

Crowdsourcing from the Community to Resolve Complex Service Requests

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ABSTRACT

The VMware Community may provide an opportunity to VMware to tap into the collective intelligence of its 2.4 million strong members to generate intelligent responses to complex Service Requests (SRs). Bill Joy, cofounder of Sun Microsystems, put it well when he said: “*No matter who you are, most of the smartest people work for someone else...*”. The data generated from the vSlua project using an Action Design Research approach shows that the Community resolves lower complexity SR issues efficiently, but begins to struggle as the complexity increases. Almost 50% of all the SRs were answered and over 50% of the answered SRs were resolved in under 6 hours.

Author Keywords

Crowdsourcing; Community; Service Requests; Action Research; Design Research; Industry-academia Collaboration.

ACM Classification Keywords

H.1.1 [Information Systems]: Systems and Information Theory.

INTRODUCTION

While we might like to think of crowdsourcing and collective intelligence as new ideas dreamed up in this Internet age, the philosopher Aristotle who lived approximately 2500 years ago recognised the value of the crowd when he said “... a feast to which many contribute is better than a dinner provided out of a single purse”. More recently, crowdsourcing has enabled a diverse set of organisations to come up with new and innovative ways of delivering value to their stakeholders. Google, Wikipedia, Threadless, Amazon-Turk are all well-known examples of loosely organized groups of people working together to deliver results.

VMware is the world leader in the provision of innovative

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virtualisation products. With each new VMware product comes an exponential increase in complexity. This complexity means that customers come to rely more and more on VMware Technical Support to help them manage and maintain their increasingly complex IT environments. This self-reinforcing cycle requires new ways of working. One avenue explored, was to seek the assistance of VMware’s own crowd, the VMware Community, which has over 2.4 million members with almost 630,000 active monthly contributors.

This paper reports on a project, vSlua, which examines the opportunity for leveraging the VMware Community to assist Technical Support Engineers (TSEs) and customers to resolve complex Service Requests (SRs). By leveraging the power of the VMware Community, it may be possible for TSEs to get assistance from the additional “sets of eyes” of the Community in looking at complex SRs. This could help to drive down the time it takes to resolve complex SRs while ensuring that customers continue to get the excellent support service that they have become accustomed to.

Figure 1 shows the current complexity pyramid across some of the VMware product pillars.

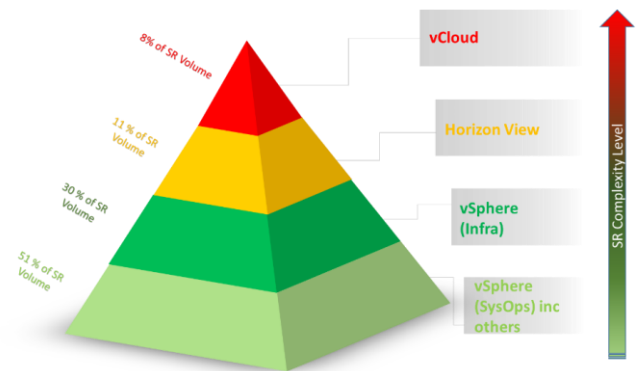


Figure 1 – Complexity Pyramid

It also details the percentage of SRs that each of these product pillars accounts for (2015 Data). Each segment of the pyramid can itself contain many sub-products. For example, the vCloud Suite has 10+ sub-products.

BACKGROUND TO CROWDSOURCING

The term crowdsourcing was coined by Jeff Howe [1] in the June 2006 issue of Wired magazine. He [2] offers the following definition:

“Simply defined, crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaboratively), but is also often undertaken by sole individuals. The crucial prerequisite is the use of the open call format and the large network of potential labourers”

Since then, a lot has been written on crowdsourcing and on its ability to affect change in how organizations function and work. There are numerous examples of successful organizations whose sole existence relies on the power of the crowd. For example, Wikipedia has empowered thousands of contributors from across the world to respond to a call for action in order to collectively create the world’s largest encyclopaedia with little or no centralized control. At the time of writing this paper, there are over 31m registered English Wikipedia usernames and 118k regular contributors. Similarly, Threadless, allows anyone to design and submit a T-Shirt design. The crowd votes on all submitted designs and the winning design goes into production. The winning designer is rewarded via prizes and royalty payments.

Howe [3] outlines reasons for the power of the crowd:

“If great minds think alike – and in many circumstances, they do - then they really constitute only one mind. A diverse group of solvers results in many different approaches to a problem. Tapping people’s collective intelligence involves trafficking in what the crowd already knows. Such crowdsourcing applications generally require small investments of time and energy on the part of individual contributors.”

Malone, Laubacher and Dellarocas [4] in their study of over 250 examples of web-enabled collective intelligence identified the logic behind why a Community forms and why members help each other. It is as a result of three primary motivators:

1. *Money.* Financial gain is an important extrinsic motivator for most people. Sometimes people may receive direct payments, but other times its peer recognition that increases their potential to earn future pay.
2. *Love.* Love or enjoyment is another important intrinsic motivator for some people. Members can be motivated to help others because of the enjoyment they get in solving a particular issue, from socializing and interacting with their peers, or simply because it makes them feel good.

3. *Glory.* Glory or recognition is a third important motivator for some people. Members like to be recognized amongst their peers as being a top group member.

These motivators – Money, Love, and Glory - also appear relevant in the case of the VMware Community. For example, a number of the top contributors have previously been offered employment and opportunities to work for VMware (Money motivator). Contributors appear to enjoy the interaction that comes from engagement in the group (Love motivator). Finally, the group has a mature rewards mechanism where badges, stars, etc. are awarded to top contributors (Glory motivator). Contributors like to be recognized amongst their peers as being a ‘guru’.

METHODOLOGY

vSlua is designed as an Action Design Research (ADR) project. The action researcher is **not** merely a spectator looking on from a distance, but he remains an active player in each iteration of the project. For example, McKay and Marshall [5] explain that Action Research is “...*the active and deliberate self-involvement of the researcher in the context of his/her investigation. Unlike the methods of objectivist science where the researcher is argued to be an impartial spectator on the research context ... the action researcher is viewed as a key participant in the research process, working collaboratively with other concerned and/or affected actors to bring about change in the problem context ...*”.

Whilst the active participation of the researcher is a core pillar of ADR, it must also be stressed that it is not just about solving a problem but is also about generating new knowledge. For example, Myers [6] states that: “*Action (Design) Research is not consulting*” and requires the participant to wear both a Practitioner and a Researcher hat. Myers states that for a successful ADR project the researcher needs: (1) A company with a problem worth solving; and (2) A problem of interest to other researchers in the field.

In the case of vSlua, VMware has (as described above) a problem worth solving and this problem is of wider interest (as can be seen by the current interest in the topic of crowdsourcing). vSlua can be described as a truly collaborative and “hands-on” ADR project, consisting of an intervention that has gone through two primary iterations as follows:

- **Iteration #1** involved an initial group of four TSEs (two Level-3 Senior Engineers and two Level-2 Engineers) **anonymously** posting technical SR queries into the VMware Community relating to the VMware Horizon View product.
- **Iteration #2** involved an extra group of six TSEs (two Level-3 Senior Engineers and four Level-2 Engineers) **anonymously** posting technical SR queries into the VMware Community relating to the VMware vSphere

product. The vSphere product accounted for almost 74% of the total volume of SRs in 2015. During this iteration, the first group of TSEs continued to post and create threads relating to the Horizon View product.

The following (Figure 2) were the rules of Community engagement for the TSEs in both groups. The most important rule was that ALL Community threads had to remain anonymous. Each Community thread was a direct copy of a Customer opened SR. The Community thread was to be worked on by the Community (anonymously), while the SR was to be worked on by the TSEs. At no stage was the Customer ever aware that a Community thread was opened for their SR and similarly the Community was always unaware that a thread was an actual Customer reported SR. In the case of any unanswered Community threads, the TSEs would continue to resolve the issue (as part of their normal activities) and when the SR was resolved to the customer's satisfaction, the knowledge was fed back into the thread (and the wider Community). All Customer contact and engagement continued to be done by the VMware TSEs.

- 1) NEVER ever ever reveal that you work for VMware or are part of VMware technical support.
- 2) NEVER ever ever use any Customer private data in the threads.
- 3) Where possible, only use the Customer's original subject (which was used to open the SR) with very minor rewording (if required)
- 4) Open the thread with a statement similar to "...." I have a client who is experiencing the following...."
- 5) For the Level 2 TSEs, please select your own SRs.
- 6) For the Level 3 TSEs – select SRs from the other TSEs within the team.
- 7) If a Community member has answered the thread, then please use the reward mechanism of the Community and deem the thread to be answered. That way the member get his/her due recognition
- 8) Please engage/reply respectfully with the community members if they look for additional information etc.

Figure 2 – Rules of Engagement

In the background, the following data was captured to reflect the activity against each opened thread (Figure 3)

Date	TSE Name	SR #	Community Thread ID	Product	Complexity Level	Did the Community resolve the issue	Time Saved (Hrs) – If any	Reference VMware support	Reference VMware KBs/WP	Reference external sources

Date	The Date when the thread was opened.
TSE Name	The name of the TSE that opened the thread.
SR #	The SR number associated with the thread.
Community Thread ID	The http link for the thread.
Product	The product under which the thread was opened.
Complexity Level	The Complexity level of the SR (Low, Medium, High).
Time Saved (Hrs.)	What is the minimum time the communities would have saved on this SR.
Reference VMware support	Did the communities reference VMware support.
Reference VMware KBs/WP	Did the communities reference the VMware Knowledge Base/White Papers.
Reference external sources	Did the communities reference external non-VMware sources of knowledge.

Figure 3 – Thread Activity Data

Unique to this approach is the direct linkage of each thread to a specific customer SR. The following levels of complexity were used to categorise the threads (Figure 4)

Low Complexity (vSphere SysOps)	★	L1
Low Complexity (Horizon View)	★★	L2
Medium Complexity (vSphere SysOps)	★★★	L3
Medium Complexity (Horizon View)	★★★★	L4
High Complexity (Horizon View & vSphere SysOps)	★★★★★	L5

Figure 4 – Complexity Level

INSIGHTS GAINED

As stated earlier ten TSEs (with similar tenure, experience and knowledge) were selected to post threads **anonymously** into the VMware Community in two iterations. The following infographs illustrate the key findings from painstaking analysis of these threads.

High Level Overview

vSlua has recorded over 17,200 unique views and 200 Community replies and interactions on the 130 threads created by the TSEs during Iterations 1 and 2 (Figure 5)

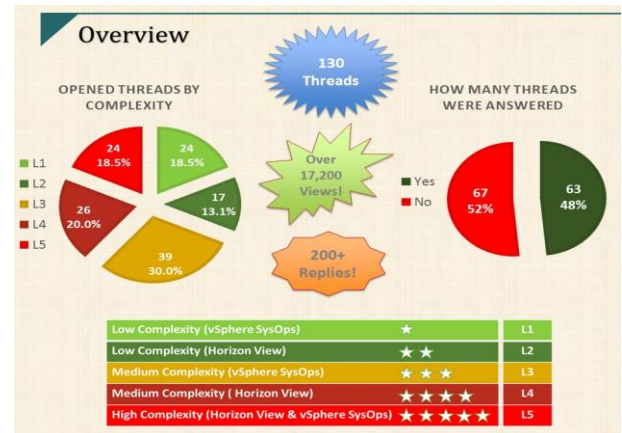


Figure 5 - Overview

The threads can be categorised according to complexity as follows:

- 24 L1 (Low Complexity vSphere SysOps)
- 17 L2 (Low Complexity Horizon View)
- 39 L3 (Medium Complexity vSphere SysOps)
- 26 L4 (Medium Complexity Horizon View)
- 24 L5 (High Complexity Horizon View & SysOps)

48% (63 threads) of ALL opened threads were answered by the VMware Community.

Answers by Complexity

87% of ALL L1 threads and 88% of ALL L2 threads were answered by the VMware Community. However, only 33% of the L3 threads and 42% of L4 threads were answered by the Community. The number of L5 threads answered by the

Community is a mere 12% of the 24 threads opened.

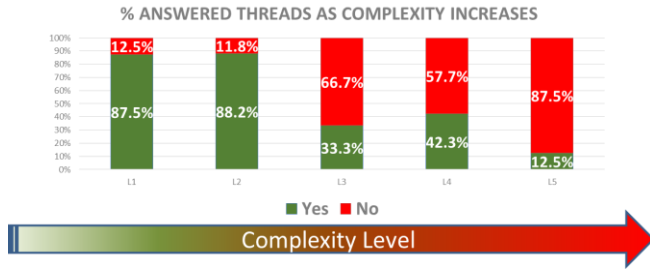


Figure 6 – Answered Threads by Complexity

Figure 6 shows a decline in the Community’s ability to resolve issues as the complexity level of SRs increases.

Answers by Time

48% (63) of the threads were successfully answered by the VMware Community. By diving deeper into the answered threads, we can see how quickly the SRs were resolved. Figure 7 illustrates the cumulative number of answered threads bucketed by time.

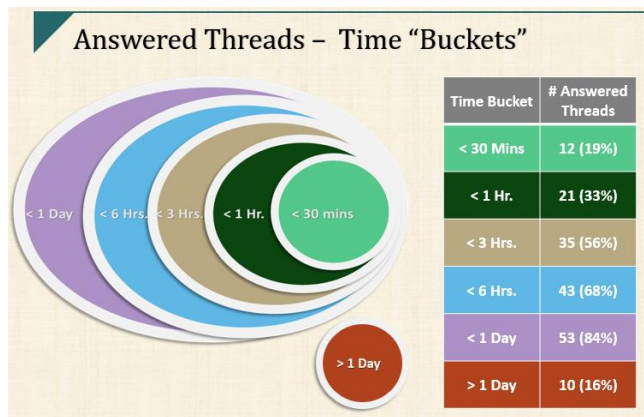


Figure 7 – Answered Threads by Time.

84% of the answered threads were successfully resolved in less than a day. Amazingly 19% of the answered threads were successfully resolved in less than 30 minutes. Over half of the answered threads were resolved in less than 3 hours and 68% within 6 hours. On the other hand 16% of the answered threads took more than a day to be resolved.

The data highlights that when the VMware Community resolves an issue, it does so relatively quickly.

Answers by Time and Complexity

Figure 8 provides additional analysis of the threads by time bucket and severity.

For L1 answered threads, 67% (14) were resolved within 3 hours and over 95% (20) were resolved within a day. On the other hand, for more complex L5 answered threads, none were resolved in less than 3 hours. Yet for L4 answered threads, 45% (5) were resolved in less than an hour. This shows the Community’s ability to resolve lower and moderately complex issues quickly.

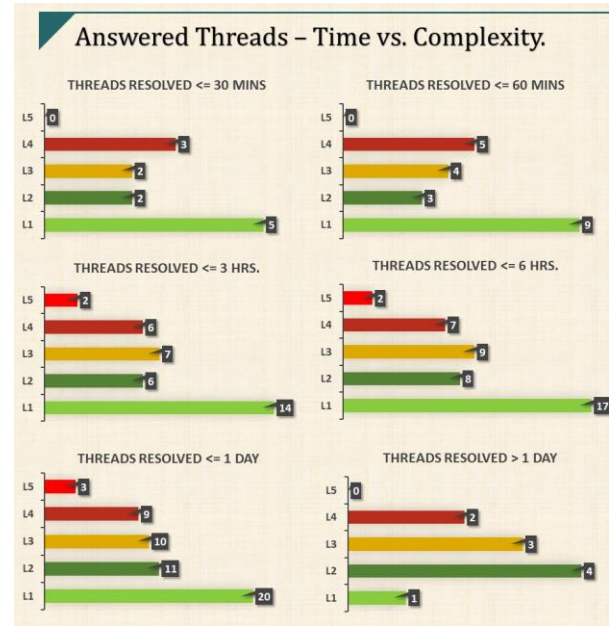


Figure 8 – Answered Threads by Time and Complexity

A 6-hour resolution window, which aligns closely to an 8 hour working day, appears sufficient for resolving a large proportion of the answered threads. This window is sufficient to close 80% (17) of all L1 threads, 54% (8) of all L2 threads, 70% (9) of all L3 threads, 64% (7) of all L4 threads, and 66% (2) of all L5 threads.

Answers by Service Level

It is important to know if the resolution can be provided in a timely manner and within the agreed Service Level Agreement (SLA) time. In other words can the SRs be resolved within the period of time during which the initial response is due.

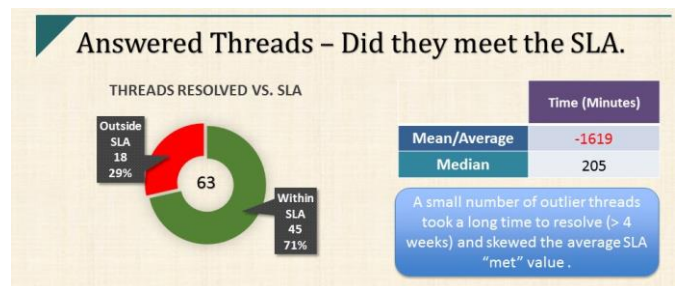


Figure 9 – Answered Threads by SLA.

71% (45) of the answered threads were resolved before the initial response was due to the customer (Figure 9). When an issue was resolved by the Community, the TSE marked the thread answered and the time stamp of when the answer was posted was used to determine if the SR was resolved before the SLA. This is a truly impressive achievement by the Community. This translates to a resolution being provided to the Customer before they were expecting an initial first contact response.

LESSONS LEARNED

This project was initiated to determine the technical motivation and capability of the VMware Community in resolving Service Requests. At the very beginning the problem definition was stated as ...

Can the VMware Community help Technical Support Engineers to resolve complex Service Requests?

The data has shown that low and moderately complex SRs are quickly resolved by the Community, but complex SRs are **not** so easily resolved by the Community.

However, if the problem definition is rephrased as follows ...

Can the VMware Community help Technical Support Engineers resolve Service Requests?

Then the answer is strongly affirmative. The data from 130 Community threads spread across five complexity levels has shown that while complex SR resolution is not necessarily the strength of the Community, a large percentage of low and moderately complex SRs can be resolved by the Community. The ability of the Community to resolve issues decreases as the complexity level of those SRs increases. The Community struggles with higher levels of complexity. The data also shows that the Community resolves issues in a timely manner and it has the ability to resolve a high proportion of them within the Service Level Agreements.

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