GOLFDATALAB

Player Performance Measurement & Golf Statistics Analysis Programmes

**How it works**

**Strokes Gained - Putting**

**October 2014 - 4 pages**

Following some market research this year, we know that the majority of golfers – inc. at professional level – and coach's are not fully familiar with the Strokes Gained metric which first appeared on the PGA Tour website three years ago.

This document therefore tries to explain it, as we deploy this as an additional tab on our Performance Data > Putting section.

First of all, the on-going academic debate on the Strokes Gained concept as a measure of differerent shot types in golf is not something we're going into here. This is simply a stat by which overall PUTTING efficiency can be seen and is therefore termed PUTTS GAINED on GDL rather than Strokes Gained.

Here's the deal.

With the collection of data for millions of shots on tour, we know now what is good, bad and average in each part of the game on the US PGA Tour. In terms of putting, these are the average number of putts from each distance range: -

| PUTTING BASELINE | |
|---|---|
| 2 feet | 1.008 |
| 3 feet | 1.054 |
| 4 feet | 1.151 |
| 5 feet | 1.261 |
| 6 feet | 1.363 |
| 7 feet | 1.449 |
| 8 feet | 1.521 |
| 9 feet | 1.580 |
| 10 feet | 1.630 |
| 11 feet | 1.673 |
| 12 feet | 1.709 |
| 15 feet | 1.792 |
| 20 feet | 1.880 |
| 25 feet | 1.937 |
| 30 feet | 1.981 |
| 35 feet | 2.021 |
| 40 feet | 2.061 |
| 50 feet | 2.144 |
| 60 feet | 2.226 |
| 70 feet | 2.296 |
| 80 feet | 2.342 |

The 1 foot doesn't appear as the number of putts missed from a foot is so small as to be statistically insignificant. It still happens of course, but if you do miss, your Putts Gained statistic will suffer a minus 1 when you do.

By adding up putting performance on each of the 18 holes - or 17 if you chip/pitch in or putt it in from off the green once – and examining how we did on each green on which we faced a first putt, we get a number that defines actual putting effectiveness during that round, COMPARED TO WHAT THE AVERAGE PGA PRO DOES.

This is key. We don't expect our amateurs, even at elite level to compete with PGA pros because they're simply not at this level… yet.

Putts Gained is purely a comparison with what these tour pros do and given the volume of data collected by Shotlink over the last decade plus, the data sample is collectively robust. In other words, we KNOW what they do on the greens.

From 4 feet for example, the average number of putts taken is 1.151. What this means is that of every 100 putts on tour from 4 feet, 85 get holed and 15 get missed, or more properly, of every 1,000 putts from 4 feet, 849 get holed and 151 get missed.

Armed with these FACTS, this allows us to put a value on each putt we hole or miss, from every distance.

If we hole a 4 footer, we GAIN 0.151 on the field. If we miss a 4 footer, we LOSE 0.849 on the field… IF THE FIELD IS COMPARING WITH US PGA TOUR PROS.

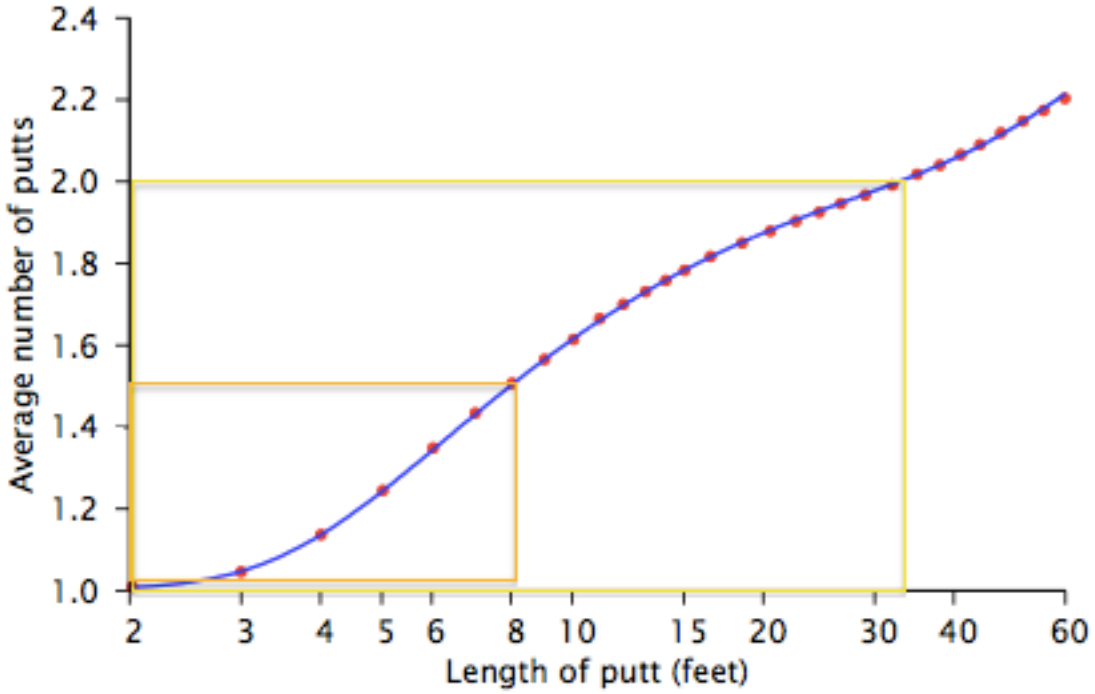
Similarly, if we hole from 8 feet, we GAIN 0.521 and if we miss, we lose 0.479.

8 feet is a statistically significant number. This is the distance (to the nearest whole foot) where the PGA pro is equaly like to hole or miss. For GDL users, this is the point (8 feet) at which the average pro's 50% conversion ratio will appear.

32.5 feet is another statistically significant number. From this distance, the average number of putts taken is 2, 2.001 to be precise! In other words, from 32 and a half feet, the PGA Tour pro is equally likely to either single putt or 3 putt, although the vast majority of times, they 2 putt of course.

Outside 32.5 feet, the likelihood of 3 putting increases as against single putting and the average number of putts increases beyond 2. From 50 feet for instance, the average number of putts is 2.144 so if you 2 putt from 50 feet, you gain 0.144 and if you 3 putt you suffer a minus 0.856 to your Putts Gained score i.e. 3 minus 2.144.

This is a pictorial representation of the average number of putts from each distance: -




This is not rocket science.

This is actual data informing us how many putts these pros take from all distances.

Hole a 20 footer and you get +0.880. Miss from 20 feet = -0.120 and take 3 putts from 20 feet and you suffer -1.120 (3 minus 1.880).

Do this for 18 holes (or 17 if you chip in once or 16 if you hole from off twice etc.) and add up all your plusses and minuses to get your Putts Gained score for that round.

Collect data for a few rounds, a tournament, month or a whole season and your average Putts Gained (or lost) will be your measure of actual putting effectiveness v. PGA Tour pros.

This is something that is computed automatically for you on GDL. An actual illustration of how it works in a round of golf is as follows: -

This was from an actual round played by one of our pros a couple of years ago at European Tour Q school, infamous for it's ridiculously good footage stat over 200 feet, still a record: -

| HOLE | First putt distance | No. of putts | Factor | Result |
|---|---|---|---|---|
| 1 | 10 feet | 1 | 1.630 | +0.630 |
| 2 | 12 feet | 2 | 1.709 | -0.291 |
| 3 | 11 feet | 2 | 1.673 | -0.327 |
| 4 | 4 feet | 1 | 1.151 | +0.151 |
| 5 | 9 feet | 2 | 1.580 | -0.420 |
| 6 | 21-24 feet | 2 | 1.909 | -0.091 |
| 7 | 11 feet | 2 | 1.673 | -0.327 |
| 8 | 21-24 feet | 1 | 1.909 | +0.909 |
| 9 | 25-29 feet | 2 | 1.955 | -0.045 |
| 10 | 36-44 feet | 2 | 2.061 | +0.061 |
| 11 | 55-75 feet | 1 | 2.261 | +1.261 |
| 12 | 14 feet | 1 | 1.764 | +0.764 |
| 13 | 12 feet | 1 | 1.709 | +0.709 |
| 14 | 30-35 feet | 1 | 2.001 | +1.001 |
| 15 | 45-54 feet | 2 | 2.140 | +0.140 |
| 16 | 25-29 feet | 2 | 1.955 | -0.045 |
| 17 | 25-29 feet | 2 | 1.955 | -0.045 |
| 18 | 16-17 feet | 1 | 1.818 | +0.818 |
| | | **28** | | **4.853** |

A Putts Gained rating of +4.853 is tremendous and was all made possible because of putting like God on the back 9. This 4.853 total means that this pro GAINED almost 5 shots against the average of US Tour pros because of his putting performance alone!

Now here's from this year, for another pro who is putting very well so far in 2014: -

| HOLE | First putt distance | No. of putts | Factor | Result |
|---|---|---|---|---|
| 1 | 10 feet | 2 | 1.630 | -0.370 |
| 2 | 30-35 feet | 3 | 2.001 | -0.999 |
| 3 | 30-35 feet | 2 | 2.001 | +0.001 |
| 4 | 3 feet | 2 | 1.054 | -0.946 |
| 5 | 21-24 feet | 2 | 1.909 | -0.091 |
| 6 | 36-44 feet | 2 | 2.061 | +0.061 |
| 7 | 1 foot | 1 | 1.000 | 0 |
| 8 | 1 foot | 1 | 1.000 | 0 |
| 9 | 21-24 feet | 2 | 1.909 | -0.091 |
| 10 | 10 feet | 2 | 1.630 | -0.370 |
| 11 | 18-20 feet | 2 | 1.862 | -0.138 |
| 12 | 25-29 feet | 2 | 1.955 | -0.045 |
| 13 | 12 feet | 1 | 1.709 | +0.709 |
| 14 | 15 feet | 2 | 1.792 | -0.208 |
| 15 | 6 feet | 2 | 1.363 | -0.637 |
| 16 | 9 feet | 2 | 1.580 | -0.420 |
| 17 | 30-35 feet | 2 | 2.001 | +0.001 |
| 18 | 36-44 feet | 2 | 2.061 | +0.061 |
| | | **34** | | **-3.482** |

A Putts Gained rating of -3.482 means that this pro LOST the equivalent of almost three and a half shots during this round because of his unusually poor putting, racking up only 31 feet's worth of holed putts during this particular 18 holes.

These two examples show how an excellent or a poor (or indeed any) putting round can be accurately quantified and measured against what the PGA Tour pros do on average.

Here's a final illustration of the concept;

Two golfers take a putt from 8 feet. One holes and one misses, and taps in. The total putts was 3, there were two of them, 3 divided by 2 = 1.5, the average number of putts taken from that distance.

Multiply this exercise by tens and hundreds and thousands and millions and as the data samples get bigger, then patterns of actual performance begin to emerge.

For example, if the data sample was only 10 golfers taking a putt from 22 feet - one of them three putts, two of them hole it and the remaining 7 take 2 putts: -

| No. of putts | Golfers from 22 feet | Total no. of putts |
|---|---|---|
| 1 | 2 | 2 |
| 2 | 7 | 14 |
| 3 | 1 | 3 |
| | | **19** |

If 19 is the total number of putts taken from this distance by 10 golfers, the "factor" for the Putts Gained measurement is 1.9 i.e. 19 / 10.

The two golfers who single putted gained 0.9. The seven golfers who took 2 putts lost 0.1 and the golfer who 3 putted lost 1.1.

When we add them all up, the net gain or loss is zero: -

| No. of putts | Golfers from 22 feet | Total no. of putts | Factor | Putts Gained |
|---|---|---|---|---|
| 1 | 2 | 2 | +0.9 x 2 | +1.8 |
| 2 | 7 | 14 | -0.1 x 7 | -0.7 |
| 3 | 1 | 3 | -1.1 x 1 | -1.1 |
| | | **19** | | **0** |

Using this measurement and this concept to establish the average number of putts taken from each distance, we have a "value" – a factor – by which each holed or missed putt can be quantified.

When all the putt values are added up from each distance, the total will be zero, which is the average putting performance for the data sample selected e.g. PGA Tour.

The golfer who scores exactly zero for a round of golf will have putted exactly on average. The golfer who has a plus + number will have putted better than average and the golfer with a minus – less than average, to varying degrees depending on the number.

We start with the PGA pro tour baseline factors on GDL and will follow this up with elite amateur, U18, U16 and female amateur baselines in due course, now that our own GDL database will exceed 4 million shots including over one and three quarter million putts before the end of this year.

GOLFDATALAB
Player Performance Measurement & Golf Statistics Analysis Programmes

**Putts Gained**

**To be aware of…**

**14th September 2014 - 5 pages**

As we prepare to deploy the new Putts Gained metric on GDL, remember that whilst it is an excellent snapshot of overall putting efficiency during a round, a tournament, month, year etc., it still does not explain the full picture of what exactly is going on. The best – and indeed the only – way to understand putting performance is to review conversions, the total number of putts holed and missed from each distance.

PpR – Putts per Round – is a very generic putting stat that tells us nothing. As it is heavily dependent (and inversely proportional) to GIR's, the total number of putts we take one round to the next is completely meaningless. Whilst the Strokes Gained Putting stat is also generic, it is a much more robust indicator of overall putting performance. There is a variable and/or weakness to be aware of with this number however.

This was a GDL golfer at Q school this week. These are his first two Rds: -

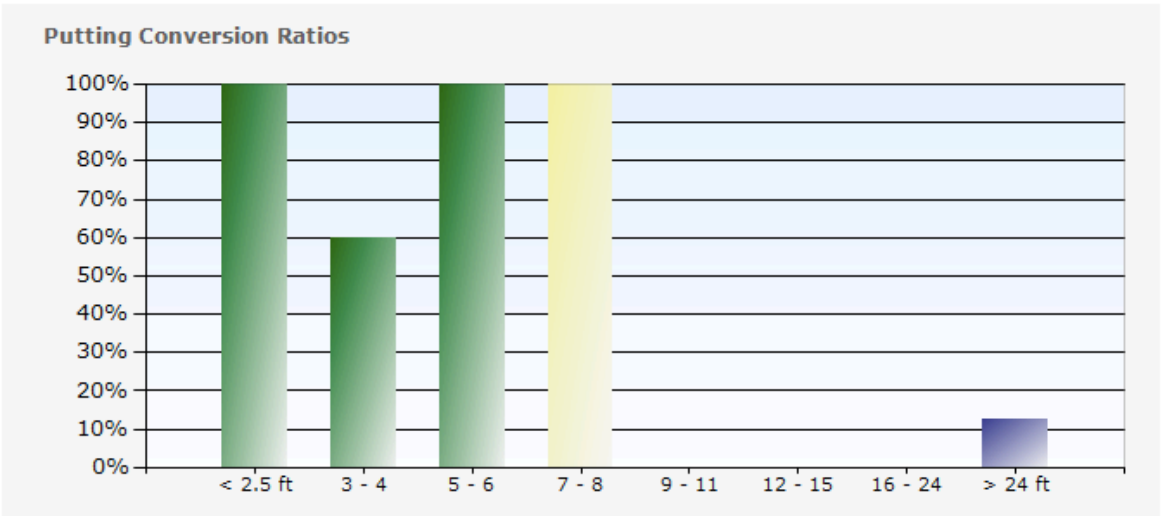
| | | |
|---|---|---|
| 10 Sep 14 | Roxburghe | -1.444 |
| 09 Sep 14 | Roxburghe | 2.601 |

These Putts Gained numbers show that he was +2.6 against PGA Tour average in Rd 1 on Tuesday. On Wednesday, he was -1.4 worse than average and therefore 4 shots worse on the greens in Rd 2 compared to Rd 1. This was Rd 2 on Wednesday: -

## Performance - Putting

Season 2014
Player

Putting Conversions | Holing Out | Medium Range | Long Range | Putts Gained | Miss Analysis




| On Green Putts Analysis | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| < 2.5 ft | | 3 - 4 | | 5 - 6 | | 7 - 8 | | 9 - 11 | | 12 - 15 | | 16 - 24 | | 25 - 35 | | > 35 ft | |
| H | M | H | M | H | M | H | M | H | M | H | M | H | M | H | M | H | M |
| 11 | 0 | 3 | 2 | 2 | 0 | 1 | 0 | 0 | 3 | 0 | 2 | 0 | 1 | 0 | 3 | 1 | 4 |
| Holing Out | | | | | | Medium | | | | | | Long Range | | | | | |

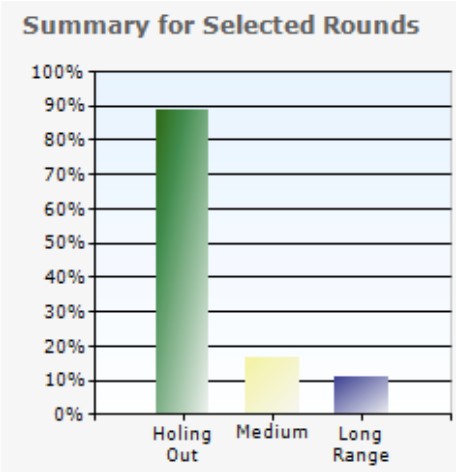
In this Rd, 2 missed from Holing Out territory – once each from 3 & 4 feet – hits the Putts Gained number hard. Two out of two from 5 feet and one holed from 7 feet gives him a plus of one shot and the long bomb from 50 feet contributes a plus number over one shot.

Number of Rounds Analysed **1**

| | | | | | | |
|---|---|---|---|---|---|---|
| Holed from off | 0 | | | | | |
| 1 Putts | 4 | >> per Rd | 4.00 | | | |
| 2 Putts | 13 | | | | | |
| 3 Putts | 1 | >> per Rd | 1.00 | >> every | 18.00 | holes |
| Total Holes Played | 18 | | | | | |

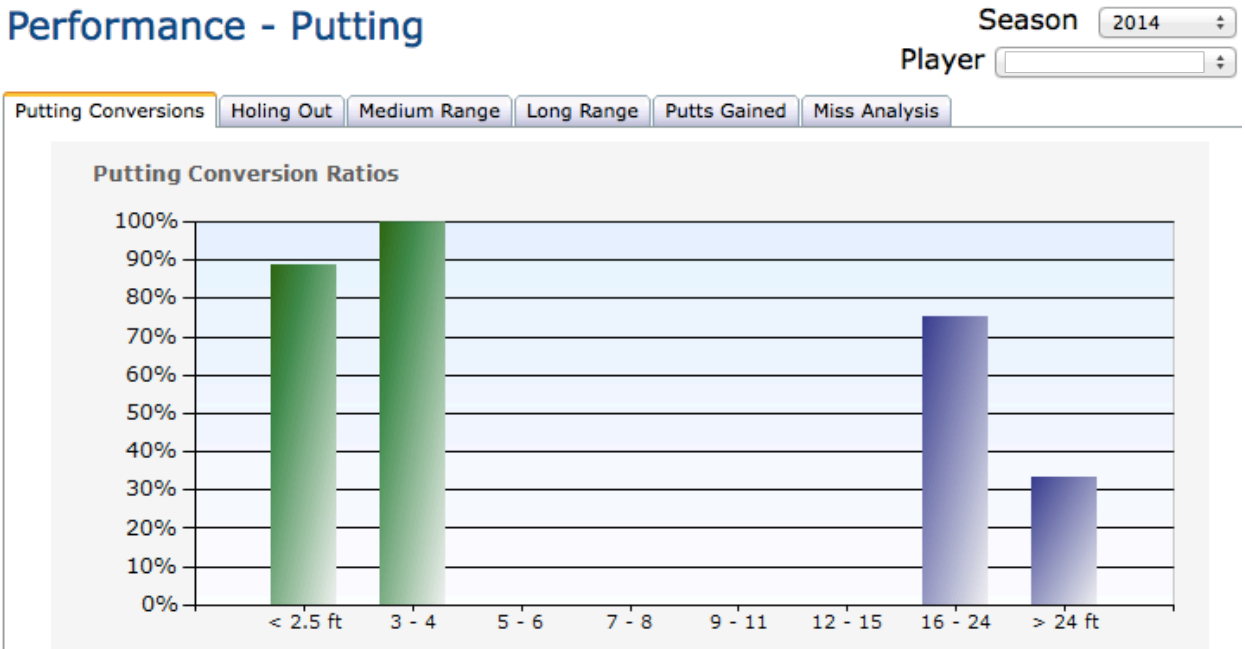
| | | | |
|---|---|---|---|
| Putts on GIR's | 26 | **Average PpR** | **33.00** |
| GIR's | 14 | Average PpGIR | 1.857 |
| inc pfjo | 16 | GIR's | 77.8% |
| | | GIR's inc pfjo | 88.9% |
| | | Tap-in Rate | 61.1% |

| | |
|---|---|
| Average Length of Holed Putt | 4.97 ft |
| Average Total Distance per Rd | 89.5 ft |




The net effect of his two short misses and zero out of five attempts between 9 and 15 feet against the putts he did hole resulted in an overall Putts Gained number of -1.444, not quite one and a half shots lost on the greens (against PGA pro averages of course).

This was Rd 1, where he putted FOUR shots better: -



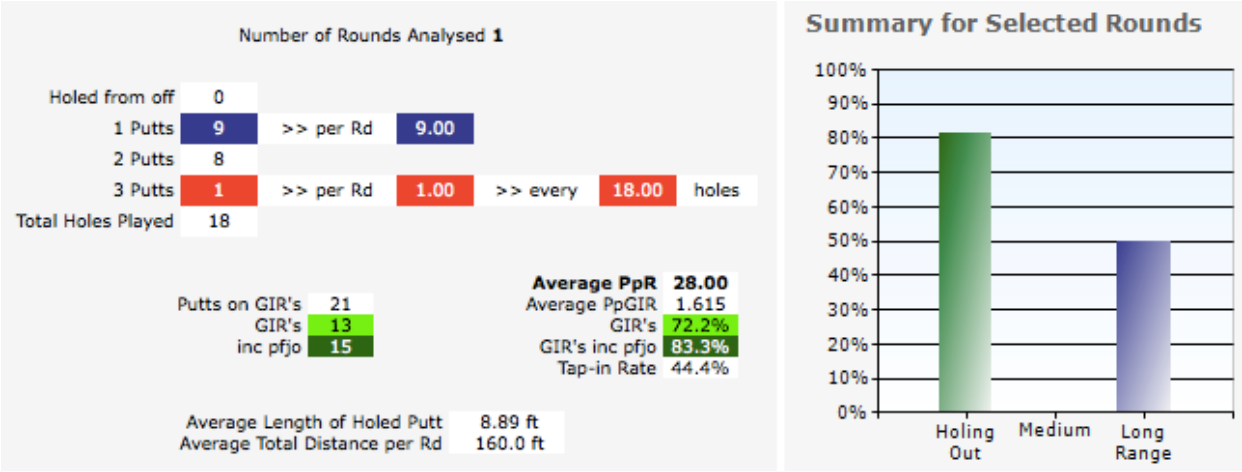

**On Green Putts Analysis**

| < 2.5 ft | | 3 - 4 | | 5 - 6 | | 7 - 8 | | 9 - 11 | | 12 - 15 | | 16 - 24 | | 25 - 35 | | > 35 ft | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **H** | **M** | **H** | **M** | **H** | **M** | **H** | **M** | **H** | **M** | **H** | **M** | **H** | **M** | **H** | **M** | **H** | **M** |
| 8 | 1 | 5 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 1 | 1 | 1 | 1 | 3 |
| **Holing Out** | | | | | | **Medium** | | | | | | **Long Range** | | | | | |

A miss from 2 feet is losing one shot and 2 x missed 6 footers cost a further one and a quarter shots (2 x -0.637 = -1.274).

But a fantastic FIVE holed from long range – twice from 18-20 feet and once each from 21-24, 30-35 and 36-44 feet – more than cancelled out the short misses, giving him an overall number of +2.601 when each putt was added up for this particular round.

Experienced golfers know that it is extremely rare to hole five putts from outside 15 feet. A 50% Long range conversion is less rare, as this can be one holed in 2 attempts or 2 holed in 4 attempts but holing 5 gives a huge boost to this particular Putts Gained stat.

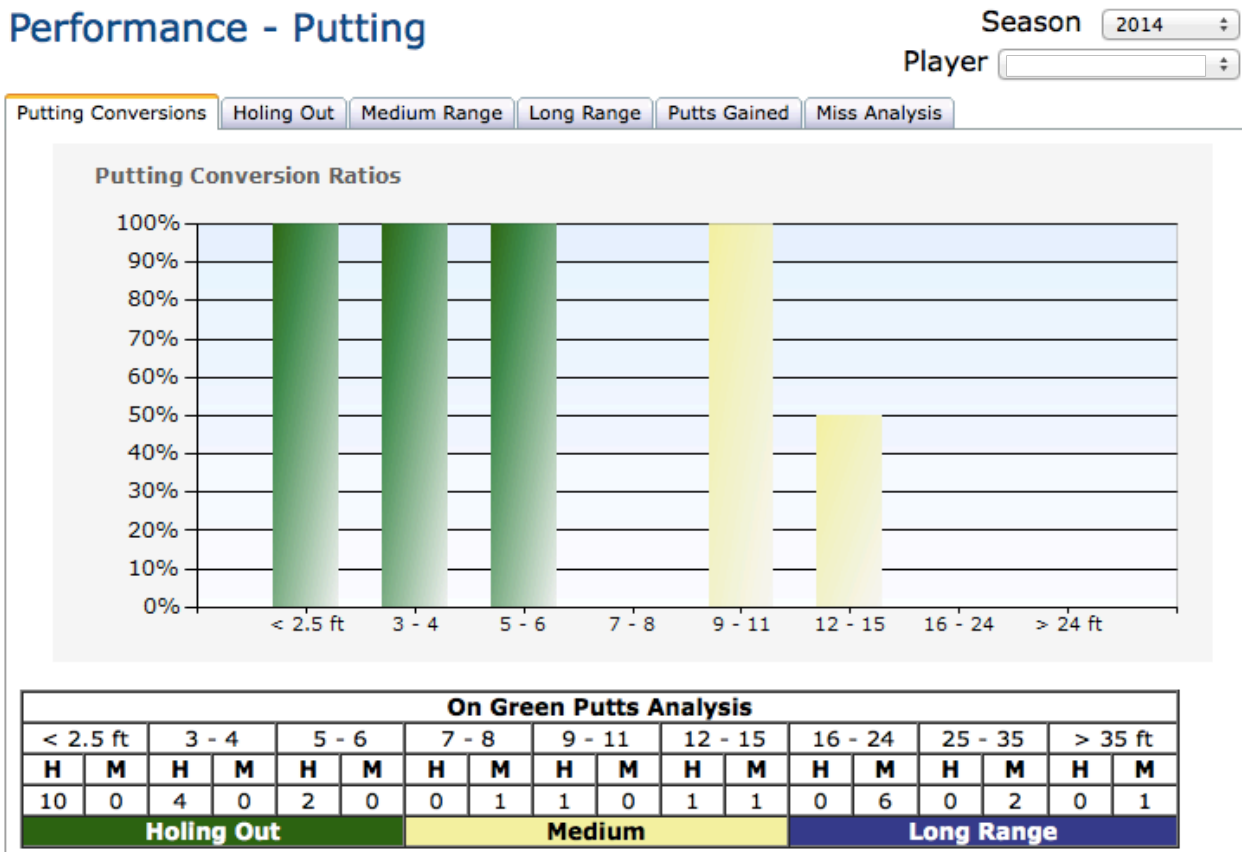



160 feet for 18 holes is also a rare stat of excellence. We don't often see golfers holing more than 50 yards in one round of golf! But Holing Out was even worse in Rd 1 and having missed from 3 & 4 feet in Rd 2, it wasn't great then either!

The overall Putts Gained number for these first two Rds show that this golfer putted more than one shot better than PGA Tour average, 2.601 – 1.444 = +1.157, or more than half a shot per Rd better than average.

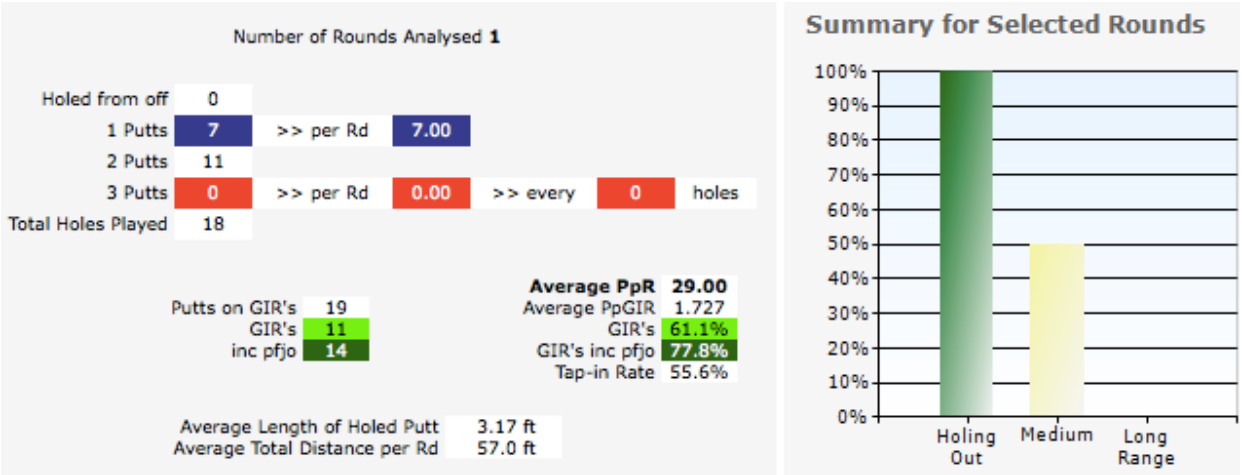
What it doesn't tell us is that he missed a total of FIVE times from 6 feet and under for Rds 1 & 2 which, if averaged for a bigger data sample (it isn't), would be a significant problem.

Rd 3 was a much more solid and consistent putting display and much less volatile: -




| On Green Putts Analysis | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| < 2.5 ft | | 3 - 4 | | 5 - 6 | | 7 - 8 | | 9 - 11 | | 12 - 15 | | 16 - 24 | | 25 - 35 | | > 35 ft | |
| H | M | H | M | H | M | H | M | H | M | H | M | H | M | H | M | H | M |
| 10 | 0 | 4 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 6 | 0 | 2 | 0 | 1 |
| Holing Out | | | | | | Medium | | | | | | Long Range | | | | | |

Only one missed under 12 feet and sweeping up all of the short stuff: -

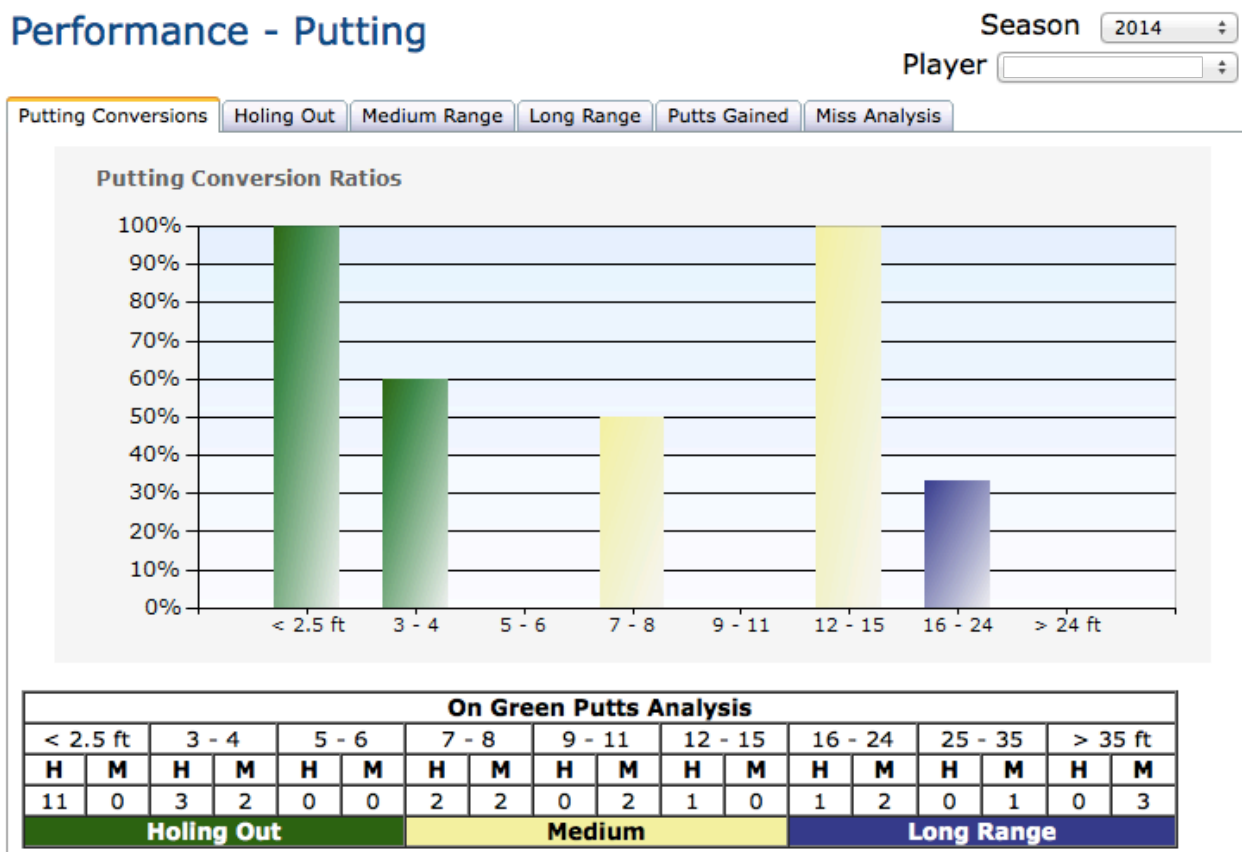



No bonus long bombs this time and an unspectacular footage of 57 feet but a Putts Gained rating of +0.268 is the equivalent of a quarter of a shot better than US pro average: -

| | | |
|---|---|---|
| 12 Sep 14 | Roxburghe | -1.238 |
| 11 Sep 14 | Roxburghe | 0.268 |

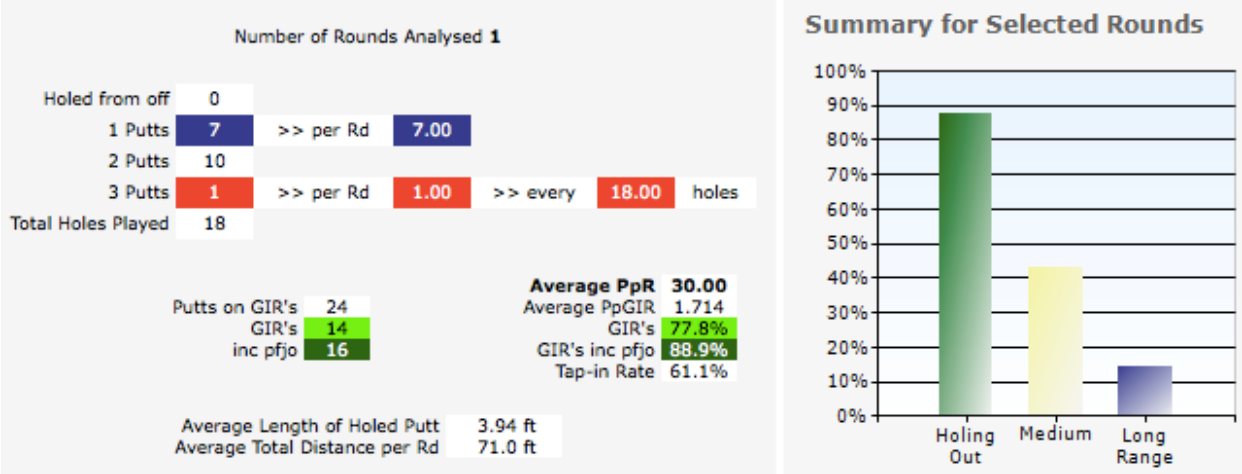
Putting volatility returned in the final Rd but overall, especially generating 61 birdie putt attempts in 72 holes and suffering an average of only 3 holes per Rd with dropped shots, he was able to make the cut and get through to stage 2.

This was Rd 4 to complete the picture: -




| On Green Putts Analysis | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| < 2.5 ft | | 3 - 4 | | 5 - 6 | | 7 - 8 | | 9 - 11 | | 12 - 15 | | 16 - 24 | | 25 - 35 | | > 35 ft | |
| H | M | H | M | H | M | H | M | H | M | H | M | H | M | H | M | H | M |
| 11 | 0 | 3 | 2 | 0 | 0 | 2 | 2 | 0 | 2 | 1 | 0 | 1 | 2 | 0 | 1 | 0 | 3 |
| Holing Out | | | | | | Medium | | | | | | Long Range | | | | | |

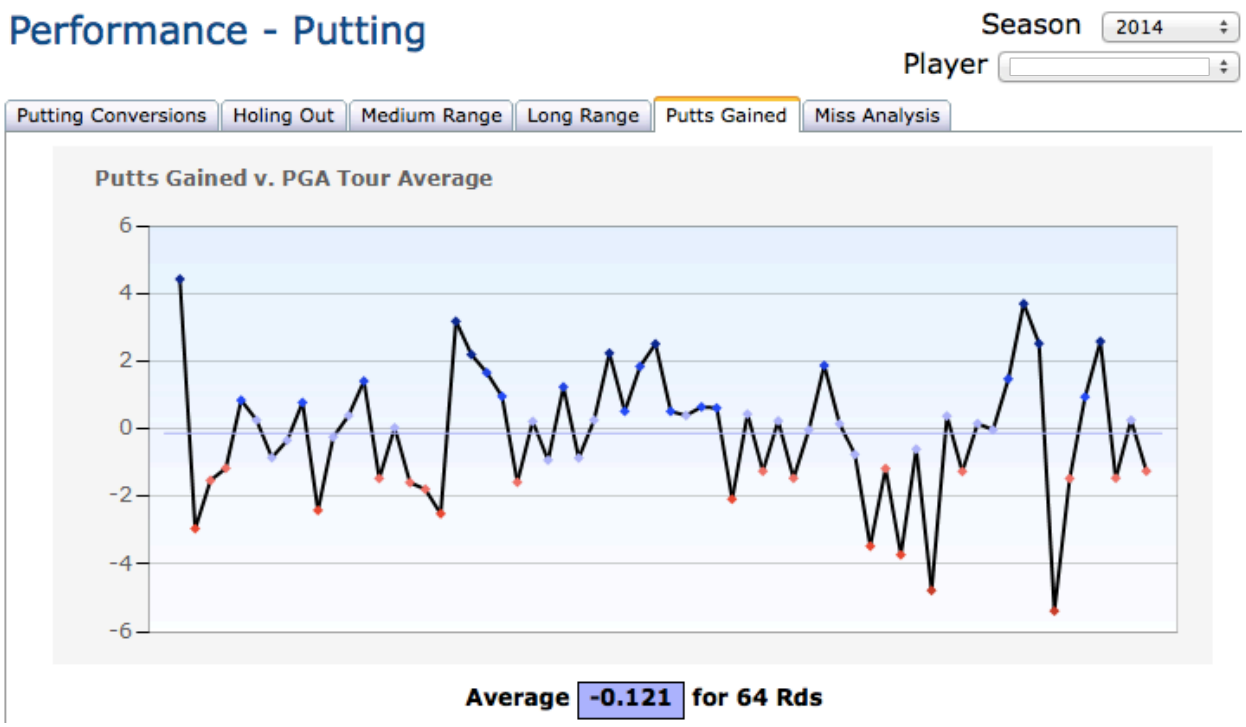
Again a couple of short misses but 3/7 from medium range and one long one was cool.




This all amounted to -1.238 so almost one and a quarter shots lost against average putting performance, the Putts Gained number taking the biggest hits from the close range misses, the two putts holed outside 11 feet repairing some of the damage.

In summary, be aware that whilst this Putts Gained number provides us with a great insight into overall putting efficiency, it does NOT explain where the strengths and weaknesses within the golfer's putting performance lie. To find this, only Putting Conversions will reveal.

This is the same golfer year-to-date, with his four Q School Rds on the right.




His putting is fine overall, within an eighth of one shot of Tour pro average – although this is losing half a shot over 72 holes! Still pretty good for an amateur looking to turn pro.

Graeme Leslie
14th September 2014