

Abstract: Was the Cheese Ever Not Moving?

A History of Sustainability Development and Future Outlook at HUBzero[®]

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ABSTRACT

In, “Who Moved My Cheese?: An Amazing Way to Deal with Change in Your Work and in Your Life,” [1] the author describes lessons in sustainability and adaptation that apply regarding science gateway infrastructures like HUBzero.

HUBzero arose from evolutions that included: i) visionary founding of PUNCH at Purdue in 1996 to make web accessible simulation tools [2] ii) funding in 2002 of the Network for Computational Nanotechnology and nanoHUB by the National Science Foundation, iii) vertical expansion of nanoHUB [3] in the nanotechnology market by easing online simulation tool usage with interactive graphics and infrastructural developments to easily put web interfaces on simulation codes (Rappture [4]) and publish them on nanoHUB, and iv) horizontally expanding into other scientific domains with founding of HUBzero in 2007 based on the nanoHUB infrastructure.

Inheriting HUBzero directorship in 2015, my goal was to apply entrepreneurship principles to create a sustainable organization. HUBzero reached break-even this fiscal year. However, startups demonstrate that the cheese of sustainability always moves. The early decision of whether a project intends to be “community supported” or to “support communities” is important in the execution among many sustainability mechanisms [5]. The former has a goal to create an open software project supported by a variety of developers from many organizations. The latter has a goal to build an organization that leads the project that may have community supported contributions. Based on lineage, HUBzero has been the latter. The team is comprised of 25 full time professionals supported entirely by revenue composed of a small number of large projects and many hosting and development arrangements, inside and outside of Purdue.

Executing several large projects while supporting many smaller diverse projects demands organizational change. Our previous funding was based on the academic model of person months. Now we are challenged to budget like a business, with allocations to R&D, marketing, and sales. To compensate, we

are challenged to treat process standardization and cost streamlining urgently. Team culture and dynamics are significant when academic looseness is replaced by customer expectations and firm commitments, and where evolving technologies have demanded a change in team thinking from “we can build it better” to “we shouldn’t build it when can integrate it and focus our attention on new innovations.” Further, our past success is an obstacle. The cheese always moves, and past success has only a finite lifetime not meriting complacency. This is challenging when those who have invested years in leading an approach are told that their work is no longer relevant and that they need to pursue something entirely new. Finally, the landscape of science funding in the US is uncertain. Rarely has it been more certain that this particular cheese is moving. This compels us to think of operating on a larger but more diverse scale to insulate against ebbs and flows.

This presentation discusses lessons in fiscal responsibility, team alignment, technology assimilation, and diversifying in the face of changing funding mechanisms as part of an ongoing strategic activity.

Keywords— *cyberinfrastructure; sustainability; science gateway; HUBzero; business model*

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