

Devising a World Cup in Tennis

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1. Introduction

A team sport includes any sport which involves players working together towards a shared objective (i.e. soccer, rugby, cricket), whereas an individual sport refers to a sport in which participants compete as individuals (i.e. golf, athletics, tennis). There are certain sports which are sometimes played as a team sport and other times as an individual sport. Tennis is one example where doubles could be regarded as a team sport and singles as an individual sport. However, overall tennis is better reflected as an individual sport since when played internationally there are often more than one singles players or doubles teams represented by the same country.

The FIFA World Cup (also called the Soccer World Cup) is the world's most widely viewed sporting event and the major international competition in soccer, and arguably the competition that countries would want to win most of all. Similar world cup competitions exist in other sports such as rugby union, rugby league, ODI cricket and recently T20 cricket. The Olympic Games are a major international event featuring summer and winter sports and have come to be regarded as the world's foremost sports competition. There has been a soccer tournament at every summer Olympic Games since 1900, except at the 1932 games in Los Angeles. Before the inception of the FIFA World Cup, the Olympics had the same status as the FIFA World Cup.

Individual sports can have the complexity of recognizing status since they can be played as an individual event or as a team event. Tennis is one such example where the four major tennis tournaments (also called the Grand Slams) are the most important individual tennis events of the year in terms of world ranking points, tradition, prize money and public attention, whereas the Davis Cup is recognized as the premier international team event in men's tennis.

Tennis was part of the Summer Olympic Games program from the inaugural 1896 Summer Olympics but was dropped after the 1924 Summer Olympics. After two appearances as a demonstration sport, it returned as a full medal sport at the 1988 Summer Olympics and has been played at every edition of the Games since then. Tennis is currently played as an individual event in the Olympic Games by using a knock-out format in all events similar to Grand Slam tournaments. Given that the Olympic Games is represented by athletes competing for their country (rather than as an individual as in Grand Slam events for tennis), this article will introduce a new tournament format for tennis at the Olympics that is reflective of team events. Further, this new tournament format is used to devise a World Cup in tennis that could be represented as the most important event for team tennis.

2. Tournament structure

The ATP World Tour comprises a series of tournaments in elite men's tennis to obtain ranking points. In order of importance in obtaining world ranking points are Grand Slams, ATP World Tour Finals, ATP World Tour Masters 1000, ATP World Tour 500 series, ATP World Tour 250 series and the ATP Challenger Tour. Ranking points are also available at the ITF Futures tennis tournaments and at the Olympic Games, which are organized by the International Tennis Federation (ITF). Similarly, the WTA Tour comprises a series of tournaments in elite women's tennis. In order of importance are Grand Slams, WTA Tour Championships, Premier Mandatory, Premier Five, Premier and International tournaments. Ranking points are also available at tournaments on the ITF Women's Circuit and at the Olympic Games, which are organized by the ITF.

Team events for men consist of the Davis Cup and the World Team Cup, for women the Fed Cup and the Hopman Cup is a mixed competition. The Davis Cup is contested between teams of players from competing countries in a knock-out format. The world's 16 best national teams are assigned to the World Group and compete in 8 first-round ties ("rounds"); the 8 winners compete 4 quarter-final-round ties; the 4 winners compete in 2 semifinal-round ties; and the 2 winners compete in the final round tie. Each tie consists of 5 rubbers ("matches") of four singles and one doubles, which are played in 3 days. The winner of the tie is the nation which wins 3 or more of the 5 rubbers in the tie. The women's equivalent of the Davis Cup is the Fed Cup.

The World Team Cup is classified as an ATP World tour 250 series tournament and has been contested annually since 1978 on clay courts, and is generally considered to be second most prestigious men's team competition in tennis after the Davis Cup. Every year, the eight nations whose top two male players have achieved the highest combined placings in the men's world rankings at the end of the previous year are invited to compete for the cup. The teams are grouped into two pools of four teams each for a round-robin preliminary round. Each round would consist of two singles and one doubles event. The top two teams in each pool play off for the title.

The Hopman Cup is an annual international team tennis tournament held in Perth, Western Australia in early January (or late December). Each team consists of one male player and one female player. Each match-up between two teams at the championships consists of one men's singles match, one women's singles match and one mixed doubles match. Each year the eight competing teams are separated into two groups of four (with two teams being seeded) and face-off against each of the other three teams in their group in a round-robin format. The top teams in each group then meet in a final to decide the champions.

3. Court Surface

The four main types of surfaces used on the ATP and WTA tours are grass, hard, carpet and clay courts. Each Grand Slam is played on a different surface with Wimbledon played on grass, the French Open on clay, the US Open on a hard court of DecoTurf and the Australian Open on a different hard court of

Rebound Ace. The court surfaces used in other ATP and WTA tour events played throughout the year reflect the surfaces used in Grand Slam events. It is documented in Furlong (1995) that Wimbledon on grass is a fast surface and the French Open on clay is a slow surface, and therefore the mid-range surfaces of hard court and carpet are somewhere between grass and clay in terms of court speed. Barnett and Pollard (2007) show that data on the highest ranked men and women players indicates that players' performances are affected by the court surface. Players that perform best on the faster surfaces can be considered to be disadvantaged on the tour, due to the lack of grass court tournaments available. Pollard and Barnett (2010) show that the change in the proportion of tournaments played on different court surfaces from 1877 to 2010 has made an impact on the game of tennis. Results were given to show that serve and volley players are disadvantaged on the tour due to the lack of grass court tournaments now available. The results also verify that serve and volley players are most likely to have their best surface on grass and that players are more likely to serve and volley on grass courts than on any other surface.

Table 1 represents categories of 2011 men's tournaments separated by court surface. Similarly, table 2 represents categories of 2011 women's tournaments separated by court surface. Hard court and carpet are grouped together in the one surface category as they are similar in relation to court speed (Barnett and Pollard, 2007). Note the surfaces used for the ATP World Tour Finals in the past have all been synthetic surfaces – indoor hard courts or carpet. Grass and clay courts have never been used at this event. Barnett and Pollard (2007) state that given the importance of all court surfaces in tennis, the following would appear to be fairer methods of allocating court surface selection for the ATP World Tour Finals; rotate the surface each year with grass, clay and hard court. A similar situation occurs for the WTA Tour Championships.

It can be observed from table 1 that there are no grass court tournaments played in the ATP World Tour Masters 1000 or ATP World Tour 500 series and yet there are 5 grass court tournaments in the ATP World Tour 250 series. Similarly from table 2, there are no grass court tournaments played in the Premier Mandatory or Premier Five categories. The calendar of tournaments is constructed such that tournaments leading up to a particular Grand Slam are generally of the same surface. This can be observed from table 3 where the number of tournaments played on each surface is given from the end of one grand slam event to the start of the next grand slam event. Of the limited number of grass court tournaments on the ATP and WTA tours, 4 out of 5 men's tournaments are played on a grass surface leading up to Wimbledon and 3 out of 3 women's tournaments are played on a grass surface leading up to Wimbledon. Each year there is only a 2 week gap between the end of the French Open (on clay) and the start of Wimbledon (on grass), as compared to a 16 week gap between the end of the Australian Open and start of the French Open, an 8 week gap between the end Wimbledon and the start of the US Open and an 18 week gap between the end of the US Open and the start of the Australian Open (the following year). A logical way to increase the number of grass court tournaments and subsequently increase the number of tournaments played in the ATP World Tour Masters 1000, ATP World Tour 500 series, Premier Mandatory and Premier Five, is to increase the number of weeks between the end of the French Open and the start of Wimbledon.

Category	Grass	Hard/Carpet	Clay	Total
Grand Slams	1	2	1	4
ATP World Tour Finals	0	1	0	1
ATP World Tour Masters 1000	0	6	3	9
ATP World Tour 500 series	0	8	3	11
ATP World Tour 250 series (ex. ATP World Team Cup)	5	20	15	40
Olympic Games	Vary depending on home nation			1 (every 4 years)
Davis Cup	Vary depending on home team			1
ATP World Team Cup	0	0	1	1
Hopman Cup	0	1	0	1

Table 1: Categories of 2011 men's tournaments separated by court surface

Category	Grass	Hard/Carpet	Clay	Total
Grand Slams	1	2	1	4
WTA Tour Championships	0	1	0	1
Premier Mandatory	0	3	1	4
Premier Five	0	4	1	5
Premier	1	7	3	11
International tournaments	2	19	11	32
Olympic Games	Vary depending on home nation			1 (every 4 years)
Federation Cup	Vary depending on home team			1
Hopman Cup	0	1	0	1

Table 2: Categories of 2011 women's tournaments separated by court surface

Grand Slam		Men			Women		
End	Start	Grass	Hard/Carpet	Clay	Grass	Hard/Carpet	Clay
US Open	Australian Open	0	19	1	0	16	0
Australian Open	French Open	0	9	15	0	9	12
French Open	Wimbledon	4	0	0	3	1	0
Wimbledon	US Open	1	6	6	0	8	4
		5	34	22	3	34	16

Table 3: Number of tournaments played on a particular surface from the end of a Grand Slam event to the start of the next Grand Slam event for 2011

4. Olympic Games

At the 2008 Summer Olympics, men's soccer was competed in a 16-team tournament. The teams were grouped into four pools of four teams each for a round-robin preliminary round. The top two teams in each pool advanced to an eight-team single-elimination bracket. Women's soccer was similar in that 12 teams were grouped into three pools of four teams each for a round-robin preliminary round. The top

two teams in each pool, as well as the best two third-place finishing teams, advanced to an eight-team single-elimination bracket.

This format is common for team events played at the Olympic Games and could be used to devise a team format for men's and women's tennis. Given that both singles and doubles are played in tennis, multiple matches would be played against another team in the preliminary-round. For example for the men's competition, suppose there were 16 teams that competed and were grouped into four pools of four teams each for a round-robin preliminary round. Further, suppose there were two men's singles matches and one men's doubles match played (which reflects on the World Team Cup format) when team A meets team B. Then a total of nine matches are played within each pool and the top two teams in each pool advance to an eight-team single-elimination bracket. The main difference between tennis and soccer is that three matches are played when team A meets team B (rather than the one match as is in soccer). As noted in section 3, Barnett and Pollard (2007) state that given the importance of all court surfaces in tennis, the following would appear to be fairer methods of allocating court surface selection for the ATP World Tour Finals; rotate the surface each year with grass, clay and hard court. A similar court surface rotation process could be used at the Olympic Games.

5. World Cup

The format used in World Cup events for a particular sport generally reflects the format that is used in the Olympic Games, but with the flexibility to include more teams in the World Cup as a result of a longer duration for the tournament. For example, in the group stage of the 2010 FIFA World Cup, thirty-two teams were divided into eight groups of four teams. Each group was a round-robin of six games, where each team played one match against each of the other teams in the same group. The teams finishing first and second in each group advanced to a sixteen-team single-elimination bracket.

For the newly devised team format for the Olympic Games, a men's and women's competition where treated separately. Given that mixed doubles is present in elite Grand Slam tennis (and used in a team format at the Hopman Cup), a World Cup tennis format is now devised that includes men's and women's singles, men's and women's doubles and mixed doubles. Similar to the FIFA World Cup, 32 teams would be divided into eight groups of four teams. Each group would be a round-robin of six rounds, where each round would consist of two men's singles matches, two women's singles matches, one men's doubles match, one women's doubles match and one mixed doubles match. The teams finishing first and second in each group would advance to a sixteen-team single-elimination bracket. Given that players' performances are affected by the court surface (Barnett and Pollard, 2007), a court surface rotation process could be implemented such that in the group stage every team plays on the three surfaces of grass, hard and clay. This is represented in table 4. In the knock-out stage the team that finishes in a higher position from the group stage has the choice of court surface.

Round	Surface
Team A vs Team B	Grass
Team C vs Team D	Grass
Team A vs Team C	Hard
Team B vs Team D	Hard
Team A vs Team D	Clay
Team B vs Team C	Clay

Table 4: Rotation process for court surface used in a newly devised World Cup team event for tennis

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