Thesis Project Portfolio

Optimizing Athletic Team Management through Django-Powered Website Development

(Technical Report)

Failing to Succeed: An Investigation into Sociological Factors that Caused Innovations in Computer Science to Fail

(STS Research Paper)

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Nathaniel Thomas Stevenson

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Department of Engineering and Society

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Executive Summary

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In the field of Computer Science and Engineering (CSE) new technologies often struggle to achieve widespread adoption. Innovation studies have historically attributed these struggles to faulty technological components or insufficient funding. However, to fully understand these innovation failures, one must also consider the innovation's sociological components. The STS research paper explored innovation studies of Artificial Intelligence in the 1970s, Virtual Reality, and the Dvorak Keyboard in an attempt to identify potential sociological components that led to these innovations failures. The results of the STS research and the findings of previous innovation studies were then combined to provide an extensive framework of technological, sociological, and financial components of past CSE innovative failures. These pitfalls were taken into account during the technical research project of constructing a web-based portal for club sports in an attempt to solve the issue of unorganized athletic team management. The future results of this technical application are critical, as, if it can gain widespread adoption, it will provide evidence that the findings in the STS research were correct, as well as help address a critical problem in the management of club sports.

Thus the focus of the technical project was to create a software application that assisted with the organizational aspects of club sports. Many clubs have a group chat with miscellaneous links to logistics spreadsheets, playbooks, film, and roster information. The decentralized nature of this information can make it extremely difficult to find and often significantly increases the workload of team leaders. Thus, this technical project constructs a customizable Django-based web portal. This allows teams to individually equip their portal with only their desired features. The project was inspired by applications such as Monday.com and Slack, but differentiates itself by targeting athletic social groups through customizable features tailor-made for athletes. These

features include a playbook, roster information, upcoming games, practice information, team budgets, indexable film room, and a Discord-like messaging tool. While this technical project is still under development, the final product will strive to combine the STS research with a technical background. In doing so, this application will attempt to gain widespread adoption within the ultimate frisbee community, and then eventually to gain traction within the club sport community as a whole.

In order to achieve the lofty goal of widespread adoption amongst the club sport community, not only will the technological aspects of the application have to be designed well, but it will also require the support of sturdy sociological components. This was therefore the focus of the STS research, as a majority of previous innovation studies on failed experiments have ignored sociological components as potential reasons for innovation failure. In order to accomplish this, three case studies of failed innovations within the field of CSE were examined. The first case study explored artificial intelligence (AI). It found that while early forms of AI may have failed due to insufficient computing power, data, and funding, there were also sociological issues such as the over exaggeration of capabilities and the exiling of a successful area of research, expert systems, from the mainstream AI community. The second case study explored virtual reality. While the early technical failures of virtual reality such as inaccessibility and bad graphics that caused simulation sickness have been solved, modern virtual reality is still having difficulty gaining widespread adoption. The main issues modern virtual reality faces are uncertainty surrounding the legal and punishment system inside the metaverse, an inability to gain popularity amongst the younger generation, and difficulty in attracting new customers who are accustomed to consuming information in a two dimensional manner such as a tablet or screen. The last case study inspected was the Dvorak keyboard. While there is a debate about

whether or not the Dvorak keyboard increases typing speed, it has been proven to be

significantly more ergonomic. Thus, many wonder why this technology has failed to gain

widespread adoption. The main conclusion is that, since the QWERTY keyboard came first,

many typists were accustomed to using it. Despite the fact that Dvorak is more efficient in the

long run, many are hesitant to transition to the newer technology due to a phenomenon known as

technological lock-in.

      Overall, both the technical and STS projects were extremely useful. While the technical

project expanded on prior knowledge in order to construct a usable application with a large target

audience, the STS research may have been more informative as most of the content was novel. In

the end, both projects have emphasized that engineers are truly in a unique position to change

society. By understanding how previous innovations have failed both technically and socially, the

engineering community can allow for future inventions to be designed in an optimal manner to

assist the greatest number of people.