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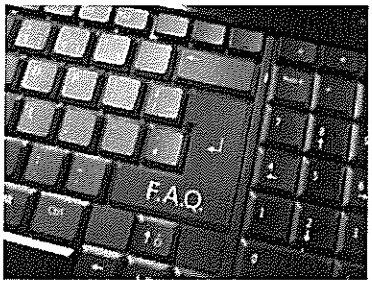

Why does the region need a [cyber] infrastructure?

Wisconsin in general and SE Wisconsin in particular has an economy that is struggling to grow and to compete in the emerging global, national and Midwest regions' "information economy." While we wish to foster new businesses, innovate by creating new products and services, refresh legacy products and services, and do so with modern information technologies, we have not developed either a strategy or accompanying technical capabilities needed to do so. Unlike other regions, Wisconsin lags in investment in its technical infrastructure – arguably our platform for the future growth. Our commitment to cyber infrastructure (e.g., broadband wired and wireless communications, datacenters, shared computing and storage systems, software, personnel) pales in comparison to our traditional commitments to civil infrastructure (e.g., roads, bridges, water, and power) – the former accepted as essential to economic growth. This lack of commitment to our technical infrastructure negatively impacts our ability to envision change and implement improvements in education, entrepreneurship, cooperation, efficient government, public healthcare delivery, and many other regional imperatives.

We do not today ask individual businesses or academic institutions to build their own roads, construct their own power plants, drill their own water wells or process their waste. Scale economics long ago convinced us to build utilities for these and other shared infrastructure. Sharing improves utilization, lowers costs/unit of consumption, and centralizes and amortizes operating and capital costs among all users. This is the impetus for cloud computing. We need to recognize that a regional cyberinfrastructure exhibits the same scale economics and represents a critical shared resource empowering creativity and innovation in the region. As important, individual institutions of education, government and business are already beginning to accept that they cannot, and indeed need not, foot the bill for their own private versions of the capabilities.

Why can't business and academia just use the cloud for their needs?

Today and for the foreseeable future the "cloud" provides only some of the "utility" computing resources required by business and academic users. Today's cloud services fall into three broad categories: 1) infrastructure as a service (IaaS), 2) platforms as a service (PaaS) and 3) applications as a service (AaaS). IaaS comprises datacenter space, power and cooling. PaaS comprises computer servers, storage servers and communications resources needed for hosting various types of application software, and AaaS comprises software applications that end-users wish to outsource to a cloud provider (e.g., email, database management, resource planning, web hosting, etc.). Today, approximately 1/3 of all IT spending in the U.S. is related to cloud-based services, and it is growing rapidly. The majority of that spend, however, is related to supporting "administrative computing." Very little is for "technical computing," either for commercial or academic pursuits. The main reason is that science, engineering and other analytical computing applications are highly specialized, technically complex, and are not "commodity" applications that are easily shared and useful across a large user base. In other words, technical computing, unlike administrate applications, does not scale well.

While the availability of technical computing platforms (specialized PaaS) is improving and becoming more commoditized, the many variations in high performance computing technologies make investments in shared analytical systems problematic for large-scale public cloud providers. More important, vendors of technical computing applications and tools (analytical AaaS) software continue to resist licensing their proprietary code for cloud environments since it cannibalizes their existing revenues. Finally, unlike administrative computing, the number of practitioners (e.g., software and systems engineers and mathematicians) knowledgeable in the development and use of analytic computing systems is very limited, especially in the Midwest. Consequently, technical computing remains a highly specialized business and not well suited to today's cloud business model. In summary, administrative clouds supporting commodity business applications are growing; technical clouds supporting analytical applications remain the province of scientists and engineers.

Further exacerbating the situation, business and academic organizations face very different financial challenges related to their respective "siloed" organizations. In business, technical computing is generally the purview of engineering, research and development departments, with costs for systems, software and personnel falling within their R&D budgets. In academic institutions, technical computing is the purview of individual departments and researchers, with costs for their systems, software and personnel underwritten by their federal and state funded research programs. In both cases centralized IT organizations (e.g., CIOs), focused on administrative systems and services, have limited or no role in the specification, acquisition, operation, maintenance or use of technical computing systems.

Finally, technical computing resources are increasingly the platforms of choice for innovation related to new technologies, new products and new services. They are the platforms for big data analytics, innovation through modeling, simulation and visualization studies and therefore, central to creating competitive advantage and intellectual property – typically derived from software (e.g., algorithms). These discoveries are subject to strict non-disclosure and patent protection policies, further restricting an organizations' willingness to risk placing applications and derived knowledge into "public clouds." This practical situation has led to the development of "private clouds," either within a given institution or shared among collaborating institutions. The Milwaukee Institute, operating as a nonprofit, is an example of a regional "private technical cloud" designed and operated on behalf of regional businesses and academic institutions that individually pursue and collectively collaborate on technical computing challenges.

Who is on the Institute's Board of Directors?
At present the Board comprises senior executives from Mason Wells, Rockwell Automation, FIS (Metavante), Golden Angels Network, EMM Holdings, Paragon Data Services, Quarles & Brady and Johnson Controls.

How will the Institute gauge its success?
Our success will be measured in terms of the success of our collaboration partners, the value derived from technology-based regional economic development initiatives, and our contribution to improvements in the ability of K12-University educational programs to motivate, produce and retain technology-savvy graduates.

Will the Institute's participation in collaborative research projects compromise or dilute intellectual property (IP) protections?
No. We are not-for profit and have no objectives to capture IP not directly derived from the Institute's own internal activities

What are the unique services offered by the Institute that cannot be offered by individual organizations?
The primary advantage of the Institute is one of focus – focus on shared grid-based computing and collaboration services. While the various organizations served by the Institute must on their own address cyberinfrastructure support, grant application writing, and inter-disciplinary/inter-organizational collaboration as three of many tasks required for support their primary missions, the Institute can focus on these tasks as its primary concern. This frees academic and business organizations to focus their resources on their core competencies. The aggregation of systems and services associated with these critical support elements allows for economies of scale, attention to achieving and maintaining collective awareness of ongoing regional activities, and the ability to attract, train, share and retain a critical mass of uniquely skilled support and research staff essential for collaboration and mutual success.

Does the Institute have a Technology Advisory Board (TAB)?
Yes. The TAB enjoys the benefit of researchers and scientists from the Universities of California (San Diego), Wisconsin (Madison and Milwaukee), Illinois (NCSA) and the Department of Defense.

How is the Institute funded?
The Institute is initially funded by grants from corporate foundations represented by the Board of Directors. Going forward we expect to receive financial support from 1) foundations supporting non-profit research and educational objectives, 2) government agencies funding R&D initiatives related to needs in the Industry Clusters, and 3) private contributors interested in our vision and mission and committed to regional economic development. Additionally, to the degree our efforts are successful in providing shared infrastructure and collaboration services, we anticipate that revenues derived from efficiencies resulting from the sharing of regional grid computing resources will be available to defray some Institute operating costs.

Will the Institute compete with local universities for limited federal research funding?
No. First, competition for research funding is not a zero-sum game. We expect to assist local research organizations in competing for funding from sources they are not now addressing or for projects for which they currently lack resources. Second, our goal is to offer services that add value to their individual efforts while improving collaboration with other institutions, regionally, nationally and eventually, internationally. Collaboration is hard, both within and among independent institutions. Since we are non-profit, we will provide "convener" and "secretariat" services that assist individuals from various institutions to more easily work together. In that respect, we see ourselves as a regional and neutral "Switzerland" where technology initiatives can unfold in a competition-free zone. Furthermore, we believe there are significant economic benefits derived from the sharing of information technology resources among local institutions, helping them avoid costs associated with duplication and underutilization that typically accompany independent, isolated and ostensibly competitive endeavors.