E-Agricultural Services and Business

How Does The Marketing Portal Work for Small-scale Furniture Producers?

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Abstract — **Markets interconnect sellers and buyers. Rigid interconnectedness has a relatively low adaptive capacity, and, therefore, vulnerable to massive collapse. Previous value chain analysis (VCA) studies conducted in the wood-based furniture producing area of Jepara in Central Java, Indonesia found that most furniture producing small- and medium-size enterprises (SMEs) in the region are interconnected with buyers through directed and hierarchical types of governance networks, which are centralised to either domestic brokers or exporters. Centralised networks are too brittle for SMEs to adapt to new conditions. In 1998, the region's furniture industry experienced a massive collapse, threatening not only economic, but also environmental sustainability. The collapse suggested that decentralising interconnectedness by giving SMEs more 'autonomy' to govern value chains was necessary to increase the adaptive capacity of Jepara's furniture industry. One way of doing so was through the use of information and communications technology (ICT). Consequently, a collective marketing portal (http://www.javamebel.com) was developed, aimed at facilitating SMEs in Jepara to market their products collectively and link them directly to potential buyers, with the domestic niche market as its main target. This study evaluates the 'usefulness' of the portal from the SMEs' perspective as well as appropriate institutions for its management. In addition to employing online statistical data, the study involved field surveys to investigate factors constraining marketing through the portal. Eighty-five days after its launch, *javamebel* had attracted relatively few SMEs and potential buyers. Though this is quite normal for a new innovation, we did establish that the portal's 'usefulness' was determined by cohesiveness among SMEs, social resistance and buyer-seller trust. This suggests that in order to develop, the portal should improve its 'orgware', the institutional settings governing rules and incentive structures for the development and employment of technology, demanding continuous inputs via investments and appropriate incentives structures. We believe that campaigning, capacity building, equipment grants and extensions for stimulating expectations of the social benefits of collective action will accelerate the achievement of this goal.**

Keywords: adaptive capacity, interconnectedness, Jepara, marketing portal, small-scale furniture producers

I. INTRODUCTION

Today, our lives in this global interconnected civilisation can seem quite horrible; collapse in one region can trigger further collapses elsewhere (Costanza *et al.* 2005). Due to the complexity of interconnectedness, once a collapse occurs, it is hard to find those causes most responsible. Everyone can be a cause, and everyone can be responsible, and consequently, everyone tends to be irresponsible. Beck (1998) termed this the 'organised irresponsibility' of a 'risk society'.

In fact, collapse is a natural phenomenon that can occur in any system (Holling 2001). Collapse is almost inevitable, and most collapses are externalities of decisions. Collapse is a process of finding a new equilibrium to survive. So, adaptive capacity; resilience to recover from collapse is much more important than just worrying about the collapse itself. Thus, when interconnectedness can amplify collapse, we also believe that interconnectedness can amplify reorganisation of a collapsing system by amplifying its resilience. Interconnectedness can be a 'weapon' to create a massive collapse, but it can also be a 'tool' to develop a massive new hope.

Jepara in Central Java, Indonesia is a large agglomerated area of wood-based furniture industries (Figure 1) populated mostly by small- and medium enterprises (SMEs) (Purnomo *et al.* 2009a, b). Previous value chain analysis (VCA) studies found that SMEs are mostly interconnected with buyers through directed and hierarchical types of governance networks, which are centralised to either domestic brokers or exporters (Purnomo *et al.* 2009a, b). Since the networks are centralised, they are too brittle for SMEs to adapt to the new conditions. In 1998, the region's furniture industry experienced a massive boom bust (Purnomo *et al.* 2009b), threatening not only the sustainability of the region's economy, particularly its SMEs, but also the sustainability of its environment (through timber plantations). The collapse suggested that decentralising interconnectedness by giving SMEs more 'autonomy' to govern value chains was necessary to increase the adaptive capacity of Jepara's furniture industry. One way of doing so was through the use of information and communications technology (ICT).

A recent study concluded that the adoption of ICT by SMEs in Jepara had the potential to create a wider socio-economic gap, mainly due to a positive feedback loop between financial capital and accessibility to ICT leaving the poor trapped in poverty (Irawati and Suyamto 2010). A further conclusion from this study suggested that strengthening collaboration among SMEs at the community level could potentially mitigate the gap through the sharing of financial, knowledge and physical capitals, potentially amplifying the adaptive capacity of SMEs.

A collective marketing portal (http://www.javamebel.com) was developed, aimed at facilitating SMEs in Jepara to market their products collectively and link them directly to potential buyers, with the domestic niche market as its main target. This paper presents the results of our study to evaluate the 'usefulness' of the portal from the SMEs' perspective and find appropriate institutions for its management.

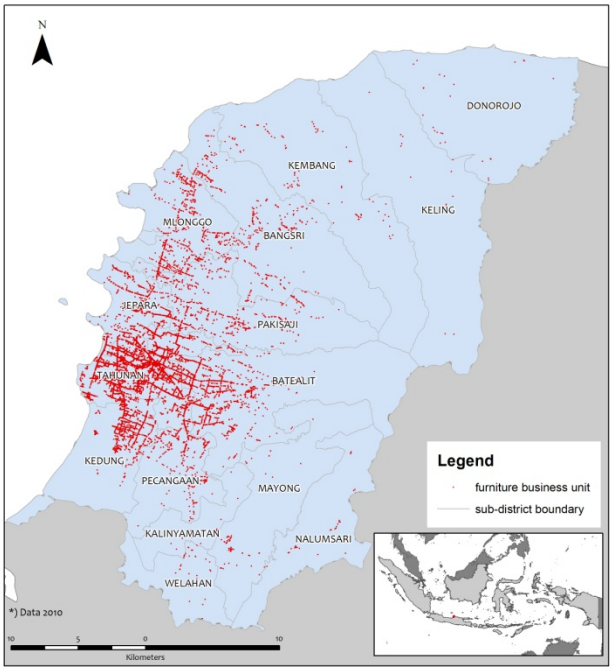


Figure 1. Spatial distribution of furniture industries in Jepara, Central Java, Indonesia

II. METHODOLOGY

A. *Developing a collective marketing portal*

The development of the collective marketing portal (http://www.javamebel.com) discussed in this paper was part of the action research conducted under the Furniture Value Chain (FVC) Project (http://www.cifor.cgiar.org/furniture), aiming to test our hypothesis that: 'decentralising the interconnectedness between SMEs and the end buyers can be done using ICT'. In order to test this hypothesis in a framework of adaptive action research, we had to initiate development of a portal based on general requirements without immediately involving SMEs, on the assumption that their attention would initially be rather weak (Roelofsen *et al.* 2010). Subsequently, the portal was evaluated and refined using a participatory approach based on feedback from SMEs. The approach used for developing the portal had to be relatively adaptable to possible changes in users' needs in the future.

There are two main approaches recognised in software engineering projects: the waterfall approach (Dorfman 1997, van Vliet 1999) and the prototyping approach (Blum 1992, van Vliet 1999). The waterfall approach comprises a stepwise process, which is relatively rigid in that it ignores the changing needs from the beginning, and the process is neither responsive nor flexible to users' feedback (Figure 2). The prototyping approach is relatively adaptive, it allows users to evaluate the software with regards to users' needs, as well as feasibility and performance issues (Figure 3). A possible problem using the prototyping approach is that users often treat the prototype as the final product. However, this problem can be reduced through intensive interaction with users.

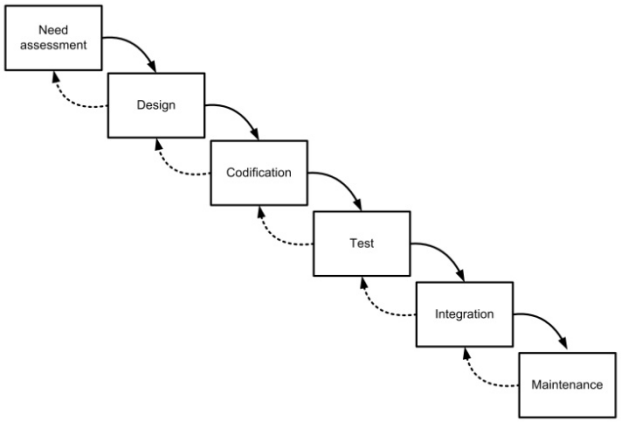


Figure 2. The waterfall approach in software engineering. Adapted from Dorfman (1997)

We used the prototyping approach in developing the marketing portal using Joomla (http://www.joomla.org) and VirtueMart (http://www.virtuemart.net), due to their ease-of-use and extensibility. In addition, both Joomla and VirtueMart are free and open source software under GNU/GPL license, thus we were not restricted by copyrighting issues during development. Joomla is a PHP/MySQL-based Content Management System (CMS), while VirtueMart is a Joomla-based e-commerce development tool.

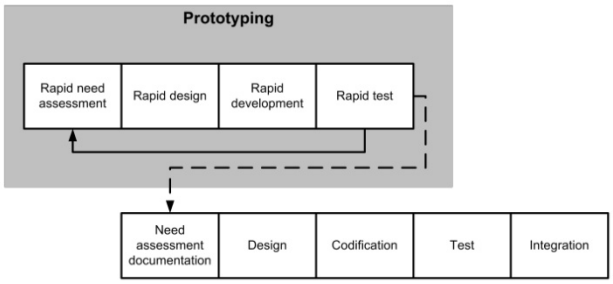


Figure 3. The prototyping approach in software engineering. Adapted from van Vliet (1999)

B. *Evaluating an action*

Evaluating an action can be done either through verification or validation (Blum 1992, van Vliet 1999). Verification should check if the action solves the recognised problem according to our current knowledge; while validation should check if the action solves the right problem from the real world (Figure 4). If an action is verified, then a valid action implies 'the recognised problem is the right one'. An adaptive action should be responsive either to verification or validation results.

An action should be considered a subset of knowledge, not the real world. Action research is a learning effort to update our knowledge about the real world by exploring whether a recognised problem can be solved using an action. Thus, action research is a hypothesis to be tested directly in a living laboratory.

The main reason for developing the marketing portal for SMEs in Jepara has been explained. In this case, the recognised problem is that the interconnectedness between SMEs in Jepara and markets have so far been centralised to brokers and exporters, and is not resilient (Purnomo *et al.* 2009a, b). Therefore, this study aimed to verify whether our action solved the autonomy problem for SMEs in selling their products.

However, the recognised problem might not reflect the right problem. In our case, the right problem could be related to the institutional capacity of SMEs in managing the portal or any other factors constraining marketing using the portal, which are usually only revealed after an initial action is taken. So, the study also aimed to validate our action and determine whether it solved the right problem. In addition to employing online statistical data, the study involved field surveys to investigate the constraining factors for marketing using the portal, including those related to institutional capacity.

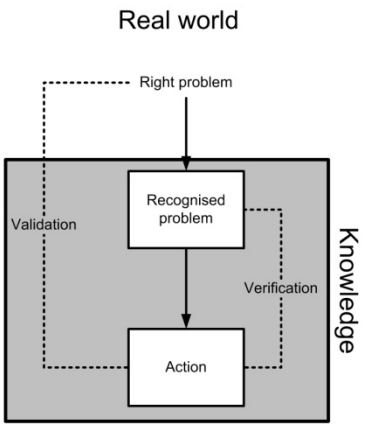


Figure 4. Problem, action and evaluation. Adapted from Blum (1992)

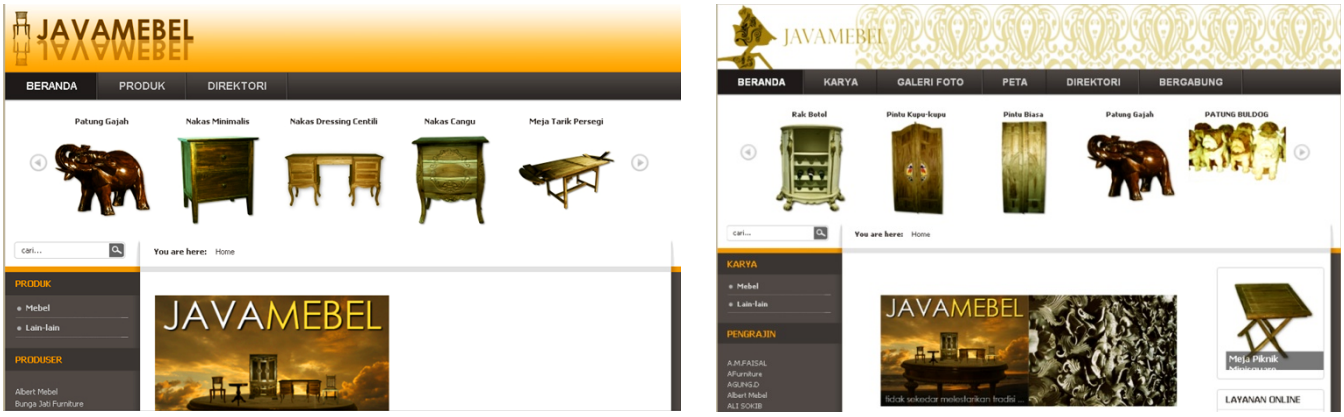
III. RESULT AND DISCUSSION

A. *Life cycle*

The first prototype of the portal was launched on the Internet on 3 June 2010. Initial development took approximately 19 working days. Feedback from SMEs in Jepara was acquired afterwards; the first was 7 days after launching through a stakeholders' meeting, and the second was 52 days after launching through a focus group discussion (FGD). The front page of the portal is shown in Figure 5.

The basic needs in developing the first prototype were assessed based on progress from the catalogue development activity; another action-based activity under the FVC Project. During this initial phase, the content of the portal comprised information on products and producers as well as a directory of relevant links (Figure 6). This required two main features: content display and search (Figure 7).

The first refinement took place after the initial feedback, the main objectives being to: (i) increase the number of participating SMEs and their products; (ii) increase the number of visitors (potential buyers); (iii) provide online support; and (iv) protect the content, especially product images, either from copying or downloading. To achieve the first objective, an online registration and product submission form was provided (Figure 6, 7). To achieve the second objective, in addition to adding content with an online furniture map (Figure 6), communications took place either through Facebook or direct communication (Figure 8).



A **B**

Figure 5. Front page of the portal: (A) the initial prototype; and (B) the recent prototype

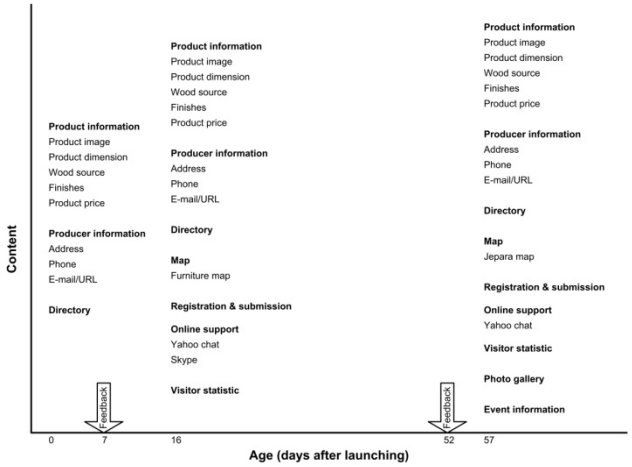


Figure 6. Content changes to the portal following collective feedback from SMEs during its development

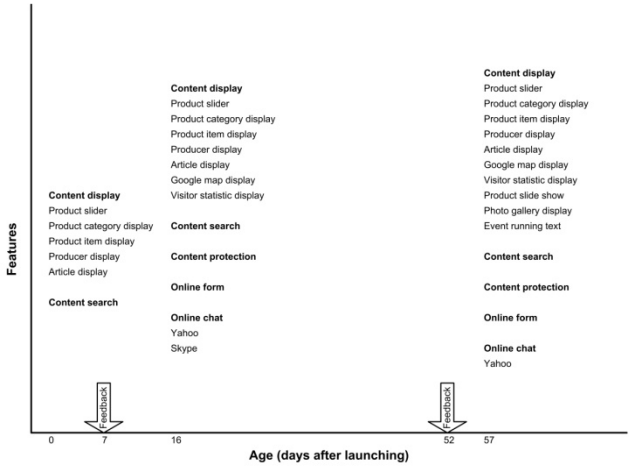


Figure 7. Changes to the portal's features following collective feedback from SMEs during its development

To achieve the third objective, online support was provided for using Yahoo or Skype, which were employed by four SMEs (Figure 6, 7). To achieve the fourth objective, a Joomla plug-in was installed for content protection (Figure 7). During this phase, three SMEs with basic web-based application skills were assigned as local administrators (Figure 9). Starting from this phase, a module was installed to record visitor statistics and monitor performance of the portal (Figure 6, 7).

The later feedback still discussed how to better achieve the first and the second objectives of the first refinement. During this phase, a photo gallery was added portraying SMEs in Jepara to attract public awareness (Figure 6, 7). Collateral communication was expanded through Twitter, blogging, photography portals and T-shirts (Figure 8). Other media such as flyers, stickers, souvenirs, radio spots, and cultural/historical/tourism communities are among the targets of promoting the portal through collateral communication. However, due to limited resources these did not take place within this study timeline.

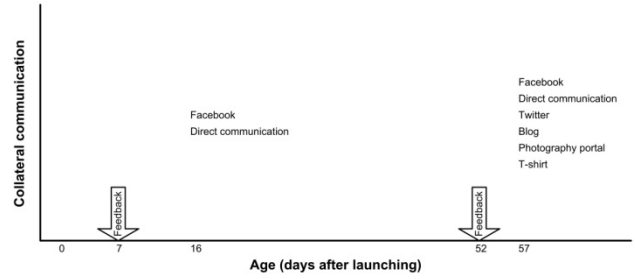


Figure 8. Collateral communication made to promote the portal

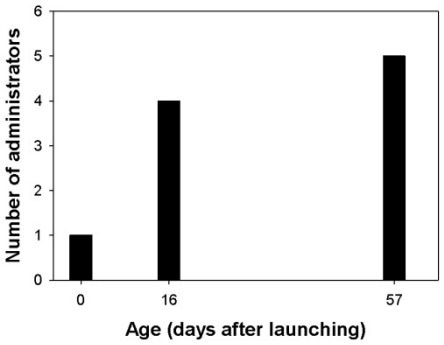


Figure 9. Number of administrators managing the portal since its launch

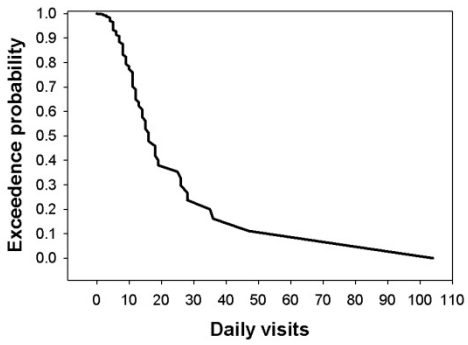


Figure 10. Exceedence probability of daily visits

B. *Verification*

As explained earlier, the study aimed to establish whether the portal was solving the autonomy problem for SMEs in selling their products. In order to do so, we had to measure: (i) whether the SMEs were interested in using the portal for marketing their products and if the portal had a significant impact in terms of actual sales resulting from advertising using the portal; and (ii) whether the portal had managed to attract a wider range of buyers.

1) *The portal's attractiveness for SMEs*

At 85 days after launching, the incremental rates of participating SMEs and submitted products were still relatively low: about 0.21 SMEs per day and 0.35 items per day respectively. Though mean product sales using the portal were about IDR 435,294 per day (Table 1). Here, participating SMEs' cumulative product sales were calculated based on their transactions with new rather than existing buyers, and summarised from only two transactions as reported.

TABLE 1. INDICATORS USED TO VERIFY THE PORTAL

Indicators \ Age (days after launching)	0	85
Number of participating SMEs	17	35
Number of products	50	80
Cumulative product sales (IDR x million)	0	37

A relatively low incremental rate of participating SMEs and submitted products is normal for an early phase of innovation diffusion. A parallel study by Irawati and Suyamto (2010) identified that lack of capital (financial, knowledge or infrastructure) can hamper adoption.

2) *The portal's attractiveness for visitors*

Mean daily visits to the portal were around 13. At a relatively high probability of about 0.92, the number of visits could only exceed 6 visits in a day (Figure 10), which is relatively low. Most visitors (69.73%) accessed the portal from Indonesia (Figure 11), since it is currently in Indonesian. However, Figure 11 suggests that a wider range of potential overseas buyers (about 11.57% from USA, and 6.81% from other countries) had accessed the portal.

Figure 12 shows that most visitors (57.88%) were attracted to the products. We assume they are potential buyers. When we reconciled this evidence with the fact that the number of actual transactions (2) was relatively low, it suggests that furniture products are not readily advertised using online media, in the way that software, books, electronics and music are (Shun and Yunjie 2006 in Dejan 2007), since they require further inspection.

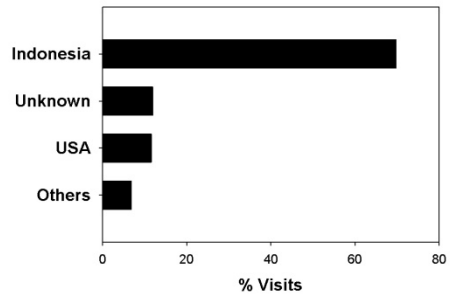


Figure 11. Geographical distribution of visitors

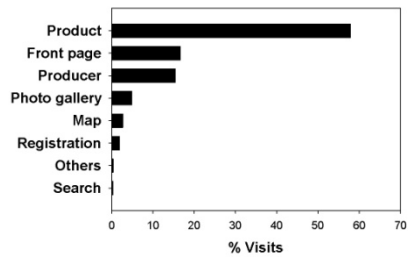


Figure 12. Statistics on page hits

C. *Validation*

The study also aimed to validate whether the portal solved the right problem. In other words, it explored whether the autonomy problem the portal aimed to solve was the right problem. The right problem could be another one constraining the portal's application only revealed once the portal had been developed.

We identified other problems as follows: (i) cohesiveness among SMEs; (ii) social resistance; and (iii) buyer-seller trust. At low levels of internal connectedness among SMEs, high social resistance, and low trust between buyers and sellers, the autonomy problem is not the right problem for

resolution using the portal. With such conditions, the portal (the action) is seemingly useless.

1) Cohesiveness

Participating SME submitted a relatively unequal number of products (Figure 13). About 11% of advertise their products through their own websites (Figure 14). Their relative share on *javamebel* was about 23% on average, ranging from 1% to 50% (Figure 15). Their share on *javamebel* was inversely proportional to the number of products advertised in their own websites.

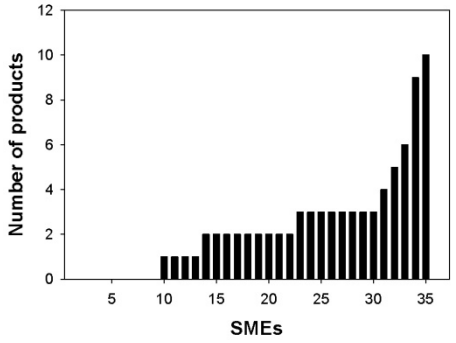


Figure 13. Number of products submitted in the portal by SMEs

We thought that SMEs' internal connectedness could be maintained through altruistic behaviour: the rich sharing capital with the poor. However, the above evidence confirms that altruistic behaviour is in fact determined by perceived cost and benefit (Bowles 2006). Moreover, sharers may gain psychological benefit from sharing expertise, but those who share frequently may carry a heavy burden (Constant *et al.* 1994).

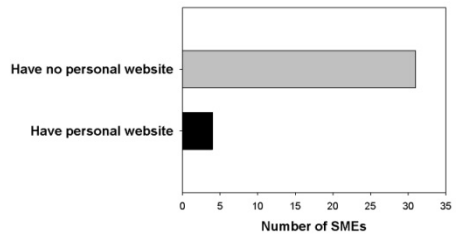


Figure 14. Distribution of participating SMEs based on their ownership of personal websites

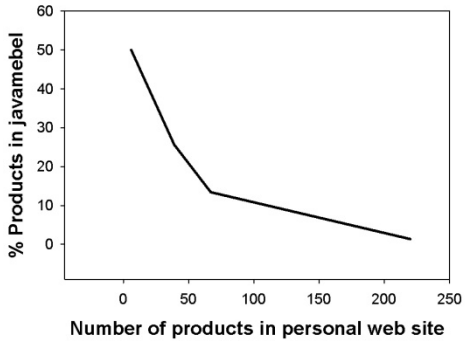


Figure 15. Correlation between the number of products advertised on personal websites and relative share on *javamebel* (%), calculated from participating SMEs with personal websites

2) Social resistance

In their attempts to make sense of a world of complex stimuli, perceivers regularly construct and use categorical representations (*e.g.* stereotypes) in their dealings with others. Given basic information-processing limitations and a challenging social environment, perceivers need some way to simplify and streamline the demands of the person perception process. This they achieve through the activation and implementation of categorical thinking (Macrae and Bodenhausen 2001). On the day when *javamebel* was promoted to a photography community, the number of visits increased to 104, but soon returned to normal (Figure 16). This was mainly due to categorical thinking suggesting that a marketing portal is purely profit-oriented.

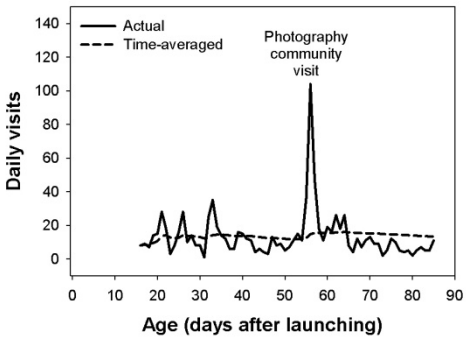


Figure 16. Photography community's social resistance to *javamebel*

3) Trust

Trust determines the quality of interconnectedness between buyers and sellers. Buyers' key criteria in selecting sellers are delivery performance and relative price/cost (Doney and Cannon 1997). However, trust of the enterprise and trust of the seller (operating indirectly through enterprise trust) do increase the likelihood that buyers anticipate doing business with the enterprise in the future. Although trust of the enterprise directly influences future purchase intentions on the basis of its characteristics (*e.g.* size) and actual behaviours (*e.g.* investing in customer-specific assets), trust of the seller is an important factor in building trust of the enterprise. 'Reputation' is a word which denotes the persistence of quality of goods provided by the sellers, and reputation commands a price (or exacts a penalty) because it economises on search (Stiegler 1961).

The unclear information on product prices provided in the portal reflects such a phenomenon. The purchase of a total order of about IDR 15 million calculated by a potential buyer based on the price information in the portal, fell through when the SME recalculated and asked for an additional 51-83%.

This suggests that trust can be developed by providing 'credible' information. Here, credibility is defined as what you see in the advertisement is what you get. It covers not only the information about price, but also quality, finishes and delivery time.

D. Can the portal eliminate the marketing constraints facing SMEs?

Based on the results of verification and validation, we can say that the portal is currently neither a pure problem solver nor a pure problem recogniser, but is something in between. If we plot this position on a map depicting the degree of consensus about values and consensus in knowledge of the stakeholders (de Vries 2005), we have a further conclusion that, as an action, the portal is shaped by a medium degree of consensus on values and a medium degree of consensus on knowledge (Figure 17). In our case, consensus on values is reflected by cohesiveness, social resistance and trust. To shift the position of the portal to one of a problem solver, the degree of consensus about values and consensus in knowledge should be improved. This applies not only to the improvement of 'software' per se, but also the improvement of 'orgware'; the institutional settings governing rules and incentive structures for the development and employment of technology (Gruebler 1998). It requires continuous inputs via investments and appropriate incentive structures (Dearing *et al.* 2005). We believe that campaigning, capacity building, equipment grants and extensions for stimulating expectations of the social benefits of collective action will accelerate the achievement of this goal.

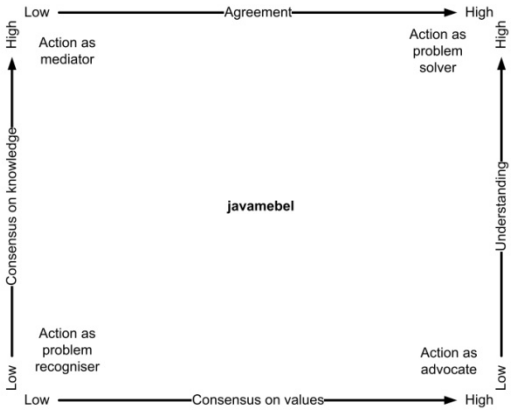


Figure 17. Relative position of *javamebel* as an adaptive action research with regards to the degree of consensus about values and consensus in knowledge of the stakeholders (either SMEs or potential buyers). Adapted from de Vries (2005)

E. Can the portal transform social interaction among SMEs?

A bandwagon effect may occur in innovation diffusion at the institutional level, whereby the sheer number of organisations adopting an innovation prompts other organisations to do the same (Abrahamson and Rosenkopf 1993). The portal discussed in this study can be considered a demonstration of ICT application, which started from a small group of SMEs in Jepara, i.e. an association of small- and medium-scale furniture producers.

We believe that it can prompt other SMEs to adopt or adapt the innovation, either through the existing organisation or others; and perhaps it can also prompt other SMEs to form new organisations. Through a participatory approach involving SMEs in managing the portal, we also expect a transfer of know-how, enabling SMEs to build their adaptive capacity to a 'new way of marketing'. This includes not only issues of portal maintenance, but also of product quality control and fund raising.

Further research is needed to evaluate the diffusion of this innovation on a larger scale. The study should measure the interconnectedness between possible emergent groups, since this one has verified that a low social opinion (consensus on values) can block the diffusion of innovations that bring individual benefits because it prevents good diffusion of information. In particular, the influence of the social opinion on the diffusion of information is a feature that explains the difficulty of diffusing innovations that have a low social image, even though they bring an objectively significant improvement to individual well-being (Deffuant *et al.* 2005).

IV. CONCLUSIONS

- The study suggests that the prototyping approach is appropriate for developing marketing portals with stakeholder involvement, since it is flexible enough to respond to feedback and possible changes by stakeholders. In this case, employing easy-to-use development kits like Joomla and VirtueMart was necessary for involving stakeholders in the next cycle of development.

- Eighty-five days after its launch, *javamebel* had attracted relatively few SMEs and potential buyers. Though this is quite normal for the early phase of innovation diffusion, we did establish that the portal's 'usefulness' was determined by cohesiveness among SMEs, social resistance and buyer-seller trust. This suggests that in order to develop, the portal should improve its 'orgware', the institutional settings governing rules and incentive structures for the development and employment of technology, demanding continuous inputs via investments and appropriate incentives structures. We believe that campaigning, capacity building, equipment grants and extensions for stimulating expectations of the social benefits of collective action will accelerate the achievement of this goal.

- A further conclusion of this study is that the portal is currently available as a demonstration, which could prompt other SMEs to adopt or adapt the innovation, either through the existing organisation or others; and perhaps it can also prompt other SMEs to form new organisations. Thus, further research is needed to evaluate the diffusion of this innovation on a larger scale. The study should measure the social dynamics emerging as a result of this innovation.

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