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Yammer: Investigating its Impact on Employee Knowledge Sharing during Product Development

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Abstract—Global manufacturing continues to grow, creating the need for enhanced innovation during New Product Development (NPD); this in-turn requires increased utilization of employee-generated knowledge. Enterprise Social Networks (ESNs), such as Yammer.com, is one method identified which can allow organisations to connect employees across departments and physical boundaries. This paper summarises the results of a dual-moderated focus group conducted with 15 employees of a UK-based sports manufacturer, aimed at identifying the impact of Yammer on employee knowledge generation and sharing during NPD projects. Results indicate that employees see benefit in its use and would welcome greater embeddedness of ESNs in the NPD process. However, barriers are identified which may inhibit its successful deployment, including issues relating to security and intellectual property rights. Identified benefits of using Yammer include: an improved ability to find people with specific domain knowledge; increased awareness of communities of practice; and the matching of problems with solutions.

Keywords—collaborative new product development; enterprise social networks; impact analysis; knowledge sharing; PLM.

I. INTRODUCTION

As the use of Social Networking (SN) sites increase in our personal lives, organisations Worldwide are beginning to capitalise on the collaboration and knowledge sharing capabilities they provide. The use of ESNs within the manufacturing sector is gaining momentum, with organisations such as Toyota, Philips, Honda and 3M taking advantage of the plethora of Enterprise 2.0 tools currently available [1]. Many, however, have only just begun to exploit the full functionality of ESNs, using them predominantly as an external communication tool to interact with customers and suppliers. Despite the continued success of customer-facing SNs, internally-focused ESNs, such as Yammer and Salesforce offer potential benefits to manufacturers operating across physical boundaries, such as enabling the connection of people to people and people to knowledge, facilitating connectivity; and improving collaboration across boundaries [2].

The NPD process, illustrated in Figure 1, follows several stages or phases, enabling NPD teams to pass through numerous ‘stage gates’ before the completion of a complete product. The process is often practical, yet not restrictive, allowing teams to adapt to consumer, management or market changes easily. NPD embraces several knowledge-intensive

activities, including: research on customer trends and preferences, product forecasting and test marketing *inter alia*. Fundamental to these activities is the acquisition and sharing of intimate employee knowledge. Manufacturers, in seeking to capture and disseminate this knowledge, are turning to ESNs in order to: improve innovation; reduce costs while maintaining or improving the quality of new products; increase the speed of product development; and aid employee collaboration [3].

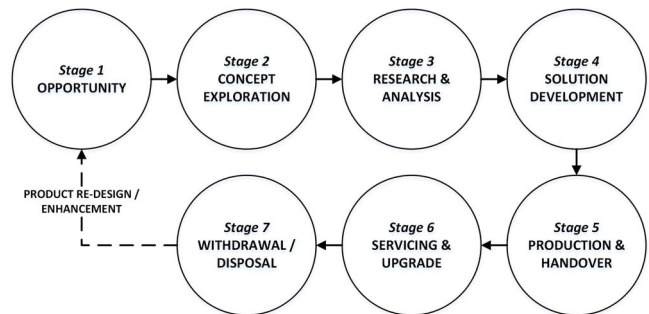


Fig. 1. Generic New Product Development Process

During NPD, employee collaboration is required in order to keep workers connected and working ‘on-the-same-page’, providing rationale for ‘why a product has turned out the way it has’ [4]. Manufacturers employing distributed development teams are having to overcome significant challenges, including: managing the explosion of data and newly-emerging knowledge which has been facilitated through the increasing use of ESNs and other technological advances; and establishing effective communication channels for collaboration in dispersed teams. During the NPD process, numerous entities are involved in the creation of a new product, including suppliers, consumers and distributors, creating a networked alliance, rather than an isolated team operating in one organisational setting; these entities require bespoke systems for effectively communicating knowledge relating to new products.

A. Problem Statement

Research [4, 5, 6] shows that the NPD process is increasingly becoming more distributed and multi-disciplinary requiring greater input from dispersed functional departments outside the traditional design centre. Knowledge silos are ever more common in engineering settings, creating the need for

bespoke knowledge sharing processes and IT tools aimed at dismantling these silos and loosening the reins of organisational hierarchies. As manufacturers grow their operations on a global scale, companies must overcome these silos by finding solutions which will encourage, sustain and develop communication between otherwise disconnected project groups [5]. ESNs are one form of technology which has been seen to improve the flow of employee knowledge amongst globally-dispersed workforces. They provide a connected space whereby employees may share personal experiences, thoughts and opinions related to NPD projects. Leadership hierarchies become less vertically-inclined and form a more horizontally-aligned hierarchy which allows employees at any level of employment to comment, make suggestions and contribute to discussions initiated by superiors.

Research relating to the use of ESNs for knowledge management purposes is abundant, but few focus on examining their impact on employee awareness and engagement with internally generated employee knowledge. Furthermore, limited research relating to the perceived benefits and barriers of employing such tools in NPD environments has been conducted. As such, this research aims to examine this gap by investigating the perceived views towards the use of Yammer during NPD by 15 personnel operating in a UK-based sports manufacturer. This will include capturing the perceived benefits of its use and barriers to its successful implementation.

II. METHOD

In order to identify the perceived benefits and potential adoption issues relating to the implementation of Yammer in NPD environments, we conducted two 2 hour focus group meetings with fifteen employees of a UK-based sports equipment manufacturer. Employees were selected based on their roles played during NPD projects; 6 leadership positions were identified to share views on the company’s business and digitisation strategies, while numerous engineering functions present allowed for practical, internal collaboration and communication viewpoints to be given. The views of employees working in the company’s customer services department was captured through 3 first line customer service advisors; this allowed for discussion relating to the integration of Yammer into customer-facing NPD processes. Interviewees were recruited by e-mail invitation, circulated by the company’s Head of Product Development. Table 1 provides an overview of employees present at the meetings.

TABLE I. OVERVIEW OF INTERVIEWEES

No.	Position	Age	Years of Engineering-related Experience
1	Head of Product Development	45-54	More than 15 Years
1	Head of Information Systems	35-44	More than 15 Years
4	Product Design Engineer	2 (18-24) 1 (35-44) 1 (45-54)	0-2 Years 10-15 Years More than 15 Years
2	Project Manager	1 (35-44) 1 (45-54)	10-15 Years More than 15 Years
1	Customer Services Manager	35-44	More than 15 Years

No.	Position	Age	Years of Engineering-related Experience
3	First Line Customer Service Advisors	18-24	2-5 Years
2	Product Testing Engineers	1 (18-24) 1 (35-44)	2-5 Years 7-10 Years
1	Product Quality Manager	35-44	More than 15 Years

While other qualitative methods, such as face-to-face interviews and online surveys have been used in previous studies to determine the impact of technology in manufacturing organisations, the authors chose a dual-moderated focus group approach as it allowed for greater discussion and clarification of points raised. Detailed responses were able to be recorded from differing viewpoints dependent on employee position. Furthermore, by hosting two separate 2 hour-long meetings, employees confirmed that they were able to dedicate more time to discussion, rather than viewing the research as a burden on their current workload.

The focus group meetings were held in December 2015 at the company’s head office. Meeting 1 (FG1) took place on the 4th December, while meeting 2 (FG2) was held on the 11th December; both meetings commenced at 2pm due to employee availability on Friday afternoons. The environment for both meetings was comfortable; rooms were air conditioned with one window facing outside. All participants were seated in non-designated chairs and offered refreshments prior to and during the meeting. Participants were not permitted to bring paper, writing material or notes to the meeting, meaning they were free from possible distraction; mobile phones were allowed in case of important calls.

Before commencement of both meetings, participants were informed of its purpose and were given the opportunity to ask questions. In total, 17 people were present during both meetings, including the author, who acted as mentor to the discussions, and one research student who acted as note taker. The meetings were semi-structured, following a series of 4 questions per meeting (Questions 1-4 were answered during FG1 and Questions 5-8 during FG2), which aimed to deepen understanding of the perceived impact of Yammer on employee knowledge generation and sharing during NPD. Upon completion of the focus group meetings, hand-written notes were transcribed and analysed using NVivo 10.

Questions asked during interview were created using the interview protocol shown in Figure 2, which were split into three sub-categories resulting in 8 distinct questions: 1) Current adoption of ESNs in NPD; 2) Potential use and implementation strategies in using Yammer during NPD; and 3) Potential barriers and problems in adopting Yammer during NPD. In following this protocol, it enabled better structuring of meeting discussions and easier analysis upon completion.

III. RESULTS

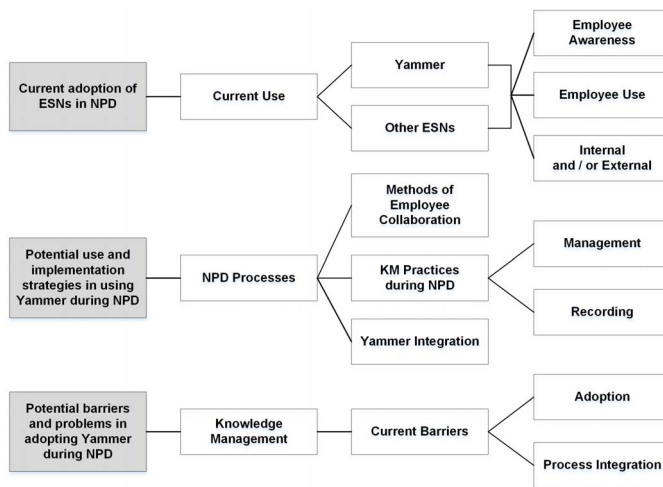


Fig. 2. Interview Protocol

The questions asked during the meetings were:

1. What use is your organisation currently making of Enterprise 2.0 tools and Yammer, in particular?

n.b. interviewees were provided a definition of Enterprise 2.0, stated here, and the tools this includes before answers were solicited.

Definition: "Enterprise 2.0 is the use of emergent social software platforms within companies, or between companies and their partners or customers. Those platforms can be bought or built in-house in order to make visible the practices and outputs of their knowledge workers." [7]

2. How do your colleagues currently identify, manage and share knowledge during new product development projects?
3. What role do you believe Yammer can play in the New Product Development process?
4. What problems could arise if your company was to make Yammer the sole communication and knowledge sharing platform used by employees during the New Product Development process?
5. What role do you believe Yammer can play in other business-related activities?
6. How do you currently identify, launch and measure progress during New Product Development and how does Yammer assist in this?
7. How are problems and solutions to problems currently recorded during new product development projects? How does Yammer assist in this recording?
8. What barriers currently prevent employees from sharing knowledge more freely with colleagues?

A. What use is your organisation currently making of Enterprise 2.0 tools and Yammer, in particular?

The focus group revealed that the organisation had begun to make use of Enterprise 2.0 tools, using Yammer as its predominant method for employee collaboration during NPD projects. It was reported that wikis were used for the joint creation of documentation during NPD projects; interviewees stated that these were stored on shared servers, accessible to all involved in projects. The Customer Services Manager confirmed that blogs were also used for customer-facing communication e.g. to report financial figures and new product lines via the company's official website. The Head of IS stated that internal communication from corporate management was reported primarily via blogs and video uploaded to Yammer, on a weekly or bi-weekly basis. Yammer Groups were reportedly available for internal knowledge-seeking, however interviewees reported that "often, it is easier to ask colleagues around the office, rather than spend time seeking answers on Yammer". Customer service representatives reported that external social media sites, including Facebook, Twitter and Youtube had recently been allowed within the workplace. All confirmed that customized workspaces for project collaboration had been created by corporate IT on Microsoft SharePoint, however four respondents agreed that the developed workspaces were "quite restrictive".

B. How do your colleagues currently identify, manage and share knowledge during new product development projects?

Interviewees identified numerous methods and tools used by colleagues for knowledge management purposes. Representatives stated that e-mail, Yammer groups, shared document servers, formally filed documentation and face to face meetings were used as the predominant methods for sharing best practice. Customer service-based employees identified increasing use of web-based methods, including tele-conferencing and wikis, while a number of employees agreed that "coffee, tea and cigarette breaks is where most knowledge about an issue is shared". All interviewees reported that the organisation shared common design processes with their customers, agreeing that "we must be able to share tools and practices with them". Some interviewees commented that face to face meetings were over used, stating "endless meetings which draw us away from our day-to-day work".

C. What role do you believe Yammer can play in the New Product Development process?

Interviewees concurred that Enterprise 2.0 tools, such as Yammer, provide greater project collaboration and an ability to share knowledge, allowing "individuals to contribute information towards a collective project resource, which could potentially be subdivided into sensible areas". However, this depends on "peoples' willingness to create, share and maintain content". Employees stated that Yammer assists with internal employee collaboration, however customer integration would only be viable if all customers also had access to Yammer, which at present "not all our customers use or have access to

these types of tools". All agreed that it enables "knowledge to be in one place to support business decision making" and "helps people find each other and get involved more personally". One interviewee added that "one tool should be used consistently, providing training so that everyone knows how to use it". Finally, another stated "I cannot see how access to Yammer improves the design awareness of employees due to the need for teams to be co-located".

The Head of Product Development and group of design engineers concurred that collaboration tools, such as Yammer, enable an "open logbook facility" to be created whereby engineers can record their development notes, in video, text or audio form, and share them with project colleagues "wherever they may be". The Head of PD added that "a centralized repository accessed through a search engine like Google which allows for the extraction of previously submitted ideas would be hugely beneficial"; two colleagues added that "different types of data could be made available, including lessons learnt from previous projects, project timetables and employee knowledge, allowing us to find someone with the required knowledge anywhere in the organisation".

D. What problems could arise if your company was to make Yammer the sole communication and knowledge sharing platform used by employees during the New Product Development process?

Interviewees raised a number of potential problems relating to the use of Yammer during the NPD process. All agreed that the transition of the company into the 'social media arena' requires careful planning. One employee stated that "security aspects of the system would be difficult to control" and that "employees may find it difficult to know what information or knowledge to trust". The Project Manager stated that the development of a knowledge sharing system "must be identified clearly as part of a change programme". All reported concerns relating to losing control of corporate data, agreeing that "social media records tend to be disjointed unless users show greater discipline than is currently shown with e-mails". Some interviewees referred to "unwanted information leaks" whereby employees may 'leak' corporate information into the public domain unknowingly or on purpose.

One manager stated that "staff may socialise rather than do work...it will get abused by timewasters"; others referred to inappropriate discussions and the accidental revealing of strategic plans to potential or current competitors. The Head of PD introduced the issue of Intellectual Property Rights (IPR), stating that "IPR is fundamental to the success of the organisation ... the company has to abide by a range of laws and regulations which govern our operations."

E. What role do you believe Yammer can play in other business-related activities?

Interviewees agreed that Yammer and other externally-hosted Enterprise 2.0 tools should be used "with an external focus" i.e. communicating with customers and suppliers. It was mentioned that "there is more to learn about how we can share information and ideas more effectively". Employees agreed that Yammer can enable greater problem solving and improve

employee abilities to find people with specific knowledge or background information before recruitment. PD representatives stated that Yammer allows for the identification of communities of interest/practice and the matching of problems with solutions, enabling "interactive lessons [to be] learned". All employees agreed that Yammer fosters collaboration, the sharing of ideas and innovation. However, the tool itself needs to be correctly managed to minimize misuse.

F. How do you currently identify, launch and measure progress during New Product Development and how does Yammer assist in this?

It was evident during the meeting that NPD projects can be identified and launched in a number of ways; this can be through the actions of business development, customer services or through strategy and design reviews. Strategic reviews are accompanied by feasibility assessments in order to establish priorities consistent with business objectives; NPD initiatives are subsequently launched through dedicated projects under the supervision of a project manager who will communicate the vision, key objectives and success criteria for the new project.

Interviewees reported that a mix of both face to face and web-based methods are used for identifying, launching and measuring progress during NPD; this includes FTF meetings, word processed documentation stored on shared servers and routine status reports. All agreed that progress was measured against road maps set out at the start of a project, including the setting of agreed metrics aligned to requirements. One engineer reported that measurement techniques varied dependent on the stage of NPD, but commonly included a "number of actions still open from design reviews" or "Microsoft project plans". Interviewees agreed that Yammer allows for the circulation of documentation between project colleagues and that the integration of Yammer into Microsoft Office provides benefits for document sharing.

G. How are problems and solutions to problems currently recorded during new product development projects? How does Yammer assist in this recording?

Interviewees reported that problems identified during NPD projects were reviewed at a post mortem meeting at the culmination of each project; problems were recorded in lessons learnt documentation which were then uploaded to shared servers and to relevant Yammer groups for future problem solving and identification. Problem reports were also generated to capture issues and corrective actions taken.

Employees agreed that "lessons learnt are always talked about, but never really used". One employee stated that "different techniques are used at different stages of each project". He added that engineers record personal handwritten notes of problems experienced, while minutes of meetings with customers and progress meetings were collected and stored. All interviewees expressed varying uses of Yammer for recording NPD problems, including "shared access to problems experienced" and "simpler capture process of comments from each department", however one employee did state that "project isolation could still exist on social media sites, meaning we could be no better off". Finally, two engineers

agreed that there is a “lack of decent sharing frameworks to make this type of information available and visible”.

H. What barriers currently prevent employees from sharing knowledge more freely with colleagues?

Focus group members identified several issues relating to security and legislative issues which represent a major inhibitor to employee knowledge sharing. Locational silos and barriers to sharing knowledge between sites were also discussed. The geographically dispersed nature of the organisation is perceived as a restraint on knowledge sharing and this prevents benefits arising from the co-location of employees and contributes to differing site cultures.

The Head of PD referred to the diverse terminology used in new product development, between sites and departments. Differences in language and culture prevent technical data from being explicitly explained to colleagues in different regions; “it is frustrating when you know what you want to say to a colleague in a different country, but cannot say it or show it due to the language barrier – tools need to be put in place for automated transcription”. Employees referred to insufficient tools being available for submitting solutions to problems and locating previously determined solutions to problems; “time and time again I’ve seen a team planning a new project completely unaware of similar work that has already been done in the company, often not very far away”. Two interviewees agreed that tools are available for collaborative purposes, including Yammer, but that insufficient usability training is provided to employees; “employees find it difficult to find what they need”.

All interviewees referred to a ‘lack of time’ with relation to knowledge sharing, with one employee stating “I want to share my knowledge, but haven’t got the time to sit down and capture it”. Two interviewees agreed that knowledge sharing is seen as a distinct activity and not an integral part of everyday work practices, while the project manager raised concerns relating to knowledge sharing not being accounted for in budgets – “if there was an overhead budget, knowledge sharing may get greater adoption”.

IV. ANALYSIS OF RESULTS

Table 2 provides an overview of the perceived benefits and barriers of using Yammer during the NPD process, captured from this investigation. Results obtained show a high reference to improved project collaboration and knowledge sharing between dispersed and co-located NPD teams. Although interviewees see a strong benefit in using Enterprise 2.0 tools during NPD projects, a number of distinct barriers were identified. The most common of these related to the security of information and knowledge shared on the Yammer site. Interviewees concurred that concerns relating to sensitive data would be the main impediment to its successful introduction.

In terms of the benefits identified, responses related predominantly to human factors or ‘soft’ aspects of knowledge sharing, including: 1) the improvement of problem solving, 2) greater ability to collaborate, innovate and share knowledge between colleagues, 3) increased awareness of people with specific knowledge or background to a problem, and 4) the

ability to contribute towards a collective resource, which if made searchable, would allow for the extraction of previously submitted ideas and problems. Respondents also commented on the ability to find communities of interest or practice within the organisation. With specific regard to NPD projects, interviewees commented on the ability to create digital logbooks whereby engineers could record development notes during the process of a project.

The results of this investigation are not dissimilar to those recorded in other studies on the benefits and/or barriers of employee knowledge sharing. With regard to perceived benefits, Wang, Noe and Wang [8] acknowledge that knowledge sharing promotes problem sharing and encourages collective resources which all employees can use. Bessant [9] agrees that the creation of a network for team knowledge sharing can generate new ideas and inspire innovation. For dispersed teams, Sole and Edmondson [10] and Brzozowski [11] posit that ESNs can help share situated knowledge and enable employees to find people with specific knowledge in dispersed organisations, while Steinfield et al. [12] recognizes the importance of ESNs for establishing connections with new people with specific expertise.

In terms of the barriers identified in this research, our findings are consistent with those found in other studies. Santos et al. [13] explored the perceived knowledge sharing barriers during research and development projects from a management perspective, identifying barriers which are in line with the results obtained in this investigation. These included: difficulty in transferring knowledge due to diverse terminology used between teams; lack of trust of knowledge; and insufficient training of tools provided. Lee et al. [14] asserts that in NPD, a lack of a common framework to assist knowledge management during projects is a common barrier to successful knowledge sharing in engineering teams.

Barriers captured relating to geographical and time differences are shown to be consistent with the results of Ghobadi and Mathiassen [15] who explored the perceived knowledge sharing barriers of workers employed in software development teams; these included differences in languages spoken, time zones and physical distances between project members. Barriers referring to the diverse terminology and cultural differences between trans-national sites are also seen to be consistent with the studies of Barkema and Vermulen [16] and Gupta and Govindarajan [17].

TABLE II. CATEGORIZATION OF THE PERCEIVED BENEFITS AND BARRIERS TO INTRODUCING YAMMER INTO NPD

Category	Perceived Factor
Benefits	<ul style="list-style-type: none"> • Greater problem solving. • Greater project collaboration and innovation. • Ability to share knowledge, allowing individuals to contribute towards a collective resource. • Ability to find people with specific knowledge or background information before recruitment. • Ability to identify communities of interest/practice and match problems with solutions. • Creation of an “open logbook facility” whereby engineers could record their development notes. • Shared access to problems experienced.

Category	Perceived Factor
Barriers	<ul style="list-style-type: none"> • Shared knowledge must be contained within the company's network and behind corporate firewall. • Lack of time allocated to knowledge sharing and capturing. • Lack of information sharing framework to make information visible. • Dependent on "peoples' willingness to create, share and maintain content. • Customer integration would only be viable if all customers also had access to Yammer. • Security aspects of the system would be difficult to control. • Employees may find it difficult to know what information or knowledge to trust. • Concerns relating to loss of control of corporate data. • Abuse of system by employee timewasting. • Diverse terminology used in product development, between sites and departments. • Differences in language prevent technical data from being explicitly explained. • Insufficient usability training provided to employees upon deployment of system. • Knowledge sharing not accounted for in budgets.

V. CONCLUSIONS

The results of our study provide an insight into the perceived benefits and barriers of using Yammer for knowledge sharing during NPD projects. The main contributions of this paper are two-fold: 1) an illustration is provided of the perceived benefits and barriers to using Yammer for knowledge sharing during NPD and 2) derived from this illustration, approaches can be conceived by NPD practitioners which minimize the potential for failure and maximize the potential in its use. In section 4, comparison was given against similar studies. It is concluded that our study shows consistency in results against other studies, including those focused on other industries, including software development and project management, demonstrating that benefits and barriers may be consistent across industrial sectors and business departments; future empirical research must identify if those perceived views are consistent across industrial sectors and our study should be applied to other countries and professional contexts to explore cultural differences towards knowledge sharing.

To extend the validity of our study, post focus group face-to-face interviews could be undertaken with employees of the company to allow expansion on topics raised and the introduction of perceptions identified post focus group. Comparative analysis could be conducted across departments (e.g. engineering, customer services and marketing) to establish common viewpoints towards the benefits and barriers of using Yammer for knowledge management purposes.

There are several promising directions for future study. Firstly, it is planned to develop a framework to enable employees operating in dispersed NPD environments to select web-based tools, based on identified project needs. Examination of corporate cultures in UK manufacturers and cross boundary projects require further investigation to study cultural differences and employee willingness to share knowledge during NPD projects. Finally, boundary spanner

networks should be investigated further to identify best practices for knowledge sharing in multi-participant networks.

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