Analysis of GAMIFICATION in E-COMMERCE using SWOT-AHP

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**Abstract**

**The e-commerce sector is an avenue where gaming elements have been widely used to ensure greater customer loyalty and create a more engaging platform to shop in, as opposed to the monotony of the catalogue-type websites. To understand the various aspects of gamification and the pros and cons of application in the e-commerce sector, an analysis of the Strengths, Weaknesses, Opportunities and Threats (SWOT) comes in handy. Criticality is used as the basis for ranking of the identified SWOT parameters. The Analytic Hierarchy Process (AHP) is an efficient tool used to compare the identified criteria in pairs, to prioritize them. The combination of SWOT and AHP can be utilized to assign quantitative values to qualitative SWOT parameters. This paper analyses the potential to gamify e-commerce platforms and identifies the Strengths, Weaknesses, Opportunities and Threats of its application. The parameters are then ranked using Analytic Hierarchy Process to ensure success of such an initiative.**

**Keywords: Keywords: Gamification, E-Commerce, Online Shopping, SWOT, AHP**

**Introduction**

The popularity of online shopping has grown by leaps and bounds. The boom of such an industry brings with it its own share of drawbacks, the problem of plenty being one. Multiple platforms offer similar products with little to differentiate between them. With the issue of customer loyalty and customer retention gaining prominence, companies are starting to shift

their focus from pricing to user experience and creating an environment where the customer enjoys shopping.

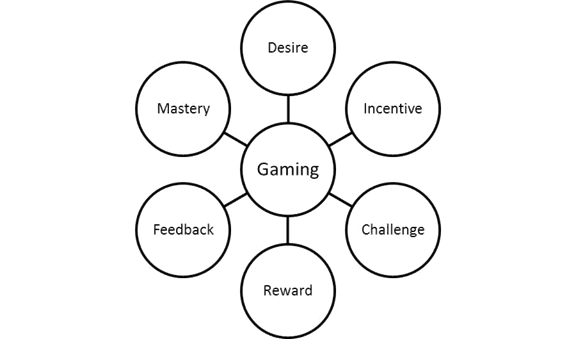
*1.1 Gamification*

Gamification is the concept of applying elements from games in applications that traditionally do not make use of game structures (Smith, 2012). The process of using game mechanics for engaging users is referred to as gamification. The trend emerged in 2010 and has since revolutionized several sectors such as education and marketing. The world spends about 3 billion hours a *week* gaming (McGonigal, 2011). The phenomenon of gaming has seen an upward trend with the advent of newer, better games and gaming technology. It is discernible from gaming statistics that well-developed video games have inherent motivating and engaging elements to keep players glued to their screens (Gee, 2003).

Gamification works by creating an engagement loop- where motivation drives actions incentivised by rewards. Both psychological and behavioural engagement can help to positively influence purchase patterns (Cheung et. all, 2015). The rewards help players earn achievements which in turn reinforce the initial motivation. The benefits of such application include enhanced user experience, better engagement and increased customer loyalty.

The core elements of gamification are:

1. Desire
2. Incentive
3. Mastery
4. Challenge
5. Reward
6. Feedback



*Figure 1: Core Elements of Gamification*

Game elements have been implemented successfully in several fields. Education is a field where the challenge lies in the ability of teachers to encourage passive students to become active learners (Ekahitanond, 2017). Gamified learning of college algebra (Faghihi, 2014), factory management education (Muller, 2015) and the French language (Perry, 2015) are testimonial to the effectiveness of the concept in the field of learning where game elements have been successfully used to improve student engagement. This is especially useful when teaching subjects with abstract concepts such as natural science, where teaching can be made more effective using non-conventional means such as animations (Karagozlu, Ozdamli, 2017). The concept has also made its way into tourism (Signoretti, 2015) and marketing (Freudmann, Bakamitsos, 2014).

*1.2 Gamification in e-commerce*

It is evident that gamification is a concept with endless possibilities for creativity and innovation and would be well suited for implementation in e-commerce platforms as they enhance:

*1.2.1 Involvement:*

Gamification increases consumer participation which enables better customer attraction and retention.

*1.2.2* *Interaction*

Gamification connects customers with brands. By using a system of rewards and incentives, gamification engages players, thereby increasing the probability of purchase.

*1.2.3 Intimacy*

Making consumers connect with products is the primary focus of retailers. Gaming strategies make it possible for companies to forge trusted and long-lasting relationships with customers using game elements and incentives.

*1.2.4 Influence*

Rewards such as tokens and badges encourage people to share their achievements on social media. This creates popularity by word-of-mouth and encourages peers to join them.

*1.3 Requisites of game elements*

*1.3.1* *Approach:*

The game experience should not be too easy or too overwhelming and it is extremely important to strike a balance between the two. An immersive experience involves a storyline or plot that focusses on the player’s journey from the beginning to the end, wherein players acquire new skills and knowledge to build his/her character and progress.

1.3.2 *Goal setting:*

Goals are effective motivators in that they pose a challenge for users to overcome. Gamification also finds potential use in Human Resources departments of organizations wherein games can be used to ease the process of orientation of a new recruit, akin to tutorials in a video game.

1.3.3 *Reputation:*

Gaming ‘profiles’ are shaped by the user’s interests. Much similar to personalities, these profiles are also influenced by experiences and interactions of the past. Rewards are indicators of the expertise acquired and are tools for motivation and engagement of customers.

1.3.4 *Status:*

Advertising a player’s accomplishments and communicating them to peers via social media builds him a reputation among peers and motivates him to achieve more.

*1.4 SWOT Analysis*

SWOT is a structured planning method that evaluates the strengths, weaknesses, opportunities and threats of a project/product. SWOT is commonly used as a precursor to decision making by enabling the analysis of internal and external environments (Ghazinoory et. al., 2007). By identifying and analysing the environment it is possible to build on strengths, capitalize on opportunities, strategize to overcome weaknesses and reduce threats (Dyson, 2004). SWOT analysis has been used in a multitude of areas, including universities and education (Dyson, 2004; Lee et. all, 2000), forest certification (Kurttila et. all, 2000), urban planning (Halla, 2007) and airline management (Ahmed et. all, 2006). While SWOT is an effective method to identify factors that impact the company, it does not provide a means for analytic assessment of their relative importance. (Kangas et. all, 2003).

*1.5 Analytic Hierarchy Process*

The Analytic Hierarchy Process (AHP) is a multi-criteria decision-making method developed by Saaty (1980). AHP is used to obtain the relative importance of factors from paired comparisons in multilevel hierarchic structures (Saaty, 1996). The relative priorities are determined by assigning numbers from a comparison scale (Saaty, 1980). AHP is an effective decision-making method in the case of SWOT where the parameters identified are subjective. The application of SWOT with AHP has previously been attempted in the fields of manufacturing (Gorener et. all, 2012), telecommunication (Mehmooda et. all 2014) and tourism (Wickramasinghe & Takano, 2010). This paper aims to use Analytic Hierarchy Process to analyze the Strengths, Weaknesses, Opportunities and Threats associated with gamification of the e-commerce sector.

**2. Analysis of Strengths, Weaknesses, Opportunities and Threats**

*2.1 Strengths*

The objective of advertising is to create awareness and association with the product or brand in question. Social media has a key role in this aspect. The linking of e-commerce and social media provides a platform for advertising a product to friends as an implicit outcome of peer recognition.

Gamification can range from simple game elements such as scores and rewards to something as complex as a full-fledged game environment itself. Companies wishing to gamify their platforms seek to adopt simple and inexpensive elements, often on probation. The LinkedIn gamification strategy is a typical case in point where incorporating progress bars culminated in better profile completion and in turn higher returns for the company. The commonly used elements such as Points, Badges and Leaderboards or PBL elements are relatively easy to incorporate and are ideal for companies testing the waters as they typically

do not require very high investment and can be achieved in short periods of time.

With game elements incorporated, online shopping becomes an immersive and engaging experience for the users rather than merely being a medium for purchase. It is a means of value addition and product differentiation. Hedonic features of an e-commerce website directly influence e-loyalty and engagement (Bilgihan, 2015). It enables them to attract more people, establish a larger customer base. Customers also competitively buy products and spend more time on the site thereby increasing the probability of purchase.

*2.2* *Weaknesses*

While gamification of e-commerce websites will make attracting customers easier, securing their loyalty will force companies to spend large amounts of time and funds towards game development to remain best in the business. The fierce competition accompanying the large number of players in the market pushes up marketing and advertising expenditures (Kim, 2013). Even by doing so, the sheer volume of customers, forces companies to adopt a one-size-fits-all strategy. It would be highly impractical to design games particularly suited to each individual customer and hence will be based on a large demographic. This means that a part of the target audience might not find the game elements appealing. The loss of some part of the customer base is inevitable.

A reward or a gift to the top purchaser is profitably viable to the company only if a large number of users competed and purchased using the platform. Although unprofitable, the company is still obligated to reward its users in the event of purchase volume being low.

Strategies for rewarding customers are based on assumptions that the engagement serves as motivation for customers to shop more. However, there is always the inherent uncertainty associated with the translation of customer engagement to increased expenditure.

*2.3 Opportunities*

Virtual Reality, used to develop game environments, can be extended to online shopping to create a virtual store that replicates real-time shopping experience instead of being a mere catalogue for customers to choose from. Gamification creates massive scope for partnerships between game developers/owners and e-commerce companies to create shopping interfaces with full-fledged storylines, levels, characters, etc. to play around with. A gamified website generates better web traffic and this phenomenon can be used to the strength of e-commerce companies as they tend to make better revenue from advertisements on their webpage. Furthermore, games today are in a state of constant improvement given their popularity among all age groups. This is a favourable trend for gamification of e-commerce businesses as newer, better strategies to engage people emerge constantly.

*2.4 Threats*

In 2012, Gartner predicted that “by 2014, 80 percent of current gamified applications will fail to meet business objectives primarily because of poor design” (Gartner, 2012). Rewards are often designed in a meaningless manner and obvious game elements (such as points, badges and leader-boards) are overused leading to redundancy. Further, gamification is often plagued by over-expectations. With endless opportunities that come with the gamification of ecommerce websites, there is also the issue of expecting too high and too quick returns. It is necessary to take into consideration the limitations of games in driving human behaviour and set reasonable benchmarks to achieve.

Gamification has also often been criticised to be a new form of hidden persuasion (Packard, 1957), as it exploits the competitive tendencies of humans to merely increase sales without actual improvement of user experience. A combination of multiple factors such as

creativity, game design and versatility of the interface is essential for the success of the gamification initiative.

1. **AHP Methodology**

The direct pairwise comparison methodology and allocation of intensity values used in AHP tends to vary with judgement and perception. To eliminate this uncertainty, a method of weighted averages of the criteria that influence the identified SWOT parameters is used.

In this method, the influencing criteria for each of the SWOT groups are identified. For example, the parameters Profits, Marketability, and Customer-centric Strategizing are recognized to be the main focus of strengths in an e-commerce industry. These parameters were then assigned weightages 3, 2 and 1 (scaling factors) respectively based on the relative importance to companies and the contribution of each of the influencing criteria to the identified strengths is ranked on a scale of 1-10. This is done using the consolidated results of a survey filled out by experts from the industry. The formula for calculation is as follows:

Let the Influencing Parameters be IP1, IP2, and IP3.

Scaling factor of

IP1=x1;

IP2=x2;

IP3=x3

Point scored by Strength 1 under

IP1=y1;

IP2=y2;

IP3=y3

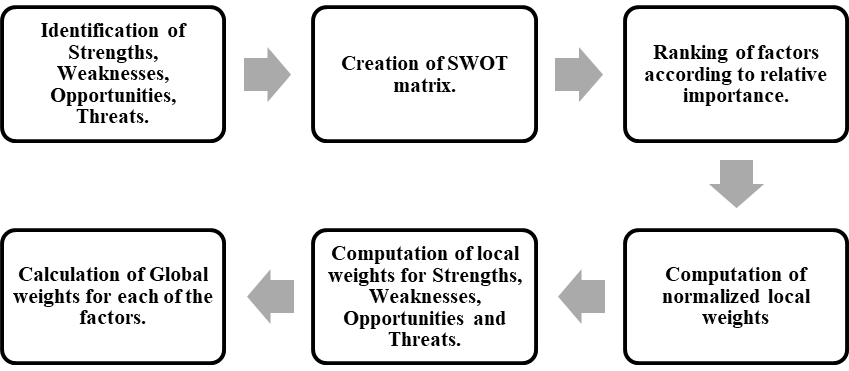
Total score assigned to that strength (TS) is given by,

TS1= .  
This value is then rounded off to the nearest integer value.

Thus, when the AHP table is created, the values to be entered in the table are calculated by finding the difference of their respective Total Scores arrived at by the weighted averages method

*Table 1: Comparison table for AHP:*

|  |  |
| --- | --- |
| 1 | Two criteria contribute equally to the objective |
| 3 | Experience and judgement slightly favour one over another |
| 5 | Experience and judgment strongly favour one over another |
| 7 | Criterion is strongly favoured and its dominance is demonstrated in practice |
| 9 | Importance of one over another affirmed on the highest possible order |
| 2, 4, 6, 8 | Used to represent compromise between the priorities listed above |



*Figure 2: Flowchart of SWOT-AHP*

*Table 2: Pairwise comparison of SWOT factors*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strengths** | **Weaknesses** | **Opportunities** | **Threats** | **Local Weight** |
| **Strengths** | 1 | 4 | 0.25 | 6 | 0.290596 |
| **Weaknesses** | 0.25 | 1 | 0.33 | 3.00 | 0.133932 |
| **Opportunities** | 4 | 3 | 1 | 7 | 0.522384 |
| **Threats** | 0.166667 | 0.333333 | 0.142857 | 1 | 0.053088 |

*Table 3: Correlation between SWOT parameters and influencing criteria*

|  |  |
| --- | --- |
| **Influencing Criteria** | **Scaling factor** |
| Increased profitability of venture (C1) | 3 |
| Customer-centric strategizing (C2) | 1 |
| Marketability and product differentiation of platform (C3) | 2 |

*Table 4: Computation of overall Strength scores*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **C1** | **C2** | **C3** | **Total** | **Score** | **Points** |
| **S1** | 8 | 2 | 4 | 34 | 5.666667 | 6 |
| **S2** | 9 | 9 | 6 | 48 | 8 | 8 |
| **S3** | 6 | 0 | 1 | 20 | 3.333333 | 3 |
| **S4** | 7 | 7 | 1 | 30 | 5 | 5 |
| **S5** | 6 | 5 | 8 | 39 | 6.5 | 7 |

*Table 5: Correlation of points to corresponding intensity values*

|  |  |  |
| --- | --- | --- |
| **Difference between points of SWOT parameters** | **Description** | **AHP Intensity value** |
| 0 | Two criteria contribute equally to the objective | 1 |
| 2 | Experience and judgement slightly favour one over another | 3 |
| 4 | Experience and judgment strongly favour one over another | 5 |
| 6 | Criterion is strongly favoured and its dominance is demonstrated in practice | 7 |
| 8 | Importance of one over another affirmed on the highest possible order | 9 |
| 1,2,5,7 | Used to represent compromise between the priorities listed above | 2,4,6,8 |

*Table 6: Pairwise comparisons of strengths for AHP*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Strengths** | **S1** | **S2** | **S3** | **S4** | **S5** | **Local Weight** |
| S1. Intrinsic advertising | 1 | 0.33 | 4.00 | 2.00 | 0.50 | 0.164868 |
| S2. Customer engagement & motivation | 3 | 1 | 6.00 | 4.00 | 2.00 | 0.417529 |
| S3. Easy Implementation | 0.25 | 0.166667 | 1 | 0.33 | 0.20 | 0.049118 |
| S4. Competitive purchasing | 0.5 | 0.25 | 3 | 1 | 0.33 | 0.1045 |
| S5. Product Differentiation | 2 | 0.5 | 5 | 3 | 1 | 0.263987 |

*Table 7: Pairwise comparisons of Weaknesses for AHP*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Weaknesses** | **W1** | **W2** | **W3** | **W4** | **Local Weight** |
| W1.Customer retention difficulties | 1.00 | 3.00 | 0.33 | 4.00 | 0.259436 |
| W2.Profitability only with customer volume & purchase volume | 0.33 | 1.00 | 0.20 | 2.00 | 0.112371 |
| W3.One size fits all | 3.00 | 5.00 | 1.00 | 6.00 | 0.557659 |
| W4.Uncertainty of engagement-expenditure correlation | 0.25 | 0.50 | 0.17 | 1.00 | 0.070535 |

*Table 8: Pairwise comparisons of Opportunities for AHP*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Opportunities** | **01** | **02** | **03** | **04** | **Local Weight** |
| O1. Incorporation with Virtual reality | 1 | 2 | 6 | 3 | 0.473885 |
| O2. Integration with existing games | 0.5 | 1 | 5 | 2 | 0.288193 |
| O3. Better revenue from advertising | 0.166667 | 0.2 | 1 | 0.25 | 0.059972 |
| O4. Advancements in gaming | 0.333333 | 0.5 | 4 | 1 | 0.17795 |

*Table 9: Pairwise comparisons of Threats for AHP*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Threats** | **T1** | **T2** | **T3** | **T4** | **Local Weight** |
| T1. Unrealistic expectations | 1.00 | 0.50 | 2.00 | 5.00 | 0.288193 |
| T2. Failure due to poor design | 2.00 | 1.00 | 3.00 | 6.00 | 0.473885 |
| T3. Overuse leading to ineffectiveness | 0.50 | 0.33 | 1.00 | 4.00 | 0.17795 |
| T4. Behaviour Manipulation | 0.20 | 0.17 | 0.25 | 1.00 | 0.059972 |

*Table 10: Computation of Global weights*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SWOT Groups** | **Local Weight** | **SWOT Factors** | **Local Weight** | **Global Weight** |
| **Strengths** | 0.290596037 | S1. Intrinsic advertising | 0.164867588 | 0.047909868 |
| S2. Customer engagement & motivation | 0.417528581 | 0.121332151 |
| S3. Easy Implementation | 0.049117506 | 0.014273353 |
| S4. Competitive purchasing | 0.104499749 | 0.030367213 |
| S5. Product Differentiation | 0.263986576 | 0.076713453 |
|  |  |  |
| **Weaknesses** | 0.133931971 | W1.Customer retention difficulties | 0.259435508 | 0.034746709 |
| W2.Profitability only with customer volume & purchase volume | 0.112370911 | 0.015050058 |
| W3.One size fits all | 0.55765875 | 0.074688335 |
| W4.Uncertainty of engagement-expenditure correlation | 0.070534832 | 0.009446869 |
|  |  |  |
| **Opportunities** | 0.522384147 | O1. Incorporation with Virtual reality | 0.473885135 | 0.247550082 |
| O2. Integration with existing games | 0.288192568 | 0.150547229 |
| O3. Better revenue from advertising | 0.059971847 | 0.031328342 |
| O4. Advancements in gaming | 0.17795045 | 0.092958494 |
|  |  |  |
| **Threats** | 0.053087845 | T1. Unrealistic expectations | 0.288192568 | 0.015299522 |
| T2. Failure due to poor design | 0.473885135 | 0.025157541 |
| T3. Overuse leading to ineffectiveness | 0.17795045 | 0.009447006 |
| T4. Behaviour Manipulation | 0.059971847 | 0.003183776 |

**Conclusion**

This paper assesses the internal and external factors associates with gamification of e-commerce platforms and assesses them using SWOT-AHP methodology. The quantitative analysis thus obtained reiterates the fact that Opportunities (Local Weight = 0.522) and Strengths (Local Weight = 0.290) are the most important factors underlining the positive change that gamification can create in e-commerce. Of the opportunities, the integration of shopping with Virtual Reality (Group Weight = 0.278) holds immense potential for companies to tap.

While it is essential to incorporate game elements in online shopping platforms, it is also equally important that these games are well designed and directed at enhancing user experiences. If achieved to perfection, gamification can create a revolution in the way we shop today and reap immense returns for companies and customers alike.

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