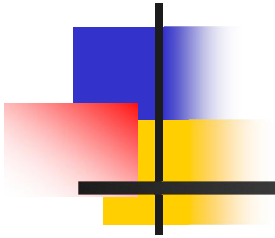


Apply Wiki for Improving Intellectual Capital and Effectiveness of Project Management at Cideco Company



Sanjay Misra
Tra Nuong Tran
Quoc Trung Pham



Outline of the research

- Introduction;
- Research method;
- Literature review;
- Problems of project management at Cideco;
- Select & implement a demo wiki;
- Experimentation and results;
- Conclusion



1. Introduction

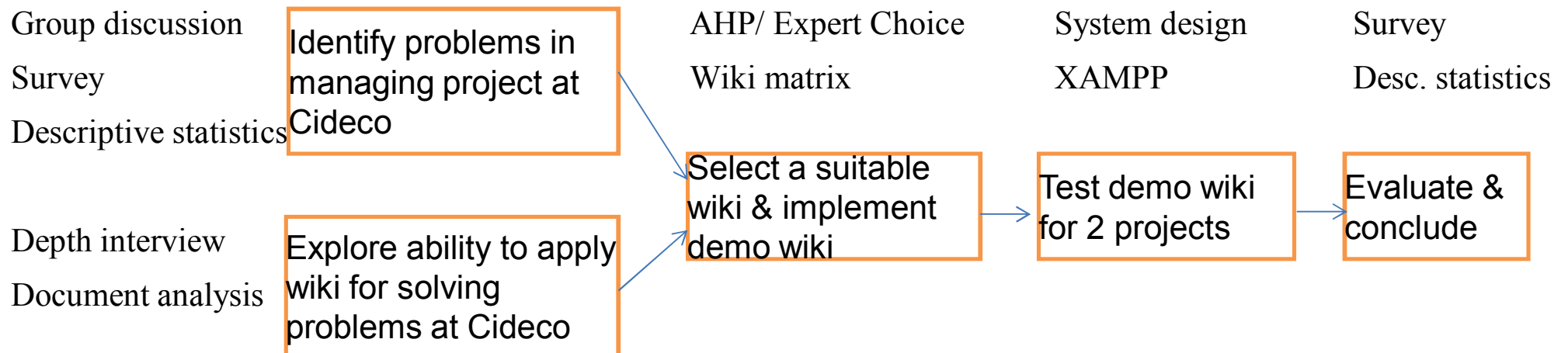
- Cideo [3] is a Vietnamese SME in construction industry, a knowledge intensive area. Main business area of Cideco is consulting and designing service. In the current economic crisis, Cideco is cutting its cost and facing difficulties in maintaining its human resource.
 - Recently, Cideco applied new policy of cutting salary & working hours by 50%. This causes big problems to Cideco for holding intellectual capitals & maintaining effectiveness of project management.
 - Wiki is one of Web 2.0 technologies, which could help to capture knowledge resources, and to improve the effectiveness of project management -> applying wiki in Cideco could be a solution.
- => Main purpose of this research is to apply Wiki for improving IC & effectiveness of PM at Cideco and to evaluate the solution in practice.

2. Research method

■ Data collection :

- Secondary data: literature reviews, scientific journals, papers, related materials from the internet, internal documents of Cideco company...
- Primary data: expert interviews, questionnaires, discussing about possibility and feasibility of suggested solution in practice.

■ Research process :





3.Literature review (1)

- Knowledge is defined as “justified belief”. Nonaka [17] also clarified that knowledge is a dynamic process of human beings for proving personal belief and truth. Polanyi [21] classified knowledge into 2 groups: (1) tacit knowledge, which is located in human brain and difficult to capture, and (2) explicit knowledge, which is easier to capture and to present. Knowledge management is a process of realizing, sharing, using and practicing knowledge inside of an organization [4].
- According to Brooking [2], intellectual capital is a collection of intangible assets of an organization. According to Roos [23], intellectual capital includes: human capital, relational capital, and structural capital (business process, learning and innovation capability).

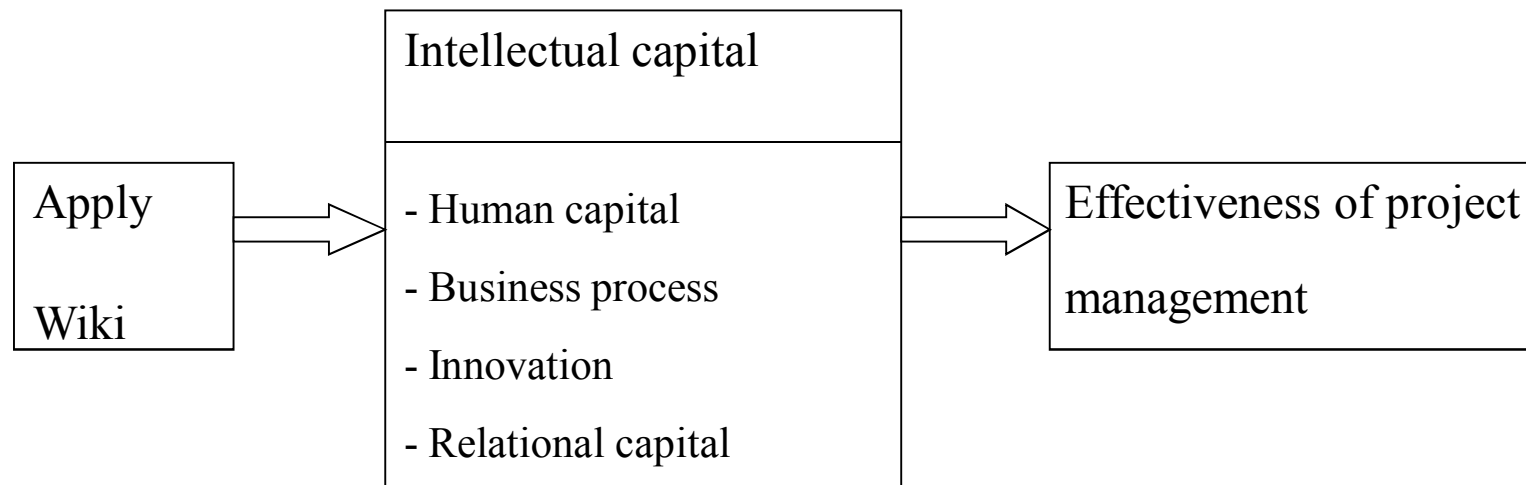


3.Literature review (2)

- Wiki was created by Ward Cunningham and appeared the first time in 1995. According to Leuf & Cunningham [10], wiki is an extensible collection of linked web pages, which could be edited easily by end-users.
- According to Grace [6], wiki has following characteristics:
 - Easy to edit by end-users, who are not necessary to know about HTML or programming language.
 - Hyperlinks & references to internal/external web-pages help readers understanding topic clearly.
 - Version management supports multi-users collaboration by recording different versions.
 - Supporting search function for finding contents inside of wiki.
- According to Amalia [1], wiki helps to increase the readiness of project participation, to stimulate self-learning, and to improve business performance.
- Besides, according to Pham [19], wiki technologies, which belongs to web 2.0, could be a suitable platform for managing knowledge successfully and improving labor productivity of Vietnamese SME.

3.Literature review (3)

- According to Lock [12], traditional way of thinking about success of a project is based on 3 constraints: on time, within budget and high quality.
- In this research, the effectiveness of a project is measured using measurement of Lei & Skitmore [9], which is based on feedback of project manager and recorded data of the project about: reduce time, reduce cost (training, redesigning, managing, outsourcing), and reduce problem occurred (internal, external).
- The research model is summarized in the following figure.



4. Problem of project management at Cideco company (1)

- Cideco [3] is a Vietnamese Construction Consulting & Designing Company, which is located in Binh Thanh District, HCMC. Main business services of Cideco are: Consulting and managing construction projects; Project planning and evaluating; Designing and constructing.
- Designing department of Cideco has 5 groups (project creating, project planning, architecture, infrastructure, component), with about 50 employees, who are well-educated (greater than 90% got a bachelor degree or higher) and experienced in different areas.
- Currently, technical tools for storing and sharing project data of Cideco are ineffective. Some problems could be easily realized in discussing with project members, such as: (1) difficult for searching related documents, (2) high probability of duplicate and overwritten, (3) difficult in protecting project documents from unexpected readers.

4. Problem of project management at Cideco company (2)

- In this research, interviews with employees and managers of Designing department are also conducted for understanding problems in managing knowledge resources and intellectual capital.
- Some main problems are realized and summarized as follows: (1) Storage architecture are complicated; (2) High cost for re-printing documents; (3) Waste of time for finding knowledge; (4) Ineffective in knowledge sharing; (5) Data storage consumes a lot of memory.
- Besides, a survey using 5 points Likert measurement scale had been conducted for measuring intellectual capital and effectiveness of project management at Cideco. Questionnaire for the survey was built based on measurement scale of Roos [23] and Lei & Skitmore [9]. Respondents are 20 employees of Designing department. The results are summarized in following tables.

4. Problem of project management at Cideco company (3)

Table 1. Current status of intellectual capital at Cideco

Intellectual capital	Mean	Stdev.
Knowledge captured	1.3	0.47
Knowledge sharing group	1.5	0.76
Network partner relationship	1.7	0.92
Number of experts	1.8	0.77
Co-operation	2.2	0.95
Information flow	2.3	1.17
Specialization	2.4	0.94
Customer relationship	4.1	0.97
Average	2.1	0.87

Table 2. Effectiveness of project management at Cideco

Effectiveness of PM	Mean	Stdev.
Reduce management cost	2	0.79
Reduce training cost	2.1	0.72
Reduce internal conflicting	2.2	0.83
Reduce cost for redesigning	2.6	0.68
Reduce cost for outsourcing	2.9	0.85
Reduce external problems	3.5	1.00
Finish project on time/ early	3.9	0.72
Average	2.7	0.80

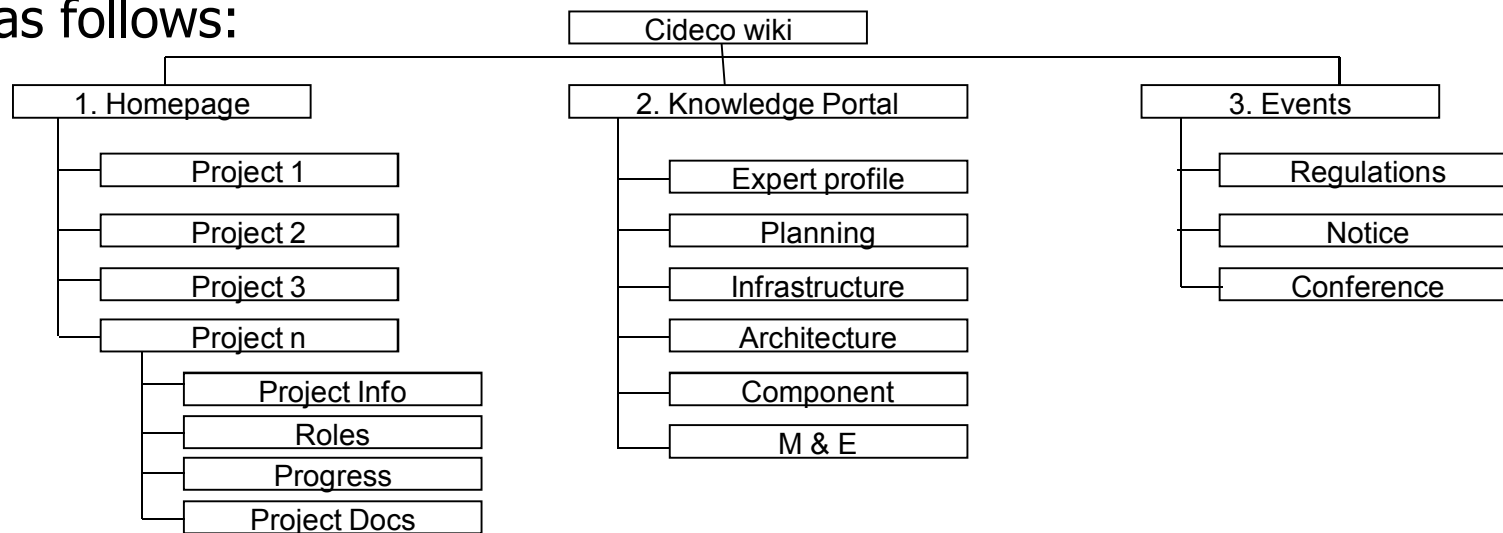
5. Select & implement a demo wiki (1)

- To select a suitable wiki for testing, a list of most popular wikis will be compared based on some criteria. This list includes MediaWiki, MoinMoin, PmWiki and Twiki.
- AHP method is used for deciding which wiki is the most suitable one.
- Criteria & weighting of factors are set by managers of IT department & Designing department.
- Finally, MediaWiki is chosen as the most suitable one for solving problems of Cideco

Solutions	Overall score	System requirement (L: .402)	Data Storage (L: .196)	Security (L: .311)	Special features (L: .536)	Developing/Supporting (L: .115)	Web link (L: .093)	Media & Files (L: .257)	Syntax feature (L: .667)	Utilities (L: .333)
MediaWiki	0.35	1.00	0.78	1.00	0.78	1.00	0.32	0.46	1.00	1.00
Twiki	0.29	1.00	0.46	0.81	1.00	0.47	1.00	0.37	0.52	0.31
MoinMoin	0.23	1.00	1.00	0.51	0.31	0.21	0.77	1.00	0.40	0.58
PmWiki	0.13	1.00	0.56	0.58	0.23	0.18	0.48	0.14	0.25	0.31

5. Select & implement a demo wiki (2)

- A demo wiki was built based on MediaWiki, using Xampp [24]. Xampp integrated necessary tools for managing an intranet, such as: Apache web server, PHP, Perl, MySQL DBMS, and phpMyAdmin tool for managing database and website.
- Main functions of demo wiki: (1) Access project information (roles, plan, progress, documents...), (2) Support learning & storing lessons (expert profile, case base, forum, experience), & (3) Access general information (regulations, events...).
- To support 3 functions above, Cideco wiki contents must be classified into 3 groups, including (1) Homepage, (2) Knowledge portal, & (3) Events. The structure of demo wiki is as follows:





6. Experimentation & results (1)

Experimentation design

- Time for experimentation: from Jan 2013 to March 2013
- The demo wiki will be applied for 2 projects: Police University, Eastern Hospital. These projects are long-term projects (>3 years) and follow standard business process of Cideco.
- General information of these 2 projects are summarized as follows:
 - Police University Project: area 17.6 ha, dormitory (6 blocks), lecture room (4 blocks), center (1 block). Main activities: project planning (4 people), infrastructure (4 people), architecture (4 people), component (2 people). Progress: 50%.
 - Eastern Hospital Project: scale 1000 beds, building (8 blocks). Main activities: architecture consulting (20 people), planning (3 people), infrastructure (4 people), M&E (4 people), component (8 people). Progress: 25%.



6. Experimentation & results (2)

Plan for apply demo wiki in Cideco through pilot projects

- System setup: build up system, create project template, and input general contents (from 7-Jan to 12-Jan).
- Data conversion: input current data from old server to demo system for each project (from 14-Jan to 26-Jan).
- Training: combination of training courses and self-learning based on documents/regulations (from 14-Jan to 16-Feb).
- Testing: using demo wiki for project works (18-Feb to 18-March)
- Evaluation: getting feedbacks from employees and managers of 2 pilot projects (interviews, questionnaires). Measuring 2 dimensions: intellectual capital and effectiveness of project management. Comparing these results with the old ones (before applying wiki).

6. Experimentation & results (3)

- After applying demo wiki for 2 pilot projects, a survey is conducted for collecting data from project members. Some results could be summarized as follows.

Intellectual capital	Before		After	
	Mean	Stdev.	Mean	Stdev.
Knowledge captured	1.30	0.47	2.85	1.04
Knowledge sharing group	1.50	0.76	2.55	0.89
Number of experts	1.80	0.77	2.65	0.75
Information flow	2.30	1.17	3.15	1.14
Co-operation	2.20	0.95	3.20	0.95
Specialization	2.40	0.94	2.50	0.83
Customer relationship	4.10	0.97	4.00	0.86
Network partner relationship	1.70	0.92	3.15	0.88
Average:	2.16	0.87	3.01	0.92
Effectiveness of PM	Mean	Stdev.	Mean	Stdev.
Reduce management cost	2.00	0.79	2.95	1.10
Reduce training cost	2.10	0.72	2.75	1.21
Finish project on time/ early	3.90	0.72	3.95	0.94
Reduce cost for outsourcing	2.90	0.85	2.95	0.94
Reduce cost for redesigning	2.60	0.68	3.25	0.91
Reduce internal conflicting	2.20	0.83	3.05	1.10
Reduce external problems	3.50	1.00	3.35	0.88
Average:	2.74	0.80	3.18	1.01



6. Experimentation & results (4)

Experimentation results

- In summary, above numbers showed that wiki helps to increase both intellectual capital and effectiveness of project management (>3).
- In comparison between 2 projects, effectiveness of project management of Police University project is better than of Eastern Hospital project. The number of data accessing and discussing through demo wiki of the 1st project is 3 times higher than the 2nd one. The main reason could be in the motivation of project members. The manager of the 1st project is realized more actively in encouraging his members. Therefore, beside technical issues, management policy for encouraging participation should be considered in applying this solution in practice.
- In general, testing results proved the possibility and feasibility of applying wiki for improving both intellectual capital and effectiveness of project management of Cideco in a long-term. It can also be considered to apply for the whole company for a better result.



7. Conclusion (1)

- Firstly, this research found some difficulties of project management of Design department at Cideco company through internal data analysis and interviews with projects' members. The most problem is found to be a lack of technical platform for managing intellectual capital. Quantitative results showed that intellectual capital and effectiveness of project management at Cideco are at a low level (<3).
- Secondly, from previous researches and analysis results, wiki is found to be a suitable solution for solving current problems at Cideco Company because of its ability in capturing knowledge resources, sharing project works, and facilitating collaboration.
- Based on user requirements and technical criteria, MediaWiki is selected as a suitable platform for building a demo wiki. This demo wiki is implemented and tested with 2 pilot projects for evaluating the real effects of suggested solution. Experimentation results showed that demo wiki can help to improve intellectual capital and effectiveness of project management at Cideco company to a higher level (>3).



7. Conclusion (2)

- Although applying wiki in practice requires some other attentions, such as: training, creating motivation, and changing organizational culture... The pilot projects proved that wiki could be applied at enterprise-wide level for solving current problems in managing intellectual capital and project management at Cideco company.
- However, this research also has some limitations, such as: small sample size, subjective feedback from respondents, short testing time... These limitations should be improved for a better result.
- Some directions for future researches include:
 - apply wiki at an enterprise-wide level of Cideco company, or test the demo wiki in various companies;
 - change the measurement scale for a more accurate feedback;
 - collect more data for testing the cause and effect relationship between wiki use, intellectual capital, and effectiveness of project management.



Reference (1)

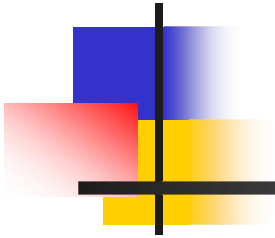
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Thank you very much !!!



Questions & Answers