


CS486C – Senior Capstone Design in Computer Science

Project Description

Project Title: Skills/Knowledge Badging System	
Sponsor Information: 	Dave Hopfensperger, Technology Manager, Digital Experience dave.hopfensperger.br2u@statefarm.com Glenn Austin, Technology Analyst, Planning & Management glenn.austin.gkst@statefarm.com State Farm Insurance

Project Overview:

One of the major advantages of a shared physical workspace is the motivation and sense of shared purpose that it creates. A huge body of research in social dynamics shows that employees that work together every day have access to an enormous number of subtle cues and resources (e.g. hallway encounters, in-person team meetings, impromptu lunch conversations, etc.) that can increase the sense of belonging within a company, and increase trust and commitment between members of a project group. A particularly important social currency that is built up in these informal ways is the sense of pride and respect that comes from having colleagues recognize your mastery of certain skills as they work with you and “word gets around” that you are competent and reliable. This vital social dynamic has always existed but has often been invisible or underrated because it’s simply a normal built-in element of the physical office environment. It is only in recent years, where working remotely has become increasingly common, that the importance of these subtle social effects have become clearer. The current COVID-19 crisis has greatly accelerated and exacerbated the situation, as entire companies have moved to 100% online work practically overnight. As a result, morale in many companies is at an all-time low as employees deal with the stress of the crisis in isolation, slogging through their daily tasks from home and relying on video-conferencing to provide critical communications.

Even in more normal times, acknowledgement of contributions and skills of team members has been recognized as a major driver of company morale. Have you ever put a lot of effort into a work assignment or a project only to feel like no one has noticed or acknowledged the success of the project? It is tremendously demoralizing to make important contributions to a project team without any idea of where you stand; everyone likes to be rewarded or acknowledged for the great work and effort that they put into a successful project.

Such intra-organizational recognition and acknowledgement can take a variety of forms, ranging from something simple like a pat on the back and a thank you from a leader or peer, to a more formal acknowledgement or certificate for some skill they have, to a formal award or monetary bonus. Having some sort of formal mechanism in place to capture and advertise such acknowledgement visibly within a company or working group is particularly vital in a remote-work scenario where the informal communication channels normally in place in the in-person office environment no longer exist.

Some companies have tried mechanisms such as newsletters or a “virtual winner’s board” to provide the missing acknowledgement and feedback, but this is only partially effective. Many will miss the email or neglect to visit the winners board; what is needed is a creative solution that allows employees to display their acknowledgements in a more obvious, permanent and ubiquitous manner. One mechanism that has strong potential here is the concept of



“badging”: employees (or their avatars, profiles, or other representations in virtual space) are given a visible mark of appreciation – a “badge” – that indicates strong performance or mastery of certain skills. Badges are a permanent and highly visible acknowledgement of recognition and appreciation within the company or workgroup; they make those skills apparent to teammates, and employees can use them to remind themselves of the successes they have had on days when things are not going so well. More broadly, a well-designed badge system that includes some subtle elements of gamification could help serve as motivation for employees to get to the “next level” of performance, to “win” that next badge. In short, a badging system can create a unique atmosphere of excitement and celebrated success that allows everyone to be in “the game”.

The Problem: A flexible skills acknowledgement system for remote work contexts.

For this project, we would like to create a powerful, flexible badging system that can be used both throughout our company and within individual work groups. Specifically, we envision a secure internal web application where employees can easily acknowledge the skills and accomplishments of others, while also proudly displaying the kudos or awards that they have received; this could also serve as a sort of virtual resume for the skills and successes they have attained. Detailed functions will be explored by the design team (we look forward to your creativity and innovation!), but some of the key features would include:

- Administration interface (based on assignment of user login roles) that allows administrators to manage the system, e.g., create new employees accounts and configure/customize overall system settings.
- Ability to distribute badges automatically when certain achievements are reached (e.g., a project finishes, a certain amount of time with company, certain “cred points” collected from teammates, etc.).
- An elegant and highly-usable web-based GUI, preferably implemented as a Single Page Application (SPA).
- A mechanism for badges to be easily visible/accessible. Having your badges hidden in some obscure internal web page is not likely to work. As an example, the system might be able to generate an auto-updated signature line that is attached to your emails that highlights the badges you’ve received.
- Ability to print your badges in some format, in case you’d like them visible in your office (at home or on site)
- Ability to create groups (e.g. for a project) of users; users could belong to more than one group. This is to allow groups to define and award badges just within that group.
- Some system (“cred points”?) that allows others on your team or within your company to express appreciation for (a) contribution to the team (b) skill in a particular area/technology or (c) engagement with the company.
- Ability for employees to distribute acknowledgements or other form of “social currency” to others (e.g. Yammer, GitLab, etc.)
- Ability for employees to be automatically “badged” based on successes using a GitLab or similar repository for things like code coverage, etc.

These are just a few ideas to outline the key features of the concept. The team will be expected to analyze existing “rewards” concepts from both online and physical world contexts, combining the best elements into an effective badging system. In the best case, the team will take this to the next level to not only address our internal needs, but to create a general purpose solution that could be adapted by *any* company to include this badging infrastructure into their operations infrastructure. The ultimate goal, of course, is happy, committed and productive employees who feel valued, take pride in their work, and motivate others in a never ending circle of acknowledgement and recognition.

Knowledge, skills, and expertise required for this project:

- Knowledge of modern Web2.0 programming techniques, web application frameworks, languages and protocols required to create a secure, easy-to-use web-based solution.
- Interest in social science of workplace management, social media, and gamified rewards systems.

Equipment Requirements:

- There should be no equipment or software required other than a development platform and software/tools freely available online.

Software and other Deliverables:

- The badging web application and related software infrastructure as described above, deployed and tested successfully.
- Must include a complete and clear User Manual for configuring and operating the software.
- A strong as-built report detailing the design and implementation of the product in a complete, clear and professional manner. This document should provide a strong basis for future development of the product.
- Complete professionally-documented codebase, delivered both as a repository in GitHub, BitBucket, or some other version control repository; and as a physical archive on a USB drive.