

Undergraduate Thesis Prospectus

**Advanced Resource Retention: Improving the Efficiency of the  
Integration Testing Processes of Cloud Computing Software**  
(technical research project in Computer Science)

**The Evolution of Internet Language in  
Response to the Evolution of Internet Culture**  
(sociotechnical research project)

by

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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## **General Research Problem**

*How do online processes evolve to become more effective and efficient?*

The internet has become ubiquitous. From 2000 to 2020, the share of the North Americans who use the internet rose from 43.88 to 91.52 percent (Roser et al., 2021). Such growth transformed the technical and social practices associated with the internet. For example, many software development practices of the 1990s and early 2000s have since become obsolete (Surbiyala & Rong, 2019). The culture of the internet is developing rapidly as well, and many cultural artifacts from a decade ago (such as slang terms, memes, etc.) may be irrelevant or even unheard of to current internet users (Crystal, 2013).

## **Advanced resource retention: improving the efficiency of the integration testing processes of cloud computing software**

*How may the integration testing processes of cloud computing software be made more efficient?*

This research project is being completed as a capstone project in the department of Computer Science with technical advisor Rosanne Vrugtman.

Cloud computing software (also known as software as a service, or SaaS) provides users with computational services over the internet (Surbiyala & Rong, 2019). The integration testing of such software, which involves testing that all components of the software function well together, is vital to ensuring that the software works properly. And with the market size of SaaS growing to \$177 billion USD in 2022, there are many companies that make widely used cloud computing software (Vailshery, 2022). These companies have great interest in developing effective and efficient integration testing procedures in order to verify that their software

functions correctly, and they generally achieve good integration testing by creating a series of tests that run automatically before software is made available to users.

Each test in integration testing requires the creation of certain resources before the test can be run. A resource may be anything a test needs in order to run, such as databases, storage volumes, etc. These resources are cleaned up if the test passes successfully; however, if the test fails or if an error is thrown during the test, the resources are kept running so that engineers can examine them and determine what went wrong. In the current state of integration testing for the Valkyrie team at Amazon Web Services, it is up to the developers to delete the resources manually after they have finished reviewing them. While this is fine in theory, in practice many resources do not get cleaned up, and these unnecessarily stored resources cost money to keep running.

During my internship at Amazon Web Services, I designed and implemented an automated method to clean up resources once they are no longer needed. To achieve this, I designed a system that created and stored metadata for each resource used in a test and a sweeper tool that goes through the metadata and cleans up any resources which have existed longer than their expiration time. Automating this process greatly minimized the cost of the resources created by integration tests.

## **The evolution of internet language in response to the evolution of internet culture**

*How have internet users developed and adopted new linguistic features to adapt to the everchanging social environment of the internet?*

The constant development of internet culture affects internet users' language use. Changes in internet culture, such as the rise of new social media platforms, the emergence of

new trends, and the increased adoption of internet platforms by people around the world, result in the need for new language features to efficiently communicate in the changed culture. These new linguistic features start in one online community and spread to others by their members. New developments in internet language are indicative of previous developments in internet culture, and they signal important cultural aspects of the internet.

### *Censorship slang*

Due to the increased censorship of sensitive topics (suicide, sex, etc.) on social media platforms, new linguistic terms, called *censorship slang*, have arisen in order to outsmart the platforms' algorithms that detect censorable content (Branham, 2021). Censorship slang is an act of rebellion that internet users adopt in order to spread their messages to their desired audience without being silenced by the platform they post their content on. One Twitter user concisely described the need for these new terms, writing "it's cause on places like TikTok you can literally get suspended just for saying it, so people had to work around it to still talk about the topics" (ItsCodyLmfao, 2022). TikTok, one of the platforms with the strictest censorship policies, has inspired many popular examples of censorship slang, which, after their popularization, promptly move to other platforms, such as Twitter and Reddit (Tait).

TikTok describes their mission as "to inspire creativity and bring joy" (TikTok, n.d., "About"). In alignment with that mission, TikTok's community guidelines prohibit or suppress videos that discuss sensitive topics, such as suicide, self-harm, disordered eating, among many others (TikTok, n.d., "Community Guidelines"). TikTok users, who wish to discuss the sensitive topics that TikTok does not want on the platform, have employed creative censorship slang to

circumvent the community guidelines. Examples include “unalive” or “sewerslide” instead of “suicide,” “corn” or “🌽” instead of “porn,” and “oid” or “🌿” instead of “weed/marijuana.”

These terms became popularized on TikTok due to the platform’s censorship system, but they quickly spread to other social media platforms as euphemisms for the original terms they were designed to replace. In particular, the term *unalive* has spread across many internet communities, as more and more social media platforms have suppressed and demonetized content that discusses topics such as suicide and self-harm. The term first became popular in 2013, but it experienced a dramatic spike in popularity across internet platforms such as TikTok, Twitter, and YouTube in 2022 (Tait).

Censorship slang demonstrates internet users’ adaptability to the changing culture of the internet, specifically to the increasing prevalence of censorship on social media platforms.

### *Semantic changes*

Another catalyst for the development of new linguistic features is the popularization of certain actions. These actions, which may be described with multiword phrases, are often replaced by single words in order to increase the efficiency with which internet users can discuss the actions. Instead of inventing completely new words, the meanings of existing words are expanded to include these new actions in a process called *semantic change*.

A salient example of semantic change lies in the word “photoshop” (uncapitalized). Previously, “Photoshop” was only a proper noun that referred to the Adobe image-editing software. However, due to the popularization of editing images posted on social media, the word “photoshop” has expanded to include a verbal sense with this meaning. As a verb, “photoshop” also carries the negative connotations associated with the action itself (see SapphicVincent,

2019). Editing images for social media may be looked down upon, as the images do not represent reality and sometimes perpetuate beauty standards that some consider to be harmful. Also, edited images may be used to spread propaganda and false information.

Internet users, such as SapphicVincent, use the verbal usage of “photoshop” ubiquitously across internet platforms, and it often carries this negative connotation (Kastrenakes, 2020). In response, Adobe has taken a stance against the use of “photoshop” as a verb. They insist that discussion of edited images should only use “Photoshop” as a proper, trademarked noun: “The image was modified using Adobe® Photoshop® software” (Adobe, n.d.).

### *The spread of terms*

Many new linguistic terms have spread from their original community to new ones. For example, due to the dominance of the English language on the internet, internet users who speak other languages sometimes adopt English words into their own languages. These English terms are adopted because they fill a void in the native language.

For example, the English word “random” has undergone a semantic change on the internet, incorporating an aspect of unexpectedness. From there, Spanish speakers adopted the new meaning of “random” by borrowing the word into the Spanish language, even though Spanish already had words that represent the traditional meaning of “random.” The word is very prevalent on Spanish-speaking but only in the new sense (see Sweetninaa\_, 2022). To represent the traditional sense of “random,” native Spanish words are used.

Some dictionaries and other language authorities resist these linguistic innovations. The Royal Spanish Academy (in Spanish, La Real Academia Española), a Spanish language authority, resists some internet neologisms, especially those that are derived from English. The

Royal Spanish Academy is aware of the term “random” and has published articles about it but does not want to add it to the dictionary as it is not considered a “proper” Spanish word (Real Academia Española, 2021). The Academy also warns of an “invasion” of Spanish by English words (Real Academia Española, 2016). In social media campaigns, it attributes the trend of using English words to perceptions that the use of English is cool or stylish.

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