HOW TO TEST FACTORS

If you want to win Global Management Challenge, you need to know not only exclusive tips and bugs, but also you must correctly and accurately forecast sales for each product. This tip describes basic method of testing demand (market growth) factors.

**Demand factors**

As everyone knows, simulator has 3 types of markets (Nafta, EU, Internet), and 3 types of products 1, 2 and 3. The result is a 3x3 matrix. Sales in each cell of the matrix depends on particular set of factors. One part of factors affects on the whole matrix, second part of factors affects on the particular type of market or product, remaining affects strictly on one of the cells. For an accurate demand forecast is necessary to determine the dependence of each of the matrix cells from a common set of factors.

*For example, corporate advertisment effects on particular type of market, assembly time effects on particular type of product, direct advertisment effects on its sole cell.*

**How to test factors**

When you set the influence factors of demand for each of the cells (3x3 matrix), you can continue to refine the power of influence. Now we start to test it. Tests can be two types - perfect tests and other. Perfect tests are the most valuable because they give absolutely accurate assessment of the impact factor on demand. Let see how factor can be tested on corporte advertisment example from the past topic:

1. You shoud have two or more teams in one group. The main thing that the teams must be in the same group, otherwise the test will not be perfect (and if the influence of factor is weak, it would be meaningless). It is impossible to compare test results of two teams from different groups correctly, because strong influence on the results will provide competitors in the group.
2. Prepare an identical general decision for both teams, but in one of the teams change a decision on the tested factor. For example, [corporte advertisment test](http://gmcworld.org/blog/corporate-advertising) was made with the values of 30 (basic team) and 80 (test team). In cases when victory in the group is not nessery (for example, if you have about 200+ teams :) or you play in demo round, choose for your teams general decision from the 5 report in history. Part of factors has a strong residual effect from past periods and this allows us to neutralize their influence.
3. 1 period - you have posted decisions and get reports from your teams from the same group. Team with the base decision (corporate advertisment 30) has sales 900-450-225, test team (image advertisment 80) 900-450-225. Conclusion that corporate advertisment has no effect on sales in the current period.
4. 2 period - basic team (30) has sales 1000-500-250, sales of the test team (80) 1070-55-268. Lets take a look on product 1. If we do not have a team with a basic solution in the group, we might think that investments in corporate advertisment increased sales from 900 (1 period) to 1070 (2 period), growth is 1070 / 900 = +19%, but this is a mistake. Seasonal fluctuations in demand and other competitors change sales in the group. To neutralize these changes you need basic team. Compared with sales of product 1 between basic team and test team, growth is 1070 / 1000 = +7%, ie much less. This is called a perfect test because allows you to find the true impact of the tested factor.
5. 3, 4 and 5 period - continue test with values of 30 and 80, we estimate the cumulative impact of corporate advertisment. 3 period basic team (30) sales 1100-550-270, test team (80) sales 1212-606-298. 1 product growth is 1212 / 1100 = +10.2%, the difference increased, manifested cumulative effect. To assess the cumulative effect, continue test with the same parameters to 5 period.

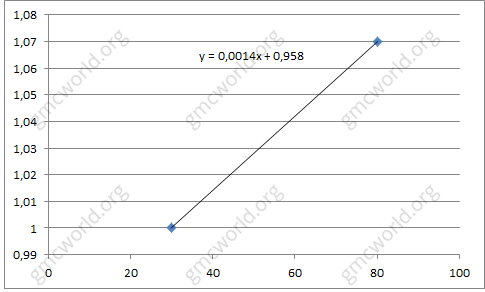
In the same time perform several tests with values of corporate advertisment 30-0, 30-45, 30-60, 30-80, 30-99. Obtain all results for the entire range 0-99 of the corporate advertisment and arranges them on the graph. It is important to test the full range to determine the type of connection between demand and factor for further modeling of the market - directly proportional, quadratic, etc.

**Assessing the impact of factors on sales**

As has been [previously determined](http://gmcworld.org/blog/corporate-advertising), the influence on sales by corporate advertisment is directly proportional, for the evaluation single test is enough. In excel make a table with the results. To estimate use relative change in sales, otherwise you will not be able to apply this formula to predict demand in the other groups.

|  |  |  |  |
| --- | --- | --- | --- |
| Team | Corporate advertisment | Product 1 (relative sales) | Product 1 (absolute sale) |
| Basic team | 30 | 1 | 1000 |
| Test tem | 80 | 1,07 | 1070 |

Add a trend line and a formula on the chart. Seeking coefficient is 0.0014 - elasticity of the factor, it means that increasing corporate advertisment by 1 unit gives growth in sales for 0.14%. It is easy to calculate that 99 corporate advertisment increase sales by (99 - 30) \* 0.0014 = 0.0966, ie +9.66%



To evaluate the residual effect it is necessary to compare the results of several periods and choose the factor that takes impact on sales of investments from previous periods.It can be found general general formula:

Δ sales (5 period) = Δ corporate advertisment (4 period) \* K + Δ corporate advertisment (3 period) \* K \* X + Δ corporate advertisment (2 period) \* K \* X² + Δ corporate advertisment (1 time) \* K \* X³, where K = 0.0014, and we know all Δ from the test. We find that X = 0.6 - 60% of the investments from previous period continue to have an impact on demand in the next period.

如何测试因素

如果您想要赢得全球管理挑战，您不仅需要了解独家提示和错误，还需要准确，准确地预测每个产品的销售情况。这个提示描述了测试需求（市场增长）因素的基本方法。

**需求因素**

众所周知，模拟器有3种类型的市场（国内，北美，互联网）和3种类型的产品1，2和3。结果是3x3矩阵。矩阵的每个单元格中的销售取决于特定的一系列因素。第一部分因素影响整个矩阵，第二部分因素影响特定类型的市场或产品，其余部分严格影响其中一个单元。为了确定每个矩阵单元与一组共同因素的依赖关系，需要一个准确的需求预测。

*例如，企业广告对特定类型的市场的影响，组装时间对特定类型的产品的影响，对其唯一的单元格直接的广告效果。*

**如何测试因素**

当您设置每个单元格（3x3矩阵）的需求影响因素时，可以继续优化影响力。现在我们开始测试了。测试可以是两种类型－完美测试或者其它。完美的测试是最有价值的，因为它们能够对需求的影响因子进行绝对准确的评估。让我们看看如何在过去的主题的比较广告的例子中测试因素：

1．你应该拥有两个或更多队伍在同一个小组。首要的事情是团队必须在同一个小组，否则测试不会完美（如果因素的影响力很弱，那将是无意义的）。不可能正确比较来自不同小组的两支队伍的测试结果，因为对结果的强烈影响将为该组提供竞争对手。

2．为两个团队准备一个相同的总体决策，但其中一个团队会根据测试因素更改决策。例如，以30（基础团队）和80（测试团队）的值进行了形象广告对比测试。在胜利不是必要的情况下（例如，你有大概200+团队），选择你团队的一般决策来自历史的第五期报告。部分因素有很强的残留效应来自过去期数，这使我们能够中和其影响力。

3．第一期－你已经发布了决策，并从同一组中获取了团队的报告。基础决策团队（形象广告30）拥有销售900-450-225 ，测试团队（形象广告80）900-450-225。结论：企业形象广告对本期销售没有影响。

4．第二期－基础团队（30）拥有销售1000-500-250，测试团队（80）拥有销售1070-535-268。让我们来看看产品1。如果我们没有一个基础的解决方案在这个小组，我们可能会认为企业形象广告的投资将增加销售额从900（第一期）到1070（第二期），增长是1070/900＝+19%，但这是一个错误。需求中的季节波动性和其它竞争对手改变了小组中的销售。为了中合这些改变你需要基础团队。比较于产品1在基础团队和测试团队，增长1070/1000＝+7%，即更少。这被称为完美测试，因为你可以找到测试因素的真正影响。

5．第三、第四和第五期－继续测试通过30和80的属性值，我们估计企业形象广告的累计影响。第三期基础团队（30）销售1100-550-270，测试团队（80）销售1212-606-298。产品1增长1212/1100＝+10.2%，差异增加，表现为积累效应。为了评估累计效应，用相同的参数继续测试直到第五期。

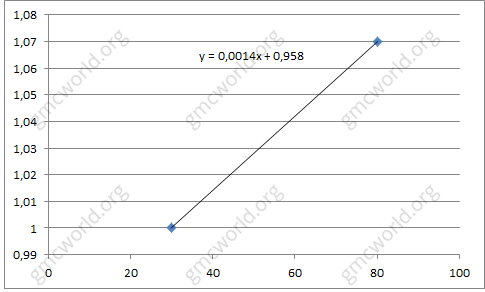
在同一时间，公司广告30-0,30-45,30-60,30-80,30-99的属性值测试。获取企业广告整个范围0-99的所有结果，并将其排列在图表上。测试全部范围以确定需求与市场进一步建模的因素之间的连接类型－直接成比例，二次，等等。

**评估因素对销售的影响**

如前所述，企业广告对销售的影响是直接成正比的，因为评估单一测试就足够了。在Excel中做一个表的结果。 要估计使用销售额的相对变化，否则您将无法应用此公式来预测其他组的需求。

|  |  |  |  |
| --- | --- | --- | --- |
| 团队 | 企业形象广告 | 产品1（相对销售） | 产品1（绝对销售） |
| 基础团队 | 30 | 1 | 1000 |
| 测试团队 | 80 | 1.07 | 1070 |

在图表上添加趋势线和公式。 寻求系数为0.0014 - 因素的弹性，这意味着增加企业广告1个单位，销售额增长0.14％。 很容易计算，99家企业广告销售额增加（99 - 30）\* 0.0014 = 0.0966，即+ 9.66％



为了评估剩余效应，有必要比较几个时期的结果，并选择对前期投资销售产生影响的因素。可以找到一般的通用公式：

Δ销售（第5期）=Δ公司广告（第4期）\* K +Δ企业广告（第3期）\* K \* X +Δ企业广告（第2期）\* K \*X2+Δ企业广告（第1期）\* K \* X 3，其中K = 0.0014，我们知道所有的Δ企业广告。 我们发现，X =上一期投资的0.6 - 60％，继续对下一期的需求产生影响。