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Research paper

A Study on Smart App Contents for the Management of Little Baseball Team with Real-Time Broadcasting and Record Keeping

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Abstract

This paper aims to suggest an app contents that could manage little baseball league as the little baseball is revitalizing in accordance with vitalization of pro baseball league. Along with the popularity of pro-baseball, the interest toward the sports is also increasing. Thus, the number of youth baseball players and amateur baseball players is also increasing. According to Korean Amateur Baseball and Softball Federation in 2016, there are 1722 elementary school players from 97 teams, 2707 middle school players from 102 teams, 2633 high school players from 69 teams and 1054 college players from 31 teams. There are 2938 players from 154 teams under Korea Little League Baseball Federation. Also, there are many players who belong to Korea Youth Baseball Federation and Korea Pony Baseball Softball Association.

Parents who support children as baseball players put much economic and timely investment and effort for their development. They use Social Network Service(SNS) such as Kakaotalk and Naver Band to share training and game schedules, notices including expenses, game broadcasting and pictures taken during training or contest. However, using general SNS is limited in supporting service specializing in baseball, thus this study suggests an app contents model for smart phone. The application designed in this study considered households that both parents work so that not only parents but also the players could receive information on real-time basis and enabled the management of players' record and broadcasting if watching the game is impossible due to personal situation.

Keywords: *smart, app, baseball, management, real-time*

1. Introduction

Since the pro baseball league started in 1982, baseball is one of the most popular sports in Korea with largest number of fans. Also, after KT Wiz joined pro baseball league in 2015, Korea Baseball Organization(KBO) now has 10 teams playing in the league[1]. In such change, 2016 Korean pro-baseball recorded 8 million spectators. Table 1 indicates the yearly spectators of KBO season for last 6 years, and the number of spectators which decreased in 2013 started to increase since 2014, recorded 8.4 million in 2017 and now looking ahead for 9 million spectators.

Table 1: Yearly spectators of KBO season for last 6 years

year	spectators(person)
2017	8,400,688
2016	8,339,577
2015	7,360,530
2014	6,509,915
2013	6,441,945
2012	7,156,157

Along with the popularity of pro-baseball, the interest toward the sports is also increasing. Thus, the number of youth baseball players and amateur baseball players is also increasing. According to Korean Amateur Baseball and Softball Federation in 2016, there are 1722 elementary school players from 97 teams, 2707 middle school players from 102 teams, 2633 high school players from 69 teams and 1054 college players from 31 teams[2]. There are 2938 players from 154 teams under Korea Little League Baseball Federation[3]. Also, there are many players who belong to Korea Youth Baseball Federation and Korea Pony Baseball Softball Association. Most of them seek their future careers as baseball player who are getting professional training, and there are many others who play for hobby in the weekends. Also, as there are many little baseball teams and clubs, it is highly likely that large number of children play baseball.

For existing mobile apps, they are used primarily in social baseball, and they manage the game record. The smart app proposed in this study not only manages the game record but also has the difference that the parents can watch the game in real time because they cannot watch the game because of their job.

The proposed smart app is created by the leader of each little baseball team. Members are joined to the group and operated on a team basis. Each team determines and operates the operators.

2. Smart App

2.1. Current Utilization Problem and Improvement Plan

This study aims to suggest an improvement plan for SNS utilization problem of little baseball team among the cases above.

Parents who support children as baseball players put much economic and timely investment and effort for their development. They use SNS such as Kakaotalk and Naver Band to share training and game schedules, notices including expenses, game broadcasting and pictures taken during training or contest. However, using general SNS is limited in supporting service special-

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izing in baseball, thus this study suggests an app contents model for smart phone[4].



(a)



(b)

Fig. 1: The screen of currently operating Band's (a) post and (b) game broadcasting.

Based on Naver Band that the little baseball team under Korean Little Baseball Association uses, the study aims to point out problems and draw up an improvement plan.

The proposed smart app is based on the Android operating system's smartphone, and develops the program using Java language.

After a student joins the team, parents join parents group and invited to band to receive all the items related to operation of baseball team. It is mostly used to post training and game schedule, expenses, game and practice broadcasting, picture and image sharing related to training and game. Figure 1 is the screen of currently operating Band's post and game broadcasting.

As seen in the figure, posting notices can be fully functioned using general SNS. However, it is game broadcasting which causes the most significant problem. As not all parents can watch the game or practice due to private conditions, they rely on broadcasting on Band. Or they use Africa TV, but there is a problem of picture quality or excessive use of data.

Only parents can join the Band as there is confidential information, and it mostly posts training and game schedule and time and location. However, there could be an abrupt change of schedule due to weather or ground, which the parents who both work cannot receive the notice on time. Thus, the application suggested by the study is joined by both children and parents, and separately operate a notice board only for parents..

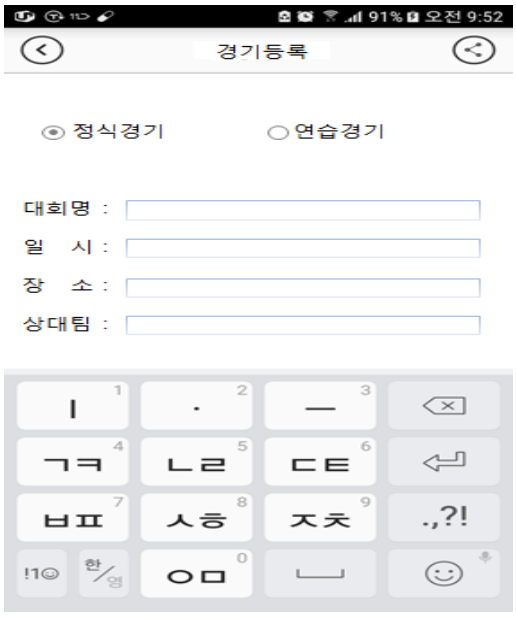


Fig. 2: The screen of photo and album function provided by Band

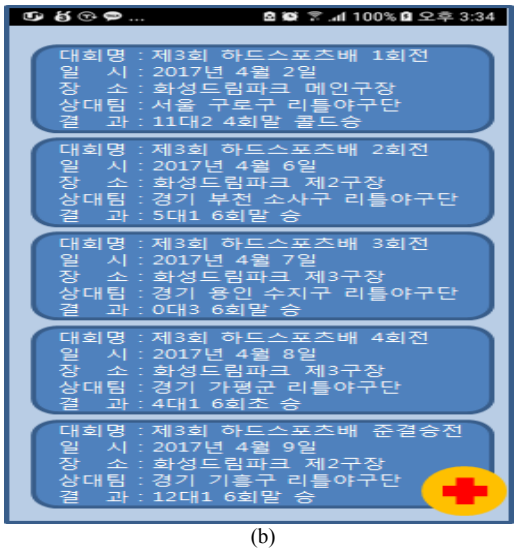
When broadcasting practice and game using band, the open chat room is used in Band, and as all the contents must be typed, it is very inconvenient and easy to make typos. For example, When pitching, it is posted as "no.1 ○○○ / S / B / F / Hit / Runner at 1st / no.2 □□/ B / Stolen 2nd / 2nd baseman fly out" and as for the defence, the initial location of defence is posted as "pitcher ○○○, catcher □□, 1st base △△△, ..." . As for the opponent's offense, it is posted as "no.1 / S / F / S / Strikeout". "S" stands for "strike" ,"F" stands for ""Foul". These kinds of input often cause error in ball count due to low typing speed. Also, there are confusions from typos and wrong information. All games are broadcasted via group chat room, as there are hundreds of messages posted during broadcasting; it is difficult to watch game again. Thus, if a separate chat room for each game is provided, it would solve the inconvenience for rewatching.

Figure 2 is the screen of photo and album function provided by Band. It has album, but as pictures are posted using album register function, it is inconvenient. Users sometimes post picture and video during broadcasting which is hard to look up after the game, so if there is a separate daily photo and video album it could resolve the inconvenience.

2.2. Proposed App Model



(a)



(b)

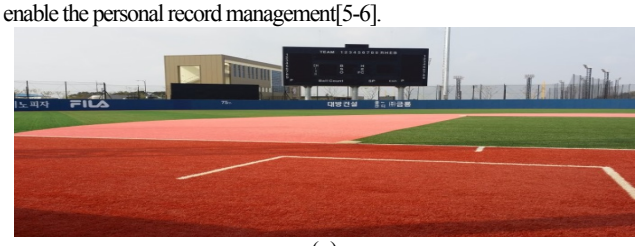
Fig. 3: The example of app screen for broadcasting (a) screen to create broadcasting tab and (b) screen to show game result

The application designed by this study enables both player and parents to join, and operate separate notice boards for parents. Notices regarding schedule, time and location are posted on board that both players and parents can watch, and other notices regarding expenses are posted on boards exclusive to parents. This can be actualized by separating the privacy scope.

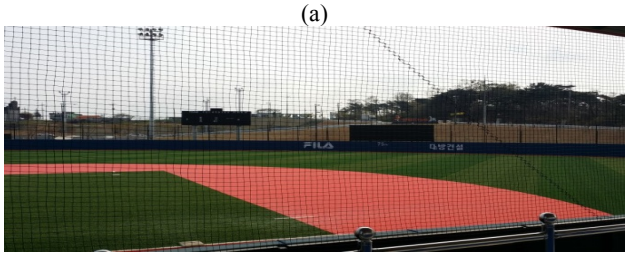
When broadcasting the game, the game and practice is separated and information such as game name, date, location, opponent and result is input to create separate broadcasting screen. Figure 3 is the example of app screen for broadcasting.

Game is broadcasted via separate tab, and when the game ends, the result is marked on the screen. Figure 3(a) is an example of screen to create broadcasting tab, and figure 3(b) shows the result. If the last game is selected on figure 3(b), the previous game contents are available, and check the result of game for each pitcher and batter.

Currently, little baseball league has opened a dream park with 8 ball parks including little main in Hwaseong, little 1, 2, 3, 4, junior main and junior 1, 2, 3 and 4, and hosts national little baseball competition. However, only main ball park is installed with electric board to display the order of hitter, and rest of the 3 ball parks can only show the score. Figure 4(a) is the electric board that shows the order of hitter, and figure 4(b) is the electric board that only shows the score. Thus, as most of the little baseball league's ball parks do not have electric board with order of bitter, it is impossible to set the order from the beginning. Thus, there is a need to enable the registration of order at the beginning of the game. The order of hitter automatically increases in accordance with game play, and automatically post "no.1 hitter ~" using the registered information once the order goes around. Such DB management could enable the personal record management[5-6].



(a)



(b)

Fig. 4: The pictures of electric board that shows the order of hitter, and (b) only shows the score

Figure 5 is the flow chart to input line-up and contents during the broadcasting. First, it selects if the team is defence or offense. If it is offense first, as it is highly unlikely to have electric board that shows the order of hitter, the order is input by distinguishing the first hitter and it is repeated until 3 outs. Once the order goes around once, it automatically shows off the hitter, and only the details of game are input. If it is defence first, the location of each defence is registered to mark the players, and process the defence details in accordance with opponents' offense. Once the out count reaches 3, the system checks if the sixth inning is over to proceed to next offence or end the game. The order of hitter is registered by the order explained above.

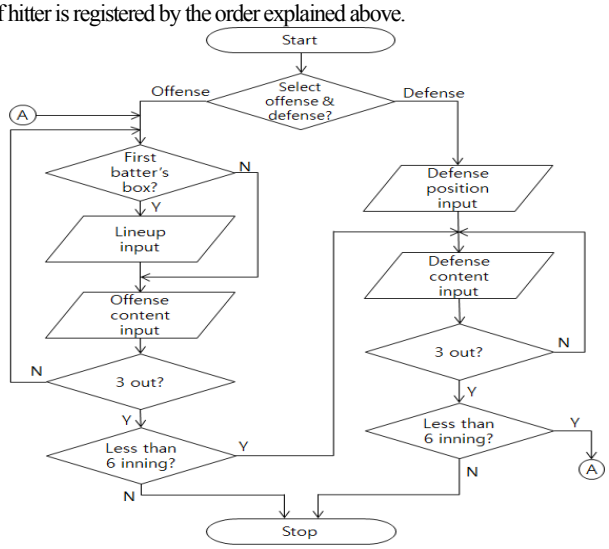


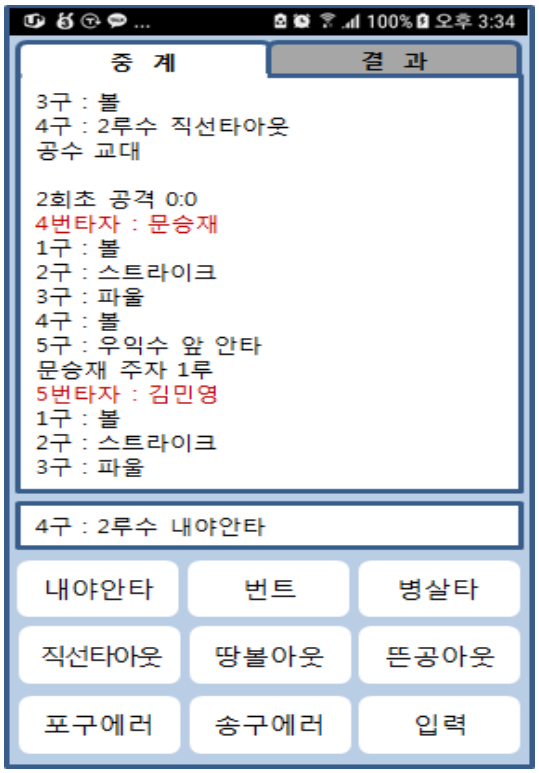
Fig. 5: The flow chart to input line-up and contents during the broadcasting

Figure 6 is the input screen of game details. Figure 6(a) is the input screen of hitter's ball count and base details. It not only marks ball, strike and missed swing counts, but when there is a ball in 3-ball, it changes the information to 4 balls, and automatically checks strikeout when there is missed swing or strike in 2-strike situation. To mark stealing base, the user can choose the player and check success or failure on safe-out window.

When choosing batting, the user can choose fielder and input result once there is a screen like figure 6(b). For adding details, there is a separate tab to input details. As baseball game itself has many rules and various conditions, it enabled to input detailed information to deliver information. If a hitter is replaced, user clicks on the replacement button to replace. Also, if the user selects wrong button during offense, one can use revision button to revise. Figure 6(b) shows how to choose batting, and select player to select next result such as hits, out and error. The application provides different screen in accordance with infielder or outfielder from the previous step. As there are differences in situation that could occur by the position of defences including the difference between infielder and outfielder, the application enabled diversification of selection button.



(a)



(b)

Fig. 6: Screenshot of game content (a)ball count and content of batter's box (b)batting results

Table 2 is the layout when a centre field among outfielder is selected after batting. For a single, it is displayed as a hit in front of centre, but in case of long hit like double or triple, there are options such as hit over centre, left-centre hit, and right-centre hit. Other than that, there is home-run, liner out or fly ball out. However, outfielders might vary in accordance with each location. There could be common details such as hit in front of outfielder, fly ball out, but in case of double or triple hit, it is different in accordance with outfielder. As indicated in the table, centre fields are displayed as left and right, but as for the left fields, they are displayed as left-field line, right centre, and right fields are displayed as left centre and right-field line.

Also, as outfielders and infielders face various situations, there is a need to create layout for them.

Table 2: The layout when a centre field among outfielder is selected after batting

fielder's choice	a batted ball choice #1	a batted ball choice #2	result
outfielder (center fielder)	hit		center hit
	double hit	left centre	left centre double hit
		over	center over double hit
		right centre	right centre double hit
	triple hit	left centre	left centre triple hit
		over	center over triple hit
		right centre	right centre triple hit
	homerun		center homerun
	catch error		catch error
	throwing error		throwing error
	fly out		center fly out
	liner out		center liner out
	input		other situations

Table 3: The layout when a second baseman among infielder is selected after batting

fielder's choice	a batted ball choice #1	a batted ball choice #2	result
infielder (second baseman)	hit		hit
	throwing out	first base	first throwing out
		second base	second throwing out
		third base	third throwing out
		home base	home throwing out
	catch error		catch error
	throwing error		throwing error
	fly out		second fly out
	liner out		second liner out
	input		other situations

Table 3 is the layout when a second baseman among outfielder is selected after batting. It is displayed as a hit, throwing out, catch error, throwing error, fly out, liner out, etc.

Table 4 is the layout when a right field among outfielder is selected after batting. For a single, it is displayed as a hit in front of right, but in case of long hit like double or triple, there are options such as hit over right, left-centre hit, and right-field line hit. Other than that, there is home-run, liner out or fly ball out. However, outfielders might vary in accordance with each location. There could be common details such as hit in front of outfielder, fly ball out, but in case of double or triple hit, it is different in accordance with outfielder. As indicated in the table, centre fields are displayed as left and center, but as for the left fields, they are displayed as left-field line, right centre, and center fields are displayed as left centre and right centre.

Table 4: The layout when a right field among outfielder is selected after batting

fielder's choice	a batted ball choice #1	a batted ball choice #2	result
outfielder (right fielder)	hit		center hit
	double hit	left centre	left centre double hit
		over	right over double hit
		right-field line	right-field line double hit
	triple hit	left centre	left centre triple hit
		over	right over triple hit
		right-field line	right-field line triple hit
	homerun		right homerun
	catch error		catch error
	throwing error		throwing error
	fly out		right fly out
	liner out		right liner out
	input		other situations

3. Conclusion

Currently, most of the little baseball teams use Kakaotalk or Naver Band for management, which is limited to providing service, specialized for baseball. However, it is limited in providing specialized service for baseball. The application designed in this study considered households that both parents work so that not only parents but also the players could receive information on real-time basis and enabled the management of players' record and broadcasting if watching the game is impossible due to personal situation. Also, this study suggested an album function that could manage pictures of training and game by day. The smart app contents which this study suggest will be able to provide convenience and

usefulness to little baseball league and parents.

4. Discussion

In this study, we present the problem of the real-time game broadcasting and records management of the existing SNS, and suggested a solution accordingly. The developed smart app works on the smartphone of the Android operating system and is programmed using Java language. The service operates a data server from the vendor, and the administration and data entry of the app is performed by the operators and parents of each team.
In the future, there is a need to improve the app further by linking the information of opposite players during game broadcasting (order and defense location).
Also, a profit model in accordance with development of smart app is required, which could be solved by connecting with online shopping mall. There are numerous online shopping malls that sell baseball goods, but most of them only provide goods and model search. However, players of little league are youth who need small sizes, and it is difficult to find small sizes as goods and models with small size are rare. By selling consumable goods such as under shirts, batting glove and artificial shoes via size search, it could provide the convenience of shopping to customers.

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