WHAT WOULD FACEBOOK LOOK LIKE IF IT WAS DESIGNED FOR MECHANICAL ENGINEERS?

INTRODUCTION

Facebook has become commonplace in recent years, with over 1 billion active users on a daily basis and accessed by over 1.5 billion users monthly[1].

Not only is it commonplace amongst family, friends, and businesses, it has become popular with engineers from all walks of life, no matter their background. In fact, it has become so popular that it has inspired engineering software providers to adopt several popular social computing capabilities.

Recent announcements from Facebook, however, seem to imply that there are plans to build specific applications for business, yet it is more likely that such efforts are for the purposes of helping businesses better market to Facebook users.

This brought to mind a famous quote from a COFES roundtable by a participant from Boeing who said:

> "We will not design a plane on Facebook!"

Research suggests that collaboration is one of the biggest challenges for engineers in a connected project and task-driven environment.

56%
take 2 days or more to get updated information to the entire team

20%
of the time engineers are working with outdated information

70%
say third parties wait a couple of days or more to send updated information.[2]

Despite such obstacles, this made us think...what would Facebook look like if it was designed for mechanical engineers?

Sure...setting aside posting family vacation photos, celebrating birthdays of your old school buddies, voicing bold political statements, and spying on your ex, we've found the following statement to be intriguing:

"While personal networking solutions aren't the answer, the concepts behind them are more compelling than the tools themselves.[3]"

Let's examine some of these concepts of merit a bit closer.

Friending

First up is the concept of "friending"; a cornerstone of any social networking application and the basic building block of a network. It defines a connection, or a "node" by which two entities have agreed to share information.

From the standpoint of a network of "friends", with whom, specifically, would engineers wish to connect?

In a work environment, their network might begin with a formalized version of the various project teams with which they interact. After all, they need to stay in touch with all members on a fairly regular basis. Engagement would increase, especially as designers and other personnel would receive live updates of design changes and experience their impact and issue feedback in a near real-time environment.

In a world where informal "water cooler" or lunchroom discussion have given way to disparate or global virtual environments, such a network infrastructure lends itself nicely and may even replace longer meetings as more conversations would take place almost instantaneously.

Building from there, a next step would be to connect within the mechanical engineering department, so as to share best practices and other ideas across projects.

Beyond this, we can connect to other engineering departments to better address the impacts and implications of mechanical, electrical, and software elements common to today's designs.
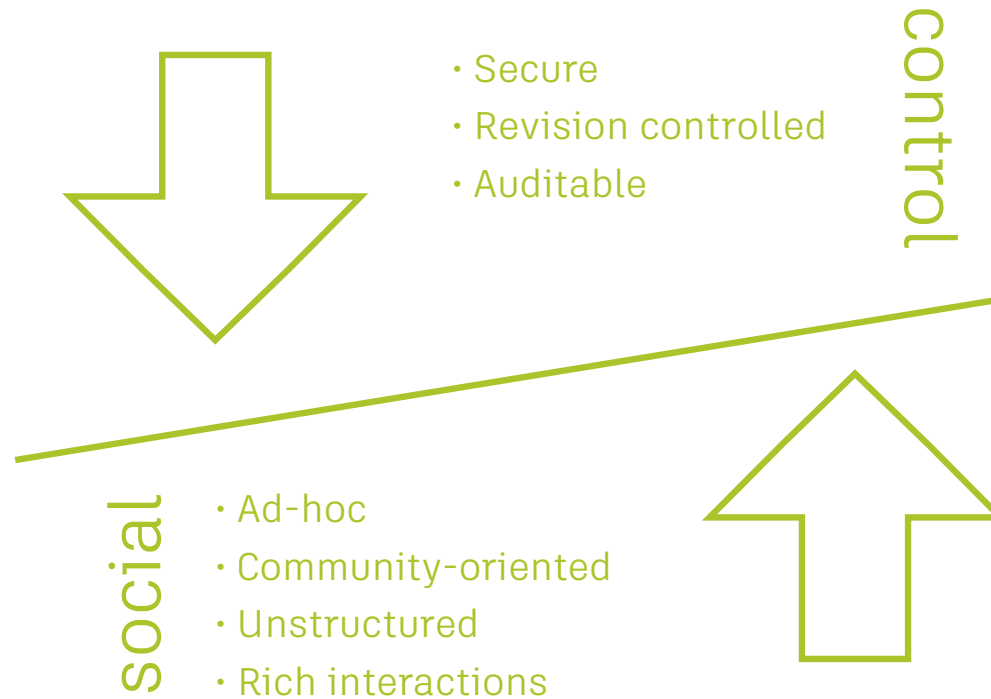
Add in vendors and 3rd party suppliers who contribute to designs, so that the network becomes a virtual clearing house to share ideas around topics of interest.

Lastly, add in customers and now we can gain valuable feedback on how users use products and get their ideas on further improvements and features.

We now have a network ecosystem in which ideas and data are shared, which is immensely valuable.

> "Top performers are 2.7 times as likely to be "very effective" at sharing data with others.[4]

An effective social network would have just the right balance of "social" and "control".

control

- Secure
- Revision controlled
- Auditable

social

- Ad-hoc
- Community-oriented
- Unstructured
- Rich interactions

Additional value-added opportunities for an ideal mechanical engineer's network would be to follow other business pages like standards organizations, vendors and CAD model libraries. With the IoT, some of an engineer's "friends" might just be their own products "phoning home" to post crucial status updates. And while there will always be the need to have control over privacy and confidentiality, an effective social network would have just the right balance of "social" and "control".

Posting

So now that we've established a vastly-interconnected ecosystem of sharing ideas and data, the question becomes, "What should we be posting?"
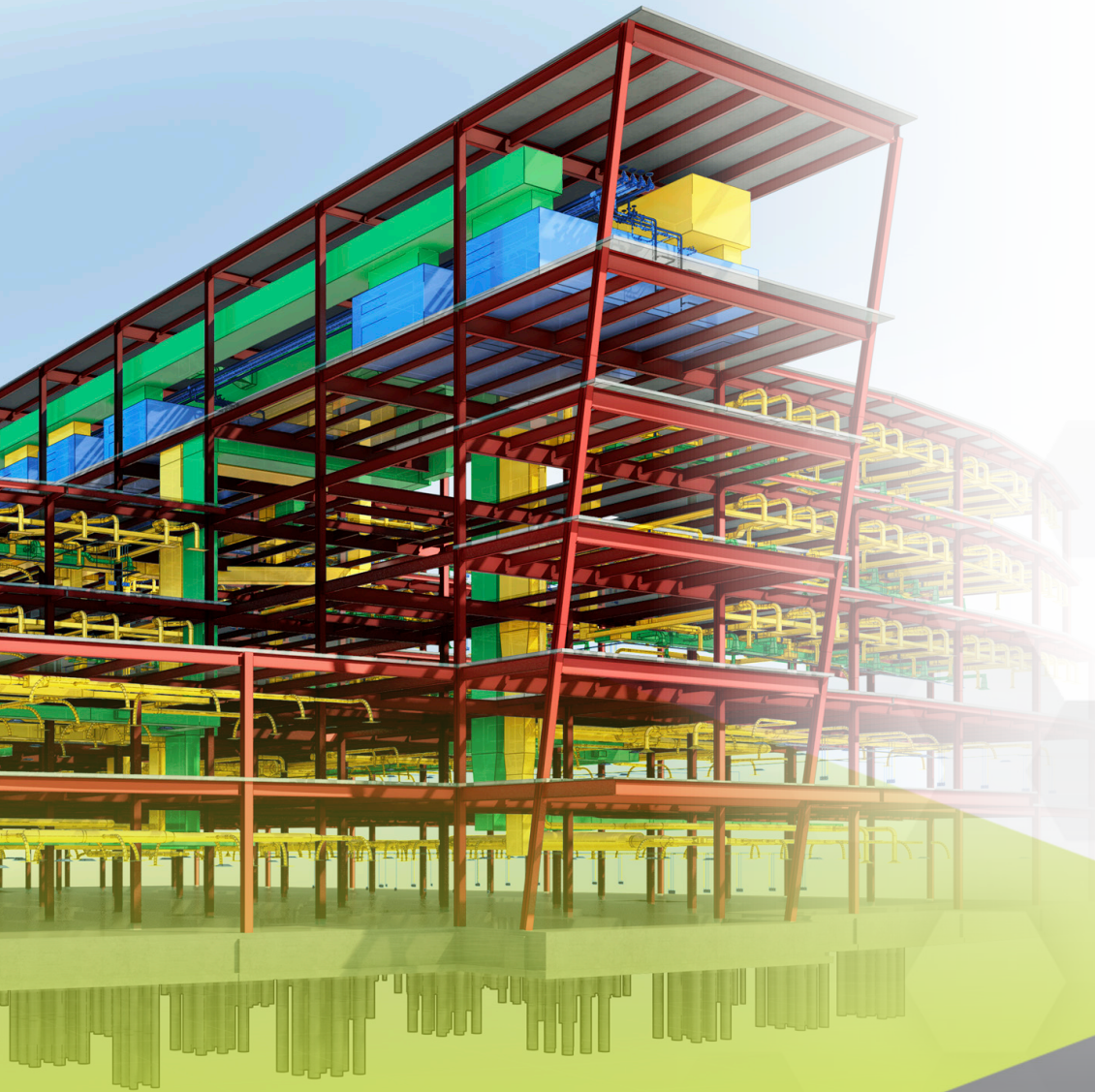
Since engineers are typically project and task oriented, the most common posts would be related to those items associated with various phases of a project, such as:

• Project status (internal and public-facing)

• Next steps

• Scope changes, deadlines or other requirements

• Frustrations/challenges with design issues

• Feedback or impact of other design changes

• Major milestones

• Designs we're particularly proud of or a newly-launched product

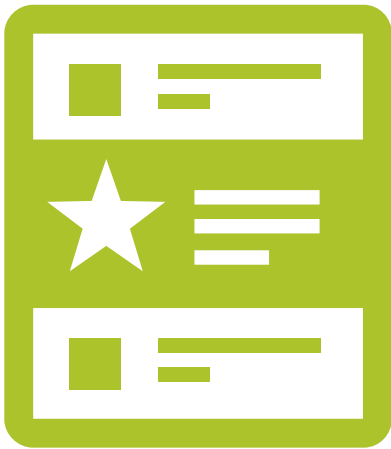• User issues, complaints, praise or suggestions for improvement

For those engineers working on multiple projects, such exchanges of information could be categorized using a group feature to keep information in separate streams.

Of course, having such conversations stored electronically via the cloud, would be, in and of itself, a reference that future engineers can review, saving time by allowing them to focus on communicating information, not managing product data as a separate process. "By automatically capturing engineering information from collaborative conversations, social computing can capture decision-making history as opposed to just the answers, allowing better learning and reuse of corporate history."[5]
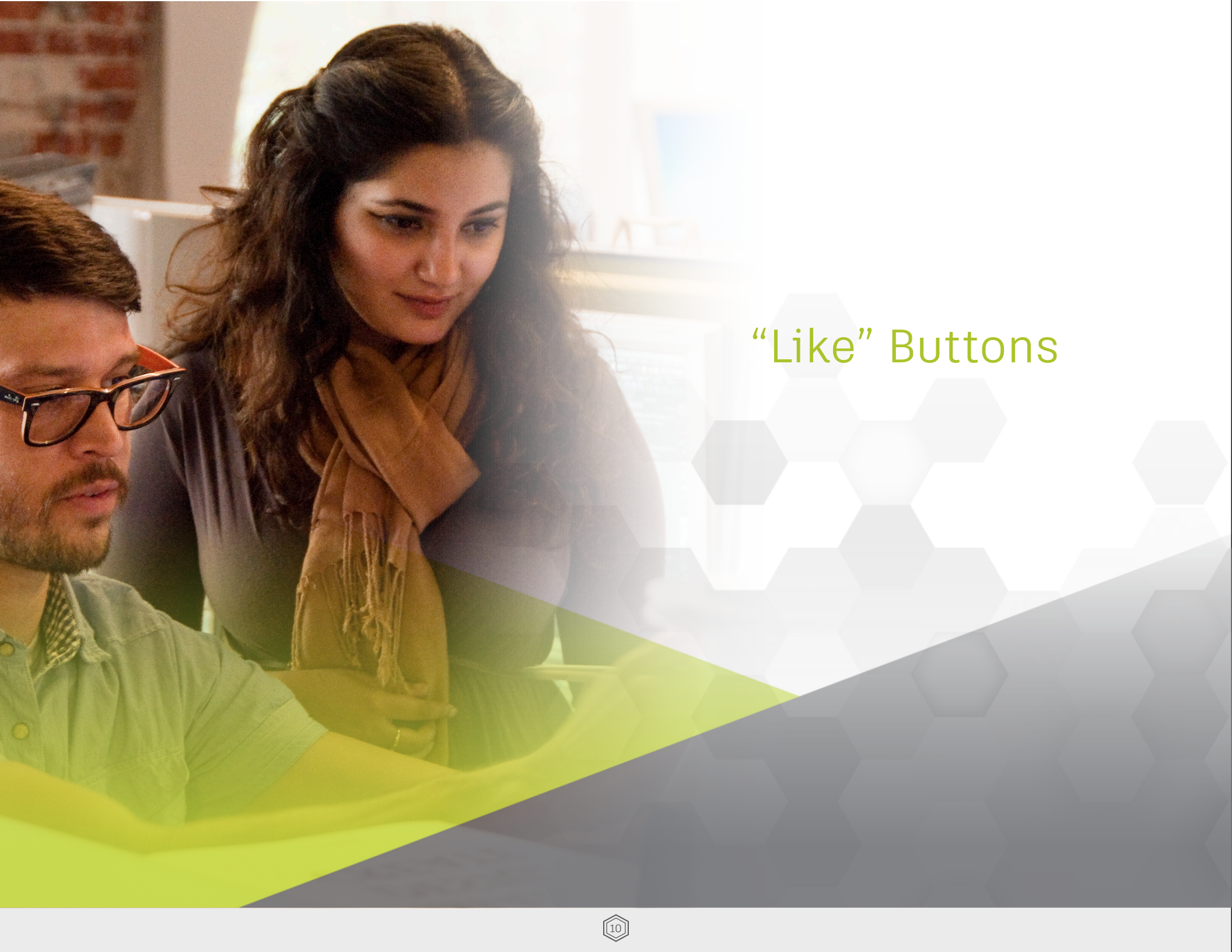
Attachments

To better optimize the textual conversation stream across social media, engineers (being visually-minded) would further benefit from the following enhancements:

· The means to attach images, including CAD models, renderings and drawings.

· Spreadsheets. According to research firm Tech-Clarity, this is the number one tool that engineers use across all processes.

· Videos depicting products in action or simulation results.

· Lifecycle analytics (LCA).

The means to share conversations, decisions, feedback and data opens the lines of communications between engineers, designers, users, and other departments that rely upon such information to perform their jobs. Such information can be shared through multiple channels, allowing for better design of manufacturability.

Potential challenges would be some form of standardized organization to prevent "information overload" and general confusion, but can be overcome with proper design.

"Like" Buttons

Facebook employs "Like" buttons as a means of one-click communication to instantly (or reactively) respond (positively) to the immense amount of data it streams daily.
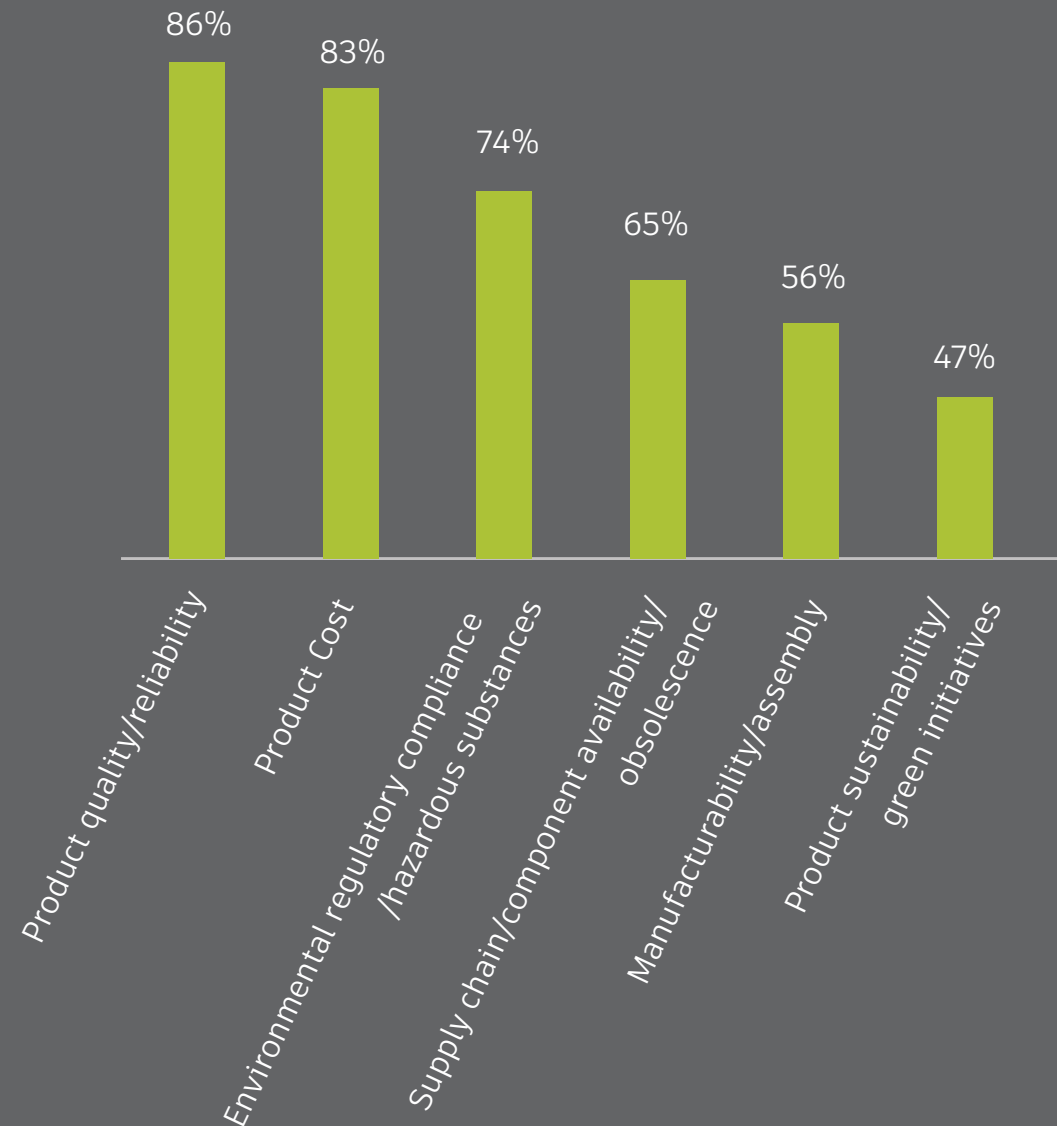
This same mechanic could be used for feedback on:

· Design review

· Performance

· Assembly

· Manufacturability

· Reliability

· Compliance

· Sustainability

· Cost

· Other "design for" characteristics.

Variations of the "Like" button may also require a response (it is optional in Facebook) for certain shared data or even stratification of response (Facebook has been toying with the addition of a "Dislike" button for some time now), similar to eBay's 1-5 star rating system.

And like with any system that employs a sufficient feedback loop and control, an engineering social network optimized for manufacturability would have a significant impact on product profitability as well.
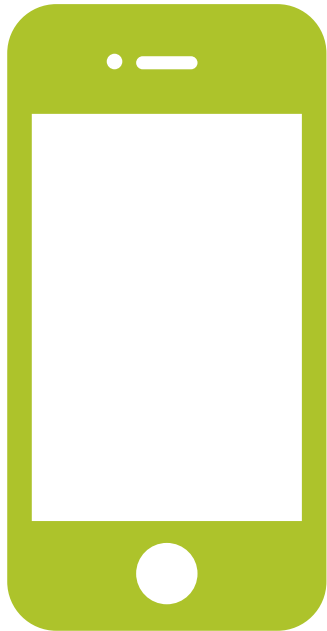
Characteristics with Significant Business Impact

86% — Product quality/reliability
83% — Product Cost
74% — Environmental regulatory compliance /hazardous substances
65% — Supply chain/component availability/ obsolescence
56% — Manufacturability/assembly
47% — Product sustainability/ green initiatives

Mobile

With 894 million mobile daily active users on average in September, 2015[6] and an estimated 10 billion mobile devices expected to be in use this year[7], we must take into account the significance of this emerging media and its effect on social networking. Since "a lot of decision-making and innovation goes uncaptured or gets put on hold when an engineer is mobile,"[8] mobile devices enable an engineer's own ability to communicate quickly while on the go.

Such mobile technology along with advances in cloud computing, allow for limitless access to data along with the ability to consume, comment on, and support:

· Ideas

· Project issues

· Tasks and due dates

· Quick questions that can help make a design decision

· Other engineers who need information while away from the office, whether they are traveling, at a supplier, at a customer, or in the field

· Workflows like ECO.

In short, engineers can "leverage mobility to extend engineers' ability to contribute while away from their workstations to improve decision making and shorten time to market."[7]

If not Facebook, what?

So, the idea of adopting Facebook for engineers still has a lot working against it; it is hardly designed for business, let alone engineering and its numerous applications. Then again, Twitter, Instagram and other social platforms aren't the solution either. "It will take more than just having engineers sign up for Facebook or Twitter – social computing needs to be applied to the business of product development."[9]

Concept	Facebook/Twitter/Ect	Product Development
Status/Tweet	Feeling like eating ice cream	Having trouble designing fan housing
Chat	Go to the movies tonight?	Are the customer requirements done?
News Feed	Keep up with friends	Project progress/issues/status
Links	Funny cartoon on Dilbert	Link to most recent design files
Pictures	Aunt Tilda's new dress	Concept sketches of new product
Videos	Little Johnny gets a new tooth	New product launch ads
Like/Dislike	Like friend going to Paris	Feedback on prototype (VOC)
Messages	Haven't seen you since high school!	Project deliverables late, need help!
Comments	That looked like fun!	Feedback on issue, design, or concept
Friends	Bob, Linda, Uncle Joe...	Team members, customers, experts
Groups	Family, Work Friends, Sport Team...	Projects, skillsets, departments
Followers	Friends, ???	Customers, downstream departments
*Blogs	My Trip to Finland	New Technology strategy
*Wikis	Favorite rock band hairstyles	Design standards and templates

Source: Tech-Clarity - "Social Concepts in Engineering and Product Development"

That being said, the concepts we've outlined are applicable if applied in combination with the capabilities of existing solutions like CAD, PDM, and PLM. "The key is to apply social computing appropriately, and to integrate it with the underlying shared context – the product or the project – by integrating with (engineering software)."[10]

The most likely outcome is to see more social capabilities like those in Facebook become more commonly used in software tools like ours at Autodesk, than for Facebook to invest in the capabilities required to support mechanical engineers. One need only refer to Tech-Clarity's comparison of current social network paradigms and content and how it could be used in Engineering and product development to get a glimpse of a likely future.

AUTODESK.

1 Facebook Website, September, 2015
2 Reducing Non-Value Added Work in Engineering
3 Product Collaboration 2.0
4 Tech-Clarity, "Best Practices for Managing Product Data"
5 Going Social with Product Development
6 Facebook Website, September, 2015
7 University of Alabama Collat School of Business, "The Future of Mobile Application" http://businessdegrees.uab.edu/resources/infographics/the-future-of-mobile-application/
8 PLM Goes Mobile
9 Going Social with Product Development
10 Product Collaboration 2.0