Using Advanced Technologies to Connect Communities Through Shared Experiences

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By

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Abstract

Lack of interactions within a shared community creates relationship barriers resulting in isolation, disconnected work teams, missed collaboration opportunities, and an overall shortage of peer connections. Community members feel connected when associations are built on perceived similarities, and the associated experiences have common features. Therefore, it is critical to understand how visually identifying and presenting associations advances opportunities to unite and remedy untapped success within a shared community.

Associations are often distinguished by similarity, contrast, and closeness. It is assumed similar stimuli evoke similar reactions, and therefore assumptions of association and connection are based on (or AKIN to) this. AKIN is a large format, interactive installation placed in the public space of a shared community. It visually makes associative, explanatory, and image associations between projects that can be interacted with and viewed by members. Like a word network, the installation recognizes associations across content and visually suggests meaningful points of connection.

When members feel connected, they engage, share information, and utilize resources efficiently, strengthening the overall community. Placing AKIN publicly in a shared space will increase interaction between community members by identifying associated characteristics among projects, establishing opportunities for meaningful collaboration and interaction across teams resulting in feelings of connection and enhanced peer relations. Understanding how to visually identify and present associations to community members increases opportunities to coalesce and remedy untapped success within a shared community.

Keywords: Interactive, community, connection, installation, association
Introduction

Isolation, disconnected work teams, missed collaboration opportunities and a deficit of peer connections are relationship barriers caused by an absence of interactions within a shared community. As communities grow, they become increasingly spread out, introducing new psychological and geographical barriers between its members. When communities fail to adapt to changing conditions, members become burned-out, frustrated, and resources are wasted (Northouse, 2013). When shared communities experience a loss of interaction between members and teams, deficiencies emerge, and how they communicate shifts. Project development becomes siloed as a result of little to no awareness of other projects within the community. Time, money, and effort are wasted with the loss of information and the redundancies of resources. Opportunities to collaborate decline as there are no identified associations established between members due to a lack of information sharing.

AKIN is a large format interactive installation, placed in a highly visible and assessable public space of a shared community (Figure 1). Associative, explanatory, and image associations are established surrounding community projects to be interacted with and viewed. By presenting established associations, the visual data becomes more manageable for audiences to digest and comprehend, increasing the impact of the data influencing the community. Resulting in a feeling of connection and enhanced peer relations. Associations advance opportunities to unite a community by drawing connections between projects and members for a clear understanding of how the community is connected and where opportunities for advancement reside. AKIN increases the opportunity for interaction between community members by identifying associated project types, teams, location, sponsors, and development stages for meaningful collaboration. Presenting common features in a highly visible and assessable space ensures content is available to the entire community, promoting user engagement opportunities. The methodologies used for developing designs explored how selected nodes relate to each other, associations are perceived visually, and the selection process for AKIN placement to ensure community engagement.

Good design is essential for displaying complex data in a comprehensive, compelling way. It has the power to illicit interaction through functional, psychological, and aesthetic traits. It can change consumers' behavior and shape a community. Users feel connected by building and identifying perceived similarities. Therefore, it is critical to understand how visually identifying and presenting associations accelerate opportunities to unite and remedy untapped success within a shared community.
Figure 1. Overview of AKIN.
Section I: Context

As communities grow, they become increasingly spread out, introducing new barriers between its members. When organizations rush to find new opportunities to remain relevant, a need to grow their community and be visible in regional markets becomes progressively critical for success in a changing world. Organizations infiltrate markets by forming satellite offices and campuses to establish influence, relevancy, and market share, hoping to grow their community with quantifiable results. The Rochester Institute of Technology (RIT), located in Rochester, New York, comprises nine constituent colleges and has permeated regional markets to establish its six global campuses in China, Croatia, Kosovo, and the United Arab Emirates. It is a shared community composed of faculty, staff, students, alumni, and parents working in teams, sharing a learning and innovation fellowship. A consequence of multiple locations across shared communities is that barriers between members and teams are introduced, both geographically and psychologically. Distance, communication, shared resources, and knowledge is affected. These barriers can lead to a lack of interactions resulting in team breakdowns and introducing weaknesses into the organization and shared community.

When shared communities experience a loss of interaction between members and teams, deficiencies emerge, and how they communicate shifts. Settle-Murphy et al. (2013), author of a series of articles on virtual leadership, argues that communication, collaboration, credibility, and respect are essential to leading remote teams. Geographically the loss of organic, open-ended, fluid office chit chat is replaced by prescribed conversations, meetings, and agendas, leaving an overall shortage of banter and peer connection essential for the sparking of ideas. Psychologically, teams become disconnected and isolated, consequently transitioning to siloed, insular project development with little to no awareness of other projects within the community. Opportunities to collaborate decline as there are no established associations between projects due to a lack of communication and awareness. The shifting in communication practices eventually leads to poor team leadership, missed opportunities to inspire advancement through collaboration, costly redundancies in the inefficient use of resources, and the loss of sharing knowledge and information.

Associations advance opportunities to unite a community by drawing relationships between members for a clear understanding of how the community is connected and where opportunities for advancement reside. We feel connected when we build associations based on perceived similarities and that the associated experiences have common features. AKIN distills project information down to nodes to establish associations between project types, teams, sponsors, locations, and development stages. It visually shows the user the associations and allows them to interact by re-sorting data based on nodes to establish new associations. The user can send themselves a screen capture of the sorted data so they may use the associations established to take independent action. By visually presenting associations and drawing connections between projects, associative, explanatory, and image, associations emerge, igniting rapport, and communication within the shared community. Partnerships become clear, resources are identified, opportunities for engagement emerge, and teams are able to successfully collaborate for increased
performance. Ross et al. (2008), a freelance business author, argues high performing companies are successful because they comprise high functioning teams where each member's skills and talents merge, and a super achieving team arises with the capacity to transcend even its most accomplished member. Therefore, if communities can connect project teams to complimentary project teams for collaboration, a super performing community will emerge that propels the advancement of inspiring ideation, efficient project development, and meaningful connections, surpassing its most individually accomplished team.

A benefit of visually identifying associations is that visual data is more manageable for audiences to digest and comprehend, increasing the impact of the data influencing the community. If building a super performing community requires identifying associations between complementary project teams, then the impact of the associations' success relies heavily on community members' engagement with the content, eventually initiating facilitation with other members. The Aesthetic-usability effect plays an essential role in how community members engage with content (Lidwell et al., 2013, 18). If associations are easily discernible, they will be perceived as more comfortable to interact with, increasing the effectiveness of the data's associations. Humans are visual creatures, and the associations need to be delivered in a compelling, relevant way to stimulate interest. AKIN visually represents nodes using the basic structure of a sunburst diagram (https://datavizproject.com/data-type/sunburst-diagram/). The structure can be interacted with by selecting specific nodes to sort data. While the initial interaction results in a data sort by project type, associations can be re-sorted at any given stage with projects clustering around the root node representing the selected sort parameter. As a result, data sorted with visual project associations are established. This creates a highly effective way for audiences to digest and comprehend at a glance which projects are associated with each other based on selected criteria. Considering the Attractiveness Bias (Lidwell et al. 2013, 26), where users are more likely to interact with something perceived as appealing, AKIN interprets the sunburst diagram into an artistic representation of a dandelion. A dandelion is a shape that closely mimics the structure of a sunburst diagram for obvious transference. It is a flower with individually identifiable parts; a seed pod, yellow flower head, and white flower head composed of multiple seed pods referred to as the wishing head. Individual dandelion seed pods delineate projects (Figure 2) that cluster together around nodes to form dandelion wishing heads (Figure 3), representing associated projects based on that node (Figure 4). By selecting a representation that is easy to understand but not entirely expected, the dandelion representation implements principles of artistry, clarity, and efficiency, increasing the impact of the data influencing the community.

Presenting common features in a highly visible and assessable space ensures content is available to the entire community, increasing user engagement confidence, and shared experiences. Humans are visual creatures and have relatively short attention spans ranging around 8 seconds (Knilans, 2016). Dynamic, large, format interactive installations in highly visible spaces attract users driven by curiosity. As members investigate an installation and observe other members interact with trust and confidence, self-esteem increases, and overall feelings of risk and anxiety are minimized (Carnegie, 2009). A shared experience emerges—planting a seed—encouraging the social interaction of physical member to member communication. The installation scale directly affects the scale of
influence as members become more courageous in observing others engage. Passive consumption is no longer available. As part of RIT's main campus in Rochester, New York, the Student Alumni Union is available to benefit every member of the RIT community, acting as the college campus's heartbeat. Similarly, each of RIT's global campuses has dedicated areas to serve as community gathering centers that are assessable to faculty, staff, students, parents, and alumni. Given the high profile of accessibility, increased foot traffic, and communal gathering space for all community members, Student Unions are ideal locations to display AKIN for maximum experience and exposure.
Figure 2. Seedpod representing a particular project.

Figure 3. All projects associated with the VR type node.

Figure 4. Projects associated with multiple type nodes.
Section II: Methods

Methodologies for developing designs considered the following criteria: establishing how nodes relate to each other, how associations are perceived visually, and the best placement for community engagement. The RIT community is a hotbed for project idea generation. Community members continually produce projects that push the boundaries of design and technology; however, it is difficult to see the full breadth of projects without establishing a centralized space to discover them. Currently, community members must rely on project members to push out information building awareness. Ultimately, emails get trashed, papers get lost, and opportunities are missed. Without a clear path identified for sharing information, members eventually focus on their critical path, and project development becomes siloed with dwindling communication between teams. It is evident that a highly engaging system where community members can see at a glance how the community is connected would be beneficial to remedy untapped success. This is the original seed idea for AKIN. Embedding the system in the daily lives of community members ensures interaction that is essential for AKIN's success. The system had to be designed with the principles of artistry, clarity, and efficiency to be fully embraced by community members. Validating concepts was done through peer review and feedback.

The creation of user flow diagrams (Figure 5) and taxonomy charts (Figure 5) was used to visualize what data was important to associate and identify as nodes and how nodes relate and interact with each other to establish clarity and efficiency. One of the most fundamentally important concepts used in project management is the Triple Constraint; scope, cost, and time (Westland, 2018). These concepts were used to identify nodes for building associations based on project types, teams, sponsors, locations, and development stage. This identification allows users to see development trends in technology and regional market activity, identify resources that can be shared, tap into potential sponsors based on interest, and find meaningful points for interjection and collaboration based on development budgets and timelines. The design principle of association, distinguished by similarity, contrast, and closeness was also taken into consideration. Similar stimuli evoke similar reactions and therefore make assumptions of association and connection based on this. Not all data is linear. In the 1970s, Joseph Novak developed the concept map as a simple illustration of networks relating nodes to each other using connection and containment properties (The Interaction Design Foundation, 2018). Subsequently, Tony Buzan developed the mind map. While it was similar to the concept map, mind maps work around a single central concept. After evaluating the differences in displaying dynamic data through a hierarchical representation of tree, nest, and stair diagrams, compared to a network, it became clear that a combination of both could be used (Bohnacker et al. 2018, 412). AKIN has limited child nodes as most are at the parent level making the data set suitable for a mind map merged with the sunburst diagram, a variation of the tree diagram. Similar to a word network, the installation recognizes associations across content and visually suggests meaningful points of connection around nodes to be interacted with and viewed. As new projects are continually updated it is clear that the system has to reside in a digital format to accommodate the constantly changing dynamic content. Re-sorting the nodes requires a flexible structure. Projects re-sort and
dynamically move closer towards associated nodes when associations are established and repel the nodes when there is no association.

Associations are best perceived visually when following the Gestalt principle of perception (Lidwell et al. 2013, 160). Aesthetic interaction compared to information absorption also had to be examined. It is essential to the success of AKIN that it is placed in a centralized, high traffic area so it is perceived as welcoming yet disruptive enough to be noticed daily, encouraging discovery and interaction. The elevated energy that a highly visible, assessable space assumes stimulates feelings of stress and anxiety. Placing something organic and floating in the space would counteract that energy and instead instill a sense of curiosity that incites interaction. Nodes and associations had to be intelligently presented for clarity, while artistic license had to be executed to represent the nodes and associations in a compelling way. To represent the data with aesthetically pleasing format, a dandelion shape was selected for project representation. Because the dandelion is a flower with multiple parts, it allotted for different representation under the same theme. The soft organic nature of the dandelion with its seed pods lightly floating through the air on a windy day establishes a calming, ethereal, visual display, creating feelings of security and trust within the community. Projects are represented by seed pods that float independently or cluster together around a particular node based on their association to that node emerging as a dandelion wishing head comprised of closely associated projects. The proximity of a seed pod to a particular node establishes how closely associated that relationship is. As seed pods group around a singular node, the seed pods can also be shared with additional dandelion wishing head clusters. If projects are sorted by "sponsor", and a project is clustered around the "company A" node because it receives funding from company A, that same project can also be associated with the "company B" node if it is receiving funding from them as well. The project seed pod appears for as many nodes as it needs to cluster around. Lines are drawn between the "company A" node project seed pod and the replicated project seed pod associated with the "company B" node. This visually establishes how a certain type of project can receive sponsorship from multiple sources. It also illustrates how some projects may have no established sponsorship relationships resulting in the seed pod floating independently. This allows AKIN to visually present opportunities to discover what different teams are working on, what resources are used, where projects stem from, and how to leverage and tap into those existing projects as new ones are developed.
Figure 5. User flow diagram for AKIN.
Figure 6. Taxonomy diagram for AKIN.
Section III: Results

Community members have different needs as they look through project associations with different lenses. Community staff, faculty and student members have different scenarios as to how they would be impacted by AKIN.

Features

- 60’ x 33.75’ projected display
- Touch foil interface applied to display surface
- Hard wired Ethernet connection for stability

Benefits

- Visually suggests meaningful points of connection for collaboration
- Encourages the advancement of community inspiring ideation, efficient project development, and meaningful connection.

Scenario Staff: Jan is fairly isolated, working in a research lab at RIT. She doesn’t get a lot of exposure to other people other than on her lunch break in the Student Union. She really has no idea who the other people are in her community because her job responsibilities have never encouraged her to explore relationships. It’s hard for her to break the ice with other community members as she doesn’t have any points of association to start a conversation. She has a personal interest in virtual reality (VR) and wonders if her community is involved with any VR projects and if there are any she can view or if there are any knowledgeable members, she can pose VR questions to. Jan approaches AKIN on her lunchbreak and is drawn to the floating seed pods on the screen. She touches the screen and the seed pods sort by project type. Some seed pods have clustered around a node entitled “VR”. Jan touches the node and can see all of the projects associated with VR listed. Jan can select individual projects to see team members associated with those projects. The project view shows contact information for the members. Jan screen captures the results and sends herself a copy which allows her to reach out to members at her convivence. AKIN has visually suggested a meaningful point of connection and ideation for Jan.

Scenario Faculty: Ahel is a faculty member at RIT and each semester hires community members to join his team to collaborate on cutting edge, development projects. Ahel has a new project to develop that requires a set of skills and knowledge not available from his current team members. He needs a member locally as they will have to do a lot of hands on development. He feels confident that there is someone in his shared community that has the skills to contribute but he doesn’t know how to find or connect with them. He would like to identify members based on a selected location and area type of work to see if they are interested in collaborating on his project. Ahel approaches AKIN and is drawn to the floating seed pods on the screen. He touches the screen and the seed pods sort by project type. Some seed pods have clustered around a node entitled “Sculpture”. Ahel touches the node and can see all of the projects associated with Sculpture listed. Ahel selects the option on the screen to re-sort the data by
location. The seed pods organize by location and Ahel can see which projects associated with sculpture are in his location. Ahel can select those projects to see members associated with them. Ahel screen captures the results and sends himself a copy allowing him to reach out to members at a later time. AKIN has visually suggested a meaningful connection for efficient project development.

Scenario Student: Aki is a student in the College of Art and Design at RIT. She has a strong project idea that the college is excited about and as she develops it, she sees that there is a potential opportunity to turn it into a lucrative business endeavor. She has the knowledge and a team assembled to complete most of the project, but she is running out of funding for prototyping which is essential to ensuring the success of the project. She wonders if there is anyone in her community who would sponsor her project and help bring her prototypes to life. Aki approaches AKIN and is drawn to the floating seed pods on the screen. She touches the screen and the seed pods sort by project type. Some seed pods have clustered around a node entitled “Installation”. Aki touches the node and can see all of the projects associated with “Installation” listed. Aki selects the option on the screen to re-sort the data by sponsor. The seed pods organize by sponsor and Aki can see which sponsors support projects associated with “Installation”. Aki screen captures the results to reach out to sponsors at a later time. AKIN has visually suggested a meaningful connection for efficient project development.
Conclusions

AKIN is a valuable tool for uniting a community by drawing connections between projects and members for a clear understanding of how the community is connected and where opportunities for growth reside. By developing the AKIN project, a critical look had to be taken at how and why communities become isolated and how design plays a role in breaking down barriers of interaction. With a centralized location for viewing projects, a clear path was established for members to take a sagacious look at how the shared community is functioning in relation to project development. When members are informed, the community is less vulnerable to communication breakdown and isolation. A healthy shared community promotes positive emotions, engagement relationships and meaningful connections (Hirsch, 2019). It leaves a lasting impression on its members.

Complex data is difficult to understand and apply if it cannot be digested and distilled into something purposeful. It looses its meaning when it is not put into context or assigned a relationship. Infographics, charts, scatter maps are all powerful methods for displaying data. Chunking data is how the human brain naturally organizes data that is similar and sequential (Dirksen, 2016). Knowledge of project management and planning provided the base for the initial AKIN design decisions as it established which nodes would be most valuable to the community. The sunburst diagram provided an organizational platform for how the data and nodes visually relate to each other and was the base for design development. Transferring a sunburst diagram structure to a dynamic dandelion was obvious at first but proved challenging when deconstructing the parts of a dandelion and assigning seed pods to multiple wishing heads. Making the relationship of a seed pod to a node was self-evident as it resembles a wishing head and made for an obvious cluster. However, it was difficult to draw lines between multiple wishing heads to show how one project could be associated with more than one wishing head. The lines were harsh compared to the organic nature of the seed pods themselves. A future design iteration might eliminate this relationship being displayed as the information would be listed in the detailed look of the particular project. There is no added value or purpose to making the association in the wishing head view.

AKIN is successful in visually identify and presenting associations, stimulating positive emotion, engagement opportunities, and meaningful points of interaction that strengthen the shared community. A future design iteration may include developing a desktop version or mobile app that proves useful to community members who want to spend more time with the data, researching and understanding it than time allows for when standing in front of a large-scale installation.
References


