Computational Integration boots profit margins by lowering the cost of maintaining electronic records and by raising employee productivity

Enterprises worldwide have invested vast sums into building and maintaining electronic record systems to produce, sell, and keep track of goods and services. These investments include the capital cost of hardware and facilities and the expenses of software procurement and employee compensation. Enterprises can see improvements to employee productivity (and thereby revenue) by focusing on the capital investments of faster computing environments and more pleasant, functional workspaces but, arguably, companies that focus on improving the way their employees engage with their record systems and with each other will see greater returns.

eLoomix, LLC, has developed and licensed novel technology that proves to do exactly this. Called Computational Integration (CI), this technology has been astonishingly successful in enhancing employee productivity and job satisfaction in the biomedical research sector. CI constitutes a form of work engineering that examines how employees engage with their enterprise record systems to produce or communicate knowledge and replaces their repetitive manual processes with custom software applications that do the same thing. At one client site, staff keyboard time was reduced by as much as 50%. Once emancipated from their keyboards, these workers had more time to do the specialized work they had trained to do, leading to an increase in their productivity and job satisfaction. Data-maintenance costs decreased as well, since these workers were spending less time engaging with their record system. Taken together, these factors improve the enterprise bottom line.

Exploiting this "two-for-one" benefit requires reimagining the relationship between people and technology in ways that enable more efficient, flexible, and resilient methods of distributing work between these vastly different yet complementary domains. CI is novel in several ways: it uses a grassroots and incremental approach to problem solving; a microservices architecture for its applications; and a functional language platform to create those microservice applications.

At eLoomix, we believe that the people who directly produce the goods or services have the best understanding of how their processes can be improved. They know where mistakes are likely to happen and when communications are likely to be missed, and they generally know how to solve these problems if only they had the resources to do it. CI is applied strategically when management targets desired outcomes, but CI's approach to achieving those outcomes is grassroots and incremental, in that the engineer and the user iteratively develop the technology solution together until the microservice performs the job exactly the way the user wishes it to.

Microservices can be thought of as smaller applications that solve discrete problems and function in coordination with each other through programmatic interfaces called APIs. By keeping applications small and discrete in their functional scope, the engineer and the user can cooperatively evolve their microservices as needed without affecting any of the other deployed applications. Users who have taken the trouble to engineer a solution with one of our developers generally want their tools to evolve with them as they learn and have ideas for how their processes could be further improved. The microservices architecture makes this evolutionary process possible for people operating in complex computing environments.

CI's microservices are built on top of a functional language platform that captures the enterprise's specialized institutional knowledge. For example, there are functions to establish connections with data sources, functions to retrieve, check, and verify data, functions to look for anomalies in data, etc. This

platform of functions is analogous to a dictionary of words. Microservice applications are analogous to essays written using those words. An infinite variety of essays can be created with a relatively fixed and small dictionary. For the specific domain of biomedicine, a platform of basic functions is already complete.

These three ingredients - incremental development, microservices architecture, and a functional language platform - account for the phenomenal speed of the development process. It is CI's exceptional productive capabilities that makes the return on investment so high. For example, in one case, a developer created a report exactly according to the user's wishes that ended up saving the enterprise over 0.5 FTE in labor. The report took 40 hours to create and paid for itself within 10 weeks of its deployment.

By focusing on individuals and their engagement with technology, CI delivers big returns to the enterprise. Each time the gap between what an individual must do and what their technology does is closed, significant labor cost savings and a boost in employee productivity and job satisfaction are realized. Enterprises competing in today's evolving knowledge economy can't afford to dismiss these opportunities.

There is another benefit to adopting CI as your enterprise solution for cognitive labor optimization, and that is the cross-seeding of proven solutions across organizations who use CI. CI supports a distinction between proprietary microservices that are owned by the client and kept private to the client's organization, and public microservices that are donated by the client to all other CI users for their benefit. Public CI microservices provide the opportunity for all organizations that use CI to benefit from the contributions made by other participating organizations. For example, if one organization has developed a particularly useful report and decides to make it public, other organizations can benefit from this captured knowledge should they find it useful.

In summary, CI's primary focus is on empowering individuals to improve their work by co-developing innovative software solutions for the tasks that machines can perform better. The benefits to the individual include increased job satisfaction, decreased stress, and improved communications with their colleagues. The benefits to the organization include improved employee productivity and reduced cost of maintaining electronic records. By making some of their microservices public, organizations can choose to benefit their industry, further empowering the individuals who re-engineered their work through CI. eLoomix, through its CI technology, is re-imagining and re-engineering work from the ground up.