

# Gamifying HPE Service Manager to Improve IT Service Desks' Knowledge Contribution

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## ABSTRACT

Nowadays a common challenge is being confronted by IT service management in many companies, which is how to prompt IT service desks to continuously contribute and share knowledge to peers and organizations, transfer knowledge-centered IT service depending on individual experience to work from collective wisdom. Because sharing and reusing valuable knowledge can greatly shorten response time, provide high-quality service to customers and lower the overall cost of support by boosting productivity. Obviously, quick and good service will enhance customer satisfaction and build their trustworthiness to a company's brand image. As a result, it will increase a company's competitiveness, promote supplemental businesses, and bring new customers.

Therefore, we create an effective solution to motivate IT service desks to continuously generate, share, and improve quality of their knowledge which is used for assisting them to achieve desired customer service goals and enhance customer satisfaction by integrating gamification and persuasion as the incentive mechanisms into the existing system.

## KEYWORDS

enterprise software, IT service management, gamification, persuasion, employee knowledge contribution, knowledge management, user behavior, HCI in business<sup>1</sup>

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## 1 INTRODUCTION

Nowadays, IT service desks in most organizations are the single point of contact for customers. IT service desks primarily settle customers' issues in a period of time and offer services to them. The services' quality and response time will directly relate to the impression of the serviced customers on the IT departments, companies and brands.

In daily work, when customers or users contact IT service desks to seek help for solving all kinds of issues. According to the description of issues, IT service desks refer to previous completed ticket records, knowledge articles (solutions) saved in the knowledge database, or think about solutions based on their own personal experience. They write down solutions in recording tickets tool after they have solved problems. Consequently, the information recorded in ticket records are the important resources used for future reference to resolve similar issues. Knowledge production, sharing and transferring in IT service industry are highly important. Not only does high-quality knowledge help IT service desks resolve service disruptions more quickly, improve their service quality and faster response to their customers, but it lowers the overall cost of support by reducing the time to rediscover knowledge.

But, converting information into knowledge for transferring knowledge is pretty limited. A major reason is that knowledge contribution requires IT service desks to spend extra efforts and time in creating content, but they are not motivated adequately to conquer the hurdles by themselves. Therefore, knowledge contribution is low through the tools, such as HPE Service Manager software. Hence, IT service desks often cannot find the results by searching knowledge articles from knowledge management databases. Consequently, IT service desks take more time

to solve problems, which impact their service response time and quality.

Similarly, many solutions recorded in closed (completed) tickets lack sufficient details after IT service desks record the final solutions and submit them to the system, which will be resources used for other peers to refer. Even though some solutions may be pretty valuable. For example, a person holds professional knowledge about a particular system and successfully solves the issue from a customer. However, he or she doesn't record the solution with enough details in a ticket record. The main reason is that IT service desks who successfully solve customers' issues already have the knowledge about how to tackle the problems. To them, the recording case is of less value, it provides only a few benefits to themselves. So, the records often have no enough details and are not good case studies for their peers to refer when the peers are meeting analogous issues.

## 2. QUALITATIVE INVESTIGATION INTO IT SERVICE DESK'S PROBLEMS

In order to explore further the reasons for why IT service desks are not actively contributing knowledge to tools or online systems, what factors influence the level of detail in ticket records, and what driving forces can motivate IT service desks to make changes around improving ticket record quality, thereby increasing knowledge contribution's quantity and quality, we researched IT service desks by means of qualitative interviews.

We found that the main problem is due to the time consumed in contributing. It is a major hindrance for interviewees to actively contribute knowledge because it required them to use extra time and effort to write down their knowledge. A few interviewees were afraid, also, that they were not professional enough to make knowledge contributions with high quality.

In most cases, interviewees would synthesize information, convert that information into knowledge, and share that knowledge when others repeatedly consulted them for the same question. In order to reduce the frequency with which they had to give oral answers, they wrote down their knowledge. However, most interviewees stated that they would feel happy and encouraged if their contributions could get recognition from their peers or they knew their contributions were helpful to colleagues.

Similarly, most interviewees were not willing to spend time in recording tickets with much detail. They record information in order to provide self-reference, which helped them to recall the details, in case they encountered similar problems in the future. However, most of them did not consider whether it could actually help peers or not.

Most interviewees claimed that they would update knowledge and correct inaccurate parts if they got feedback or comments from peers. On the contrary, when they were reviewing their colleagues' articles, most of them seldom

actively commented, because they thought that the authors would not update the case studies in a timely fashion, and some interviewees mentioned that they tried to avoid offending the authors in public. They preferred to communicate in a small scale or privately.

## 3 SOLUTION

### 3.1 A Continuous Loop: Capturing, Contributing, Improving and Reusing Knowledge Articles

In order to shift IT service desk teams from relying on individual experiences to working from collaborative knowledge, we design a continuous loop of capturing, contributing, improving and reusing knowledge articles to make IT service desks to take positive behaviors.

**Capture information.** Customers contact IT service desks for helping solve issues. After IT service desks resolve problems by using their first-hand experience, they record the information about how to solve customers' problems in ticket records. Incentive mechanism will appear to motivate IT service desks to record the detailed information in ticket records, which will be useful assets for other peers to refer when dealing with the similar issues.

**Contribute knowledge.** Once the IT service desks know the value of information in their ticket records, which means the information in closed (completed) ticket records has been cited by their peers to resolve similar issues, IT service desks will be encouraged to contribute such knowledge to benefit more people by creating knowledge articles.

**Improve Knowledge.** Measuring how effective each knowledge article is used for solving problems is to allow internal their peers and external customers to give feedback. Motivating customers to engage in the loop of enhancing knowledge quality is one of the best ways to fine-tune knowledge articles. A feedback loop drives IT service desks to enhance service, improve the quality of knowledge articles, and make knowledge contributors more fully engage in.

**Reuse Knowledge.** When working on customer issues, IT service desks search knowledge articles stored in a knowledge base for reference. They can link relevant articles to ticket records. The value of knowledge will be utilized most by the teams through citing knowledge articles in ticket records. Not only does this improve IT service desks First Call Resolution, but it lowers the overall cost of support by boosting productivity.

We set up the following goals and principles for encouraging IT service desks to take active behaviors when using enterprise software, increasing IT service desks'

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knowledge contribution and motivating them to shift from focusing on individuals to target at cultivating a culture of collaboration.

- To increase the quality of ticket records to provide value to peers and organization.
- To improve the quantity of knowledge articles in the knowledge base by actively exchanging knowledge.
- To enhance knowledge articles' quality before formally publishing by encouraging internal peers to actively review and comment the drafts.
- Enable external customers to actively send feedback about the usefulness of knowledge to IT service organization and engage in the loop of continuously enhancing the quality of published knowledge.

We propose to integrate mechanisms of gamification [1] and persuasion into the current HPE Service Manager product based on what we have learned from our user research, which are used as incentives and fit into IT service desks' natural interactions during performing their daily tasks.

### 3.2 Incentive System

In our designed concept, IT service desks can gain reputation points by contributing valuable knowledge and gaining positive customer feedback through the HPE Service Manager. They are able to collect reputation points through four ways.

- To submit high-quality and detailed ticket records that can be cited and referred by their peers.
- To devote knowledge by creating knowledge articles and transferring knowledge.
- To create and enhance the quality of knowledge articles, which can be cited and utilized most by IT service teams and organization.
- To get positive feedback from customers about the usefulness of service and related knowledge articles.

Additionally, in order to encourage customers actively give feedback and help enhance the quality of knowledge, we also use incentive mechanism to encourage customers to engage in the loop of knowledge management, because many customers skip customer satisfaction surveys. A lot of corporations want customers to provide feedback, but they do not pay the customers for their time as customers did in user studies. Therefore, customers are getting smarter and ignoring such surveys. So, in the loop of knowledge collaboration, customers will be rewarded and they can

earn points, and get gifts by providing useful feedback to IT service teams.

## 4 DESIGN PROCESS

We create a process flow, users' journey, use scenarios, as well as key user interfaces to describe how IT service desks might use the application.

### 4.1 Process Flow

We use the process flow diagram to display the relationships between different parts and modules in the application (See Figure 1).

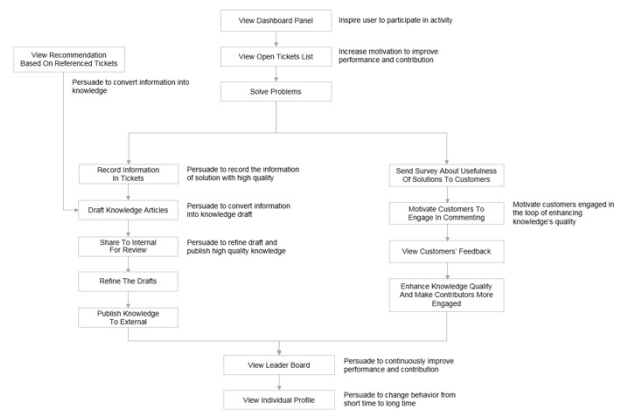


Figure 1: Process flow diagram

### 4.2 Users' Journey

The users' journey is similar to basic human needs initiated by Maslow.

**Dashboard:** Once new IT service desks members register, they can know where they are on their journeys and how to take part in activities to earn points.

**Contribution:** After they have participated in activities, they can achieve and accumulate points. There is a clear progress they have made. Therefore, IT service desks can know where they are in the process, where they are going.

**Recognition:** When they start to be well known in the internals, they gain recognition from internal colleagues and external customers.

**Healthy competition:** They can know where their positions are on leaderboards, and what to do the next for exceeding other's levels.

**Self-express:** They keep honor by continuously contributing their knowledge and supplying service with high-quality.

**Desires to do better:** As long as they've achieved all of the leading, they want to do better and are motivated to "pay it forward" in order to keep a good image to others.

### 4.3 Persona

In user-centered design, personas describe basic, and typical user types with specific characteristics, objectives, and impact on the design. We defined a typical user named Tom Jones:

Tom Smith, 27 years old, works as an IT Service Desk in a medium-scale software company. He is responsible for offering service and solving problems for different customers.

#### User Objectives

- Tom wants to get valuable solutions by seeking knowledge in a knowledge base so that he can deal with customer problems without taking much effort and solve them as soon as possible. Because whether he can resolve problems effectively or not will directly impact customer satisfaction.
- Sometimes, Tom hears others talking about his peers' success cases in private, Tom hopes to refer these valuable cases with enough details, so he can learn experiences from the peers as well.
- Tom is concerned about his key performance indicators (KPI) and reputation, which will directly relate to his bonus. He is eager to gain high recognition by peers and managers and to be visible once he gets good feedback from his customers or after he contributes worthy knowledge.

### 4.4 Use Scenario

Use scenarios describe the persona takes typical activities in everyday language, not in technical jargon.

When Tom first registers in HPE Service Manager, there is no reputation point for him. However, he finds a performance comparison between him and his peer through points displayed in a message. His colleague is much better than him in the ranking, which motivates him to want to know how to gain points. HPE Service Manager provides some advice to him.

After Tom solves a tricky problem for a customer by using his professional experience in the first response time,

the customer is delighted and gives Tom a "Good Rating" in the customer satisfaction of feedback. Within less than ten minutes, Tom records his solution in a case record (a ticket record) with enough details and submits it to the system. The ticket record contains high-value content for other peers to refer despite the fact that he mainly wants to get points.

Based on this experience, Tom begins to write articles once his case records are valued and referred by his peers. A week later, Tom finds that one of his submitted articles stored in knowledge base has been cited seven times by his peers. Hence, he is pretty contented because his first-hand experience and knowledge benefit both customers and his peers.

Tom quickly earns his points from zero to the fifteen in three weeks. As a result, he ranks number four on the leaderboard! Since his performance visibility makes him have a sense of personal accomplishment. It motivates him to commit himself to continue contributing.

Tom becomes a Hero of the Week based on a large number of points he gained. Besides that, he receives congratulations from his peers. Tom's boss is also very glad to his impressive performance. Therefore, he gives Tom some restaurant coupons as a reward and praises him in an internal employee meeting, which reinforces him to behave even better.

### 4.5 User Interface

The user interface is adding gamification and persuasion mechanisms on the original HPE Service Manager user interface in order to improve the original version.

#### 4.5.1 Show Instruction and Comparison for New Users

For the sake of motivating IT service desks to actively take part in making contribution, we designed a pop-up message with instruction about what actions to take for getting points. We also added a comparison. Therefore, the users can compare themselves with the peer who has gotten the highest score within the last week. This visualized performance gap helps motivate the new users to join in and contribute.

#### Game mechanics used (See Figure 2.): Guideline, Competition

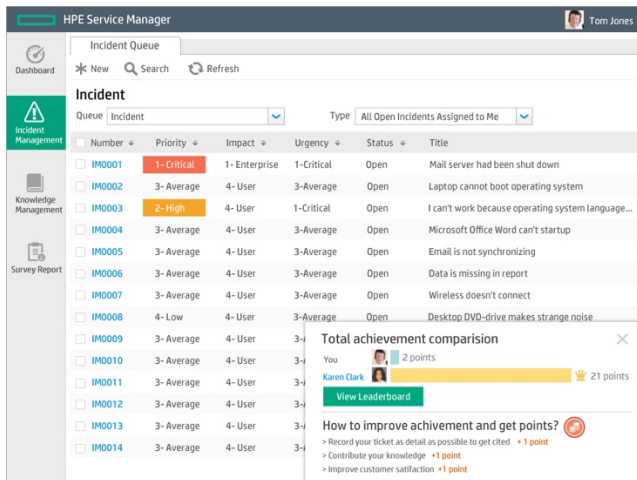


Figure 2: Show instruction and comparison for new users

#### 4.5.2 Record Solution in a Ticket

In the step of recording a solution, the count of people who are drafting knowledge articles is shown on the user interface in order to persuade the IT service desk to share knowledge. We encourage IT service desk representatives to write down information of solution that includes enough details, and to convert the information into knowledge.

**Persuasion mechanics used (See Figure 3): Power of because:** When giving a reason for a request, the request can boost people's compliance from 60% to 90%, which is reported by a psychology study that appeared in a book named Mindfulness [2].

**Collective behavior:** Collective behavior can lead to peer pressure, which impels people to conform to a collective behavior.

**Peer pressure:** Peer pressure helps drive people to do what their peers are doing.

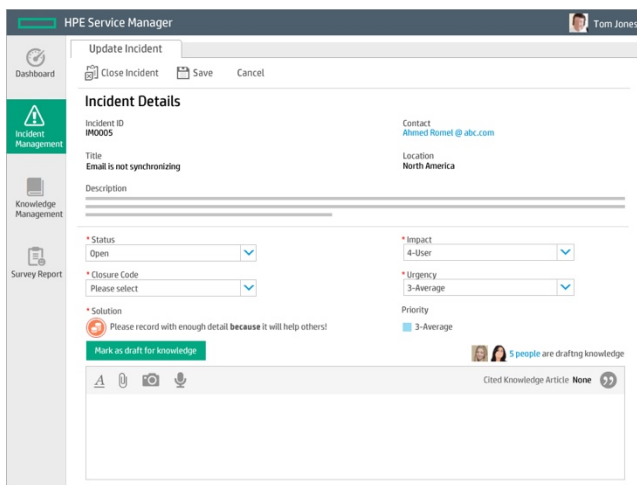


Figure 3: Record solution in a ticket

#### 4.5.3 Encourage IT Help Desks to Draft Knowledge Articles

Another way to motivate IT service desk personnel to draft knowledge article is providing feedback from peers. Once closed tickets have been cited in other case records by their peers, which signifies the problems solved is analogous to what others are encountering. So, IT help desk personnel feels encouraged to draft knowledge article due to a certain value of the solutions.

In order to make a time-consuming task to be more manageable, a progress bar is designed for breaking down the task into more feasible bites, which comprise three phases: the drafting knowledge phase, the internal sharing and reviewing phase, and the formal publishing phase.

**Game and persuasion mechanics used (See Figure 4): Reciprocal liking:** People feel well when they are liked, which persuades them to be better.

**Progress bar:** A big task is broken down into step by step activities.

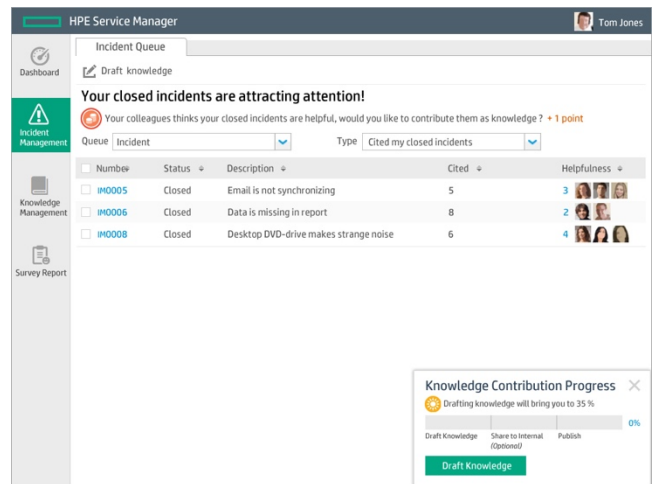


Figure 4: Encourage IT help desks to draft knowledge article

#### 4.5.4 Contribute Knowledge

Three phases are designed to help users better manage tasks until publishing a knowledge article. For instance, the phase of "Share to Internal" allows IT service desks to choose close friends for reviewing their knowledge drafts. Since people will feel less pressure and more comfortable to move forward when confronting close friends.

**Game and persuasion mechanics used (See Figure 5):**

### Step-by-step to finish a task, Social influence

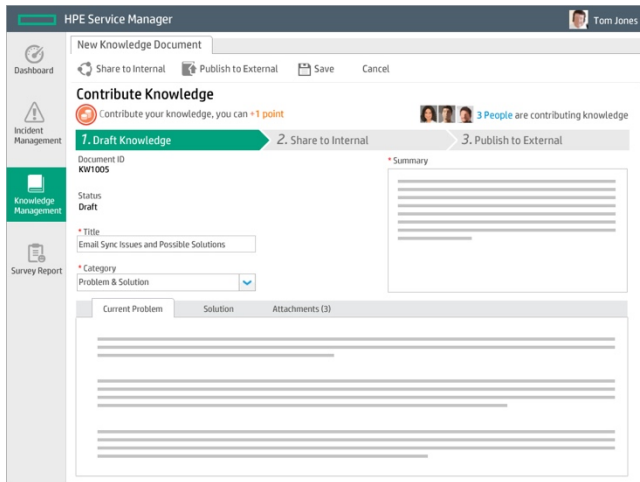


Figure 5: Contribute knowledge

#### 4.5.5 Share with Internal Peers

IT service desk personnel can select peers who are trustworthy to review their article drafts.

**Persuasion mechanics used (See Figure 6): “I need your help.”** This helps flip the roles of leading and subordinate, bring a transfer of power and make other people engage as well.

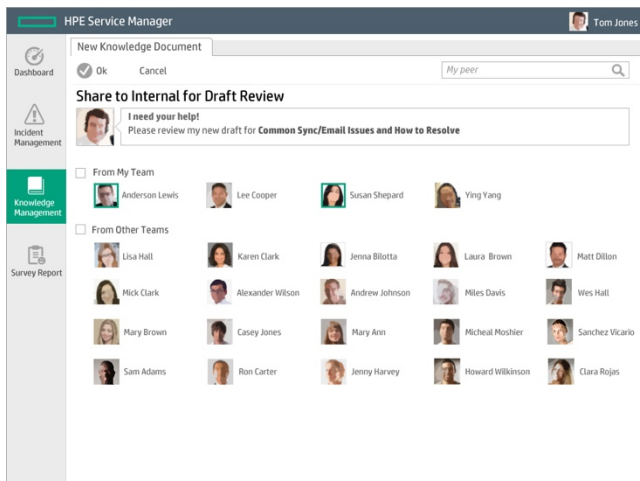


Figure 6. Share with internal peers

#### 4.5.6 Notification

After IT help desk personnel sends out an invitation for reviewing a draft to close peers, the users’ colleagues will receive a notification. Due to the “close peer pressure,” the reviewers are more willing to review and give feedback, which will help enhance the quality of a knowledge article.

**Persuasion mechanics used (See Figure 7): Power of people we like:** people are impacted by people around us and act due to invisible peer pressure.

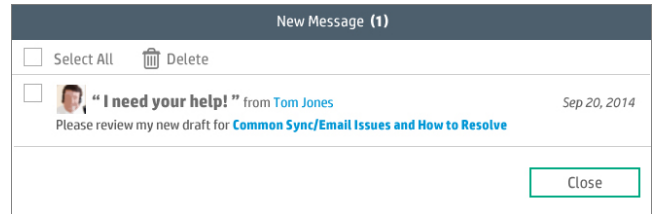


Figure 7: Notification

#### 4.5.7 Leader Board

The incentive mechanism is comprised of points, ranking, and achievements. IT service desks are able to review the top five individuals or teams, compare themselves to any winners via the Leaderboard in order to make them learn how much they have contributed and also motivate them to improve performance.

**Game mechanics used (See Figure 8): Points:** When IT service desks actively take actions, such as writing solutions with enough details in ticket records that can be good references to peers, contributing high-quality knowledge articles that have been cited by teams to solve similar issues, and receiving positive customer feedback about the usefulness of knowledge articles when solving customers’ problems. The points will be rewarded to IT service desks.

**Ranking:** On the Leaderboard, it shows the top five IT service desks after a competition. The visibility of good performance encourages IT service desks to remain improving their performance.

**Achievements:** The achievements gained by the top five winners are visible to all IT service desks. The achievements focus on measuring the value of knowledge and which articles are being utilized the most.

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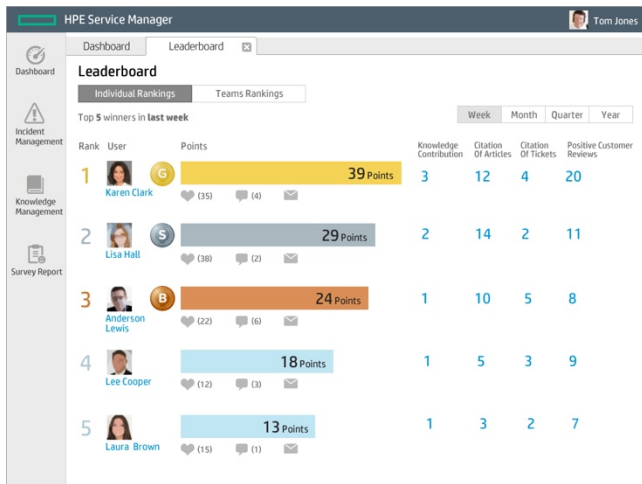


Figure 8: Leader board

## 4.5.8 Customers Survey

We use customer feedback to measure the usefulness of knowledge article. Customers can vote solutions and related knowledge articles and leave comments on them. Feedback and statistics will be sent to both IT service desks who provides the service and the author who create the knowledge article. Therefore, they can continuously improve service quality and refine the quality of knowledge articles.

### Game and Persuasion mechanics used (See Figure 9):

**Rewards:** The power of reward cannot be underestimated. It is one of the fastest ways to persuade people. Because it delivers benefits to impact others. The rewards can be financial or psychological forms.

**Power of Personal-Identity:** Customers who are labeled as “TOP contributor” are more likely to spend time in voting. Because people like being part of an “elite” group of people, which implies they have some superior quality. The personal-identity phrasing significantly increased interest in registering to vote, which is showed by a psychology study appeared in the Proceedings of the National Academy of Sciences [3].

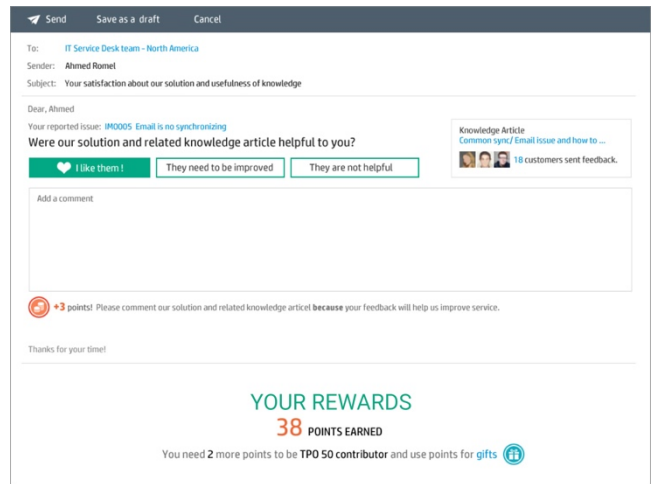


Figure 9: Customers survey

## 5 EVALUATION

We took A/B design evaluation to estimate if our concept was helpful to enhance the IT service desks' contribution, as well as the employee's attitude of gamification and persuasion used in an enterprise. We used two different designs to see which designs performed better. Design A was the original product; Design B was a new design that adds gamification and persuasion mechanics based on the original one. Two designs were separately reviewed by two different user groups. During the process of reviewing, we took face-to-face user interviews, then requested the interviewees to complete an attitudinal survey with a 10-point scale that was used for us to analyze the interviewee's opinions about the two different designs.

### 5.1 Feedback of Users Testing

Overall, the interviewees believed that the incentive mechanism could motivate them to contribute their knowledge and perform better.

In the step of recording information about solutions in tickets, most interviewees were willing to write down information with details to help their peers to refer after they saw the “Because” reminder. However, the degree of detail was not clear. So they suggested that using a good sample for them to refer would be helpful.

Most interviewees believed that they would be impelled to contribute knowledge if the system could automatically notify them how many their completed tickets have been cited by their peers. But it was debatable that if the status of how many peers were contributing their knowledge should appear on the screen when IT service desks were writing a solution in the ticket record. Because some of them would

be impacted by the number. In case that few peers were drafting knowledge articles, they did not feel encouraged.

Regarding involving peers to help improve knowledge quality, interviewees believed that they would spend time in improving the quality of article drafted when close peers requested them. Additionally, if the topic was the interviewees' specialized field, they were more willing to actively comment. In contrast, when the IT service desks chose who would review their article drafts, over half of them told that they preferred to choose subject matter experts since the experts' comments were authentic. Therefore, they proposed that the system would have an option for interviewees to choose subject matter experts.

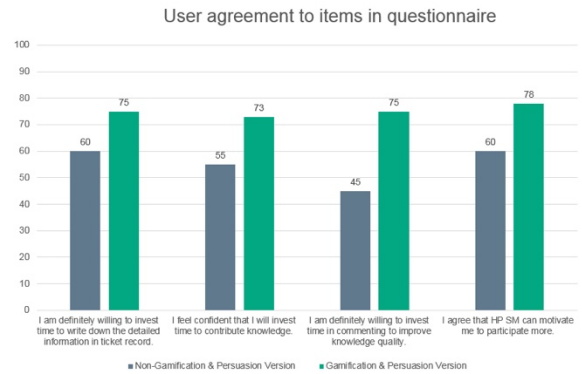
About the concept designs of getting direct feedback from customers for evaluating the usefulness of knowledge, almost all interviewees stated that they were concerned about customer feedback. Some of them stated that they paid more attention to the neutral or negative reviews from their customers than positive feedback for the reason that the comments would help them know which parts did not work well and how to further improve.

Most interviewees asserted that they cared about the winners in Leaderboards and hoped to learn more about the contributions from these winners. Since the winners' performances were informal benchmarks and would motivate the interviewees to enhance their own performance. While mentioning points and badges, some of the interviewees suggested that the system could indicate what their current level was and what the next attainable level would be. Therefore, they would have a clear goal to move forward.

**5.2 Questionnaire Result about Users' Attitudes**

With the use of a user-attitudes questionnaire, we also found that the new design could motivate most interviewees to perform better and would be more willing

to contribute knowledge. (See Figure 10).



**Figure 10: Comparison of users' attitudes.**

**6. NEXT STEPS**

We have gotten positive and valuable feedback from user interviews, which provided us new insights about how to further improve our design. Therefore, the user experience of the enterprise software would be enhanced by using gamification and persuasion techniques in suitable contexts.

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