the user requirements so that they can be applied in designing and developing prototypes. This stage was carried out through interviews with old Genshin Impact players, to find out and determine the weight criteria.

2. Quick Design

   The next step is to make the overall website design quickly according to the needs given. The goal is for users to have an idea of what the system will be like, and if there are some changes in the design then revisions can be made quickly.

3. Build a prototype

   This third step is to develop the first prototype, i.e. a mockup that will show the user how the system will look like, and will be built based on the requirements and a quick design.

4. User Evaluation

   In this step, the user can evaluate how the website works, by evaluating the prototype. Several enthusiasts or users are selected and asked about the performance of the system, and if revisions are needed then the prototype needs to be perfected.

5. Refining prototype

   If the prototype is rejected or requested for revision, the website will be refined according to user evaluation, then repeat step 4 until the revision is approved. If there are no changes, then this step can be skipped, or it can be used to make minor adjustments to the website.

6. Implement and Maintain

The aim of this project is to assist fans in choosing which character they should draw, hence to allow easy access for them this system will be implemented web based.

IV. RESULT AND DISCUSSION

A. *Reqirement*

In building this recommendation system, the calculation was done using SAW Method. The steps are as follow:

1. Determining and choosing the necessary criteria and assess each criteria with its weight.

TABLE I. RATE FOR DPS

Rate	Weight (%)
Really Important	0.3
Important	0.25
Neutral	0.2
Less Important	0.15
Not as Much	0.1

TABLE II. RATE FOR SUPPORT

Rate	Weight (%)
Really Important	0.5
Important	0.3
Less Important	0.2

Table I Rate for DPS and table II Rate for Support are arranged by discussing it with player Arisa. Overall there are a total of ten criteria, which are HP, ATK, DEF, Elemental Mastery, CRIT Rate, CRIT DMG, Healing Bonus, Energy Recharge, Elemental Type, and Elemental DMG Bonus. Then all ten of them will be placed on five combat roles (DPS, Heal Support, Shield Support, Buff Support, and Elemental Support). Rating from table I and table II, each have their own combat role and they won't have any connection with the other combat role. It means that table I will only be used to calculate the ranking for DPS. Table II will be used to calculate the ranking for Support (Heal, Shield, Buff, and Elemental) only.

2. Making a decision matrix with character as (A_i), criteria as (C_i), and (w) for weight.

TABLE III. CRITERIA & WEIGHT FOR DPS

DPS			
Criteria	*Type*	*Weight (%)*	*Rate*
ATK	Benefit	0.2	3
CRIT Rate	Benefit	0.25	4
CRIT DMG	Benefit	0.3	5
Elemental DMG Bonus	Benefit	0.15	2
Elemental Mastery	Benefit	0.1	1
Total		1	

TABLE IV. CRITERIA & WEIGHT FOR HEAL

Heal Support			
Criteria	*Type*	*Weight (%)*	*Rate*
Healing Bonus	Benefit	0.5	3
HP	Benefit	0.3	2
ATK	Benefit	0.2	1
Total		1	

TABLE V. CRITERIA & WEIGHT FOR SHIELD

Shield Support			
Criteria	*Type*	*Weight (%)*	*Rate*
DEF	Benefit	0.5	3
HP	Benefit	0.3	2
Energy Recharge	Benefit	0.2	1
Total		1	

TABLE VI. CRITERIA & WEIGHT FOR BUFF

Buff Support			
Criteria	*Type*	*Weight (%)*	*Rate*
Elemental DMG Bonus	Benefit	0.3	2
Elemental Mastery	Benefit	0.5	3
ATK	Benefit	0.2	1
Total		1	

TABLE VII. CRITERIA & WEIGHT FOR ELEMENTAL

Elemental Support			
Criteria	*Type*	*Weight (%)*	*Rate*
Elemental Mastery	Benefit	0.5	3
Energy Recharge	Benefit	0.2	1
Elemental DMG Bonus	Benefit	0.3	2
Total		1	

Table III is for DPS, table IV is for Heal Support, table V is for Shield Support, table VI is for Buff Support, and table VII is for Elemental Support. Each combat role's criteria's weight won't allow even Admin to change it, and has been set for the total to be exactly 1. Above criteria and weight are chosen by considering what kind of attribute are player Arisa will prioritize when building a certain combat role characters.

TABLE VIII.   DECISION MATRIX SCENARIO

Weight	0.2	0.25	0.3	0.15	0.1
Alternative	C_1	C_2	C_3	C_4	C_5
	ATK	CRIT Rate	CRIT DMG	Elemental DMG Bonus	Elemental Mastery
	Benefit				
Childe (A1)	1712	56.2	154.1	83.2	105
Xiao (A2)	2035	60.5	154.1	61.6	105
Hu Tao (A3)	1389	57.1	181.1	61.6	105
Eula (A4)	1712	57.1	181.1	114.8	105
Arataki Iito (A5)	1197	71.5	172.4	58.6	105

Table VIII above is table scenario for decision matrix for combat role DPS. The alternative for this decision support system will be the characters, and are the representative for criteria ATK, CRIT Rate, CRIT DMG, Elemental DMG Bonus, and Elemental Mastery. Table is filled using data attributes from the in-game character trial attributes, because the higher the number of each attributes the better, therefore the criteria type is benefit, and will be normalize using max formula.

3. Normalize the decision matrix based on the type of attributes (max for benefit and min for cost) to get normalized matrix R using formula 1.

Criteria ATK (C_1):

$$r_{11} = \frac{1712}{\max\{1712;2035;1389;1712;1197\}} = \frac{1712}{2035} = 0.84$$

$$r_{21} = \frac{2035}{\max\{1712;2035;1389;1712;1197\}} = \frac{2035}{2035} = 1.00$$

$$r_{31} = \frac{1389}{\max\{1712;2035;1389;1712;1197\}} = \frac{1389}{2035} = 0.68$$

$$r_{41} = \frac{1712}{\max\{1712;2035;1389;1712;1197\}} = \frac{1712}{2035} = 0.84$$

$$r_{51} = \frac{1197}{\max\{1712;2035;1389;1712;1197\}} = \frac{1197}{2035} = 0.59$$

Criteria CRIT Rate (C_2):

$$r_{12} = \frac{56.2}{\max\{56.2; 60.5; 57.1; 57.1; 71.5\}} = \frac{56.2}{71.5} = 0.79$$

$$r_{22} = \frac{60.5}{\max\{56.2; 60.5; 57.1; 57.1; 71.5\}} = \frac{60.5}{71.5} = 0.85$$

$$r_{32} = \frac{57.1}{\max\{56.2; 60.5; 57.1; 57.1; 71.5\}} = \frac{57.1}{71.5} = 0.80$$

$$r_{42} = \frac{57.1}{\max\{56.2; 60.5; 57.1; 57.1; 71.5\}} = \frac{57.1}{71.5} = 0.80$$

$$r_{52} = \frac{71.5}{\max\{56.2; 60.5; 57.1; 57.1; 71.5\}} = \frac{71.5}{71.5} = 1.00$$

Criteria CRIT DMG (C_3):

$$r_{13} = \frac{154.1}{\max\{154.1;154.1;181.1;181.1;172.4\}} = \frac{154.1}{181.1} = 0.85$$

$$r_{23} = \frac{154.1}{\max\{154.1;154.1;181.1;181.1;172.4\}} = \frac{154.1}{181.1} = 0.85$$

$$r_{33} = \frac{181.1}{\max\{154.1;154.1;181.1;181.1;172.4\}} = \frac{181.1}{181.1} = 1.00$$

$$r_{43} = \frac{181.1}{\max\{154.1;154.1;181.1;181.1;172.4\}} = \frac{181.1}{181.1} = 1.00$$

$$r_{53} = \frac{172.4}{\max\{154.1;154.1;181.1;181.1;172.4\}} = \frac{172.4}{181.1} = 0.95$$

Criteria Elemental DMG Bonus (C_4):

$$r_{14} = \frac{83.2}{\max\{83.2; 61.6; 61.6; 114.8; 58.6\}} = \frac{83.2}{114.8} = 0.72$$

$$r_{24} = \frac{61.6}{\max\{83.2; 61.6; 61.6; 114.8; 58.6\}} = \frac{61.6}{114.8} = 0.54$$

$$r_{34} = \frac{61.6}{\max\{83.2; 61.6; 61.6; 114.8; 58.6\}} = \frac{61.6}{114.8} = 0.54$$

$$r_{44} = \frac{114.8}{\max\{83.2; 61.6; 61.6; 114.8; 58.6\}} = \frac{114.8}{114.8} = 1.00$$

$$r_{54} = \frac{58.6}{\max\{83.2; 61.6; 61.6; 114.8; 58.6\}} = \frac{58.6}{114.8} = 0.51$$

Criteria Elemental Mastery (C_5):

$$r_{15} = \frac{105}{\max\{105;105;105;105;105\}} = \frac{105}{105} = 1.00$$

$$r_{25} = \frac{105}{\max\{105;105;105;105;105\}} = \frac{105}{105} = 1.00$$

$$r_{35} = \frac{105}{\max\{105;105;105;105;105\}} = \frac{105}{105} = 1.00$$

$$r_{45} = \frac{105}{\max\{105;105;105;105;105\}} = \frac{105}{105} = 1.00$$

$$r_{55} = \frac{105}{\max\{105;105;105;105;105\}} = \frac{105}{105} = 1.00$$

4. The final result will be obtained by multiplying the respective weight with each criteria normalized matrix and summing the result of each alternative to get the best alternative to rank them.

$$R = \begin{pmatrix} 0.84 & 0.79 & 0.85 & 0.72 & 1.00 \\ 1.00 & 0.85 & 0.85 & 0.54 & 1.00 \\ 0.68 & 0.80 & 1.00 & 0.54 & 1.00 \\ 0.84 & 0.80 & 1.00 & 1.00 & 1.00 \\ 0.59 & 1.00 & 0.95 & 0.51 & 1.00 \end{pmatrix}$$

Using formula 2, the next step is to multiply each value with their respective weight, for ATK, CRIT Rate, CRIT DMG, Elemental DMG Bonus, and Elemental Mastery in order $w = [0.2; 0.25; 0.3; 0.15; 0.1]$. After that, all the result will be added with each other, below:

$V_1 = (0.2 \times 0.84) + (0.25 \times 0.79) + (0.3 \times 0.85) + (0.15 \times 0.72) + (0.1 \times 1.00)$
$\quad = 0.82874315580488$

$V_2 = (0.2 \times 1.00) + (0.25 \times 0.85) + (0.3 \times 0.85) + (0.15 \times 0.54) + (0.1 \times 1.00)$
$\quad = 0.84729959606864$

$V_3 = (0.2 \times 0.68) + (0.25 \times 0.80) + (0.3 \times 1.00) + (0.15 \times 0.54) + (0.1 \times 1.00)$
$\quad = 0.81664921103946$

$V_4 = (0.2 \times 0.84) + (0.25 \times 0.80) + (0.3 \times 1.00) + (0.15 \times 1.00) + (0.1 \times 1.00)$
$\quad = 0.91790587790588$

$V_5 = (0.2 \times 0.59) + (0.25 \times 1.00) + (0.3 \times 0.95) + (0.15 \times 0.51) + (0.1 \times 1.00)$
$\quad = 0.82979729478006$

From above ranking calculation, it can be concluded that alternative V_4 (Eula) has the highest value of 0.91790587790588, which mean Eula is rank 1 and the most suited for combat role DPS, followed by alternative V_2 (Xiao), V_5 (Arataki Iito), V_1 (Childe), and V_3 (Hu Tao).
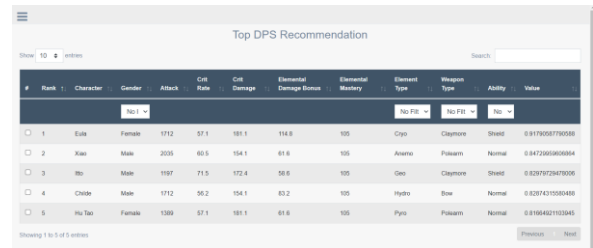
Fig. 3. Ranking DPS in Website

Figure 3 above is the screenshot from the web-based decision support system this project made. To prevent any difference from the scenario, at the image, there are only five characters that was inputted into the system.

TABLE IX. COMPARISON RANKING

Rank	Characters	Ranking's Value	
		Manual/Scenario	System
1.	Eula	0.91790587790588	0.91790587790588
2.	Xiao	0.84729959606864	0.84729959606864
3.	Iito	0.82979729478006	0.82979729478006
4.	Childe	0.82874315580488	0.82874315580488
5.	Hu Tao	0.81664921103946	0.81664921103945

Table IX above is the table comparison of the five rank's value, and as can be the ranking is the same Eula with 0.91790587790588, followed by Xiao, Iito, Childe, and Hu Tao.

B. Quick Design
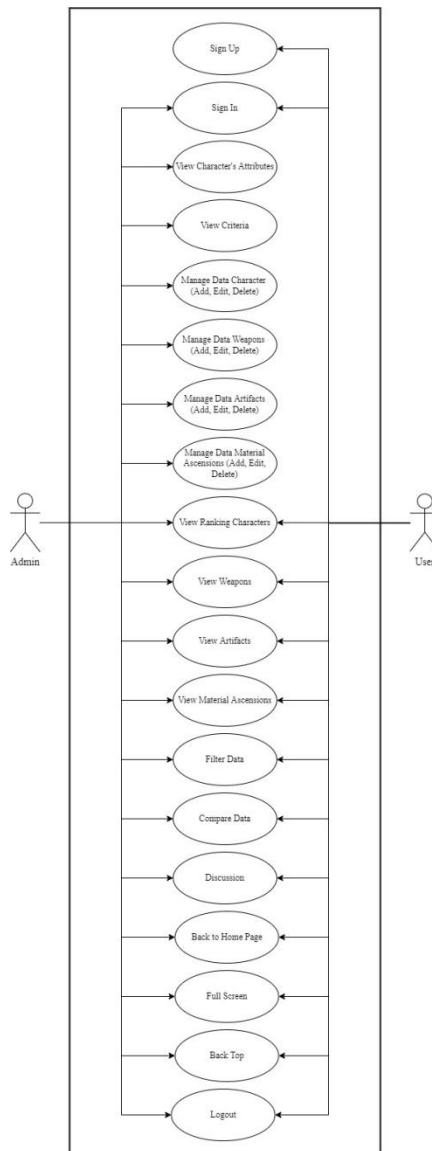
Image 3. Use Case Diagram

Image 3 is the use case diagram showing some features or interactions that are happening in the system involving users. Those are;

1. Sign up and Login If user doesn't have any account yet, they can create a new account by registering their username, email, and password. If user already had account, they can input the detail such as their username and password and Login into the website.
2. View Character's Attribute User can view attributes of characters based on in-game character's trial.

3. View Criteria View Criteria is residing inside Data Admin tab, it consists of criteria DPS, criteria Heal, criteria Shield, criteria Buff, and criteria Elemental Mastery. This page is restricted only for Admin.
4. Manage Data Character Admin can add new character along with their attributes, make some changes, and delete the existing character.
5. Manage Data Weapons Admin can add, edit, and delete data weapons into and from the Data Weapons page.
6. Manage Data Artifacts Admin can add new data Artifacts, edit, and delete the existing data Artifacts from the page.
7. Manage Data Material Ascensions Admin can add, edit, and delete data Material Ascensions.
8. View Ranking Characters Admin and user can view the ranking of characters based on their combat role, those are Ranking DPS, Ranking Heal, Ranking Shield, Ranking Buff, and Ranking Elemental Mastery.
9. View Weapons, Artifacts, and Material Ascensions Admin and user can view information regarding Weapons, Artifacts, and Material Ascensions from tab Data Information.
10. Filter Data Both admin and user can filter data from table Character's Attributes, Ranking Characters, Weapons, Artifacts, and Material Ascensions.
11. Compare Data Admin and user can choose at least two items, and click button compare. Then user can see only the data from those chosen items.
12. Discussion Admin and user can view, add new discussion, reply to another discussion, and like discussion or reply,
13. Back to Home Page Admin and user can back to Home Page by clicking button at the bottom-left with home icon and click "The World of Teyvat" at top-left.
14. Full Screen Admin and user can full screen the website by clicking the second icon after home icon at bottom-left.
15. Back Top Admin and user can back to the top of their page by clicking the up-arrow icon at bottom-left
16. Logout Admin and user can logout from the website and returning back to the login page.

C. Build a Prototype

While developing both the website and SAW algorithm, the prototype of that version was shown and discus with player Arisa and Golddy to gain feedbacks

on how the user experience of that current prototype was.

1. Ranking Character's Tables only Showing Name, Gender, and SAW Value.
2. Filter Positioned in the Bottom of Table.
3. There is no Function for "Full Screen" or "Back Top".
4. Can only Compares at least and at most 2 Items.
5. Can only Compare Ranking Characters.
6. Character's Attributes can only be view by admin
7. Website is Open without Sign up/Login.
8. Website is Completely Restricted for Member only

D. User Evaluation

1. Users that participate on giving feedback is mainly player Golddy, and player Arisa also giving some comments about the website. Table X below is the feedback from users for every time user view and try the website.

TABLE X.   USER EVALUATION

No	Function/Interface	Feedbacks
1	Ranking Character's Tables only Showing Name, Gender, and SAW Value.	Users prefer to be able to see the necessary attributes for that combat role
2	Filter Positioned in the Bottom of Table	Users feel that the position of filter at the bottom makes it harder to see, and tends to move a lot
3	There is no Function for "Full Screen" nor "Back Top"	Users got ideas to add "Full Screen" and "Back Top" button
4	Can only Compare at least and at most 2 Items	Users prefer to be able to compare more than 2 characters
5	Can only Compare Ranking Characters	Users think it would be better if compare function is applied on other tables as well
6	Character's Attributes can only be view by admin	Character's Attributes should be able to be view by user as well
7	Website is Open without Sign up/Sign in	Users said that if there is discussion section, then user should need to Sign up/Sign in
8	To enter website, user needs to Sign up/Sign in	User thinks that the website should be able to be enter freely, and Sign in only for discussion section

2. The second round of testing will be done by three players Genshin Impact that has been playing for quite some times, they are Arisa (Rank 58) who have been playing since September 2020, Golddy (Rank 56) have been playing since Mei 2021, and Nick_Vero (Rank 56) have been playing since Mei 2021. They will be testing if all of the functions in the website is working as without any issue.

TABLE XI.   USER ACCEPTANCE TEST (UAT)

Date	Tester	Success	Fail
20/05/2022	Nick_V (Rank 57)	43	0
20/05/2022	Golddy (Rank 56)	43	0
21/05/2022	Arisa (Rank 58)	43	0

Table XI above is the summary for the UAT that have been done. The results of this testing will be recorded using User Acceptance Test (UAT) that can be seen in detail via Appendix. For the UAT, there are a total 15 process for user, and a total of 28 for admin.

E. Refining Prototype

While developing both the website and SAW algorithm, the prototype of that version was shown and discus with player Arisa and Golddy to gain feedbacks on how the user experience of that current prototype was.

1. Ranking Character's Tables are now Showing their Respective Criteria Column
2. Filter Positioned now in the Top of Table, as Header under Title.
3. There is now Function for "Full Screen" and "Back Top".
4. Now can compare more than 2 characters.
5. Now Can Compare at Ranking Characters, Weapons, Artifacts, and Material Ascensions.
6. Now user can view Character's Attributes page.
7. Website is now can only be enter or view through Sign up or Sign in.
8. User now only required to Sign up or Sign in when entering Discussion Section.

F. Implementation and Maintenance

The design of website for this project has two sides, one is for user and the other is admin. But this journal will only show the admin side, with the difference between user is only that admin is capable of managing data such as add, edit, and delete.
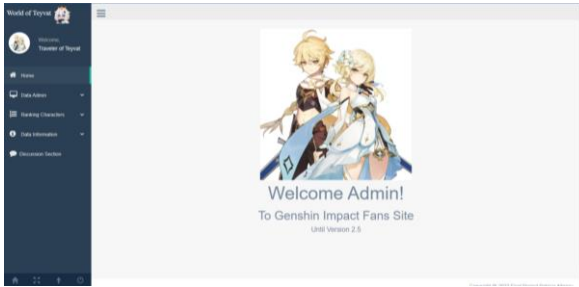
Fig. 4. Home Page

Figure 4 above is the Home Page layout for admin of Genshin Impact Fans Site that admin, will definitely lands in when he or she login into the website. There are navigation bar or menu on the left side, serves as buttons to go to another page. From the top is the word "World of Teyvat" and Home for returning into the Home Page, menu Data Admin, Ranking Characters, Data Information, and Discussion Section. The four little icons at the bottoms serves as a button, from the left Home, Full Screen, Back Top, and Logout.
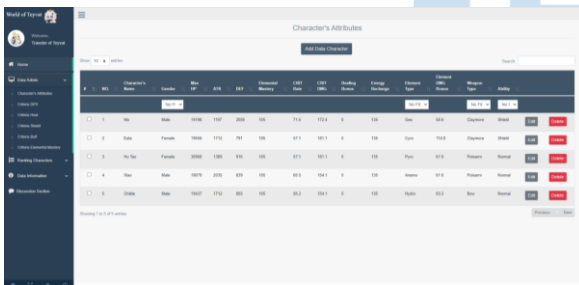
Fig. 5. Character's Attributes Page

Figure 5 above is the interface for Character's Attributes Page for admin, and is residing inside Data Admin tab. Character's Attributes Page's purpose is so that admin can view the current list of data character, to add a new character for ranking it, to edit, and delete if necessary. Admin can filter the data inside the table, select show entries, and search for keywords that exist inside the data table.

Fig. 6. Criteria DPS Page
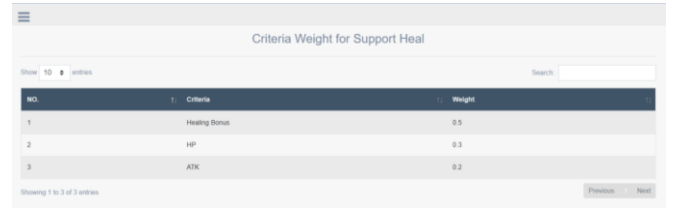
Fig. 7. Criteria Heal Page

Fig. 8. Criteria Shield Page
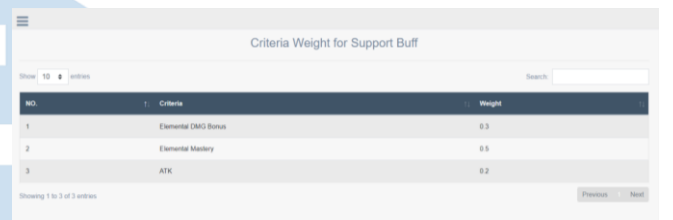
Fig. 9. Criteria Buff Page

Fig. 10. Criteria Elemental Page

Figure 6, 7, 8, 9, and 10 above are the interface for Criteria Pages for DPS, Heal, Shield, Buff, and Elemental that is all located inside Data Admin tab. This page's purpose is to show the criteria used for calculating and ranking characters based on their combat capabilities (DPS, Heal, Shield, Buff, and Elemental). Data criteria can only be view and can't be change or delete even by admin.

Fig. 11. Top DPS Recommendation

Fig. 12. Top Heal Recommendation

Fig. 13. Top Shield Recommendation

Fig. 14. Top Buff Recommendation

Fig. 15. Top Elemental Recommendation

Figure 11, 12, 13, 14, and 15 above is the interface for ranking characters based on their combat role (DPS, Heal, Shield, Buff, and Elemental). The rankings of these characters are based on the final result of SAW calculations of each character, sorted by descending. So these rankings of characters could hopefully serve as recommendations for user. The interface for Ranking Characters does not differ from what user seen on user's site. Admin can filter the data inside the table, select show entries, and search for keywords that exist inside the data table.

Fig. 16. Weapon Page

Fig. 17. Artifacts Page

Fig. 18. Material Ascensions Page

Figure 16, 17, and 18 above are the interface for Weapon, Artifacts, and Material Ascensions Page for admin that is located inside tab menu Data Information. In this page, admin can view currently existing data, can add a new item inside the database, edit, and can also delete the existing data. Admin can filter the data inside the table, select show entries, and search for keywords that exist inside the data table.
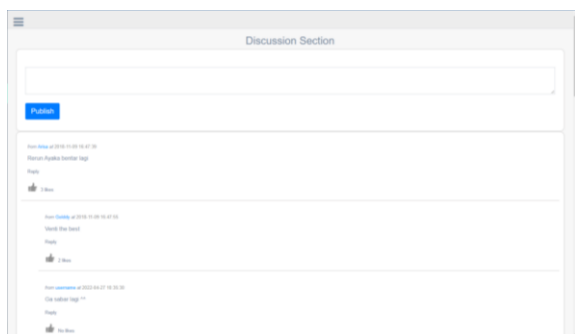

Fig. 19. Discussion Section

Figure 19 above is the interface for Discussion Section Page. This page purpose is for every user to be able to communicate, share their opinions or thought for others to see. User can write a new discussion, write a reply from an existing discussion then publish it, also to like and unlike, or reply a discussion.

V. CONCLUSION

A web-based decision support system to rank characters based on their combat role and a platform that provides a more straightforward view of the information of Genshin Impact Weapons, Artifacts, and Material Ascensions has been successfully created. Thus through this platform, the free-to-play user can view the Genshin Impact character's trial version that has been ranked according to the set criteria, weight, and character's attributes. This recommendation was made by looking into five different combat roles that are DPS, Heal, Shield, Buff, and Elemental.

These recommendations (ranking) along with information regarding Weapons, Artifacts, and Material Ascensions are decorated with features such as filters, search, and compare functions. Using these features and functions, the users will have easier time viewing information on characters' trial attributes and the rest of the pieces of information.

This website also has completed the User Acceptance Test (UAT) with the help of three Genshin Impact players and from Table XI the test is successful 43 Success and 0 Failure from 3 players, thus is granted with a score of 100%.

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